

辛 春 辛天闻 编著

# 临床实用 影像解剖 彩色图谱



北京大学医学出版社

责任编辑：韩忠刚

封面设计： 设计

# 临床实用 影像解剖彩色图谱

ISBN 978-7-81116-991-1



9 787811 169911 >

定价：88.00元

# 临床实用影像解剖彩色图谱

辛春 辛天闻 编著

北京大学医学出版社

## 图书在版编目 ( CIP ) 数据

临床实用影像解剖彩色图谱/辛春, 辛天闻编著.

—北京: 北京大学医学出版社, 2010.9

ISBN 978-7-81116-991-1

I. ①临… II. ①辛… ②辛… III. ①影象—人体解剖学—图谱 IV. ①R813-64

中国版本图书馆CIP数据核字 (2010) 第161839号

## 临床实用影像解剖彩色图谱

---

编 著: 辛春 辛天闻

出版发行: 北京大学医学出版社 (电话: 010-82802230)

地 址: (100191) 北京市海淀区学院路38号 北京大学医学部院内

网 址: <http://www.pumpress.com.cn>

E-mail: [booksale@bjmu.edu.cn](mailto:booksale@bjmu.edu.cn)

印 刷: 北京画中画印刷有限公司

经 销: 新华书店

责任编辑: 韩忠刚 责任校对: 金彤文 责任印制: 张京生

开 本: 787mm×1092mm 1/16 印张: 17 字数: 220千字

版 次: 2010年9月第1版 2011年1月第2次印刷 印数: 2001-4000册

书 号: ISBN 978-7-81116-991-1

定 价: 88.00元

版权所有, 违者必究

(凡属质量问题请与本社发行部联系退换)

## 作者简介

江苏省盐城卫生职业技术学院影像系 辛春  
手机: 13401750759; E-mail: x3c3j3@163.com

辛春,男,江苏省盐城市人,生于1962年2月。1987年7月毕业于苏州医学院临床医学专业,获学士学位,同年被分配到盐城卫生学校任教《放射解剖学》和《X线诊断学》。2006年被评为影像诊断学副教授。

2006年8月任江苏盐城卫生职业技术学院影像系副主任。2008年7月29日被聘为全国医学影像职业技术教育研究会第五届二次教学研究委员会常委,影像诊断组副组长。2009年5月23日当选为“全国医学高职高专教育研究会医学影像教育分会”第一届委员会常务委员。

2000年被评为“盐城市中等职业学校第二批医药卫生学科”教学能手。2003年11月20日被评为“南京医科大学成人高等教育”优秀教师。2005年被评为“江苏省卫生职业教育”学科带头人。

2001年2月独自编写《X线诊断学(含CT)》影像高职版校本教材(上册)。2009年1月和阮先会、张照喜共同主编《医学影像解剖学》教材,湖北长江出版集团湖北科学技术出版社。2009年12月和赵志梅、杨瑞明共同主编《影像诊断学》教材,人民军医出版社出版。



# 序

医学影像科及临床学科的年轻医师，每天都要阅读大量的X线（CR，DR）、CT、MRI、DSA与USG等大量医学影像学资料，往往苦于影像解剖的识别与判断。

辛春教授编写的《临床实用影像解剖彩色图谱》一书，内容简洁，由浅入深；图像清晰，标识准确；范围宽广，非常实用。是一本难得的临床参考用书，非常适合于临床实习医师与低年资临床医师阅读。

特此推荐。



2009-08-11

## 前 言

医学影像学发展迅速，各级医疗卫生人员都会建议就诊者做相关的影像检查，还要阅读检查出来的影像图片及其报告单。可是现在很多医院虽然设立了影像中心，内部各科室却仍然相对独立。放射科、超声室、CT室、DSA室、MRI室、介入放射科等影像科室医生的专业知识通常也局限在自身比较单一的领域内。事实上这些科室的诊断知识应该是互补的，影像诊断必须综合分析病人所有的影像检查结果，如果超声医生看不懂CT、MRI，CT医生看不懂声像图，临床医生只会看报告单，就会滥用甚至误用影像检查。

也正因为没有成立真正的影像中心，医学院校中的《影像解剖学》、《影像诊断学》两门课程尽管教材是按章节整合了影像知识，可是在实际授课时仍然分科分段教学，在有限的学时内学生们很难对影像诊断知识做到融会贯通。因此，根据临床和教学的需要，作者参考了国内外相关影像解剖学教材和图谱，并结合22年的临床和教学经验，编著了这本图谱。旨在有益于临床医疗卫生工作人员对影像解剖知识做更进一步的了解，帮助影像专业学生更深刻地理解和熟练地掌握影像解剖学知识，提高影像诊断水平。

分析任何一张影像图片，首先要明白这张图片的成像原理、检查方法、检查部位和检查目的。所以本图谱从影像技术入手，首先在总论中介绍常用的普放、CR、DR、CT、DSA、USG、MRI等基本的成像原理、检查方法。然后按照骨与关节、头部、胸部、腹部顺序向读者展示各个解剖部位在相关影像图片上的表达，尽可能做到对比分析，即用影像表现与解剖图谱上的经典图像对比；用超声的横断面与相关的CT、MRI对比；把同一部位的CT平扫与增强对比；上下层面按序排列进行相邻层面结构对比；CT与MRI对比；影像解剖与同一部位容易误诊的病变对比（如儿童长骨的骨骺线与同一部位的骨折线对比，颅壁上脑血管压迹与颅骨裂缝型骨折的对比）等，通过对比更能熟悉正常影像、区别异常影像。另外，在某些特殊情况下用病变片来表达正常结构，如气胸和液气胸，气体的外面是壁层胸膜，里面是脏层胸膜；硬膜下血肿，血肿的外面是硬脑膜，里面是蛛网膜和软脑膜等。

最后,非常感谢江苏省盐城卫生职业技术学院影像系张益兰主任、李仕红老师在本书的编著工作中所给予的支持。感谢本院2005年级三年制影像技术专业的赵梦初、吴爱娟、潘海梅、2003年级五年制影像诊断班的张鑫颖等同学帮助校对。更感谢苏州市市立医院介入中心的周大勇博士、无锡市人民医院影像中心胡晓云硕士、常州市第二人民医院影像中心石海峰硕士、无锡市第四人民医院骨科陆守荣硕士、徐州医学院第一附属医院影像中心赵红兰硕士、徐州市中医院影像中心尹文州副主任、张家港市第一人民医院CT室胡翼江医师等,在收集资料、标注结构方面做了大量的工作。同时,本图谱尽量统一参考Atlas of Clinical Anatomy (Frank H. Netter, MD) 图谱中的图片,以利于读者进一步对照查阅,也参考了一些网站上的图片,在此一并表示感谢。

因本人才疏学浅,图谱中的错误和疏漏之处在所难免,恳请各位读者提出宝贵意见,以便再版时进行修改。

辛春

2010年6月

于江苏盐城

## 目 录

第一章 总论.....	001	三、M超.....	021
第一节 X线检查.....	001	四、CDFI.....	022
一、X光机.....	001	第六节 NMRI, MRI.....	023
二、检查方法.....	002	一、原理与设备.....	024
三、图像分析.....	003	二、图像分析.....	024
第二节 CR与DR.....	004	第二章 骨与关节.....	027
一、CR.....	005	第一节 骨骼的发育.....	027
二、DR.....	005	一、骨骼的发育过程.....	027
第三节 CT.....	006	二、软骨内化骨过程.....	027
一、成像原理与设备.....	006	三、儿童长骨结构.....	027
二、扫描方法.....	008	四、骨龄.....	029
三、图像分析.....	011	五、胎儿骨骼.....	030
四、螺旋CT.....	015	六、儿童肘部.....	031
第四节 DSA.....	016	七、儿童髋关节.....	032
一、成像原理.....	017	八、小孩脊椎.....	034
二、检查方法.....	018	第二节 躯干骨.....	034
第五节 USG.....	019	一、颈椎.....	034
一、A超.....	019	二、胸椎.....	039
二、B超.....	020	三、腰椎.....	041

四、骶尾椎.....	045	二、椎-基底动脉.....	100
五、胸骨.....	047	三、脑底动脉环.....	100
六、肋骨.....	048	四、静脉和静脉窦.....	101
七、锁骨.....	048	五、全脑血管.....	102
八、肩胛骨.....	048	<b>第三节 脑和脑室.....</b>	<b>103</b>
九、髌骨.....	049	一、相关解剖.....	103
<b>第三节 骨连结与四肢骨.....</b>	<b>050</b>	二、CT平扫.....	105
一、肩关节.....	050	三、CT增强.....	108
二、肘关节.....	052	四、MRI.....	111
三、腕关节.....	055	<b>第四章 胸部.....</b>	<b>118</b>
四、掌指关节.....	056	<b>第一节 胸廓软组织影.....</b>	<b>118</b>
五、髋关节.....	057	一、胸锁乳突肌.....	118
六、膝关节.....	060	二、锁骨上皮肤皱褶.....	118
七、踝关节.....	065	三、胸大肌.....	119
八、足.....	068	四、乳房.....	119
<b>第五节 解剖变异.....</b>	<b>071</b>	五、锁骨下动脉.....	122
一、躯干骨变异.....	071	六、肋骨伴随阴影.....	123
二、四肢骨变异.....	074	<b>第二节 呼吸道.....</b>	<b>123</b>
<b>第三章 头部.....</b>	<b>078</b>	一、上呼吸道.....	123
<b>第一节 颅骨.....</b>	<b>078</b>	二、下呼吸道.....	128
一、颅平片.....	078	<b>第三节 肺.....</b>	<b>131</b>
二、头颅CT骨窗.....	088	一、肺实质.....	131
<b>第二节 脑血管.....</b>	<b>099</b>	二、肺间质.....	131
一、颈内动脉.....	099	三、肺野分区.....	132

四、肺门.....	132	三、肾.....	169
五、肺纹理.....	134	第二节 消化道钡餐检查.....	170
第四节 胸膜.....	135	一、造影检查范围.....	170
一、胸片.....	135	二、消化吸收过程.....	170
二、超声.....	136	三、造影检查方法.....	170
三、CT.....	136	四、食管钡餐检查.....	171
第五节 纵隔.....	138	五、贲门钡餐检查.....	174
一、胸腺.....	139	六、胃钡餐检查.....	175
二、纵隔九分法.....	139	七、十二指肠钡餐检查.....	177
三、纵隔淋巴结.....	140	八、小肠钡餐检查.....	178
第六节 心脏大血管.....	141	九、结肠造影.....	179
一、循环.....	141	第三节 胆系造影.....	179
二、胸片.....	142	一、胆道构成.....	180
三、造影.....	147	二、胆囊造影.....	180
四、CT C+.....	149	三、胆囊术后T形管造影.....	180
五、MRI.....	154	四、ERCP.....	181
六、USG.....	159	第四节 尿路造影.....	181
第七节 横膈.....	165	一、泌尿过程.....	182
一、X线胸片.....	166	二、静脉尿路造影.....	182
二、MRI.....	167	三、逆行尿路造影.....	183
第五章 腹部.....	169	第五节 生殖道造影.....	185
第一节 腹平片.....	169	一、排精过程.....	186
一、腹壁结构.....	169	二、精囊腺造影.....	186
二、胃肠道.....	169	三、子宫输卵管造影.....	186

<b>第六节 腹部血管造影</b> .....	187	三、男性盆腔.....	214
一、腹部血液循环.....	187	四、腹部冠状面（重建）.....	218
二、腹主动脉造影.....	188	五、腹部矢状面（重建）.....	224
三、腹腔干造影.....	189	六、腹主动脉CTA 3D-CT.....	233
四、肝总动脉造影.....	189	<b>第八节 腹部MRI</b> .....	233
五、肠系膜上动脉造影.....	189	一、上腹部MRI.....	234
六、肠系膜下动脉造影.....	190	二、男性盆腔MRI.....	241
七、肾动脉造影.....	190	三、女性盆腔MRI.....	245
八、盆腔动脉造影.....	191	<b>第九节 腹部超声</b> .....	247
九、髂内动脉造影.....	191	一、腹腔超声.....	248
<b>第七节 腹部CT</b> .....	191	二、盆腔超声.....	255
一、腹部横断面.....	191	<b>参考文献</b> .....	258
二、女性盆腔.....	207		

# 第一章 总论

影像解剖学是影像诊断学的一个重要组成部分，是衔接人体解剖学和影像诊断学的一门边缘学科。

影像解剖学是利用医学影像成像技术使人体组织器官成像，从而研究人体组织结构的大小、形态、位置及其毗邻关系。

医学影像成像技术包括X线检查、CR、DR、CT、DSA、USG、MRI等。

1

## 第一节 X线检查

X线是一种不可见的光线，在医学领域内被用来检查人体，主要是因为它具有很强的穿透性、能激发荧光物质产生可见光、能使胶片感光等光学特性。

本节简要介绍X线机的类型和构件，重点讲解X线的透视、拍片和造影三大检查方法。目的是帮助理解和分析X线影像。

2

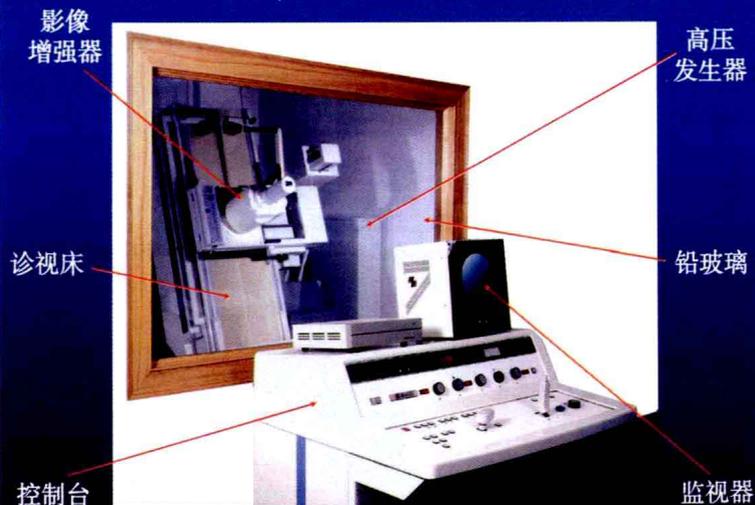
### 一、X线机

#### 1. 摄影床X线机



3

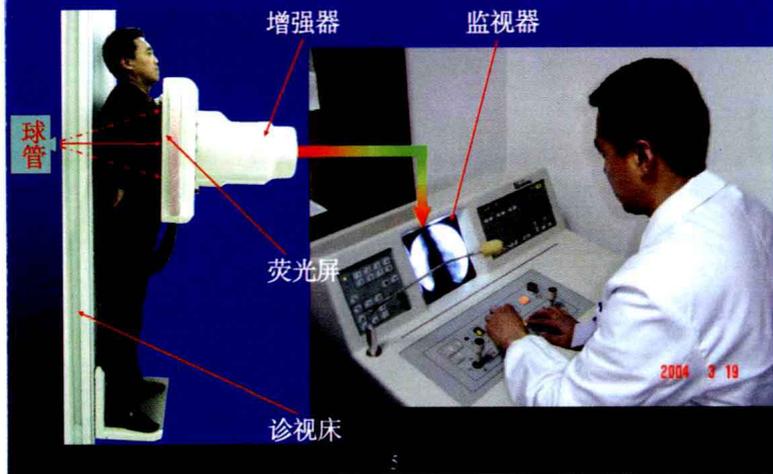
#### 2. 诊视床X线机



4

## 二、检查方法

### 1. 透视



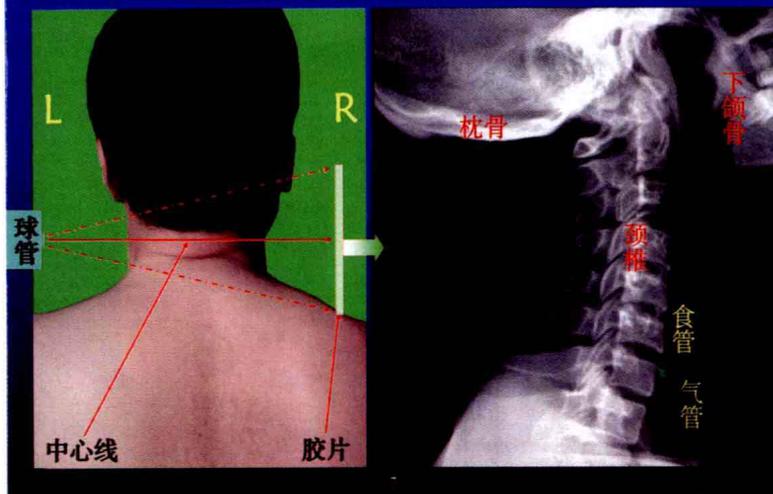
### 透视的评价

优点：①方法简便易行；②可以多方位观察；③可观察器官的活动状态；④价格便宜。

缺点：①无影像资料不利于对比和会诊；②X线量较大，对人体损伤大；③荧光屏透视影像不清；④主观性强，容易漏诊和误诊。

### 2. 拍片

#### 颈椎右侧位片



### 拍片的评价

优点：①影像比荧光屏上的清晰；②有影像资料，便于会诊和研究；③复查时可与以前的X线片对比观察；④曝光时间短，X线量较少。

缺点：①要装片、冲洗等，过程比较复杂；②一次曝光只显示一个体位影像；③不利于对组织结构的活动状态及其功能进行观察；④价格较贵，CR和DR检查费更贵。

### 3. 造影

人体内许多器官之间因缺乏明显的密度差异，透视或拍片时组织结构显示不清，使X线检查受到限制。

为了改变其对比度，向人体内人为地引入某些物质，改变器官组织之间的密度差异，称人工对比，又叫造影。

9

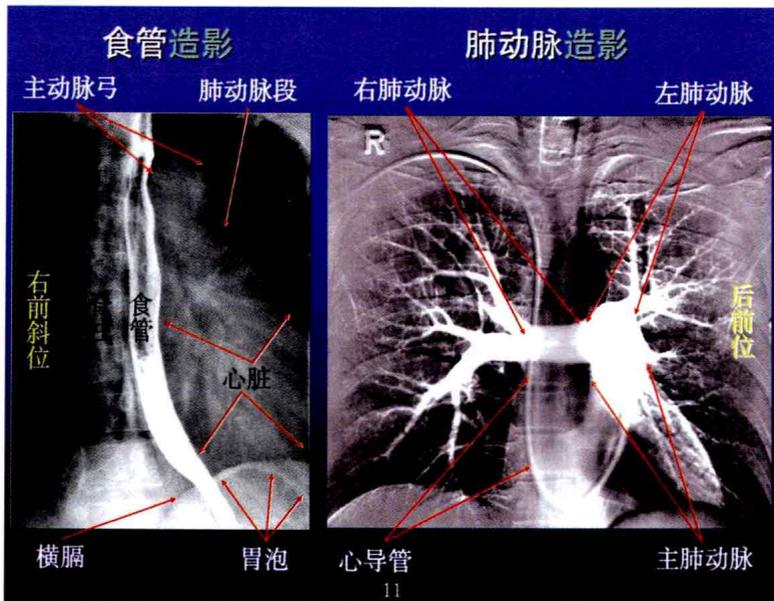
造影检查时，被引入人体内的造影物质叫造影剂或对比剂 (contrast medium)。

对比剂分为两大类：

1. 原子量高、比重大的物质，如钡剂和碘制剂，称为阳性（高密度）对比剂。
2. 原子量低、比重小的物质，如气体、植物油、水等为阴性（低密度）对比剂。

10

003



11

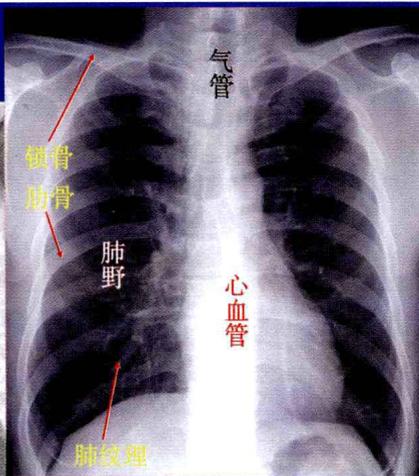
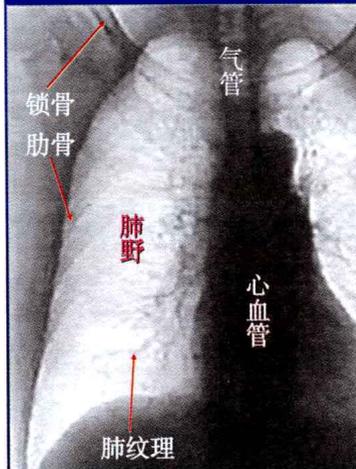
### 三、图像分析

#### 1. 天然对比

人体组织结构存在着一定的厚度和密度差异。X线通过人体后，在荧光屏或X线片上产生明暗不同的黑白影像。这种自然差异称为天然对比，又叫自然对比 (natural contrast)。

12

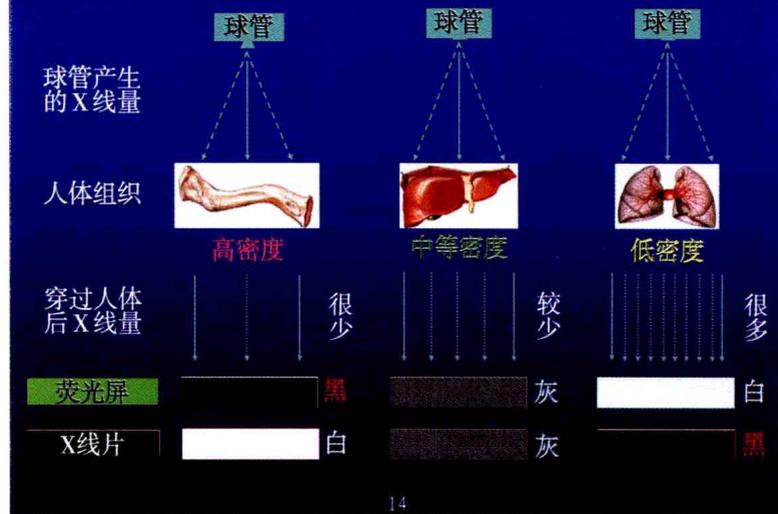
### 胸透荧光正像



胸片感光负像

13

### 2. 组织密度与X线影像关系示意图



14

### 3. 组织密度与X线影像关系对比表

组 织	密度	透视	X线片	CT
骨 骼	最高	黑	白	白
软 组 织	较高	灰黑	灰白	灰白
含液器官	较低	灰	灰	灰黑
脂肪组织	低	灰白	灰黑	黑
含气器官	最低	白	黑	最黑

15

## 第二节 CR与DR

本节介绍 CR 和 DR 的工作原理与相关设备，并将它们的影像与传统的 X 线影像进行比较。理解 CR 和 DR 的优势，便于临床上更好地使用。

16

## 一、CR 又称CDR

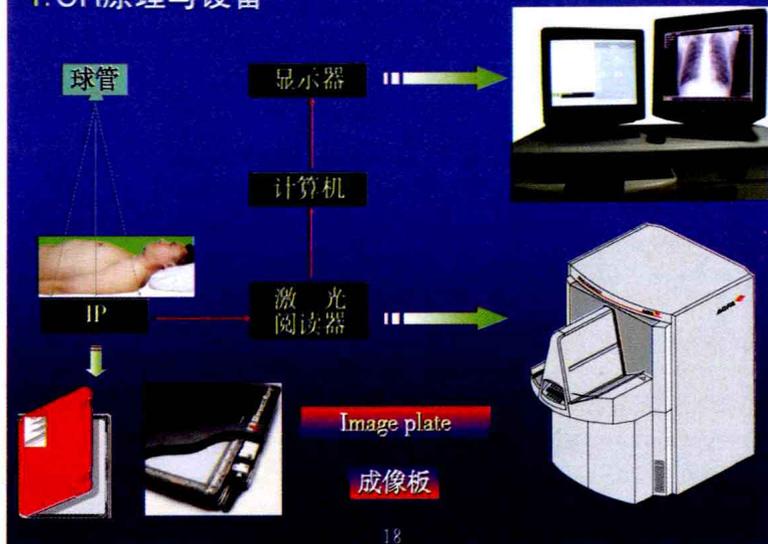
Computer Digital Radiography

计算机 数字化 X线摄影

CR 成像是将人体吸收 X 线的信息以潜影方式记录在成像板上，以激光束扫描成像板，读取其中的潜影信息。经模/数转换后进入计算机成像系统，再经后处理，出数字化图像。

17

## 1. CR原理与设备



18

## 2. 与传统X线成像对比，CR有如下优点

- ①数字化输入代替了书写或贴铅字
- ②可反复运用的成像板取代了胶片
- ③用计算机查阅影像替代了观片灯
- ④磁盘存储图像，节约了人力和物力
- ⑤胶片给就诊者，方便临床诊治工作
- ⑥可通过PACS传输图像进行远程会诊
- ⑦可对影像做后处理，提高诊断质量

19

## 二、DR 又称DDR

Direct Digital Radiography

直接 数字化 X线摄影

DR 成像是将人体组织结构吸收的 X 线信息，由平板探测器直接输出数字信号，进入计算机成像系统，直接形成数字化图像。

20

## 1. DR原理与设备



21

## 2. 与CR对比, DR有如下优点

- ①不用成像板, 直接用平板探测器。
- ②成像速度快, 10秒内即可完成图像的采集和处理全过程。
- ③图像比CR更清晰。



22

006

## 第三节 CT

Computer Tomography

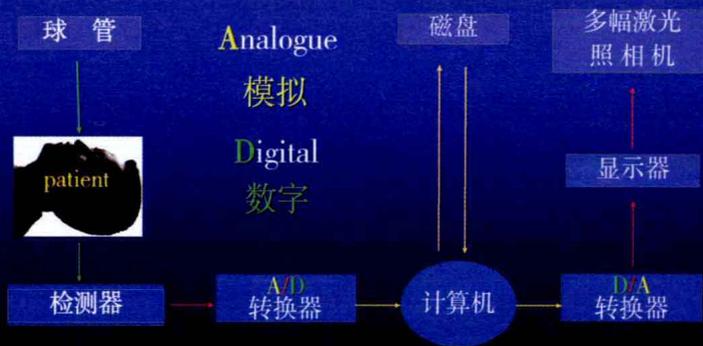
计算机 体层 摄影

本节通过介绍CT成像原理、机器结构、扫描方式等知识, 进而了解CT图像特点。帮助熟悉CT片上的组织结构, 分析组织结构之间的密度差异及其意义。

23

## 一、成像原理与设备

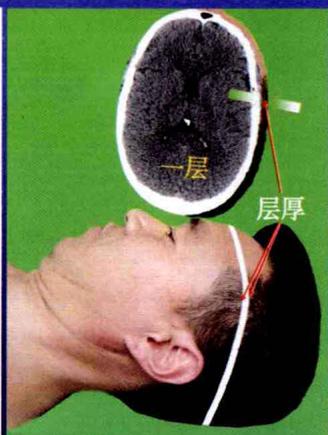
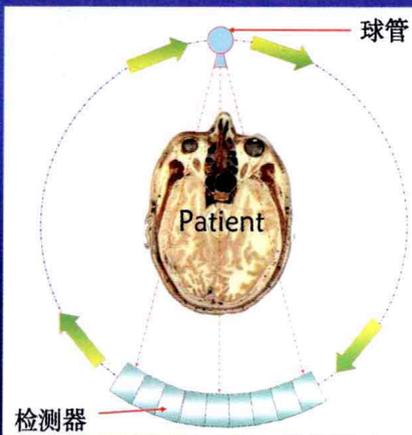
### 1. 成像原理



24

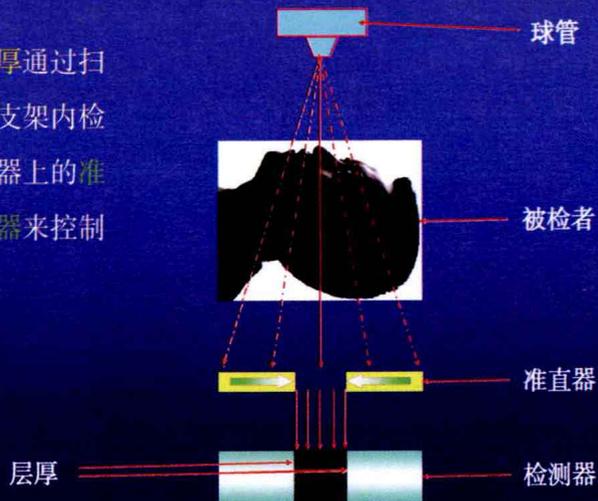
球管和检测器绕着人体预设的层面作同步圆周运动

球管作圆周运动同时曝光一圈扫一层



25

层厚通过扫描支架内检测器上的准直器来控制



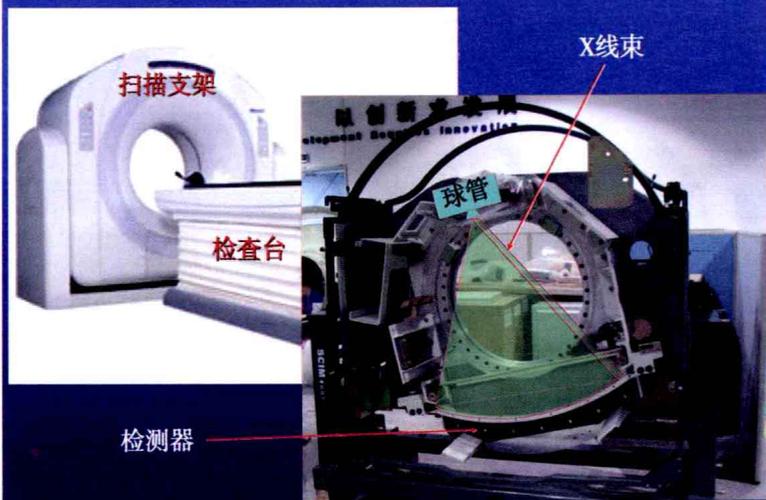
26

## 2. CT设备



27

## 打开扫描支架



28

## 二、扫描方法

### 1. 定位像(Scout view)

Reference localization line

参考定位线

先确定第一层定位线

再确定最后层定位线

根据我们输入的层厚和层距大小，在这两根定位线之间自然分布其他各层的定位线

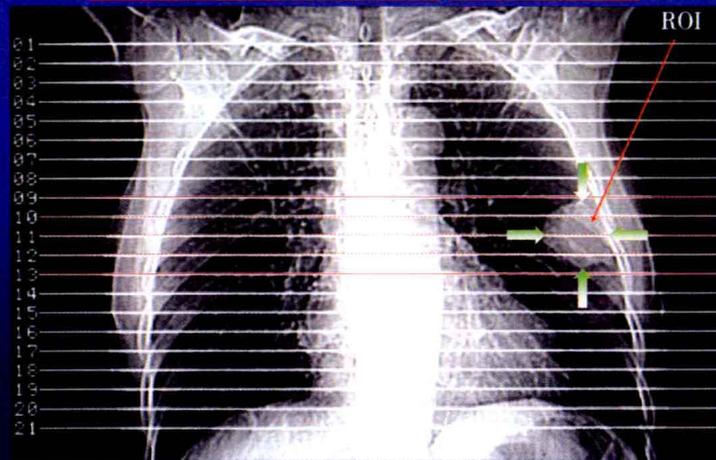


29

与ROI相匹配的层面有：第9~13层

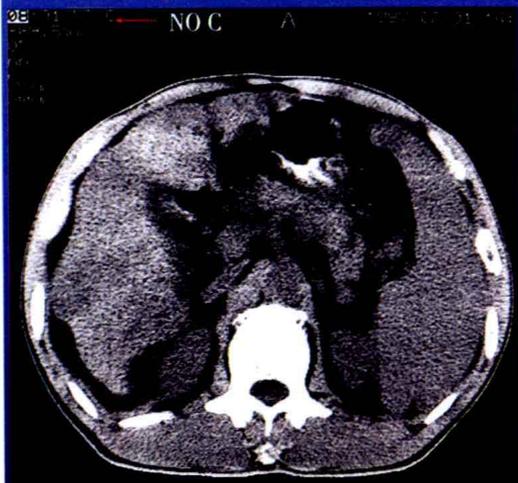
Region of interest

感兴趣区



30

### 2. 平扫(Plain scan)



31

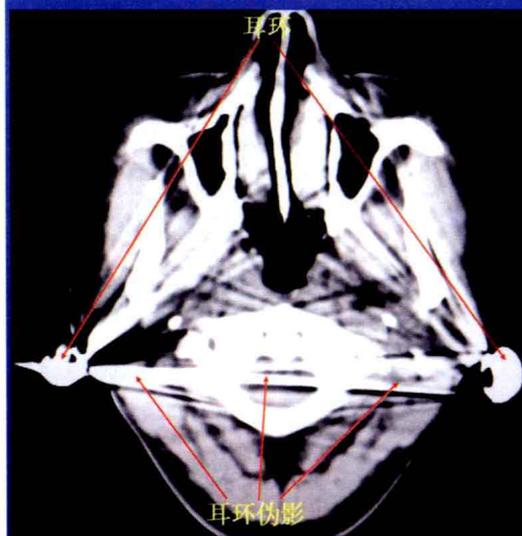
片子上的标记

No  
Contrast  
scan

NO C,  
C-,  
-C.

准备

(1) 去体表异物



32



耳环

**准备**  
 (2) 腹腔扫描  
 空腹;  
 扫描前30分钟内口服2%~3%的泛影葡胺 800ml~1000ml

目的: 标记肠管

有泛影葡胺 (高密度) 的为肠腔

33

**准备**  
 (3) 盆腔扫描

扫描时, 膀胱充分充盈

目的: 提高对比度

34

### 3. 增强(Contrast scan)

向血管内注射高密度对比剂以后, 对比剂到达靶器官立即对靶器官重复进行不同时相的CT扫描, 称为**增强**。

对比剂越多的地方, CT值就越高, 血液供应也就越**丰富**。

**标记** C+; +C **准备** 碘过敏试验

阴性者可以增强, 但要防止假阴性。

35

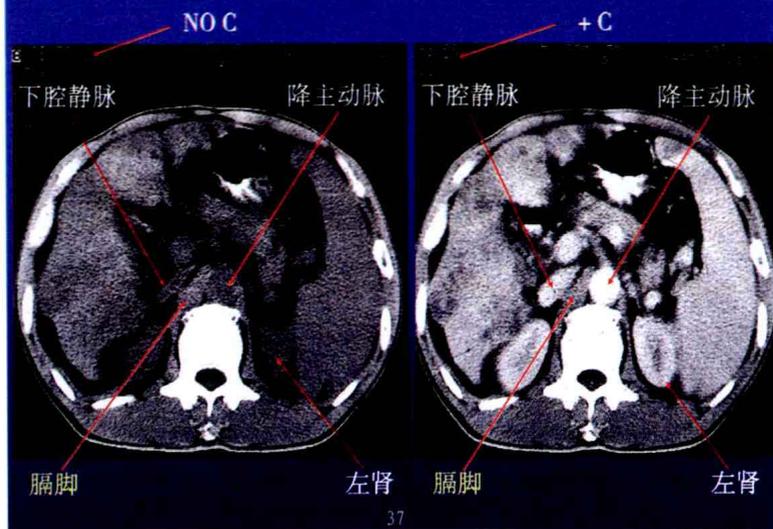
### 对比剂

- |     |                      |                   |
|-----|----------------------|-------------------|
| 离子型 | 泛影葡胺<br>康瑞<br>Conray | 价格便宜, 但<br>毒副作用强。 |
|     |                      |                   |
|     | 欧乃派克<br>Omnipaque    |                   |

作用: 提高血供丰富区域密度。

36

平扫与增强对比



4. 扫描方式(Method Of scan)

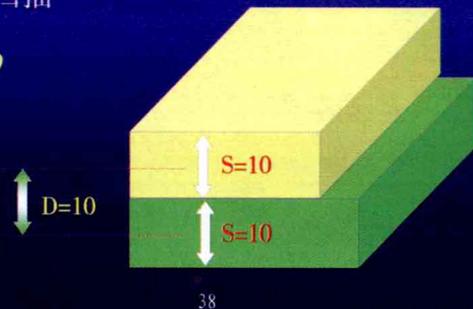
Slice 层厚

Distance 层距

层距表示相邻两层中心线之间的距离

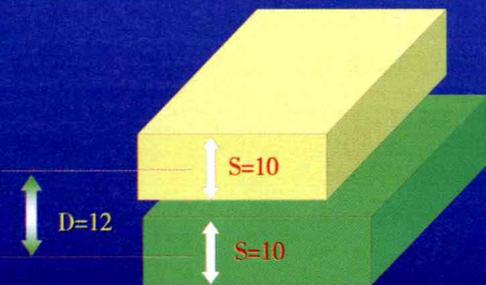
(1) 连续扫描

$$S=D$$



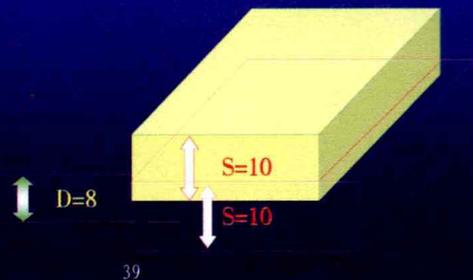
(2) 间断扫描

$$S < D$$



(3) 重叠扫描

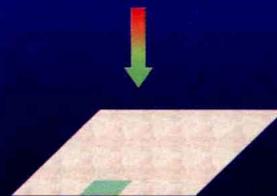
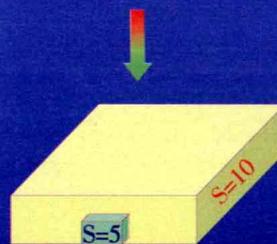
$$S > D$$

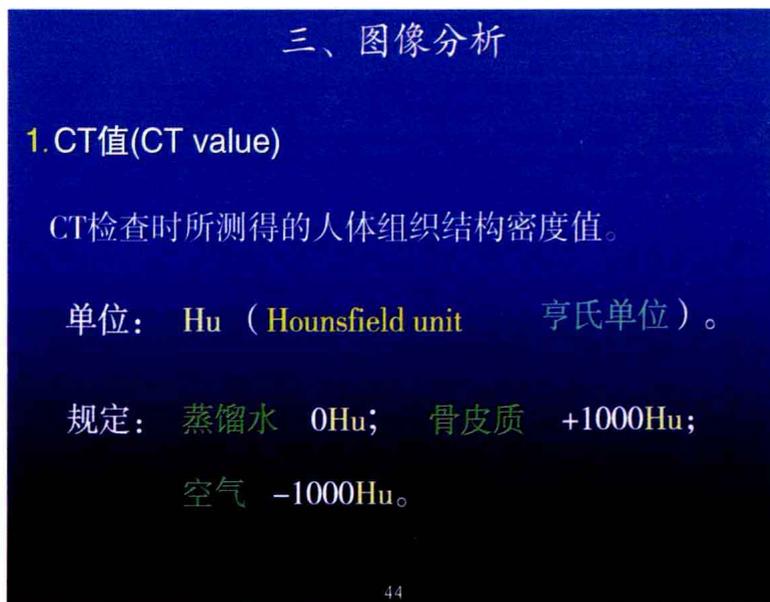
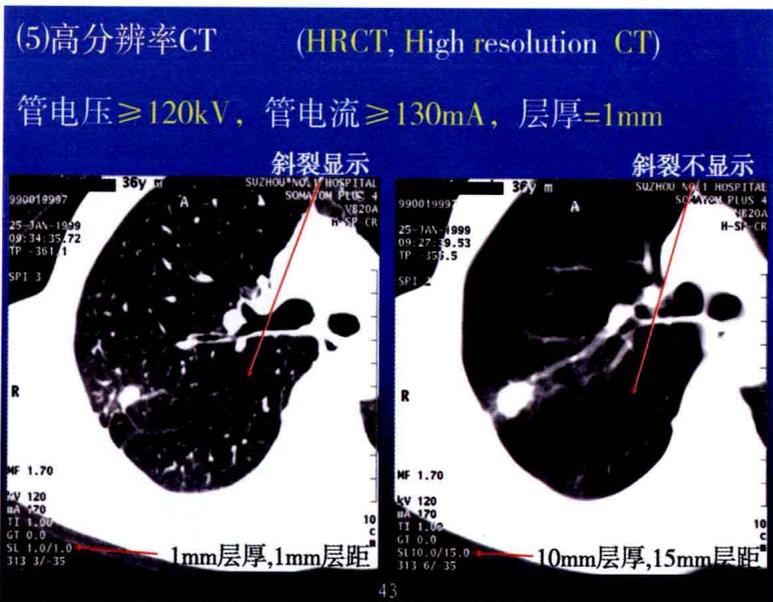
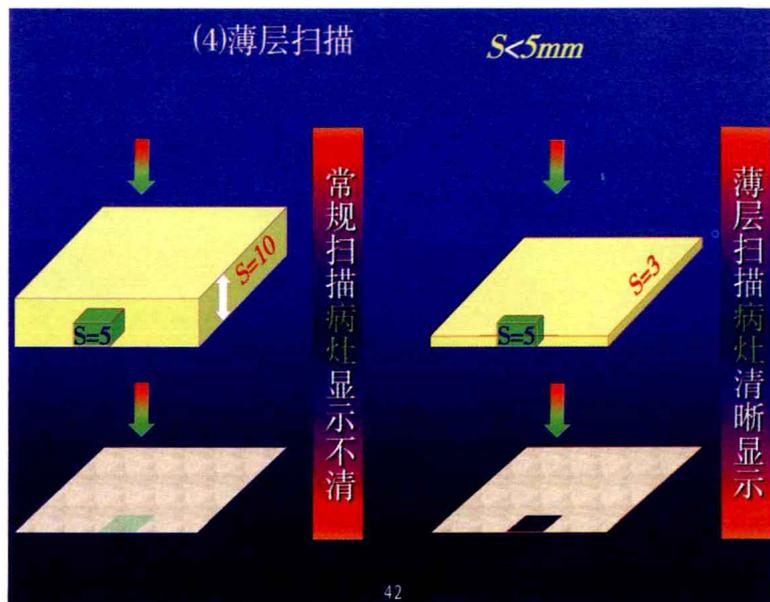
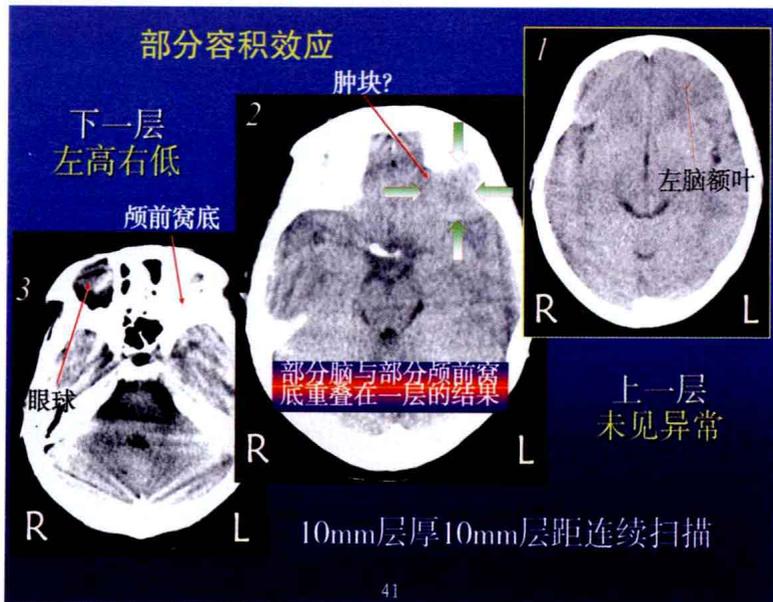


部分容积效应

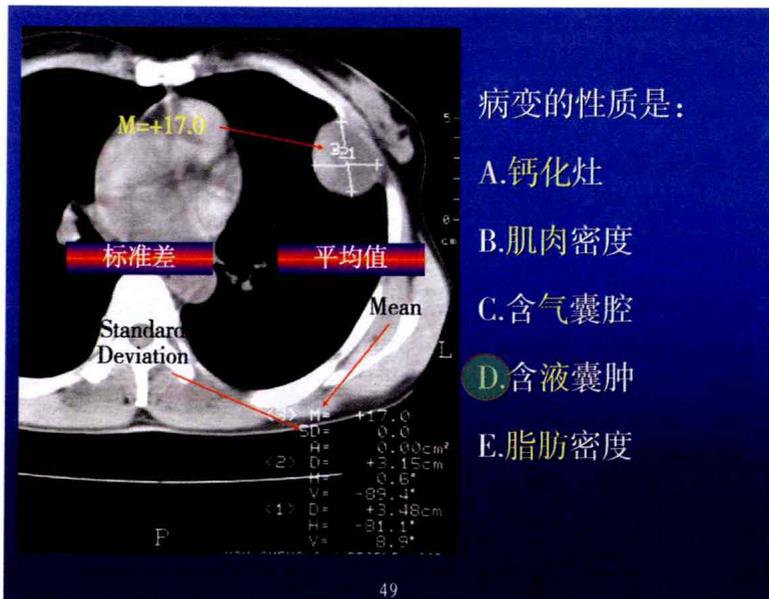
Partial volume effect

如果有5mm厚的病灶重叠在10mm厚一层内，病灶显示不清。









## 2. 窗技术

窗宽 (WW)      Window Width

窗宽用来调节CT图像上16个灰阶所包括的CT值范围。

如果窗宽是400Hu，那么肉眼可分辨的两种组织密度差至少达到25Hu。

$$400 \div 16 = 25$$

如果窗宽是80Hu，那么肉眼可分辨的两种组织密度差只需5Hu。

$$80 \div 16 = 5$$

50

013

窗位 (WL)

Window Level

窗中心 (WC)

Window Center

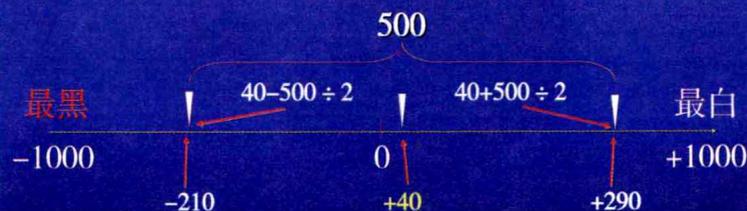
以需要重点观察的组织密度CT值为准，这个CT值就叫窗位或窗中心。

如脑窗的WL(WC)是35Hu左右，肺窗则为-700Hu左右。

通过调节CT图像上的窗位和窗宽侧重于观察所要检查的组织结构，达到诊断目的。

51

如果调节到WL+40Hu，WW500Hu。

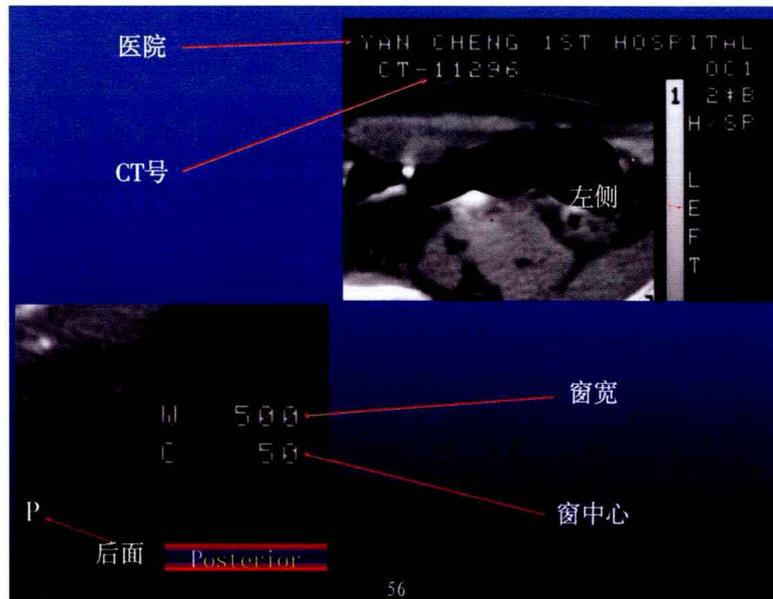
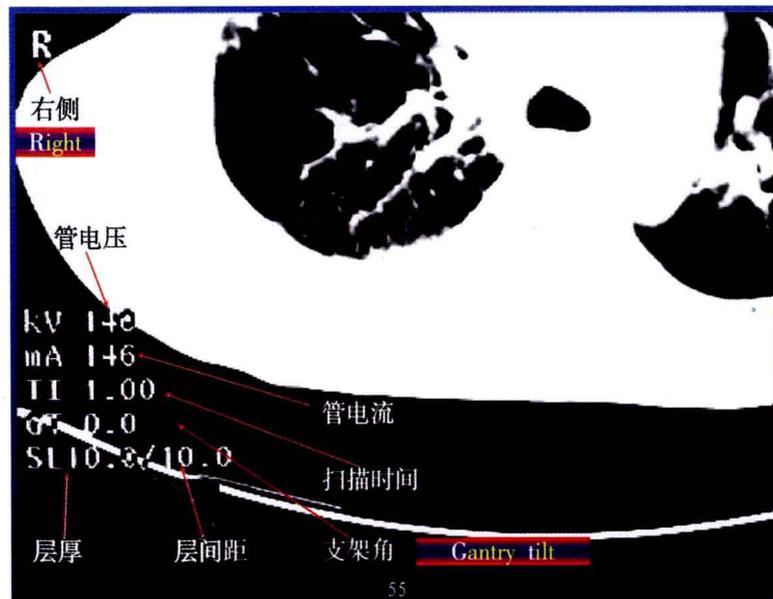
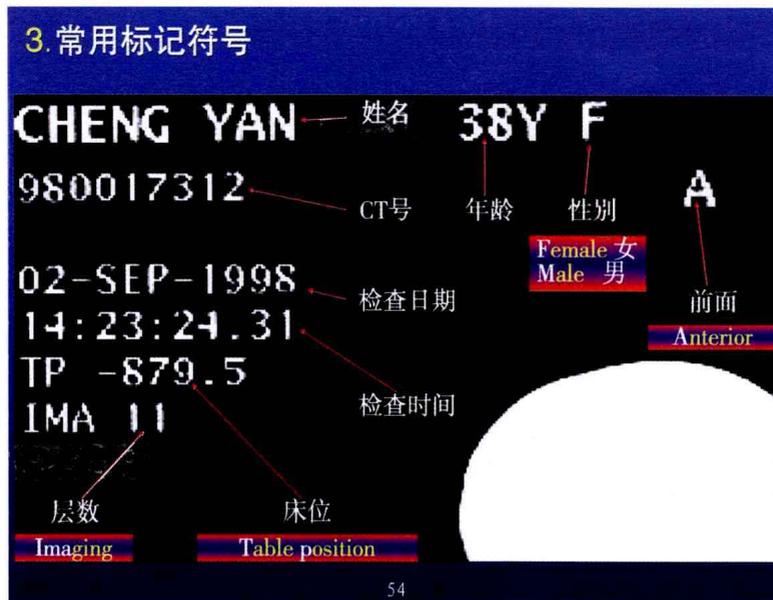
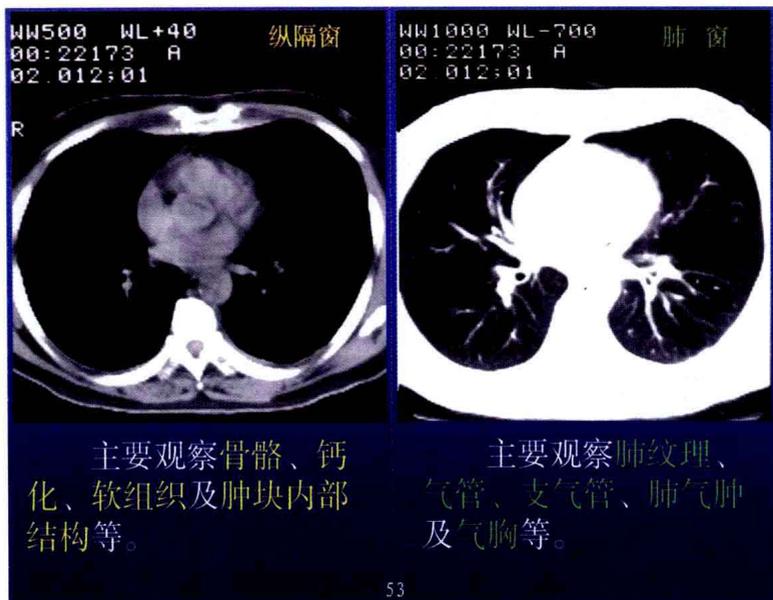


CT值在+290Hu以上的组织在CT片上图像呈白色，在-210Hu以下的组织呈黑色。

肉眼可分辨的两种组织结构密度差是：

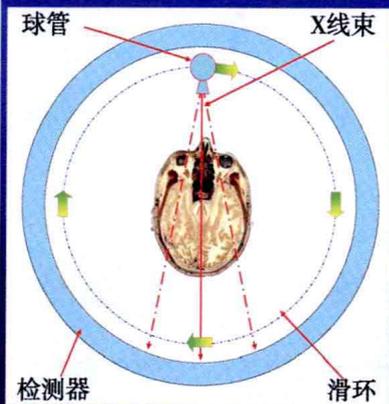
$$500 \div 16 = 31.25 \text{ (Hu) 以上}$$

52



## 四、螺旋CT

### 1. 扫描方式



检测器固定，只有球管做自旋运动。球管相对运动轨迹呈螺旋形。



57

### 2. 螺旋CT优点

#### (1) 扫描速度快

一个部位可在10~20秒内一次扫完。可以消除呼吸运动伪影，便于对危重病人和婴幼儿的检查。

增强扫描则可选择造影剂在靶器官内分布达到峰值时扫描。既减少造影剂的用量，成像效果又好。

58

#### (2) 扫描层面薄

按照诊断的需要，螺旋CT检查时可选用层厚1~10mm扫描，通常用层厚3~5mm扫描。

层厚越薄检查出来的图像也就越细腻，但被检查区域内扫描层数增多了。

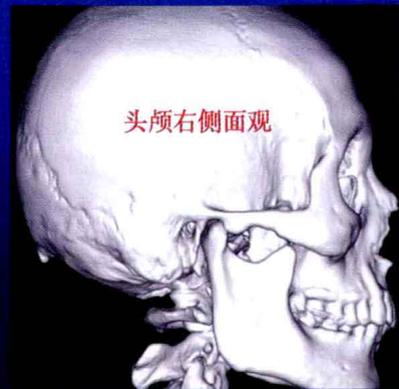
59

#### (3) 多功能显示

##### ① 3D-CT

##### Three-dimensional CT

如果对感兴趣区用1~3mm层厚、很小的螺距扫描，可以重建出高质量的三维立体CT图像。



60

## ②CTVE

### CT virtual endoscopy

扫描条件同3D-CT，重建出管腔结构的内表面，并能染上类似受检器官内膜的颜色。图像可以动态回放如同在做内镜一样，称为CT仿真内镜技术。



61

## CTVE评价

**优点：**没有痛苦和危险；可以反复回放图像；可以调整图像格调；能观察管外情况；能从不同角度观察。

**缺点：**图像真实性差；对病变的质地、颜色、动态观察不如内镜检查；不能取组织做病理检查；图像受干扰的因素多；检查费用高。

62

## ③CTA

### CT angiography

增强扫描的同时用1~3mm层厚、很小的螺距扫描。可以进行选择性血管重建，就得到了类似于DSA的CT血管成像。



63

## 第四节 DSA

Digital Subtractive Angiography

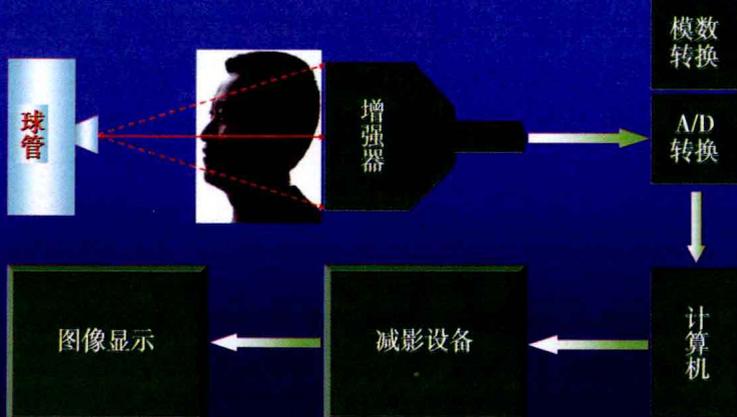
数字 减影 血管造影

本节简要介绍DSA成像原理、设备、成像方法。帮助了解DSA图像特点，能分析DSA图像，更好地合理应用DSA检查。

64

# 一、成像原理

## 1. DSA成像过程



65

## 2. 图像数字化

普通光学图像



图像的像素化



图像的数字化的



66

## 3. 数字化图像减影



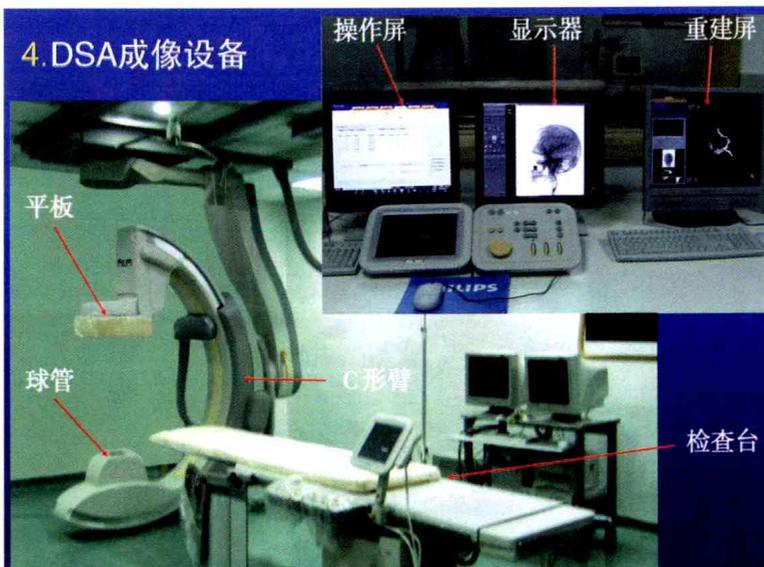
数字化的  
造影图像

数字化的  
普通图像

= DSA

67

## 4. DSA成像设备



68

### 5. 血管介入现场



生理监测

69

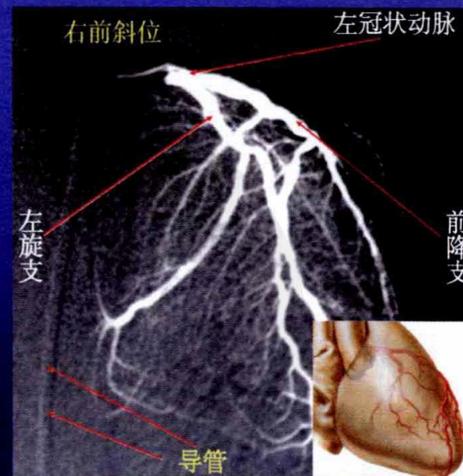
图像显示

### 二、检查方法

#### 1. IA--DSA

Intra-artery

经动脉DSA  
(逆行插管)

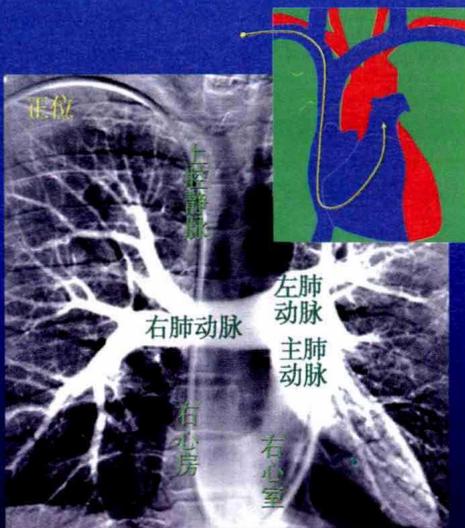


70

#### 2. IV--DSA

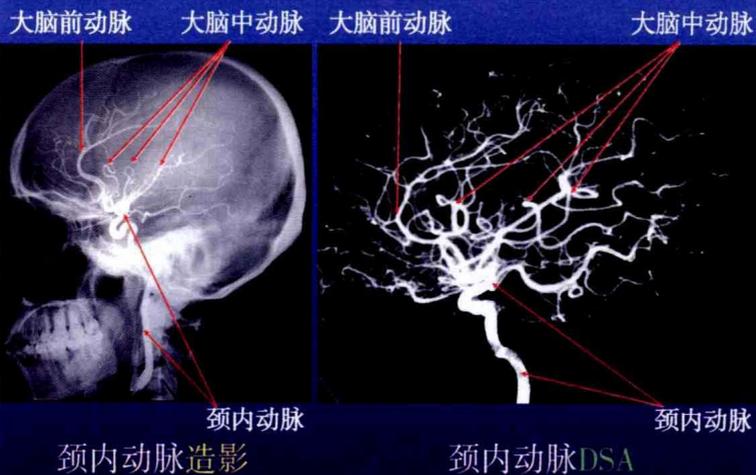
Intra-venous

经静脉DSA  
(顺行插管)



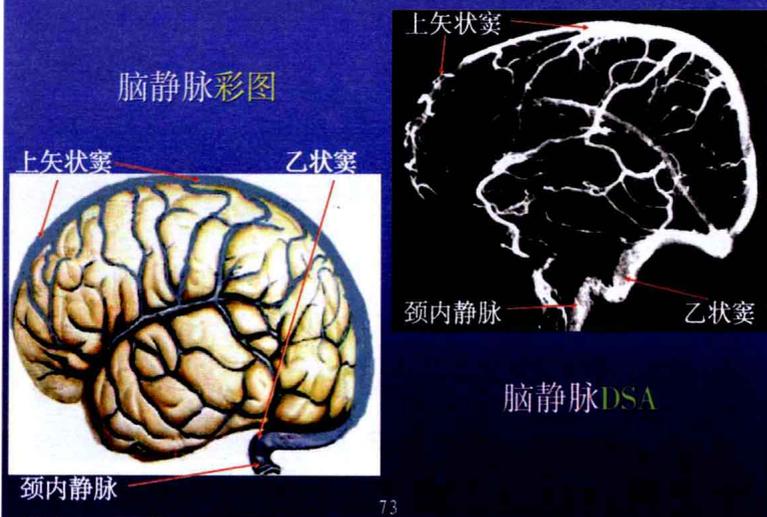
71

#### 比较 造影和DSA



72

## 比较 解剖和DSA



## 第五节 USG

Ultra sono graphy  
超 声 成 像

本节简要介绍超声检查基本的成像原理、超声仪器类型和结构，重点帮助分析各种声像图特点。

74

## 一、A超

Amplitude model USG  
幅度调制型超声

A超虽然在临床上已很少应用，已被B超所取代，但是它的成像原理能帮助我们理解其他超声成像的基本原理。

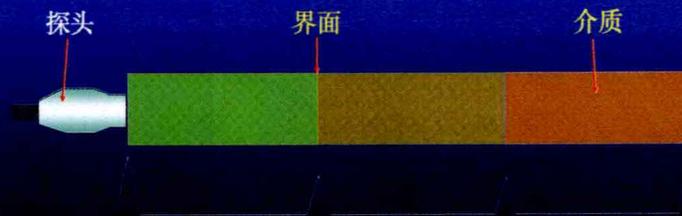
75

## 1. 成像原理

**介质：**波能在其中传播的物质。

**界面：**两种介质之间的交界面。

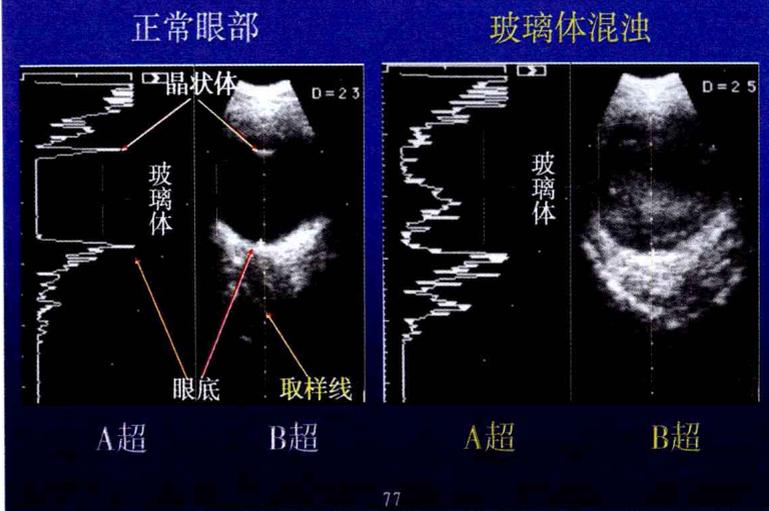
**声阻抗：**介质的密度与超声在介质中传播速度的乘积。反应介质对波的反射能力。



A超显示线型波形

76

## 2. 图像分析

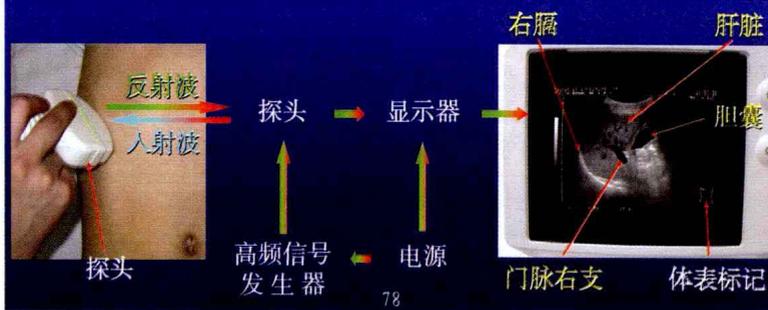


## 二、B超

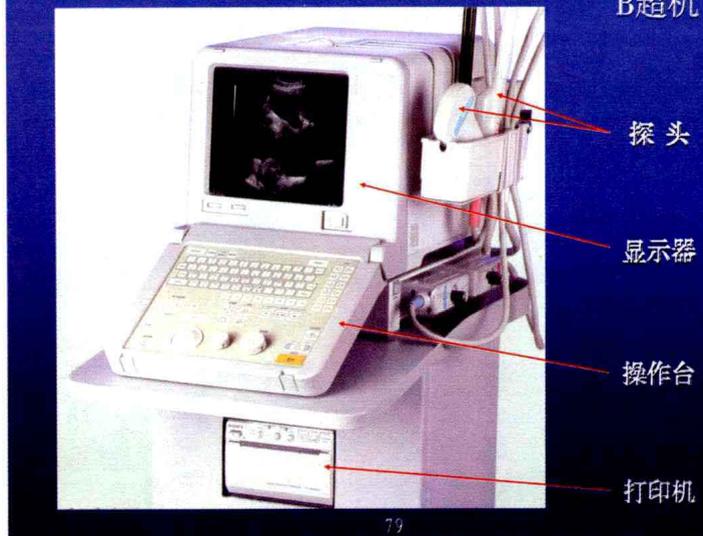
Brightness model  
辉度调剂(灰阶)型

USG  
超声

### 1. 成像原理



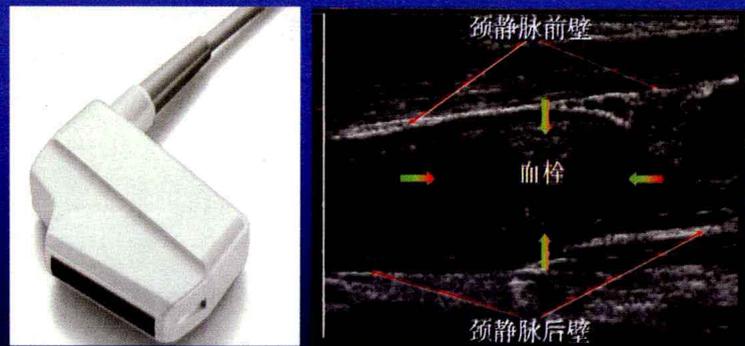
## 2. 机器结构



### 3. 探头与图像

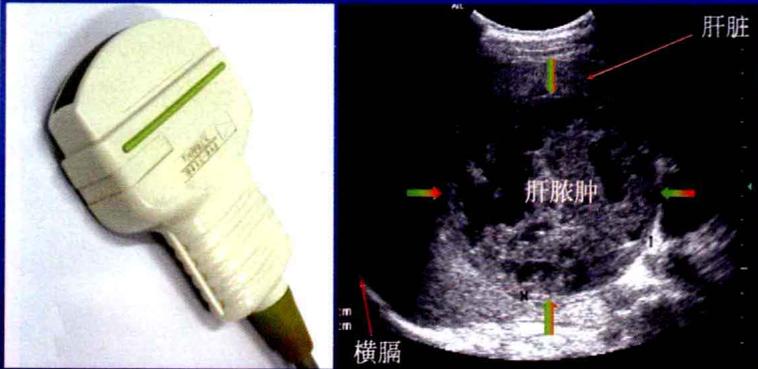
线阵探头

声像图呈矩形



主要用来检查腹部及浅表器官

凸阵探头                      声像图呈大扇形

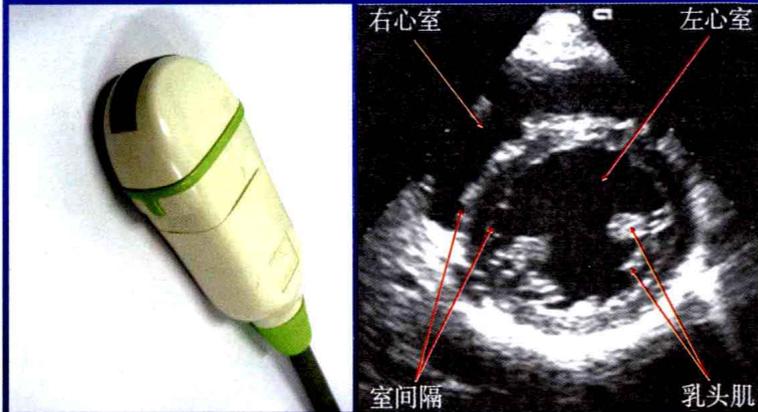


肝脏  
肝脓肿  
横膈

**主要用来检查腹部及盆腔器官**

81

微凸探头                      声像图呈中扇形

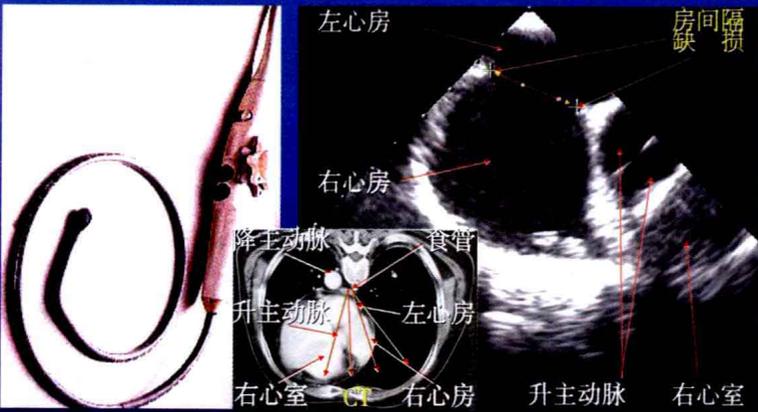


右心室                      左心室  
室间隔                      乳头肌

**主要用来检查心脏大血管**

82

食管内心脏探头                      声像图呈小扇形



左心房                      房间隔                      缺损  
右心房                      食管  
降主动脉                      升主动脉                      左心房  
右心室                      右心房                      升主动脉                      右心室

**主要用来经食管检查心脏大血管**

83

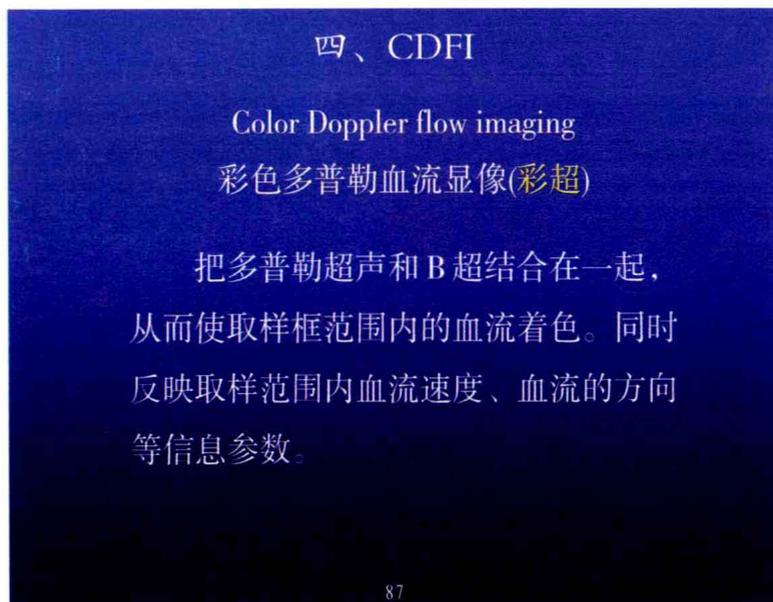
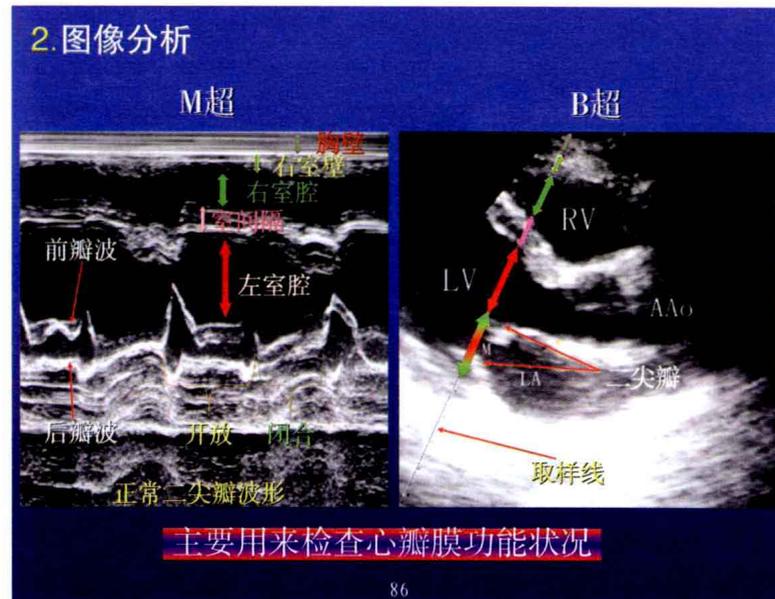
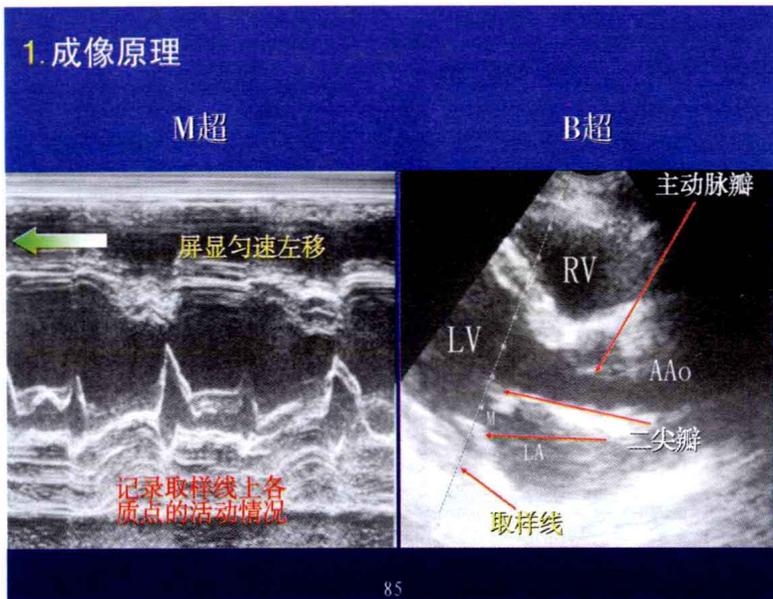
三、M超

Motion model USG  
超声心动图

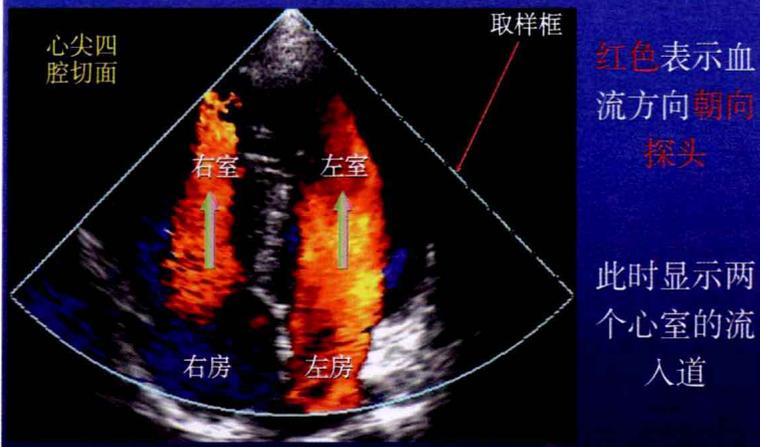
一般B型超声机器上都带有M型超声检查功能。

我们通常所说的黑白超，其实大多数是B超 + M超。

84

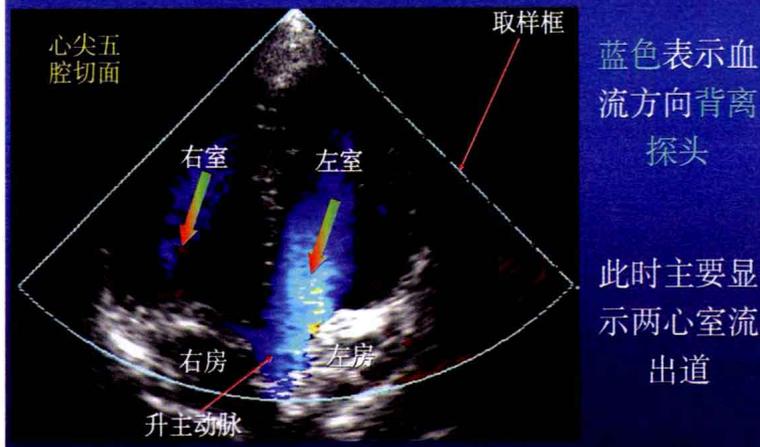


## 2. 彩超图像分析



89

## 彩超图像分析



90

## 彩超图像分析



91

## 第六节 · NMRI, MRI

Nuclear Magnetic Resonance Imaging

核 磁 共 振 成 像

人体各种组织结构所含的氢质子数量不同。把这些氢质子放在匀强磁场中，它们就会在同一个方向上做自旋运动。

如果再用电磁波从侧向轰击人体，这些氢质子就会吸收电磁波能量。停止侧向轰击，它们又会释放能量，回到原来方向上做自旋运动。

接收氢质子吸收和释放的电磁波能量，并在不同方向上形成切面图像即核磁共振成像。

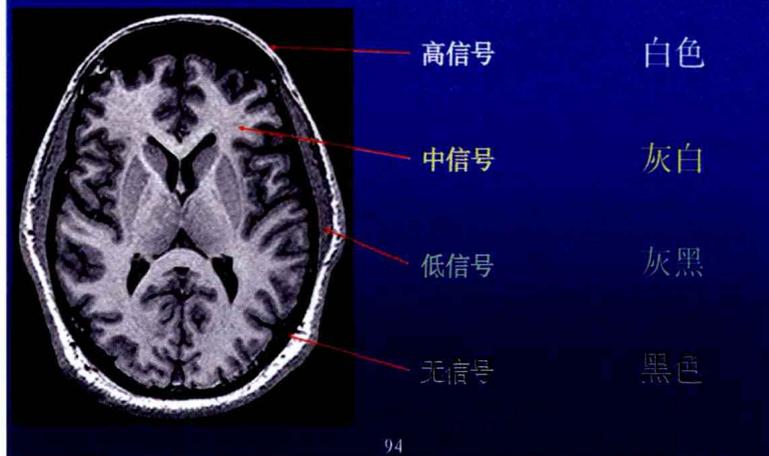
92

## 一、原理与设备

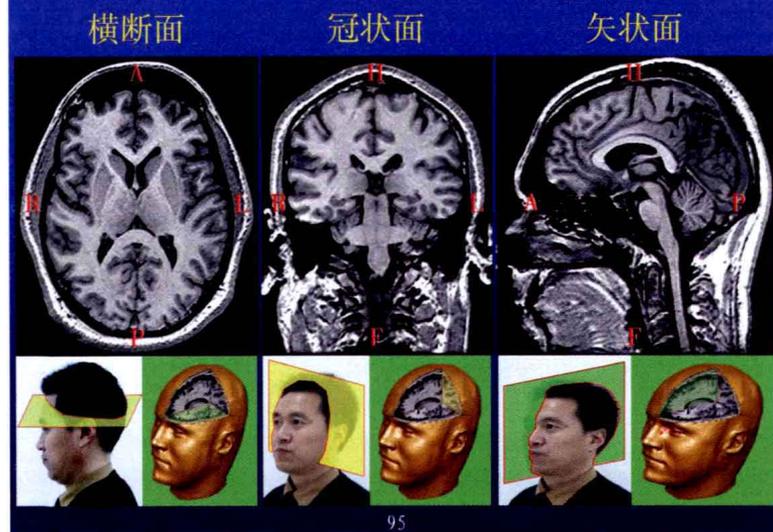


## 二、图像分析

### 1. 反映质子密度的图像



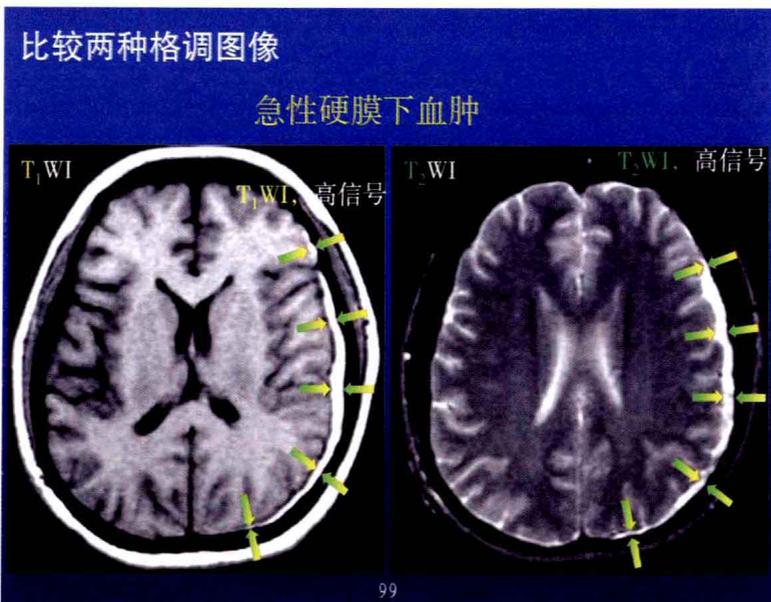
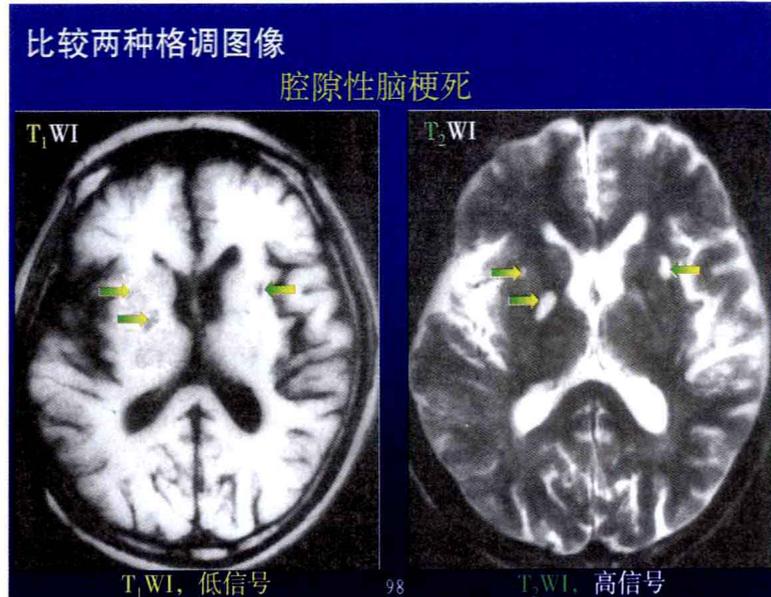
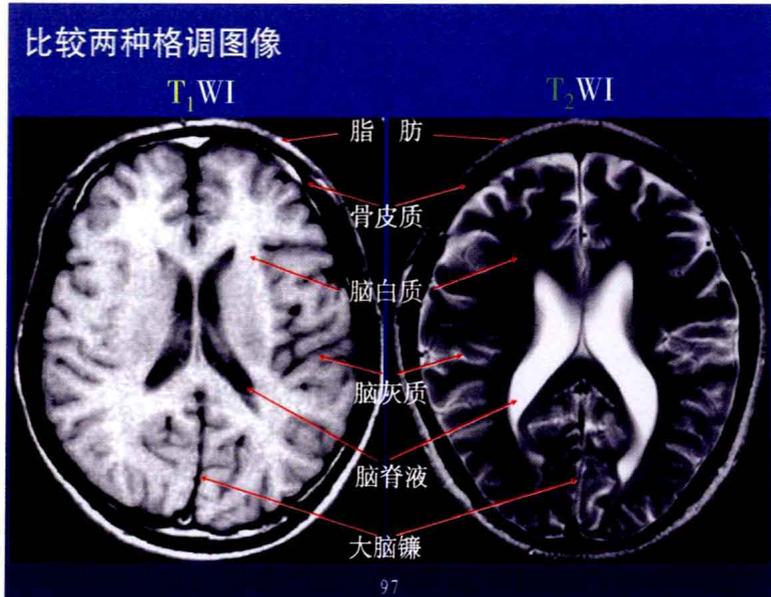
### 2. 多切面图像



### 3. 多参数图像

通常使用的是 $T_1$ WI和 $T_2$ WI(Weighted Imaging 权重图像)

比较	脂肪	骨皮质 气体等	液体	脑白质	脑灰质
$T_1$ WI	高信号	无信号	低信号	高信号	低信号
$T_2$ WI	高信号	无信号	高信号	低信号	中信号



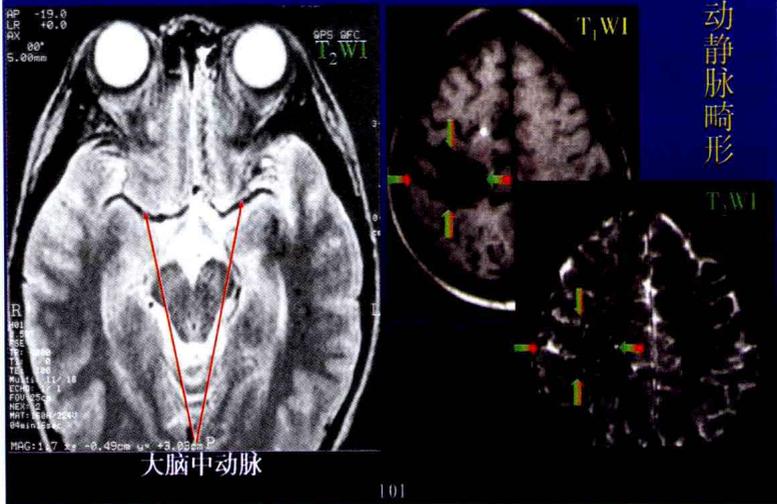
#### 4. 流空效应

MR检查时，血管内流动的血液将接收到的电磁波信号带到磁场外。

梯度线圈选择层面成像时，血流较快的血管表现为无信号（黑色）。

# 流空效应

## 动静脉畸形



大脑中动脉

101

## 第二章 骨与关节

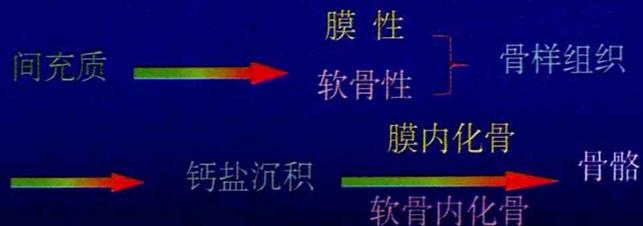
骨质含有大量的钙盐，与其周围软组织在密度上有显著的差别。同时骨密质、骨松质、骨髓腔、关节腔等结构的密度也不同，又形成了鲜明的自然对比。

因此骨与关节非常适合于X线、CT和MRI检查。

1

## 第一节 骨骼的发育

### 一、骨骼的发育过程

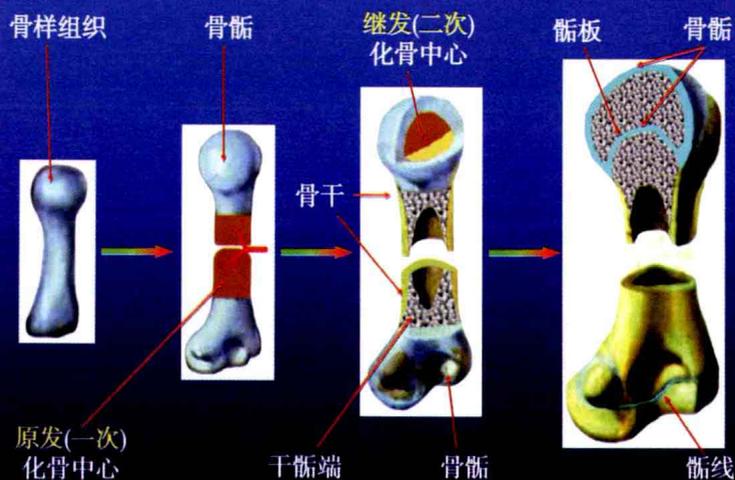


膜内化骨：颅顶骨、面骨和下颌骨等。

软骨内化骨：颅底骨、脊柱和四肢骨等。

2

### 二、软骨内化骨过程



3

### 三、儿童长骨结构



4

### 区别骨折线和骨骺线

区别	骨折线	骨骺线
临床体征	固定压痛点 骨擦音骨擦感	无压痛及 骨擦音等
年龄关系	关系不大	密切相关
远端位置	有改变	无改变
线的边缘	淡而模糊	临时钙化带
线的走向	僵直	柔和

5

### 区别骨折线和骨骺线



6

### 儿童长骨的X线特点

儿童长骨分骨干、干骺端、骺板及骨骺四个部分，**成人**只有骨干和骨端两部分



7

### 不同年龄骨组织比较

成分	无机盐	有机质	水分	特点
成人	50%	25%	25%	因人而异
儿童	↓	↑	↑	韧性较大
老人	↓	↓	↓	脆性较大

8

## 四、骨龄

在骨的正常发育过程中，原发化骨中心和继发化骨中心的出现时间、骨骺与干骺端的融合时间及其形态变化同实际年龄的关系称骨龄。

测骨龄最常用的部位是腕关节。

9

### 3岁内出现两个化骨中心



10

### 4岁内出现三个化骨中心



11

### 5~11岁出现七个化骨中心

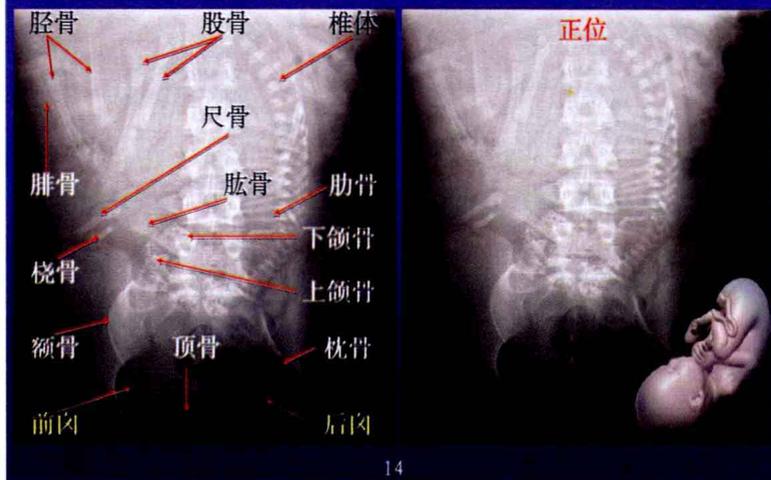


12

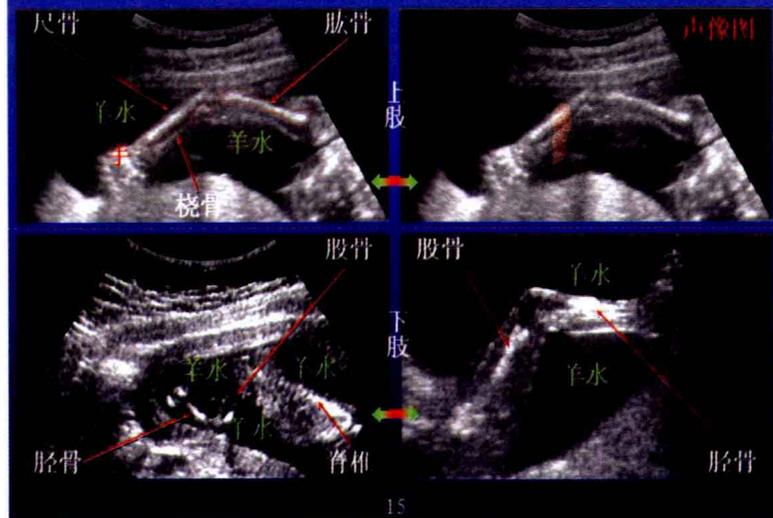
### 11岁后八个化骨中心长全



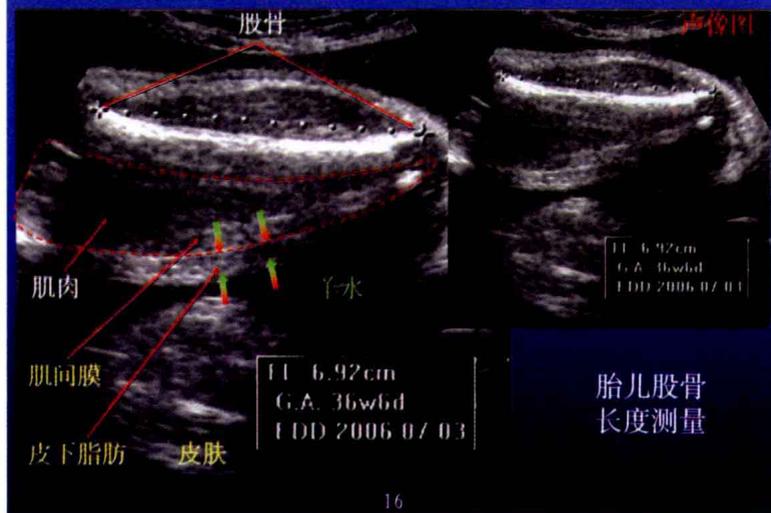
### 五、胎儿骨骼 孕37周 母亲腹盆腔

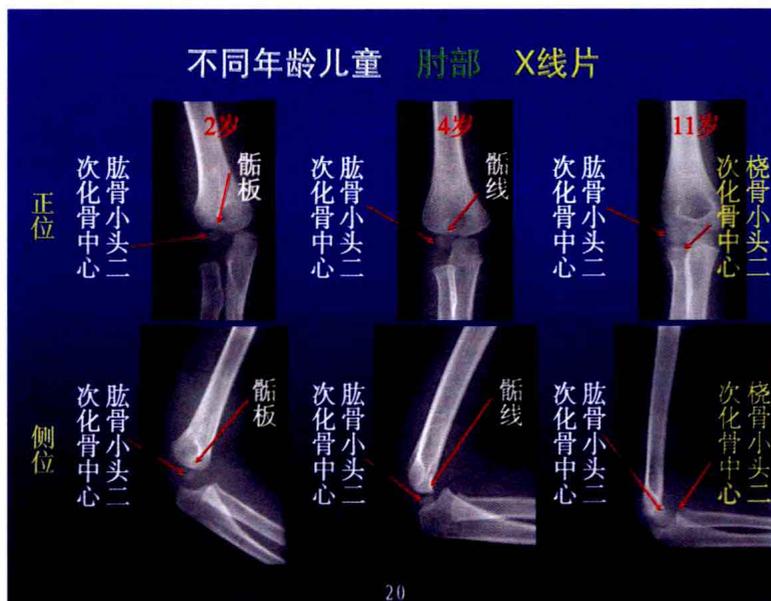
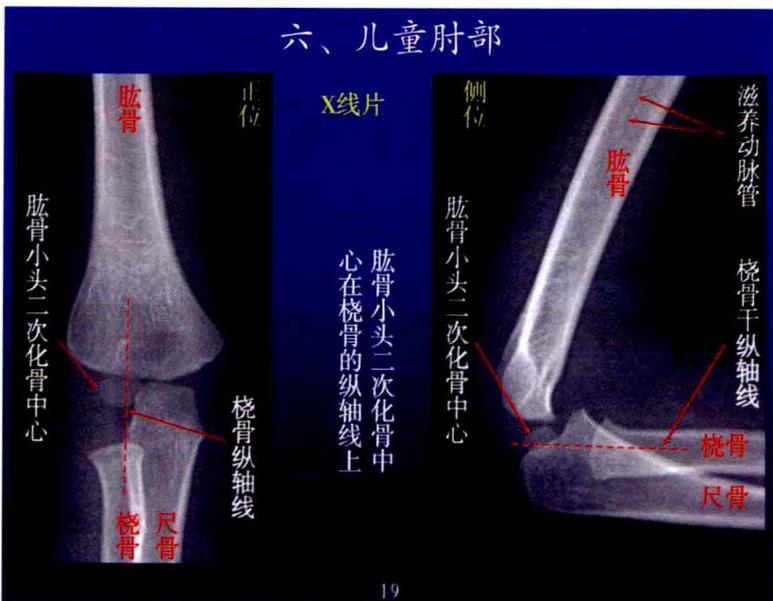
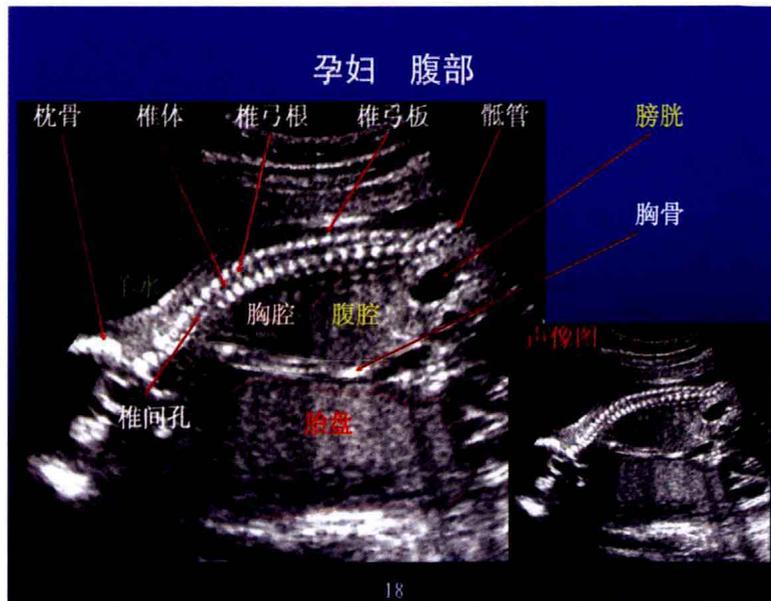
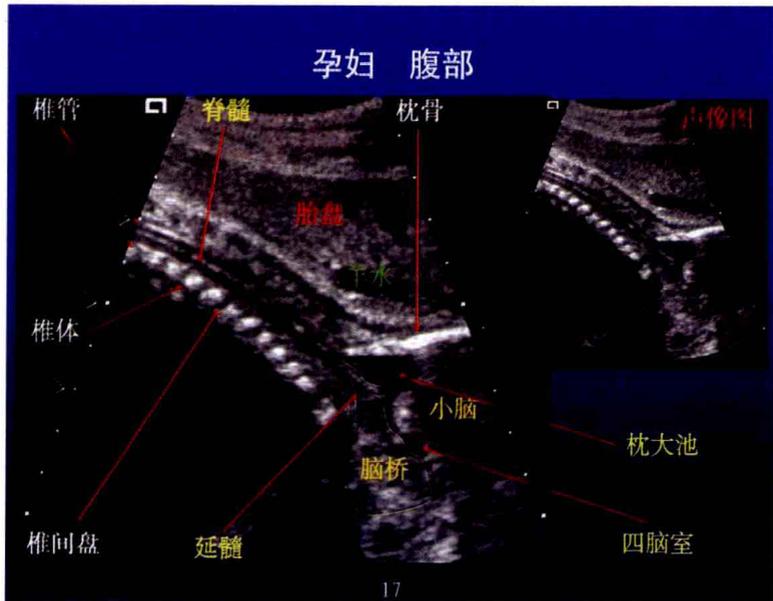


### 孕妇 腹部



### 孕妇 腹部





成人 肘部 X线片 髁线消失

正位

侧位



21

七、儿童髋关节

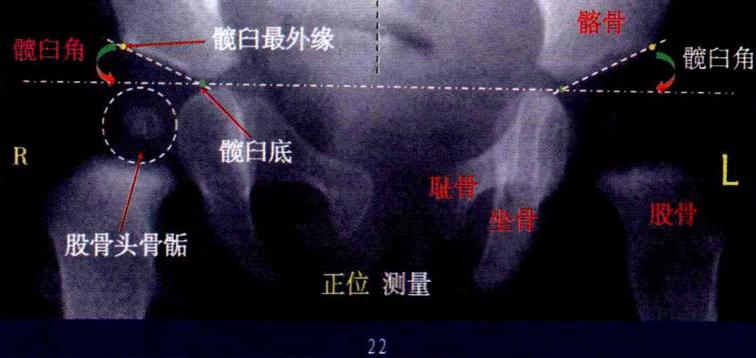
出生时为28~30°

一周岁为23°；

二周岁为20°；

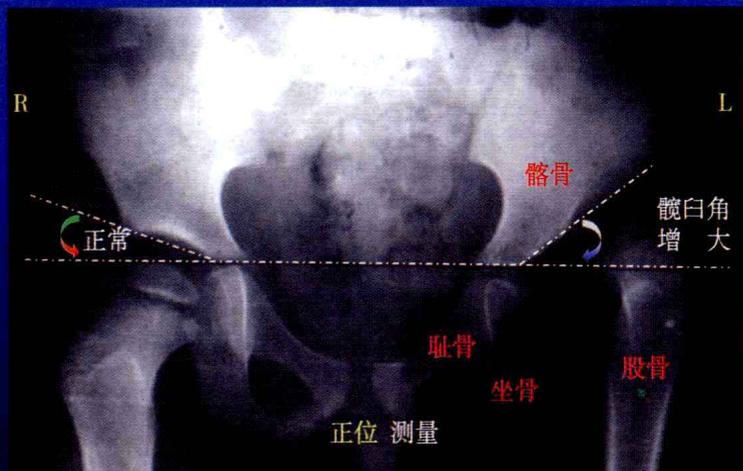
以后每增加一岁，  
髋臼角减小1°；

到10周岁后为12°



22

左侧先天性髋关节脱臼



23

随年龄增加髋关节的关节间隙变窄

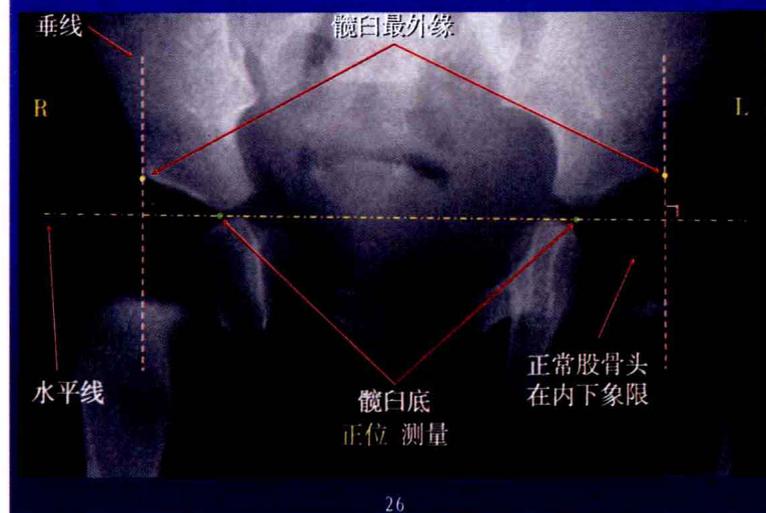


24

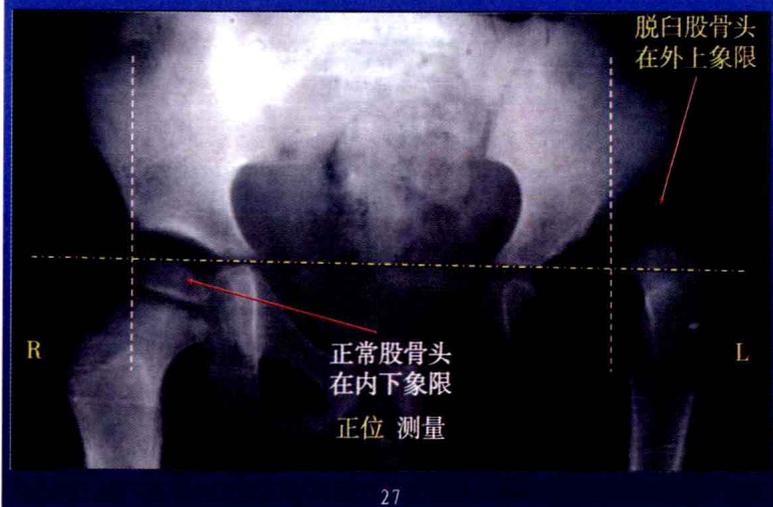
成人髋关节的关节间隙较窄



柏金 ( Perkin's ) 方格



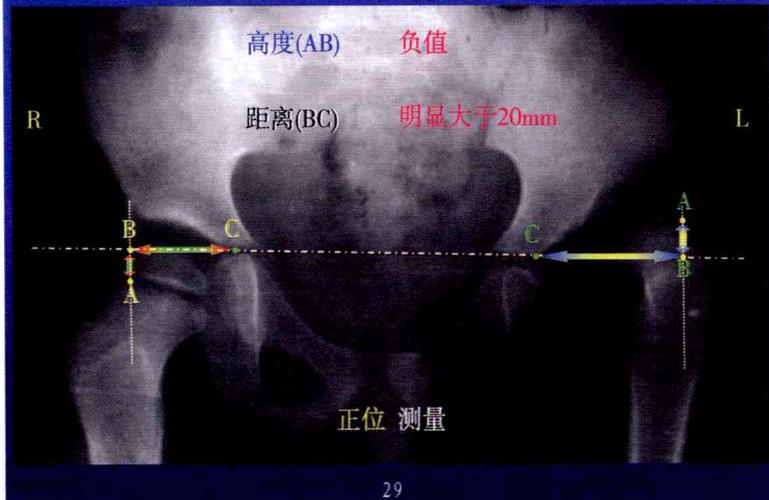
左侧先天性髋关节脱臼



儿童髋关节距离和高度

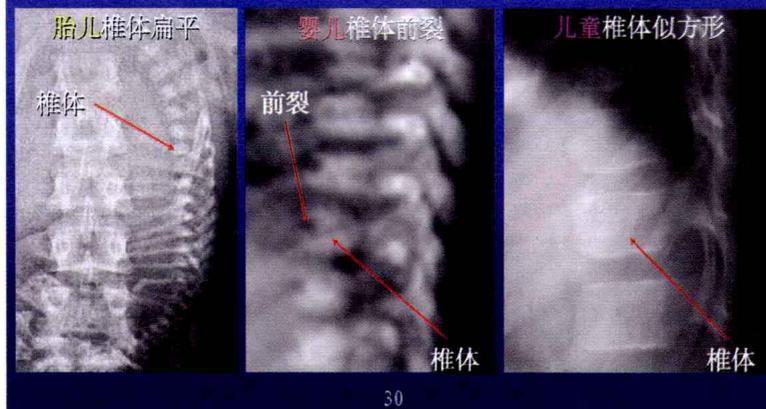


### 左侧先天性髋关节脱臼



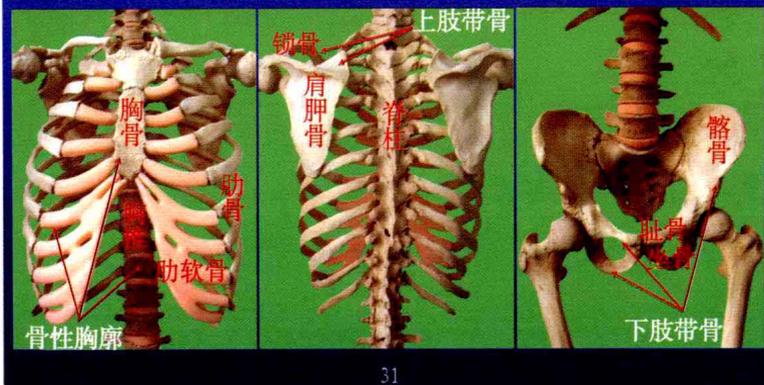
### 八、小孩脊椎

#### 不同年龄段的小孩脊椎形态不同



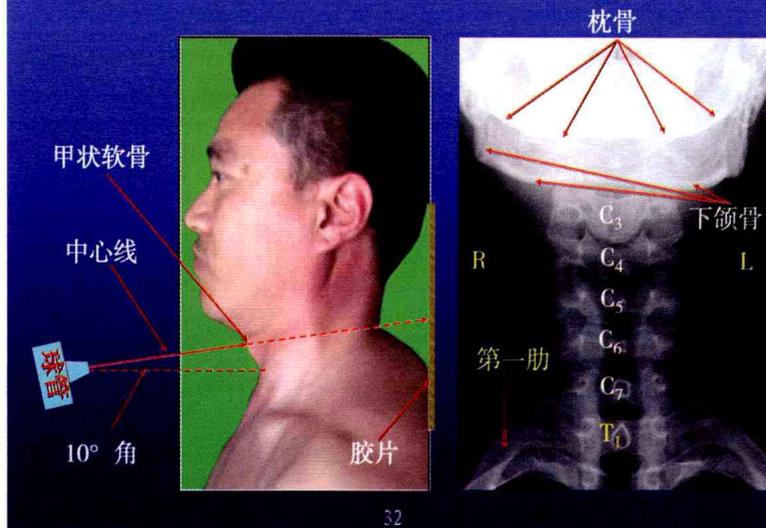
### 第二节 躯干骨

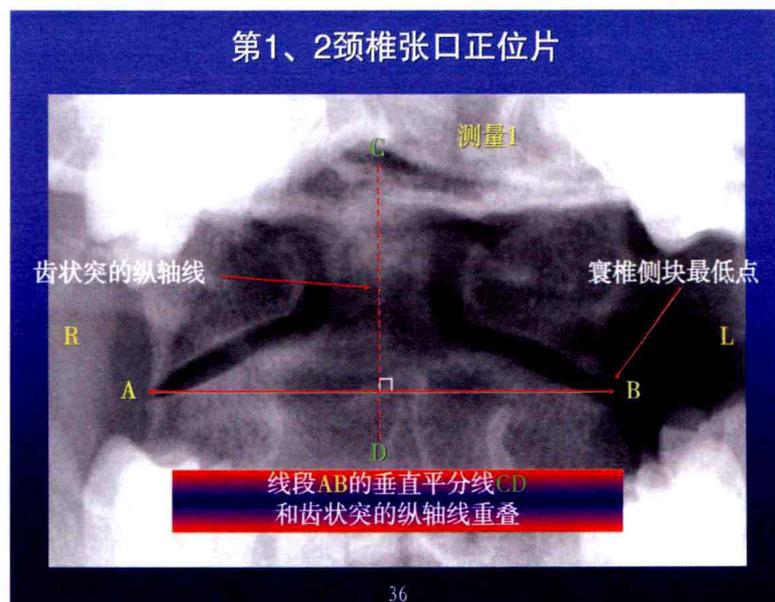
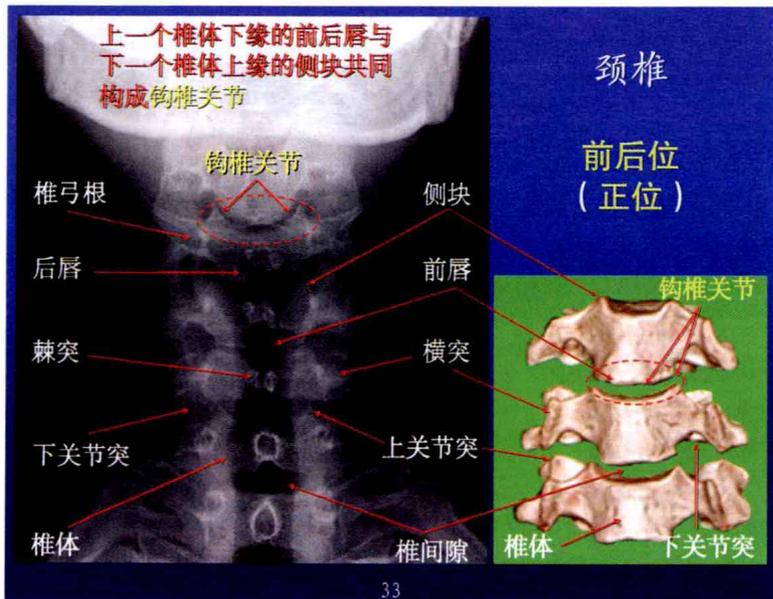
本节介绍脊柱、骨性胸廓、上肢带骨、下肢带骨等影像解剖知识。



### 一、颈椎

#### 1. 前后位片



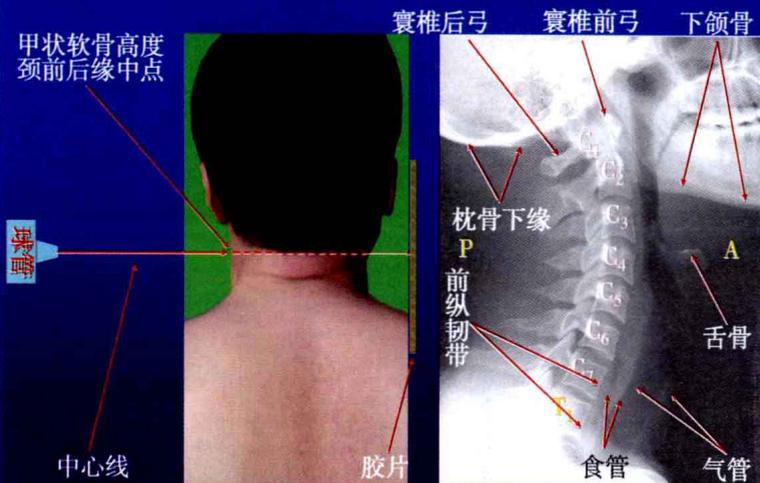


### 第1、2颈椎张口正位片



37

### 3. 颈椎侧位片

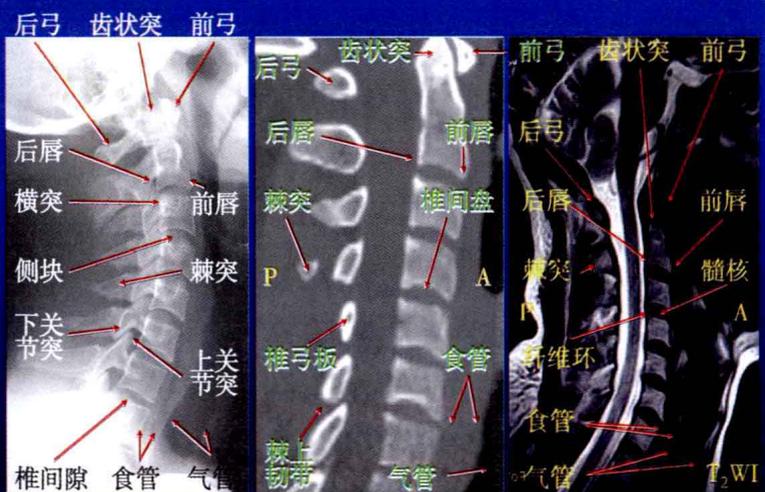


38

### 右侧位片

### CT矢状面重建

### MRI矢状面



39

### 右侧位片

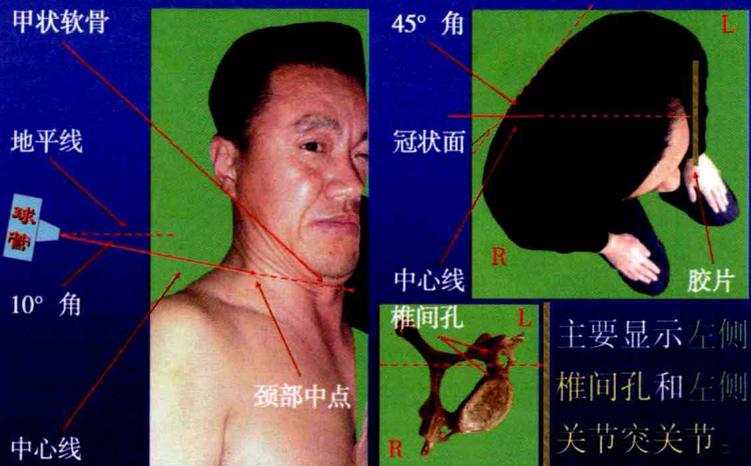
### CT矢状面重建

### MRI矢状面



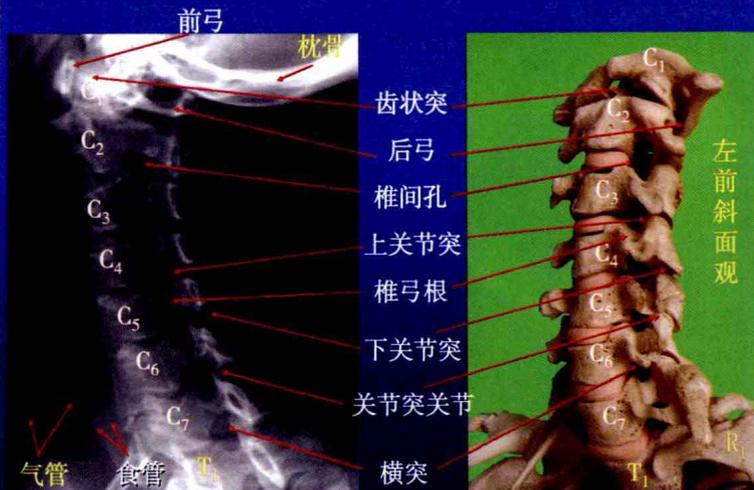
40

### 4. 颈椎左前斜位片



41

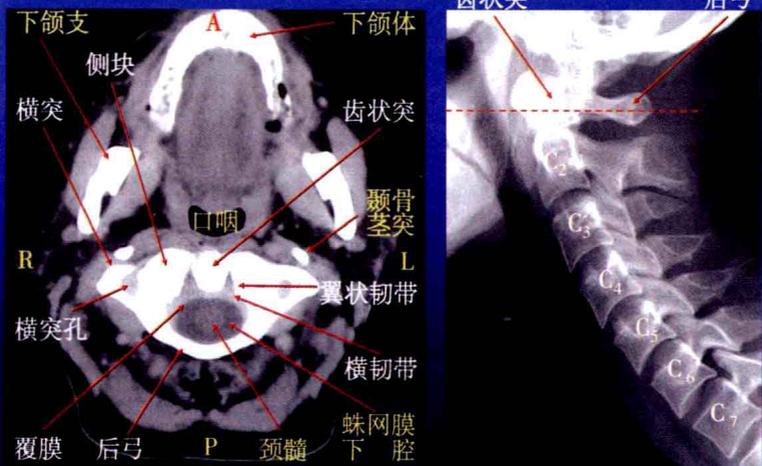
### 颈椎左前斜位片



42

### 5. 颈椎CT 寰枢椎

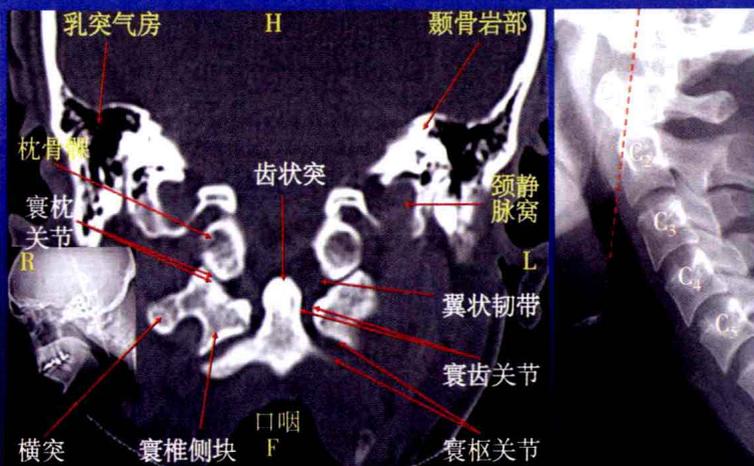
#### 横断面



43

### 颈椎CT 寰枢椎

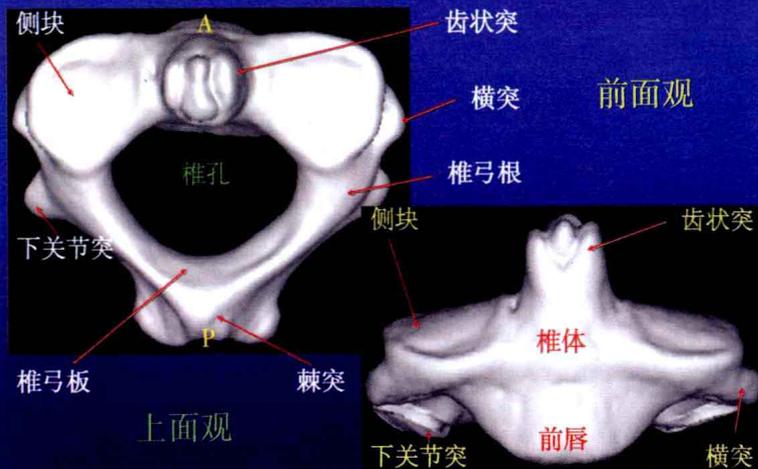
#### 冠状面



44

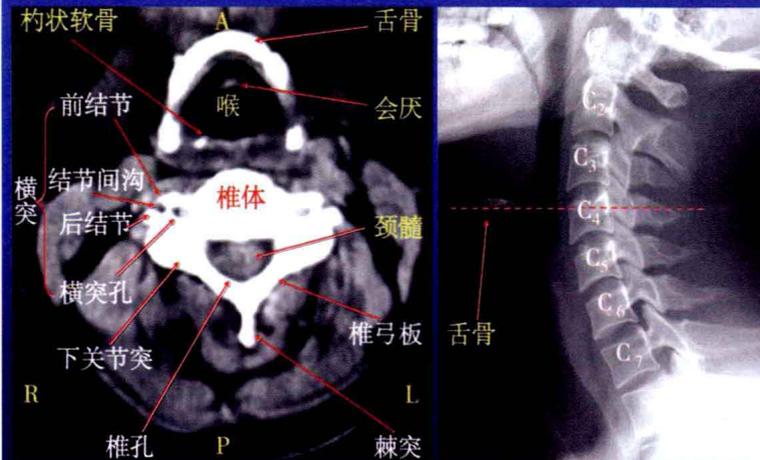
颈椎CT 枢椎

三维重建



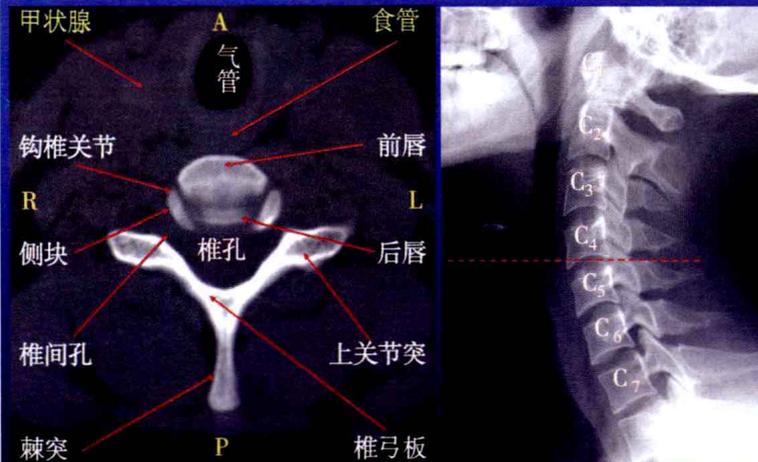
45

颈椎CT 第4颈椎



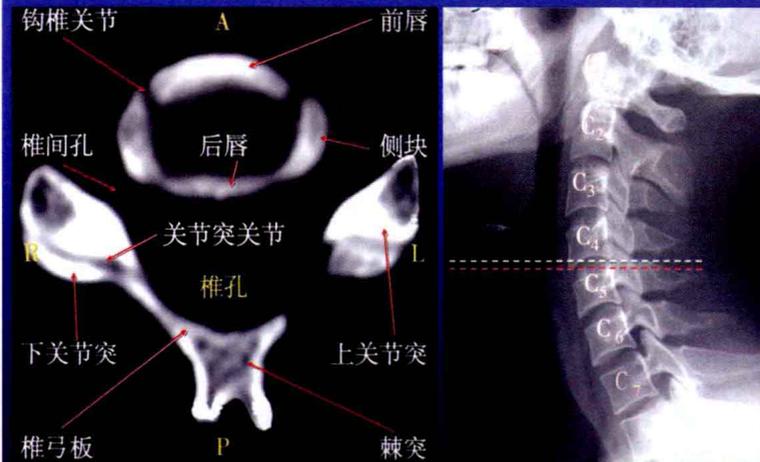
46

颈椎CT 钩椎关节

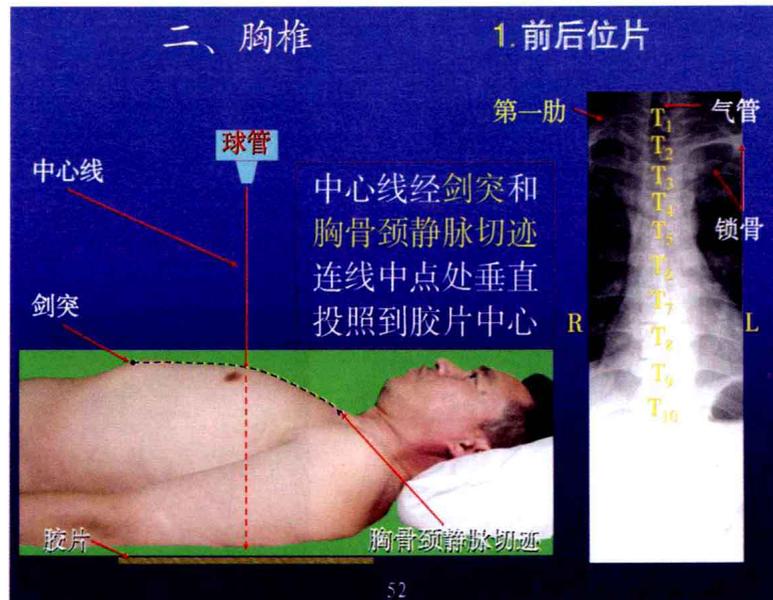
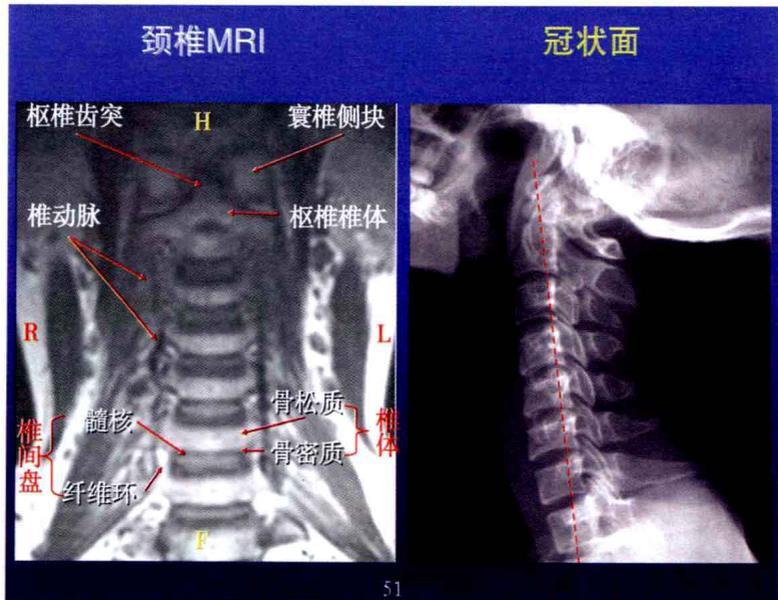
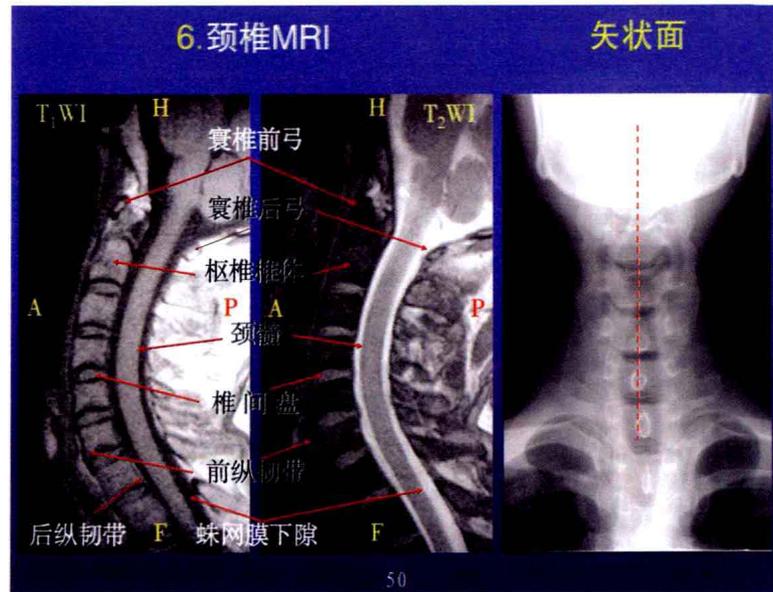
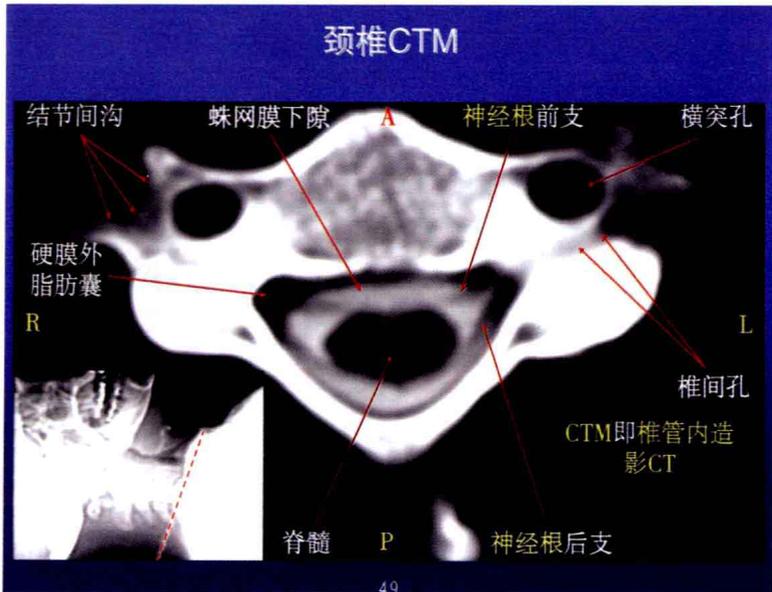


47

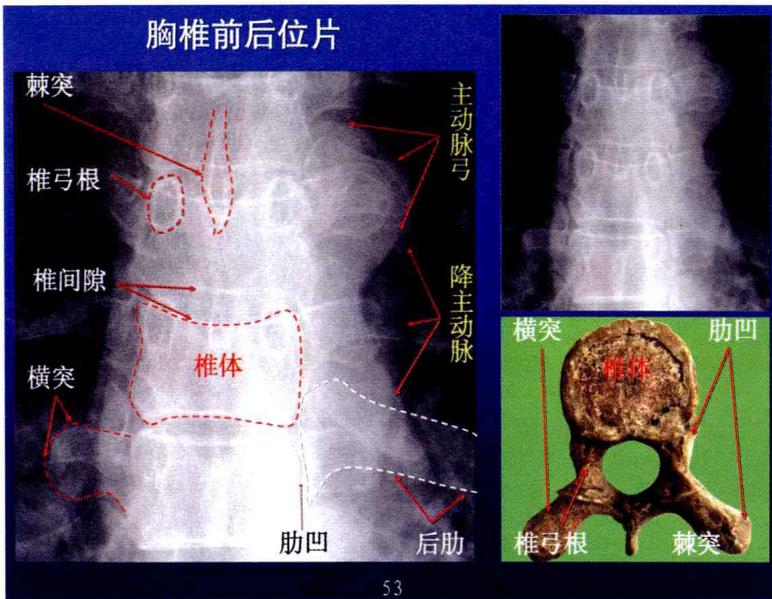
颈椎CT 钩椎关节



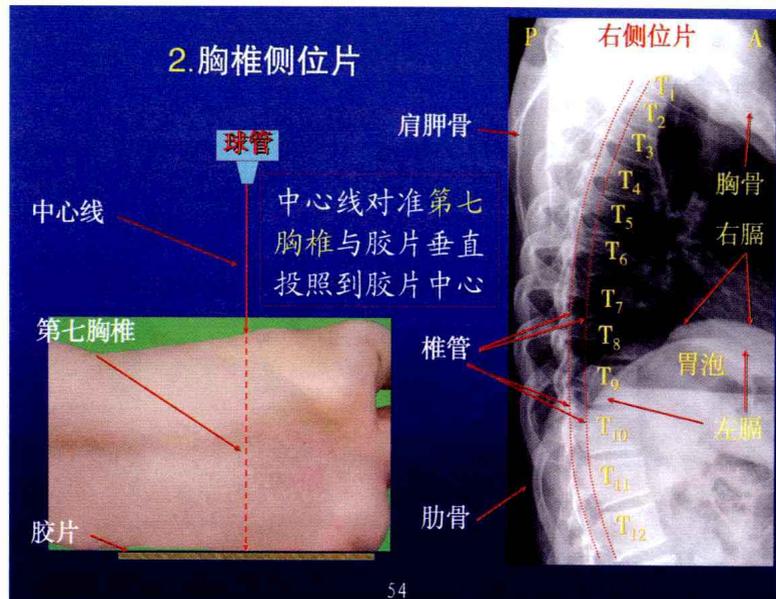
48



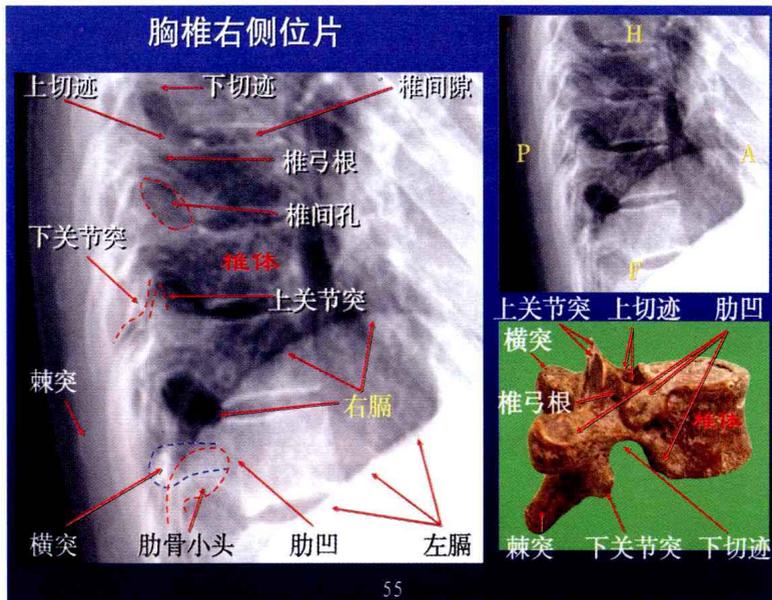
### 胸椎前后位片



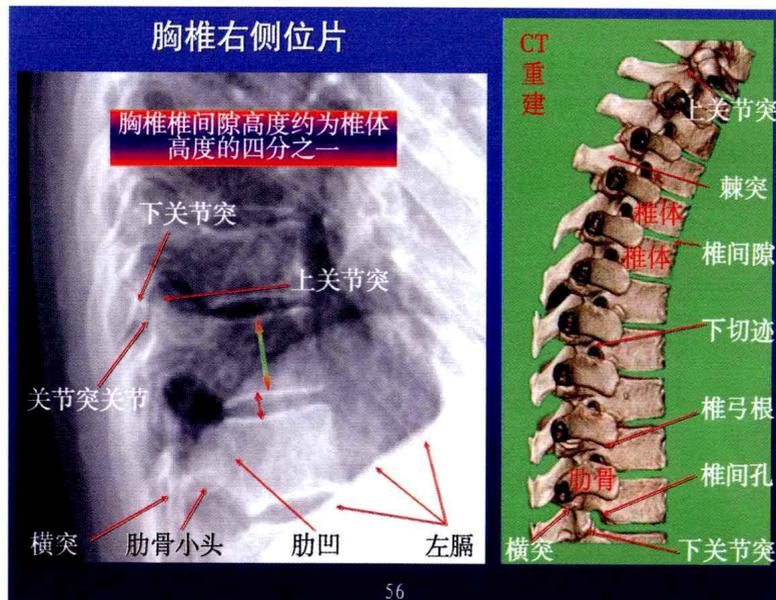
### 2. 胸椎侧位片

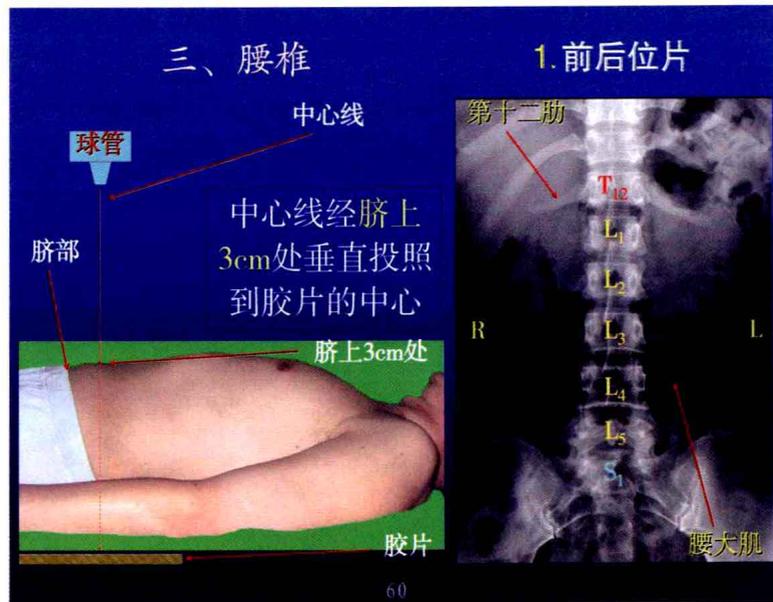
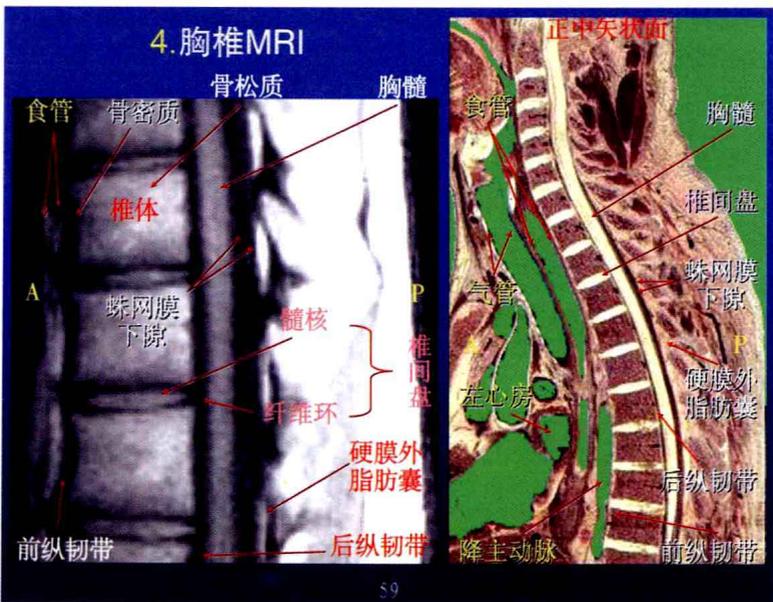
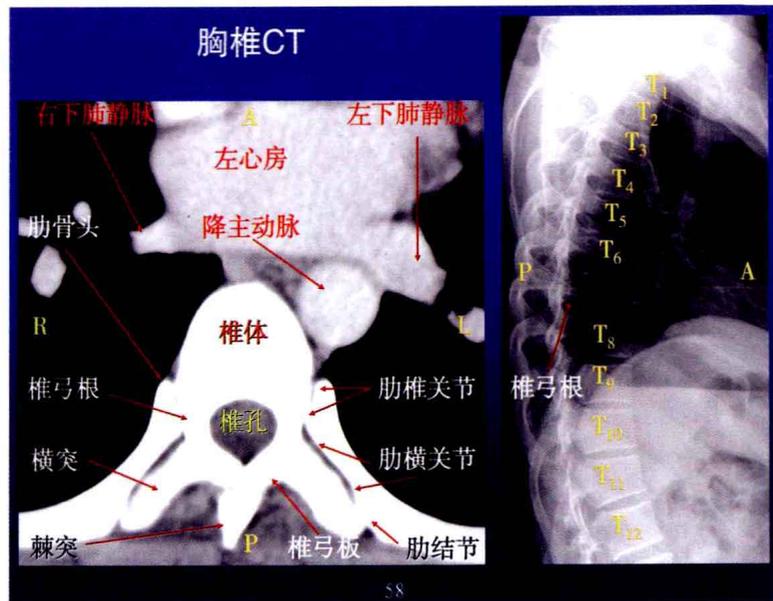
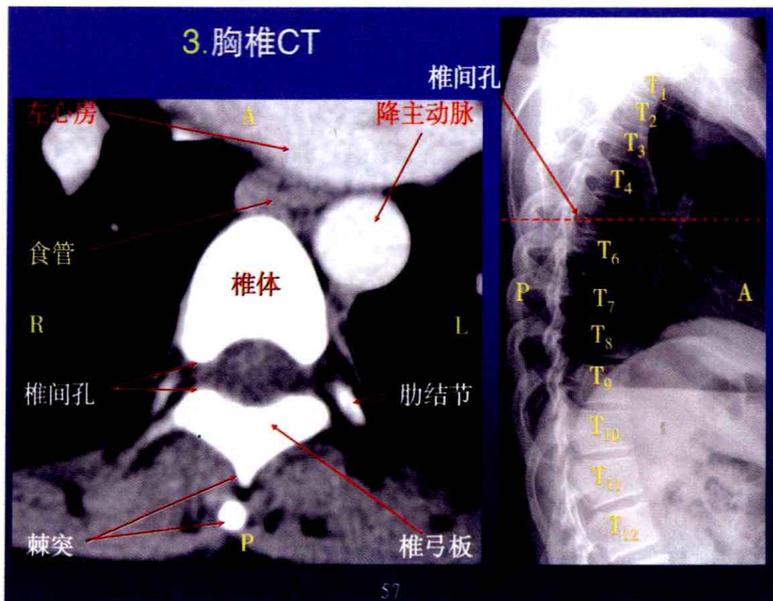


### 胸椎右侧位片



### 胸椎右侧位片







腰椎 左后斜位片

椎弓及附件影很像猎狗：

- 狗嘴为近胶片侧横突；
- 狗眼为近胶片侧椎弓根；
- 狗耳为近胶片侧上关节突；
- 狗颈为近胶片侧椎弓峡部；
- 狗体为椎弓板；
- 狗腿为下关节突；
- 狗尾为远胶片侧的横突。



65

腰椎 左后斜位片

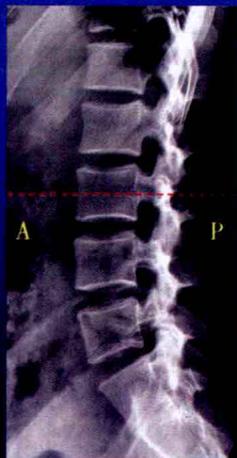
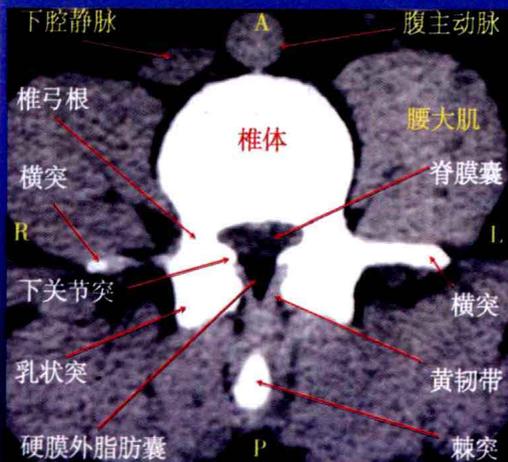


66



腰椎

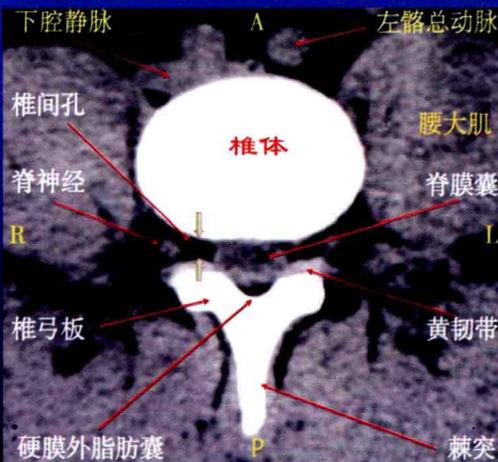
4. CT



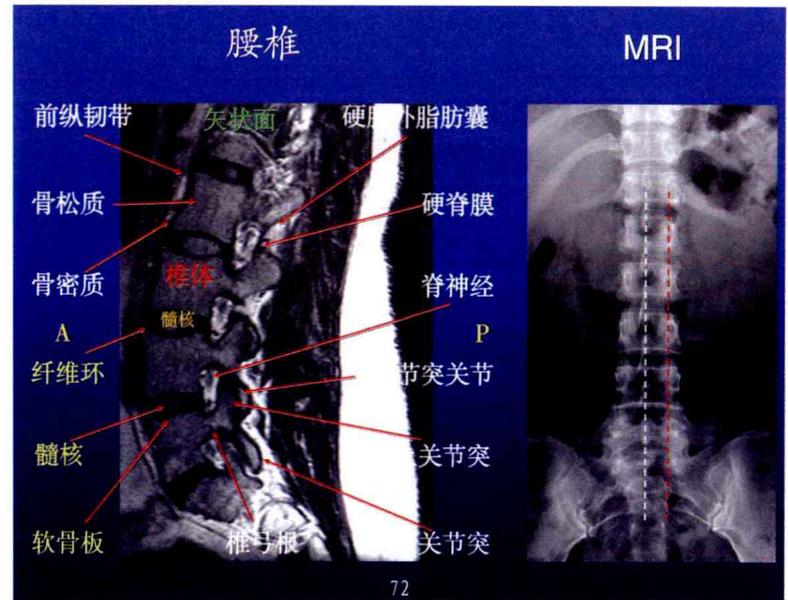
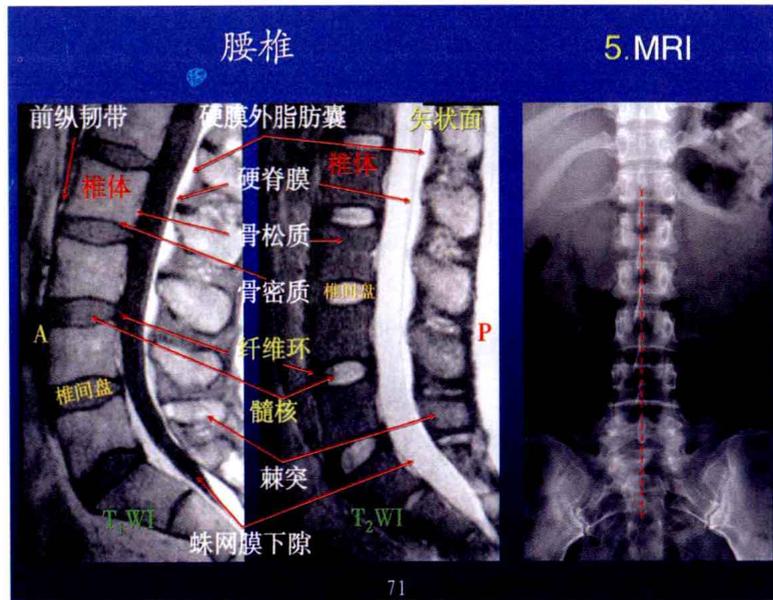
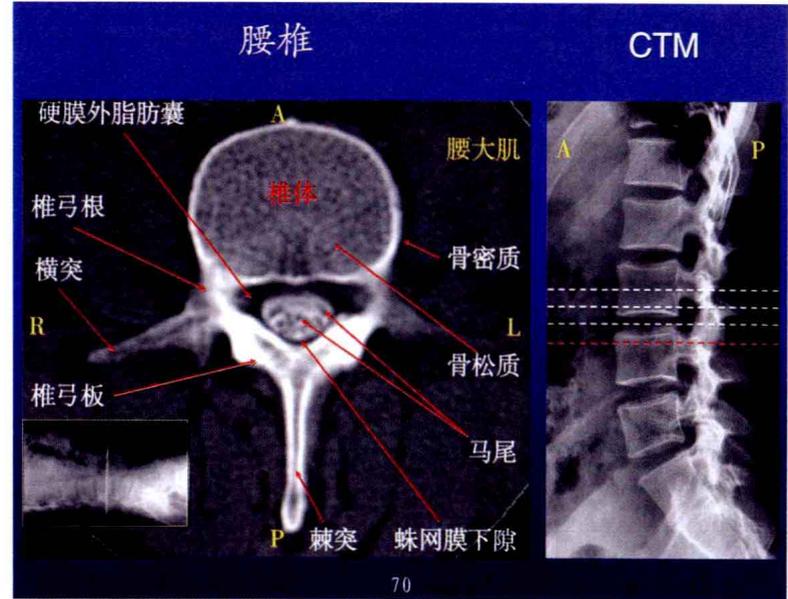
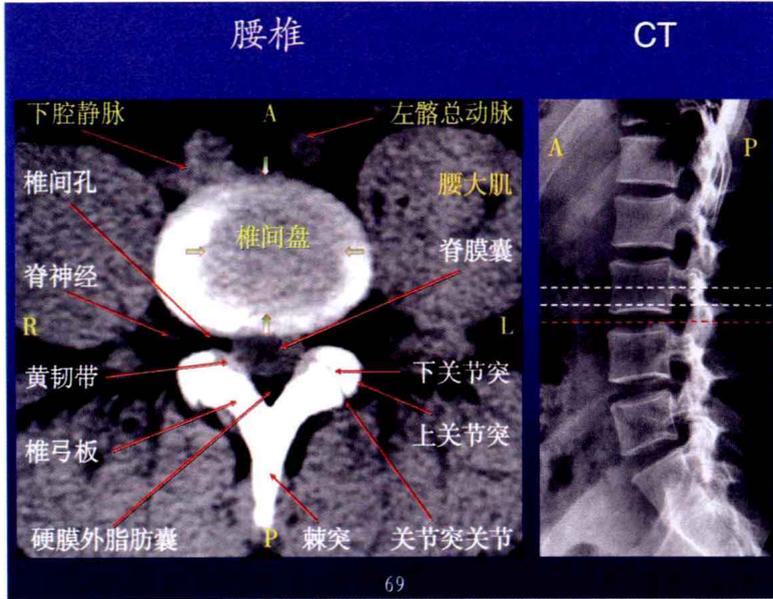
67

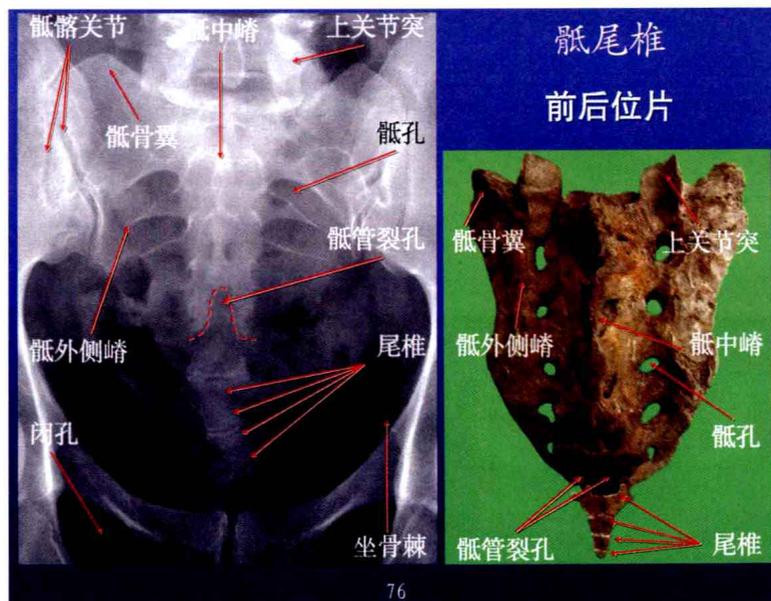
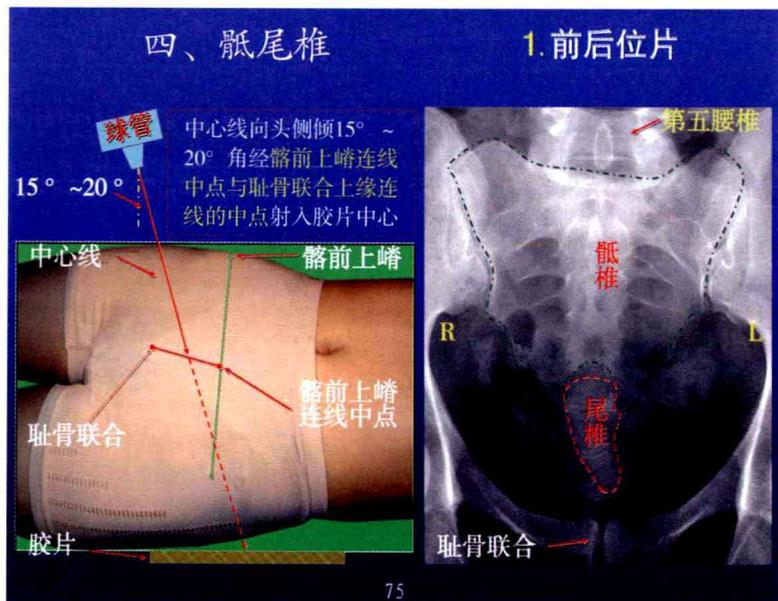
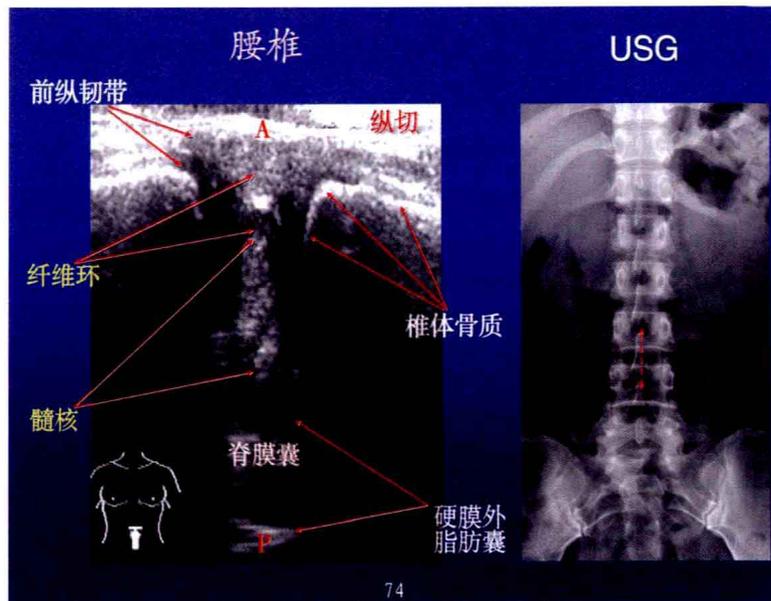
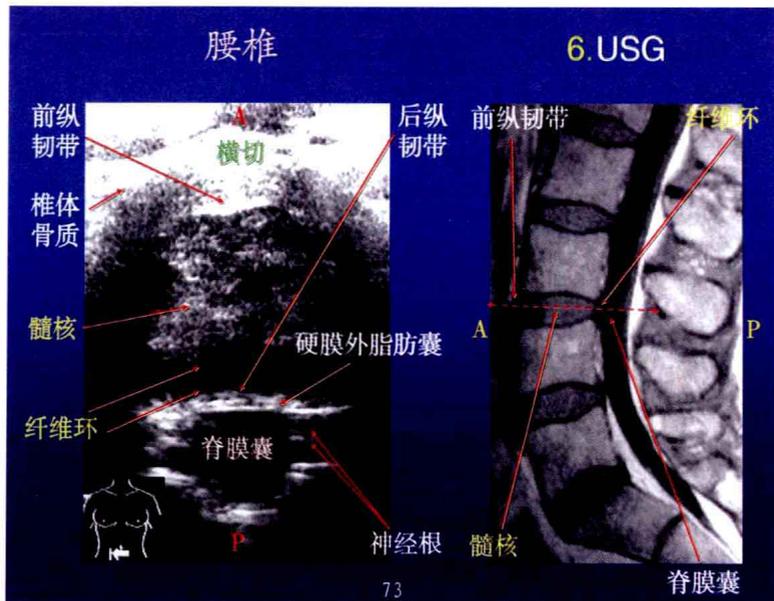
腰椎

CT



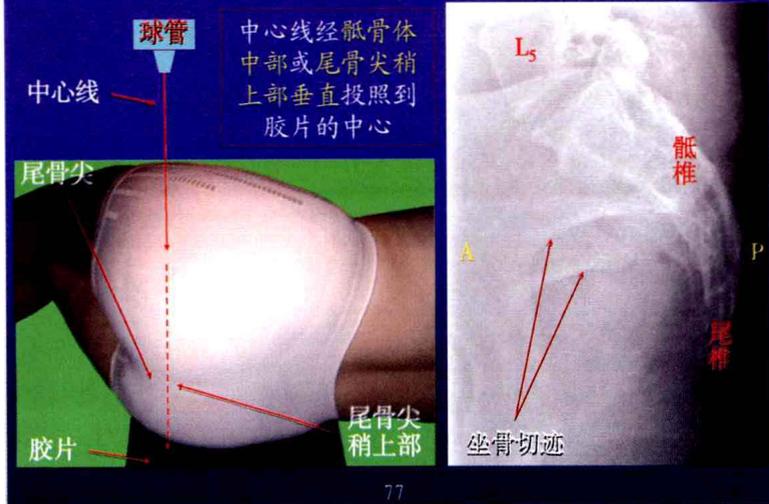
68



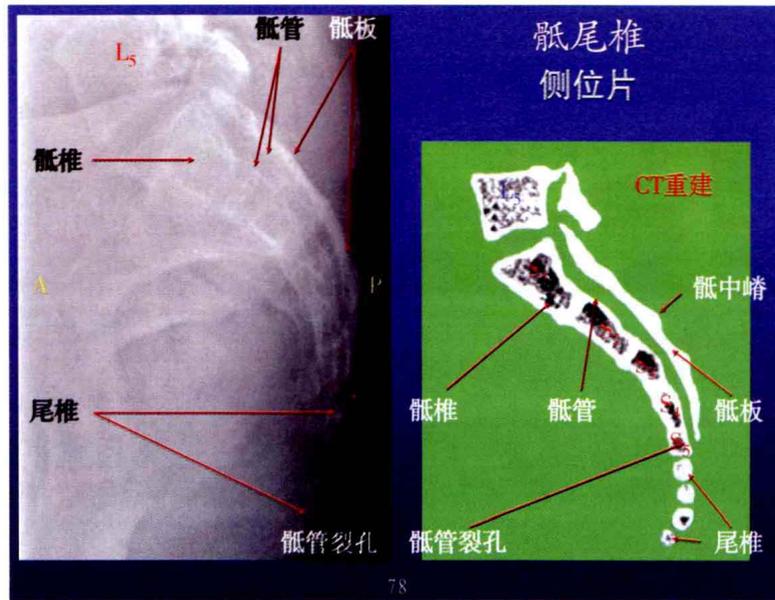


### 骶尾椎

### 2. 侧位片

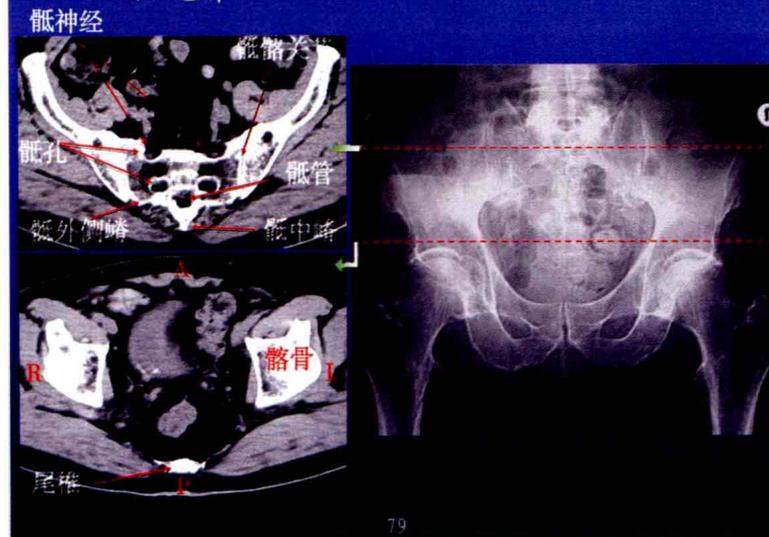


### 骶尾椎侧位片



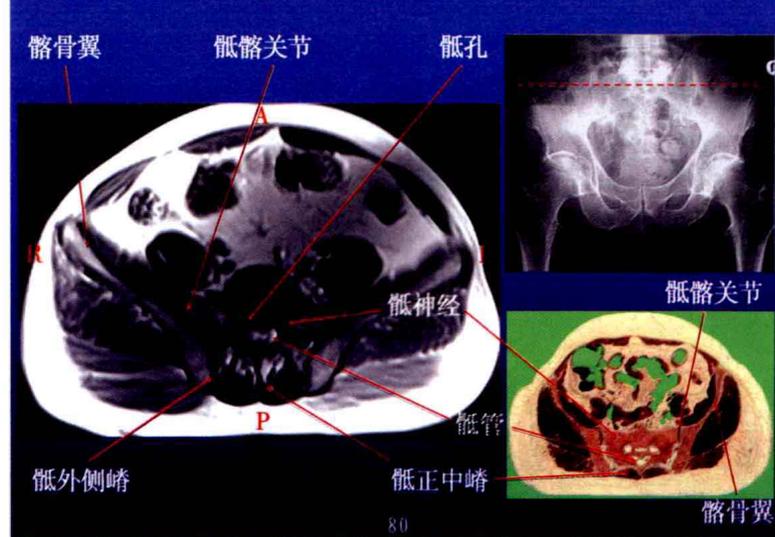
### 骶尾椎

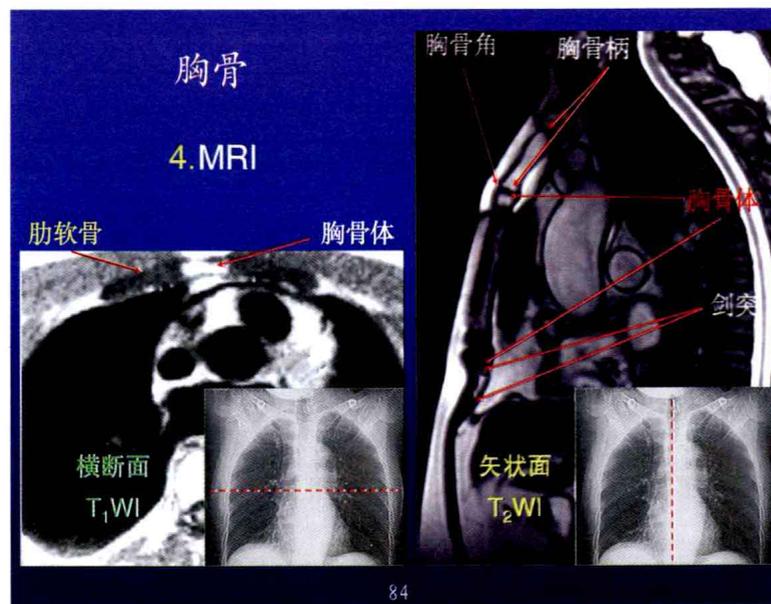
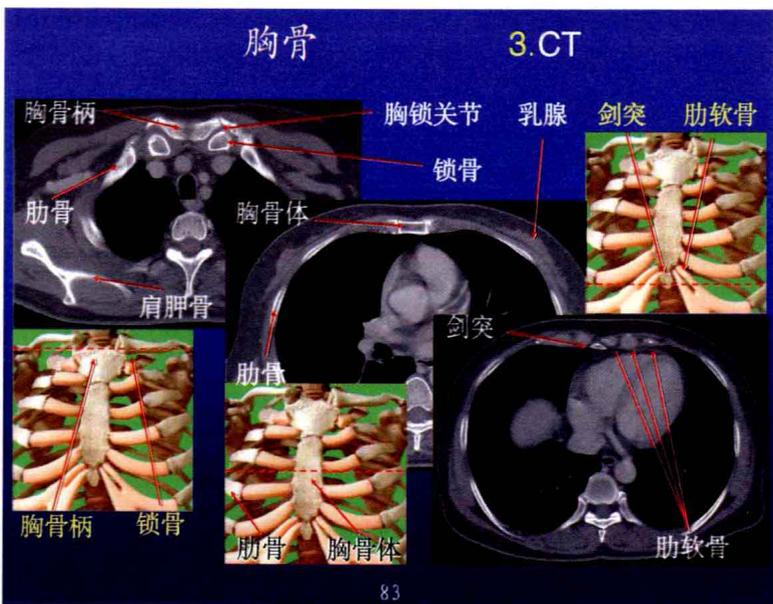
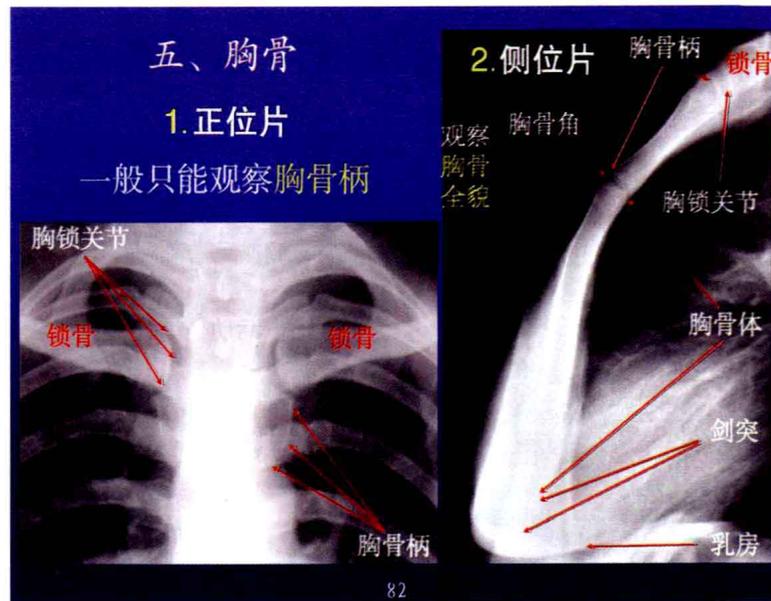
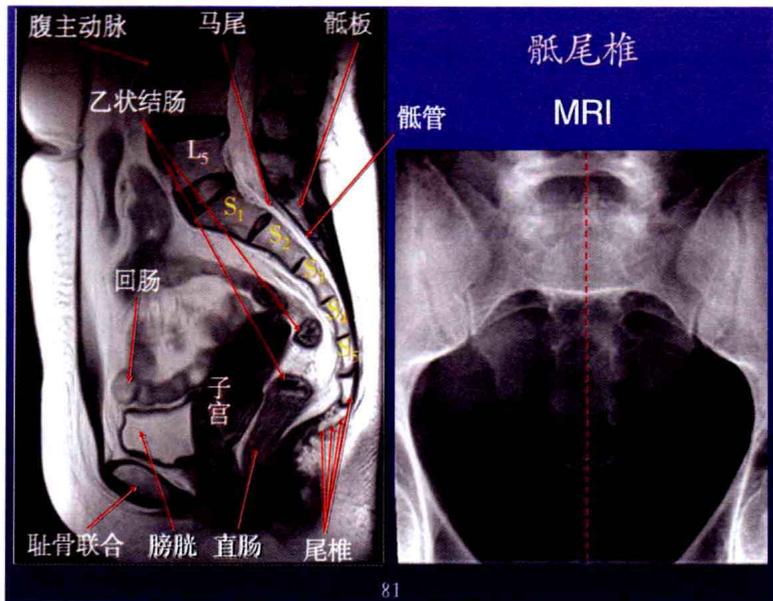
### 3. CT



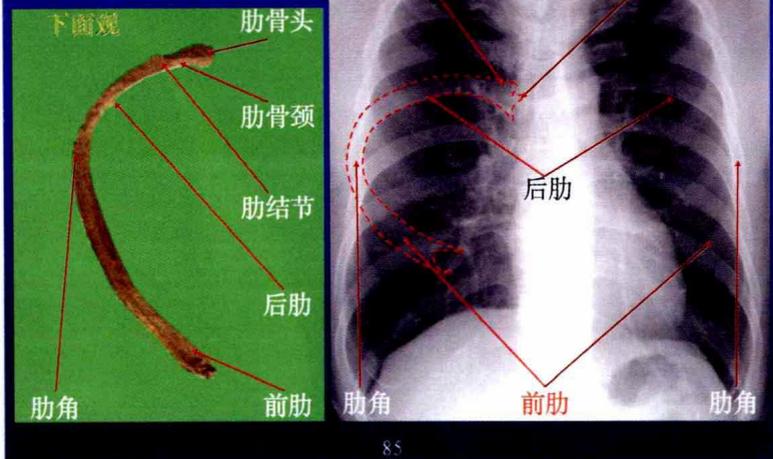
### 骶尾椎

### 4. MRI





## 六、肋骨 正位片



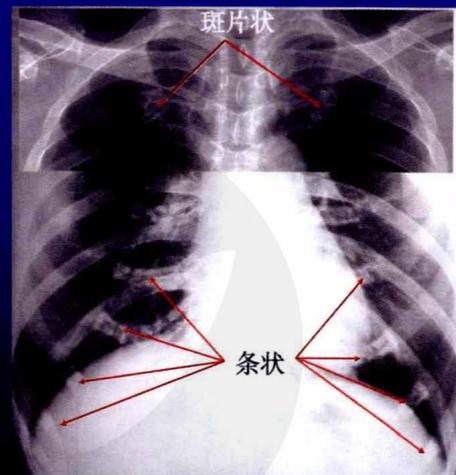
85

## 肋骨 正位片

在前肋方向上呈片状或条索状。

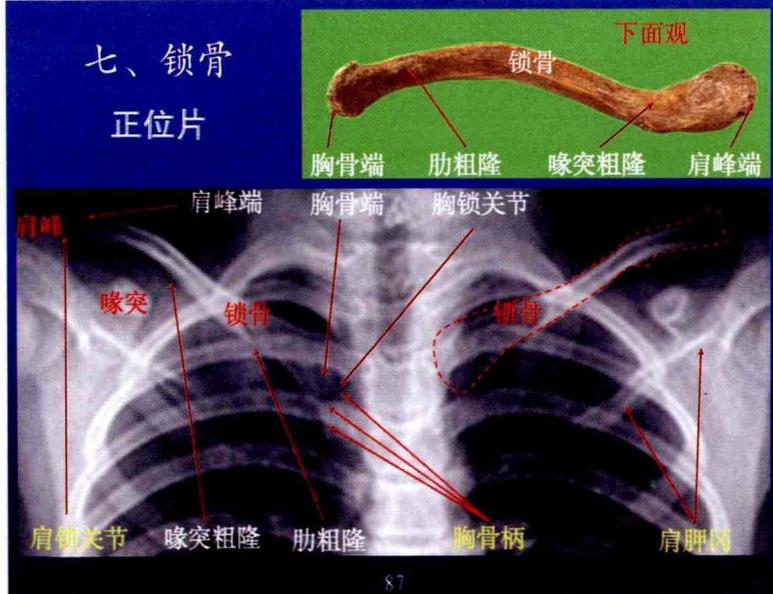
第一肋软骨最先钙化，接着是第十二肋软骨钙化。然后就依次从下向上钙化。第二肋软骨最后钙化。

## 肋软骨钙化



86

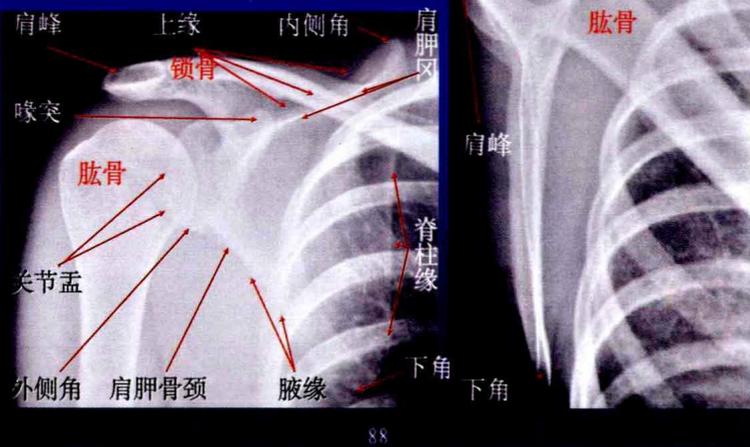
## 七、锁骨 正位片



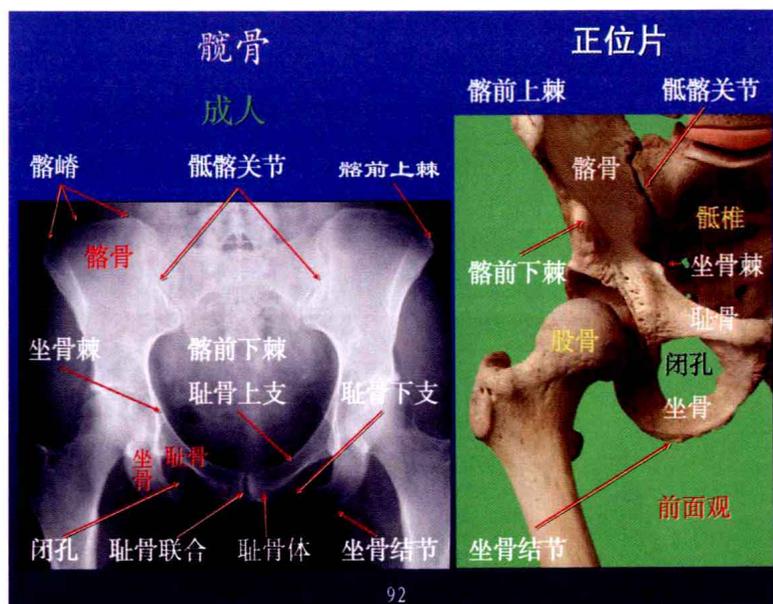
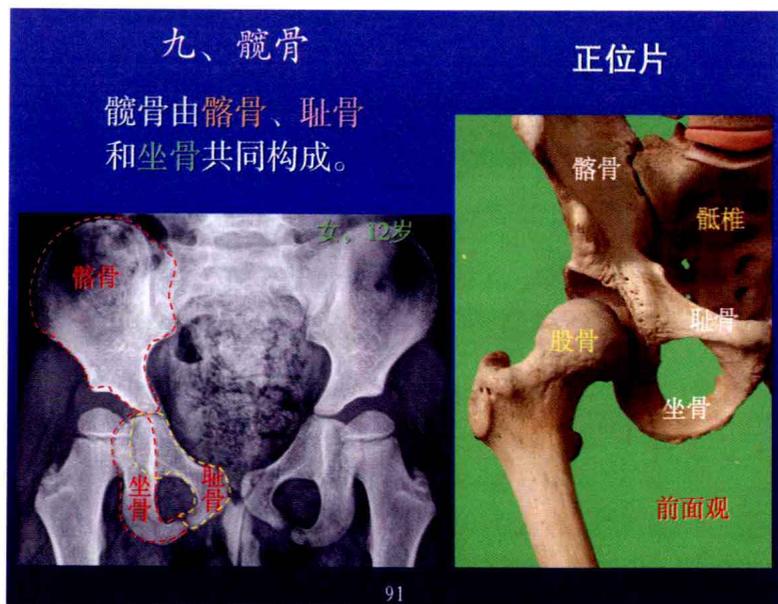
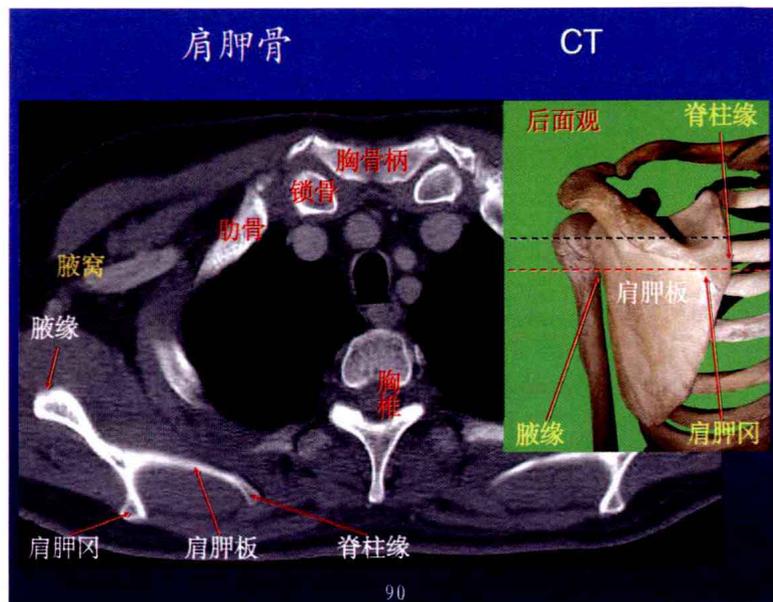
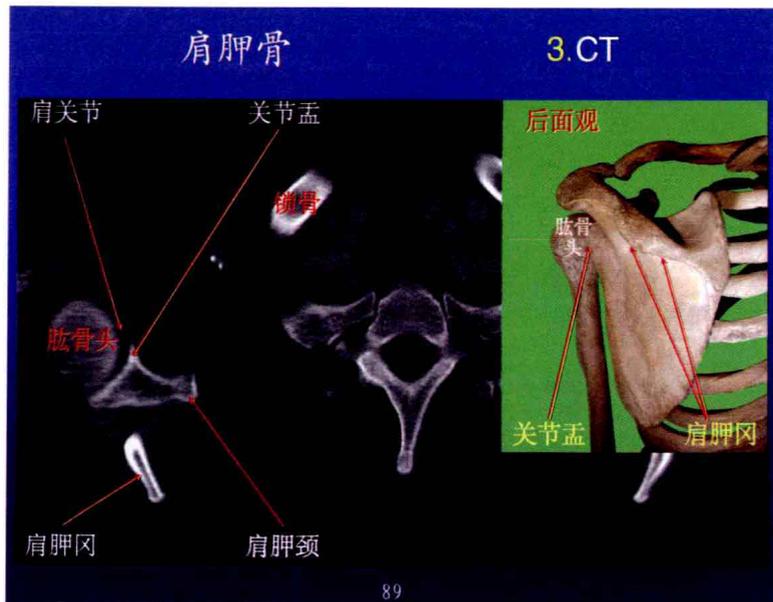
87

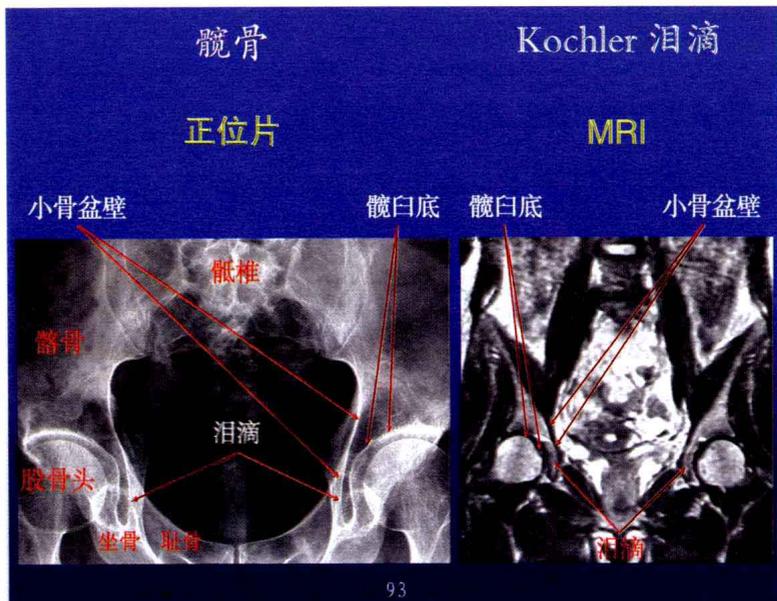
## 八、肩胛骨

### 1. 正位片 2. 切线位片



88





## 第三节 骨连结与四肢骨

### 全身骨骼的连结方式

**直接连结:**

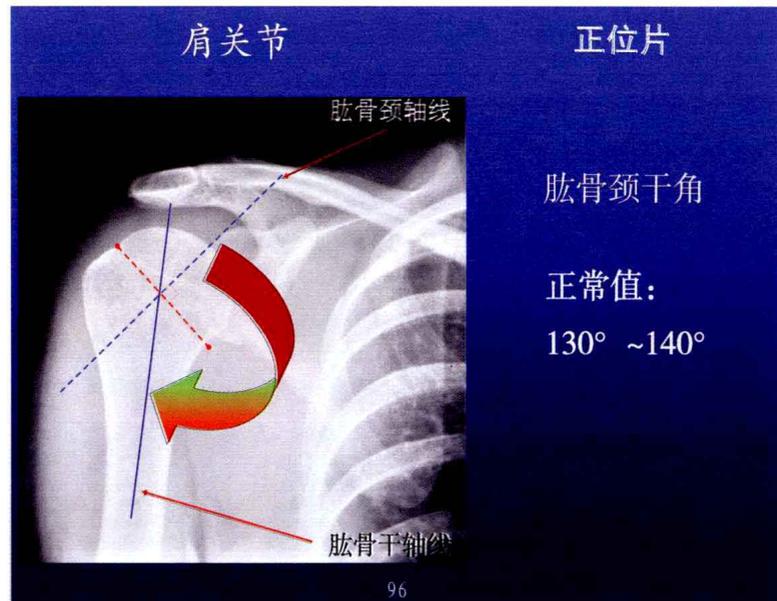
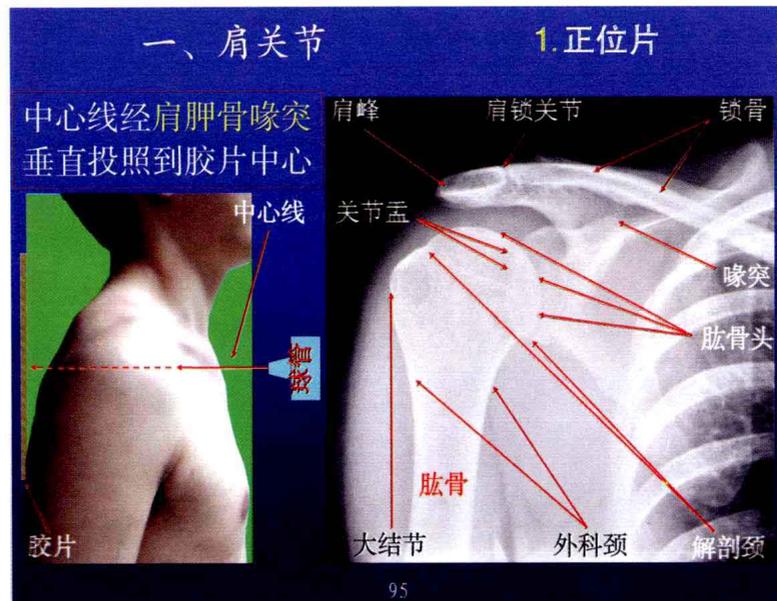
- 1 膜连结, 如颅缝、韧带等。
- 2 软骨连结, 如耻骨联合、椎间盘等。
- 3 骨连结, 如骶骨、髌骨等。

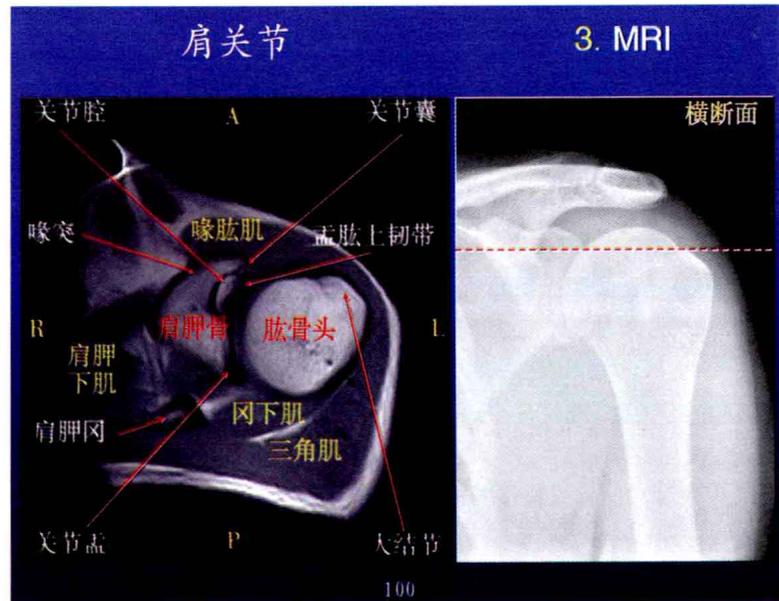
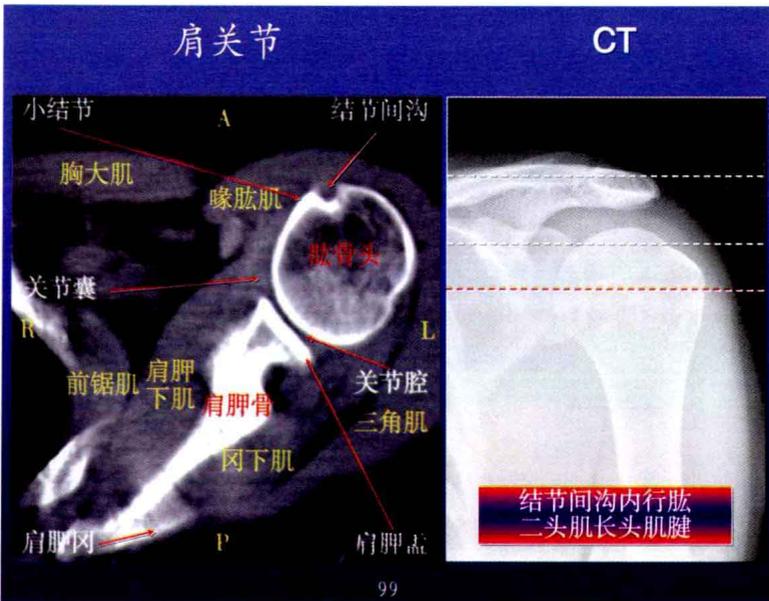
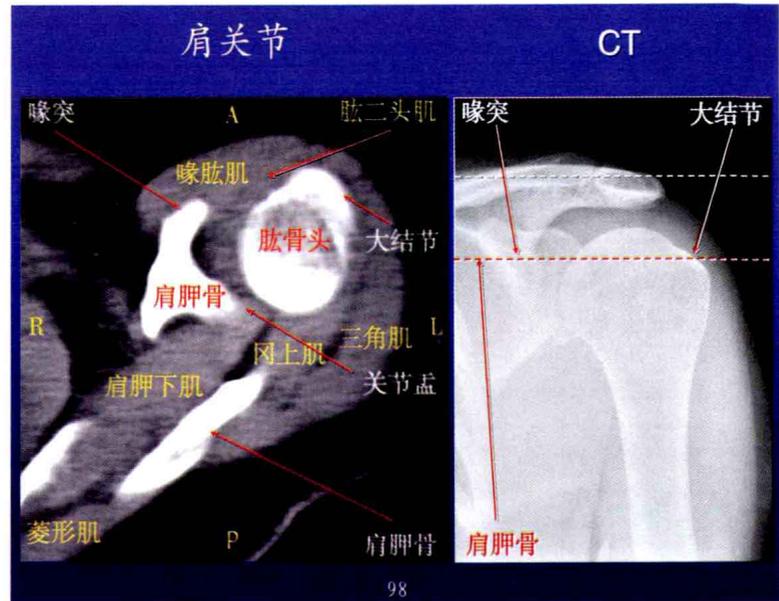
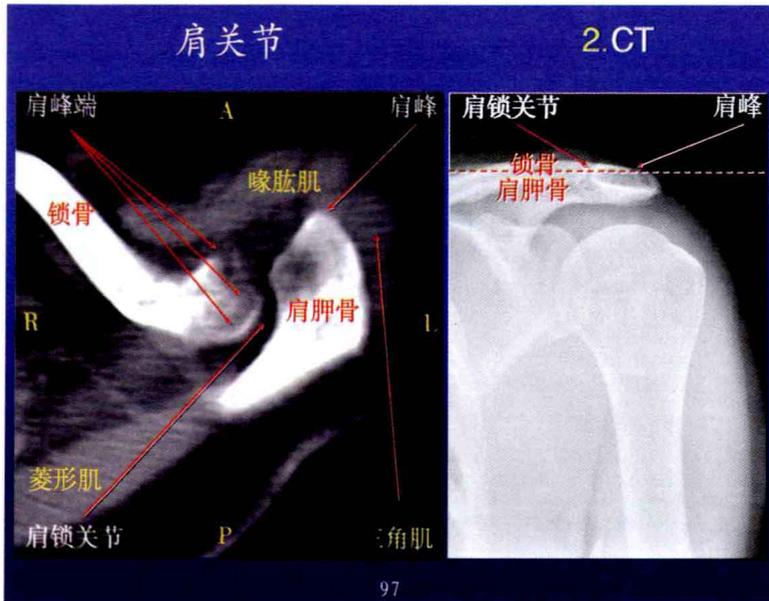
**间接连结:** 指关节。

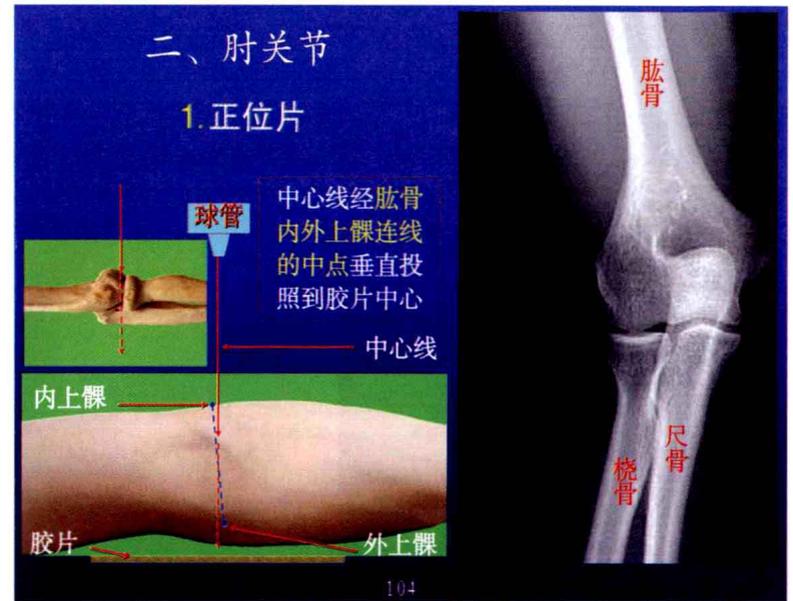
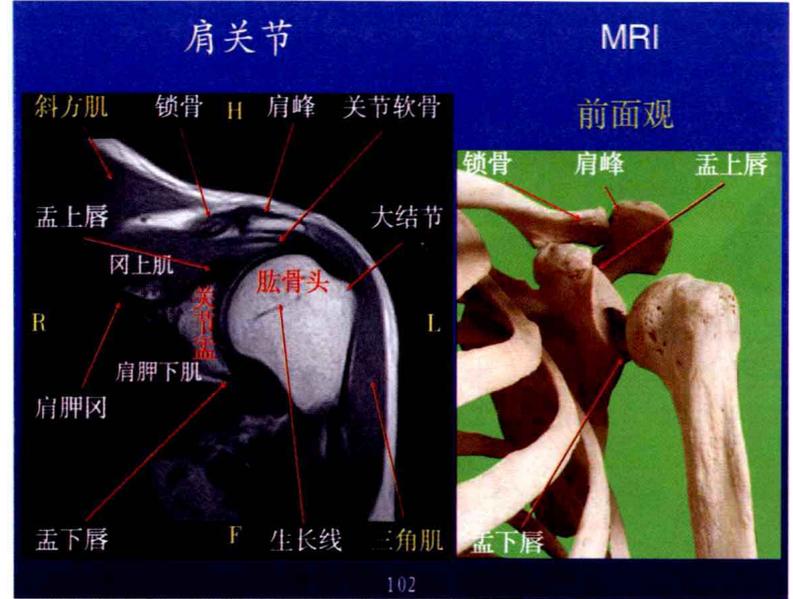
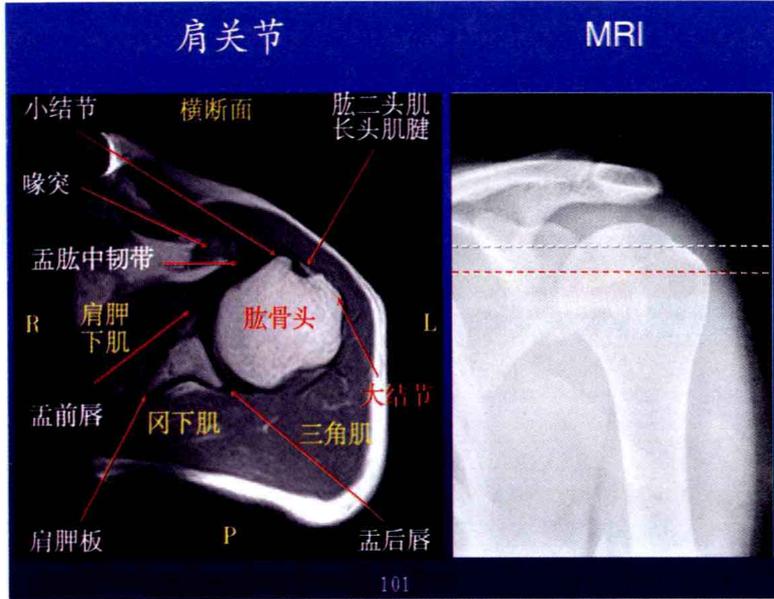
关节包括 关节面、关节囊、关节腔。

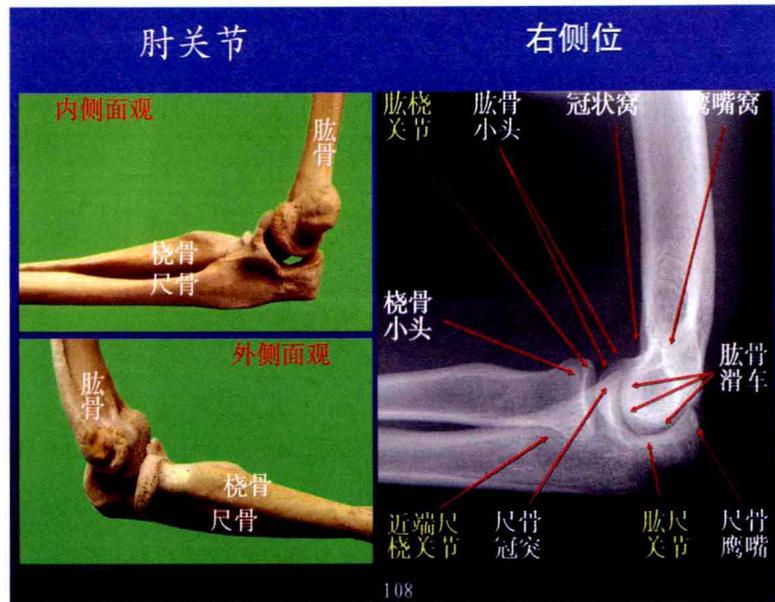
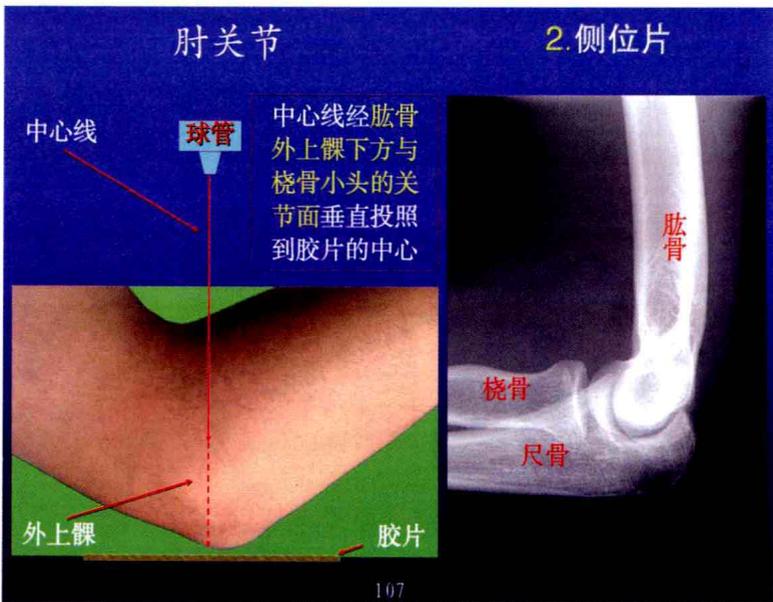
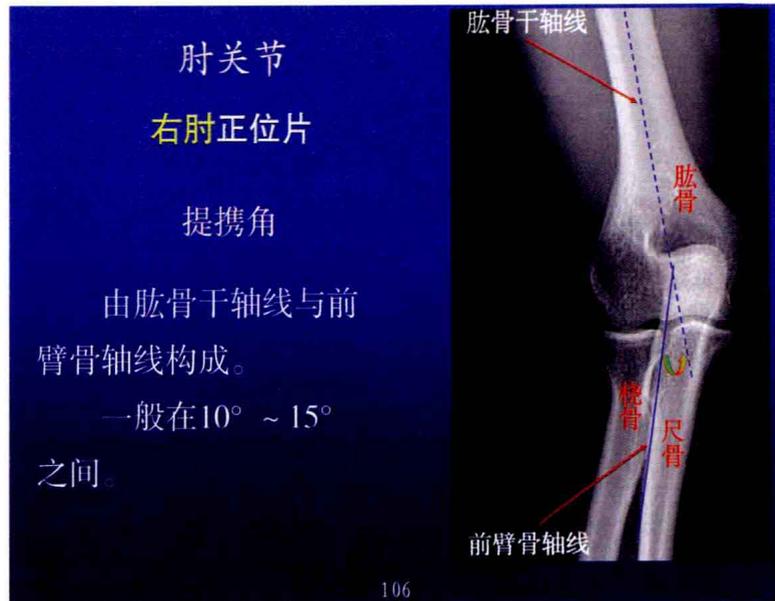
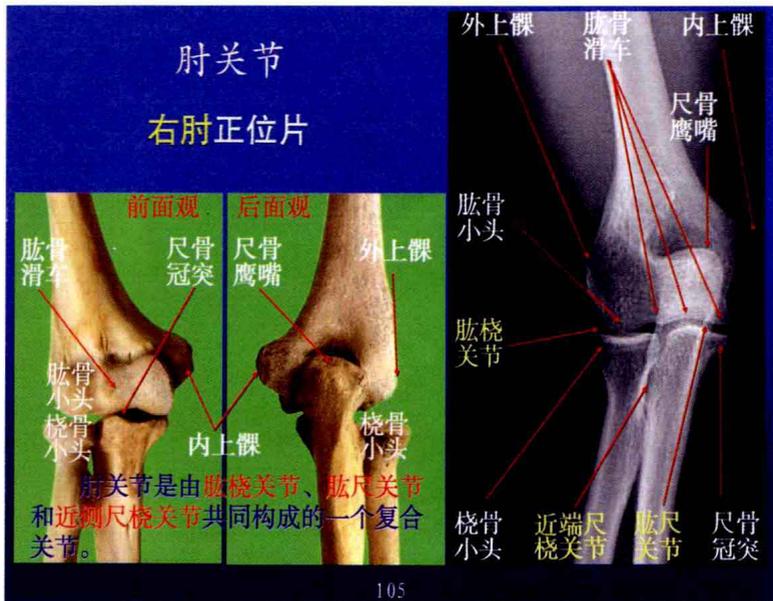
**本节重点讲解四肢骨与关节结构**

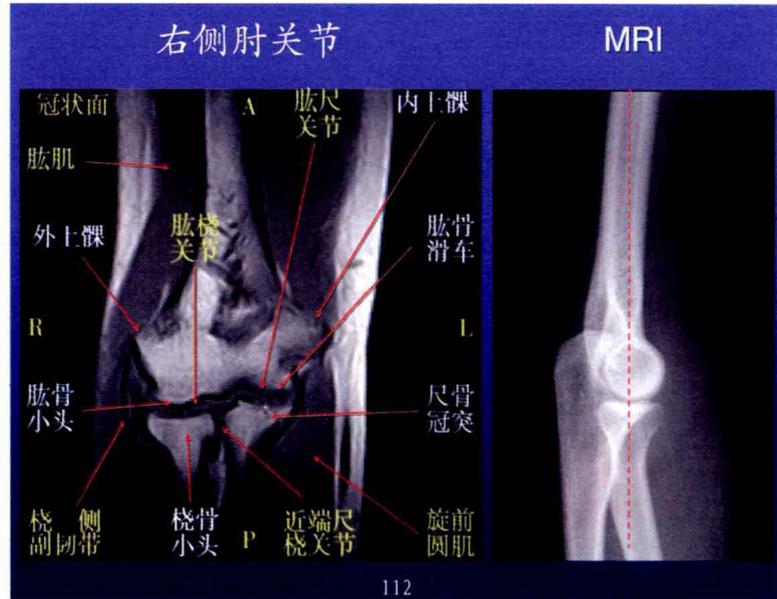
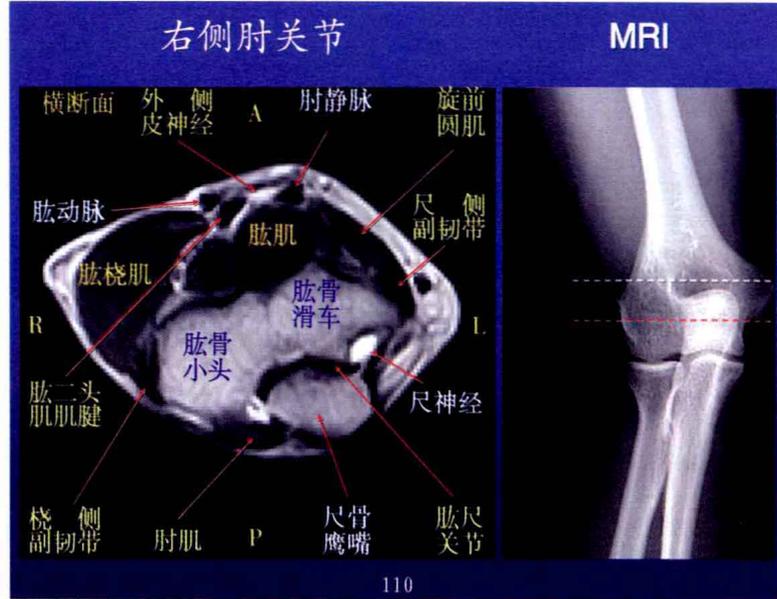
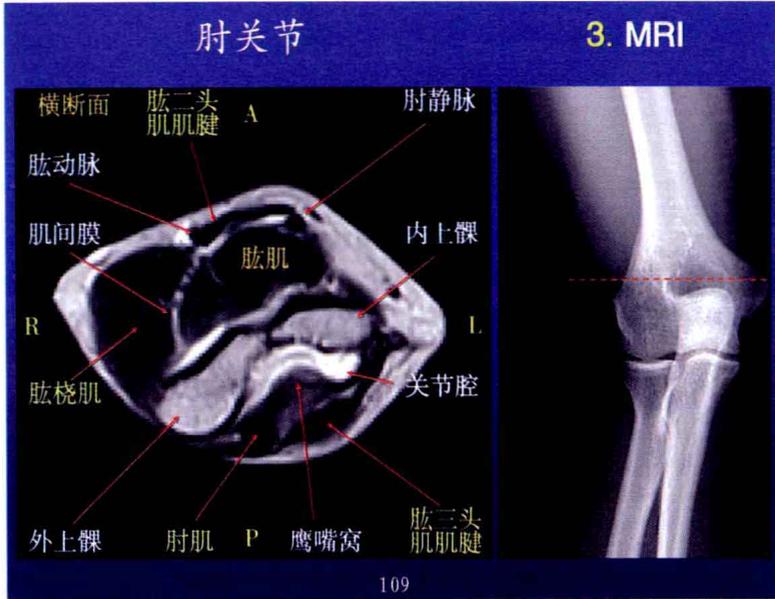
94

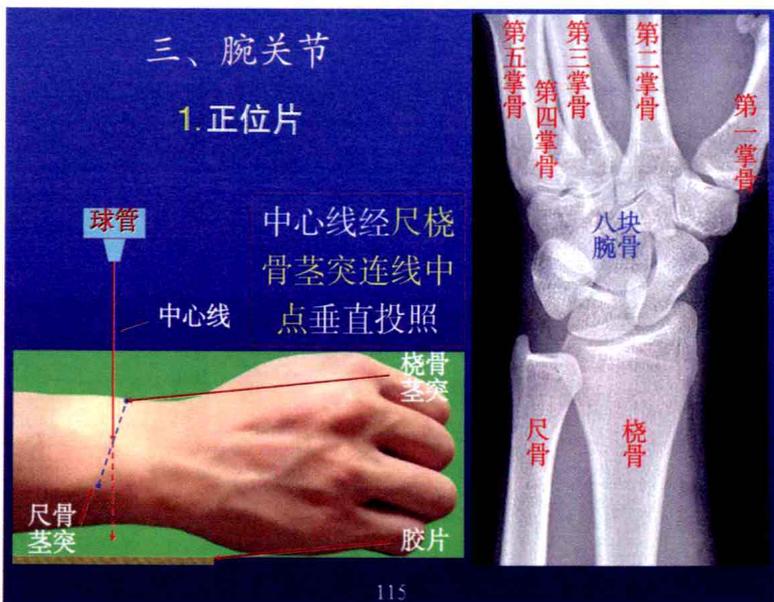
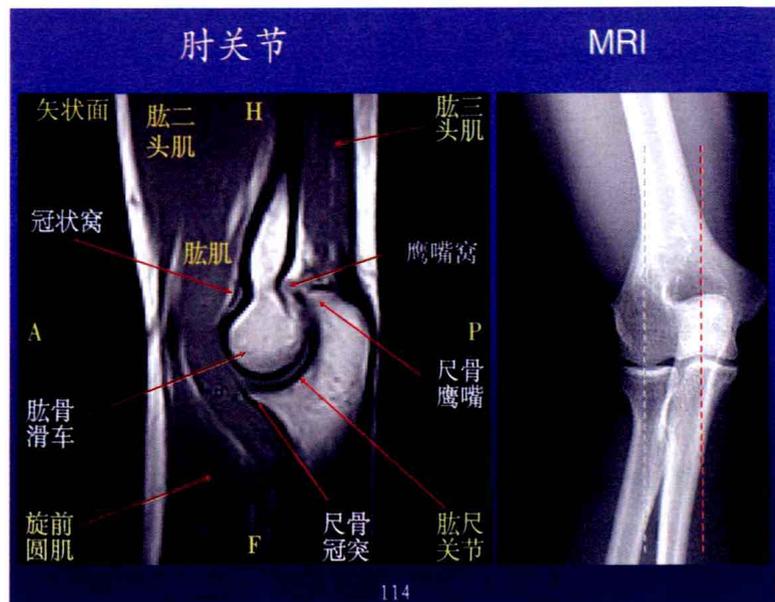
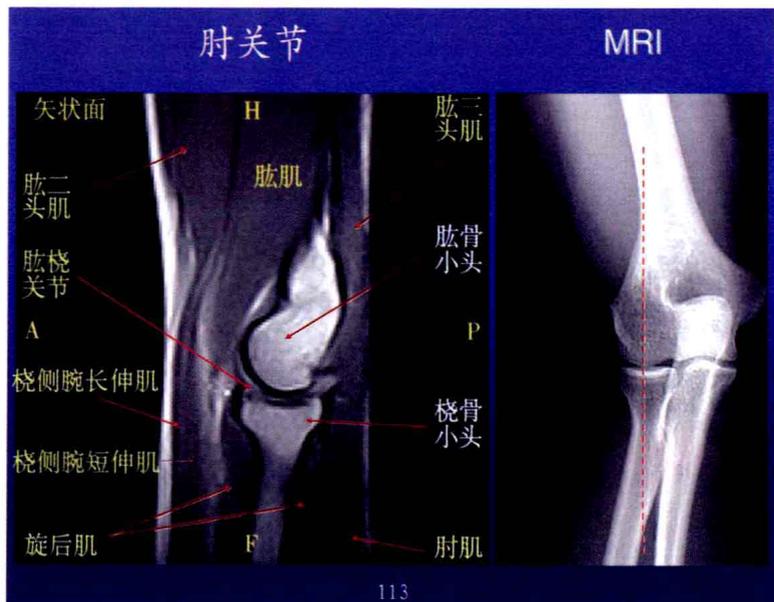










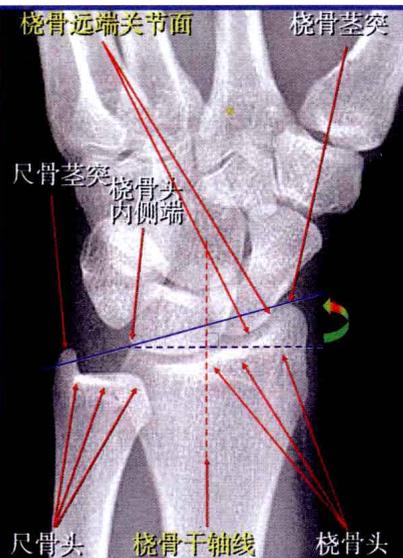


### 腕关节

#### 正位片

#### 桡骨内倾角

桡骨干轴线的垂线与桡骨远端关节面之间的夹角。  
正常值 $23^{\circ} \sim 40^{\circ}$ ，  
平均值 $32^{\circ}$



117

### 腕关节

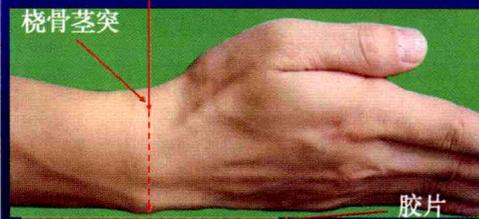
#### 2. 侧位片

中心线

球管

中心线经桡骨茎突垂直投照到胶片的中心

桡骨茎突



118

第一掌骨  
第五掌骨  
第二三四掌骨

桡骨

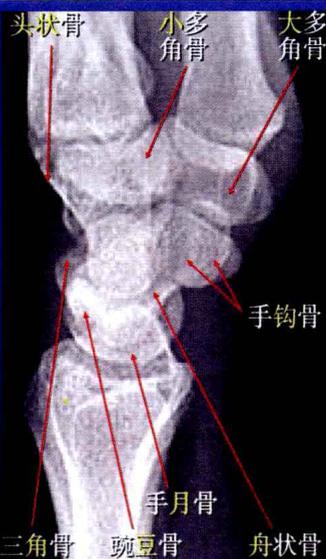
尺骨茎突

桡骨茎突



### 腕关节

#### 侧位片



119

### 四、掌指关节

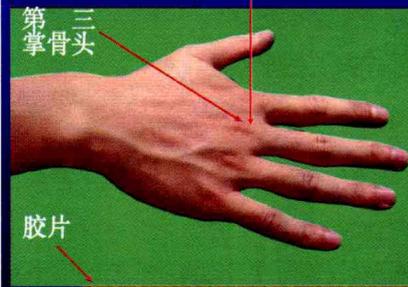
#### 正位片

中心线经第三掌骨头垂直投照到胶片的中心。

球管

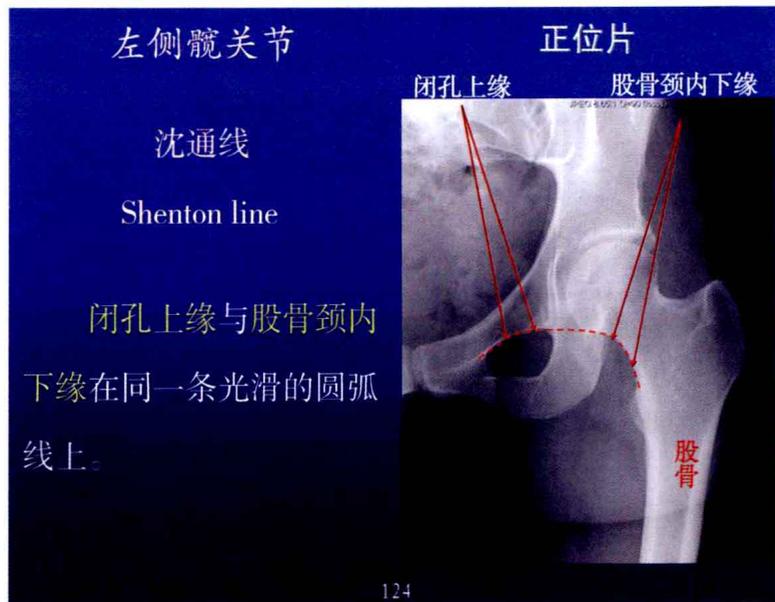
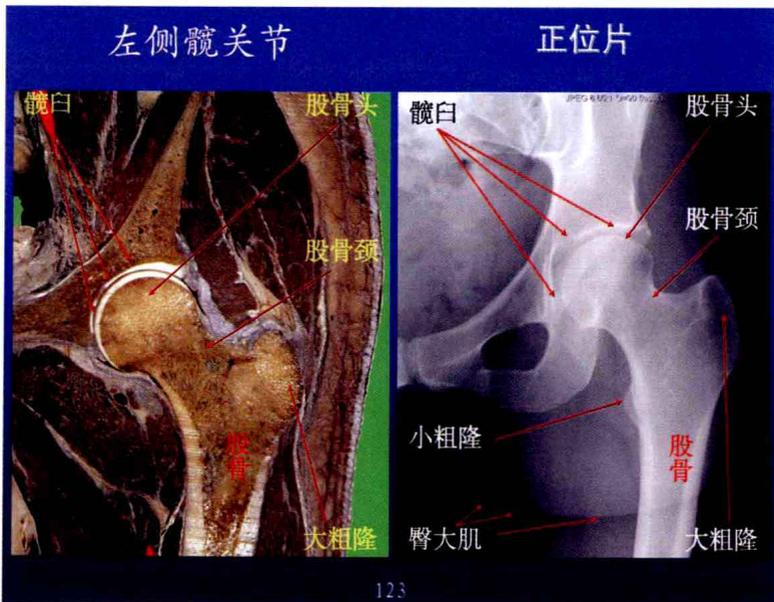
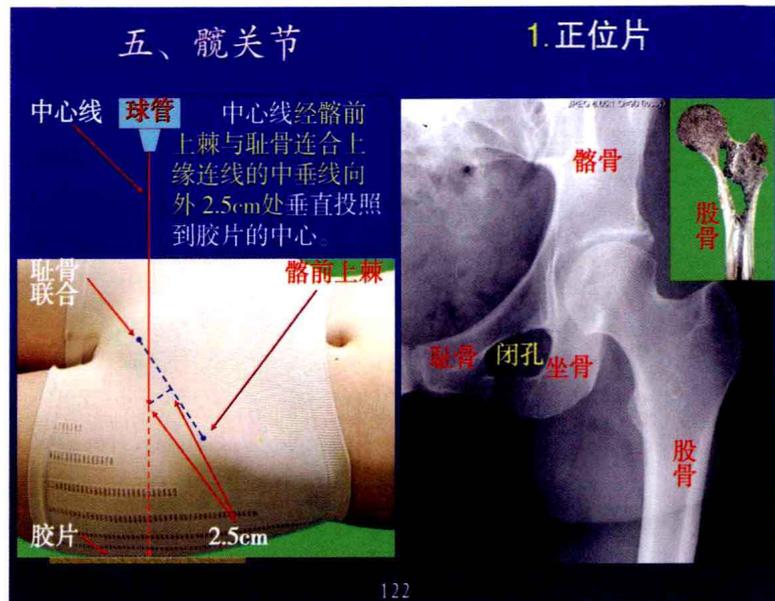
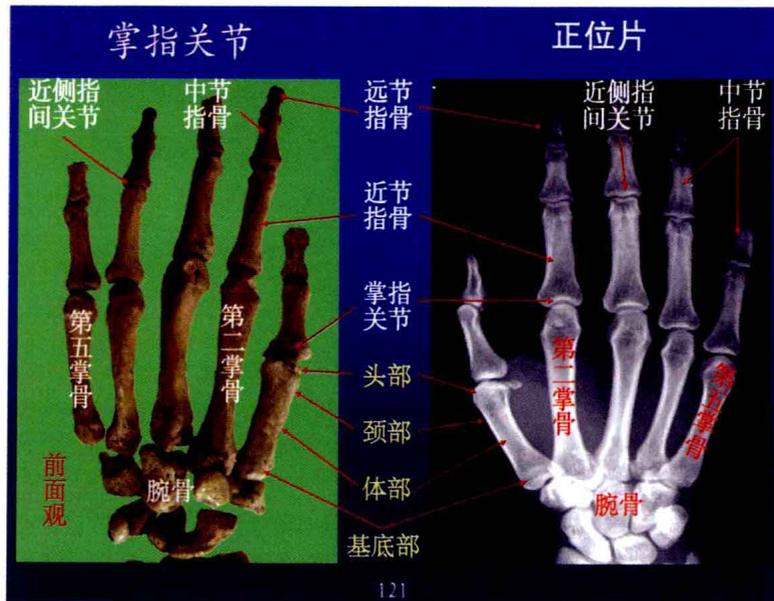
中心线

第三掌骨头



120





### 左侧髋关节

正位片

卡尔弗线  
又叫髋颈线

Calve line

髋前下嵴与股骨颈外上缘在同一条光滑的圆弧线上。

髋前下嵴



股骨颈外上缘

125

### 右侧髋关节

正位片

司肯纳线

Skinner line

经股骨大粗隆顶点向股骨干纵轴线所作的垂线。

此线刚好通过股骨头中央凹。

大粗隆

股骨头中央凹



股骨干纵轴线

126

### 右侧髋关节

正位片

股骨颈干角

股骨颈纵轴线与股骨干纵轴线之间夹角。正常成人： $120^{\circ} \sim 130^{\circ}$ ；儿童 $\geq 140^{\circ}$ 。

股骨颈纵轴线



股骨干纵轴线

127

### 髋关节

正位片

先天性髋关节脱臼

股骨头缺血坏死

卡尔弗线不连续



沈通线不连续

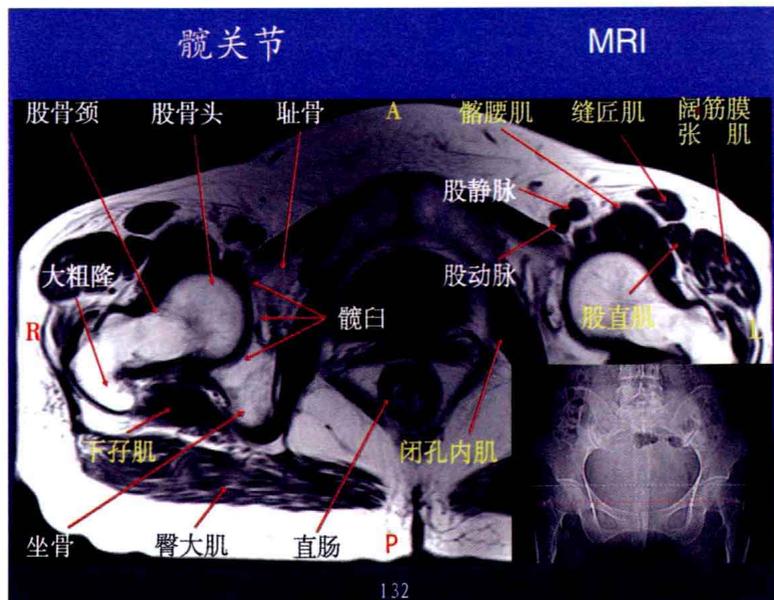
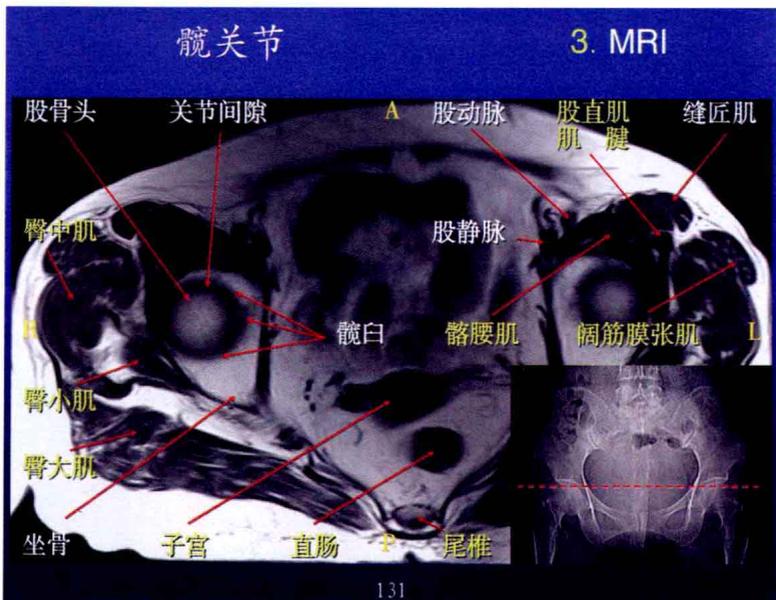
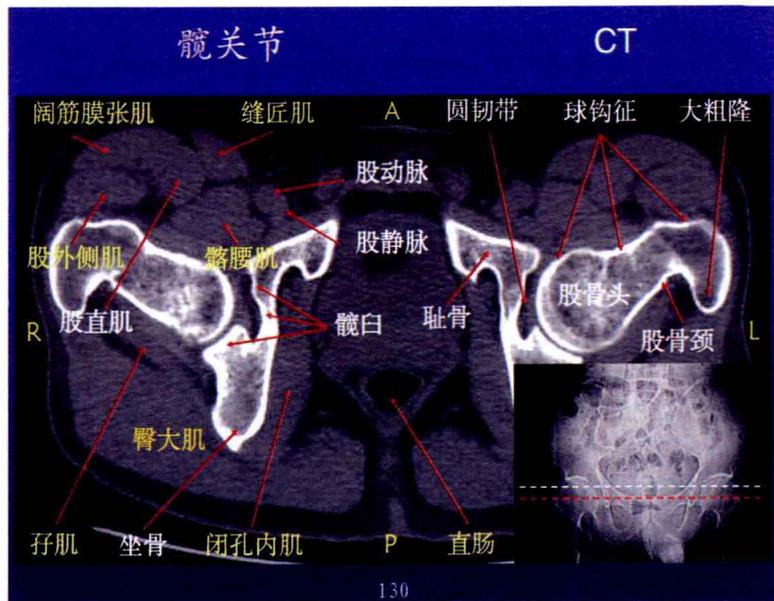
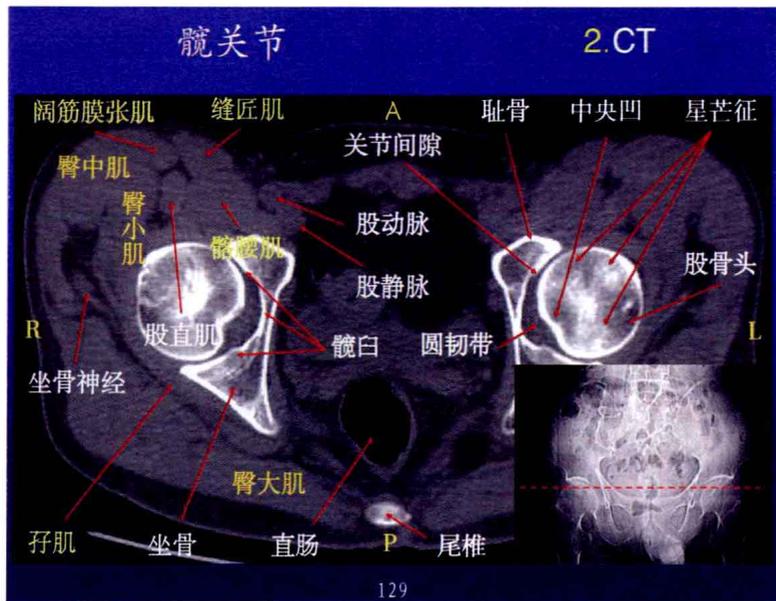
颈干角增大

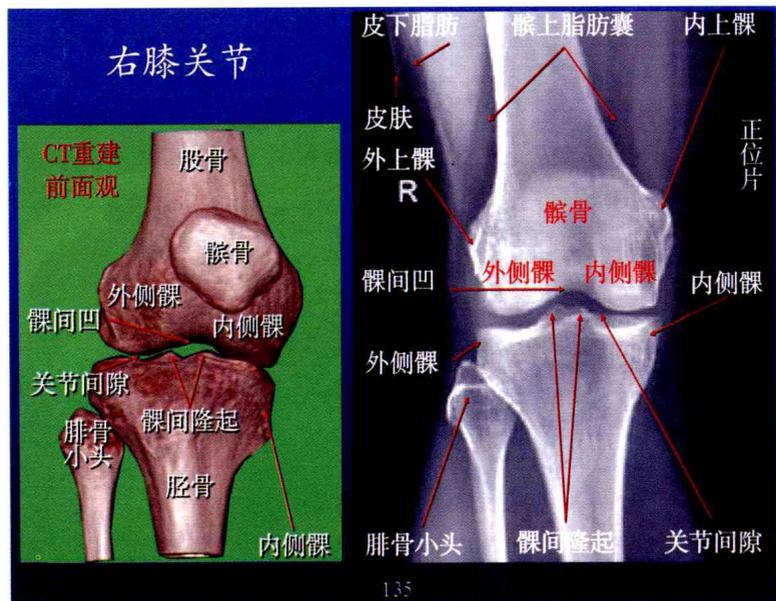
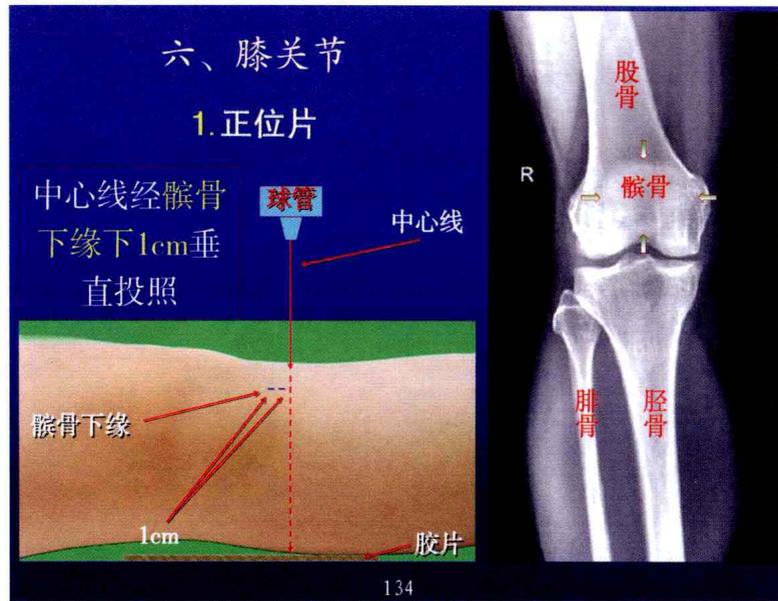
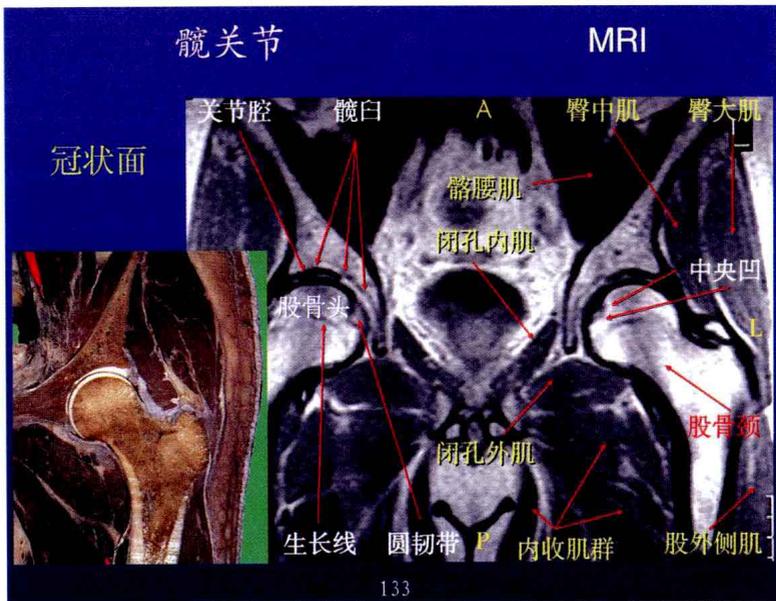
卡尔弗线不连续

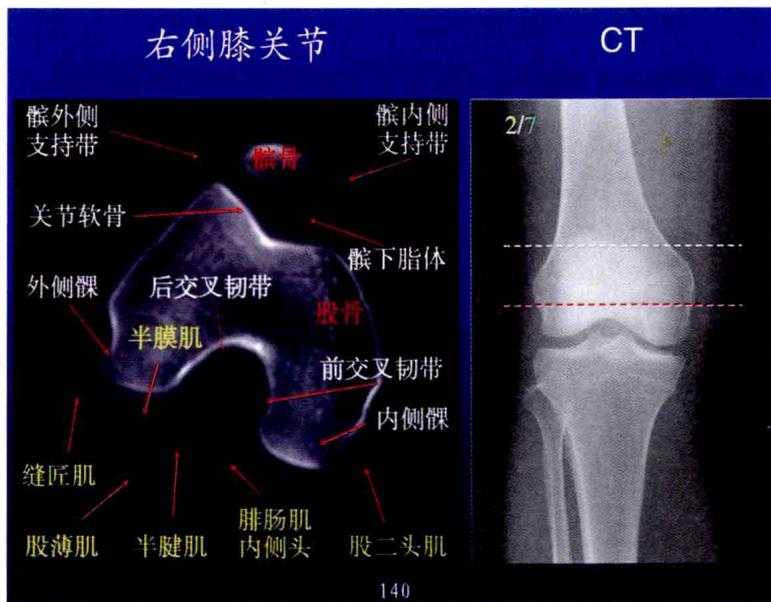
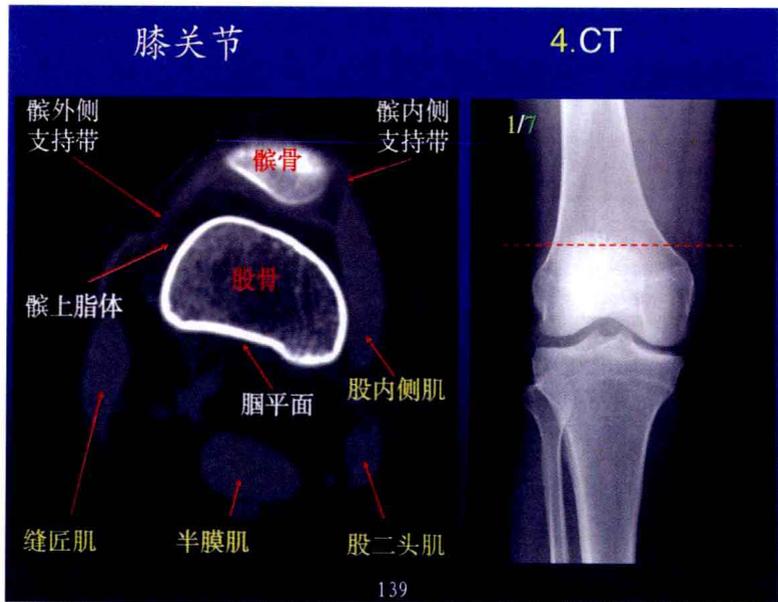
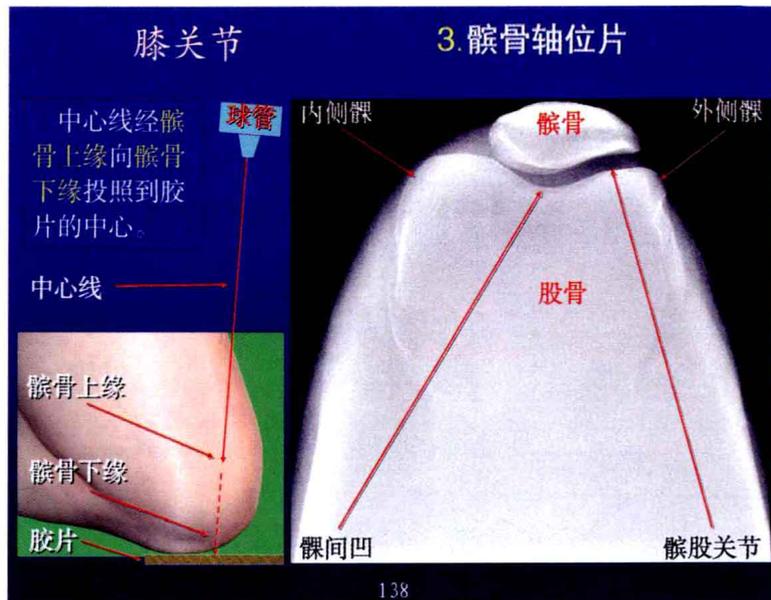
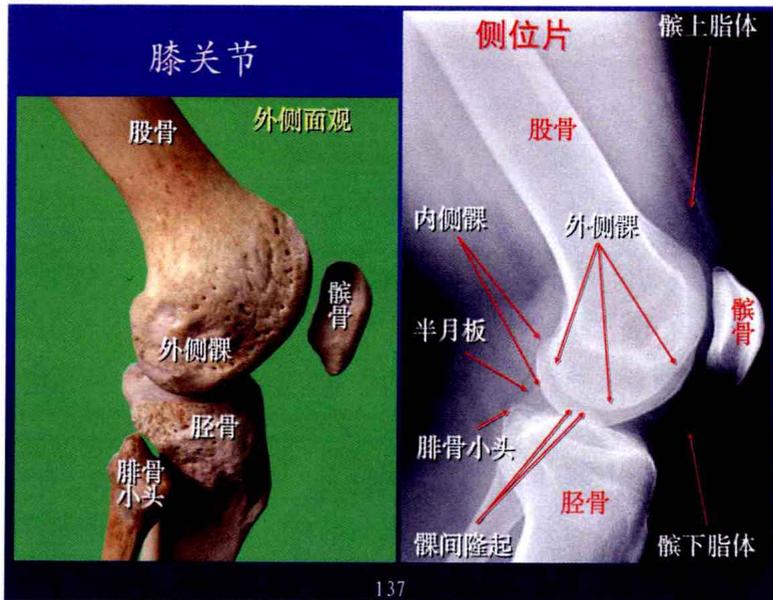


颈干角变小

128







### 右侧膝关节

CT



141

### 右侧膝关节

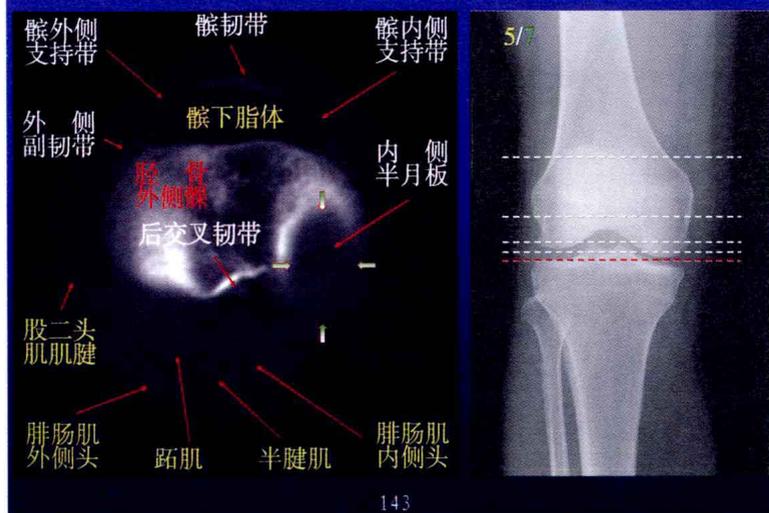
CT



142

### 右侧膝关节

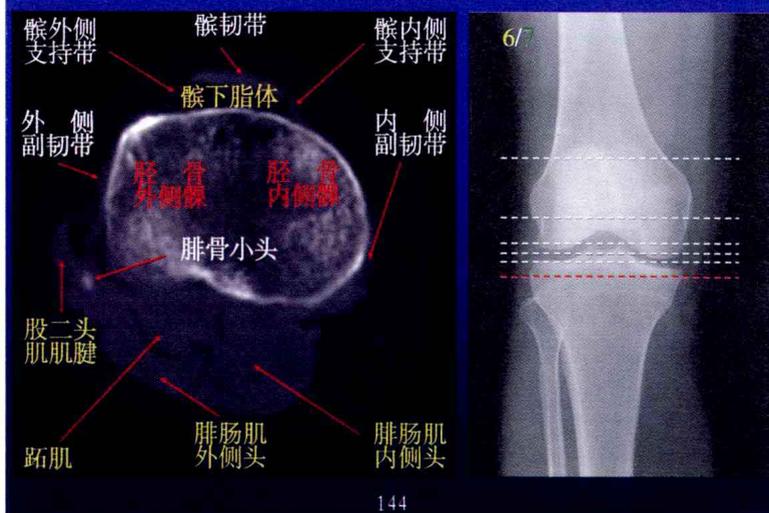
CT



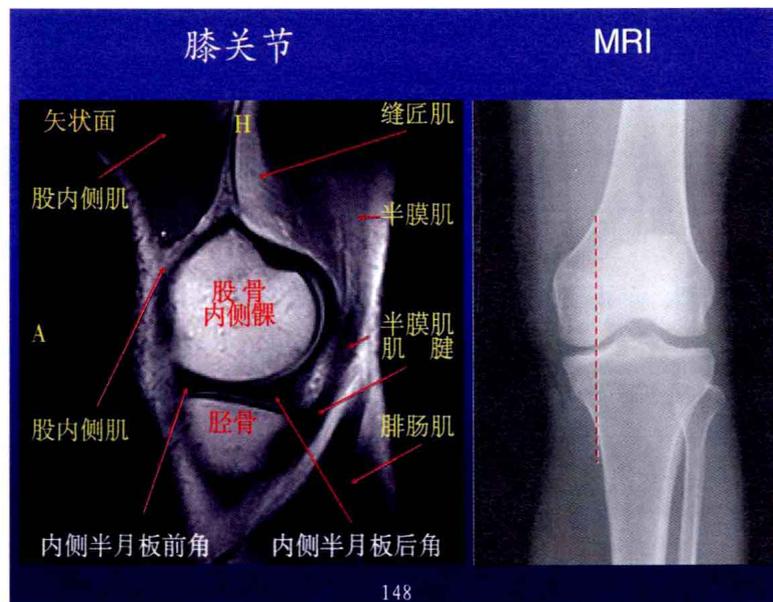
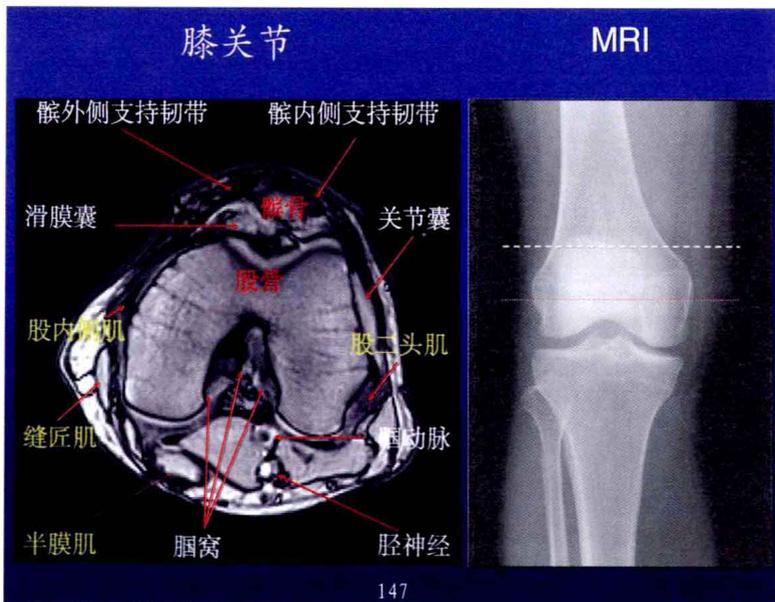
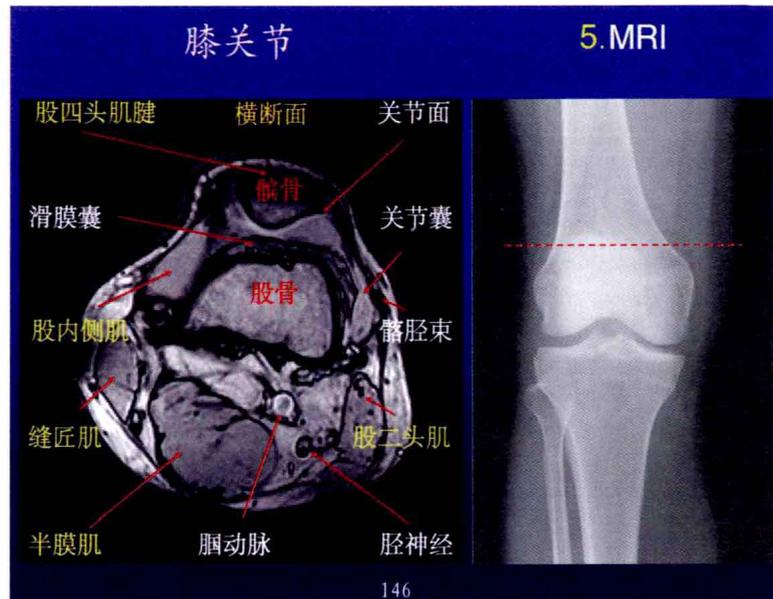
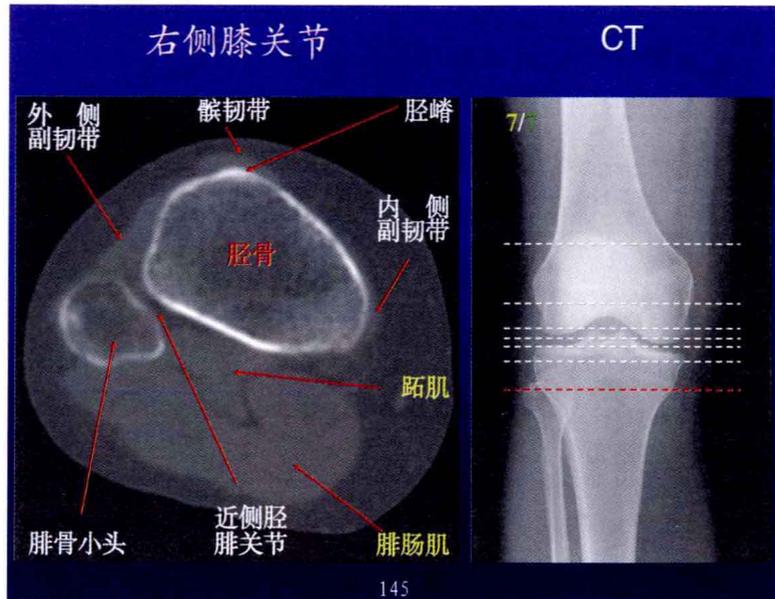
143

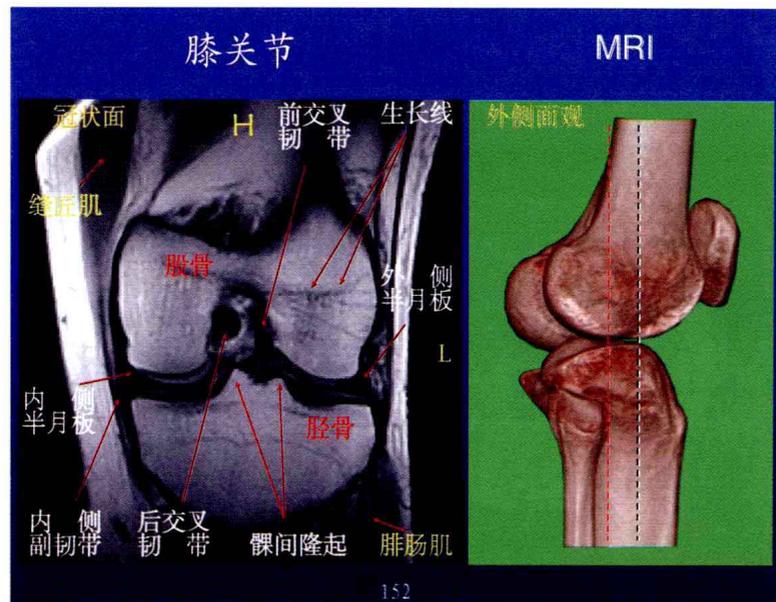
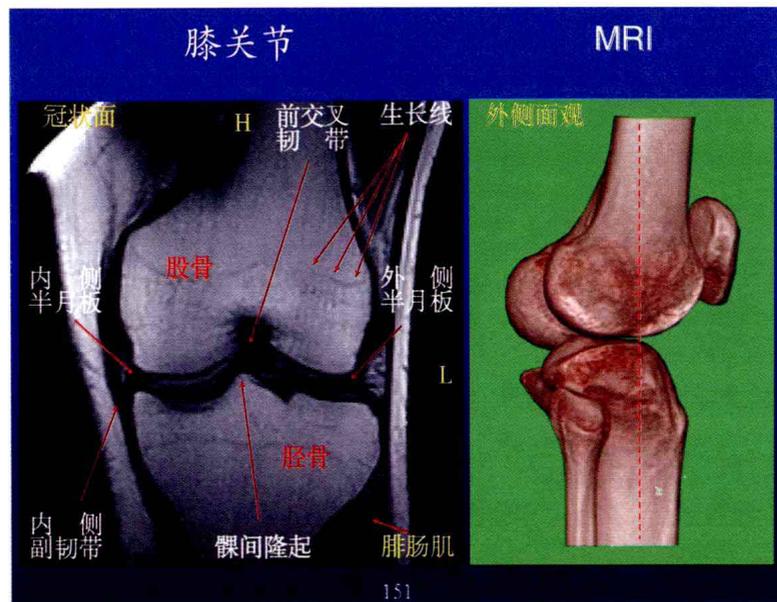
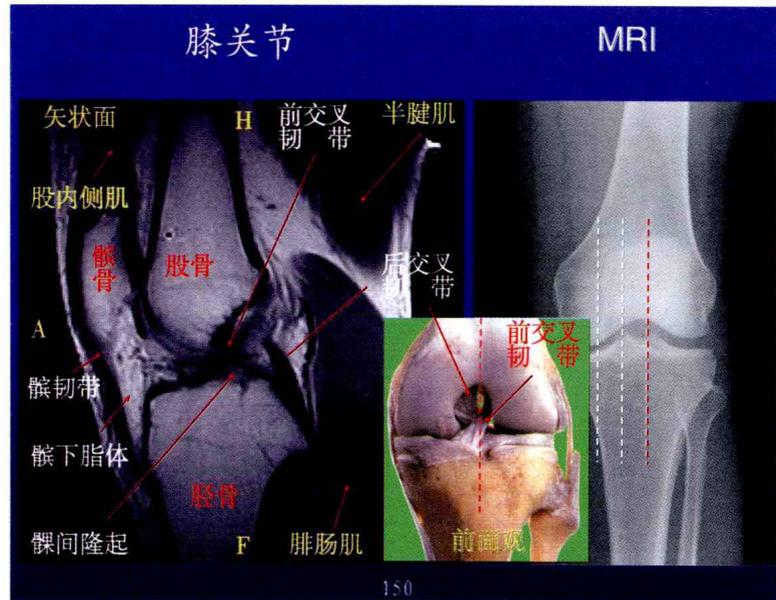
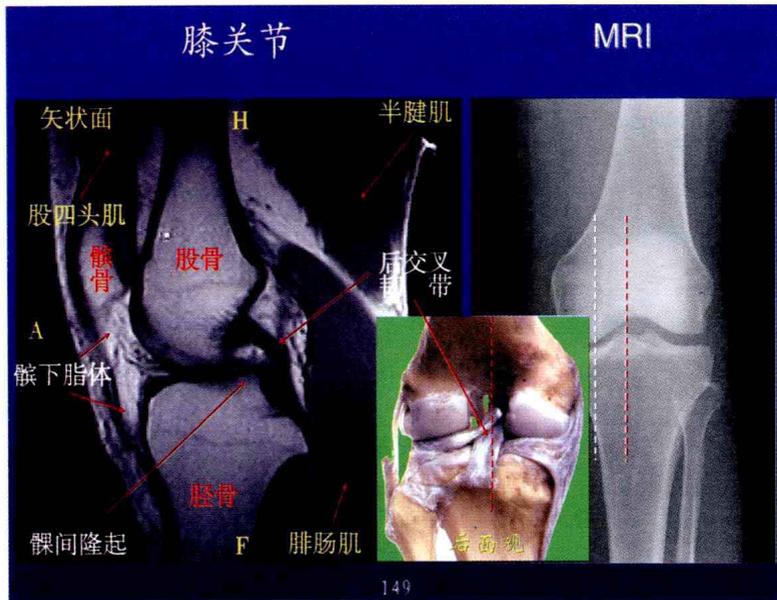
### 右侧膝关节

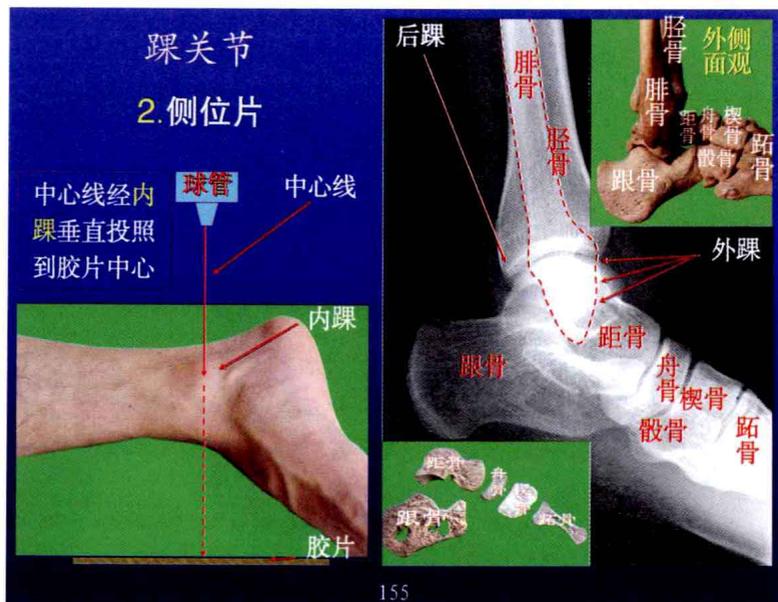
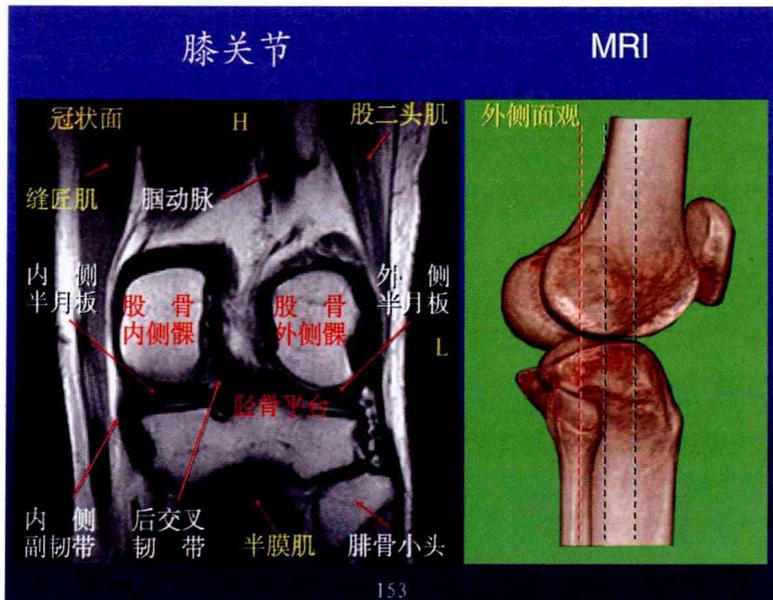
CT

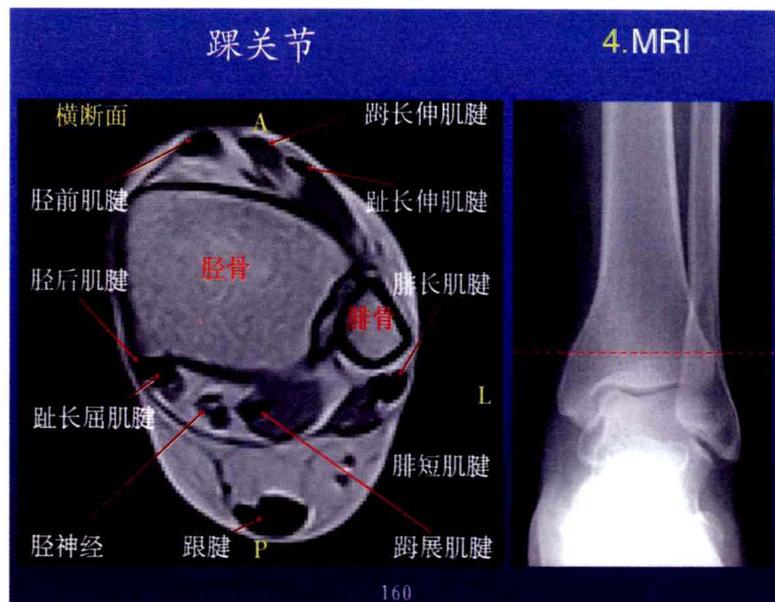


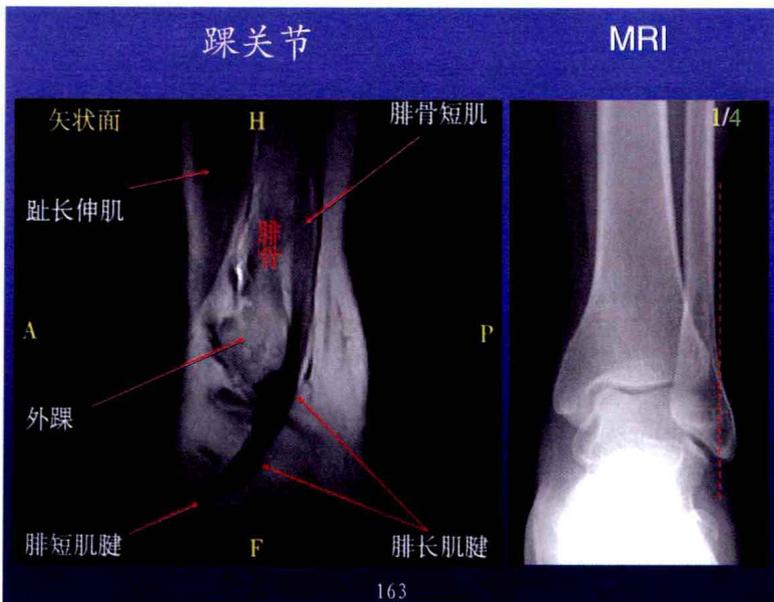
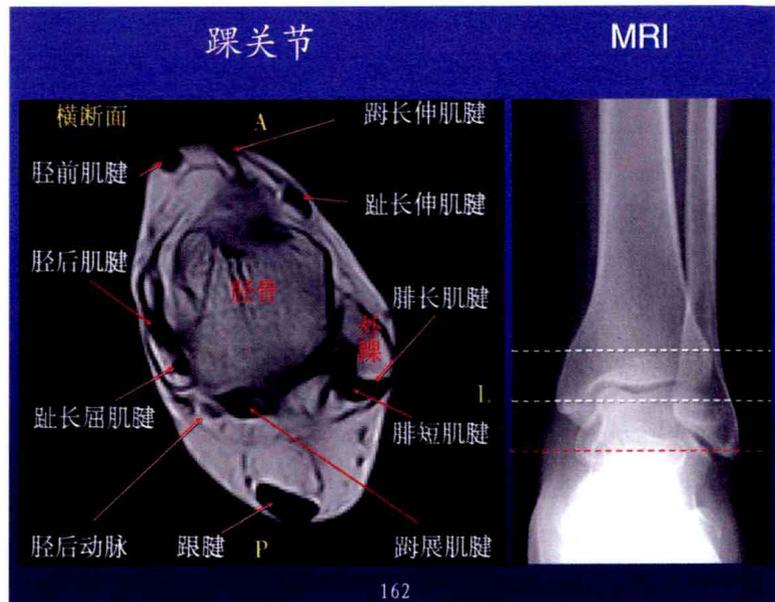
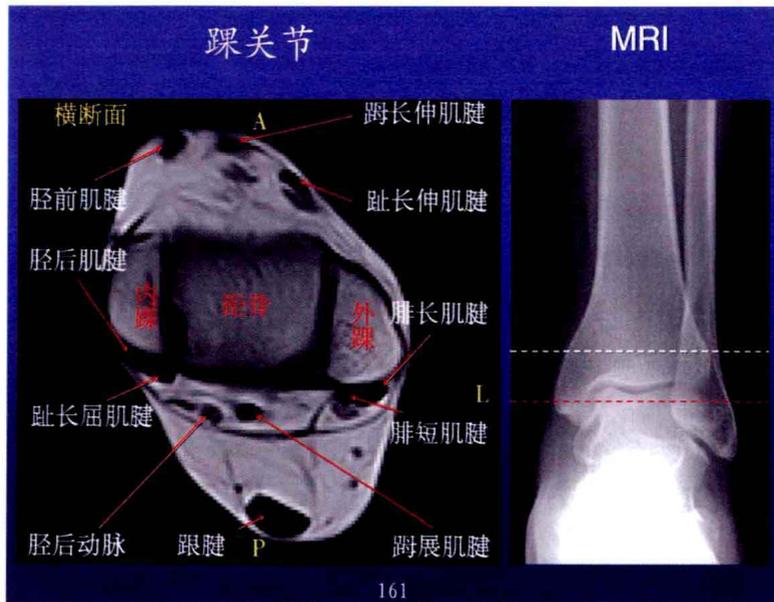
144





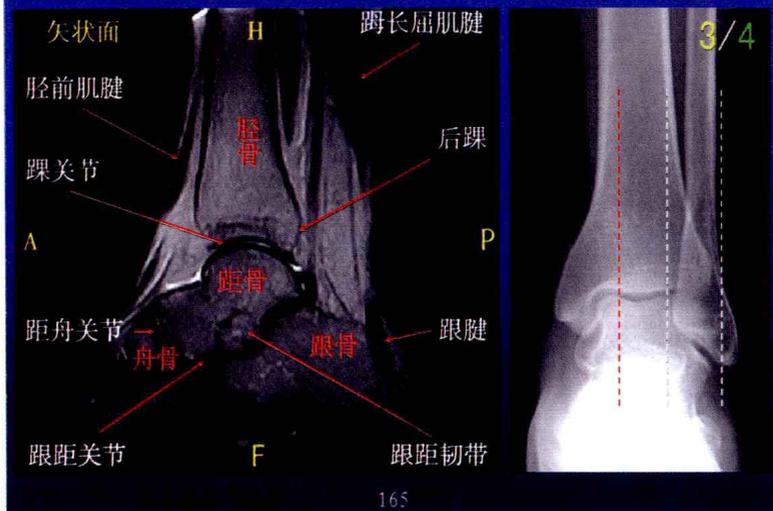






### 踝关节

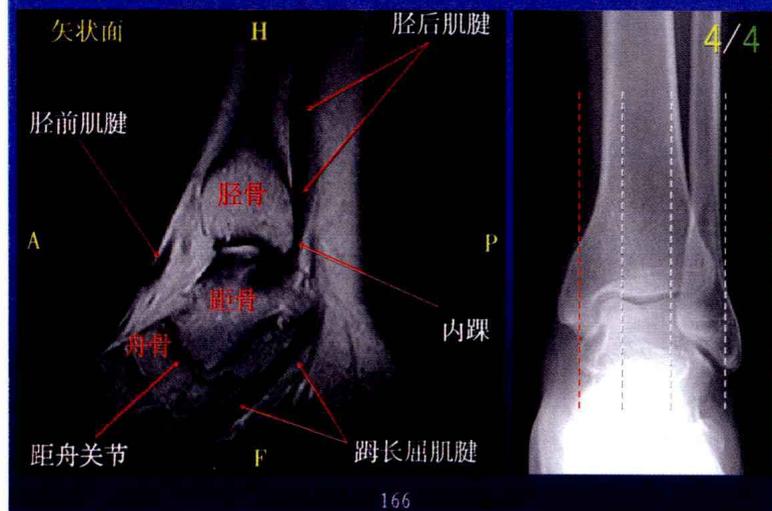
MRI



165

### 踝关节

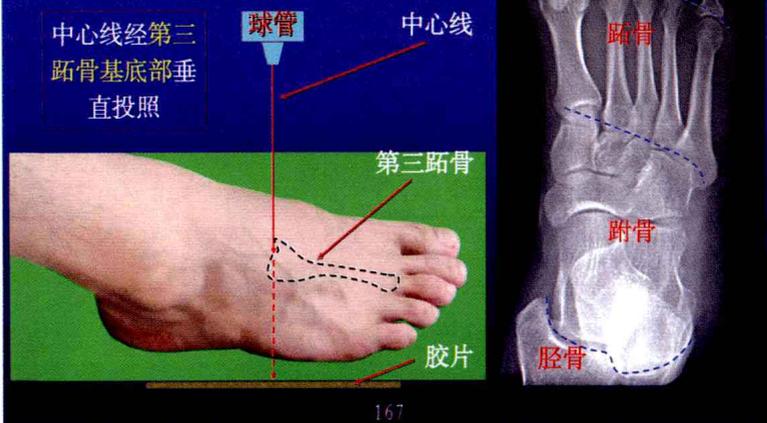
MRI



166

### 八、足

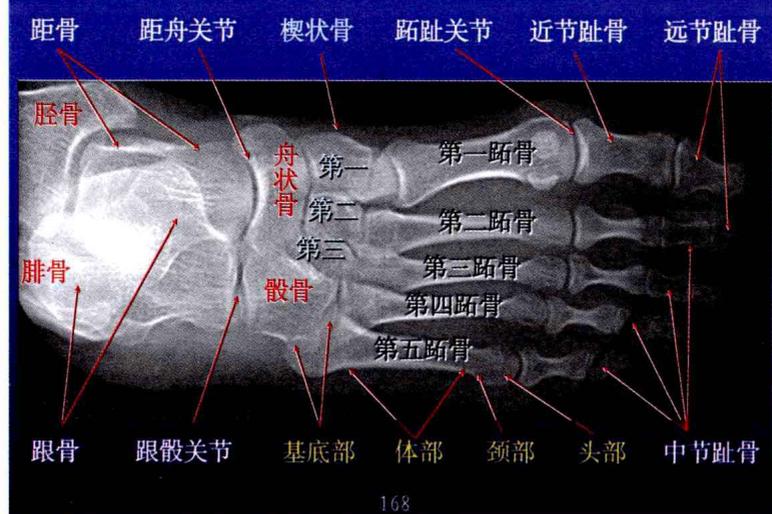
#### 1. 正位片



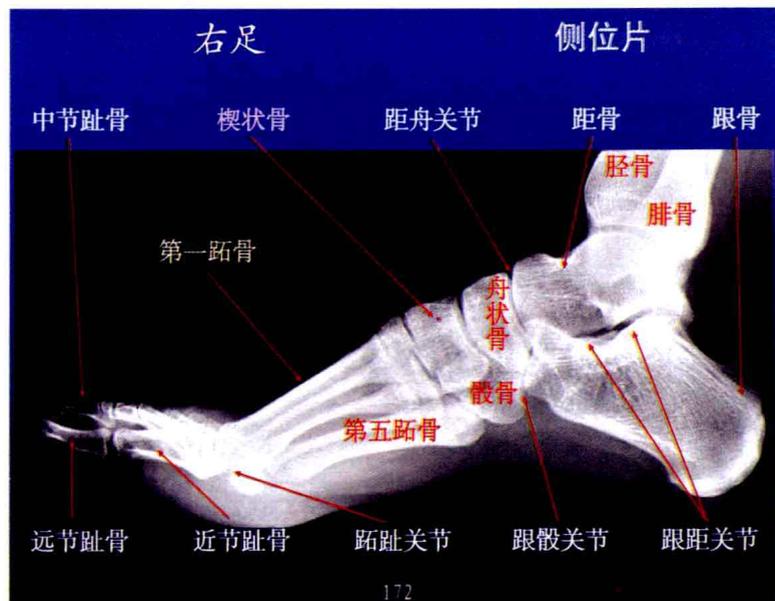
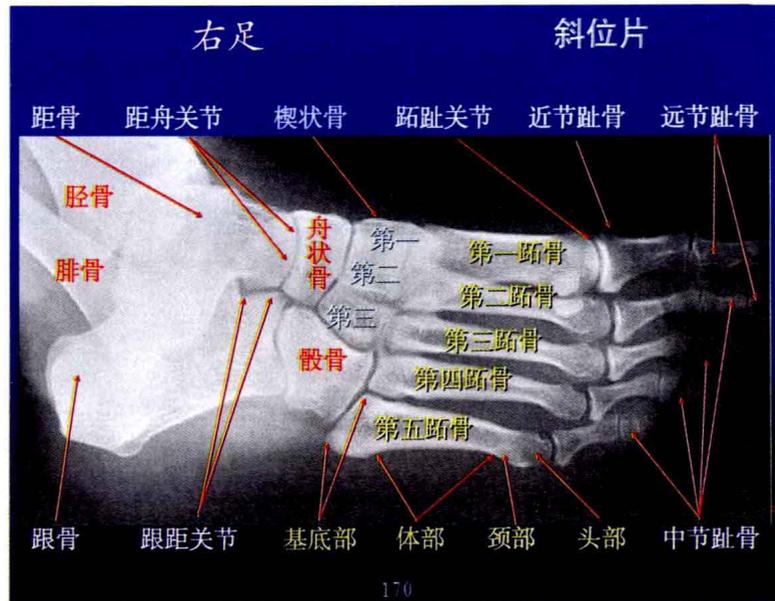
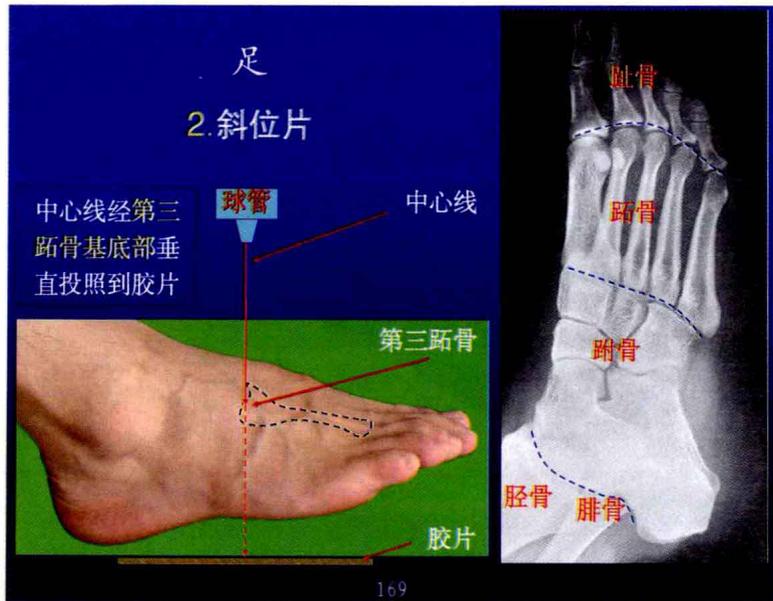
167

### 右足

### 正位片



168



右足

侧位片

内弓角, 正常值:  $113^{\circ} \sim 130^{\circ}$

① 距骨头最低点

② 跟骨最低点

③ 第一跖骨头最低点

第一跖骨



173

右足

侧位片

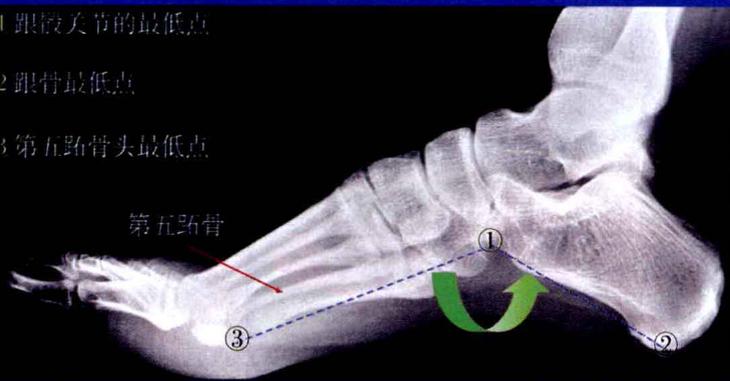
外弓角, 正常值:  $130^{\circ} \sim 150^{\circ}$

① 跟骰关节的最低点

② 跟骨最低点

③ 第五跖骨头最低点

第五跖骨



174

右足

侧位片

扁平足

内弓角和外弓角都增大

内弓角



正常足

外弓角

175

足

4.3D-CT

跖趾关节

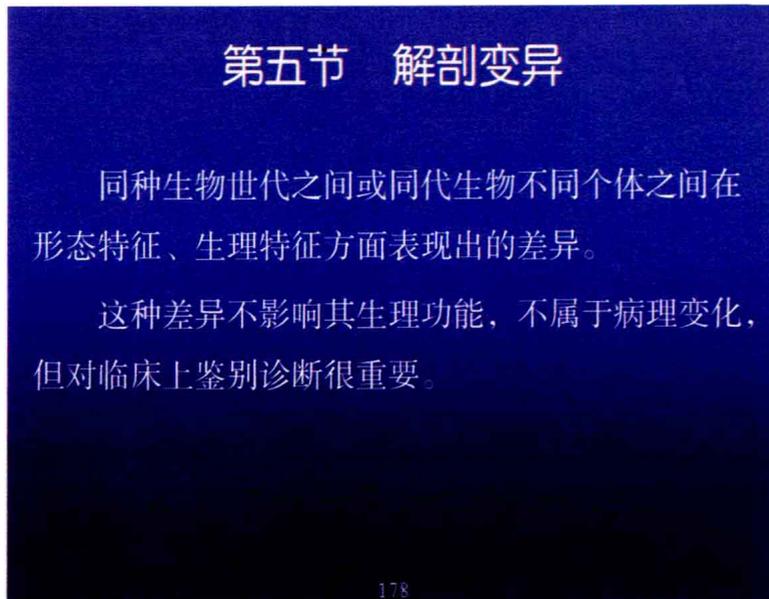
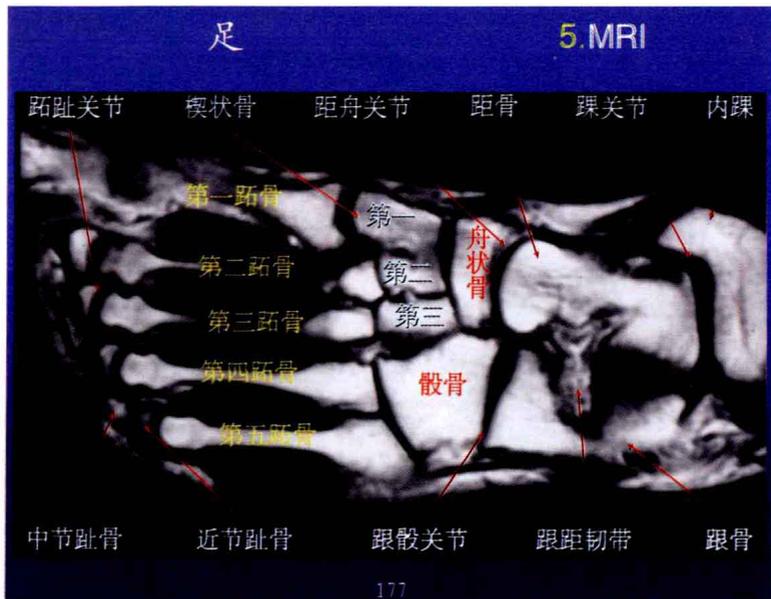
楔状骨

距舟关节

距骨

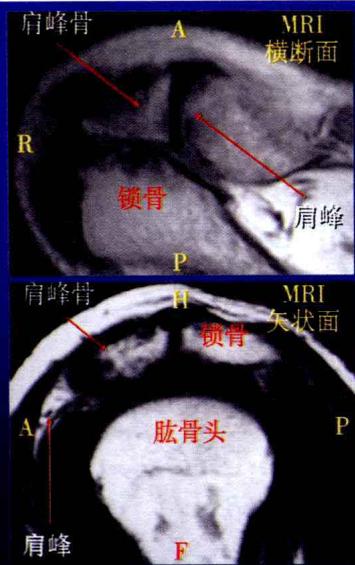


176



### 3. 肩峰骨

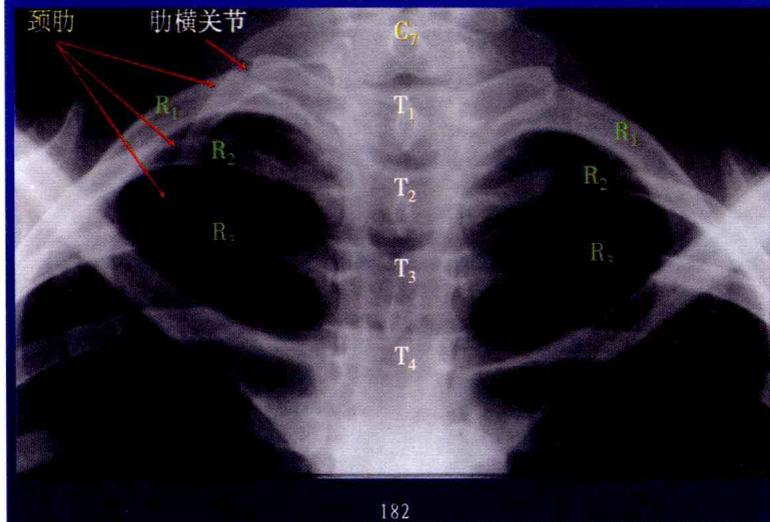
是肩部的副骨，位于肩峰的外上方，呈椭圆形或肾形。在轴位像上呈三角形，位于锁骨肩峰端和肩峰之间。



181

### 4. 肋骨变异

#### (1) 颈肋



182

#### (2) 肋骨联合

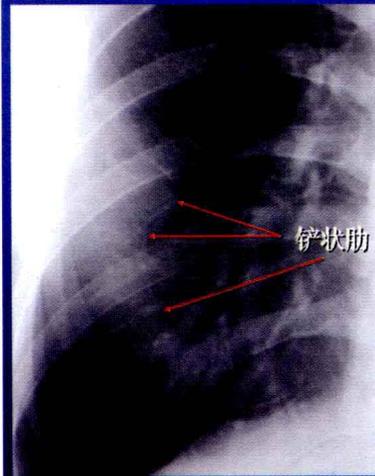


183

#### (3) 杈状肋



#### (4) 铲状肋



184



## 5. 椎体楔形变

正常成人第十二胸椎和第一腰椎椎体侧位观可有轻度楔状变形。



185

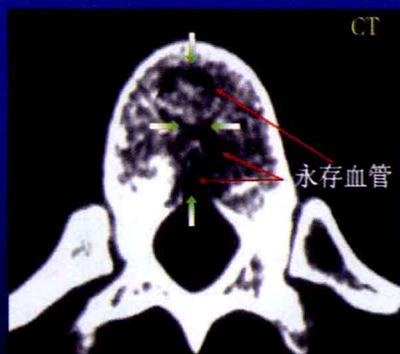
## 6. 椎体永存骨骺

常见于椎体前上下缘，为一三角形多余小骨块，须与骨折区别。又称为椎体额外骨突。



186

## 7. 椎体永存血管



正常成人仍保持新生儿椎体中央的营养血管。

187

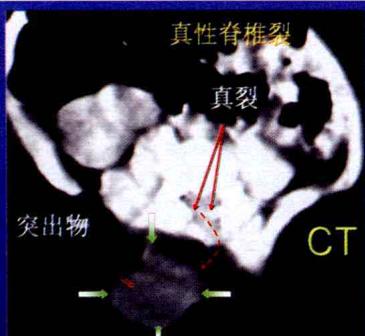
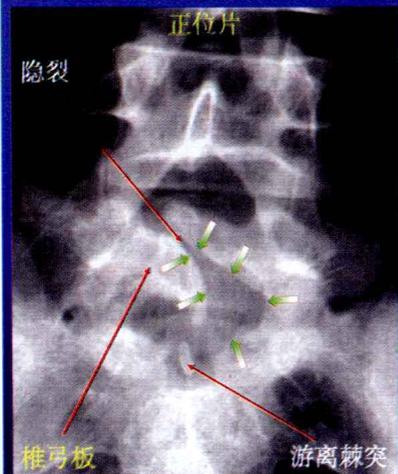
## 8. 骶椎隐裂



椎弓板发育时形成一裂隙，但无椎管内容物突出。

188

### 脊椎隐裂



真性脊椎裂在椎弓板裂开处有椎管内内容物突出。

189

## 二、四肢骨变异

### 1. 滑车旁骨



是发生在肱骨内上髁旁的一种副骨，位于肱骨滑车的内侧。

190

### 2. 滑车上骨



是发生在肱三头肌腱内的一种籽骨，位于肘关节的后方，尺骨鹰嘴之上。

191

### 3. 肘髌骨



是发生在肱三头肌腱内的一种籽骨，位于肘关节的后方。

192

## 4. 髌上突



## 5. 滑车孔



## 6. 籽骨

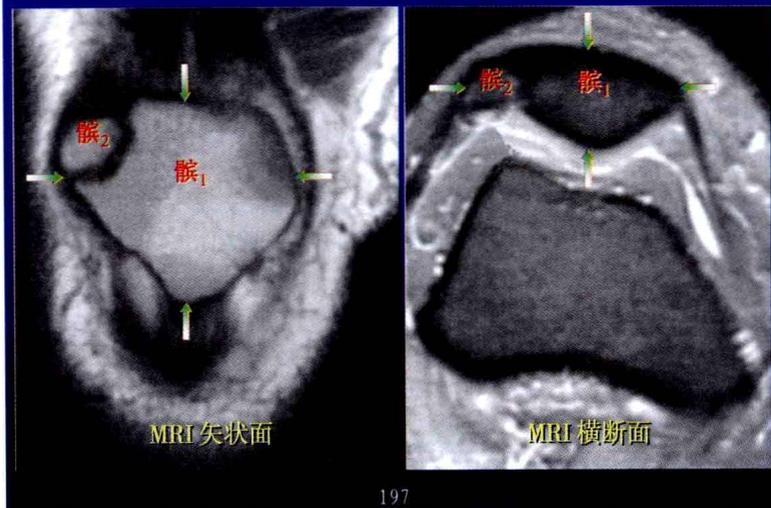
由发生在掌指关节和指间关节附近肌腱内的化骨核骨化所形成的。最常见于第一掌指关节。



## 7. 二分髌骨



## 二分髌骨



## 8. 足籽骨

由肌腱骨化而来，位于肌肉和跖、趾骨间。最常见于第一跖骨的头部。



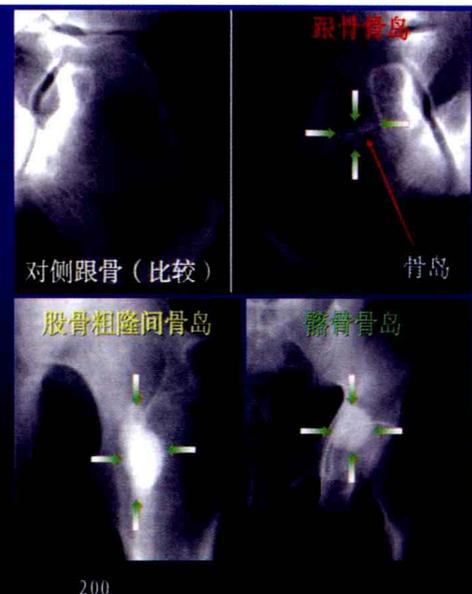
## 9. 足副骨

由多余的化骨核骨化而来。最常见的是外胫骨。



## 10. 骨岛

骨松质内局限性骨质生长变异。为边缘清楚的致密影。呈圆形或卵圆形，长轴通常与骨纹的方向一致。





# 第三章 头部

本章重点注解头颅的X线和CT表现，脑血管的DSA、CTA和MRA表现，脑的CT、MRI表现。

1

## 第一节 颅骨

- 脑颅骨 共8块
  - 不成对的： 额骨、筛骨、蝶骨和枕骨
  - 成对的： 颞骨和顶骨
- 面颅骨 共15块
  - 不成对的： 犁骨、下颌骨 及舌骨
  - 成对的： 鼻骨、泪骨、下鼻甲、腭骨、颧骨、上颌骨

2

### 一、颅平片

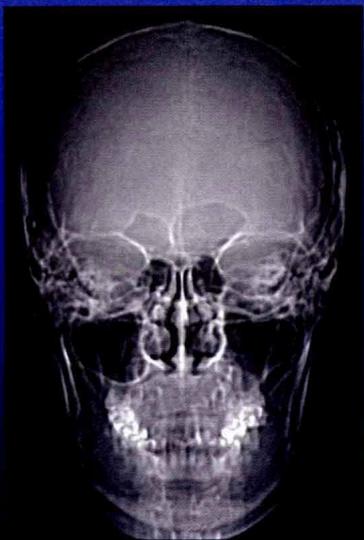
#### 1. 后前位（正位）

球管

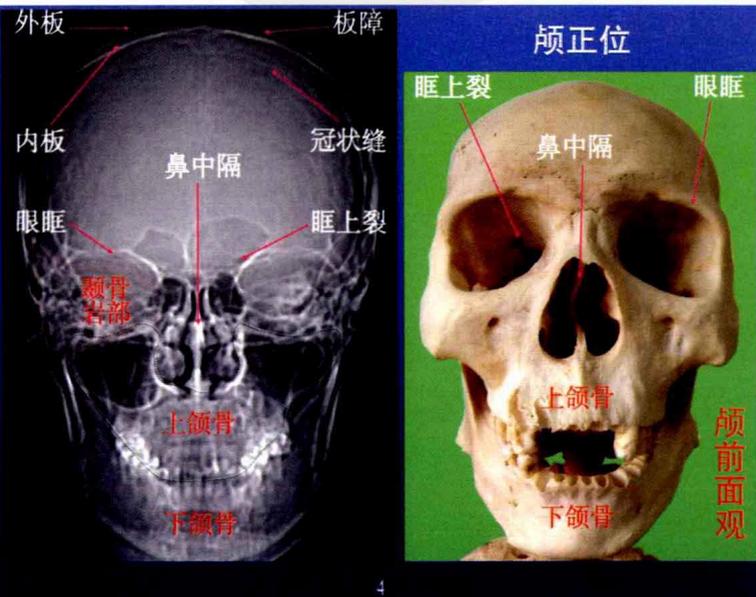
中心线经枕外隆突至眉间，投照到胶片的中心



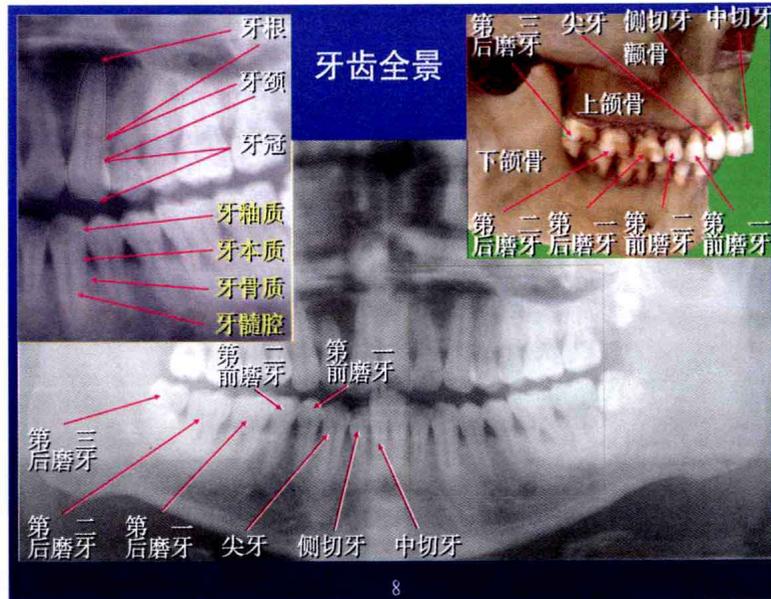
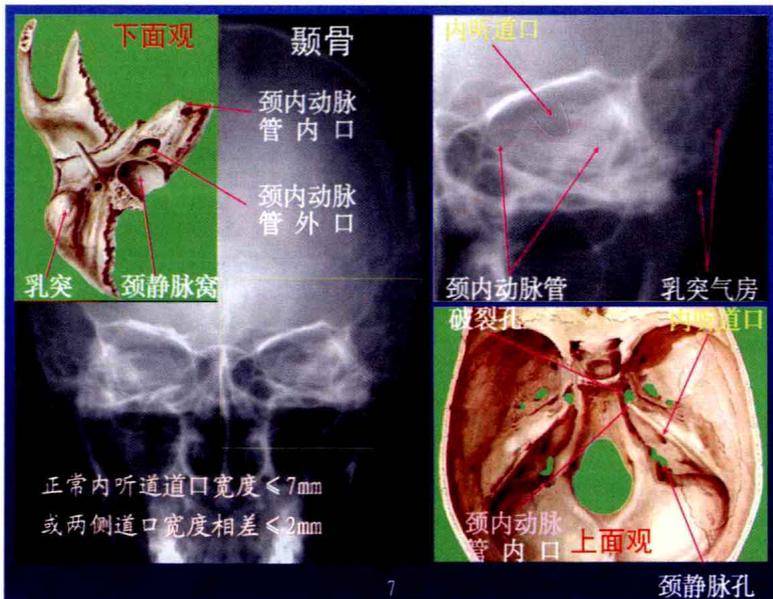
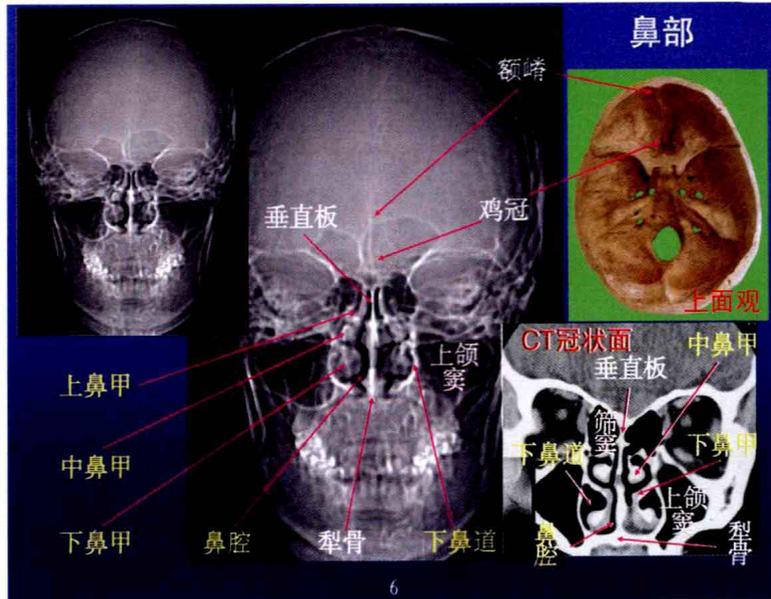
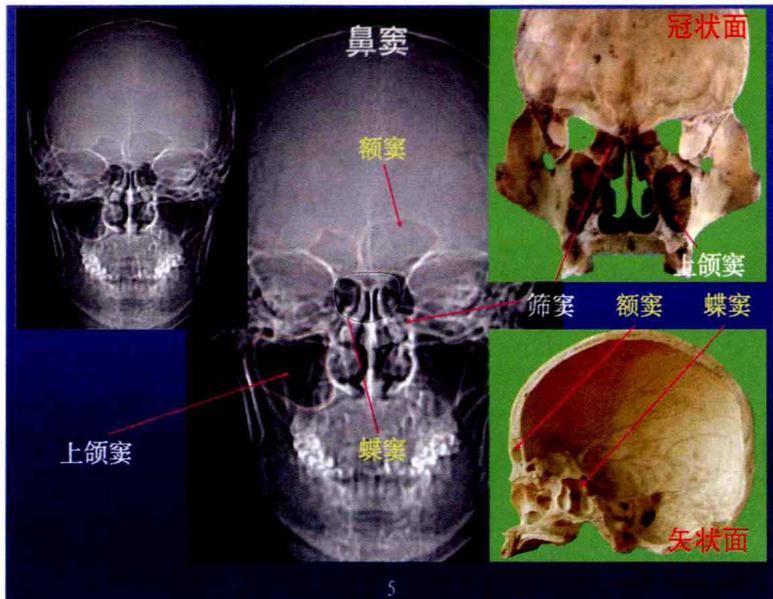
中心线  
听毗线

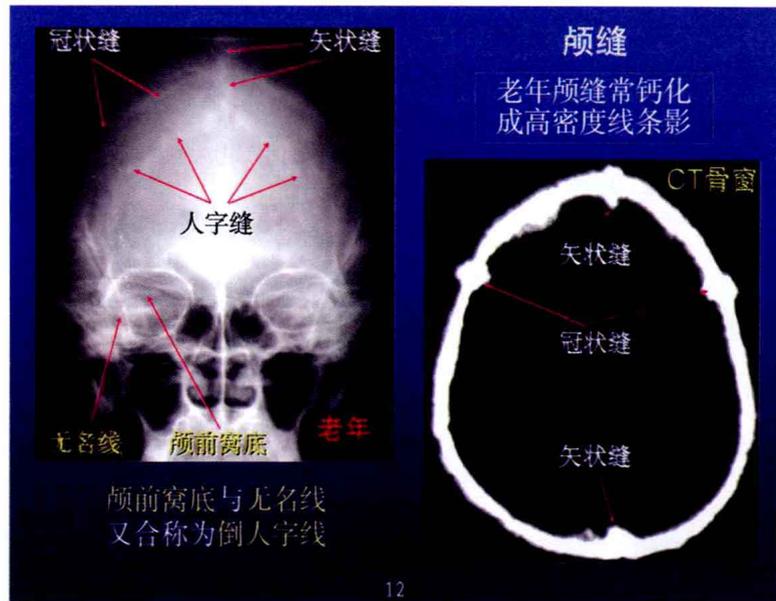
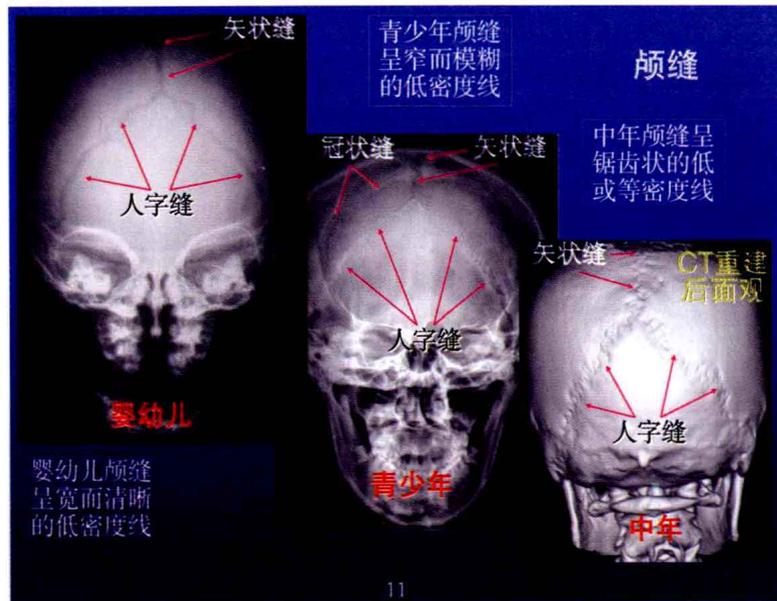
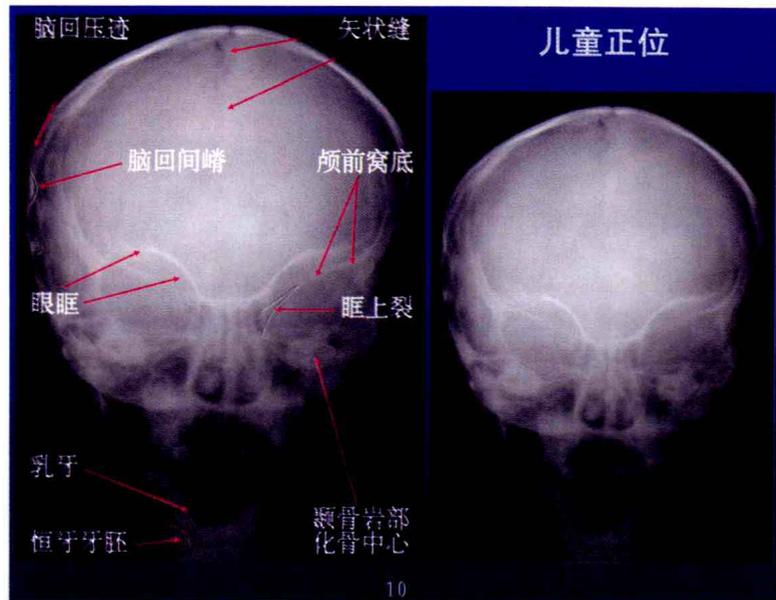
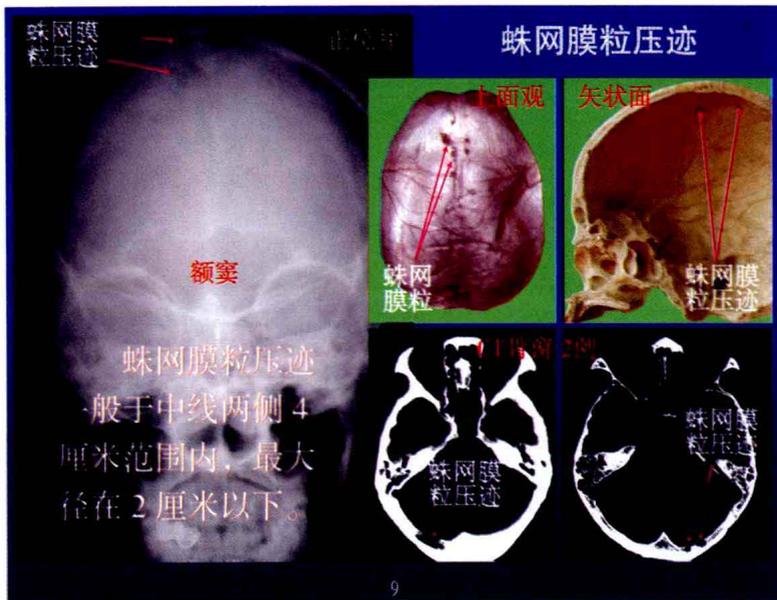


3



4



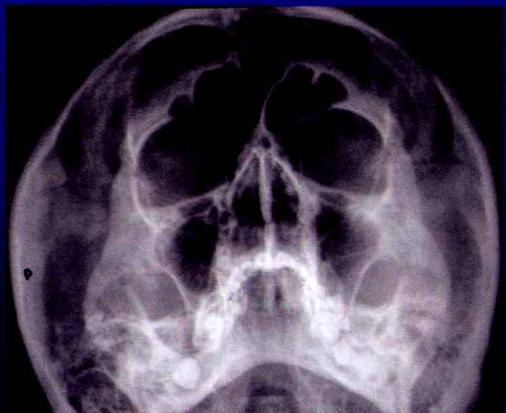


## 2. 瓦氏位

Water's position

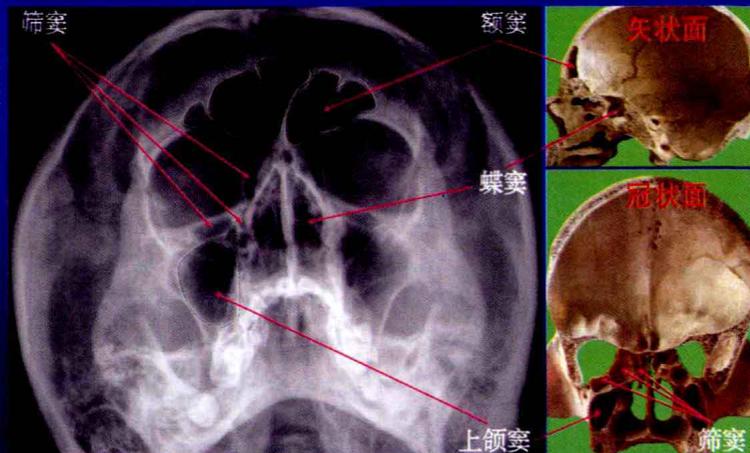
副鼻窦后前37°位

主要显示鼻窦



13

## 头颅瓦氏位片



14

## 3. 汤氏位

Towne's position

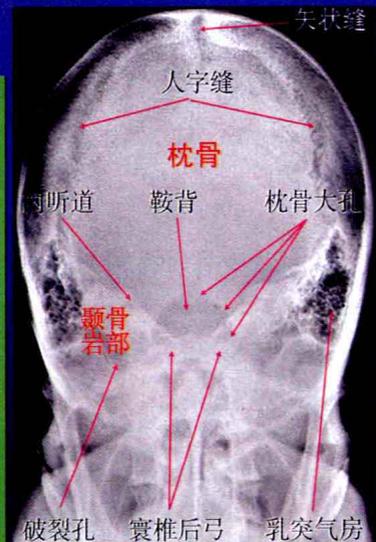
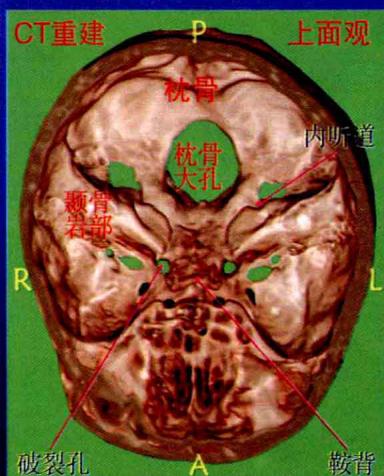
头颅前后半轴位

主要显示枕骨等结构



15

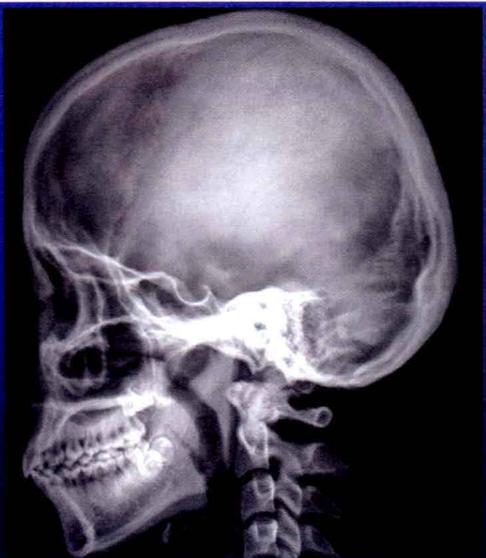
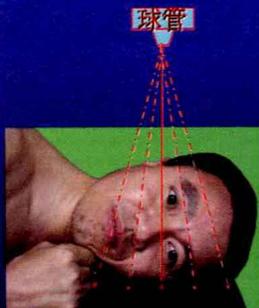
## 汤氏位



16

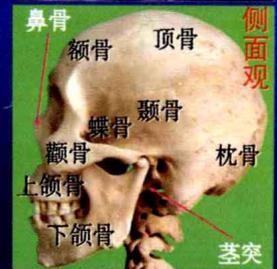
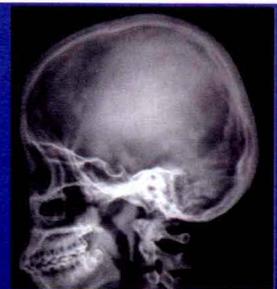
4. 侧位

中心线经外耳孔  
前、上方各2.5cm  
处向胶片中心照射



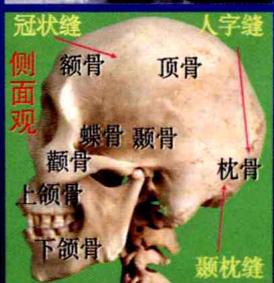
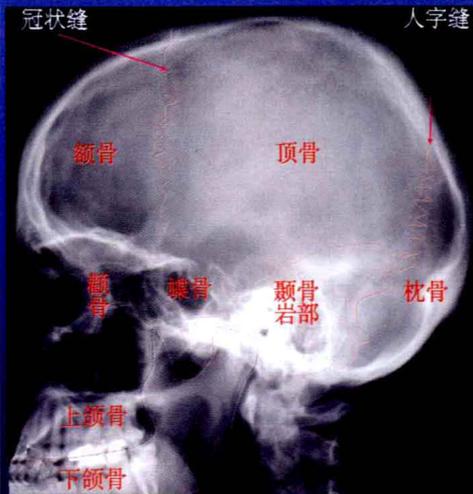
17

侧位片

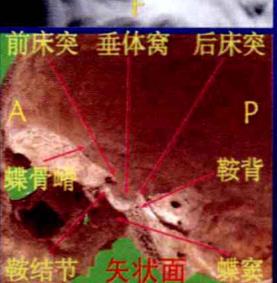
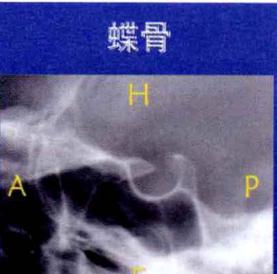
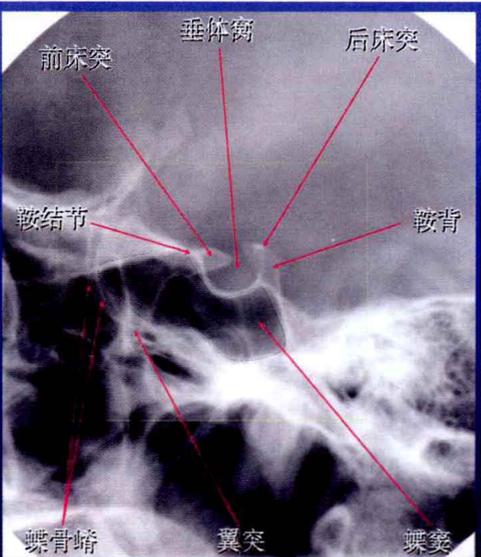


18

侧位片

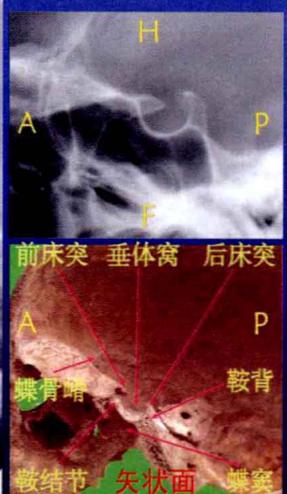


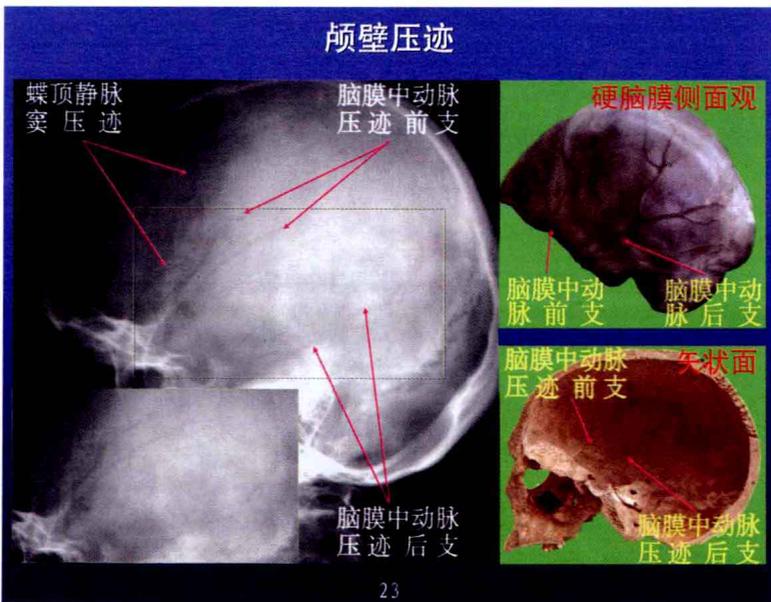
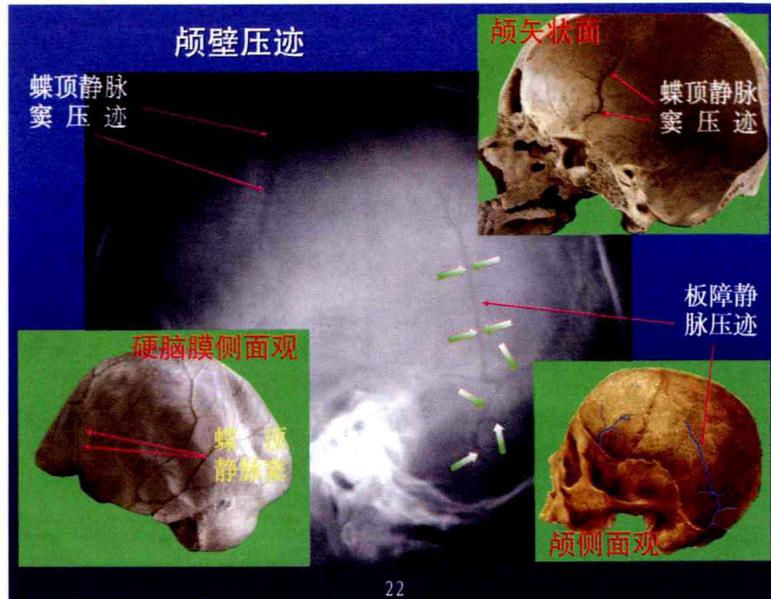
19



20

蝶骨





### 骨折线与颅壁血管压迹鉴别

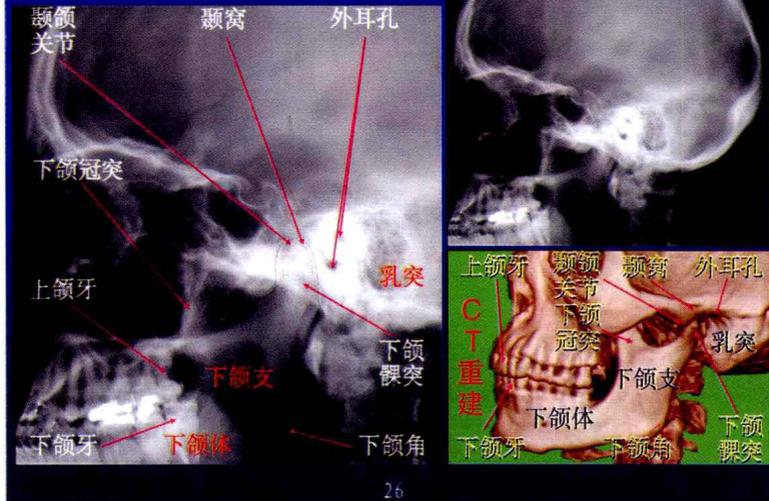
比较	骨折线	血管压迹
部位	创伤处	血管处
走行	僵直	柔和
宽度	一致	由粗到细
边缘	清晰	较模糊
分支	无分支	常有分支

24

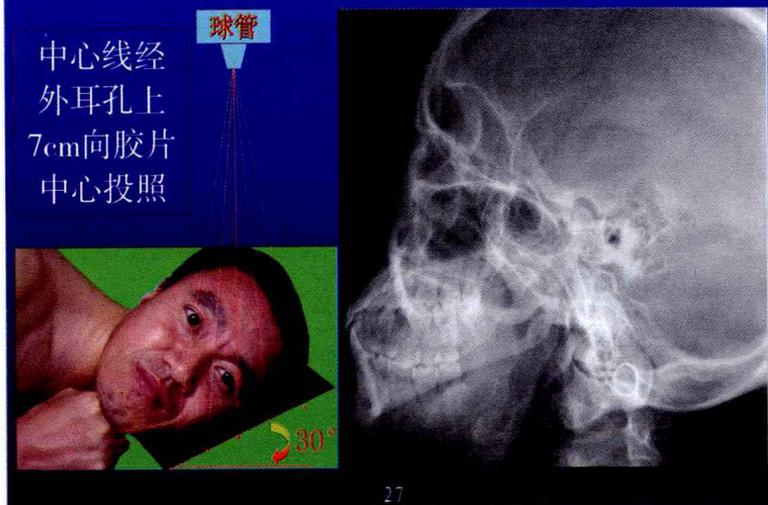
### 骨折线与颅壁血管压迹对比观察



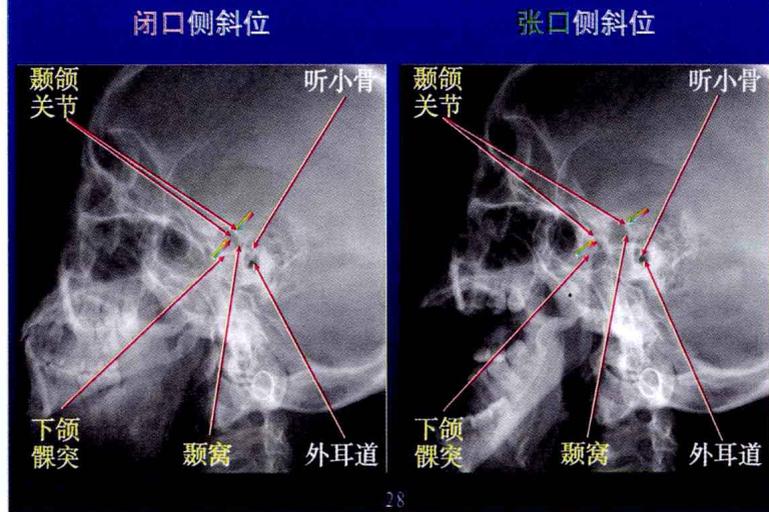
### 颞颌部



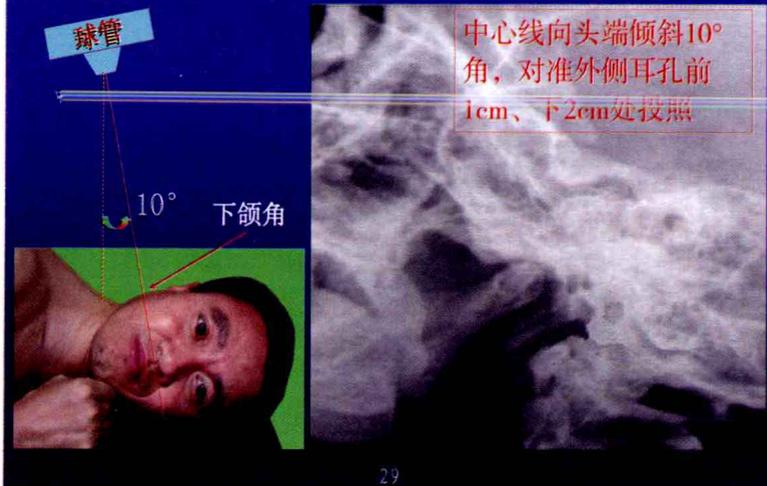
### 5. 颞颌关节侧斜位



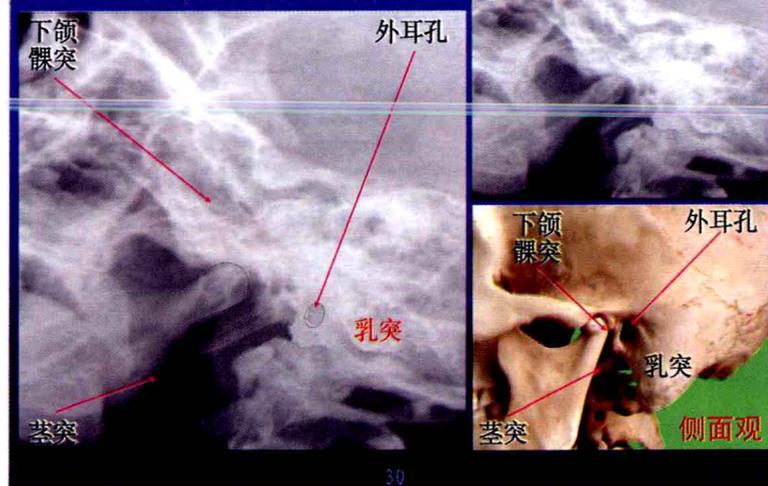
### 颞颌关节侧斜位



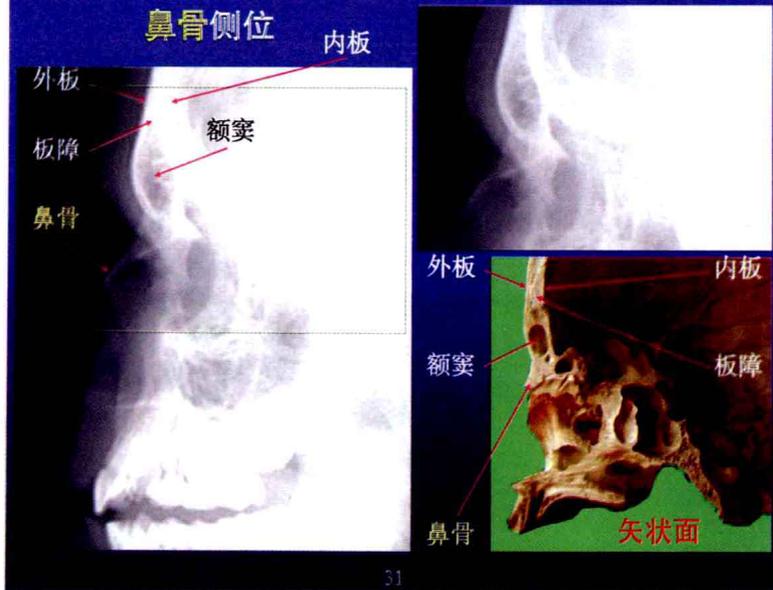
### 6. 茎突侧位



### 茎突侧位

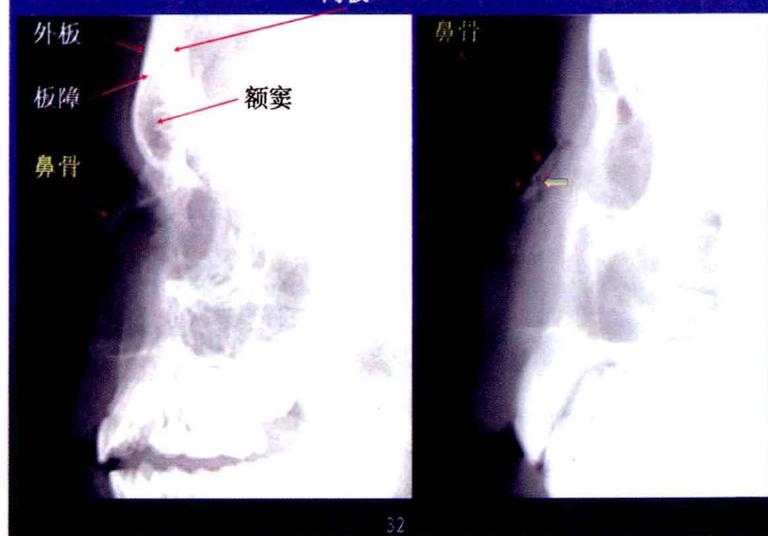


### 鼻骨侧位

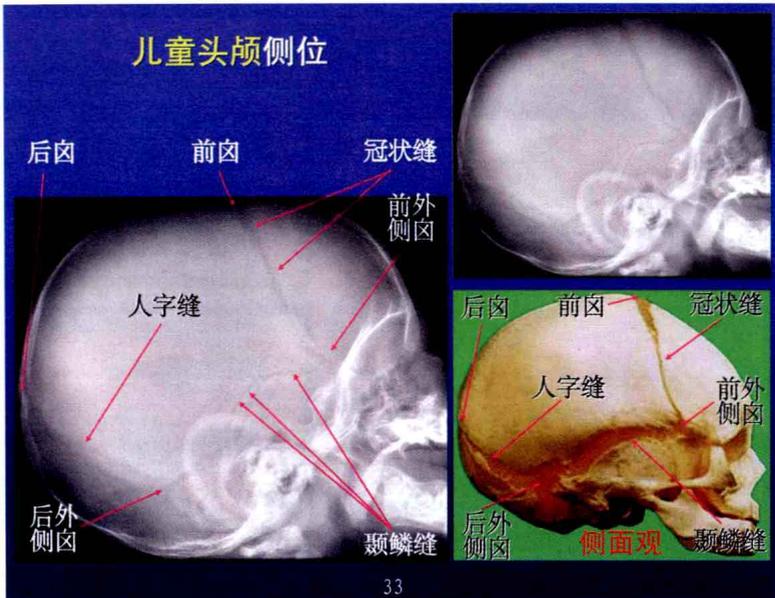


### 鼻骨侧位

### 鼻骨骨折



### 儿童头颅侧位

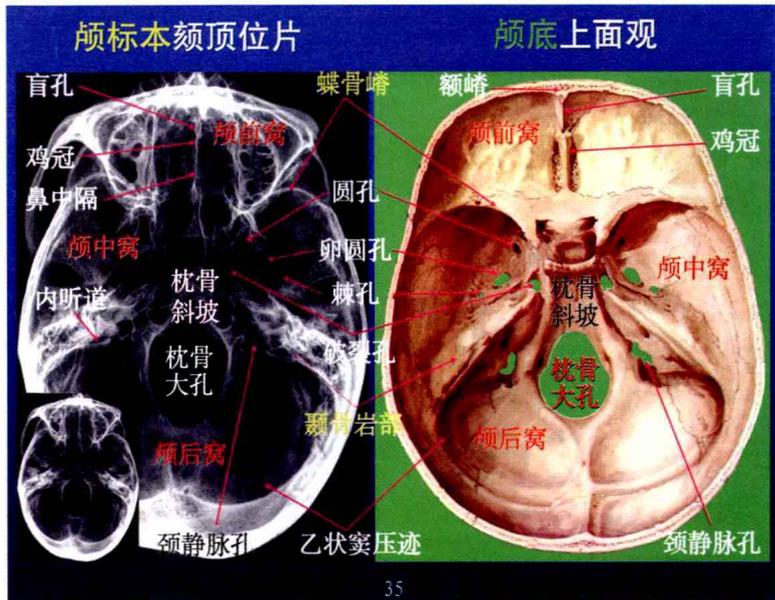


### 7. 颞顶位



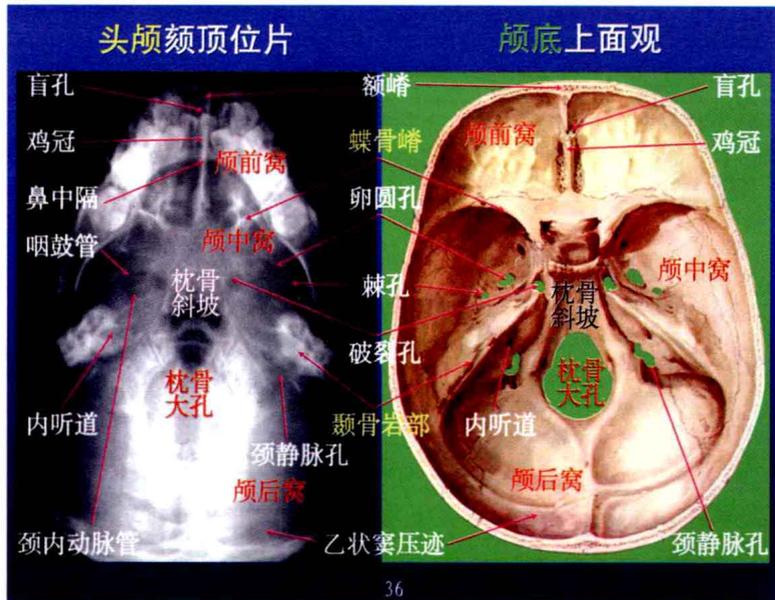
### 颅标本颞顶位片

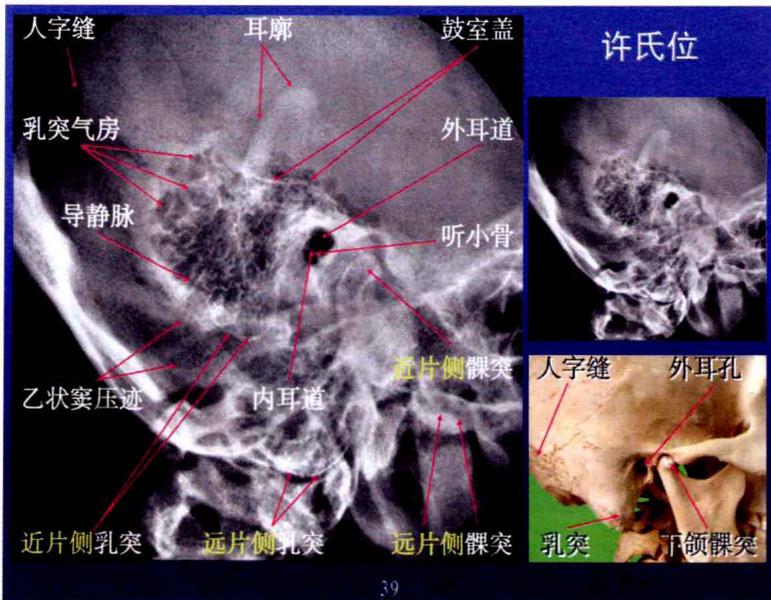
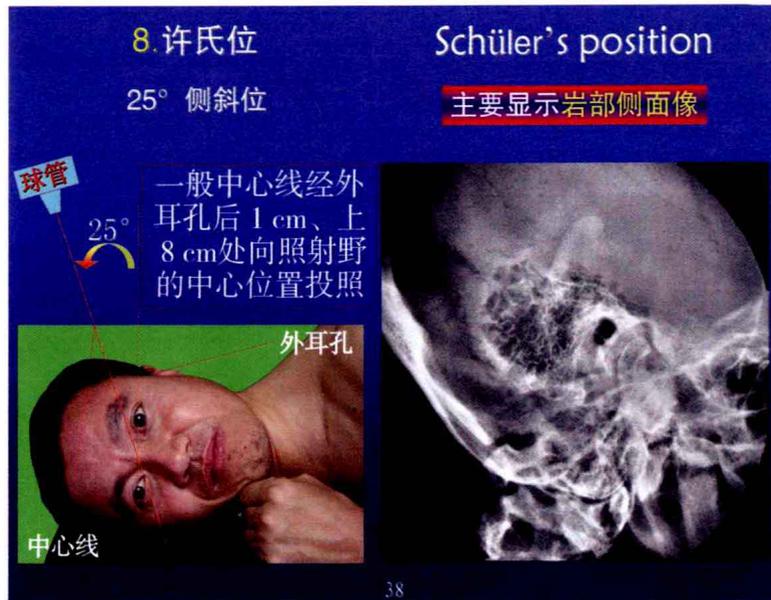
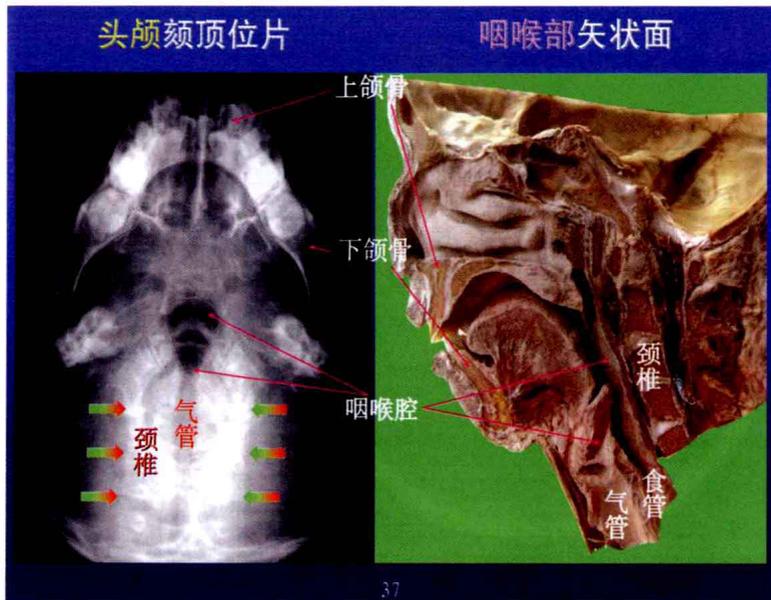
### 颅底上面观

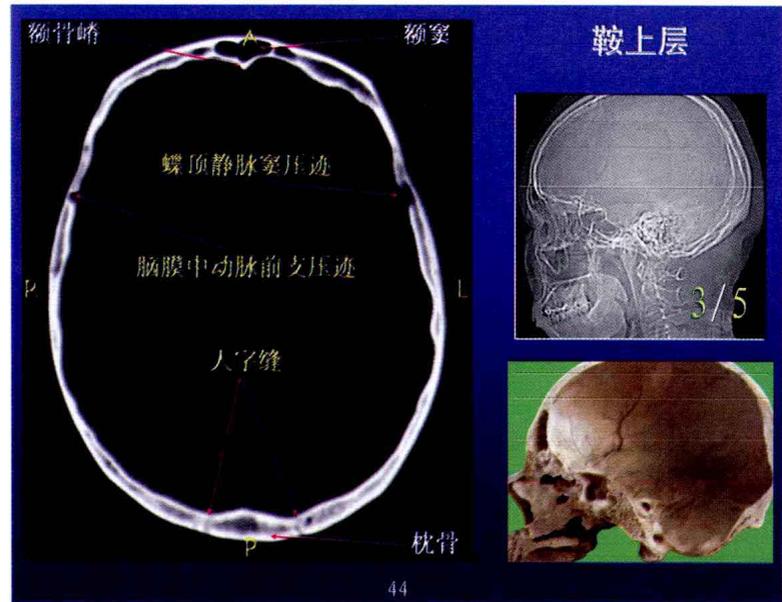
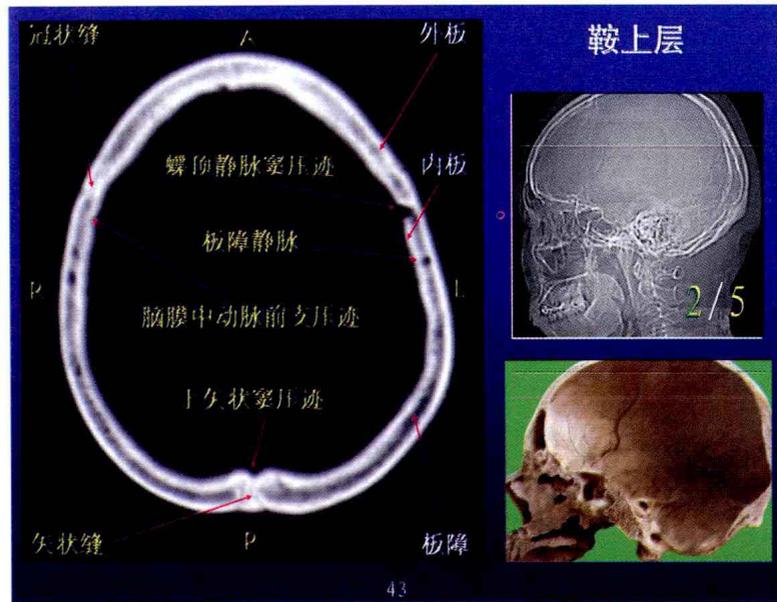
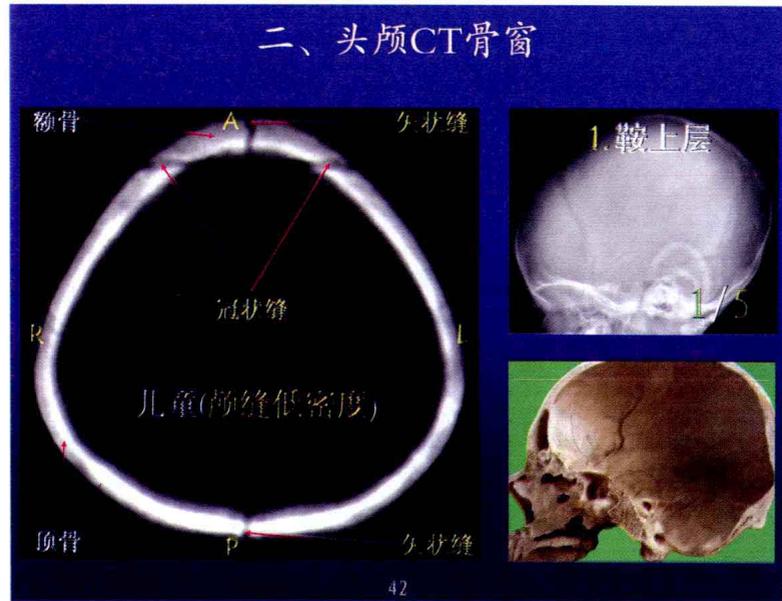
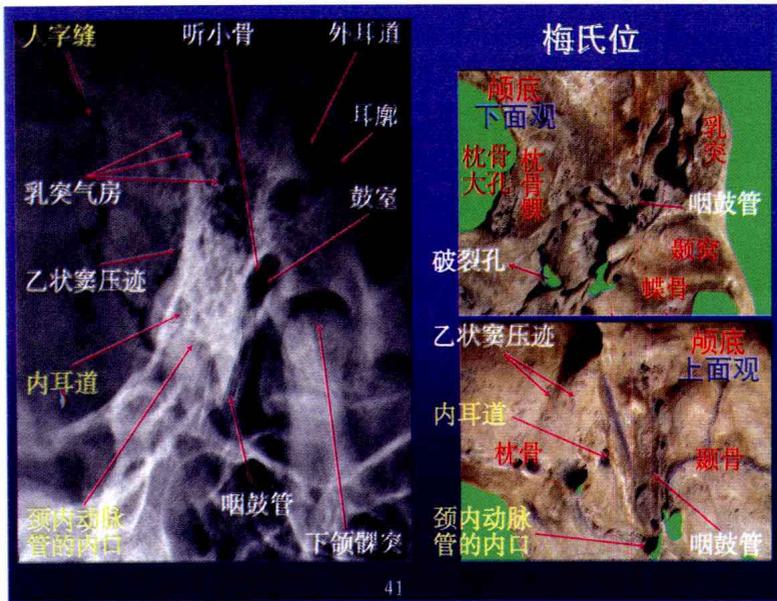


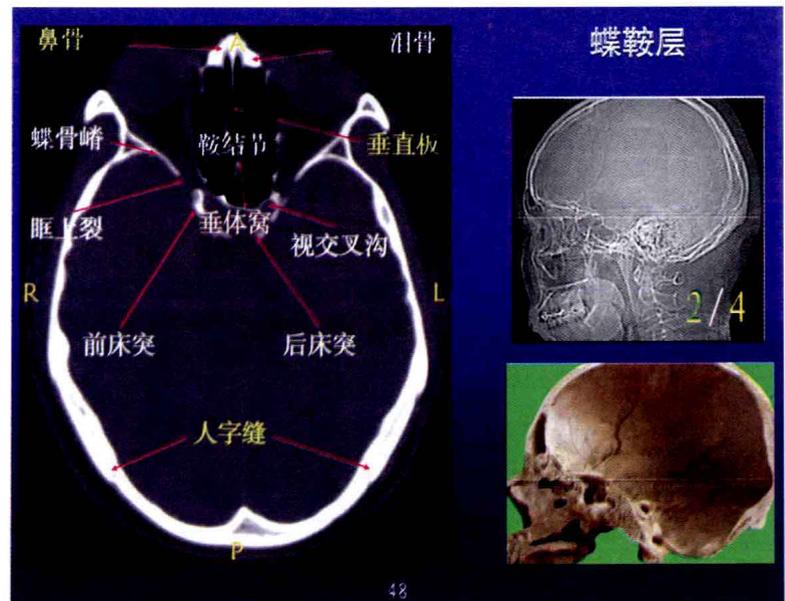
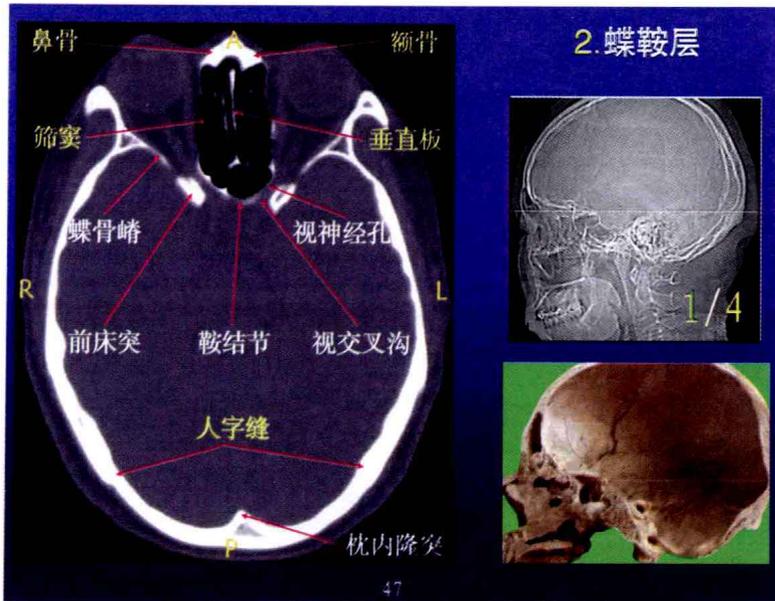
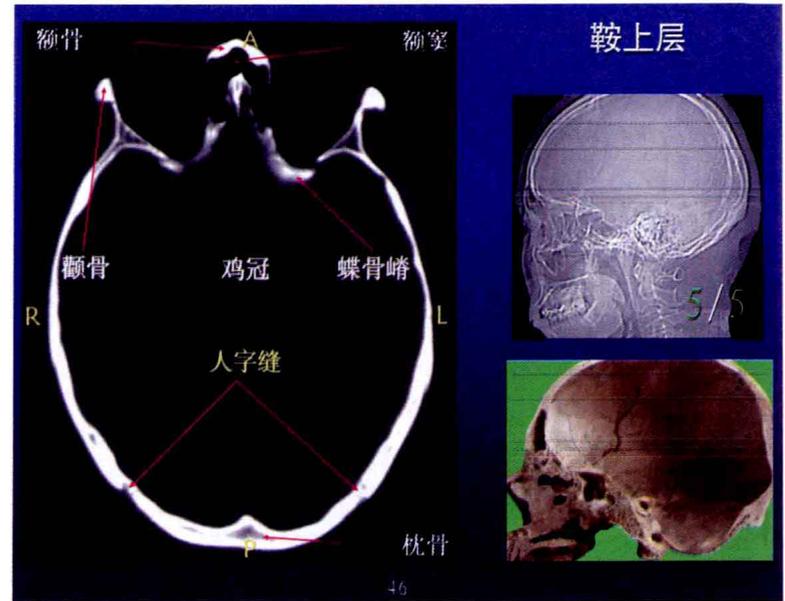
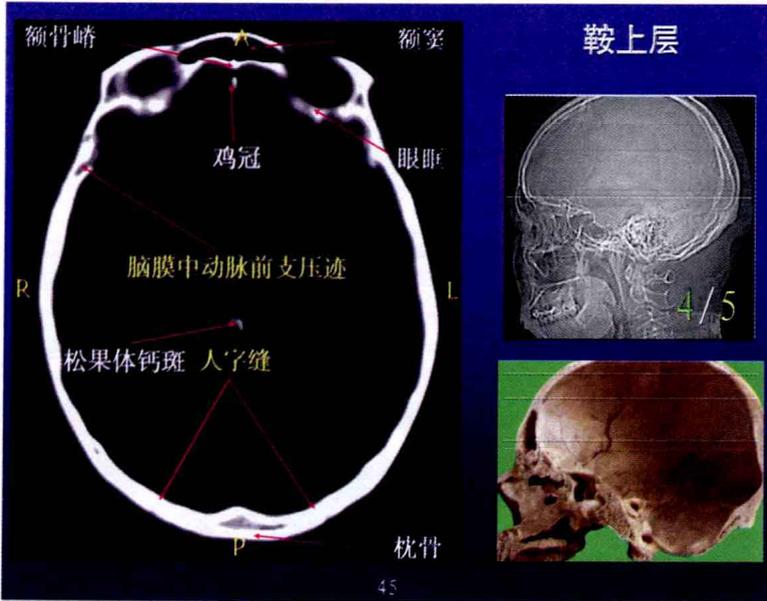
### 头颅颞顶位片

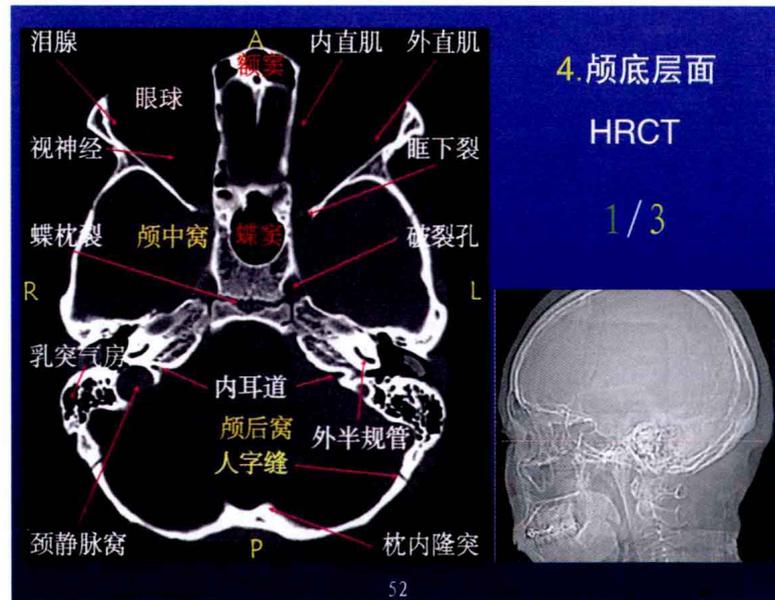
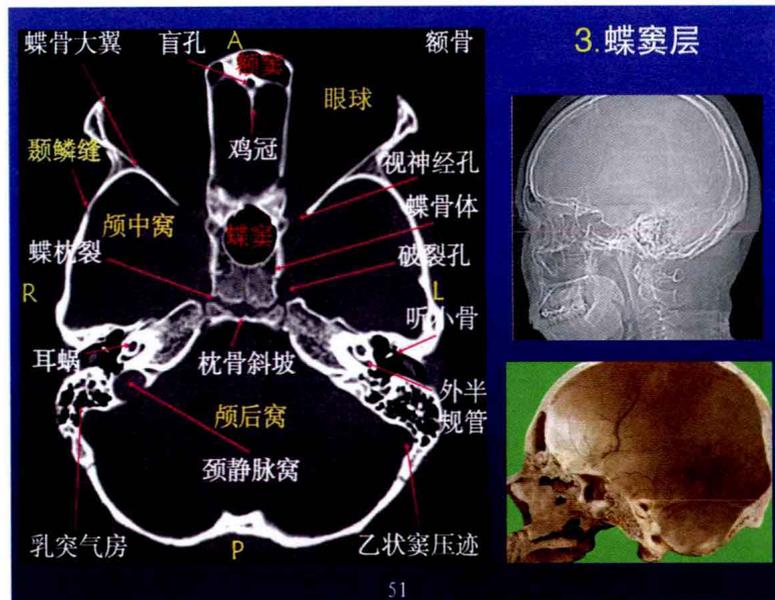
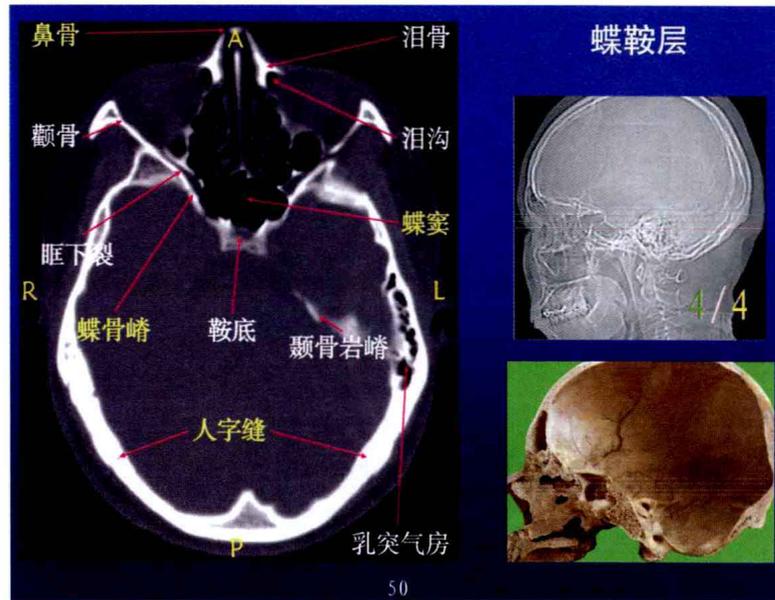
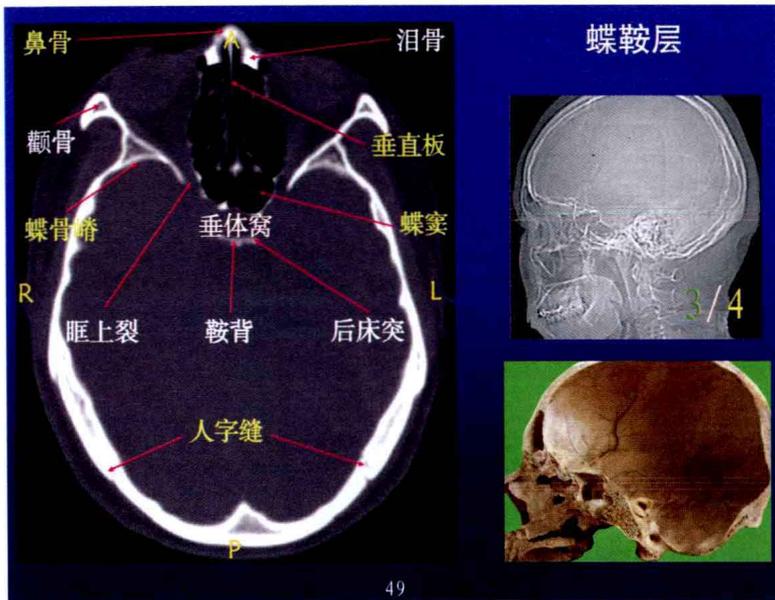
### 颅底上面观

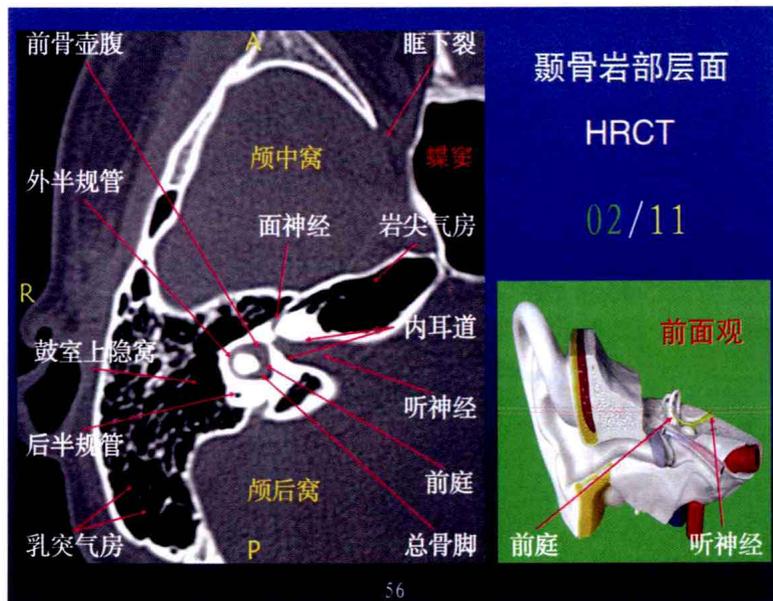
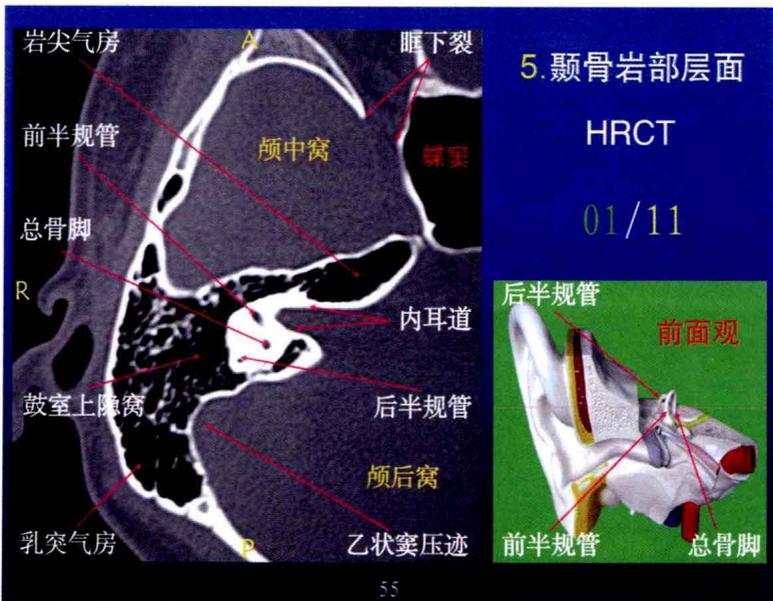
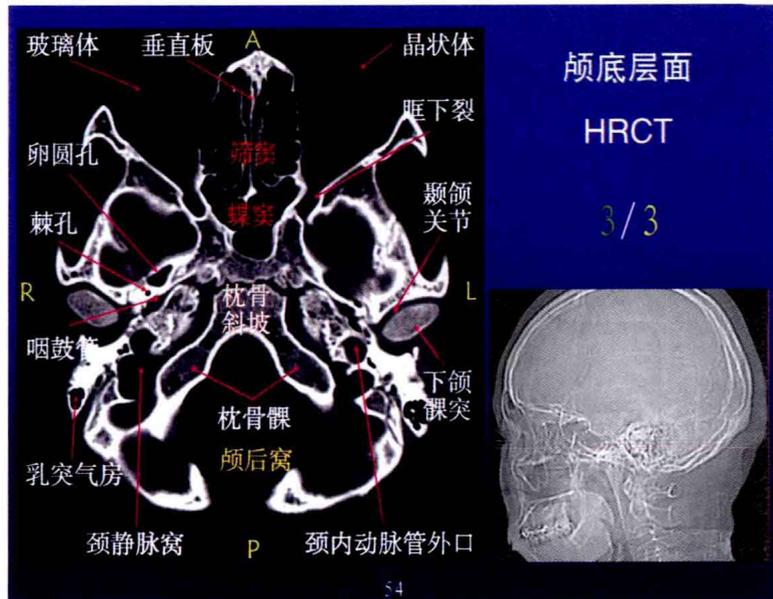
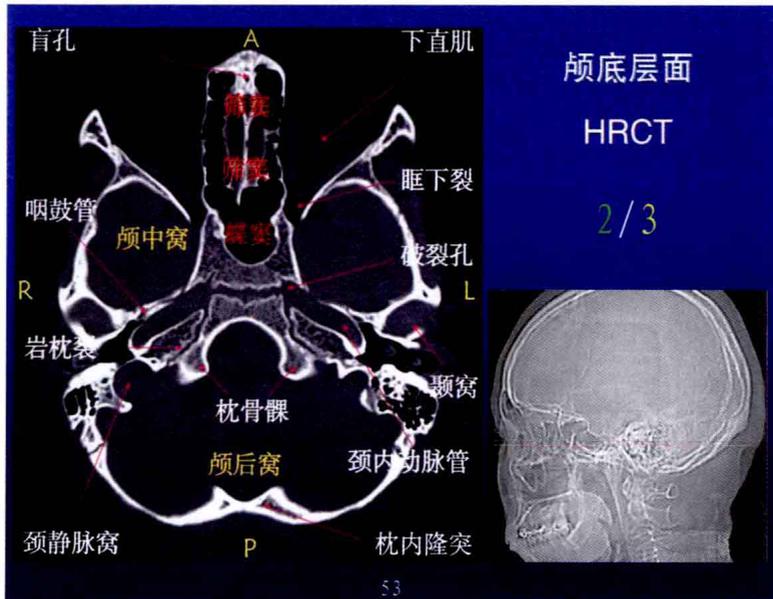


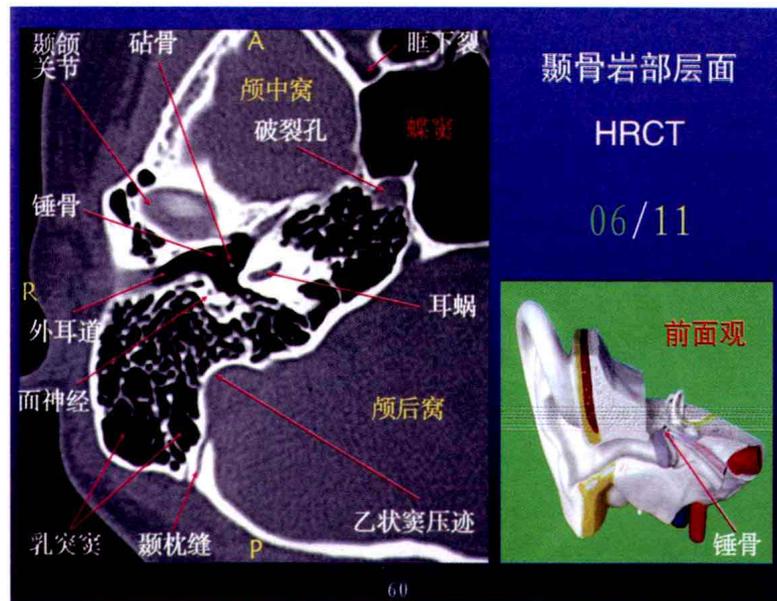
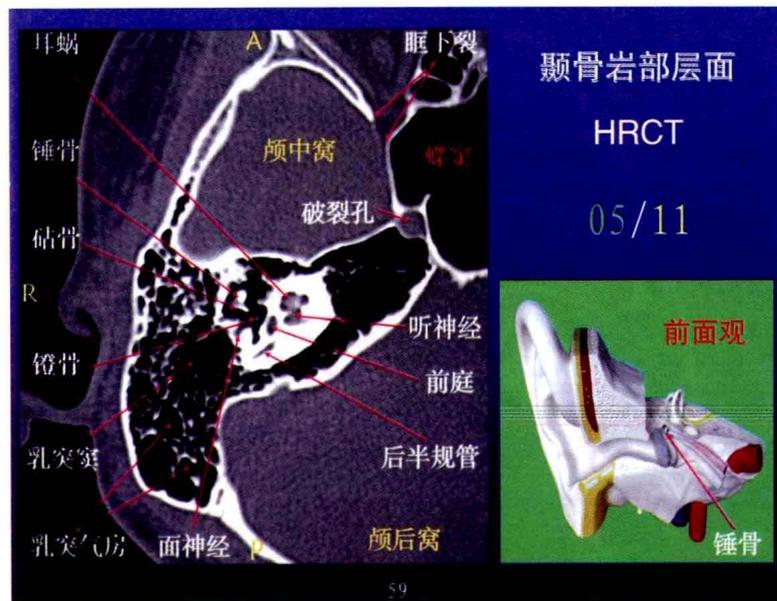
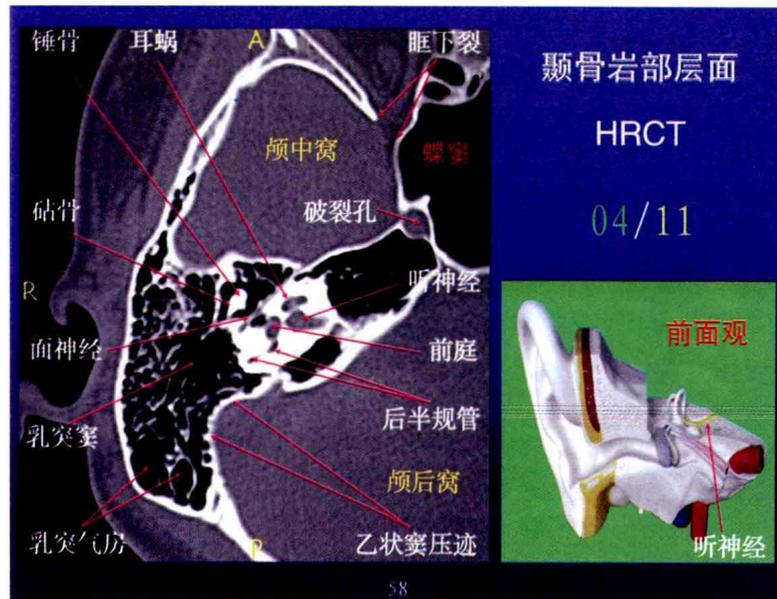
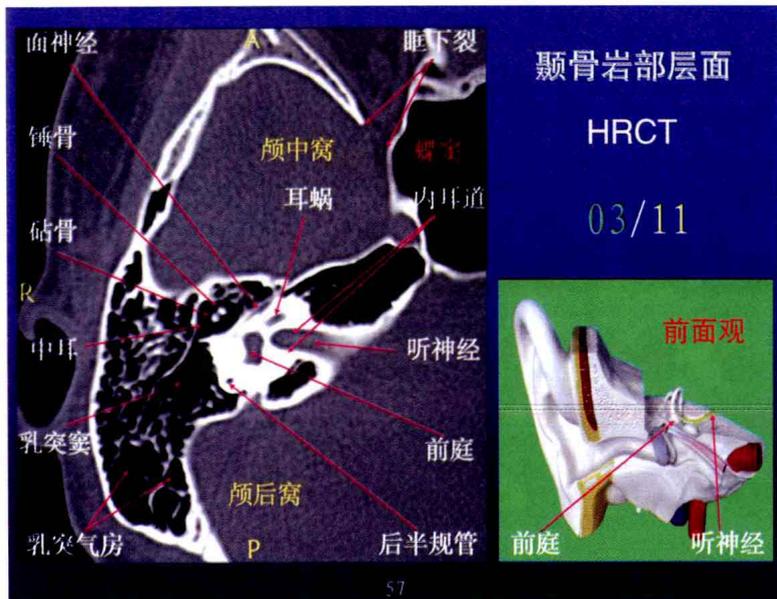


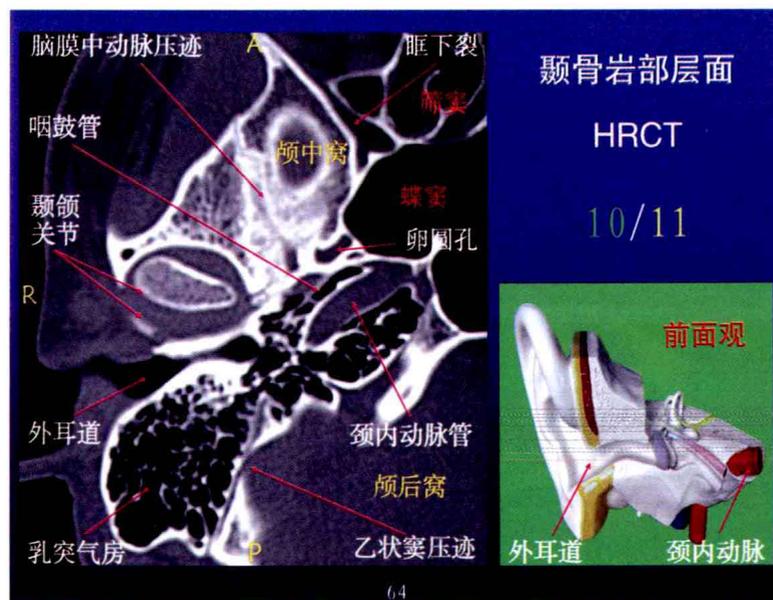
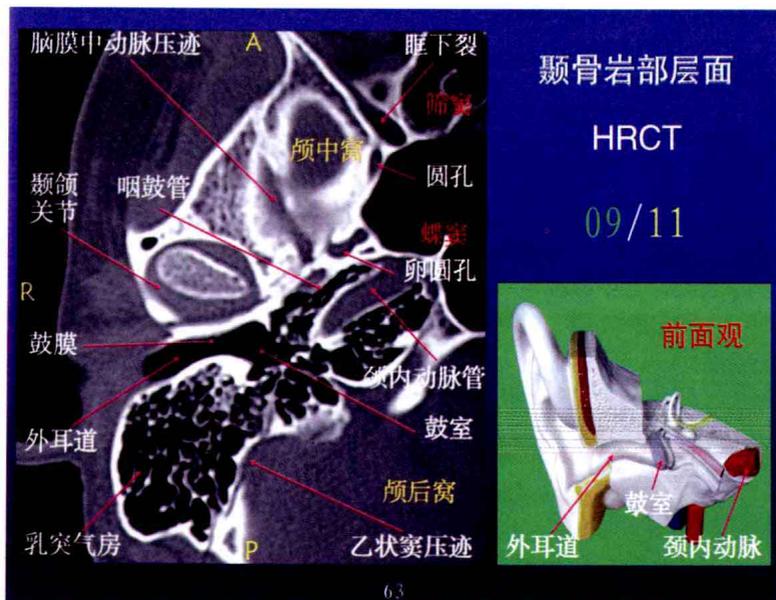
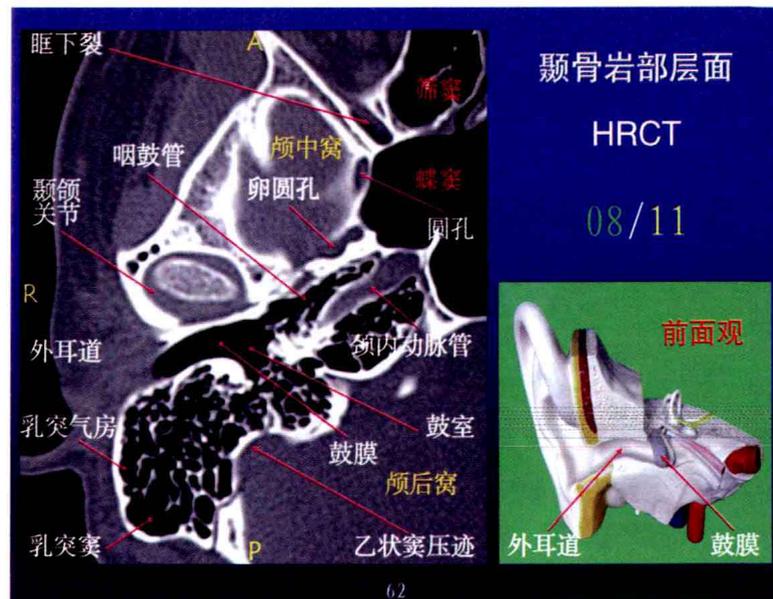
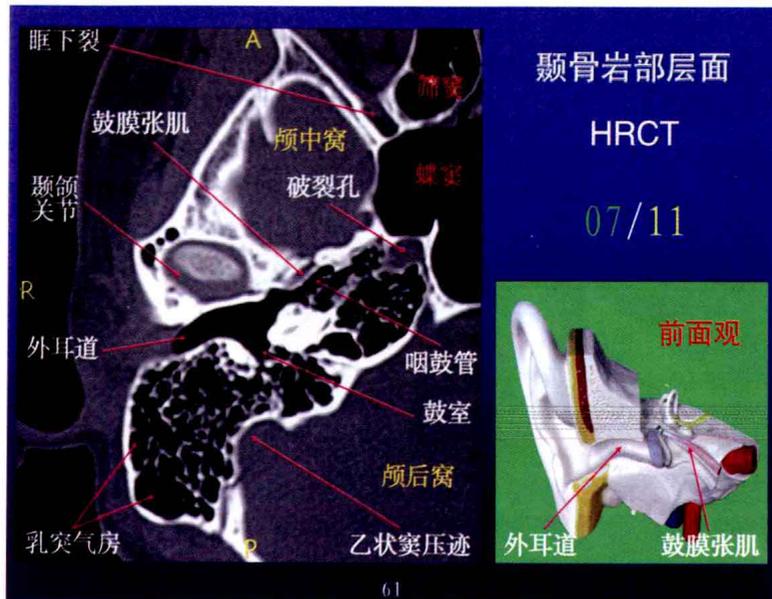


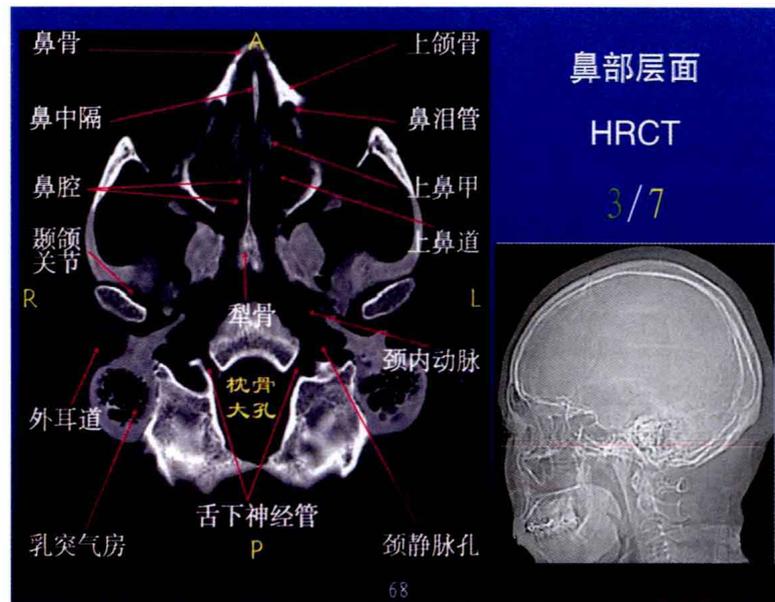
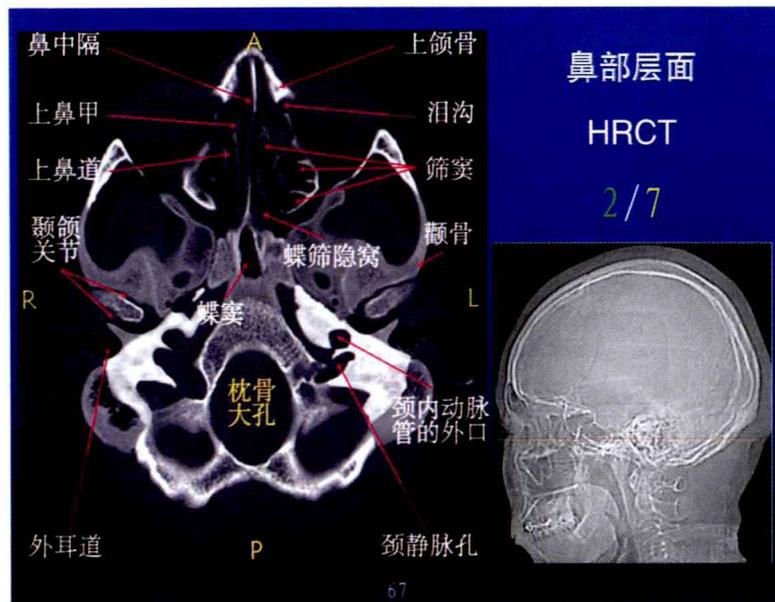
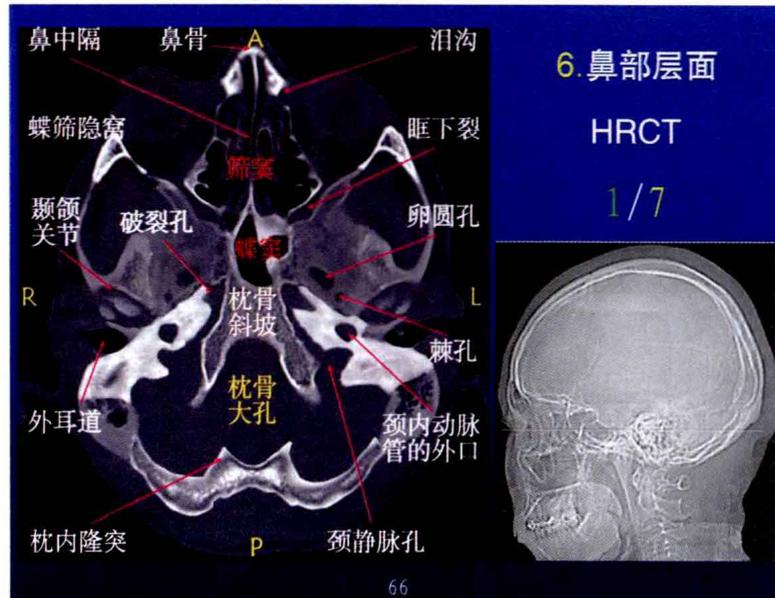
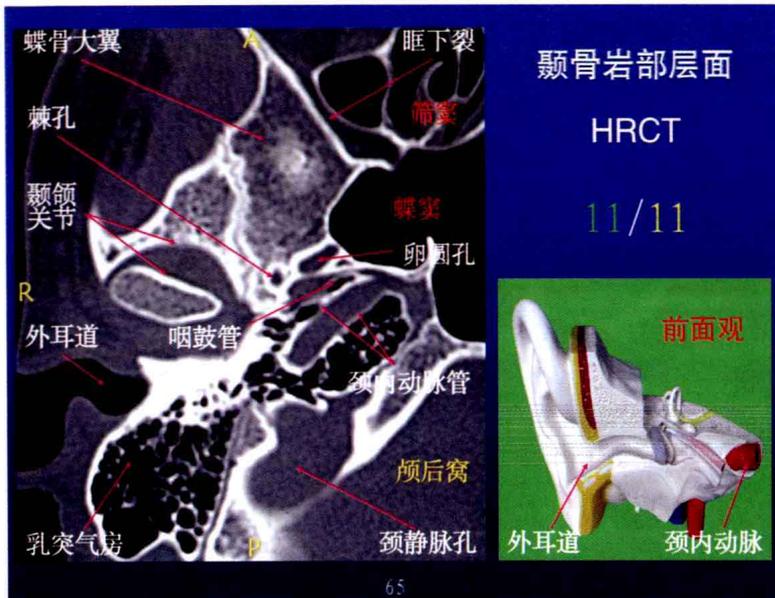


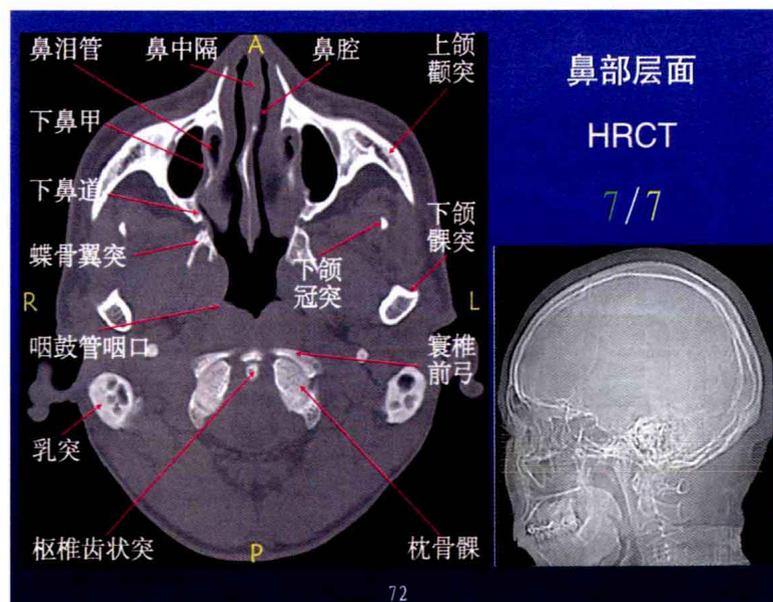
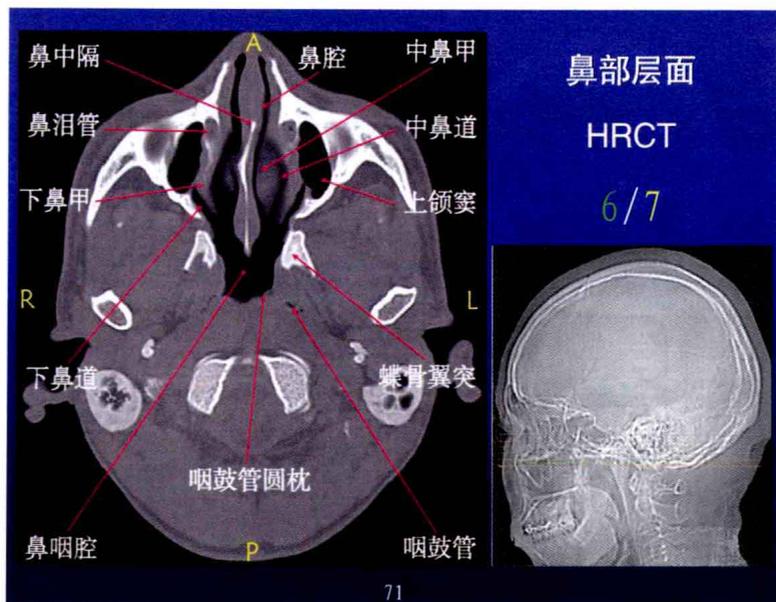
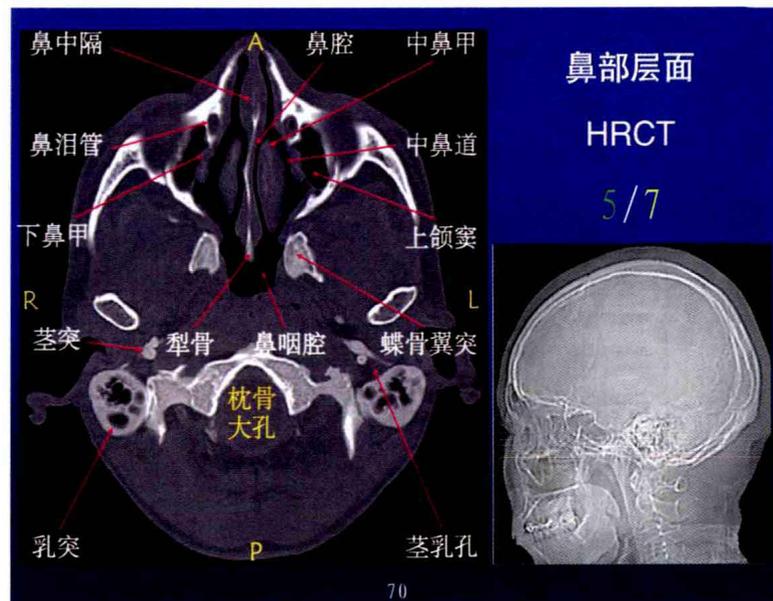
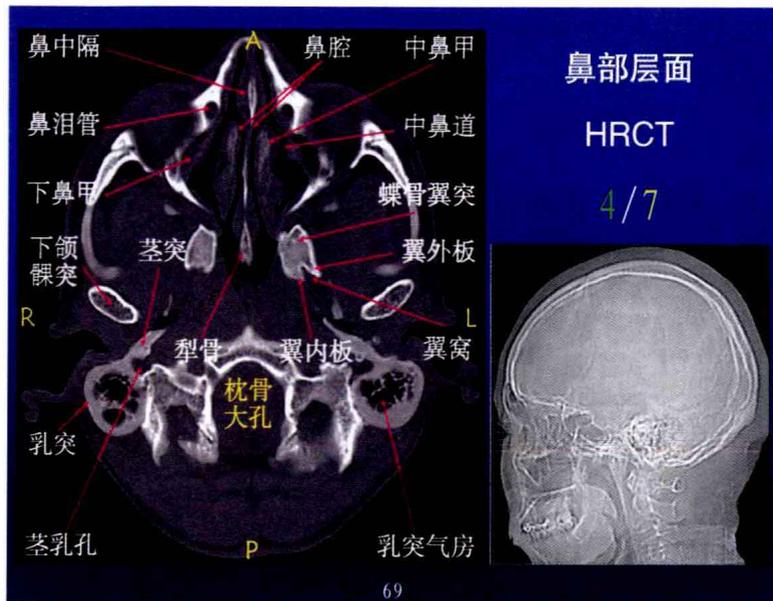


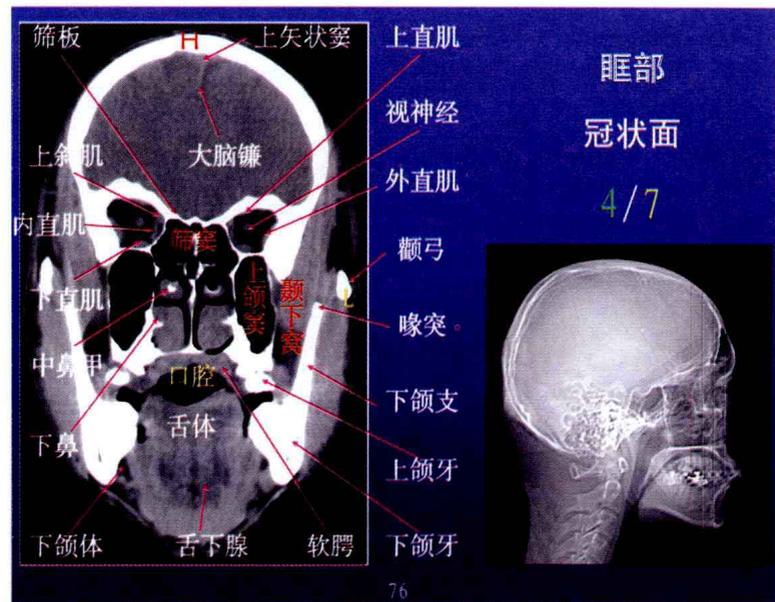
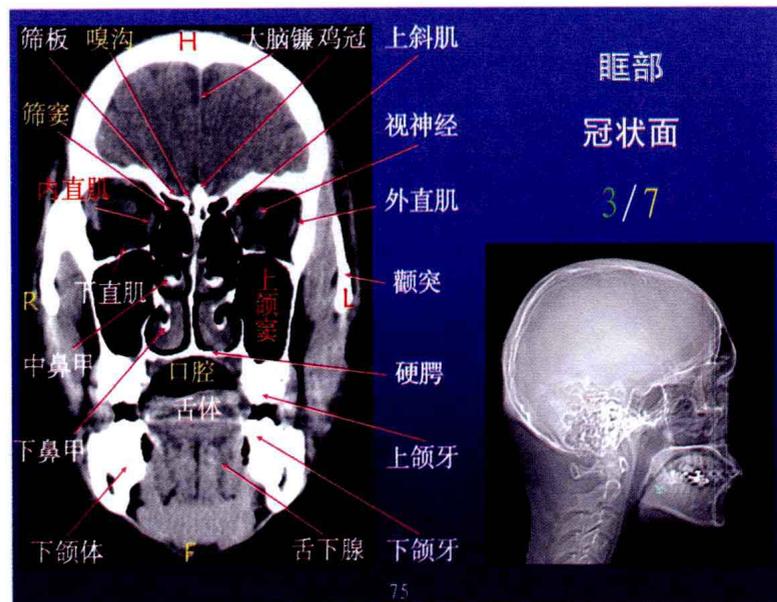
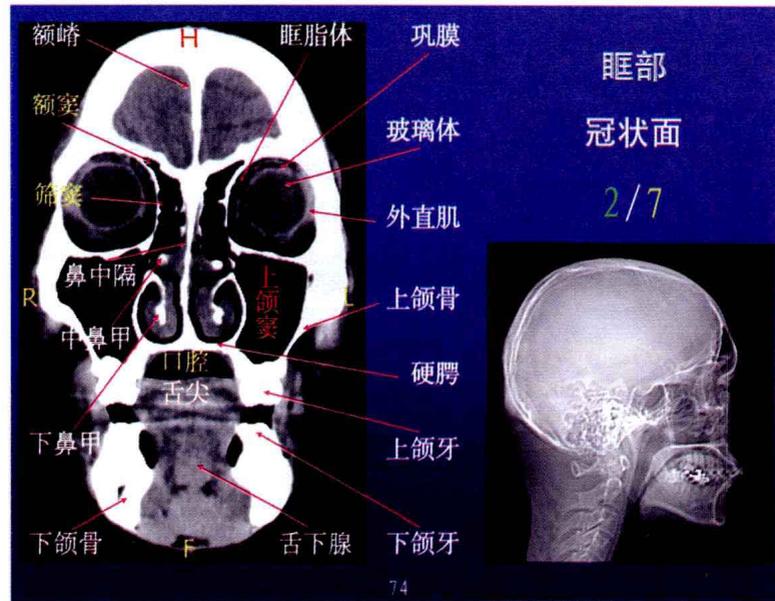
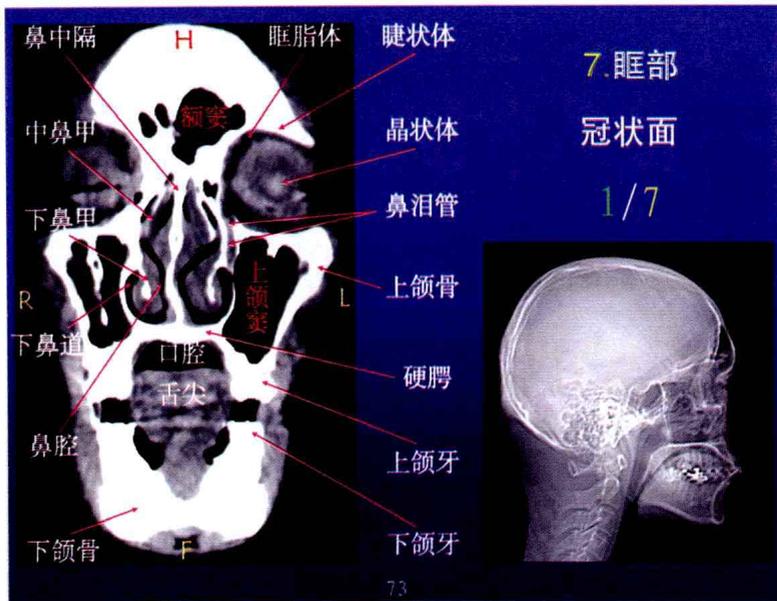


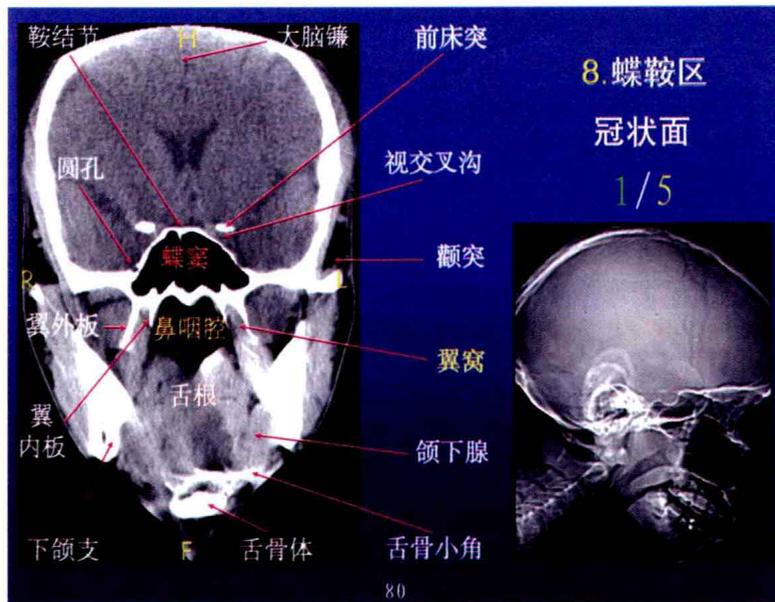
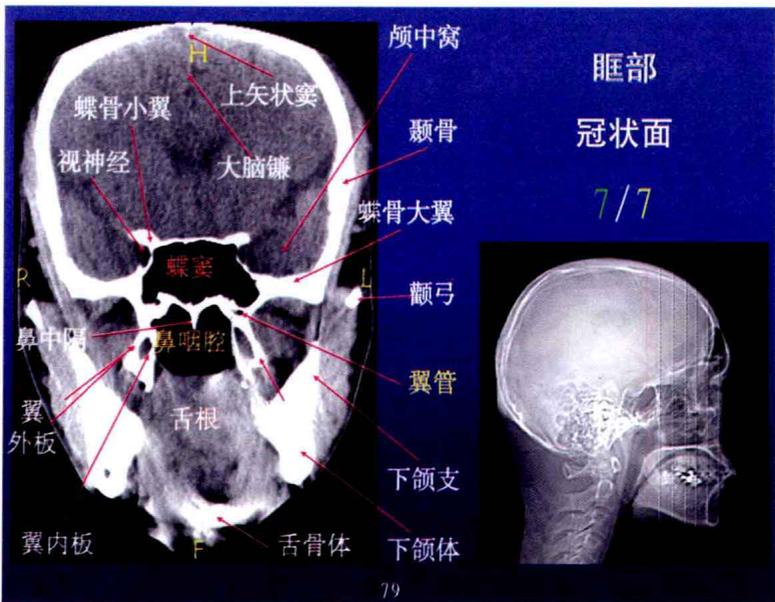
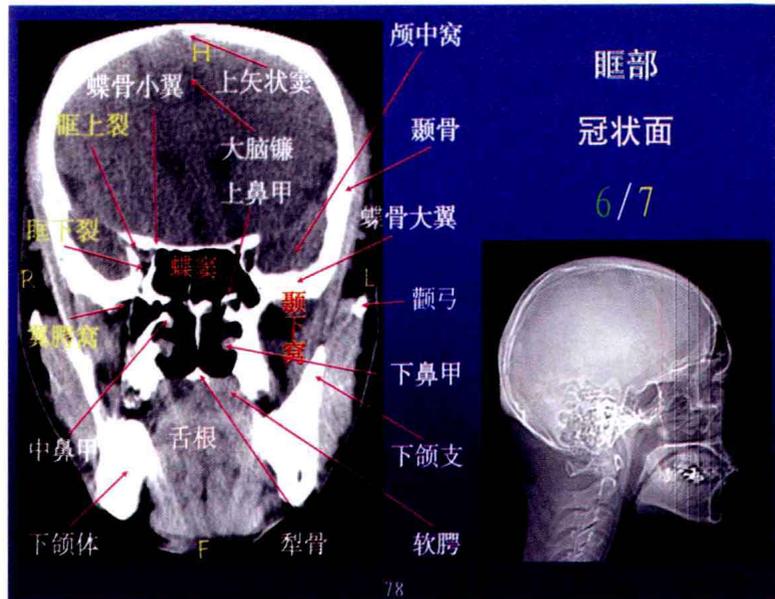
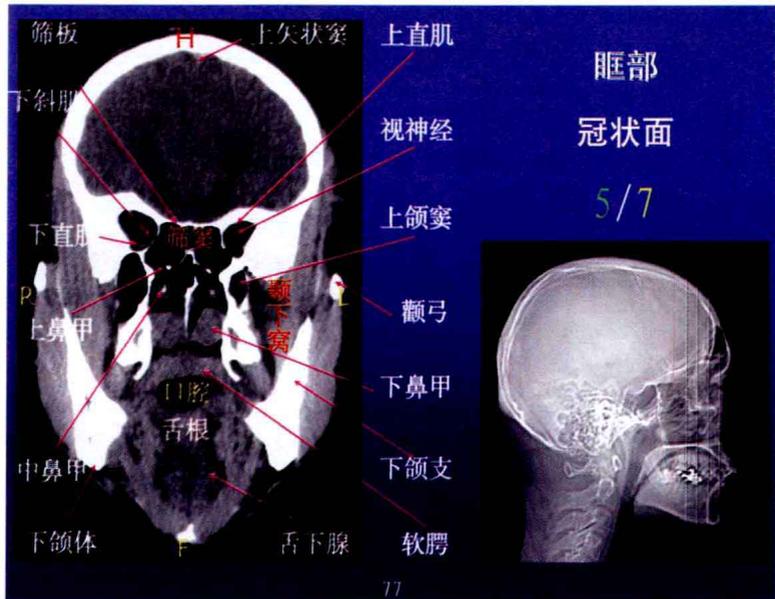


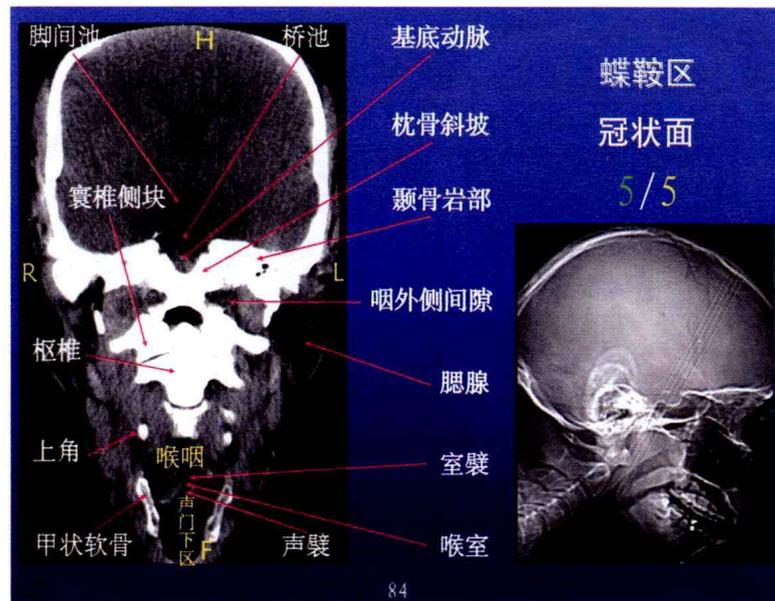
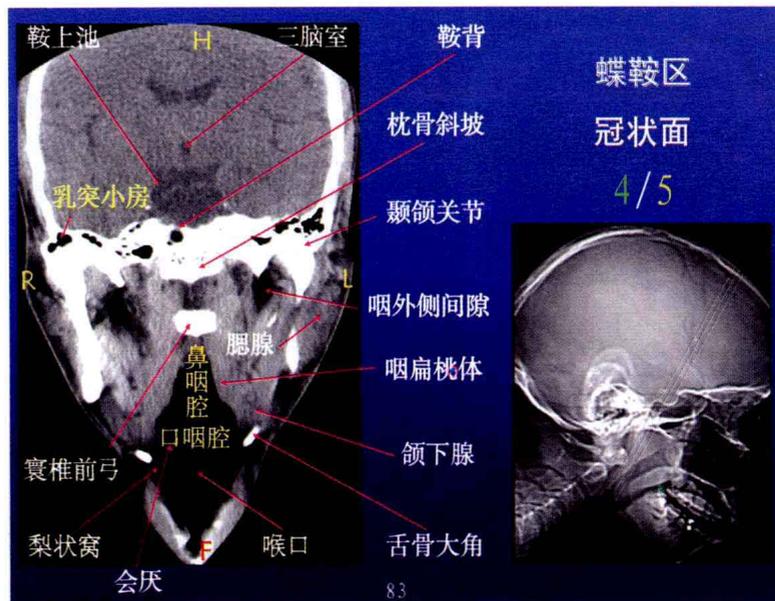
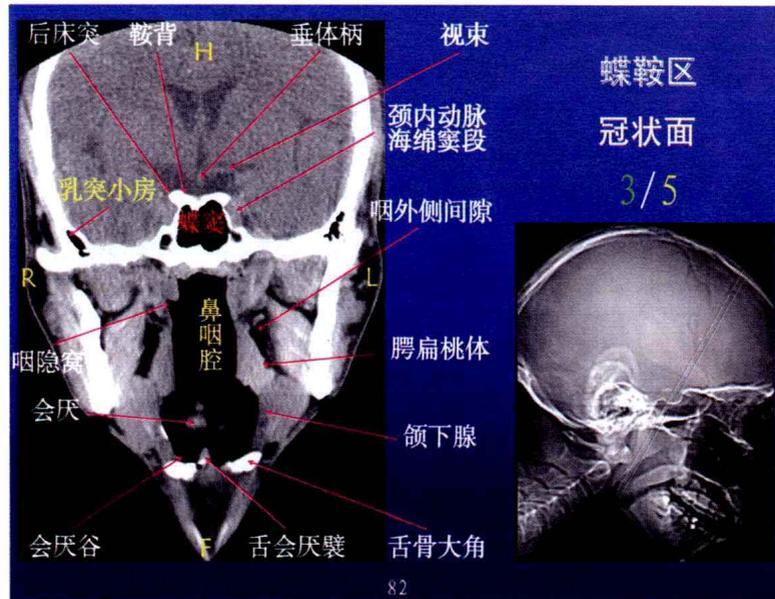
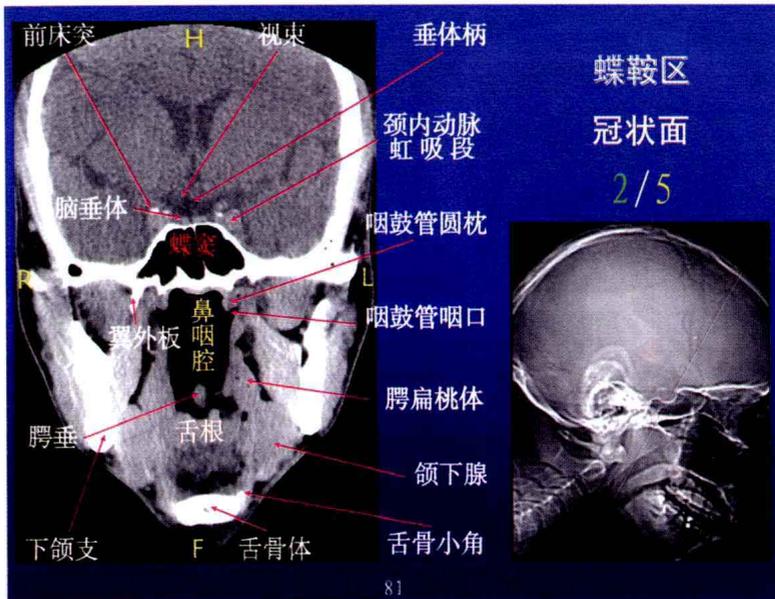






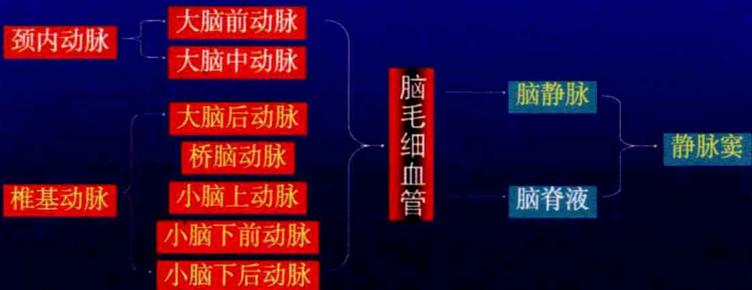






## 第二节 脑血管

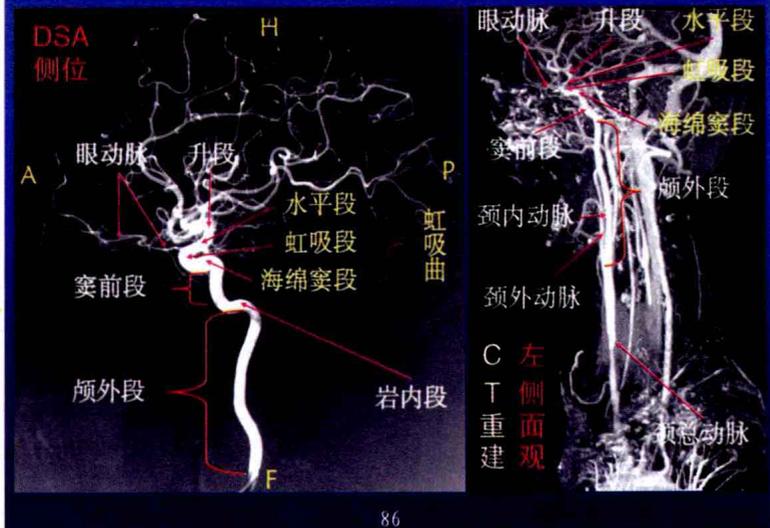
脑内血管由颈内动脉、椎基动脉、脑底动脉环、脑毛细血管和静脉窦等组成。



85

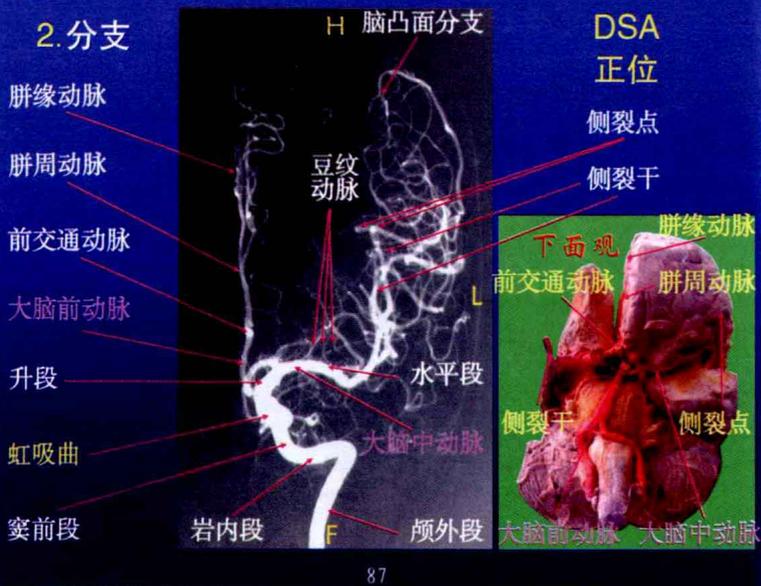
### 一、颈内动脉

#### 1. 分段



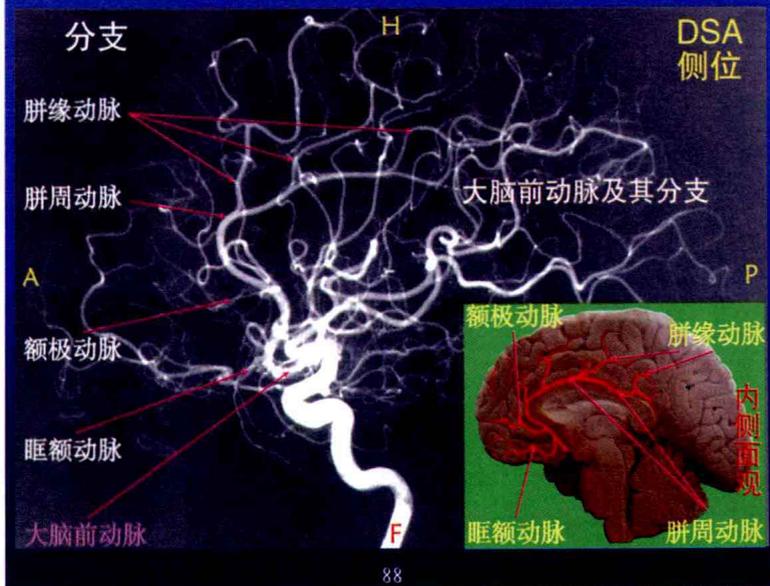
86

#### 2. 分支

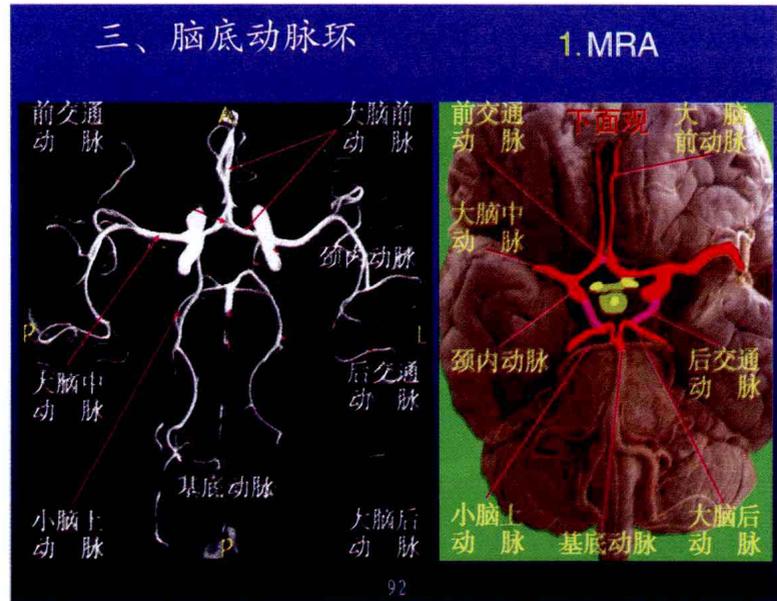
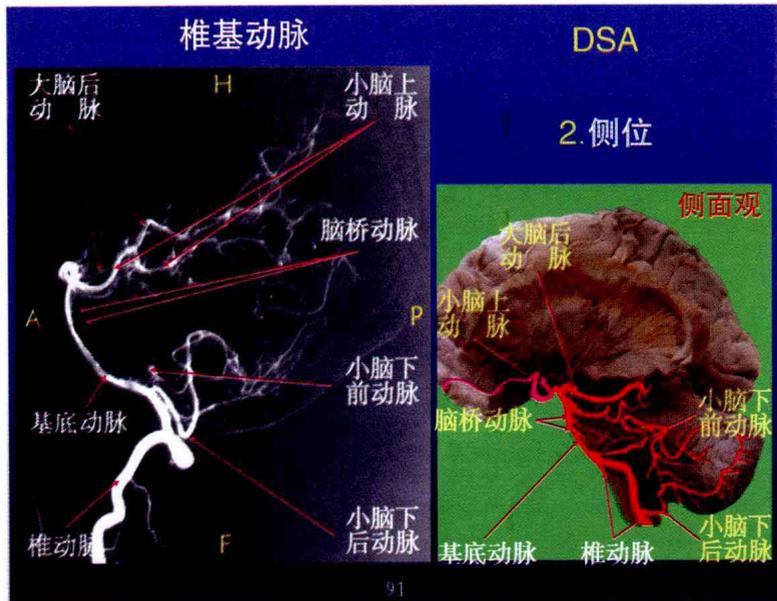
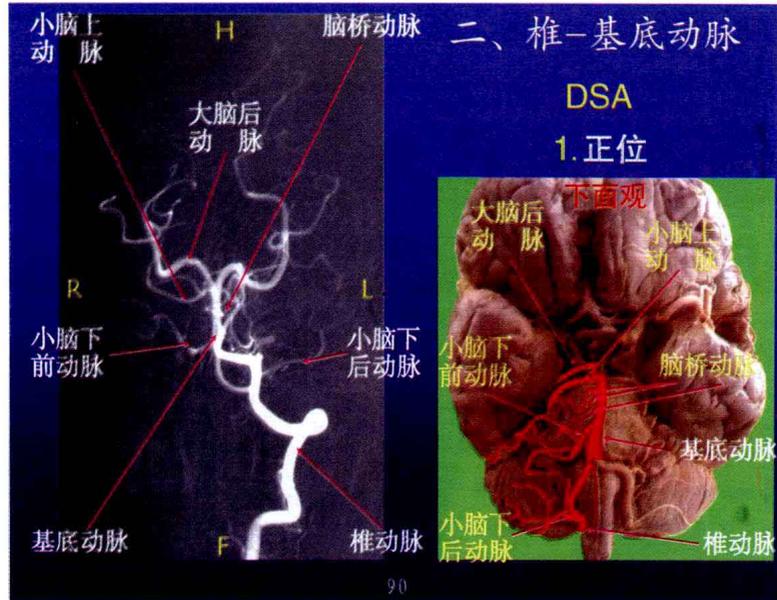
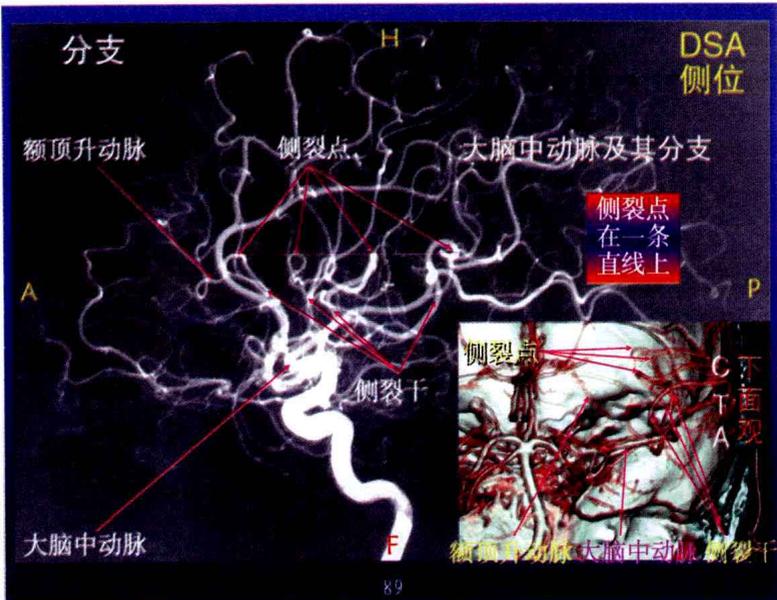


87

#### 分支

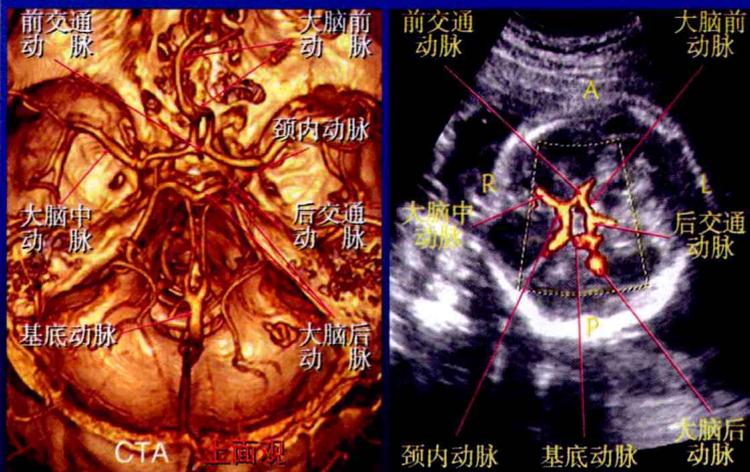


88



脑底动脉环

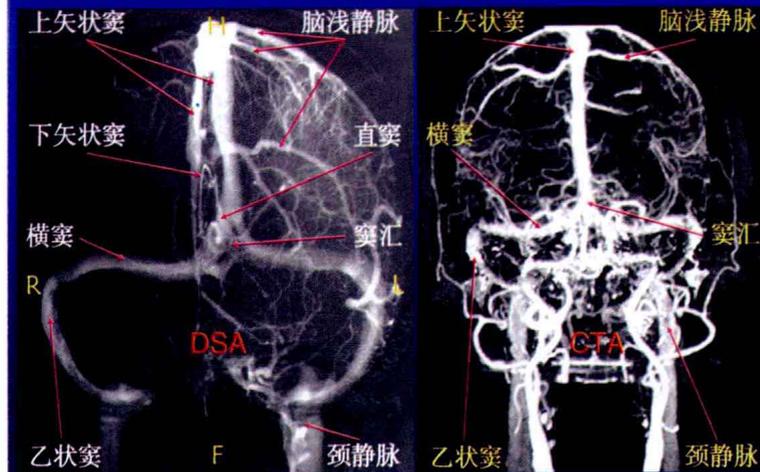
2.CDFI



93

四、静脉和静脉窦

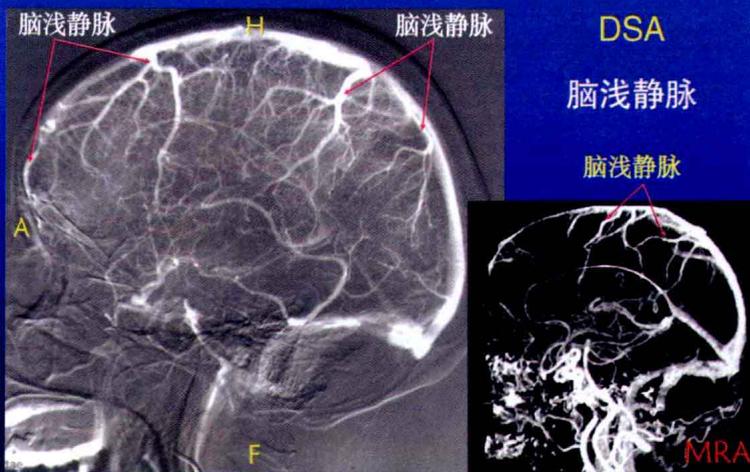
1. 正位



94

静脉和静脉窦

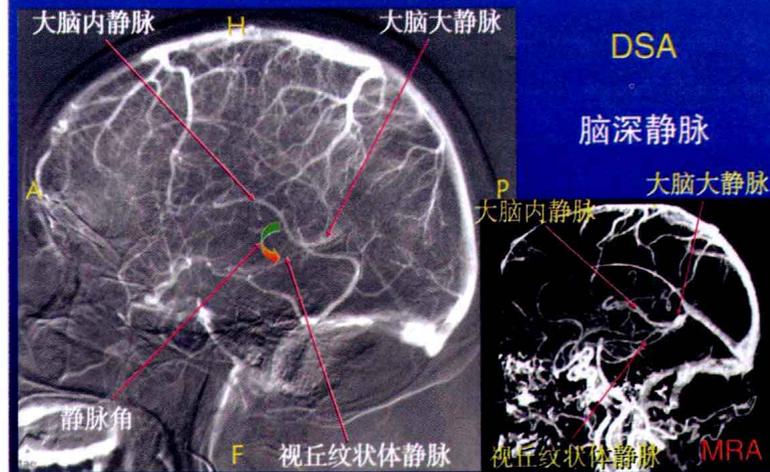
2. 侧位



95

静脉和静脉窦

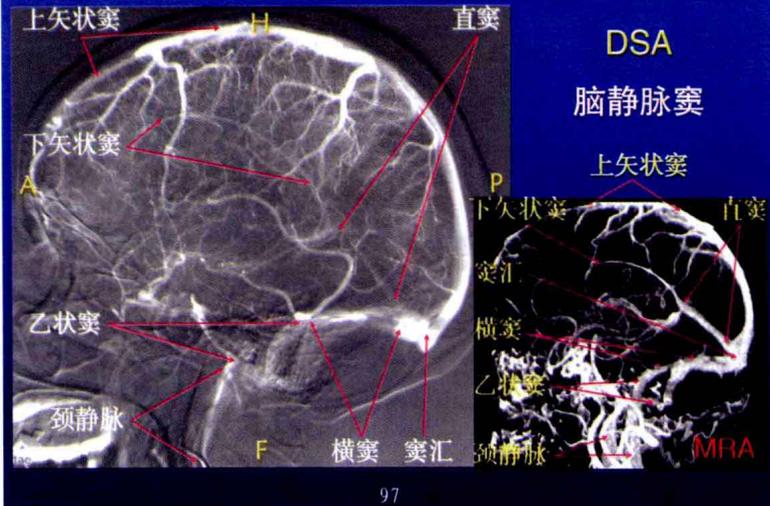
侧位



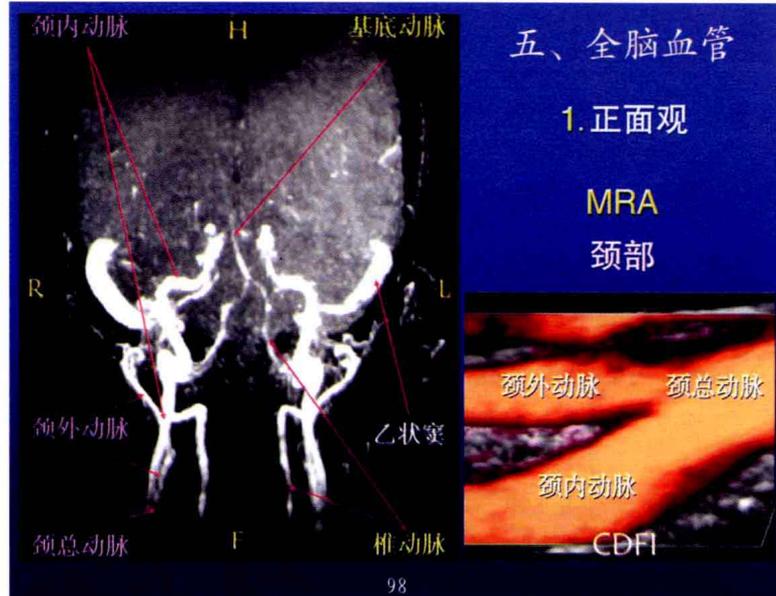
96

静脉和静脉窦

侧位



97



五、全脑血管

1. 正面观

MRA  
颈部

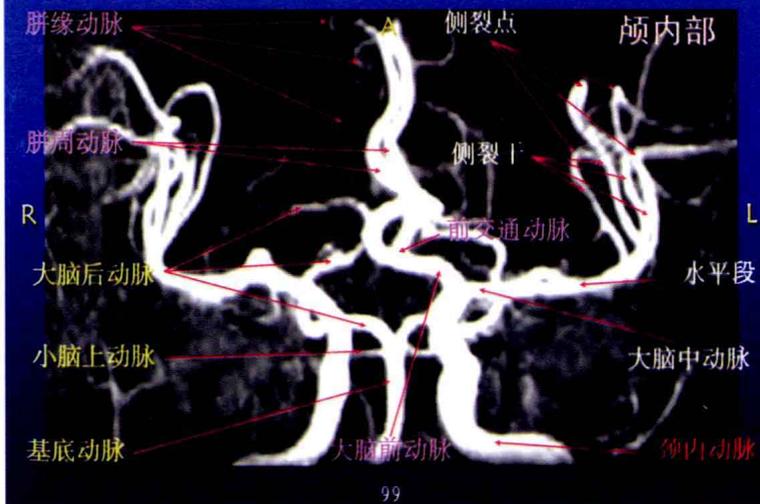


98

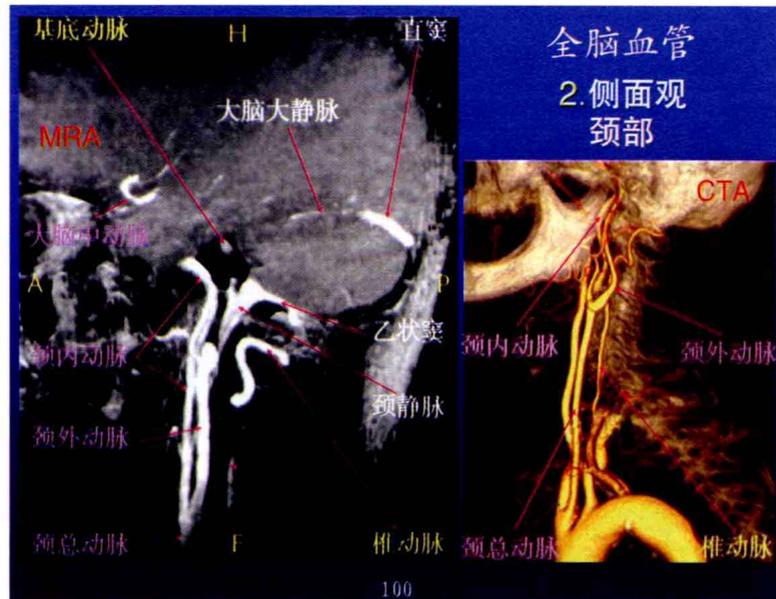
全脑血管

正面观

MRA



99

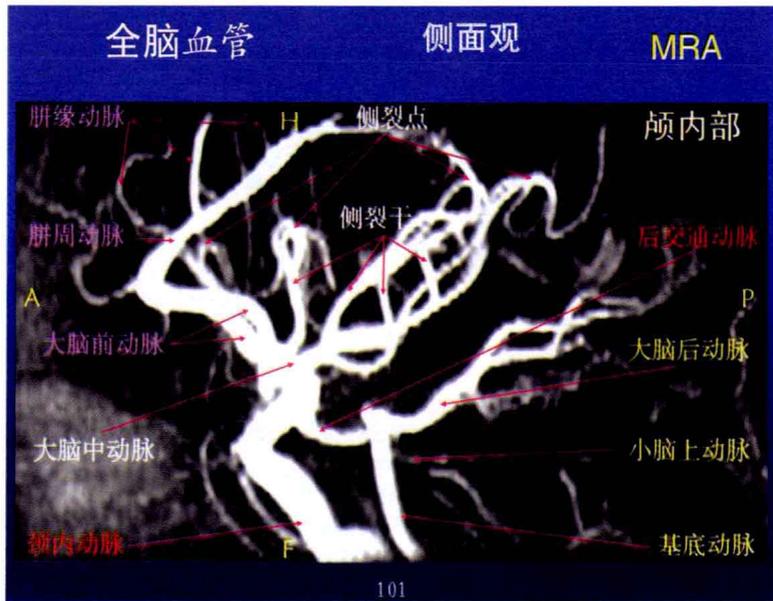


全脑血管

2. 侧面观  
颈部



100



### 第三节 脑和脑室

本节介绍脑和脑室相关的解剖学知识，脑CT定位像、脑窗、骨窗及其强化后的正常表现，脑和脑室MRI横断面、冠状面及矢状面表现。

102

### 一、相关解剖

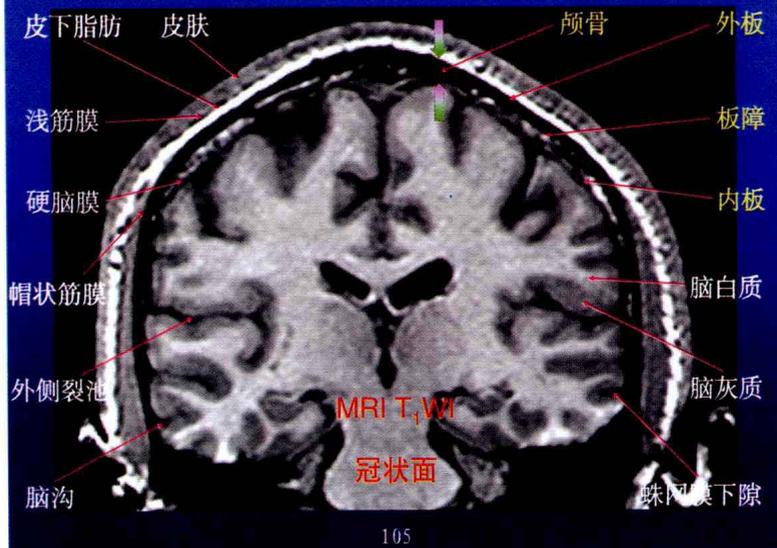
#### 1. 由皮肤到脑的解剖层次

颅外	皮肤	蛛网膜下隙内 充填脑脊液
	浅筋膜	
	帽状筋膜	
	骨外膜	
颅内	颅骨	硬膜外隙
	硬脑膜	硬膜下隙
	蛛网膜	蛛网膜下隙
	软脑膜	

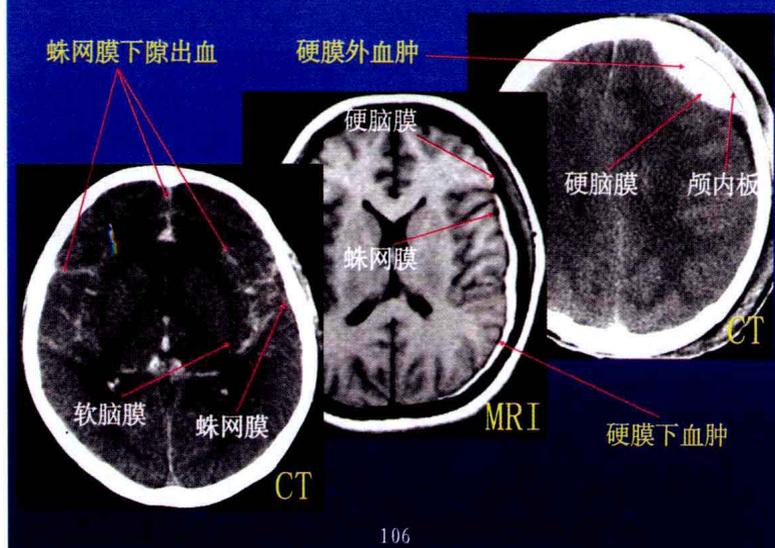
103



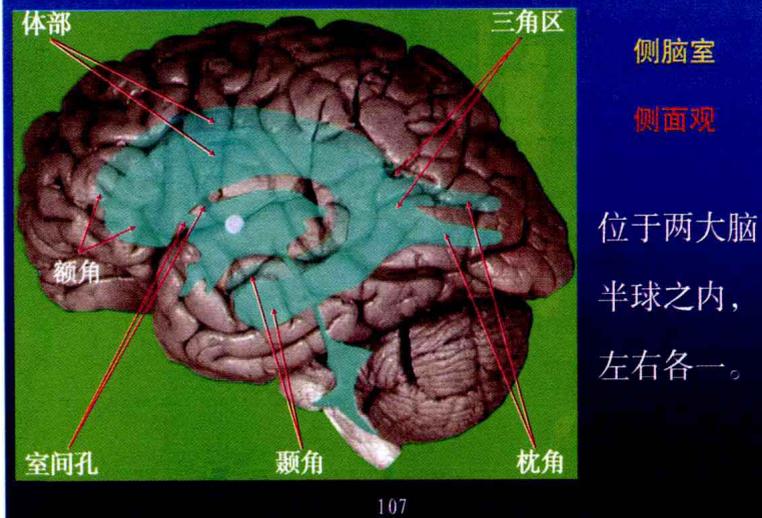
## 2. 由皮肤到脑的MRI层次



## 3. 比较颅内血肿的影像表现

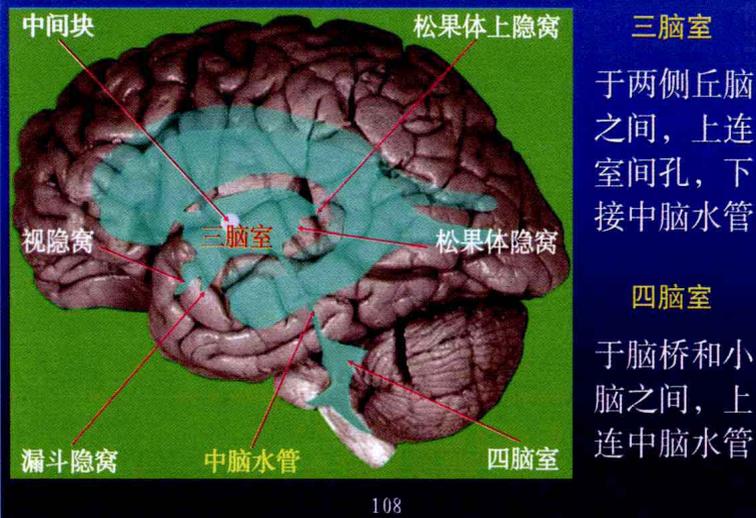


## 4. 脑室系统



## 脑室系统

侧面观



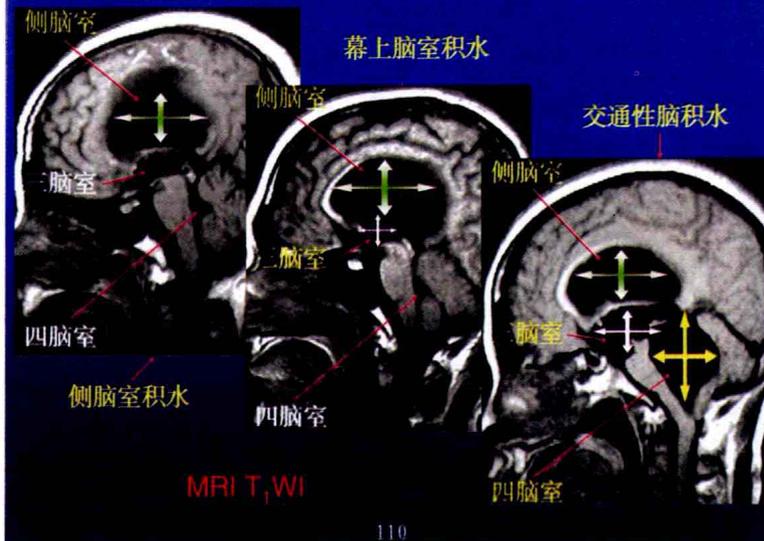
## 脑室系统

### 脑脊液循环途径



109

## 5. 比较脑室积水

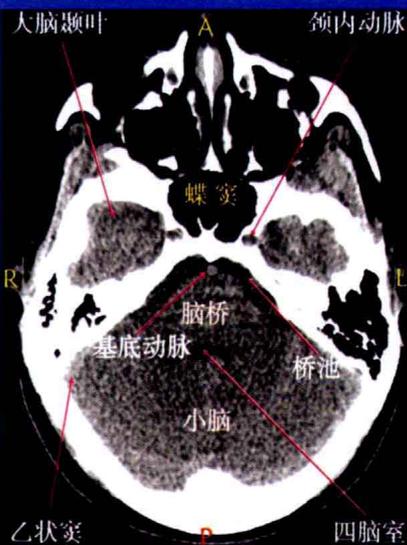


110

## 二、CT平扫

介绍颅脑CT用10mm层厚、10mm层间距连续扫描后，脑窗图像上脑和脑室在常规十个横切面上各层面所显示的结构。

111

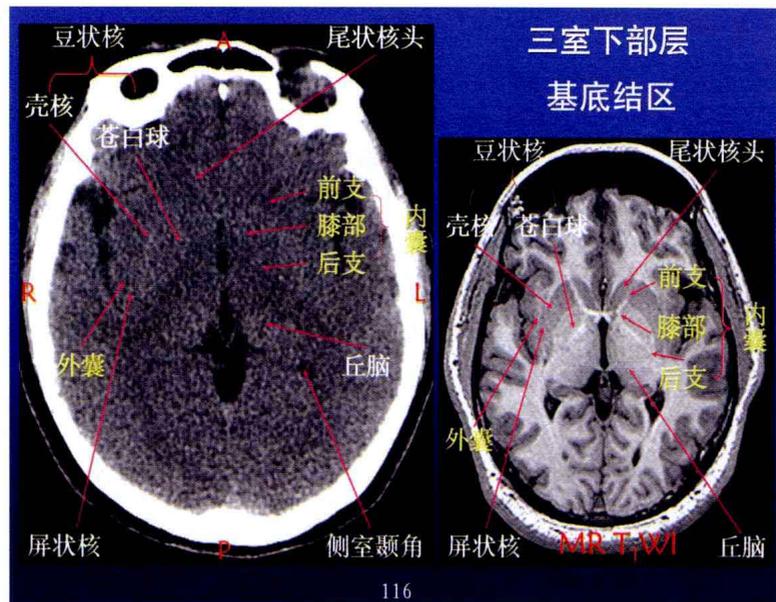
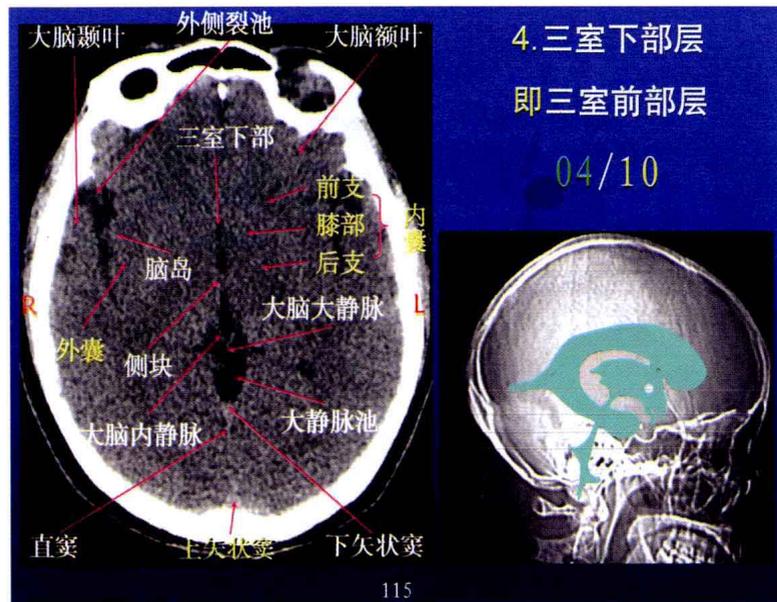
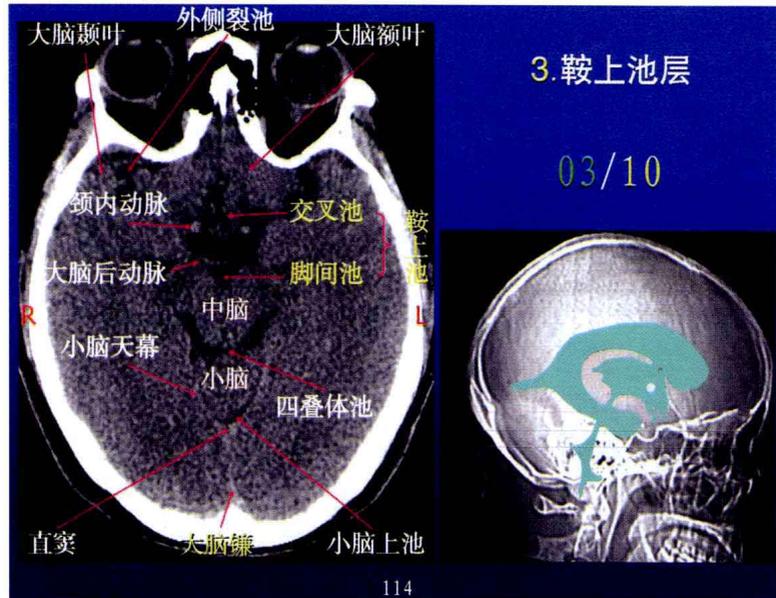
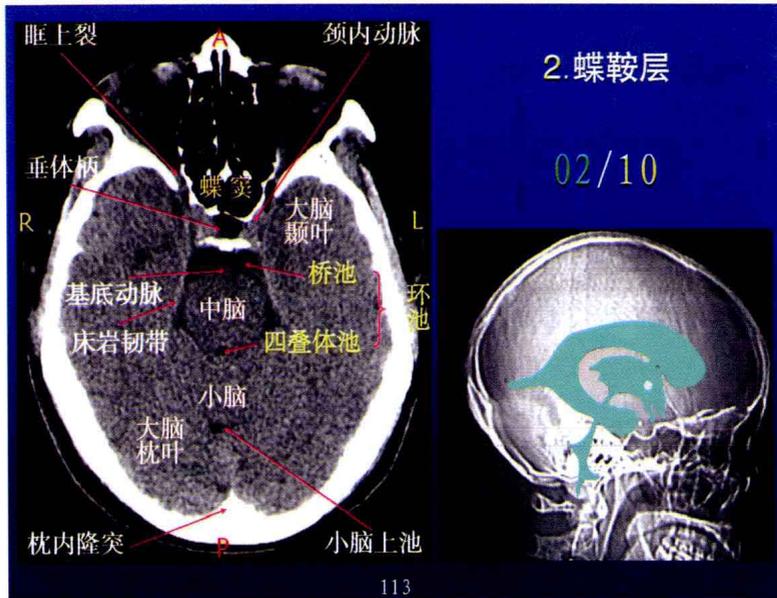


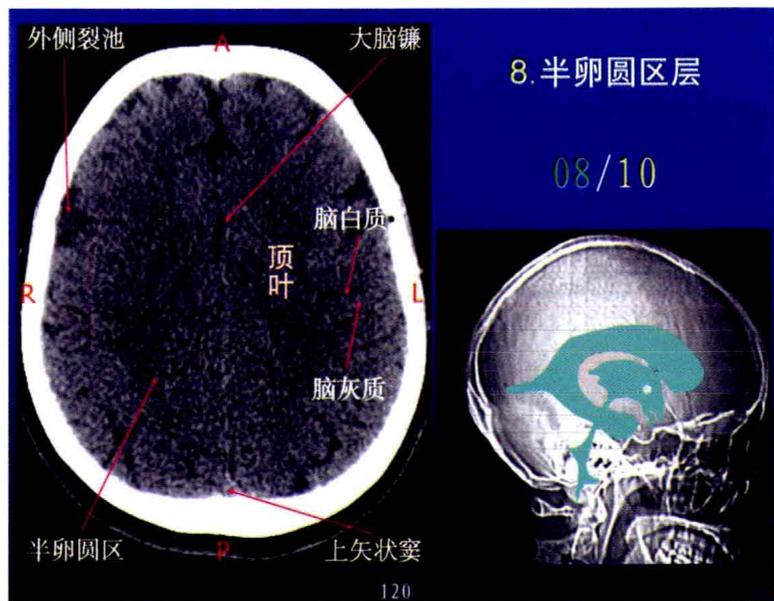
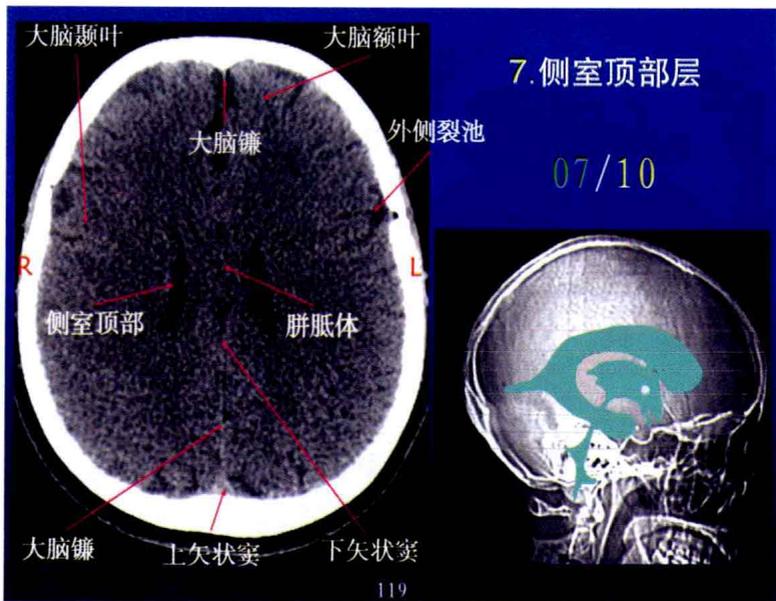
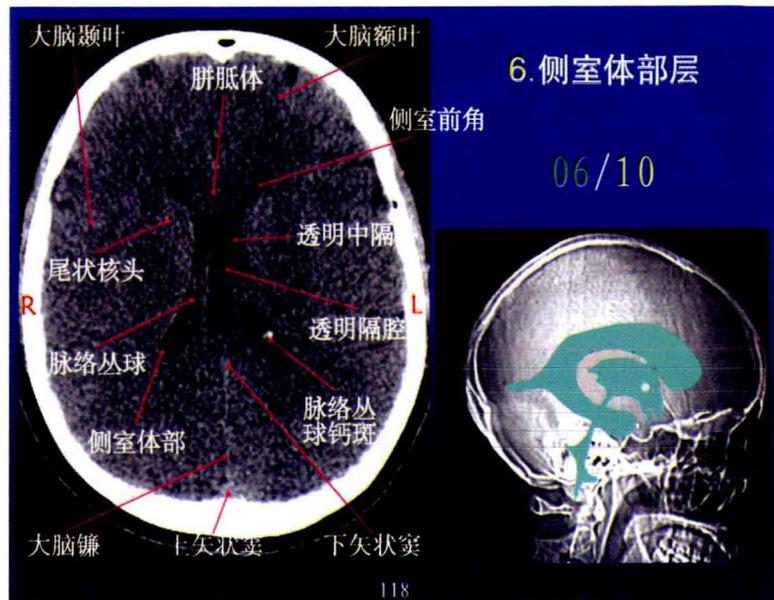
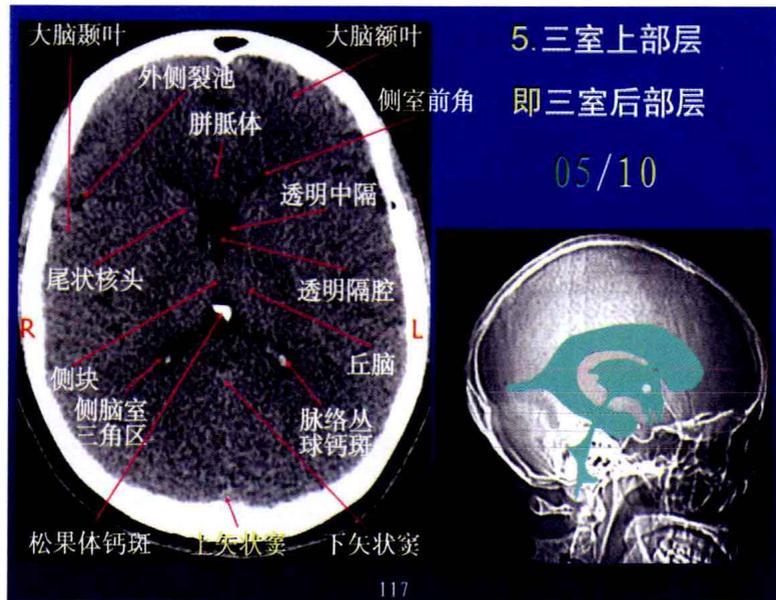
112

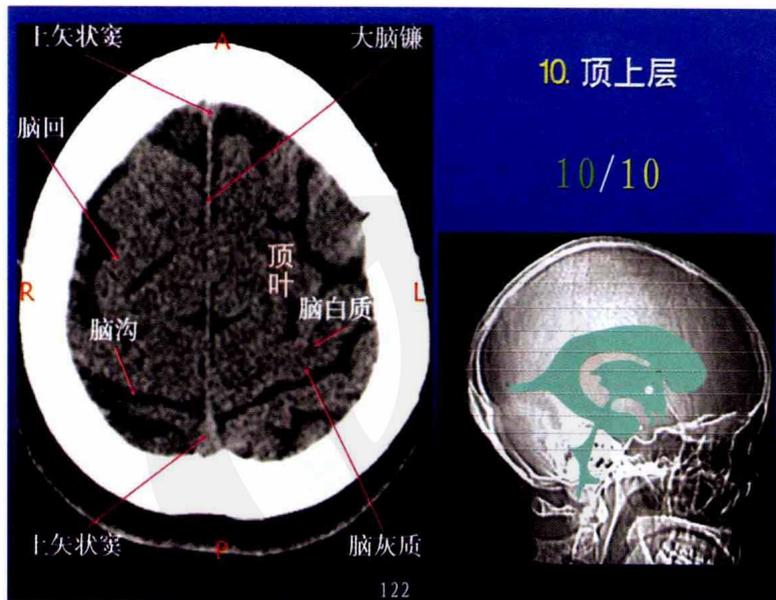
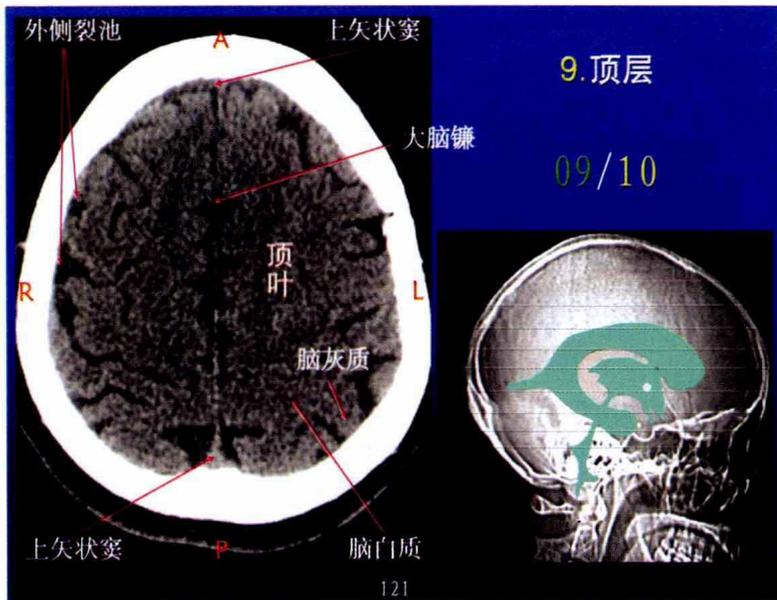
## 1. 蝶窦层

01/10



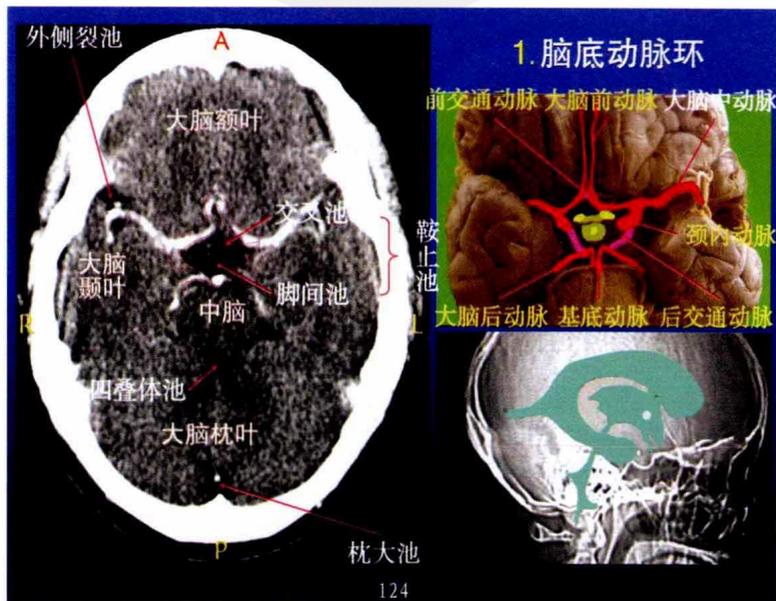
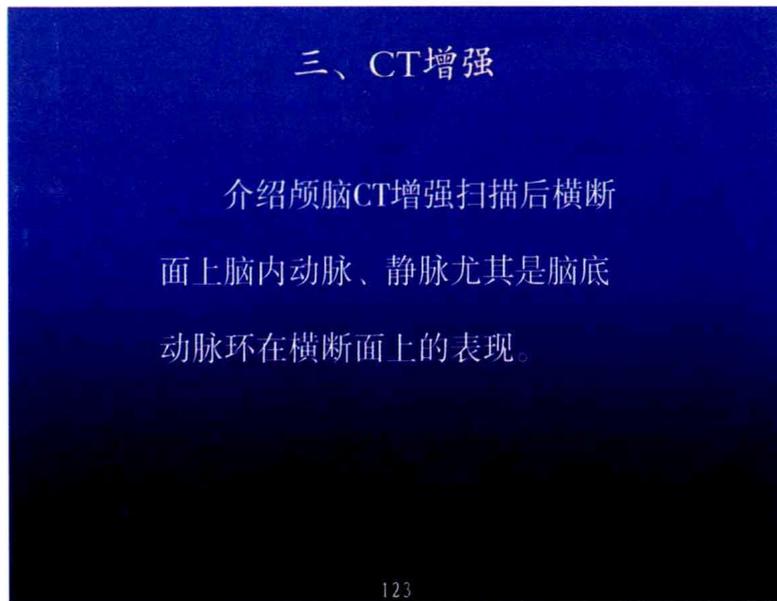


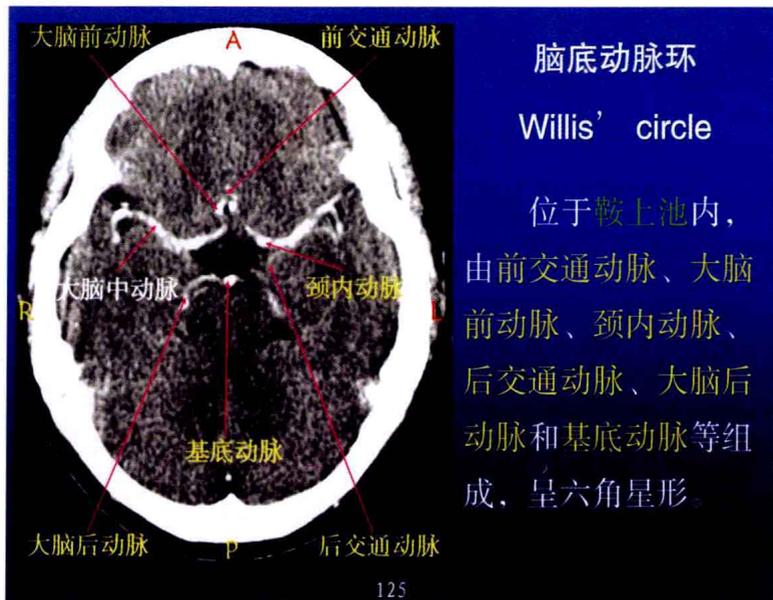




### 三、CT增强

介绍颅脑CT增强扫描后横断面上脑内动脉、静脉尤其是脑底动脉环在横断面上的表现。

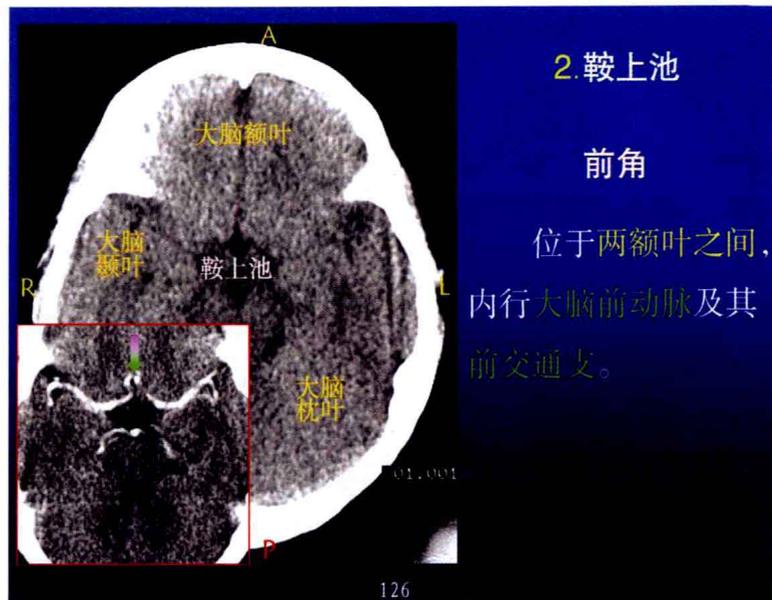




### 脑底动脉环

Willis' circle

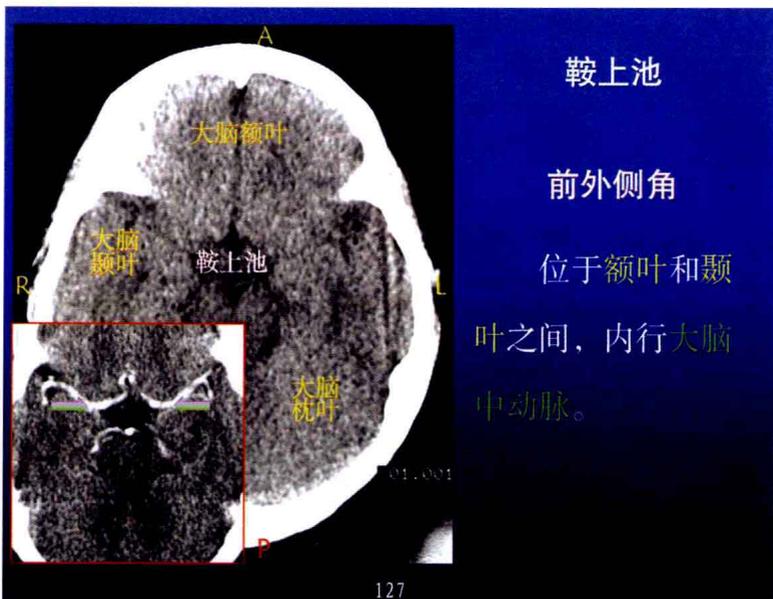
位于鞍上池内，由前交通动脉、大脑前动脉、颈内动脉、后交通动脉、大脑后动脉和基底动脉等组成，呈六角星形。



### 2. 鞍上池

前角

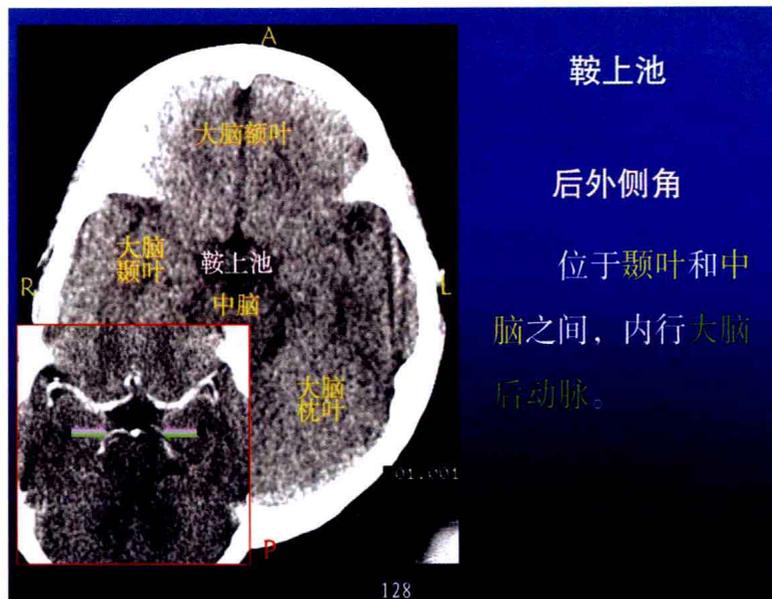
位于两额叶之间，内行大脑前动脉及其前交通支。



### 鞍上池

前外侧角

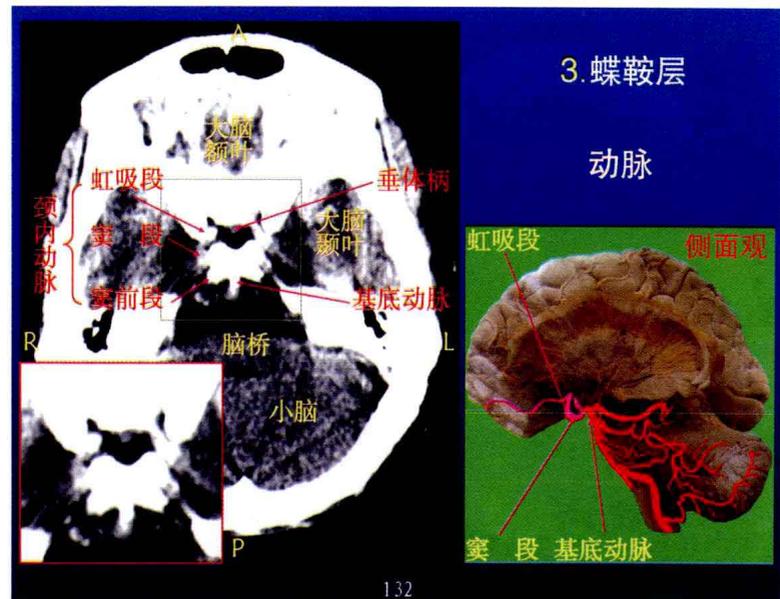
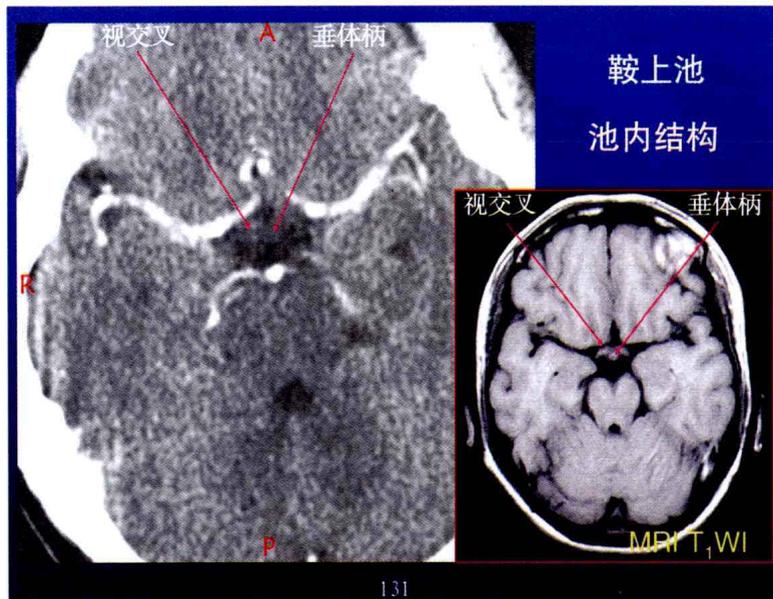
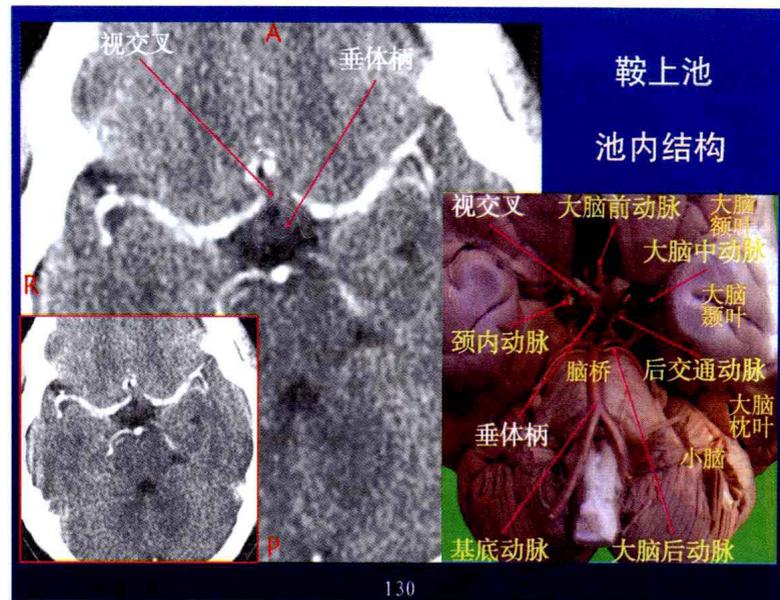
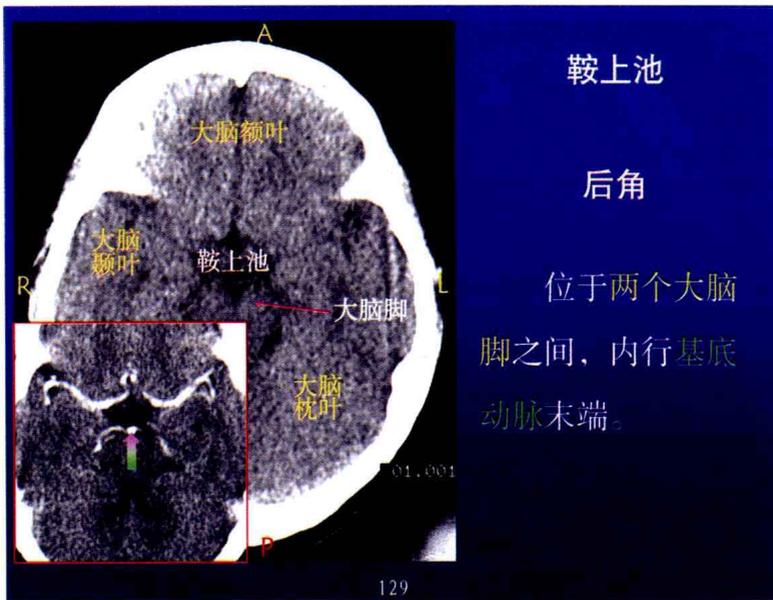
位于额叶和颞叶之间，内行大脑中动脉。

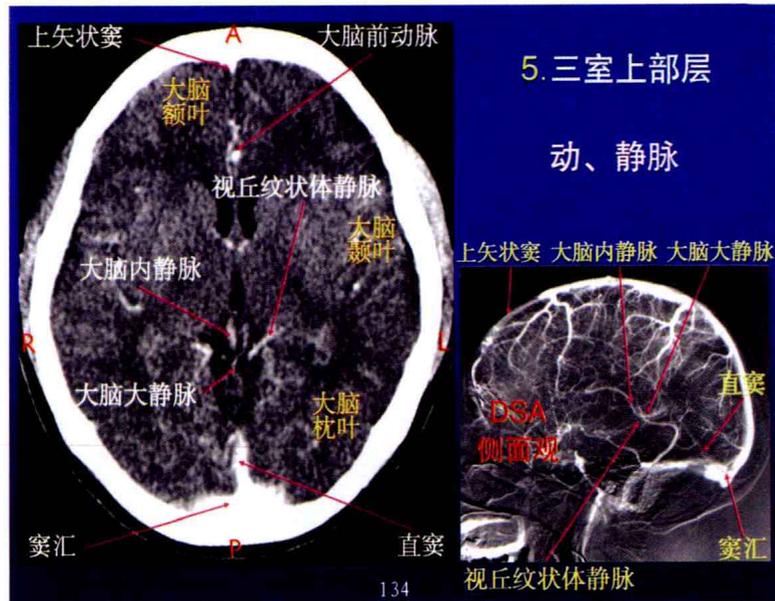
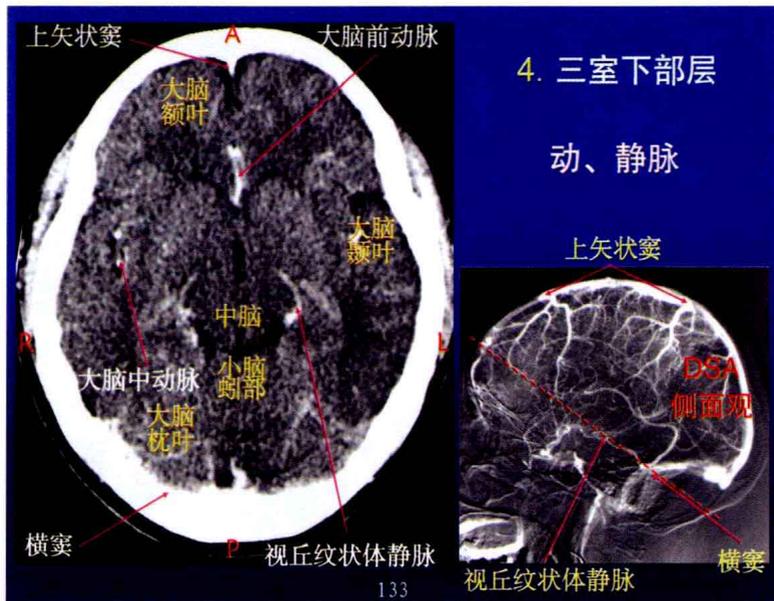


### 鞍上池

后外侧角

位于颞叶和中脑之间，内行大脑后动脉。

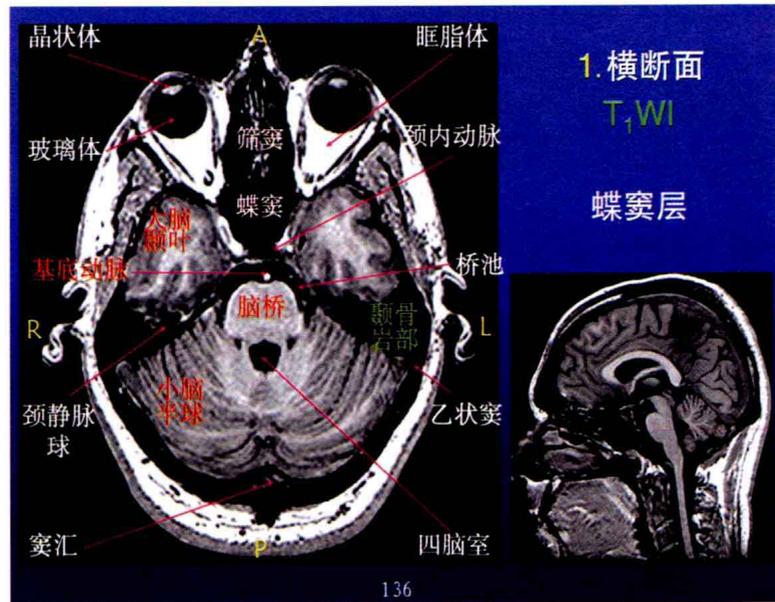


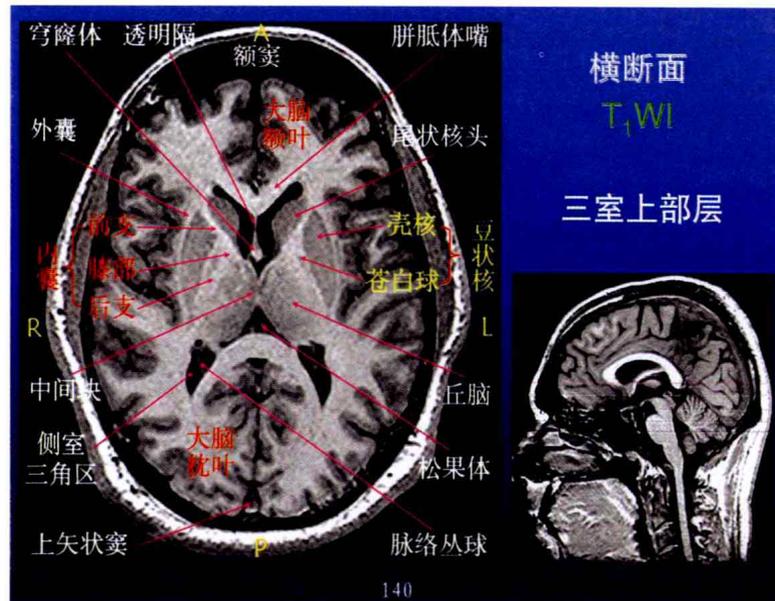
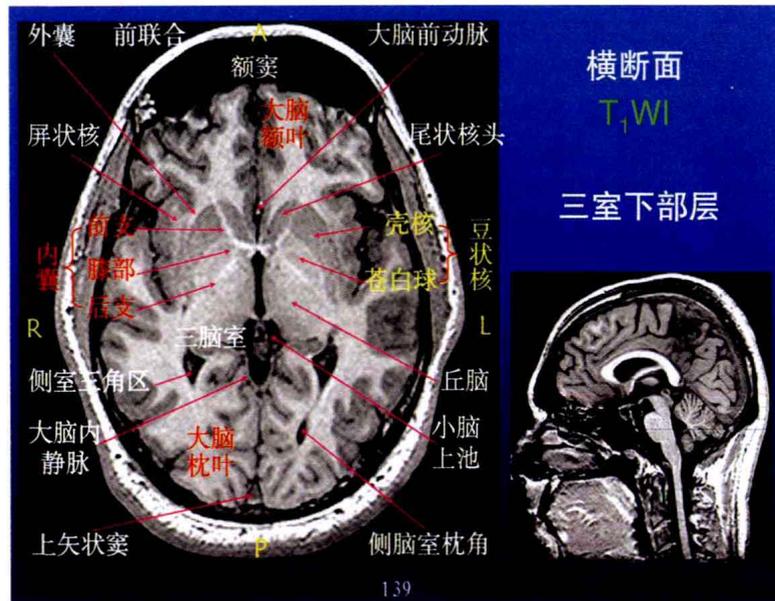
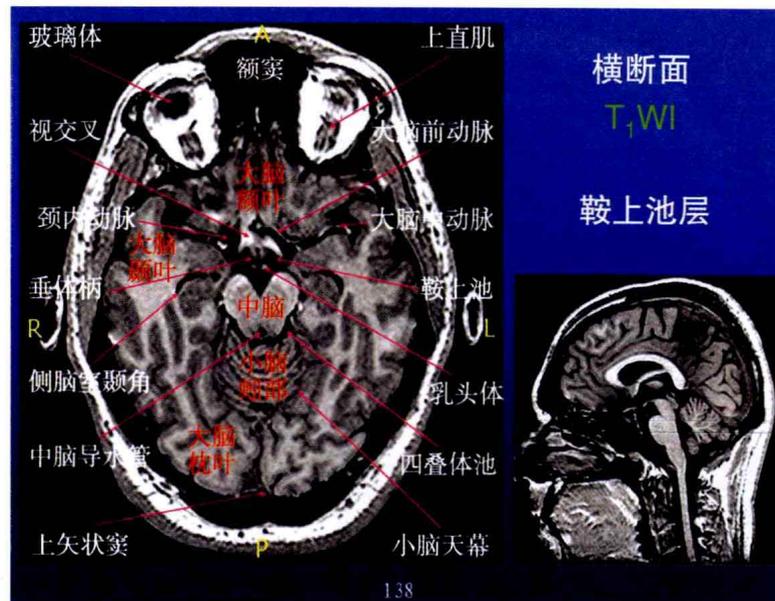
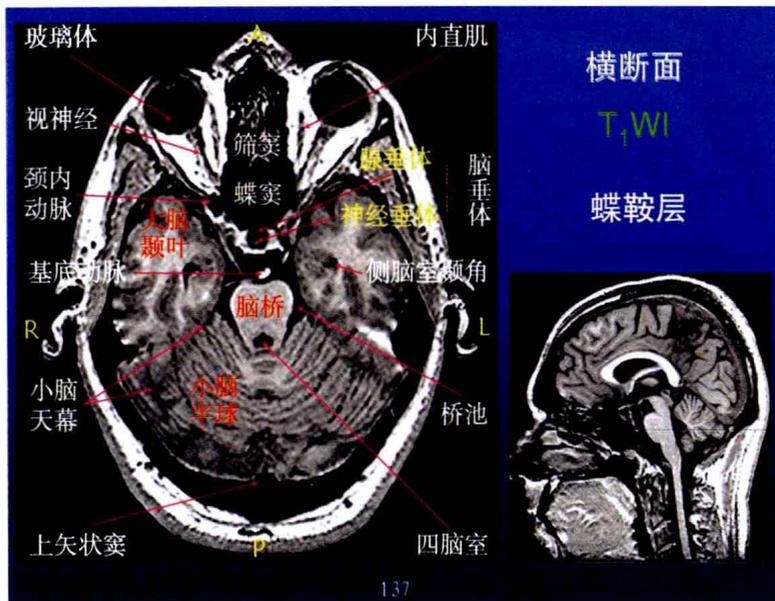


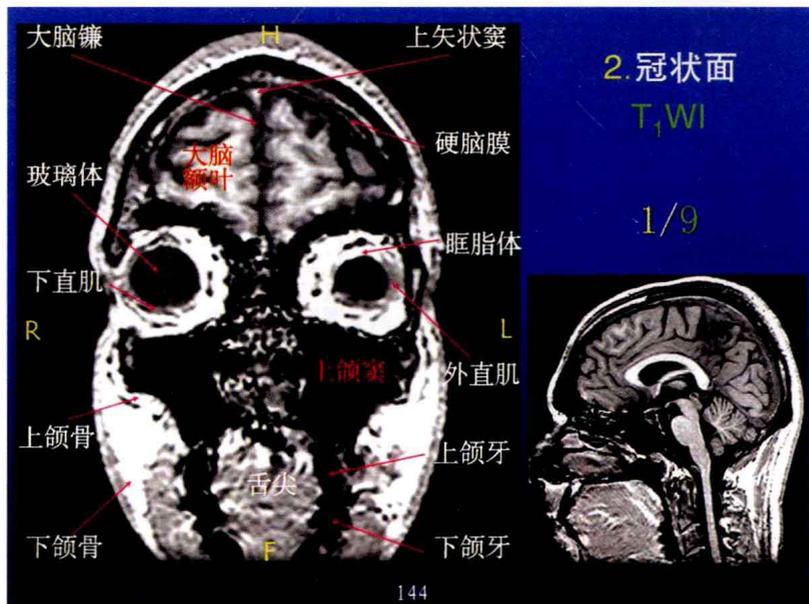
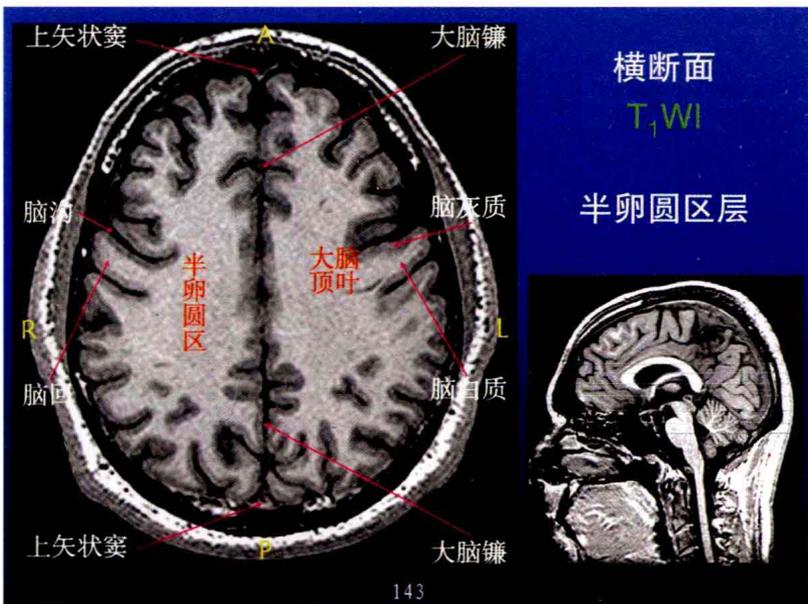
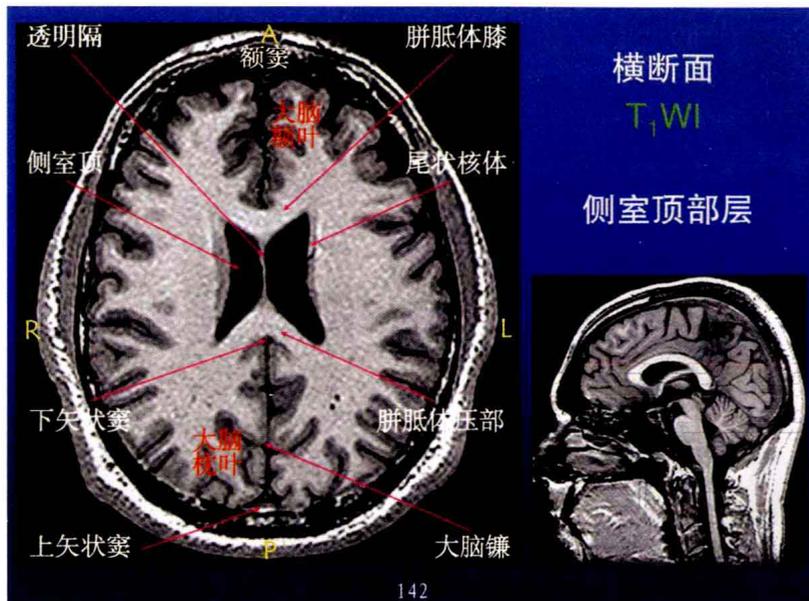
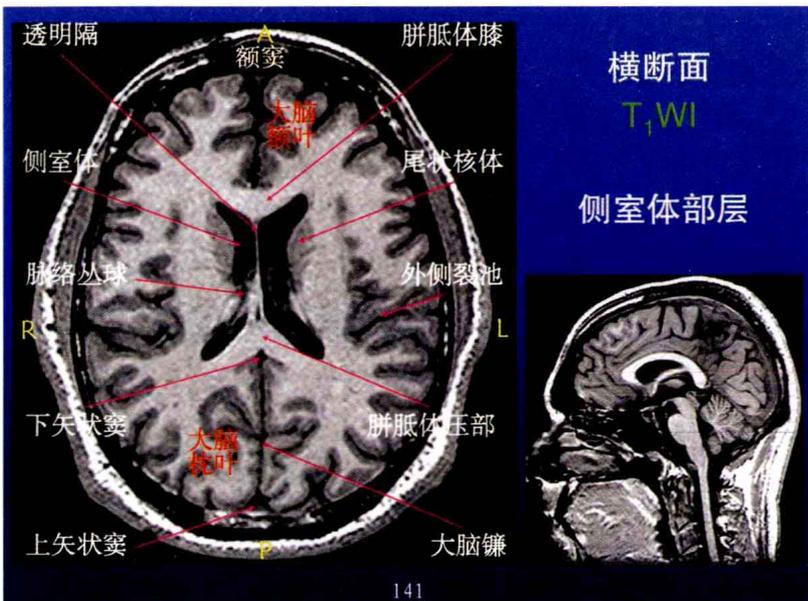
四、MRI

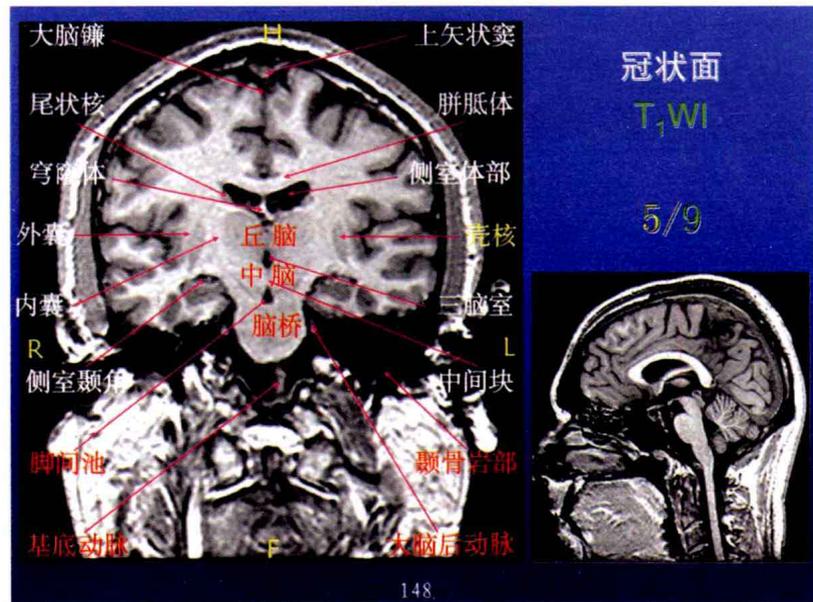
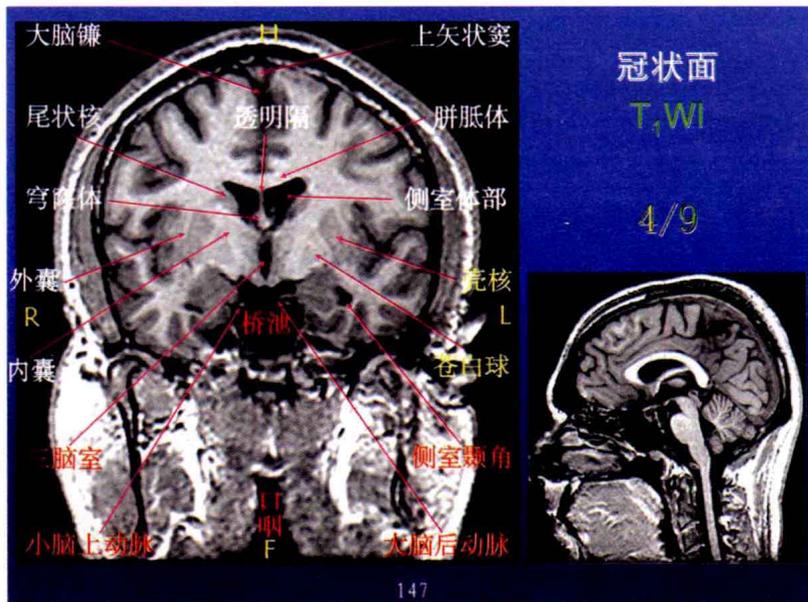
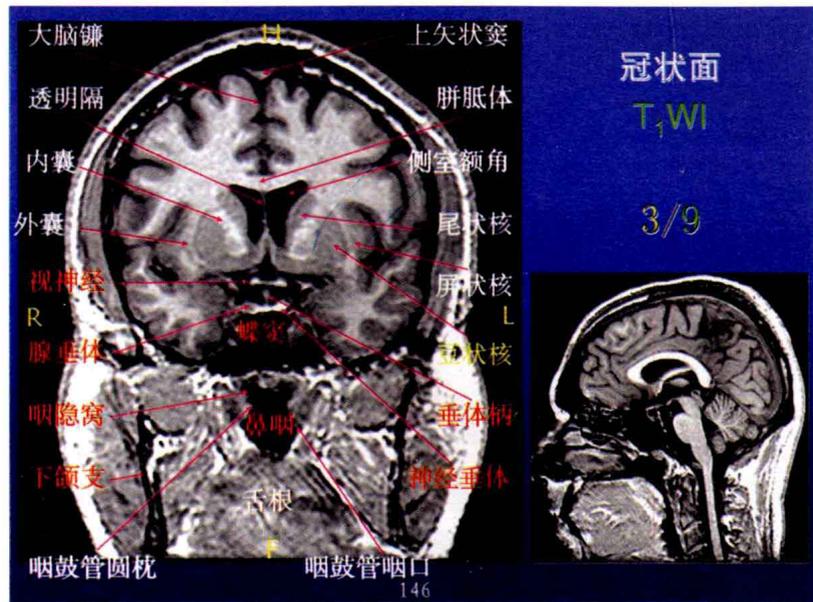
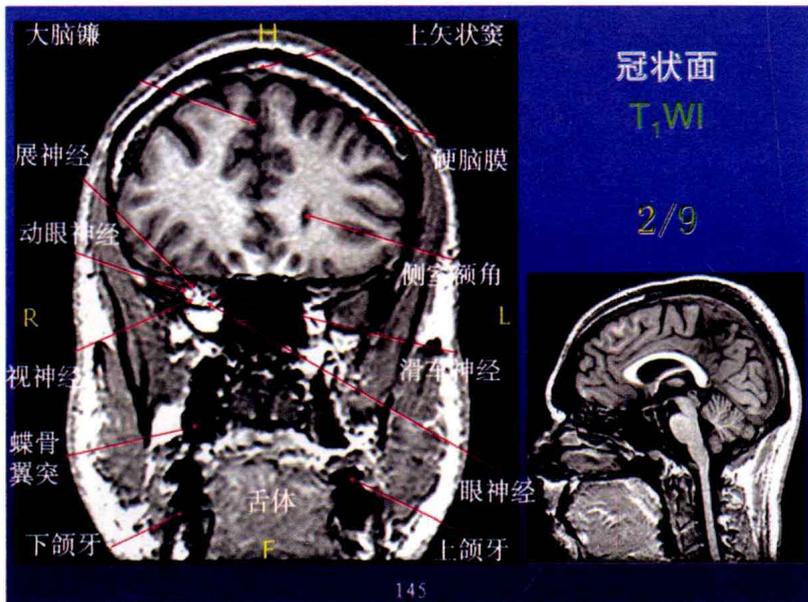
介绍颅脑结构在MRI横断面、冠状面T<sub>1</sub>WI上的正常表现，在矢状面T<sub>2</sub>WI上的正常表现。

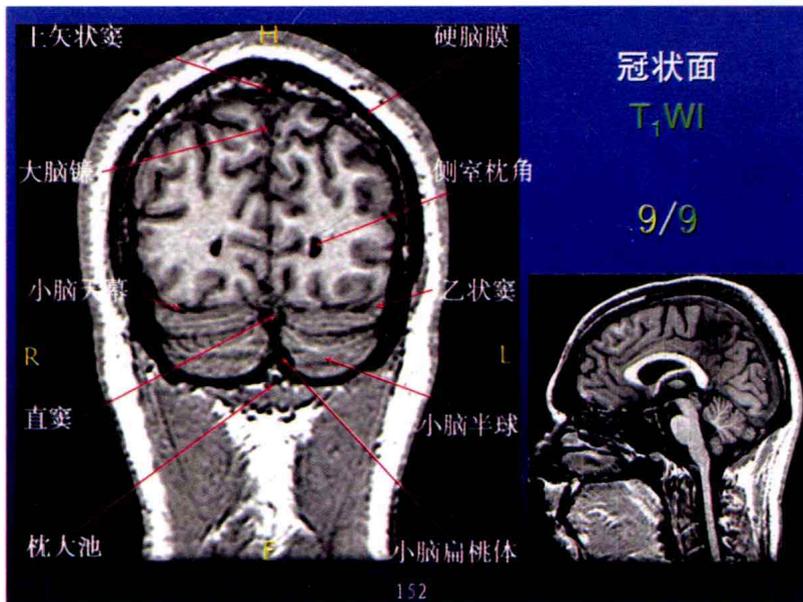
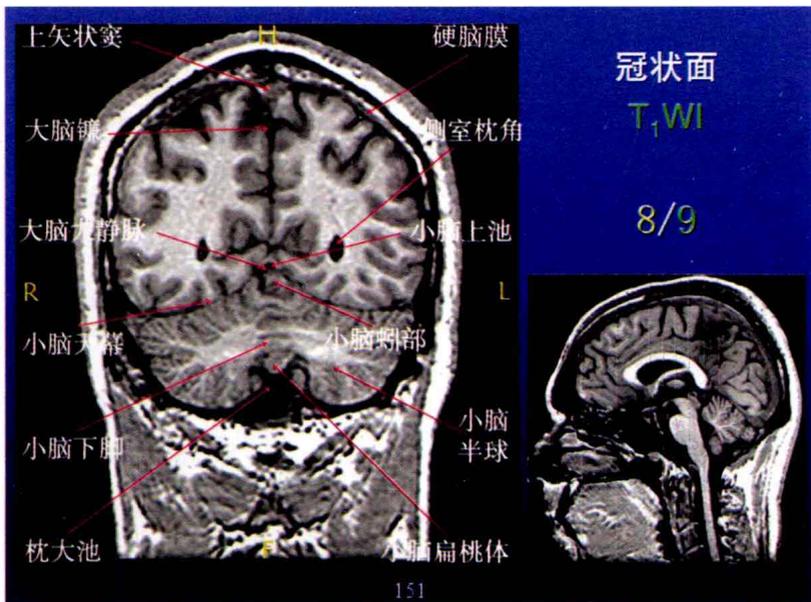
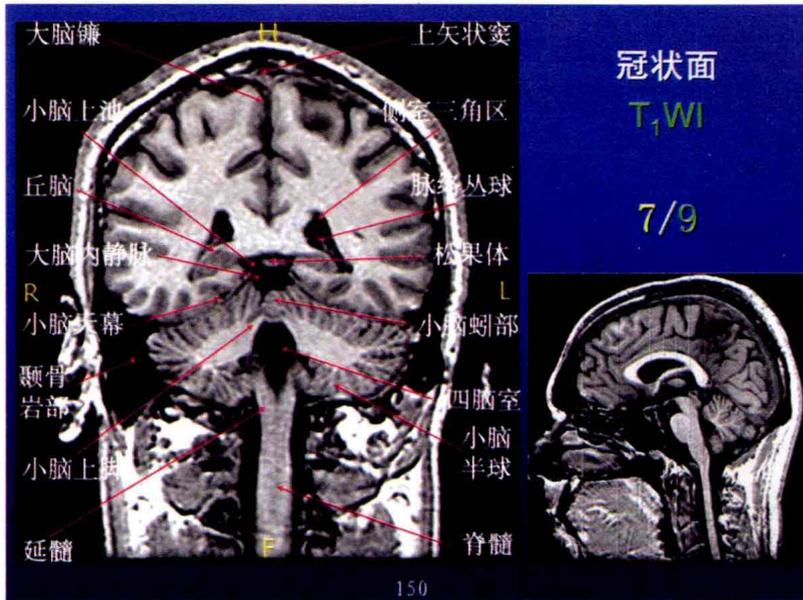
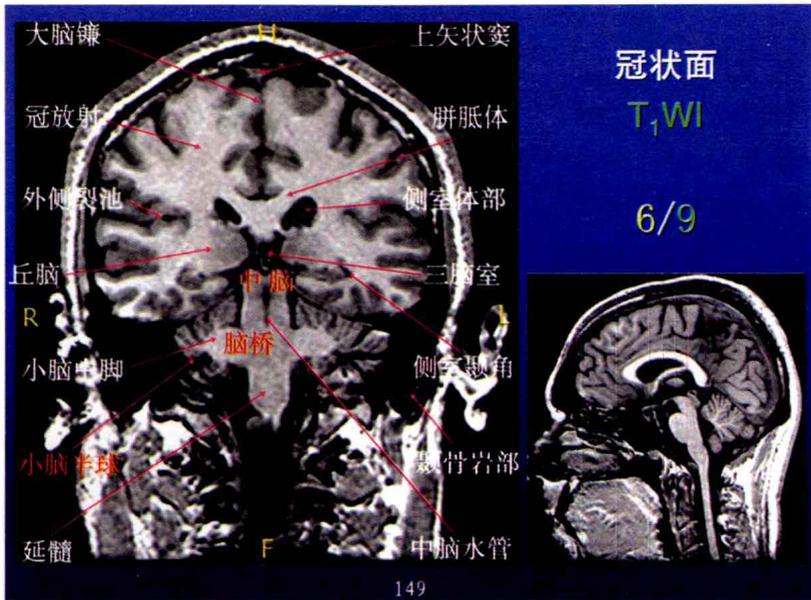
135



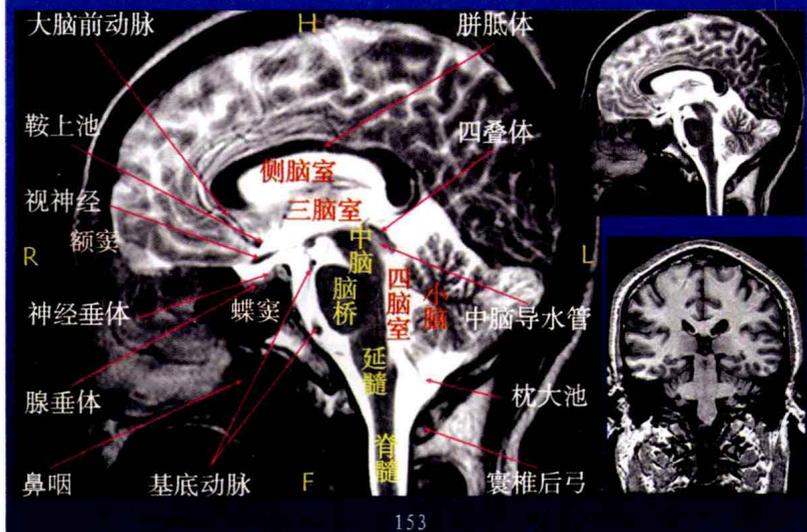




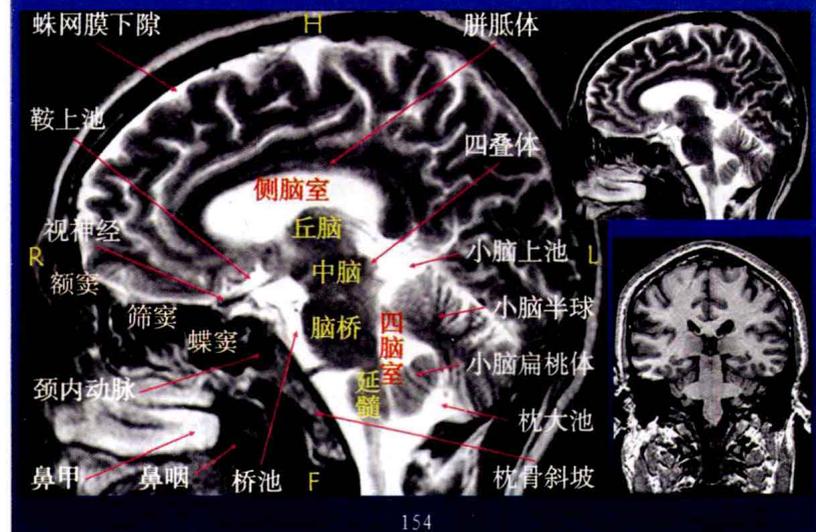




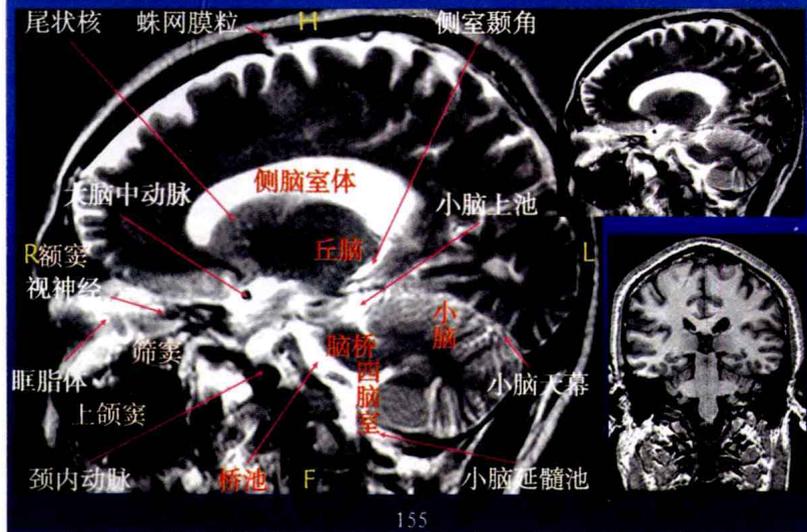
3. 矢状面 T<sub>2</sub>WI 1/7



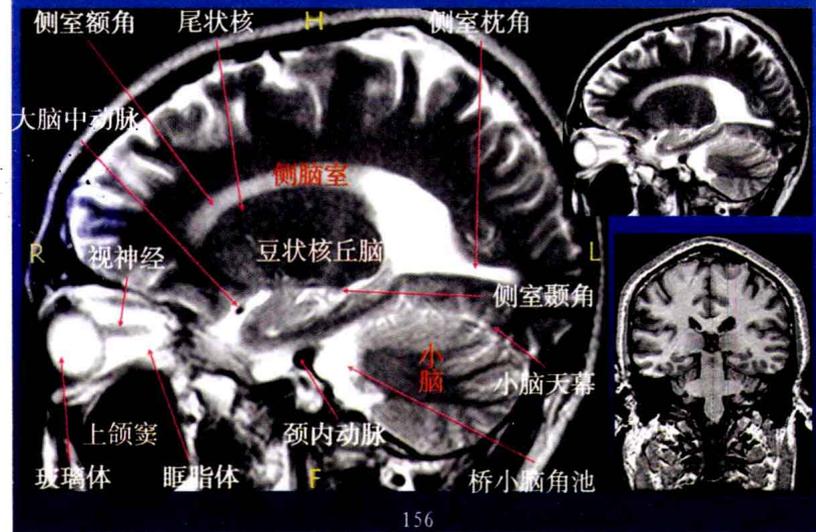
矢状面 T<sub>2</sub>WI 2/7

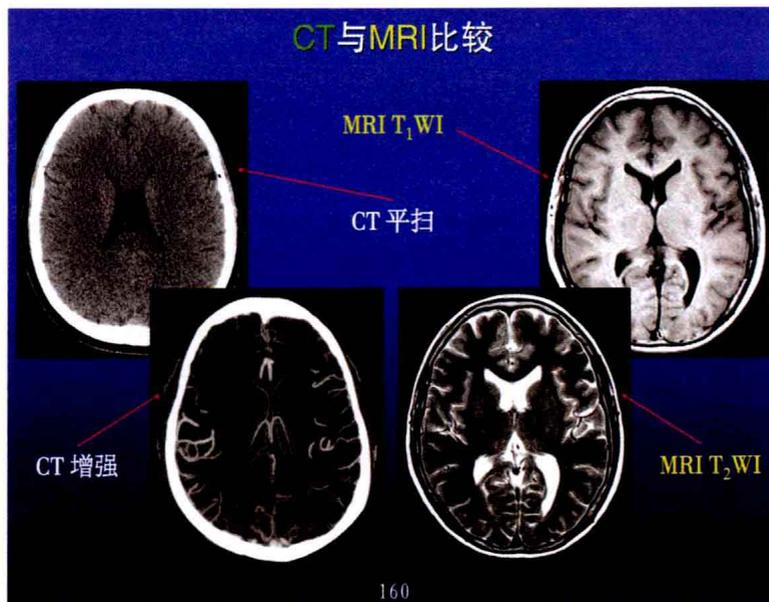
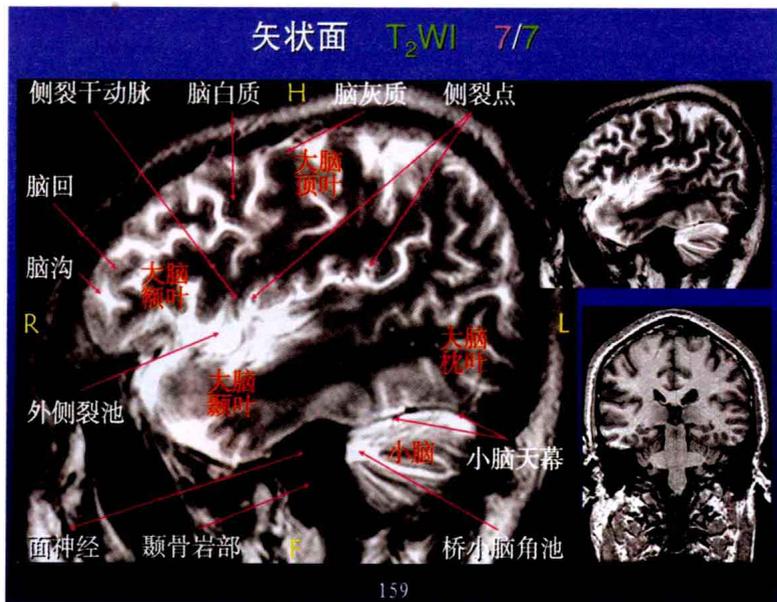
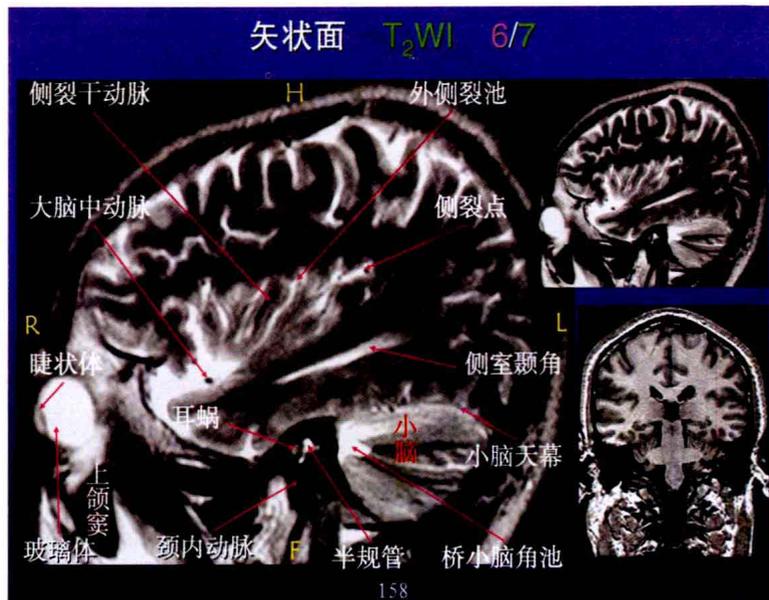
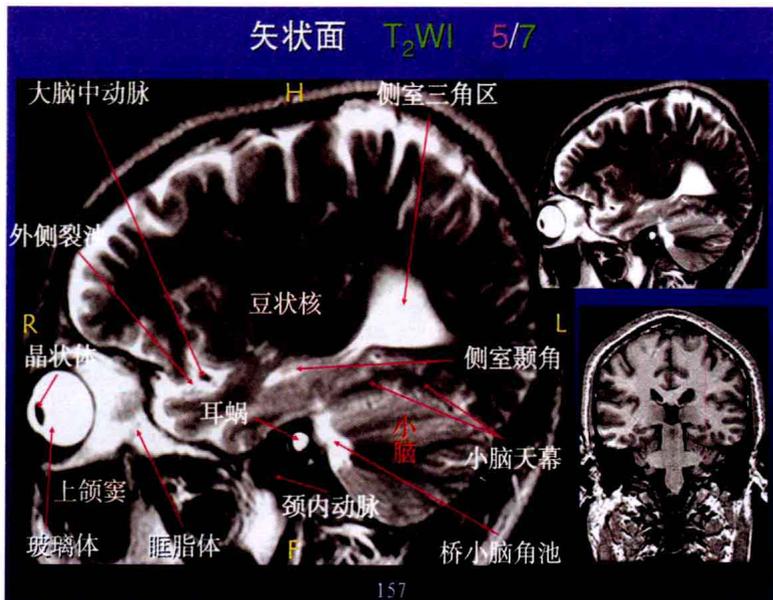


矢状面 T<sub>2</sub>WI 3/7



矢状面 T<sub>2</sub>WI 4/7





# 第四章 胸部

本章重点介绍呼吸系统和循环系统两大部分的正常影像表现。

胸部影像主要观察：骨性胸廓（见第二章 骨与关节 第二节 躯干骨）、胸廓软组织、气管支气管、肺、胸膜、纵隔（以心脏大血管为主）和横膈等结构。

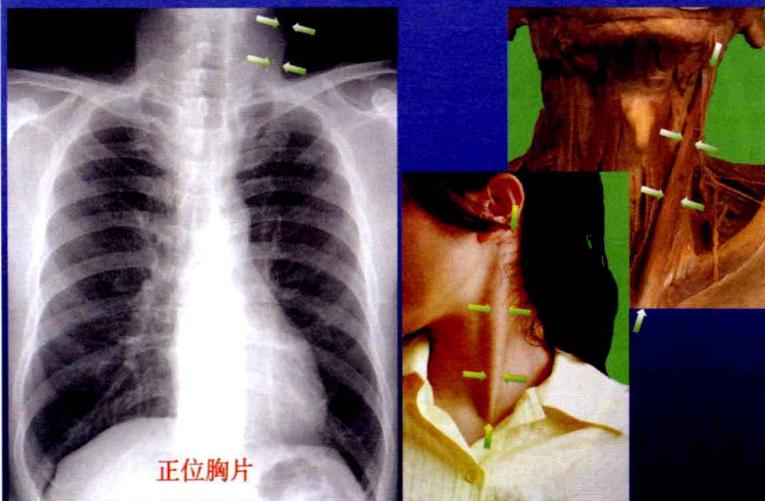
1

## 第一节 胸廓软组织影



2

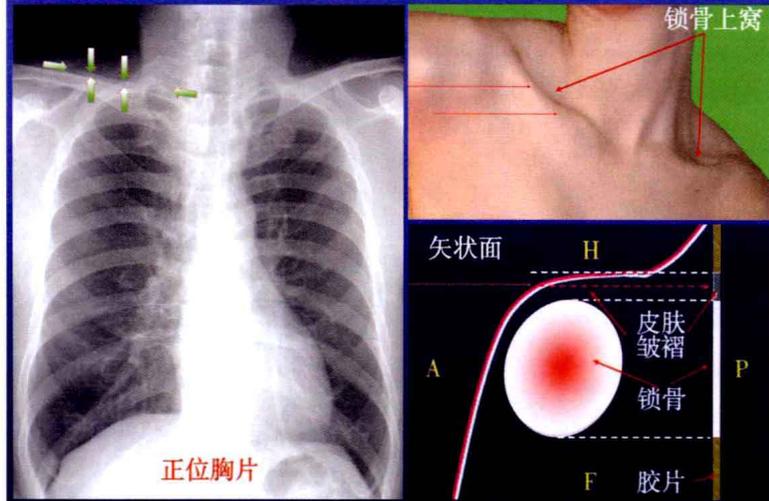
### 一、胸锁乳突肌



正位胸片

3

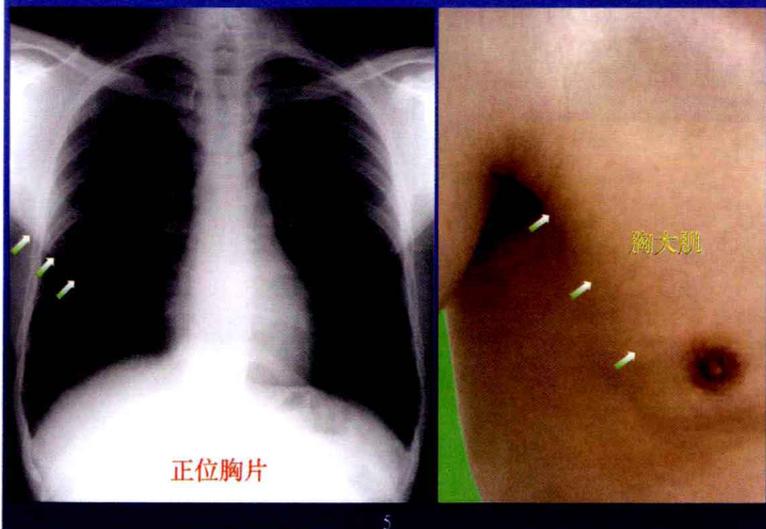
### 二、锁骨上皮肤皱褶



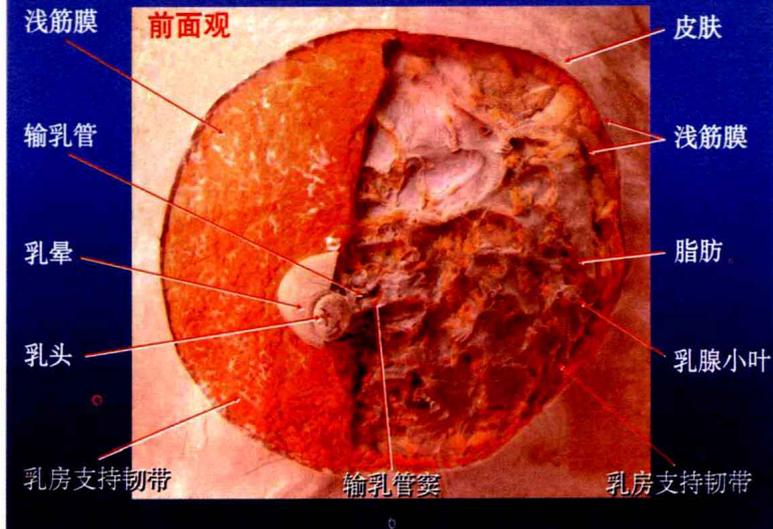
正位胸片

4

### 三、胸大肌

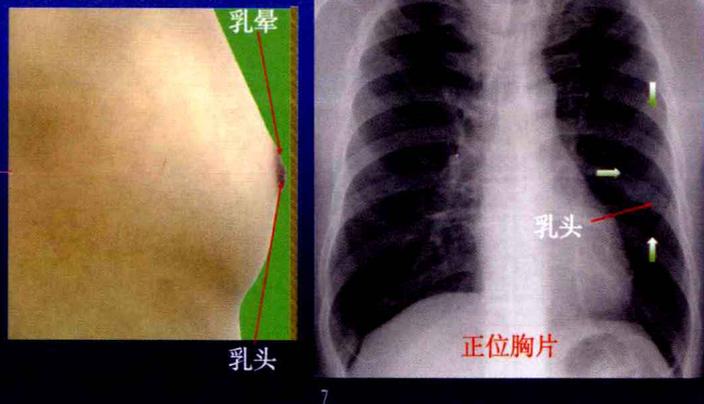


### 四、乳房



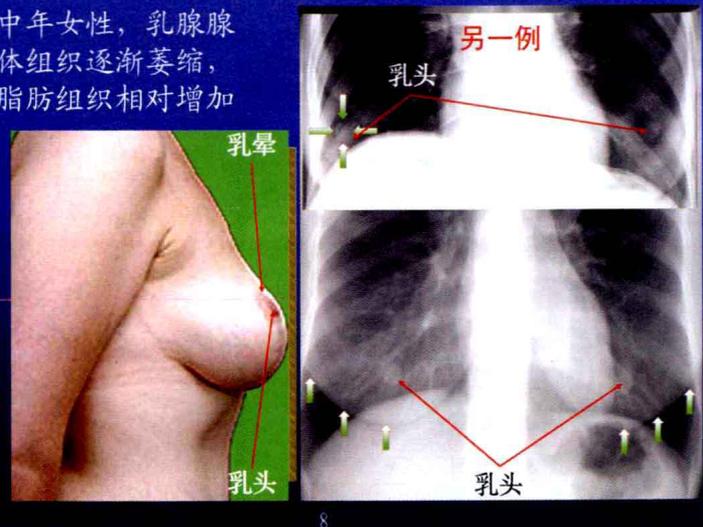
#### 1. 正位胸片

年轻或未生育过的女性，腺体和结缔组织较丰富



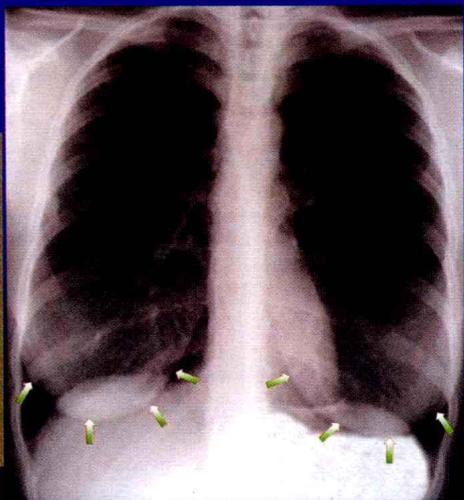
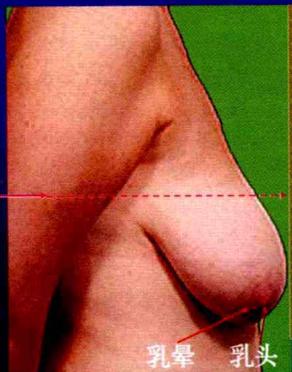
#### 正位胸片

中年女性，乳腺腺体组织逐渐萎缩，脂肪组织相对增加



### 正位胸片

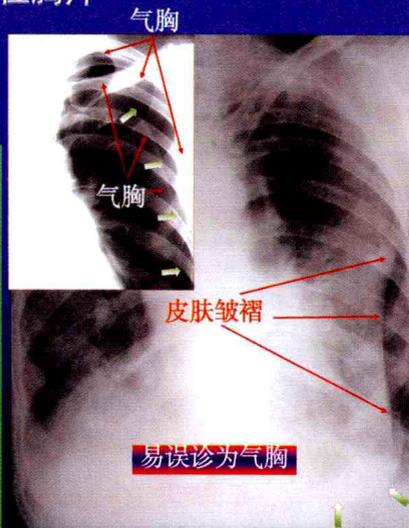
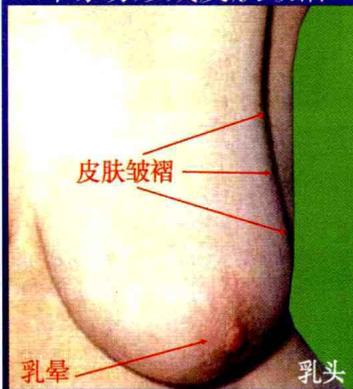
有生育史的老年女性，全部由脂肪、小梁以及血管构成



9

### 正位胸片

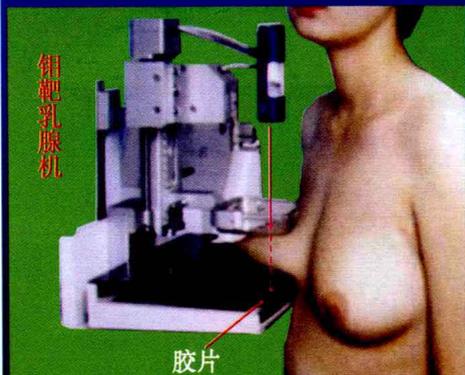
老年女性乳腺结构松弛，位置很低，在其外缘易形成皮肤皱褶



10

### 2. 钼靶片 致密型

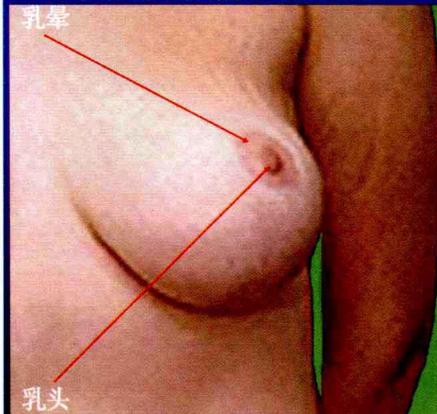
整个乳腺呈致密阴影，缺乏层次对比



11

### 钼靶片 中间混合型

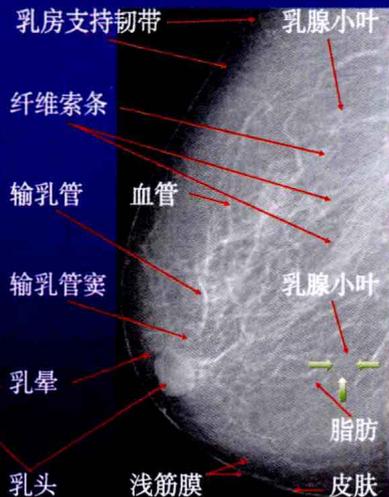
散在的片状致密影，其间夹着脂肪透光区



12

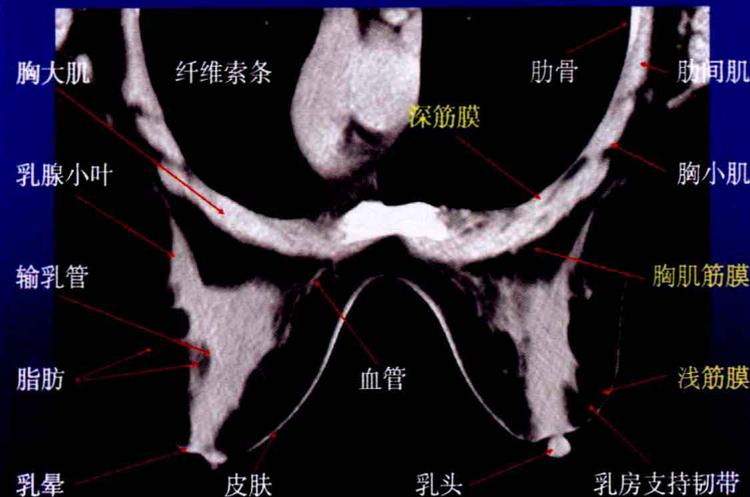
钼靶片 脂肪型

整体密度低，导管和纤维结缔组织等清晰



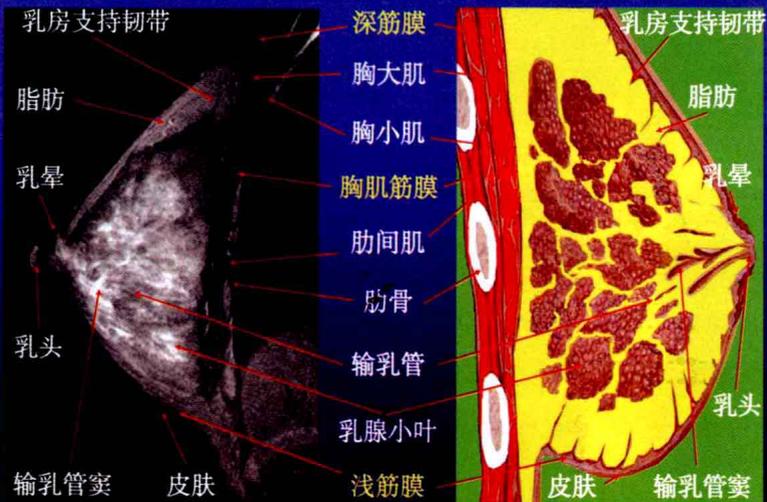
13

3.CT 俯卧位



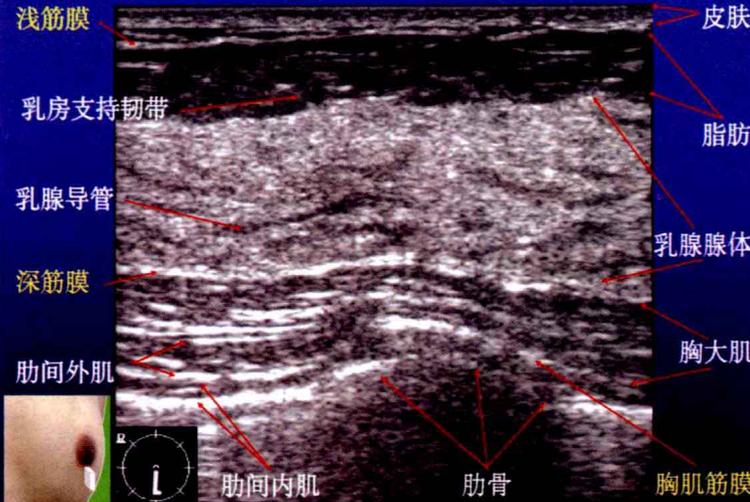
14

4.MRI



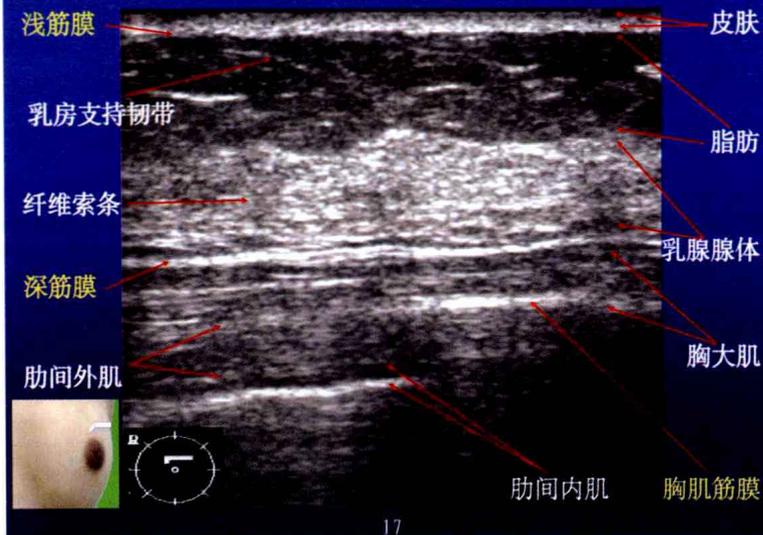
15

5.USG 致密型

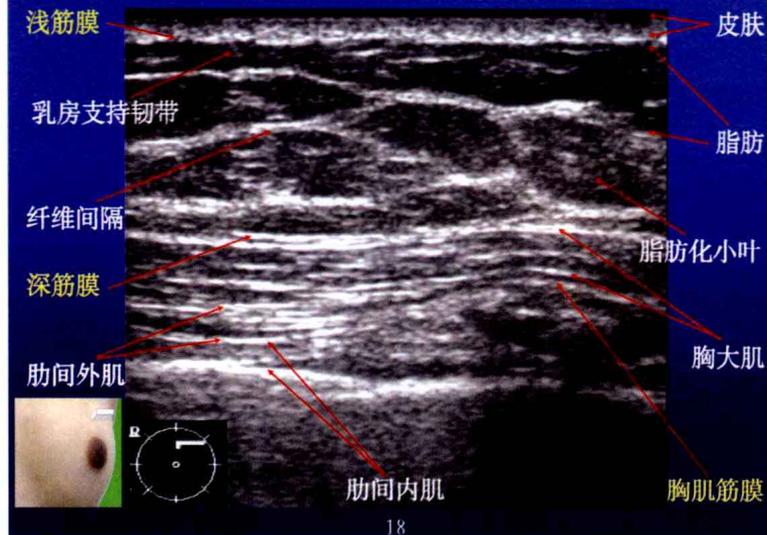


16

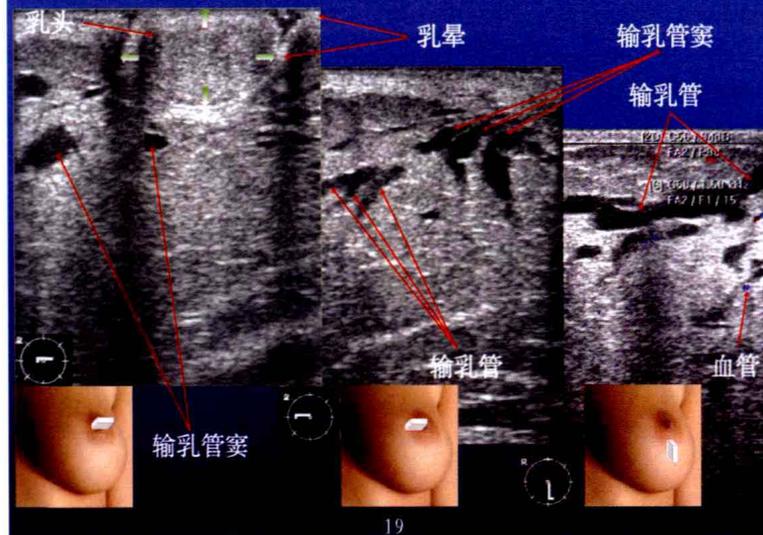
USG 中间混合型



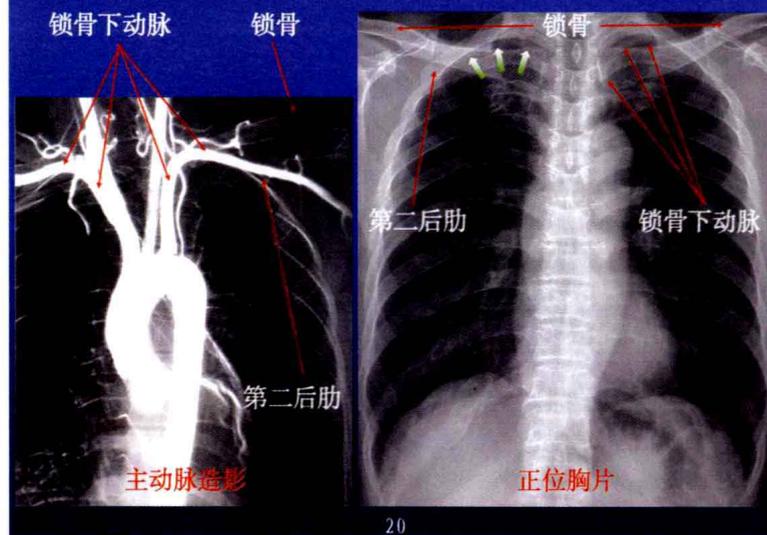
USG 脂肪型

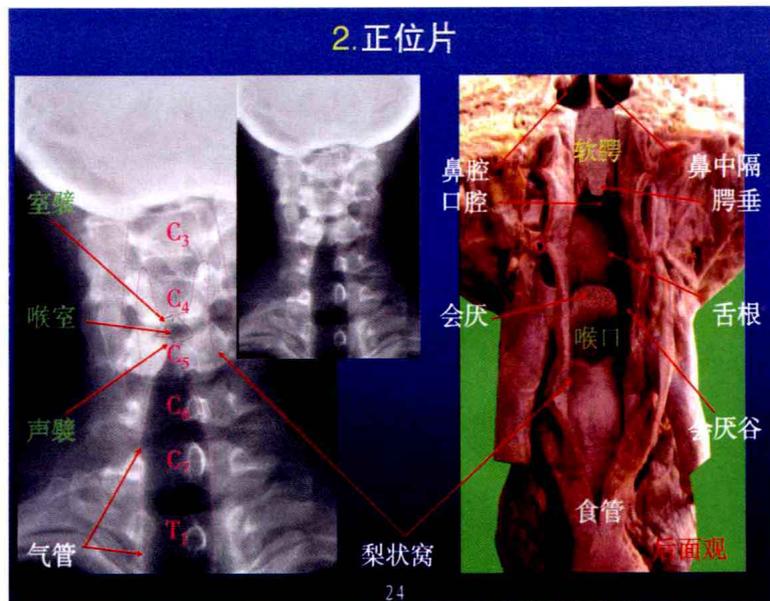
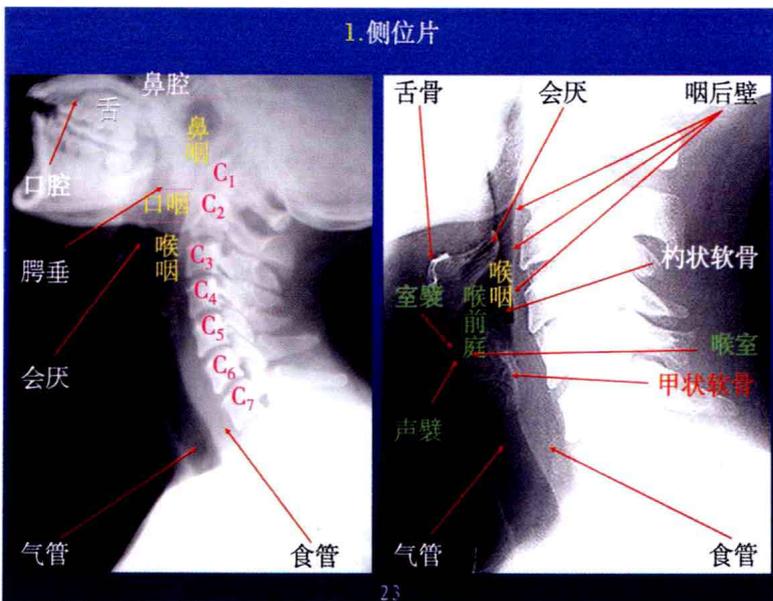
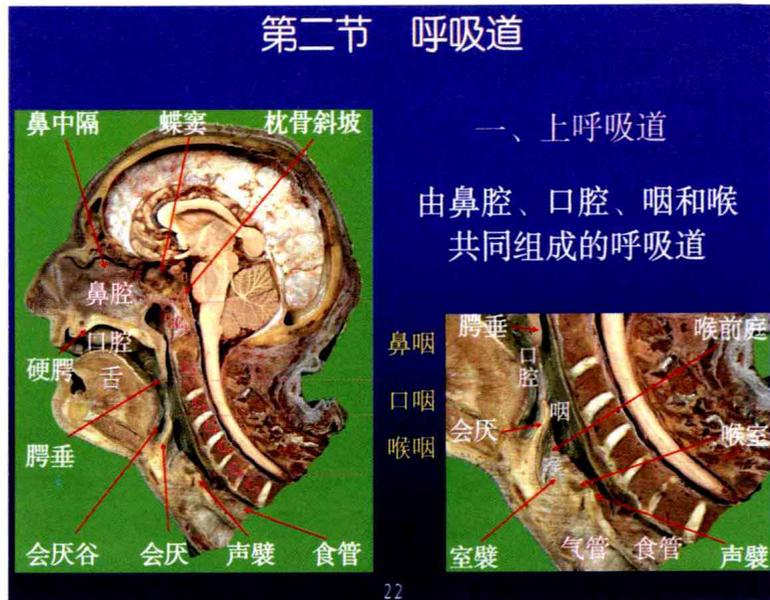
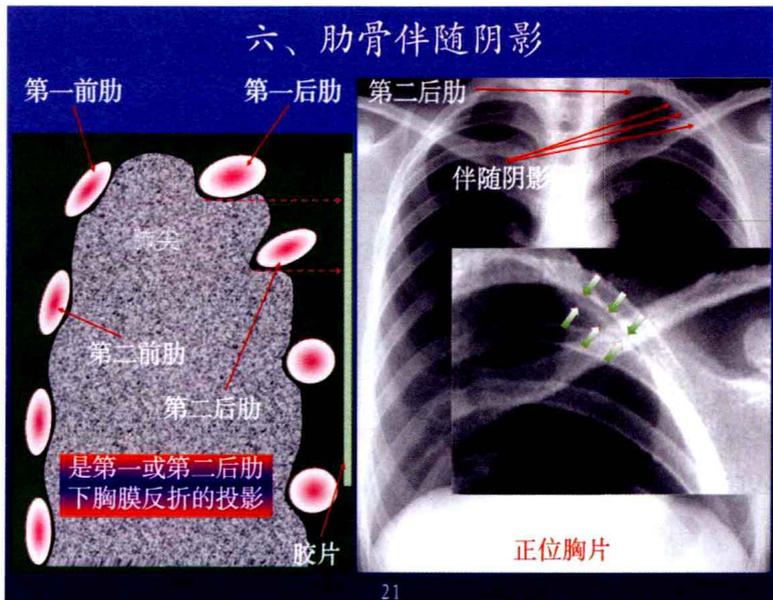


USG 泌乳期

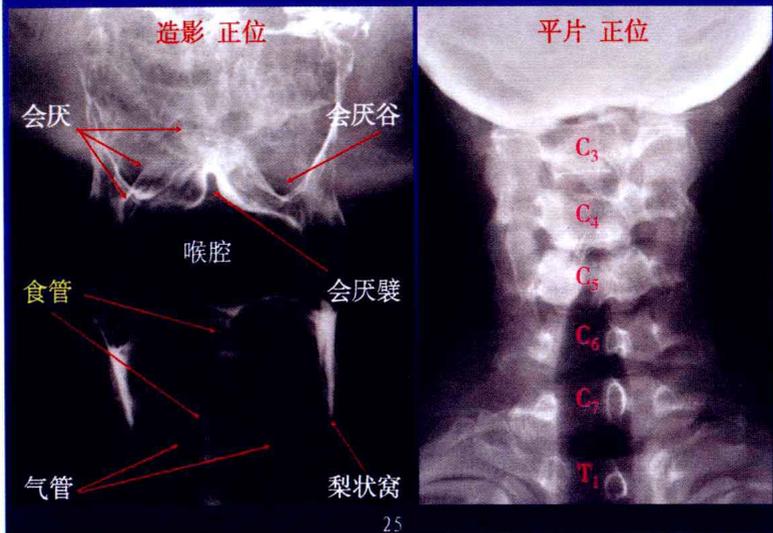


五、锁骨下动脉

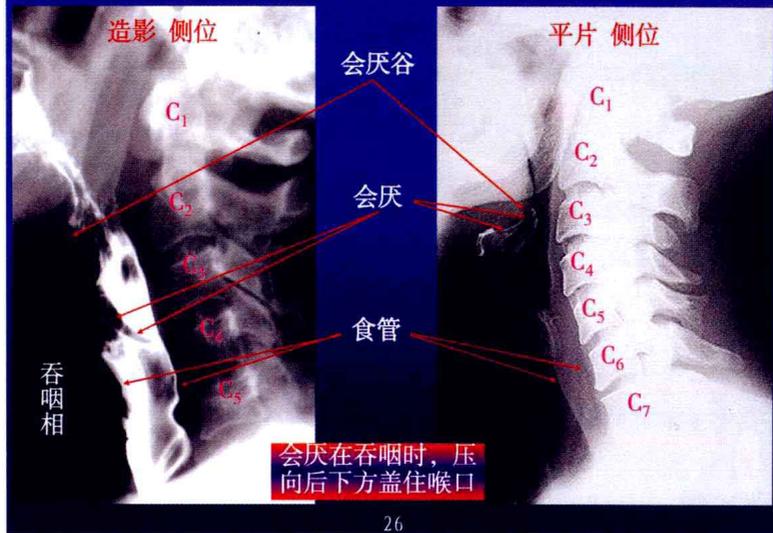




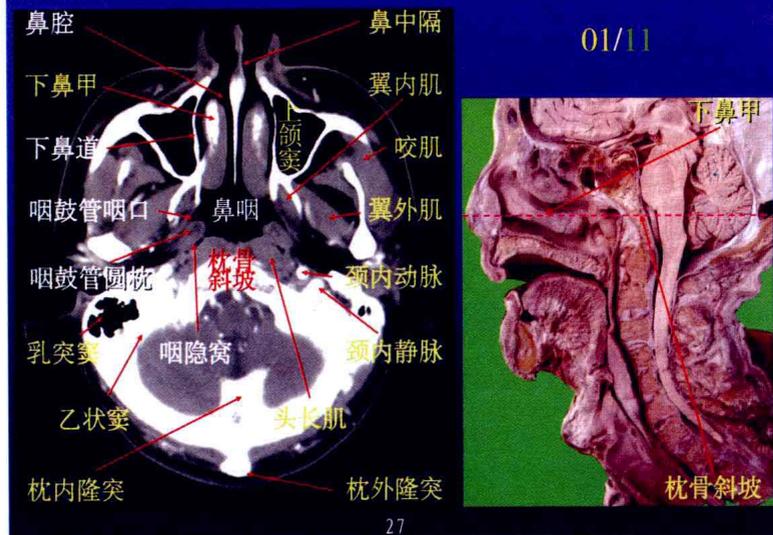
### 3. 钡剂造影



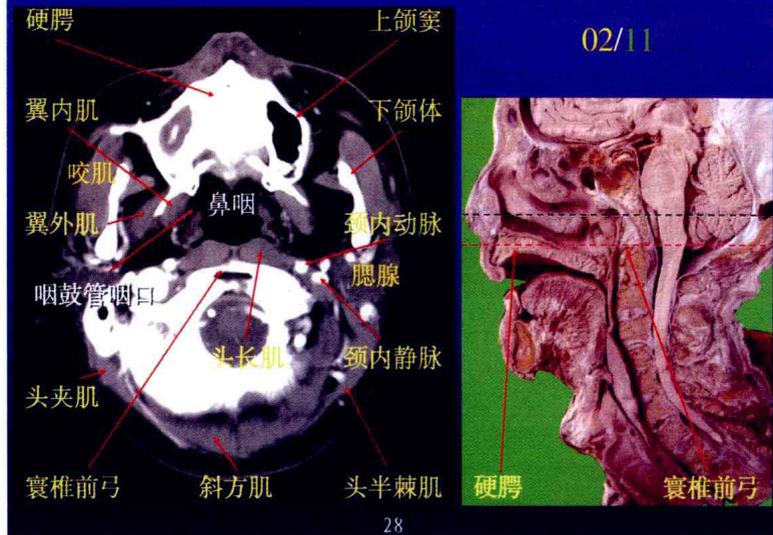
### 钡剂造影

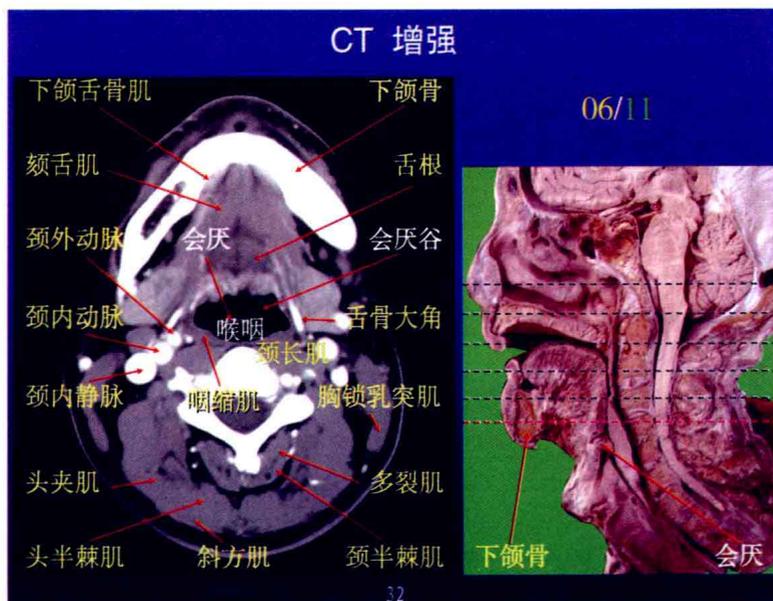
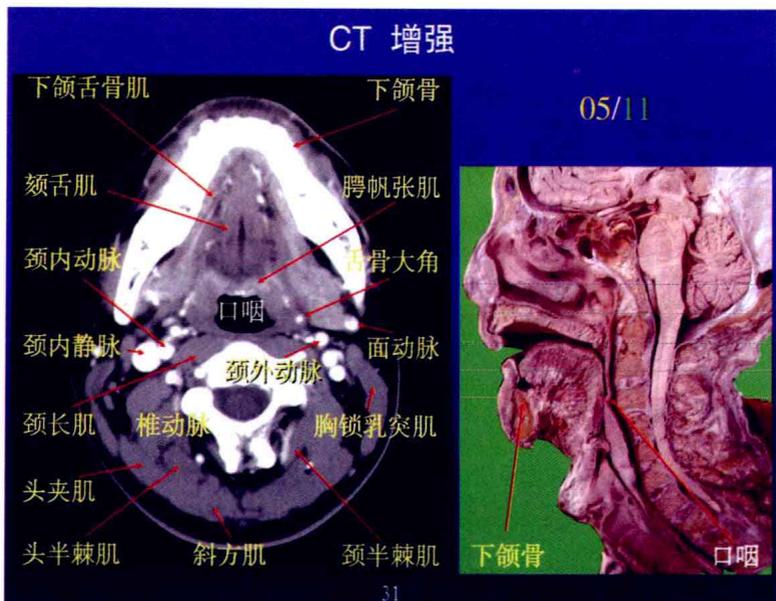
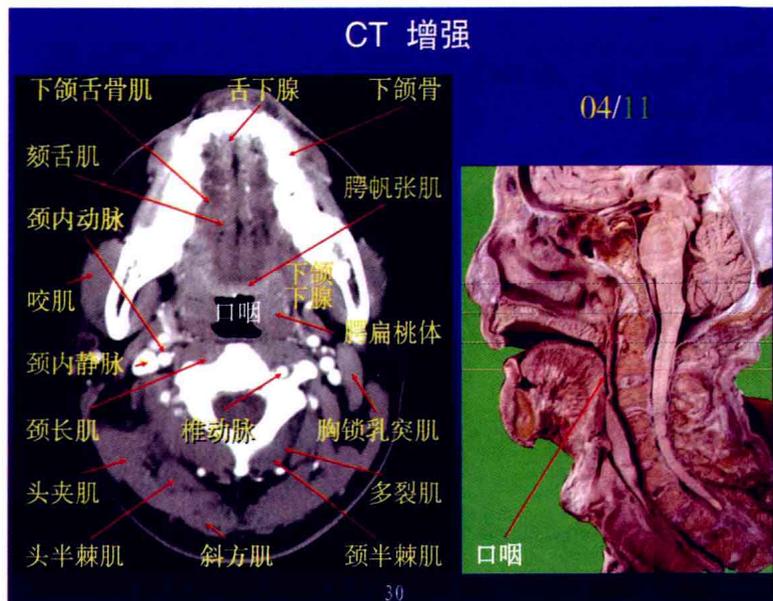
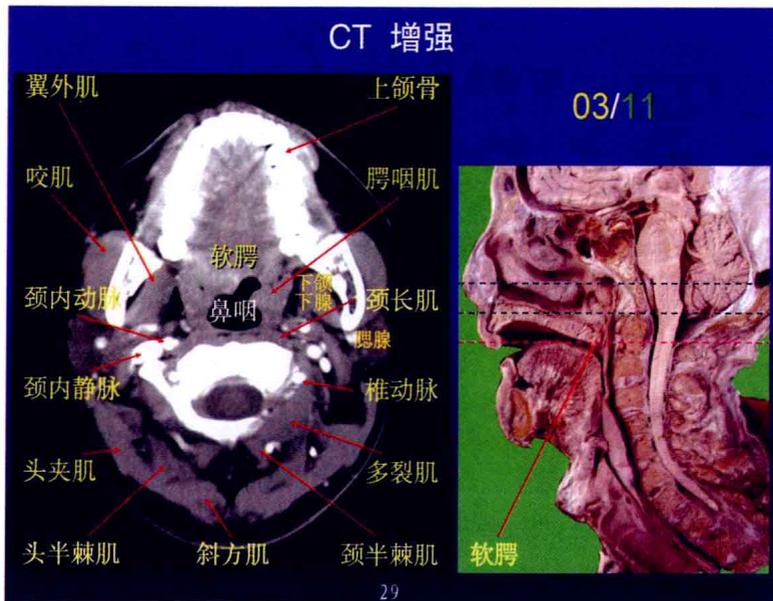


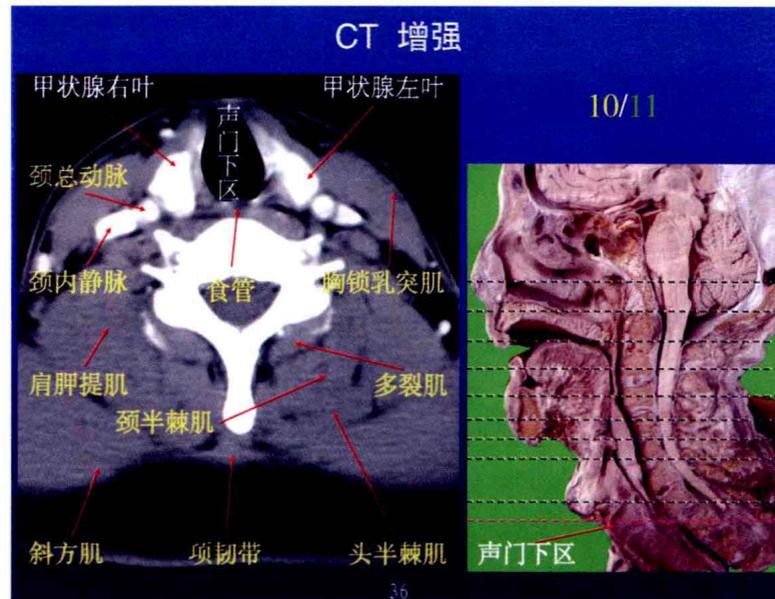
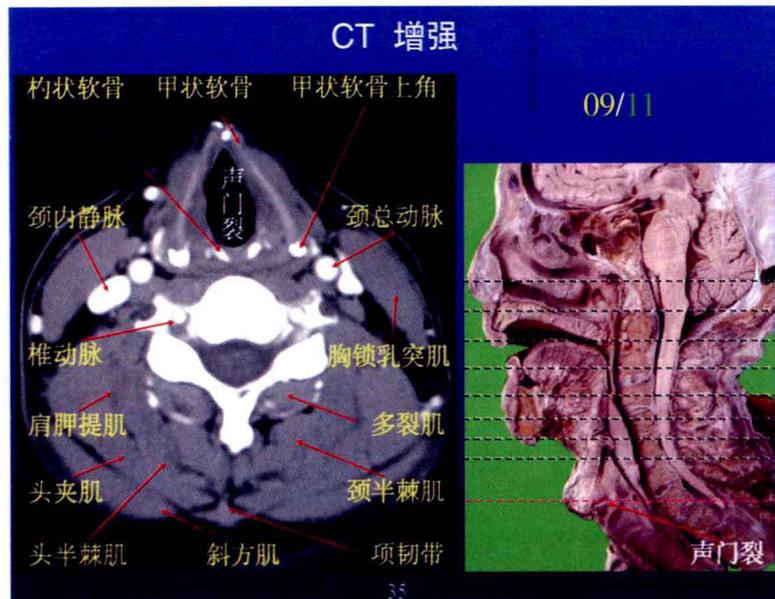
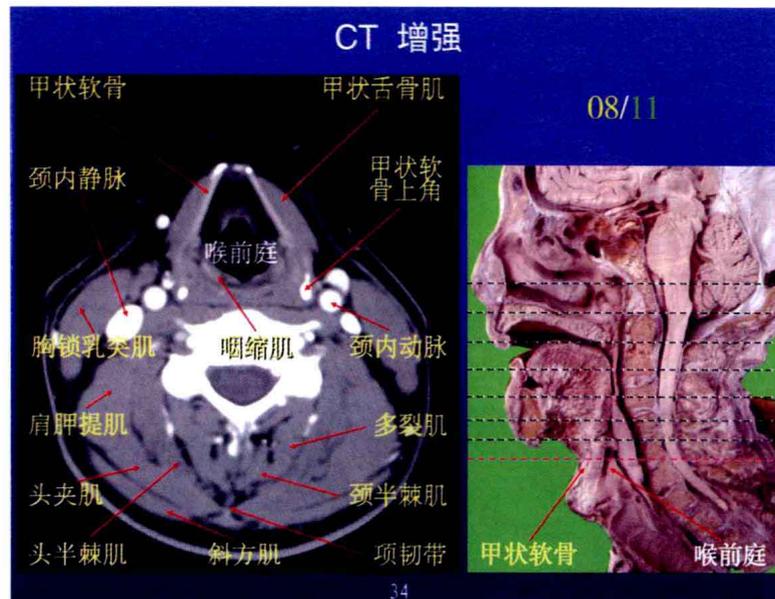
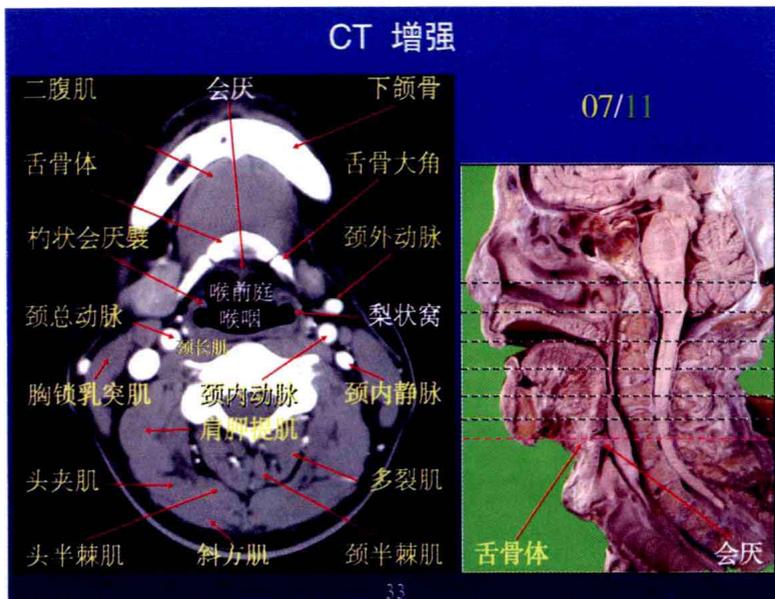
### 4. CT 增强

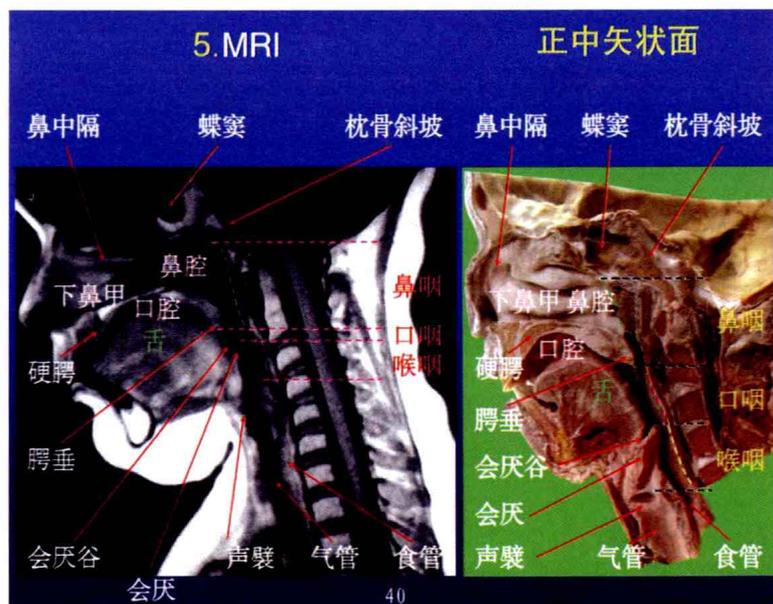
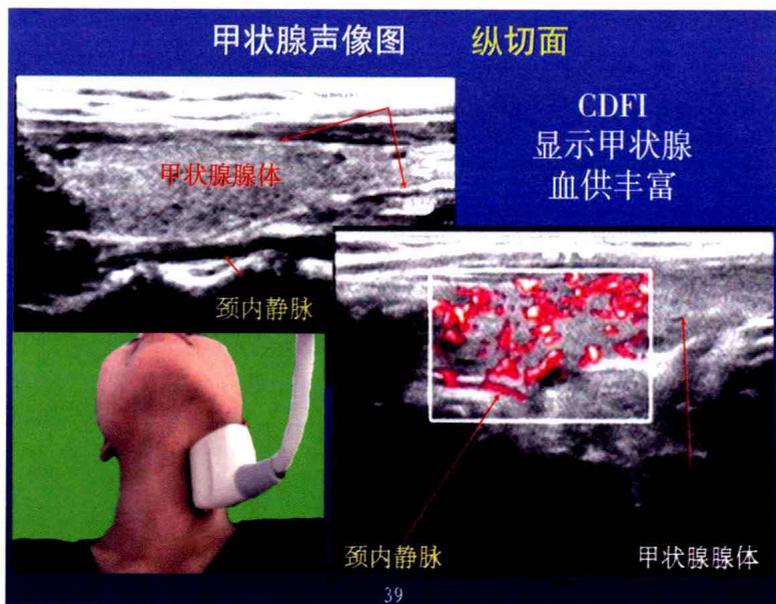
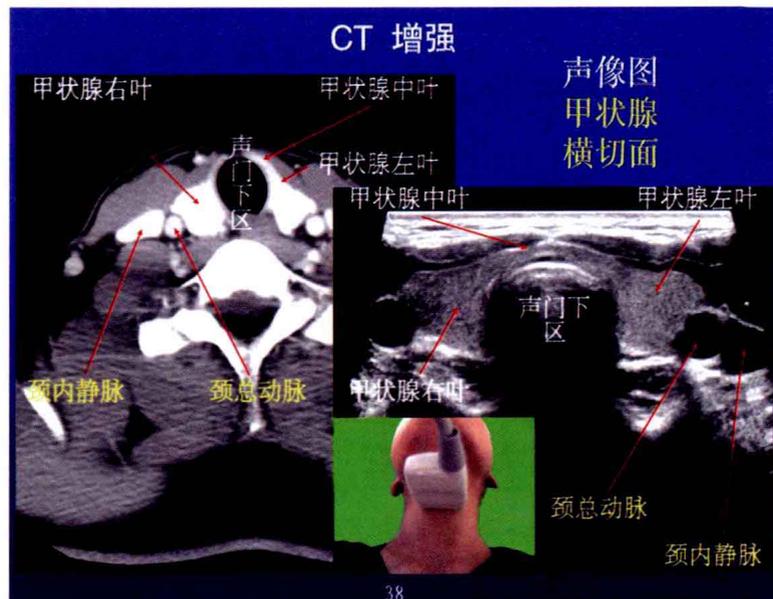
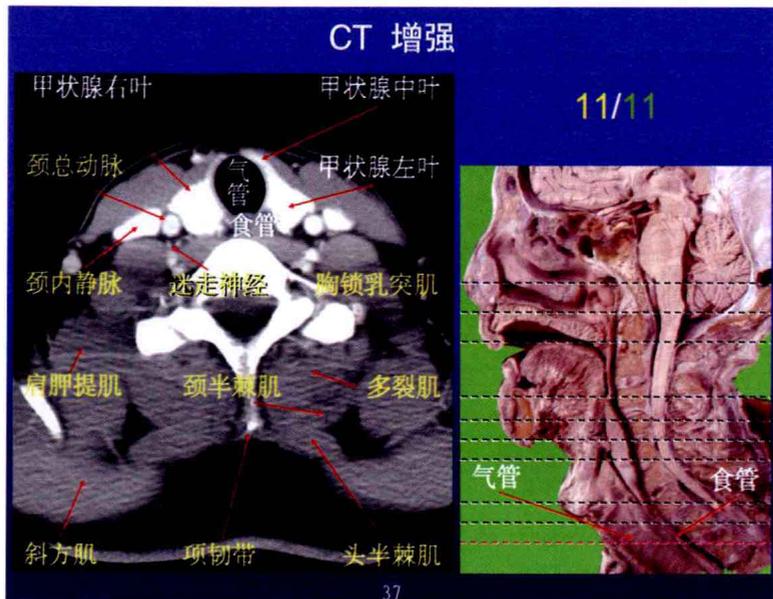


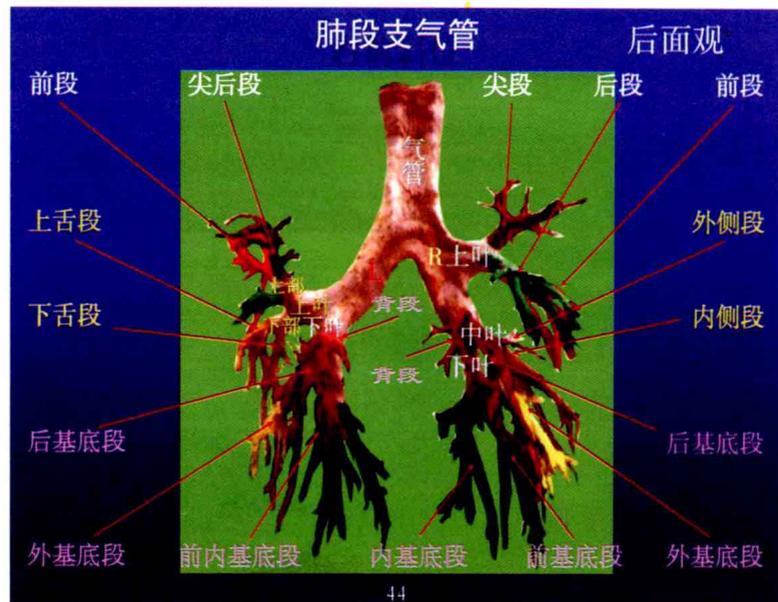
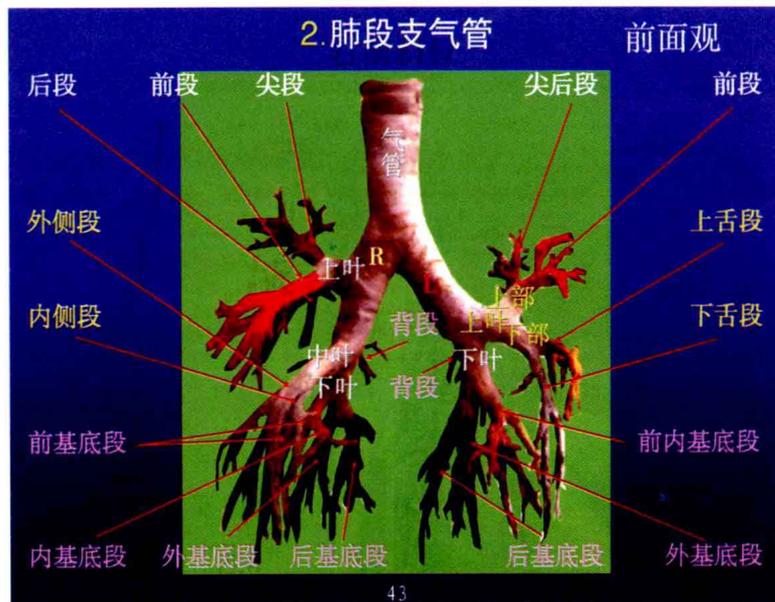
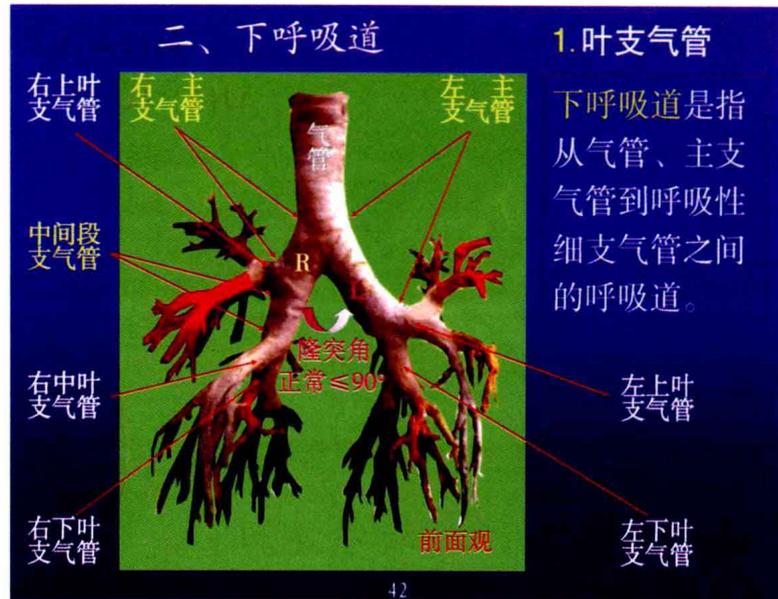
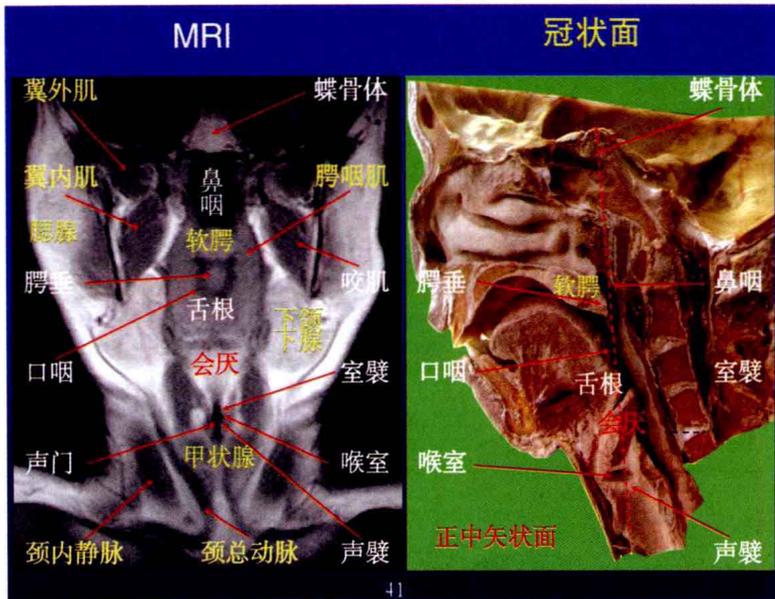
### CT 增强



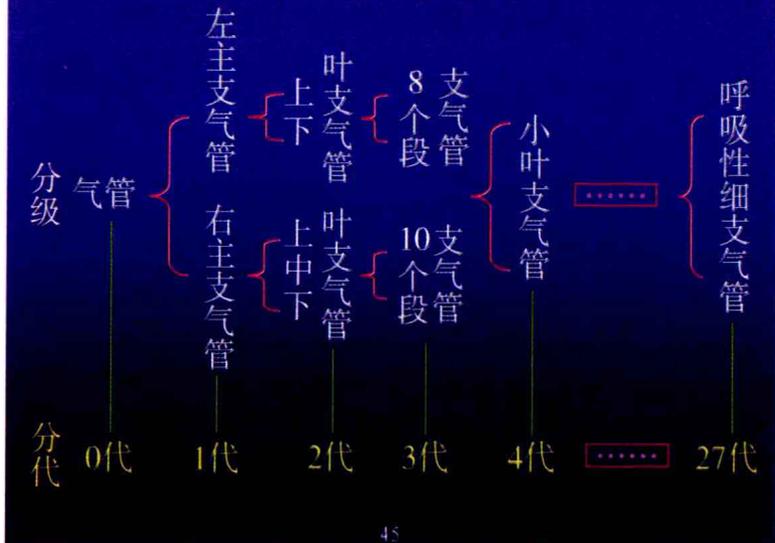






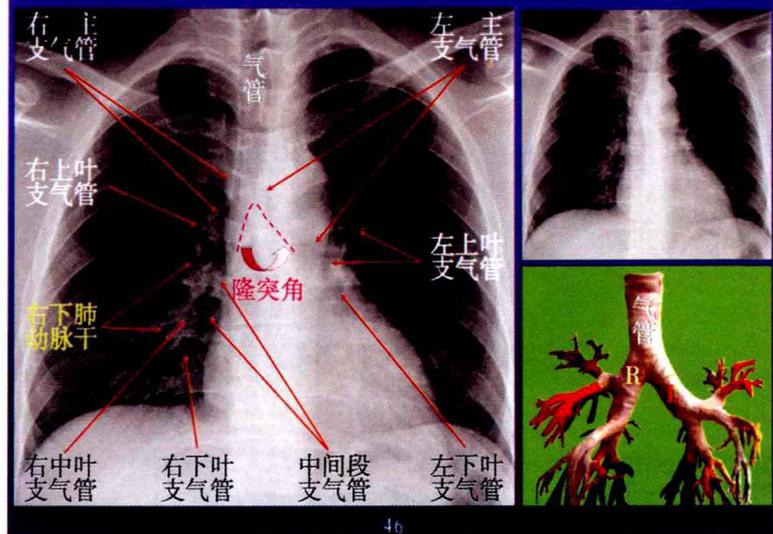


### 3. 支气管分级与分代



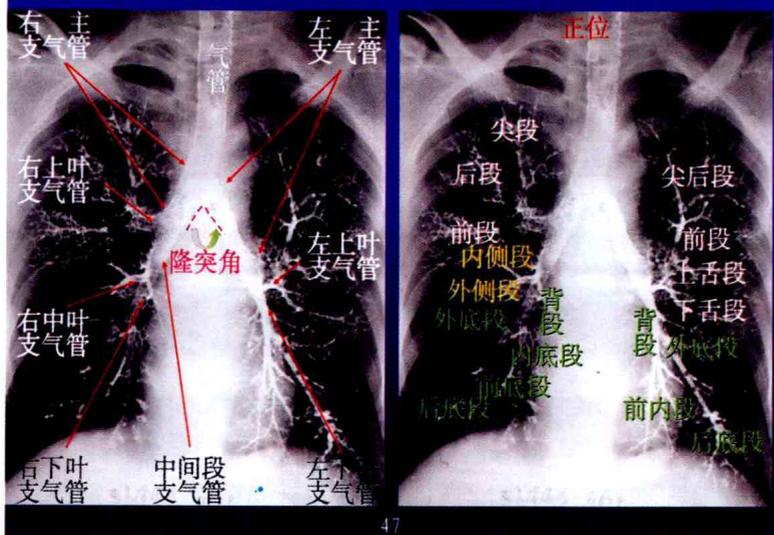
45

### 1. 正位胸片



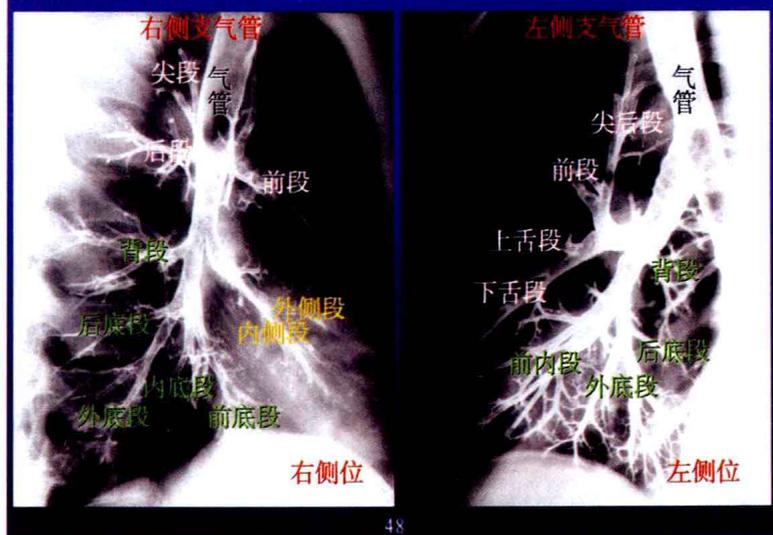
46

### 2. 支气管碘油造影

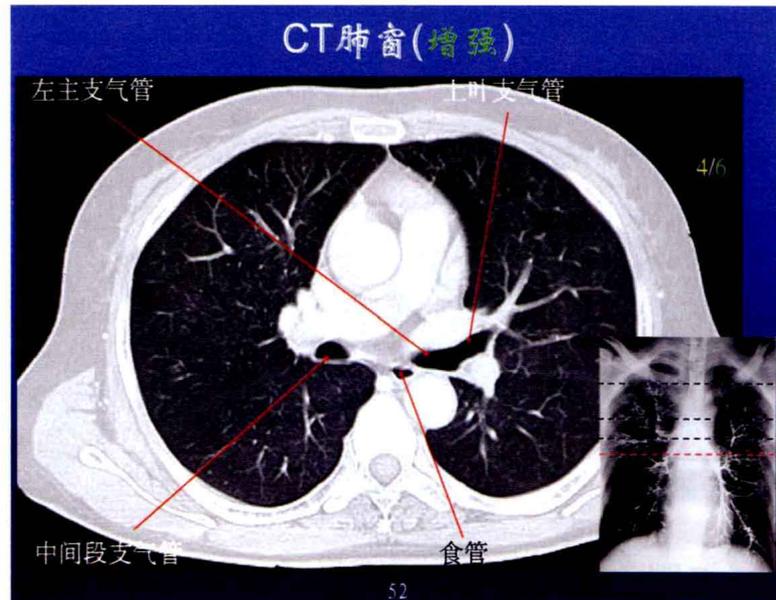
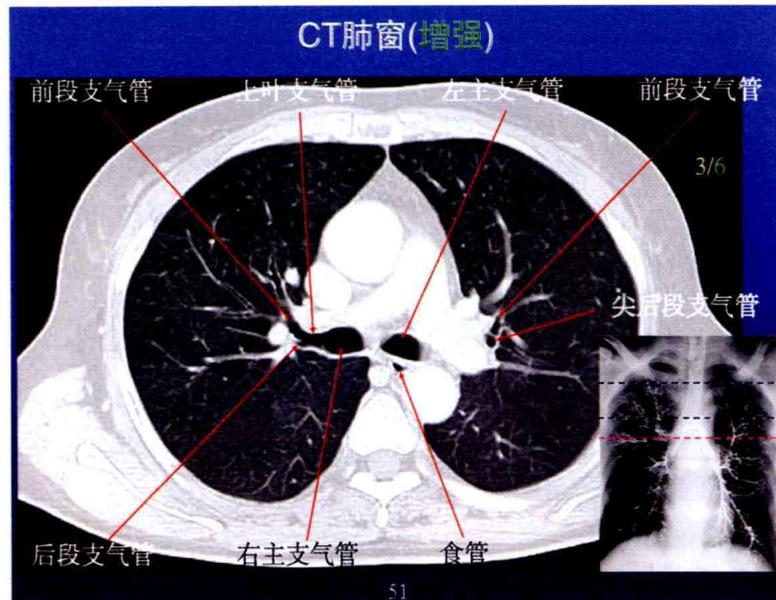
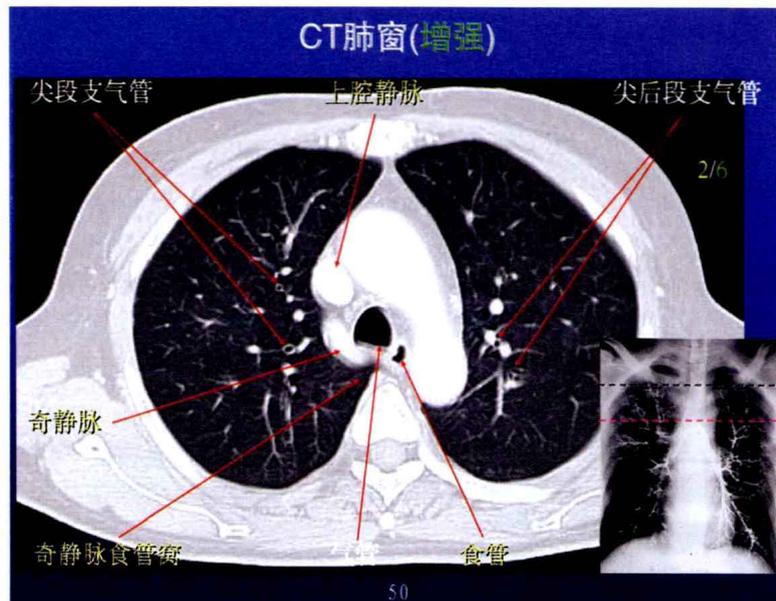
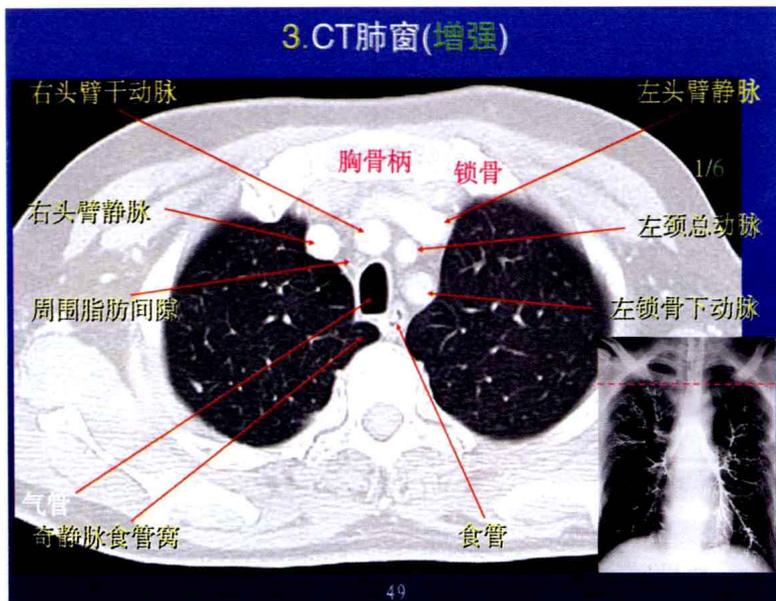


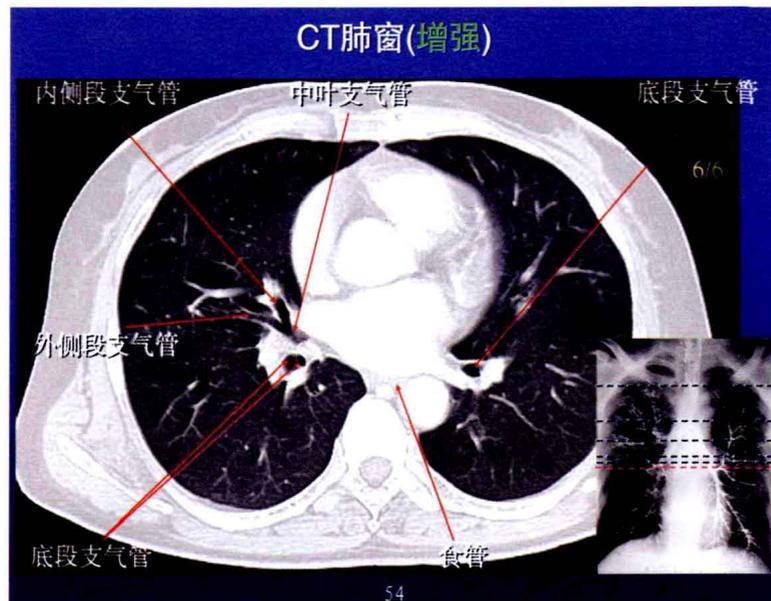
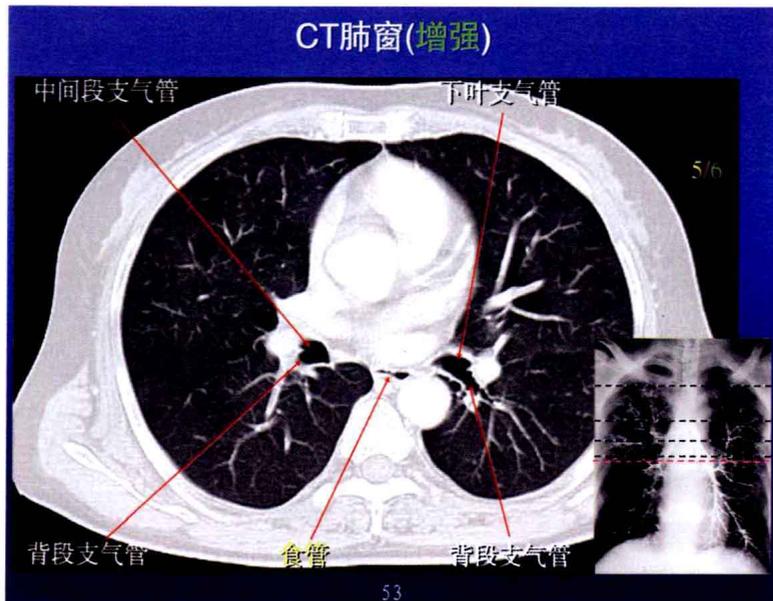
47

### 支气管碘油造影



48





### 第三节 肺

#### 一、肺实质

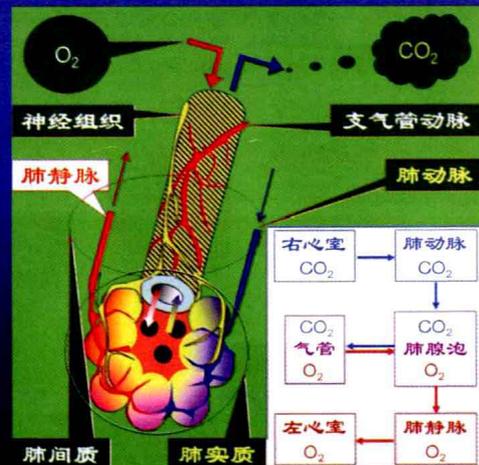
由若干个肺腺泡即呼吸性小叶构成。肺腺泡由有气体交换作用的呼吸性细支气管、肺泡管、肺泡囊和肺泡组成。在X线片上表现为 5 mm 大小的圆形透光区。



55

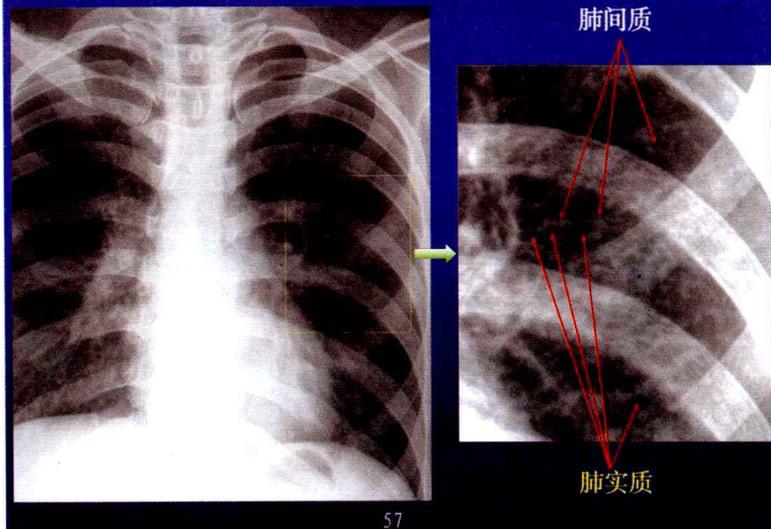
#### 二、肺间质

位于肺腺泡之间索条状的高密度影，由肺内血管、淋巴管、神经组织、纤维组织等构成。

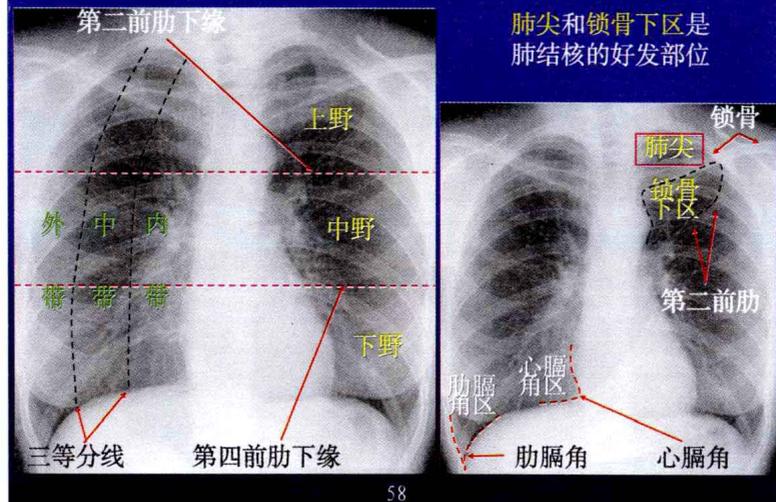


56

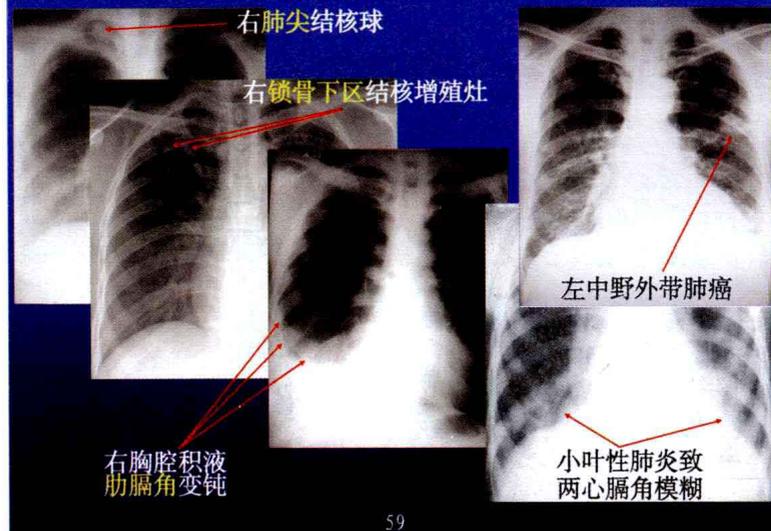
### 肺实质和肺间质



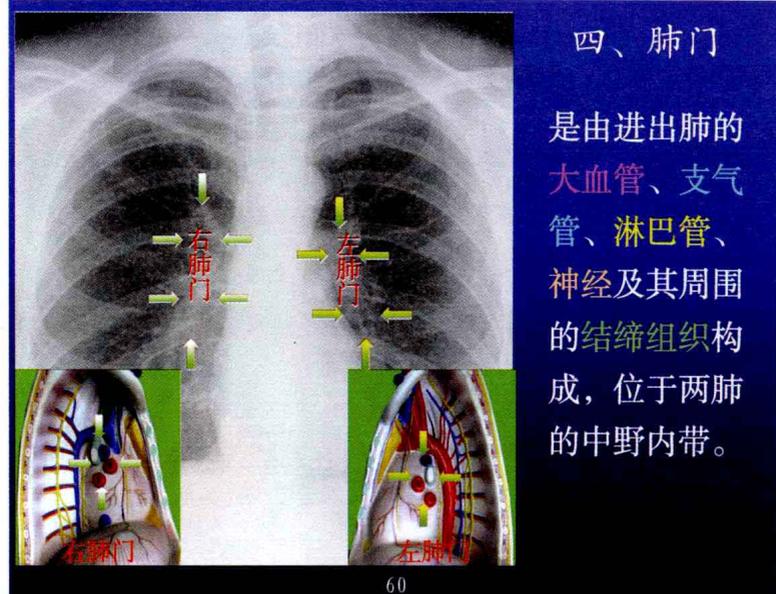
### 三、肺野分区

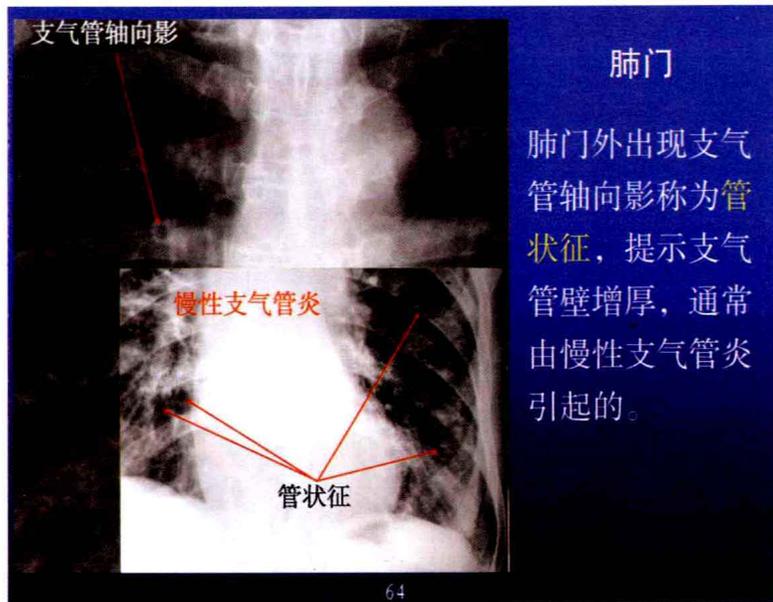
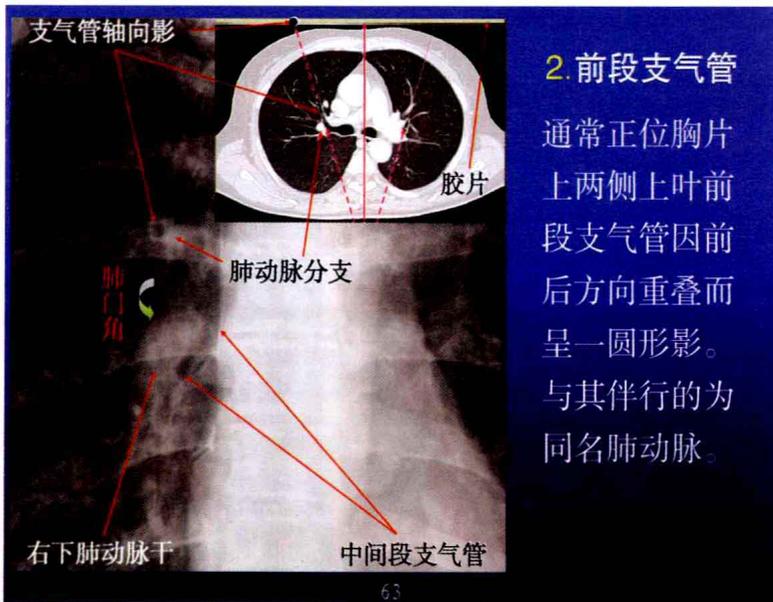
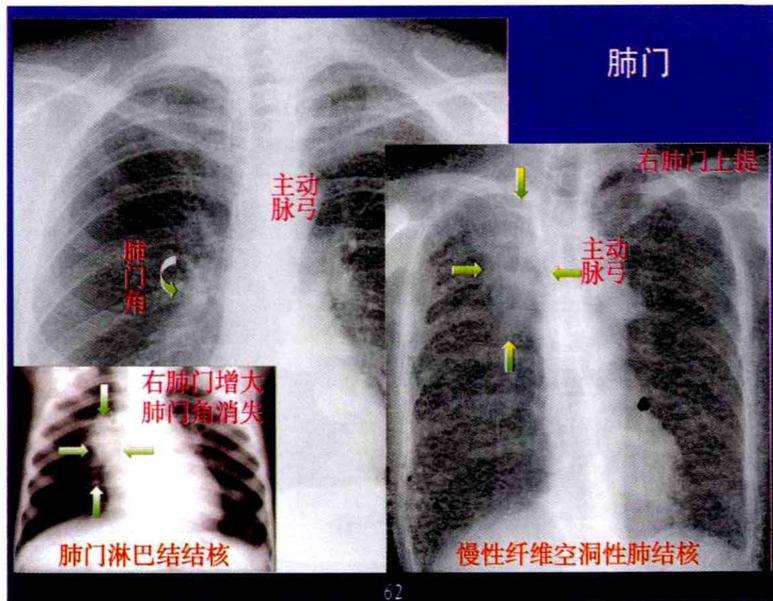
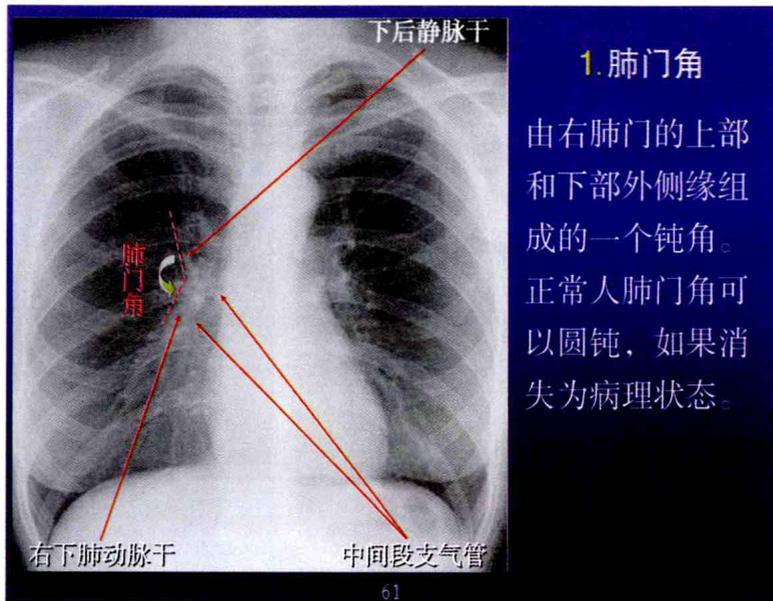


### 肺野分区

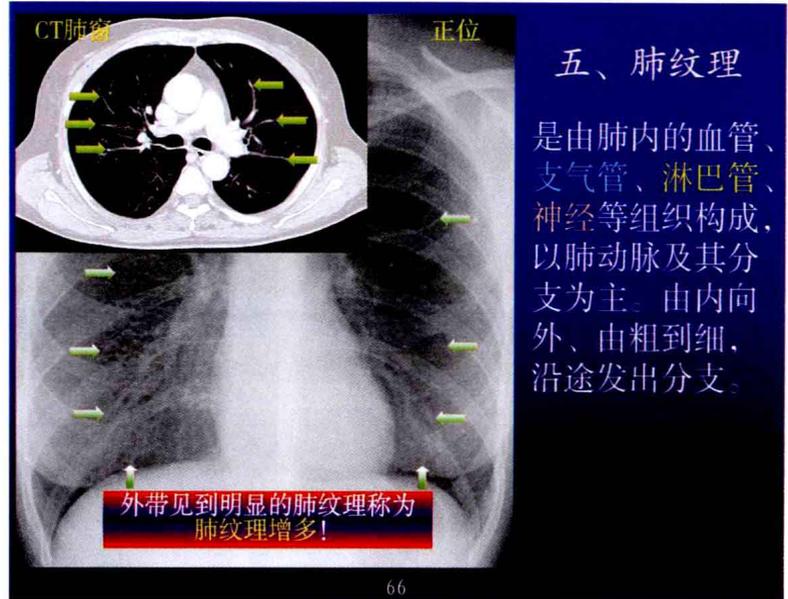
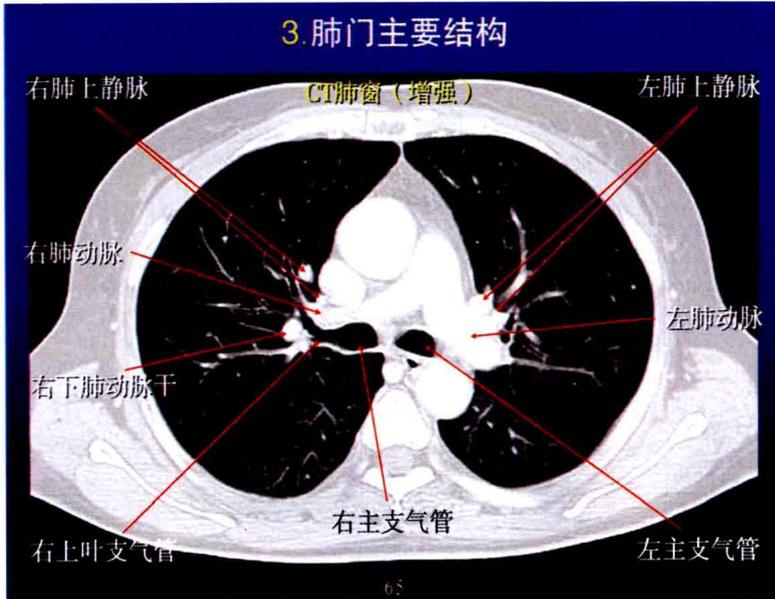


### 四、肺门





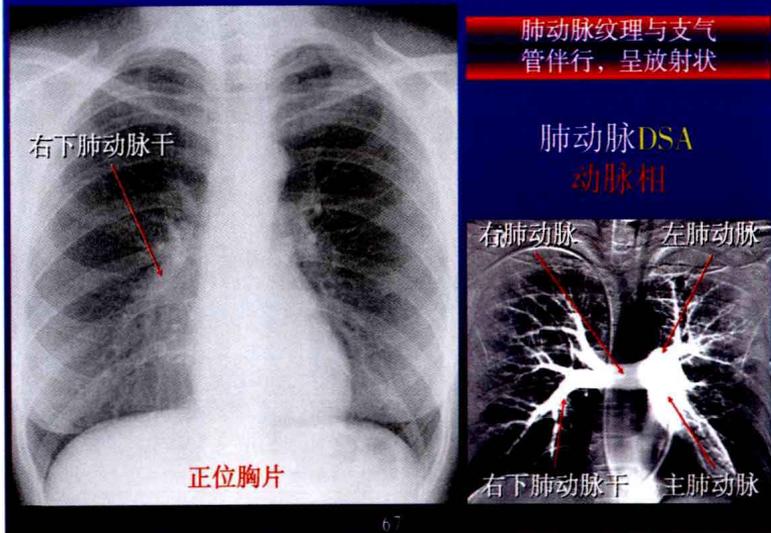
### 3. 肺门主要结构



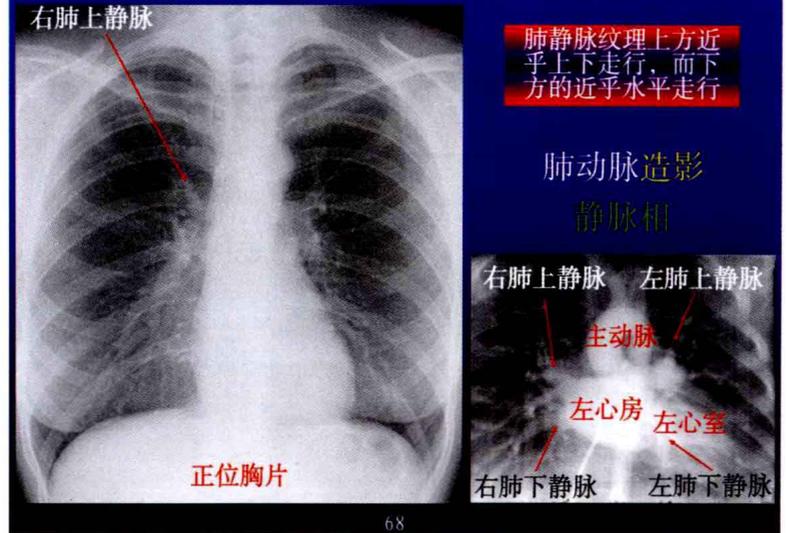
### 五、肺纹理

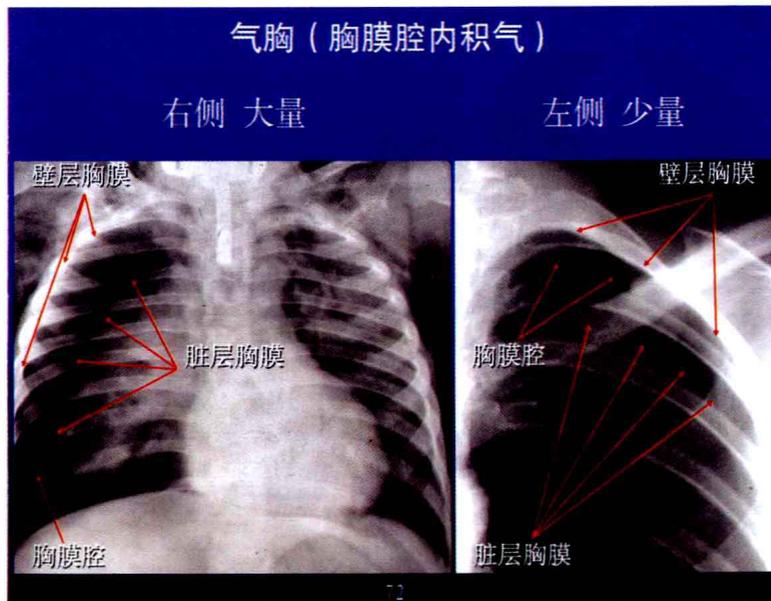
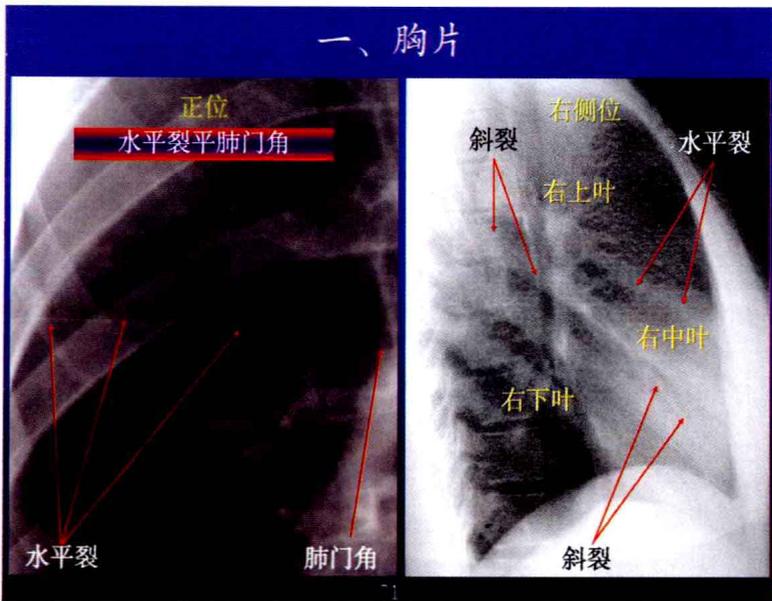
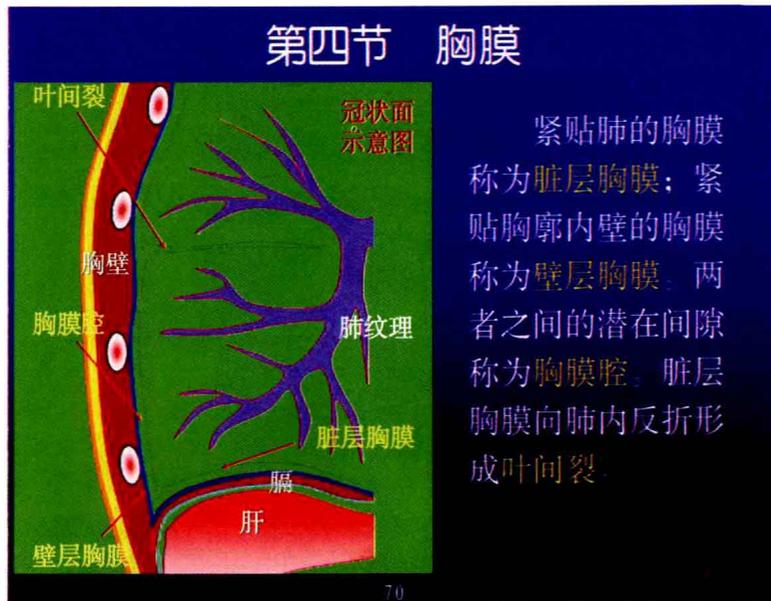
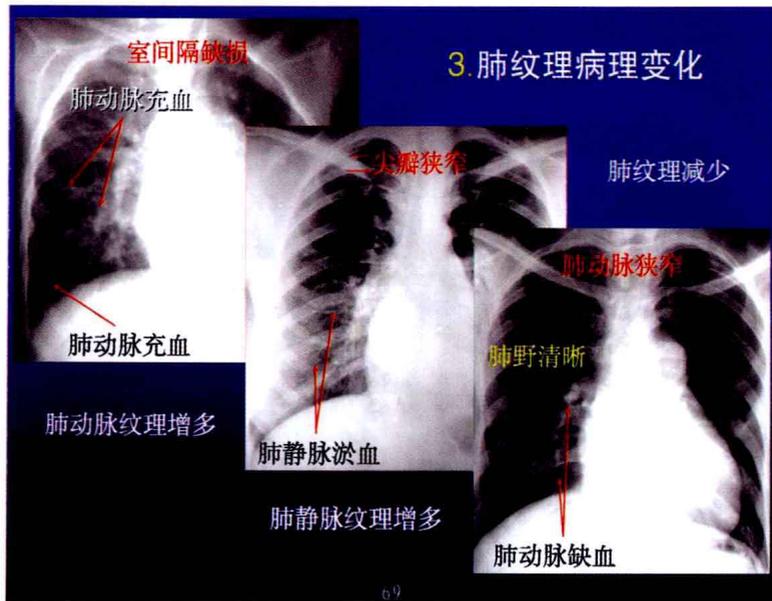
是由肺内的血管、支气管、淋巴管、神经等组织构成，以肺动脉及其分支为主。由内向外、由粗到细，沿途发出分支。

### 1. 肺动脉纹理

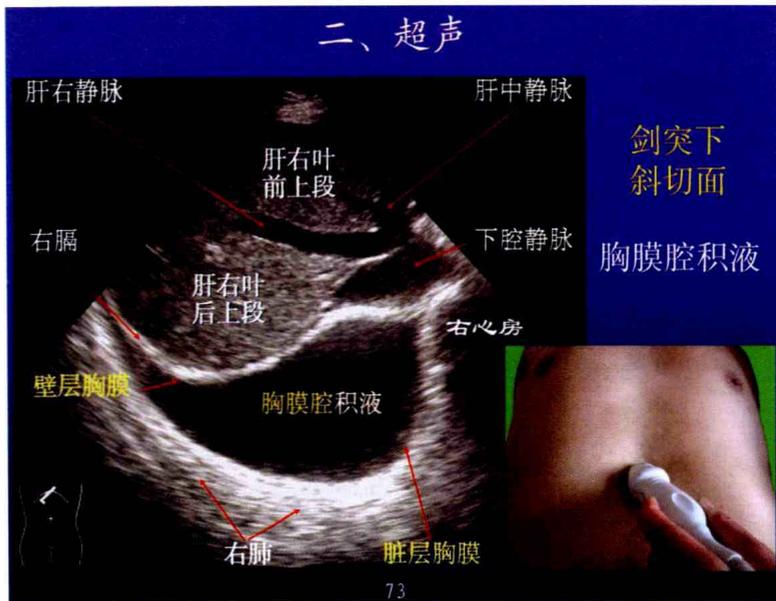


### 2. 肺静脉纹理

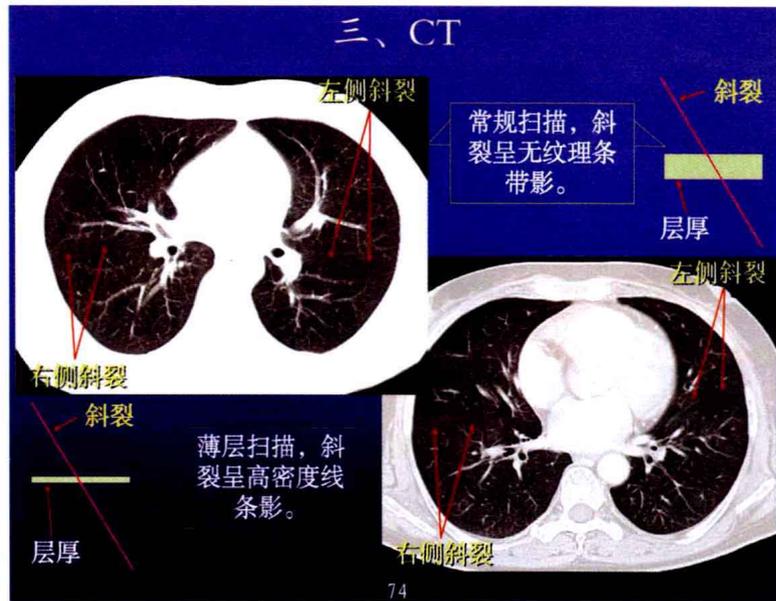




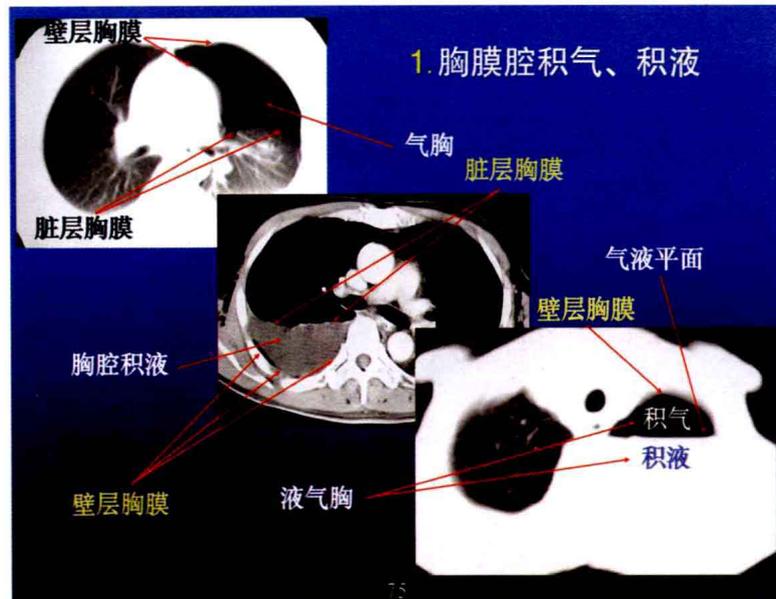
## 二、超声



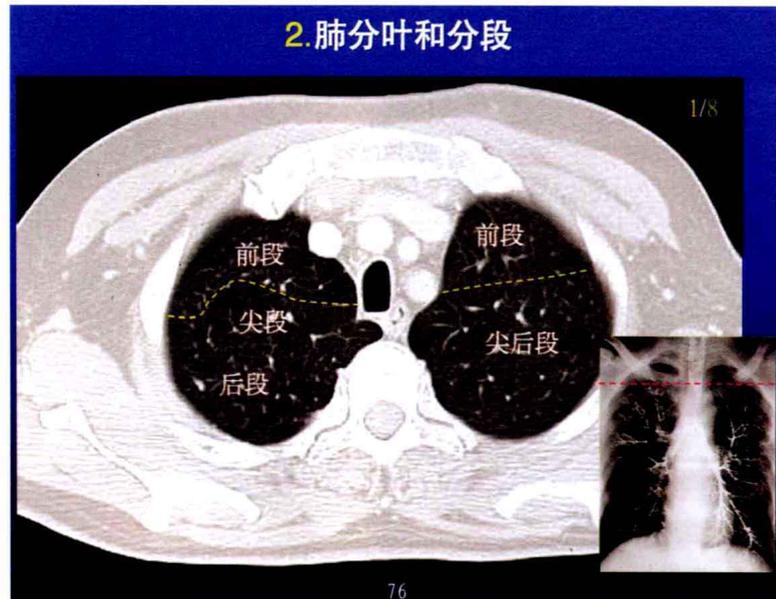
## 三、CT



### 1. 胸膜腔积气、积液

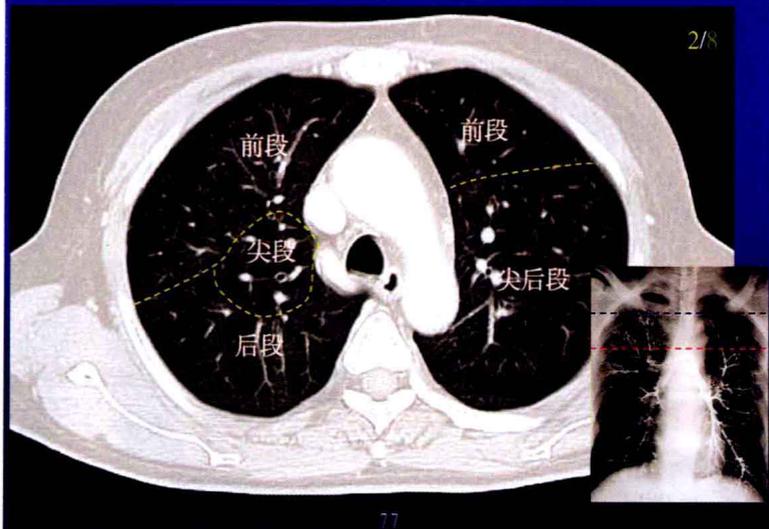


### 2. 肺分叶和分段



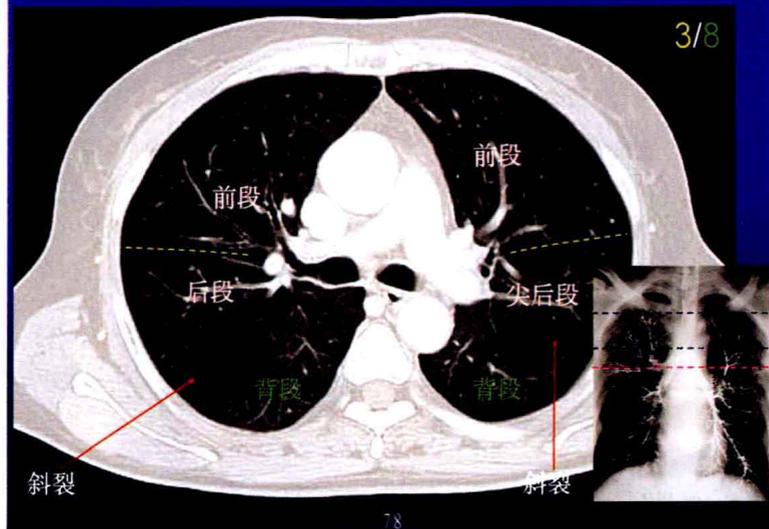
肺分叶和分段

2/8



肺分叶和分段

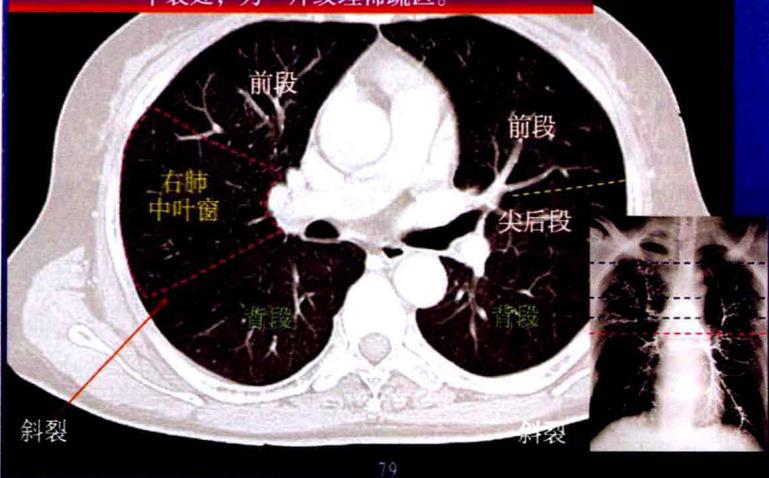
3/8



肺分叶和分段

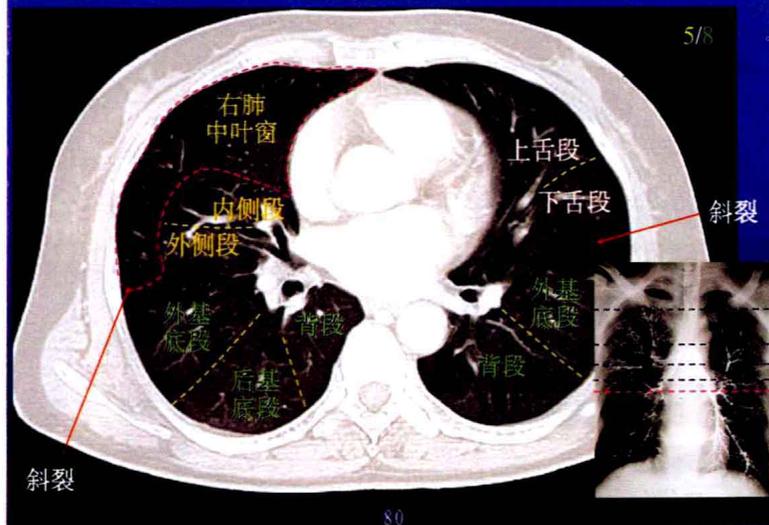
右肺中叶窗指胸部CT肺窗，肺门角层面刚好扫描到水平裂处，为一片纹理稀疏区。

4/8

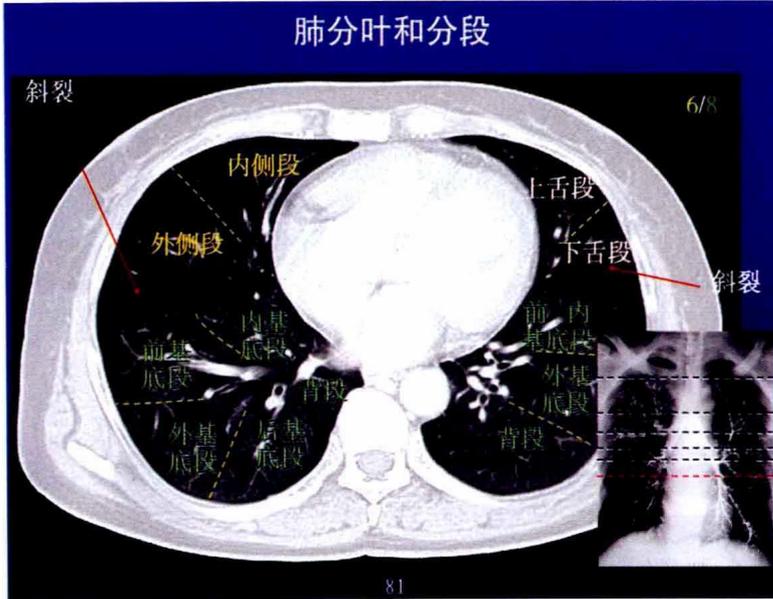


肺分叶和分段

5/8

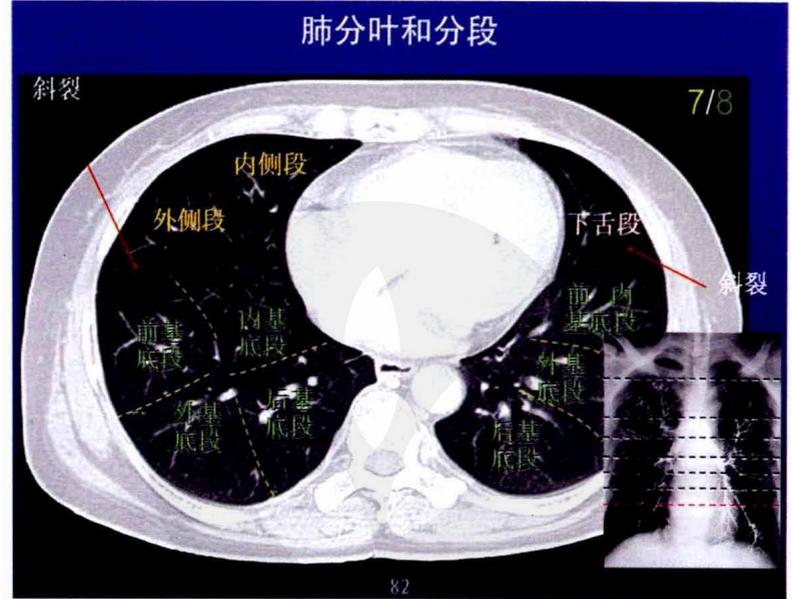


肺分叶和分段



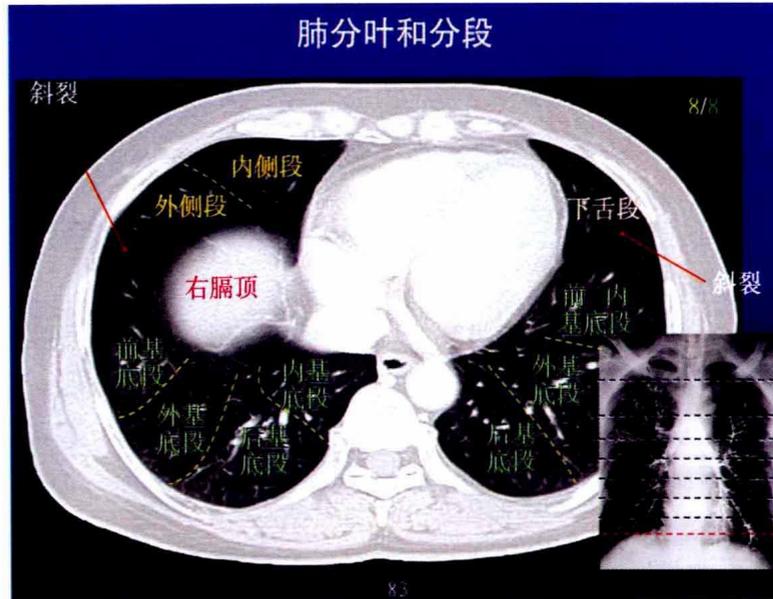
81

肺分叶和分段



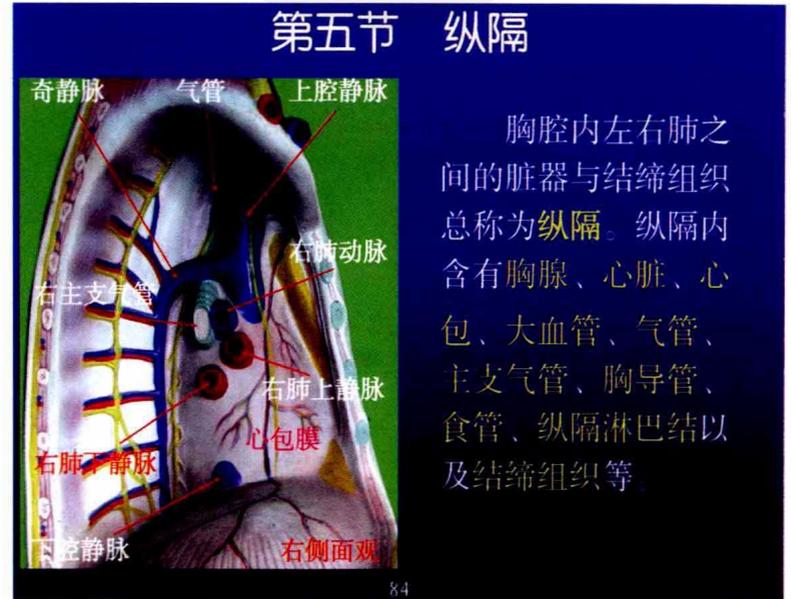
82

肺分叶和分段



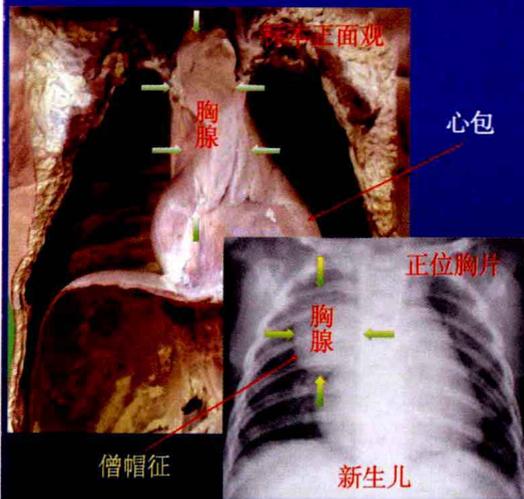
83

## 第五节 纵隔



胸腔内左右肺之间的脏器与结缔组织总称为**纵隔**。纵隔内含有胸腺、心脏、心包、大血管、气管、主支气管、胸导管、食管、纵隔淋巴结以及结缔组织等。

## 一、胸腺

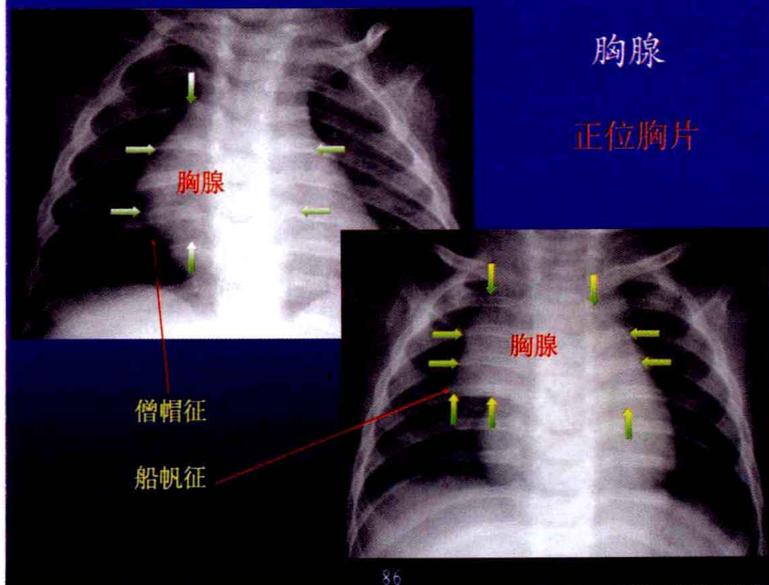


位于胸骨后，气管、心脏和大血管之前。新生儿相对较大，随年龄增长逐渐萎缩，15岁以后基本上被结缔组织取代。

85

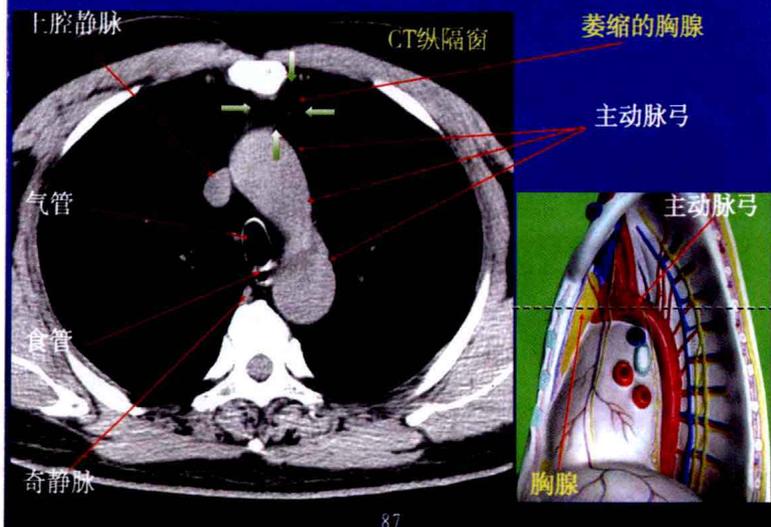
## 胸腺

### 正位胸片



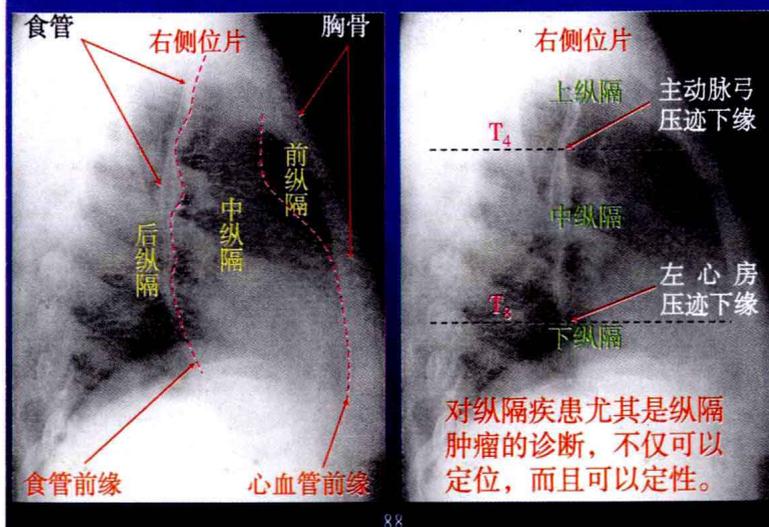
86

## 胸腺



87

## 二、纵隔九分法



对纵隔疾患尤其是纵隔肿瘤的诊断，不仅可以定位，而且可以定性。

88

### 三、纵隔淋巴结

#### 1. 分组

前纵隔淋巴结

位于前纵隔内

中纵隔淋巴结

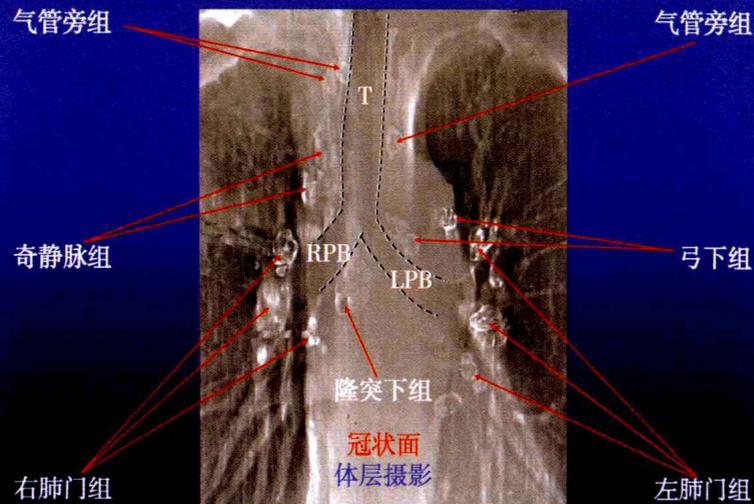
- 气管旁组
  - 气管支气管组
  - 肺门组
  - 隆突下组
- } 奇静脉组
- } 弓下组

后纵隔淋巴结

沿降主动脉和食管分布

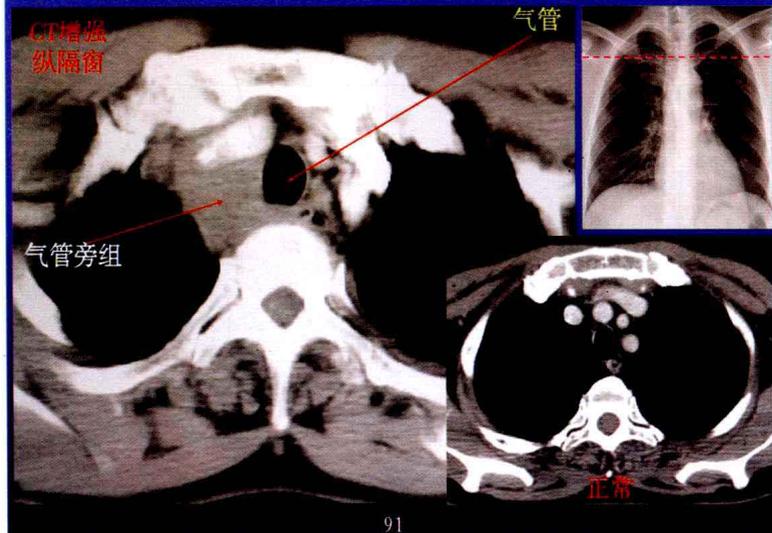
89

#### 2. 钙化的中纵隔淋巴结



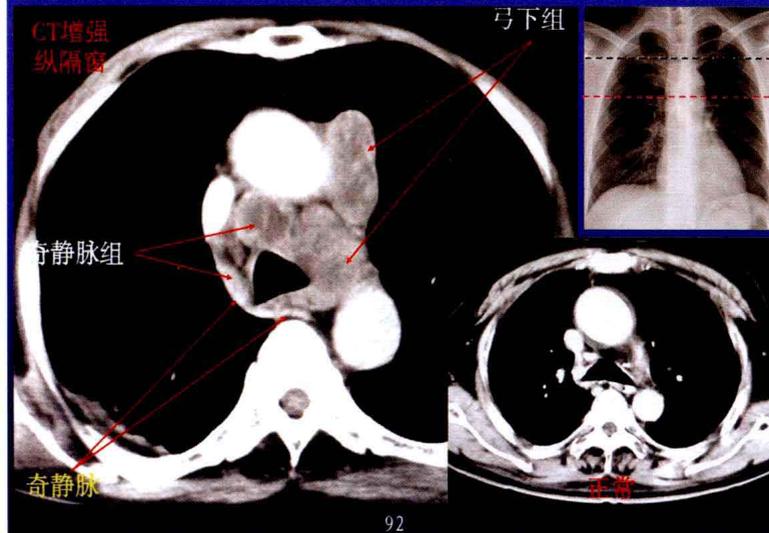
90

#### 3. 中纵隔淋巴结转移瘤

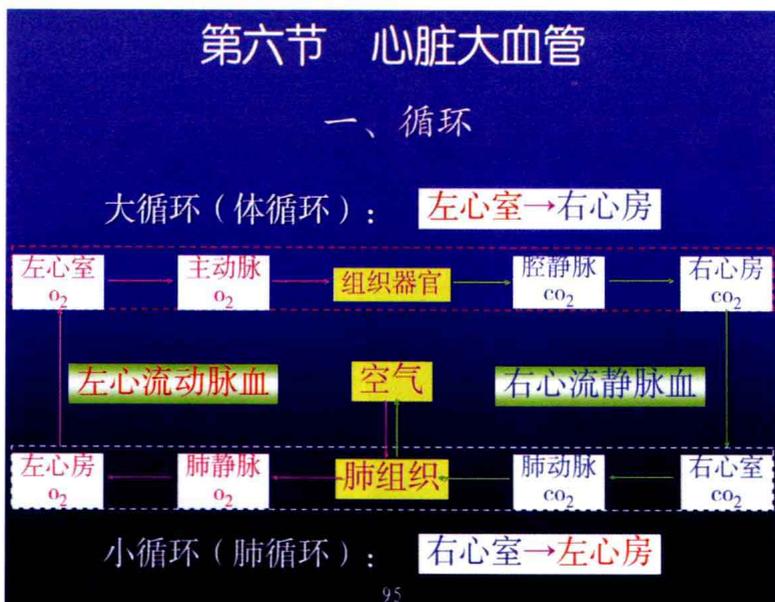
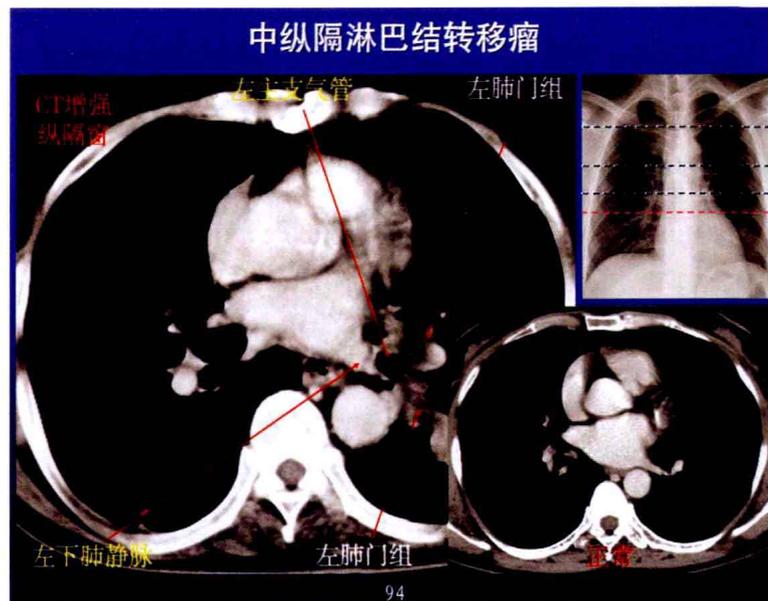
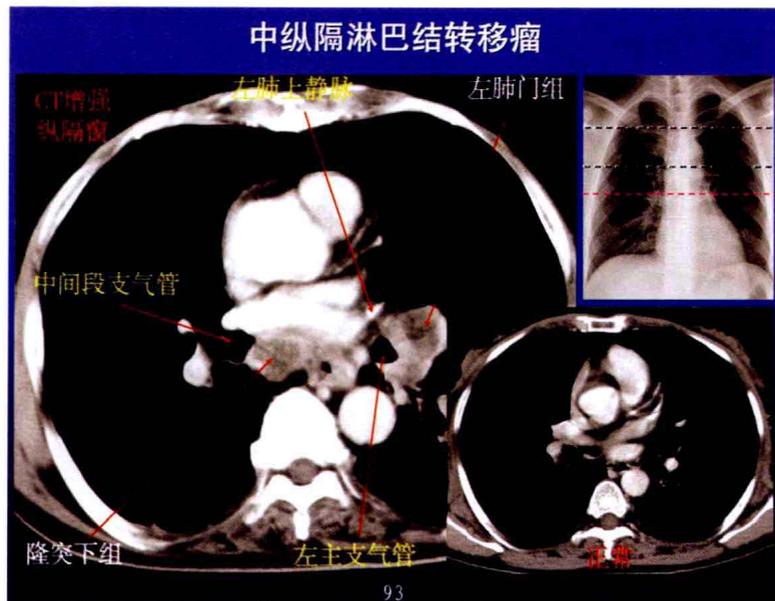


91

#### 中纵隔淋巴结转移瘤



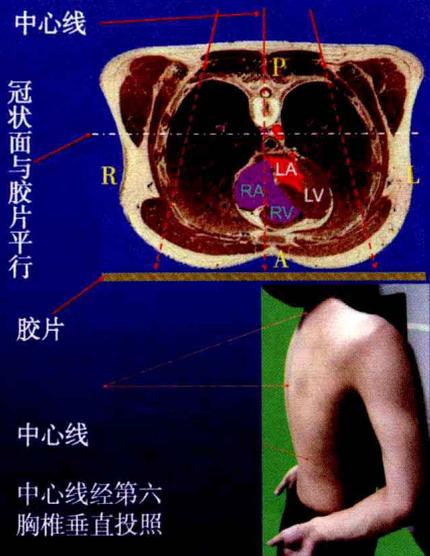
92



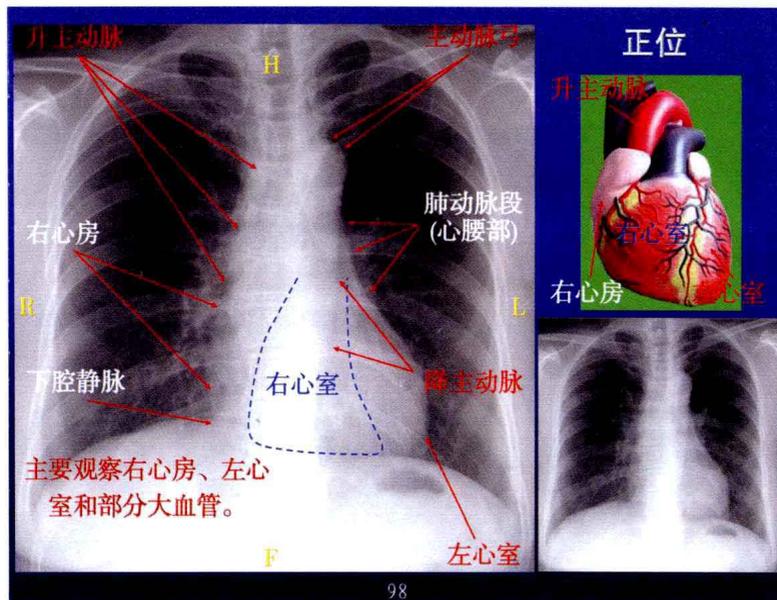
## 二、胸片

### 1. 后前（正）位

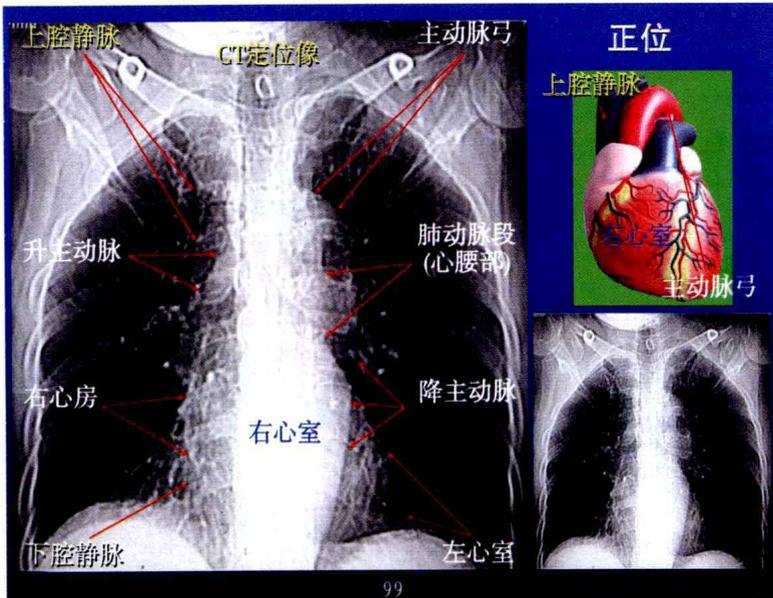
Head 头侧  
Foot 足侧  
Right 右侧  
Left 左侧  
Anterior 前面  
Posterior 后面  
Atrium 心房  
Ventricle 心室



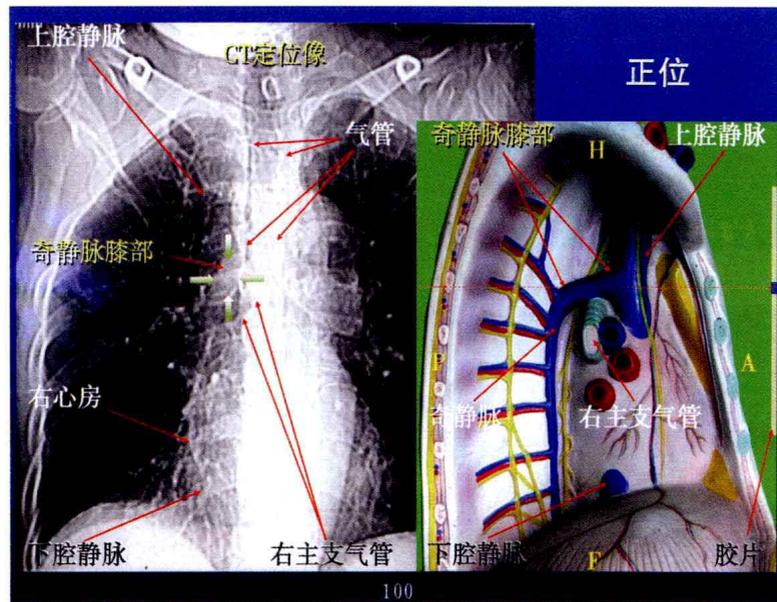
97



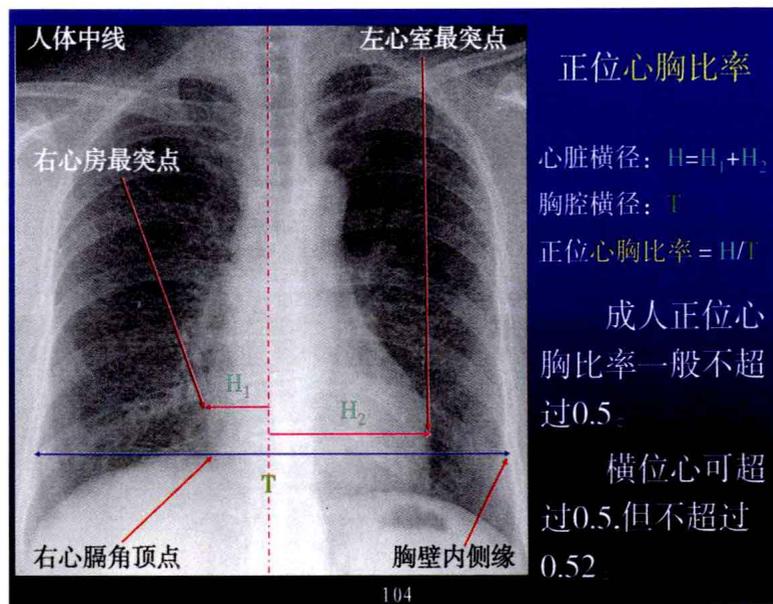
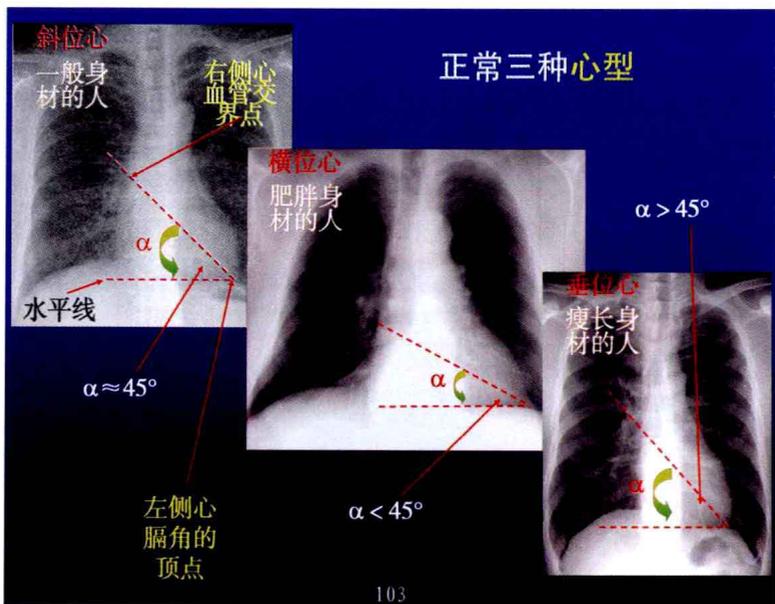
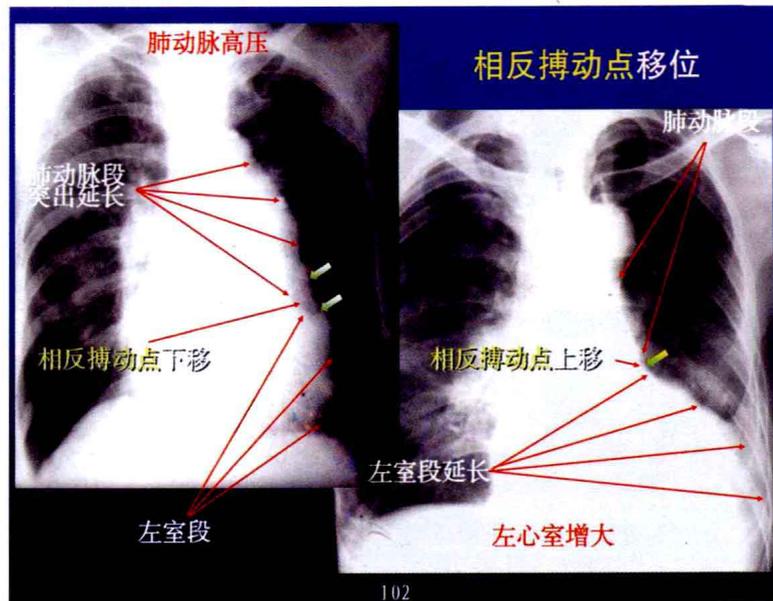
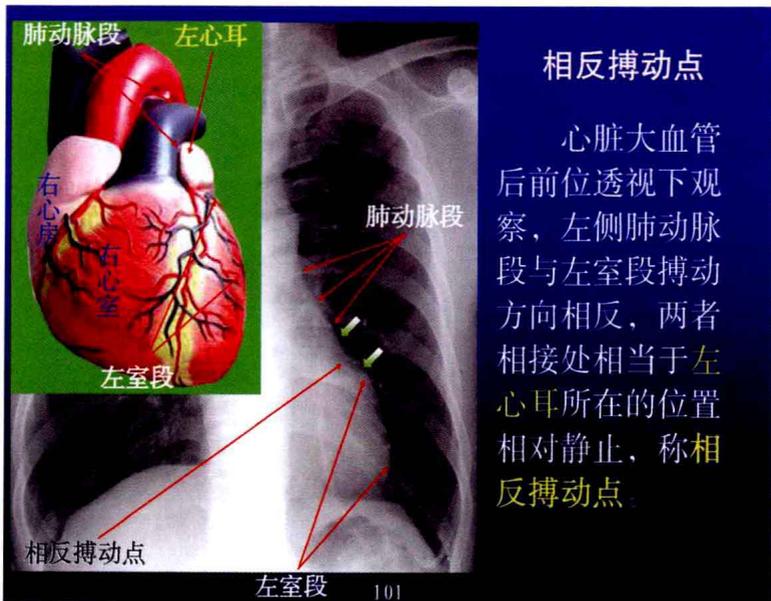
98

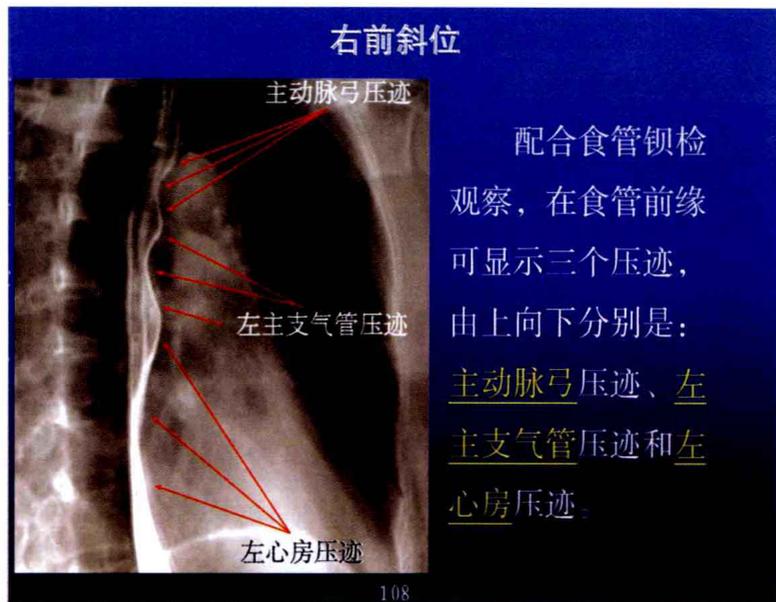
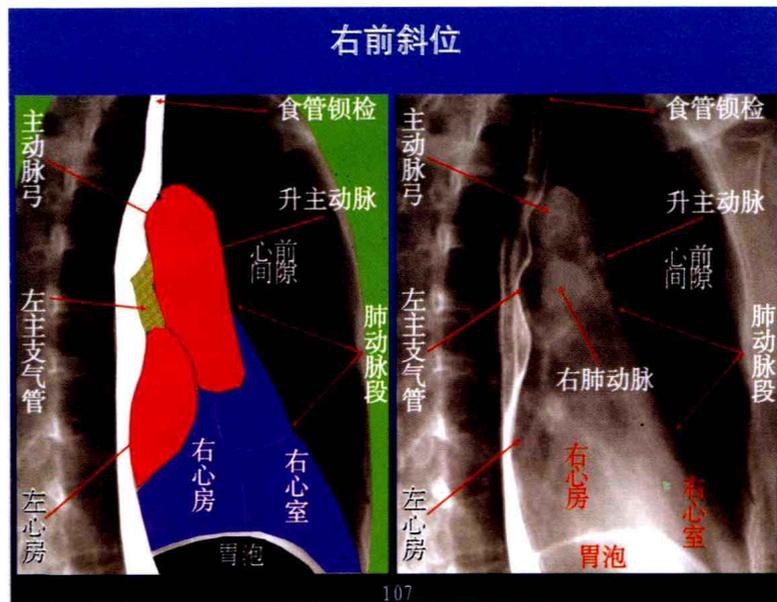
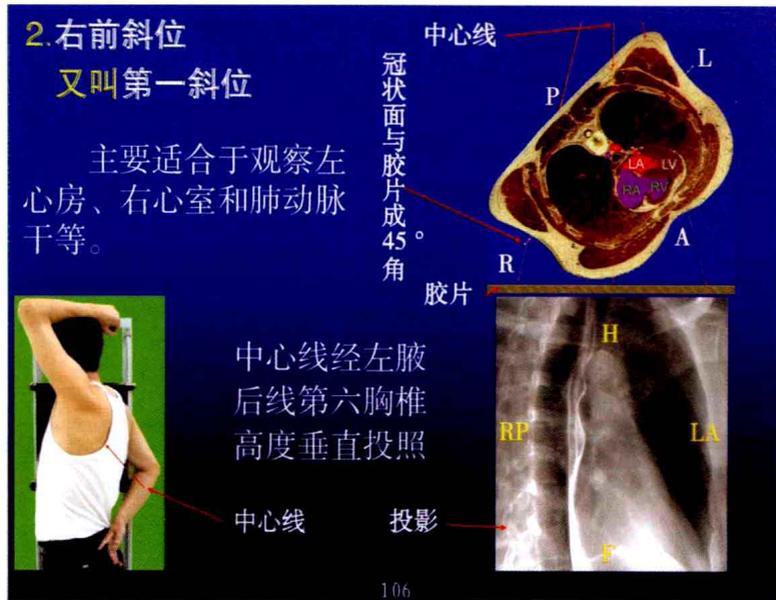
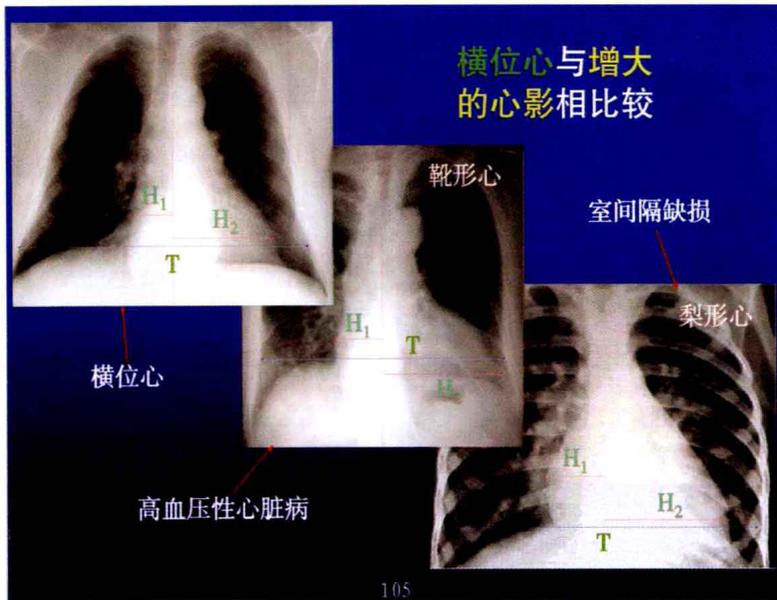


99



100



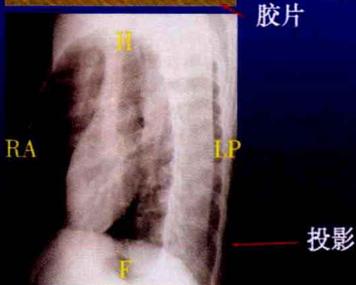
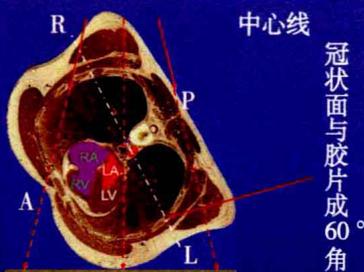


### 3. 左前斜位 又叫第二斜位

主要适合于观察各房、室结构和主动脉弓等。

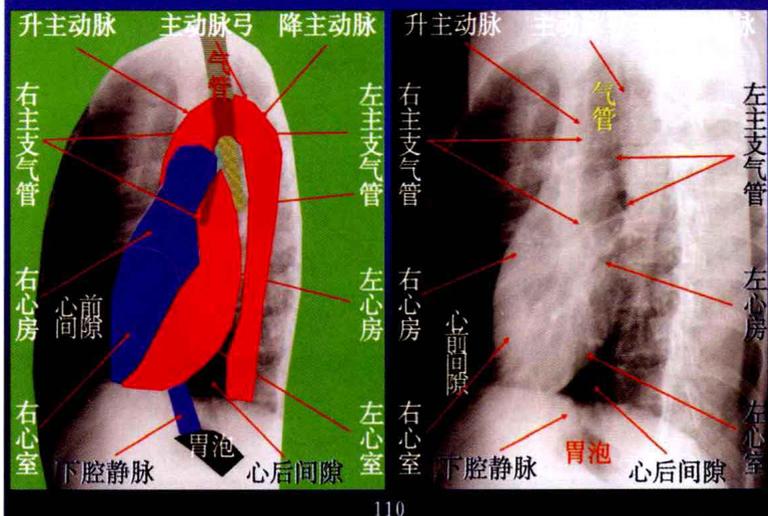
中心线经右腋后线第六胸椎高度垂直投照

中心线



109

### 左前斜位



110



### 主动脉窗

心血管左前斜位观察，升主动脉、主动脉弓和降主动脉呈舒展状态。其下方有一透光区称为主动脉窗。



左心房增大，左主支气管受压抬高，主动脉窗缩小以至消失。

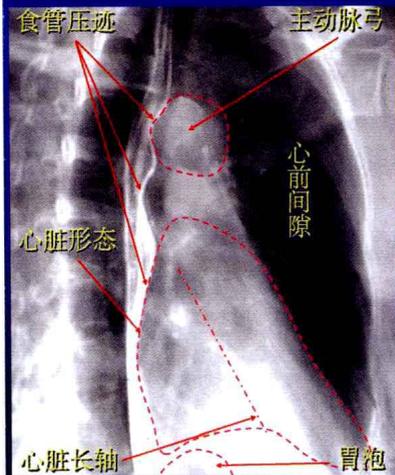
111

### 比较心血管左、右斜位不同点

比较	右前斜位	左前斜位
心脏长轴	倾斜	近似垂直
心脏形态	三角形	茄形或卵圆形
心前间隙	呈倒三角形	近乎于长方形
主动脉弓	各部显示不清	呈舒展状态
显示结构	右室、肺动脉、左房	各房室结构
毗邻关系	食管三个压迹	主动脉窗
胃泡位置	脊柱前与心脏重叠	心脏后与脊柱重叠

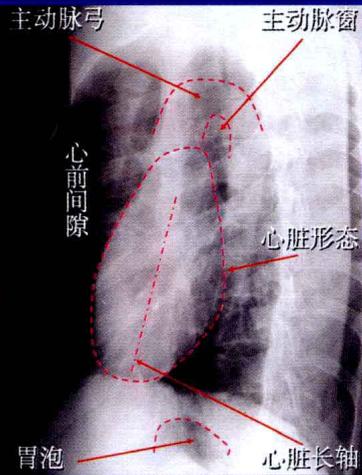
112

右前斜位



113

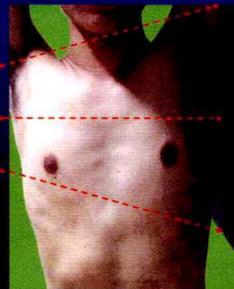
左前斜位



4. 左侧位

同右前斜位相当，主要适合于观察左心房、右心室和肺动脉干等。

中心线

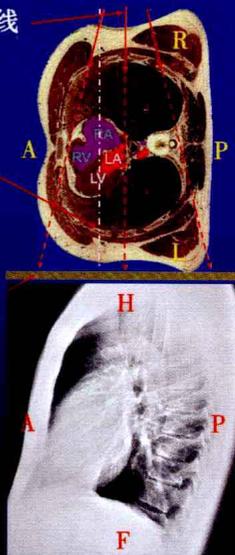


中心线经第六胸椎水平投照

中心线

冠状面与胶片垂直

胶片

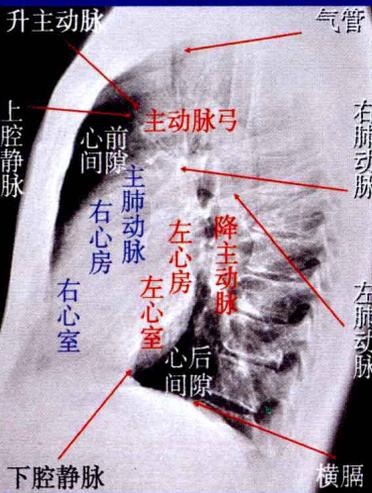


114

左侧位



115

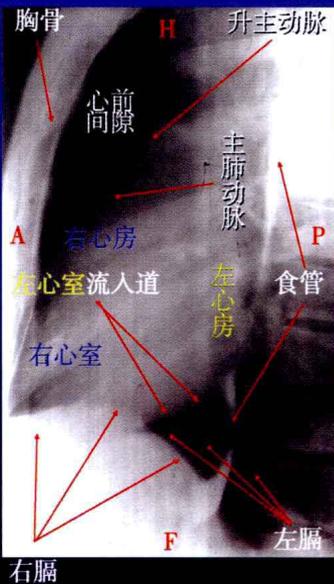


左侧位

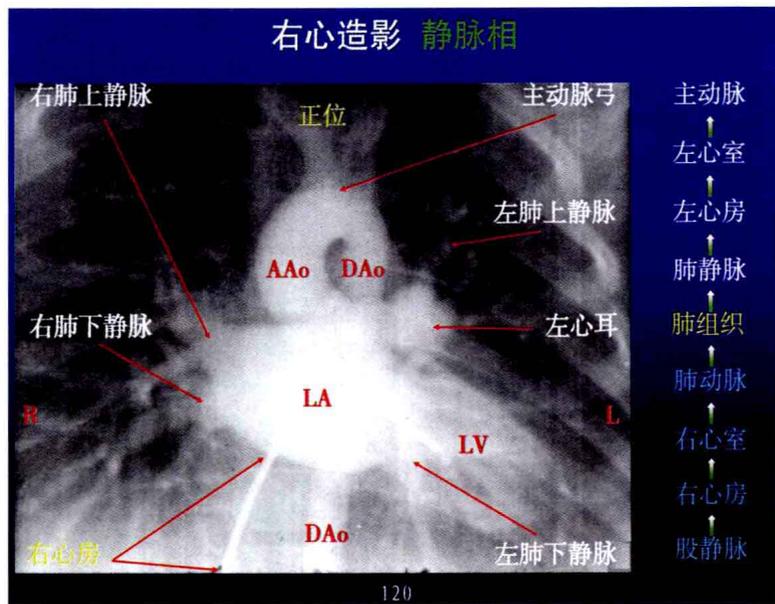
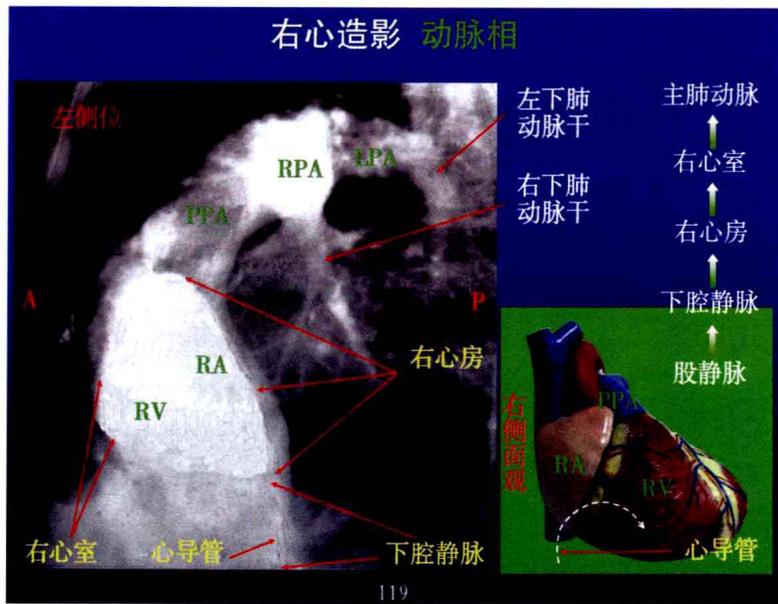
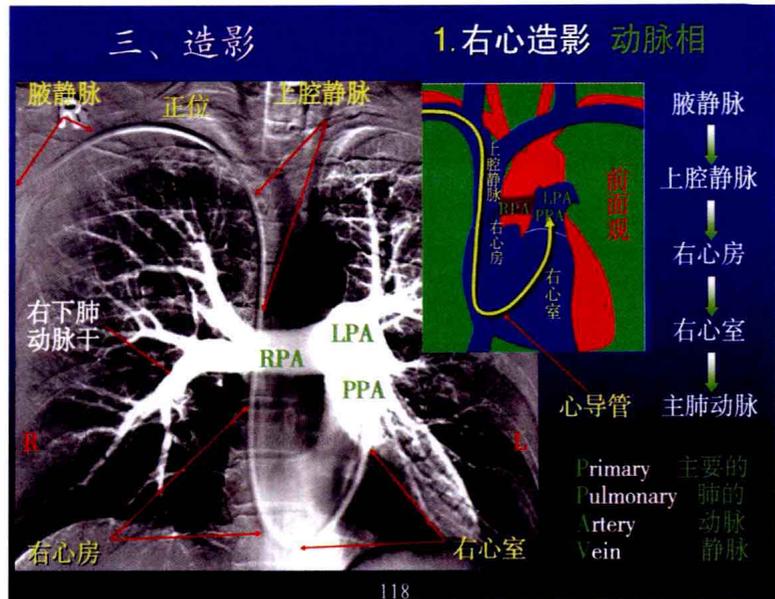
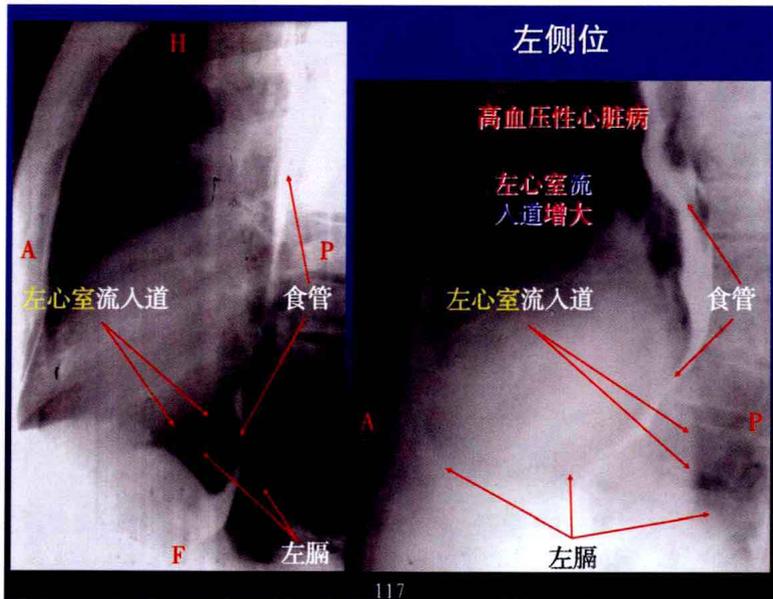
心后膈食管三角

左侧位胸片配合食管钡检，于心后、膈、食管之间的一个三角形透光区。

此区缩小或消失提示：左心室流入道增大。

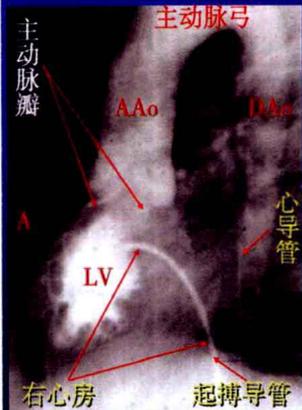


116



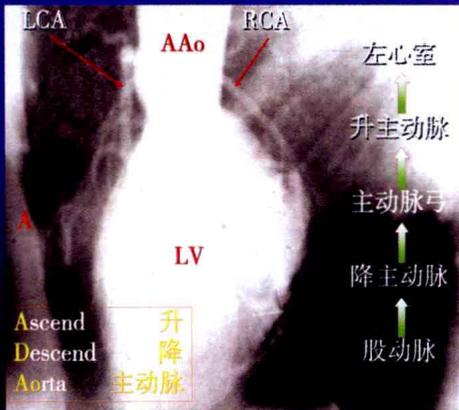
## 2. 左心室造影

收缩期



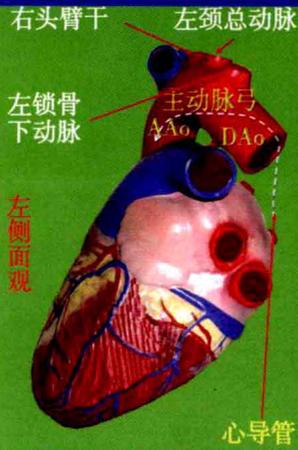
左侧位

舒张期



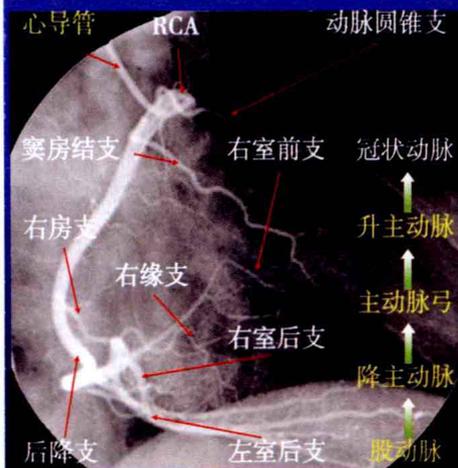
121

## 3. 主动脉造影



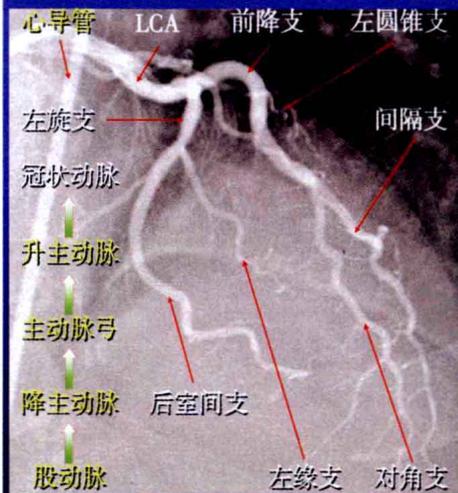
122

## 4. 冠状动脉造影(右)

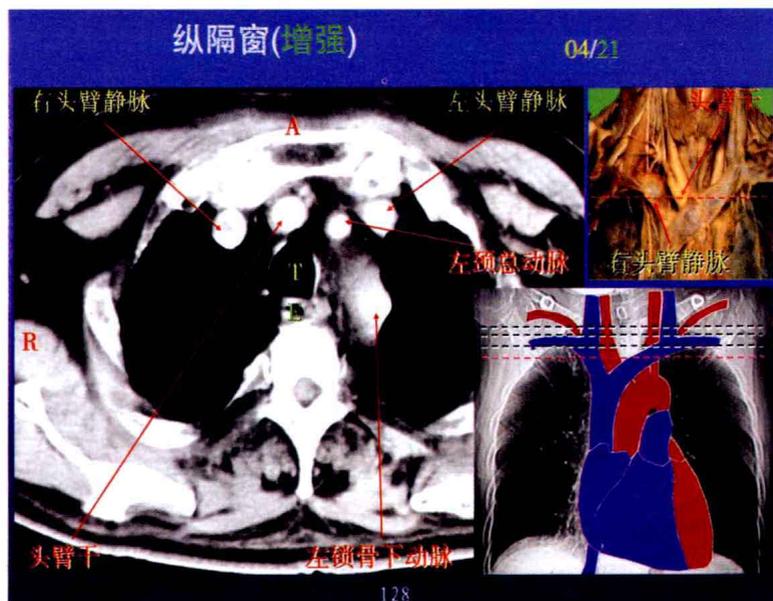
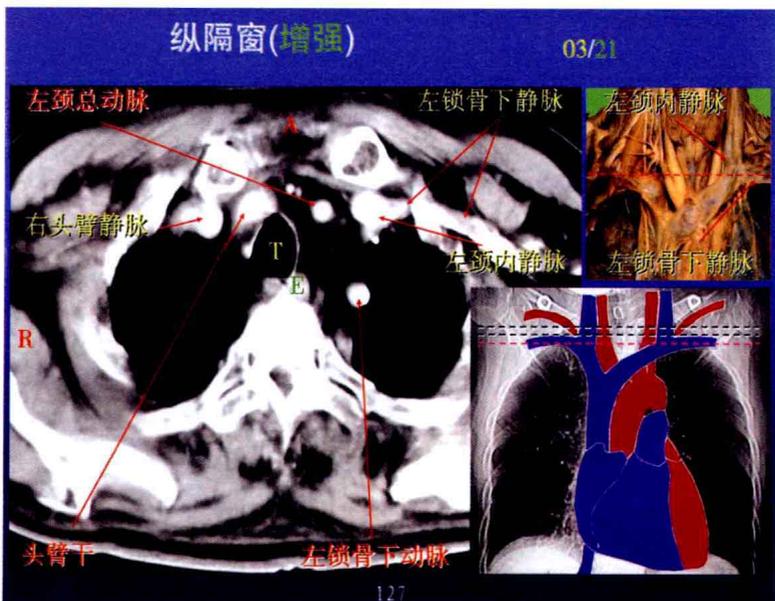
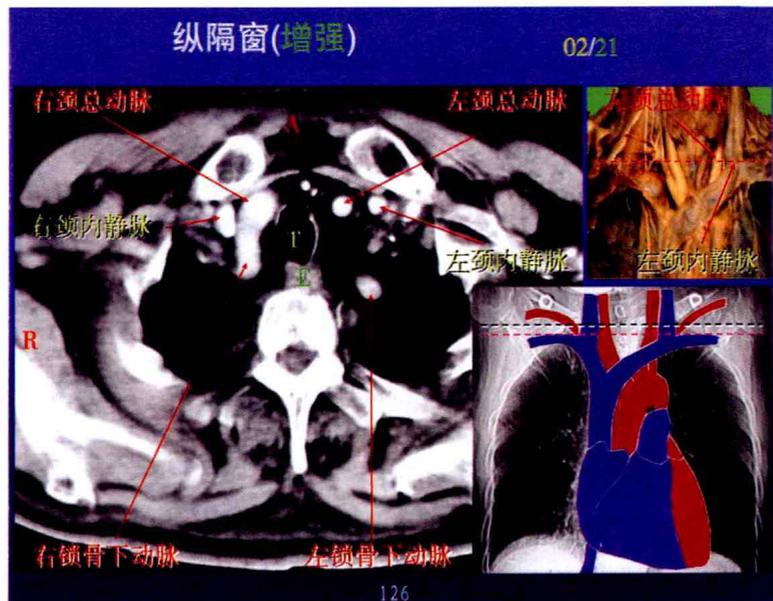
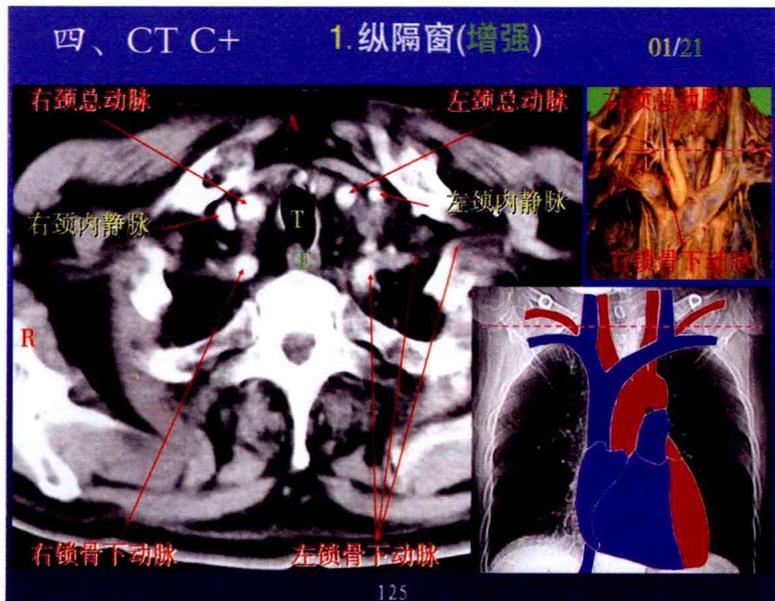


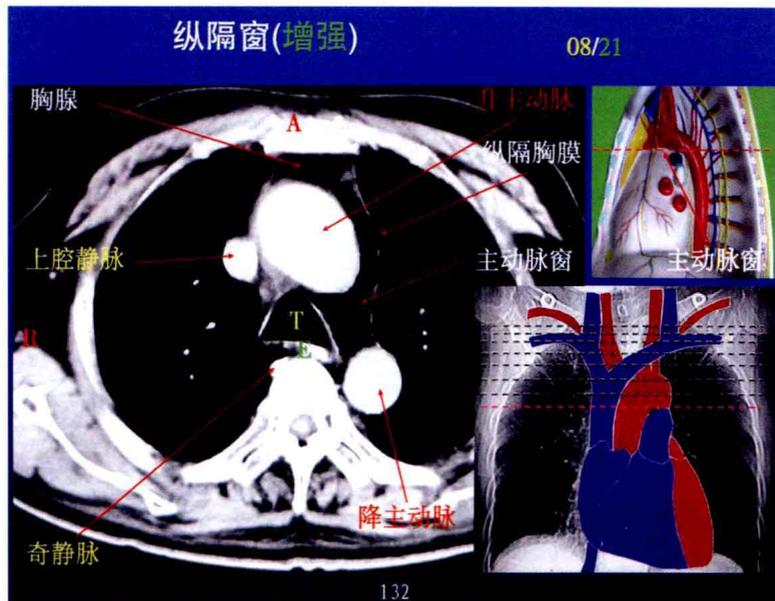
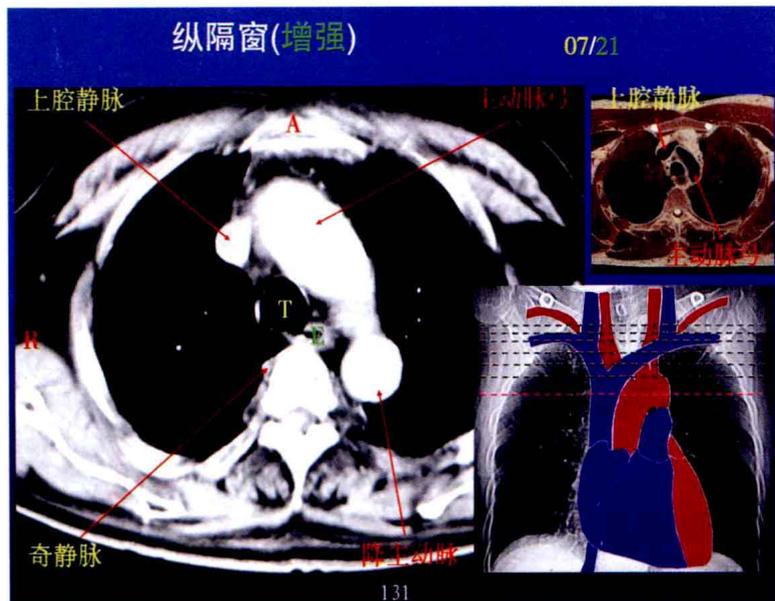
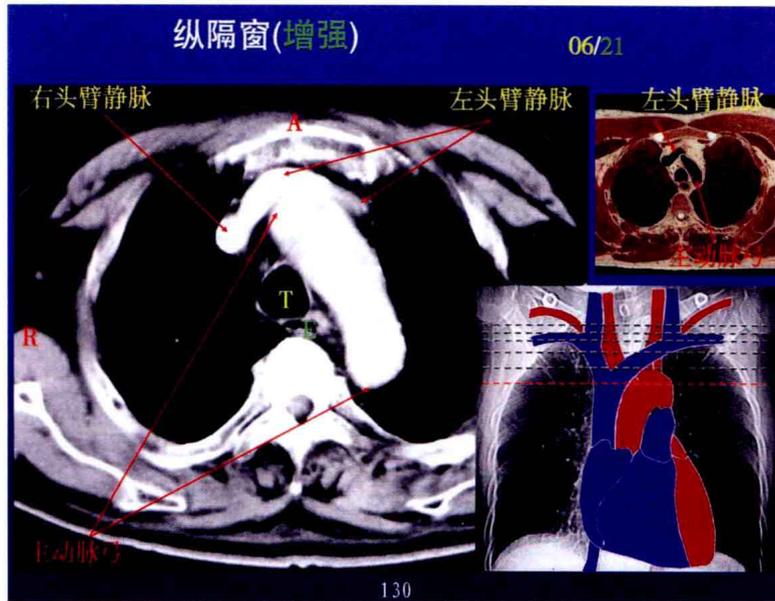
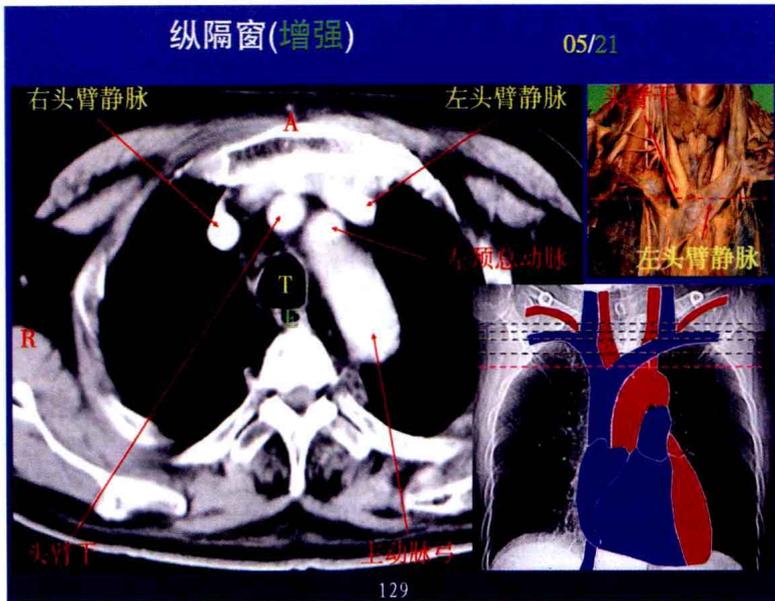
123

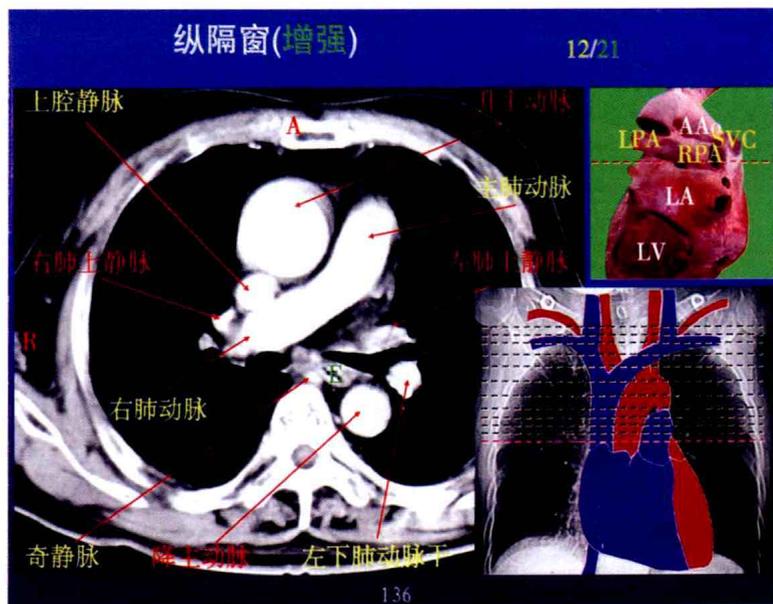
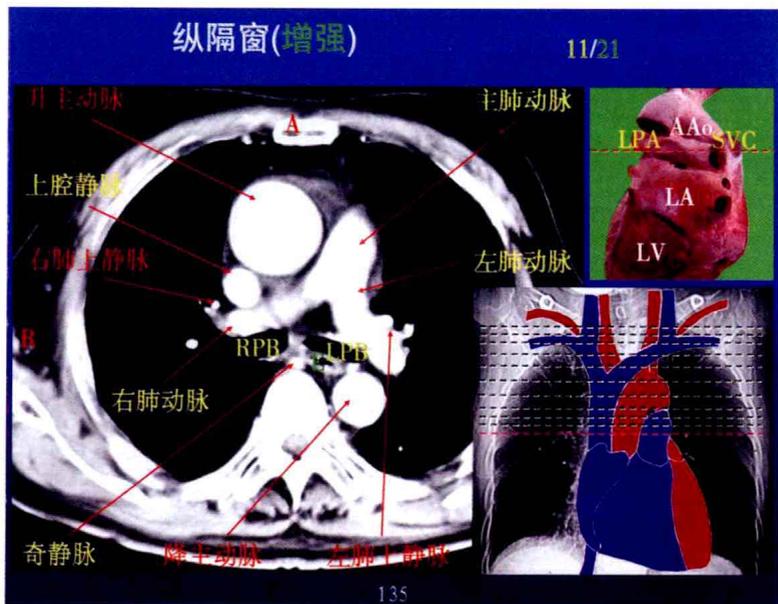
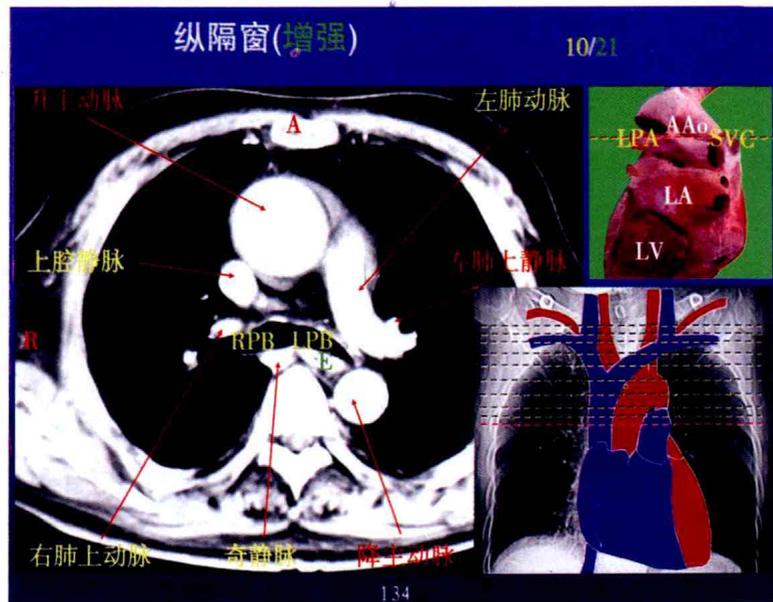
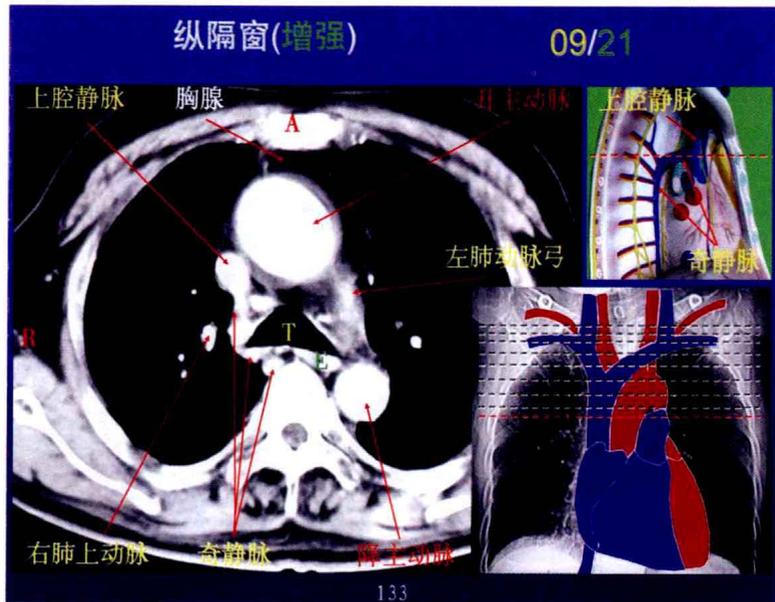
## 冠状动脉造影(左)



124

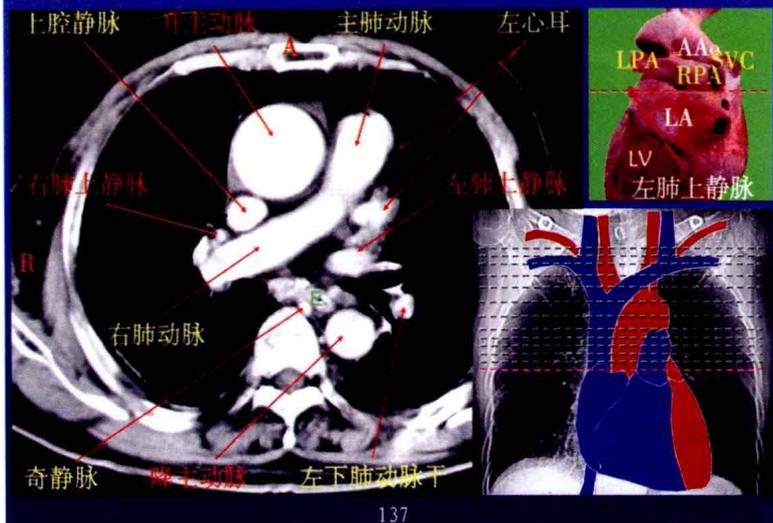






纵隔窗(增强)

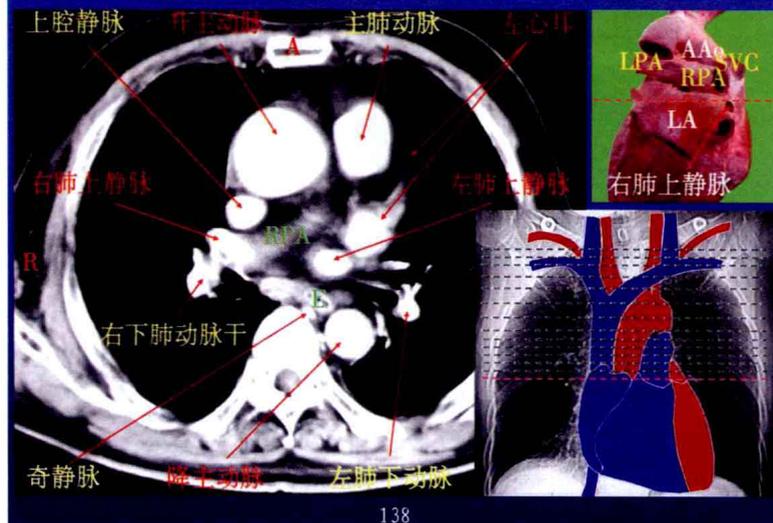
13/21



137

纵隔窗(增强)

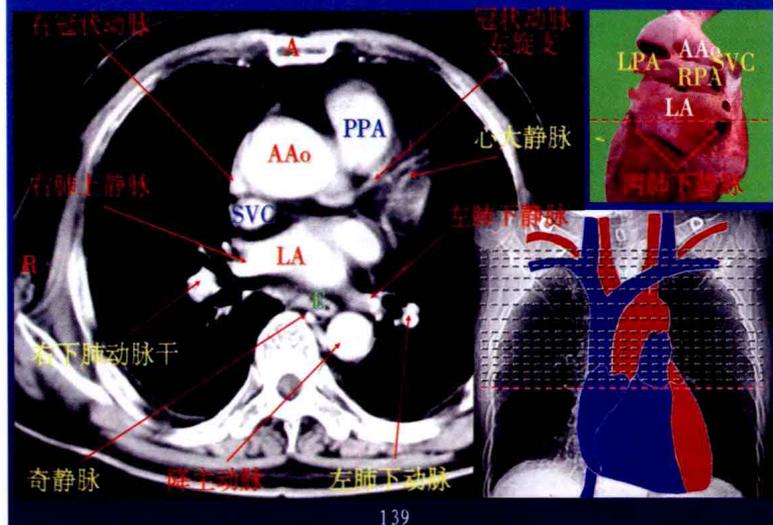
14/21



138

纵隔窗(增强)

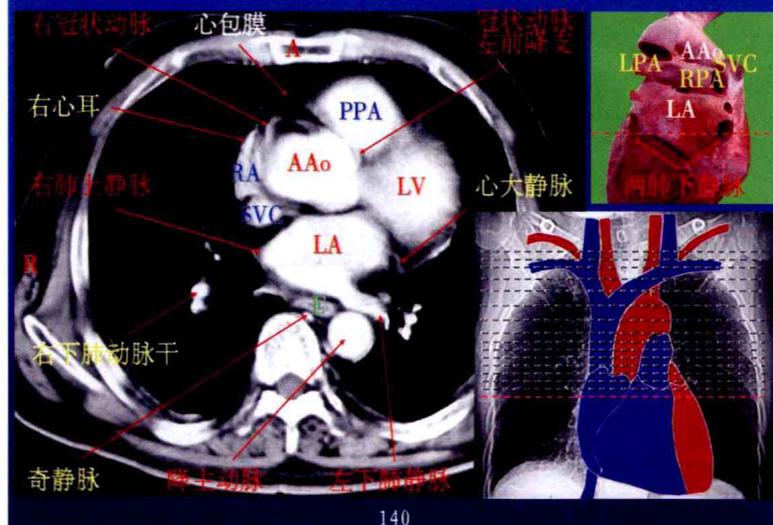
15/21



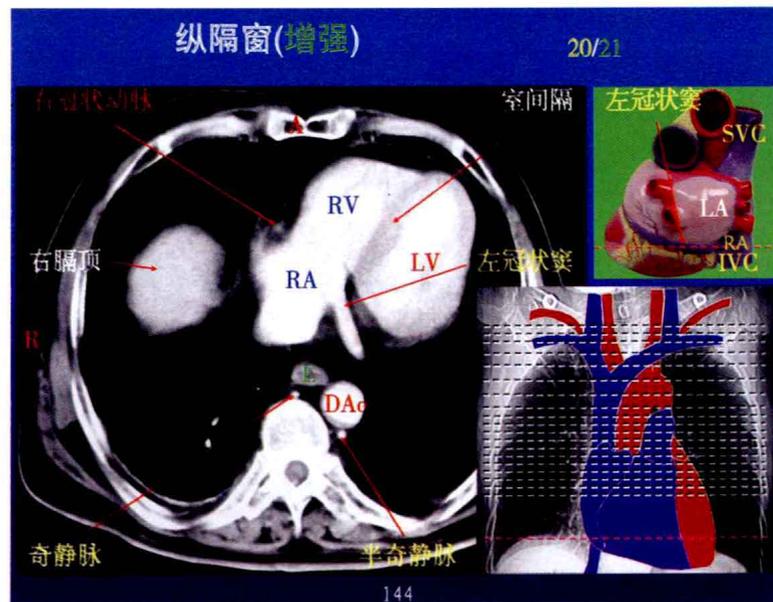
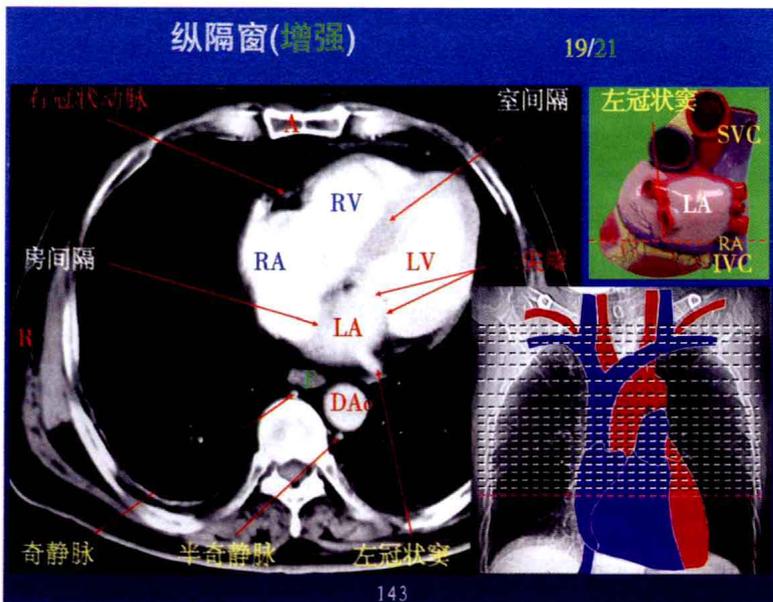
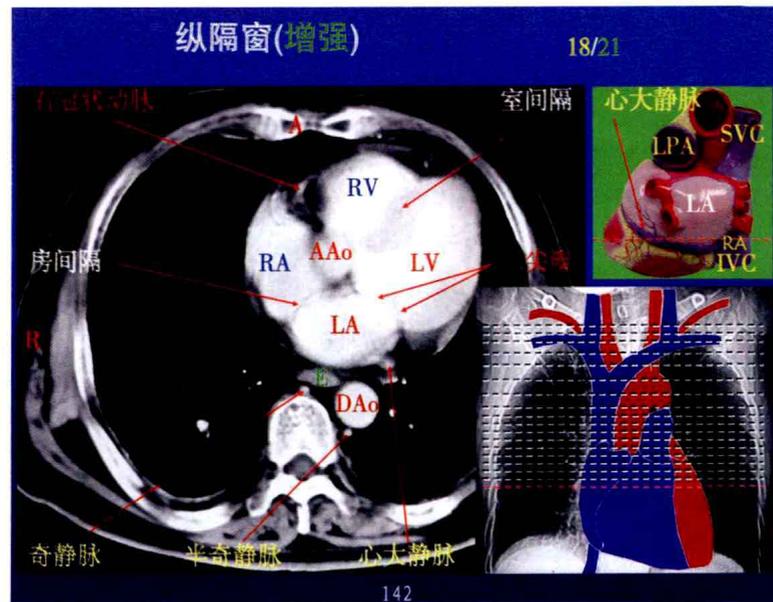
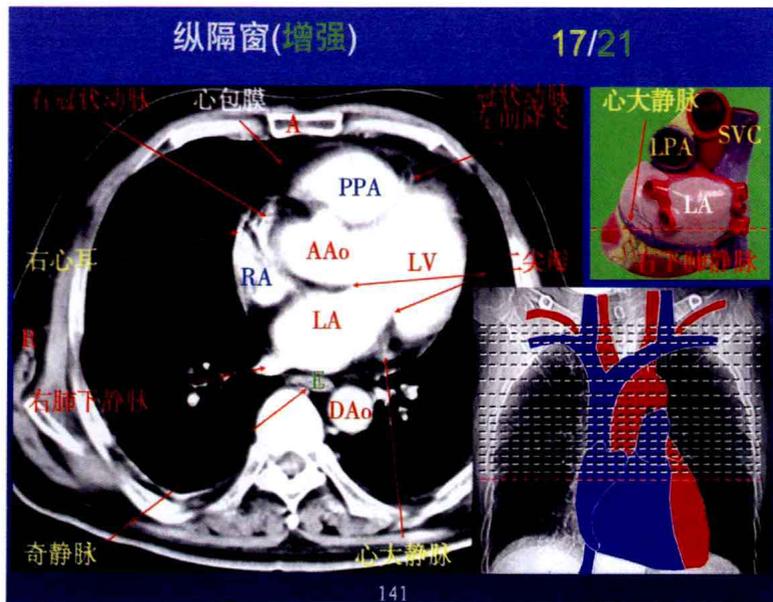
139

纵隔窗(增强)

16/21

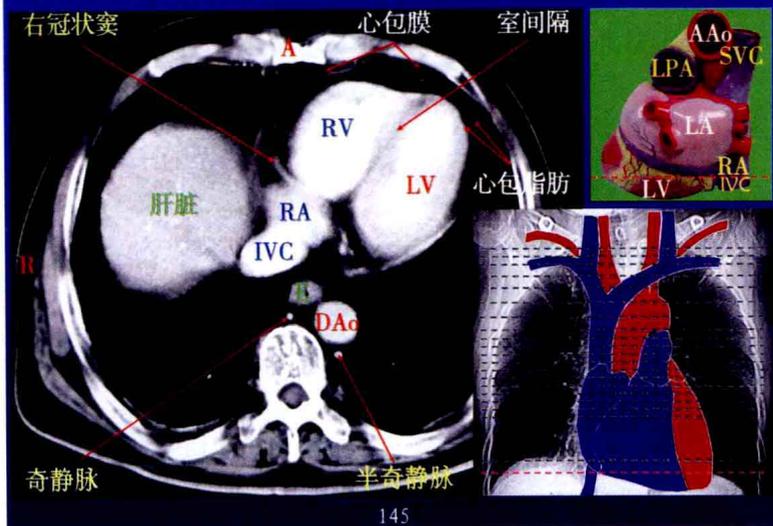


140



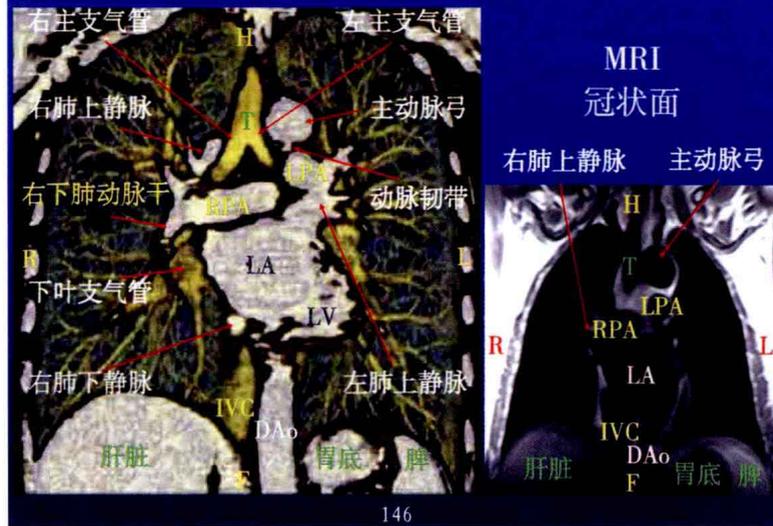
### 纵隔窗(增强)

21/21



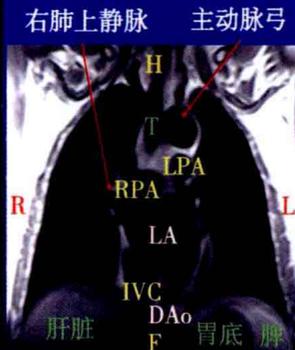
145

### 2. 冠状面(重建)



146

### MRI 冠状面



### 3. 三维成像(重建)

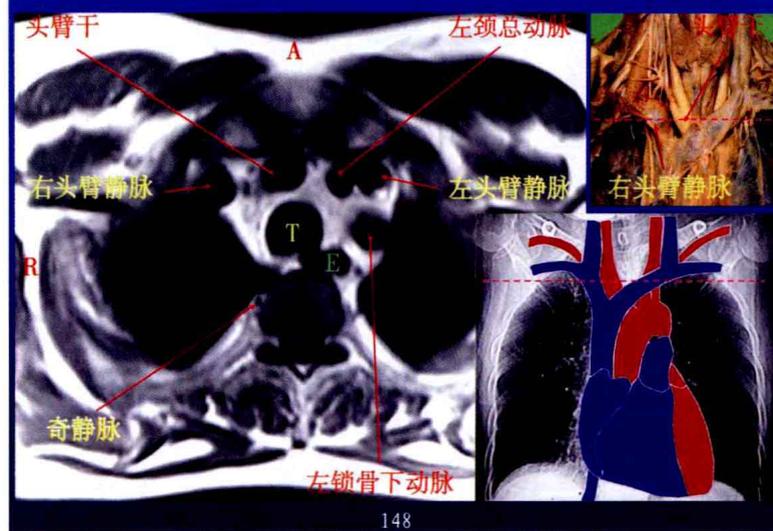


147

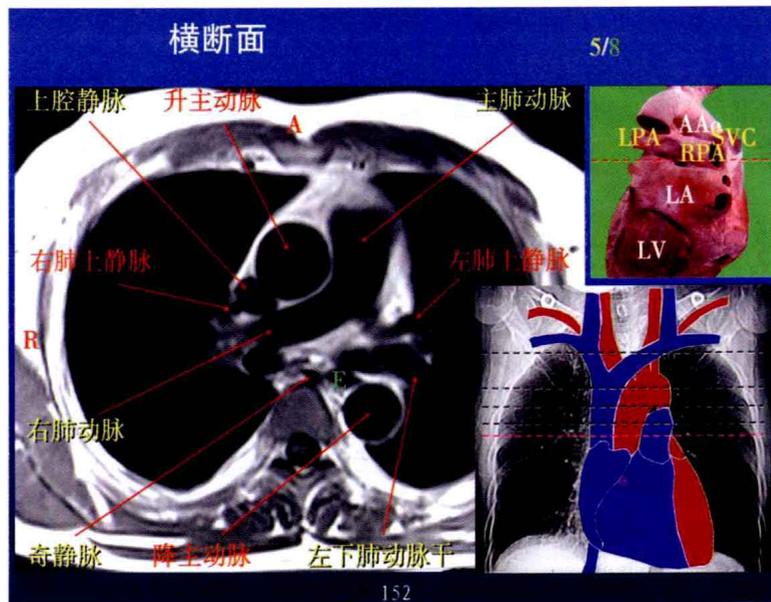
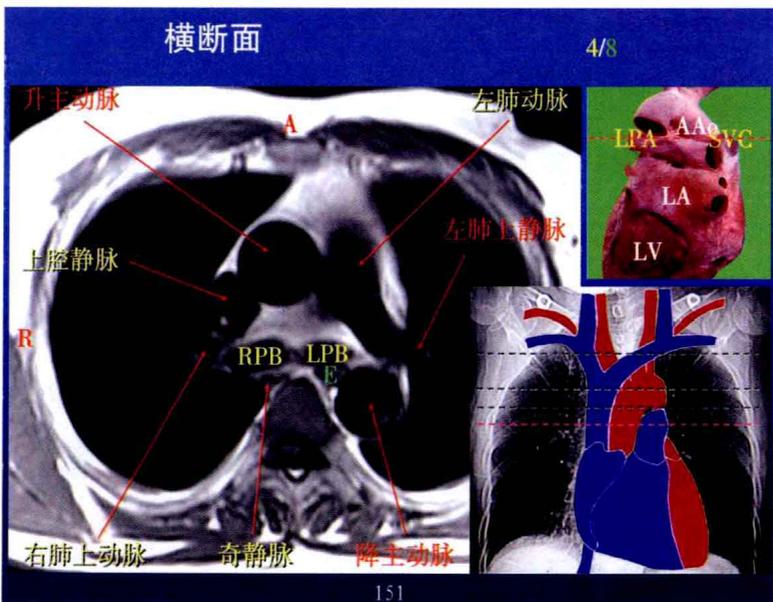
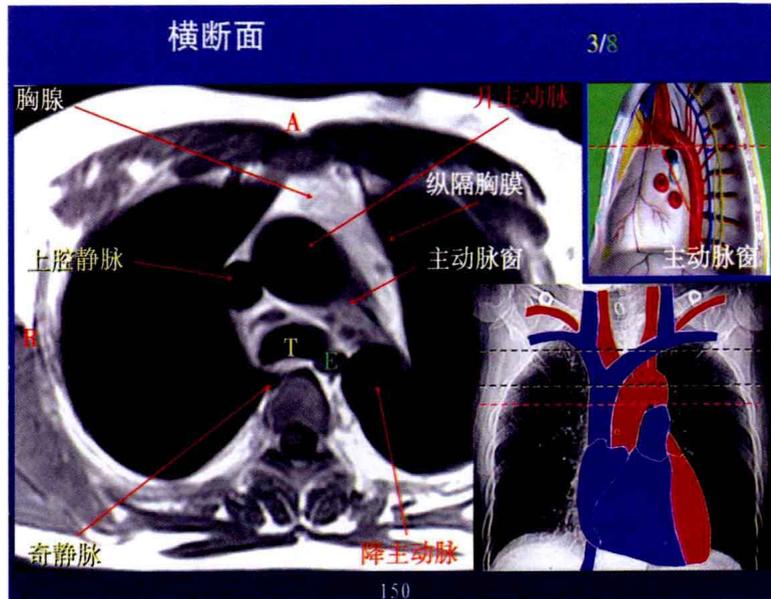
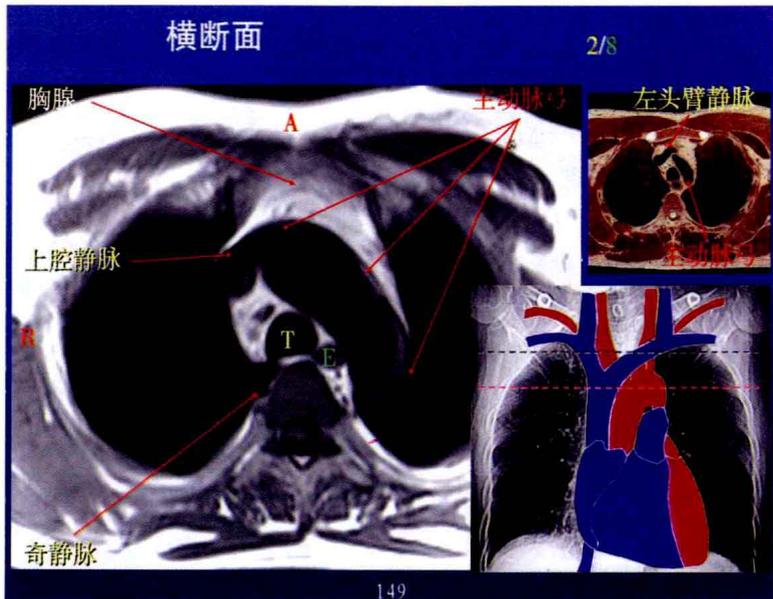
### 五、MRI

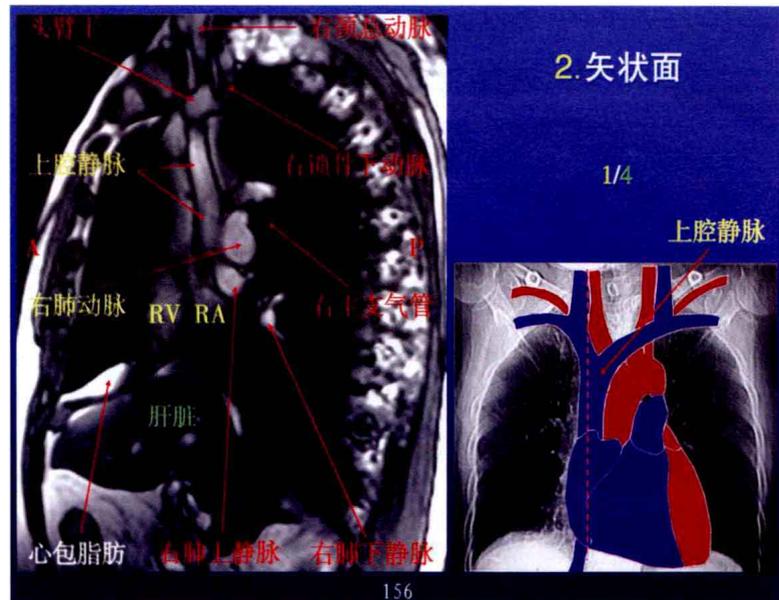
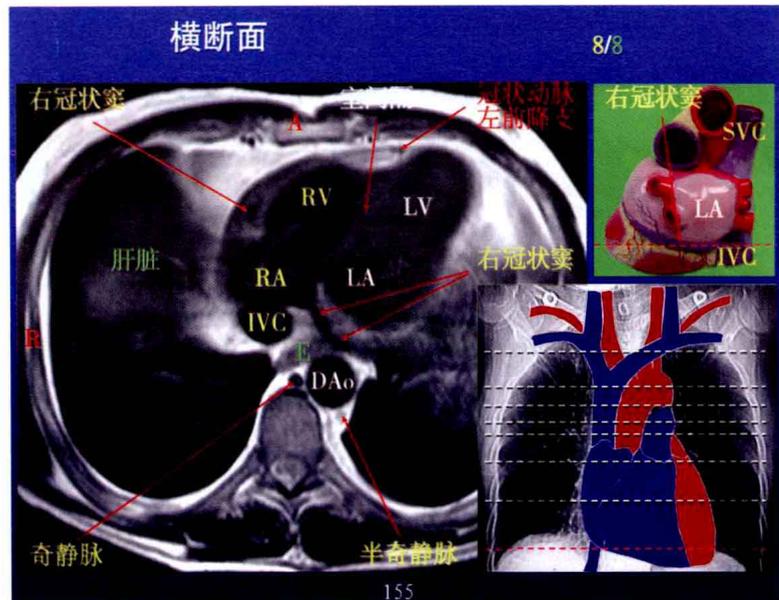
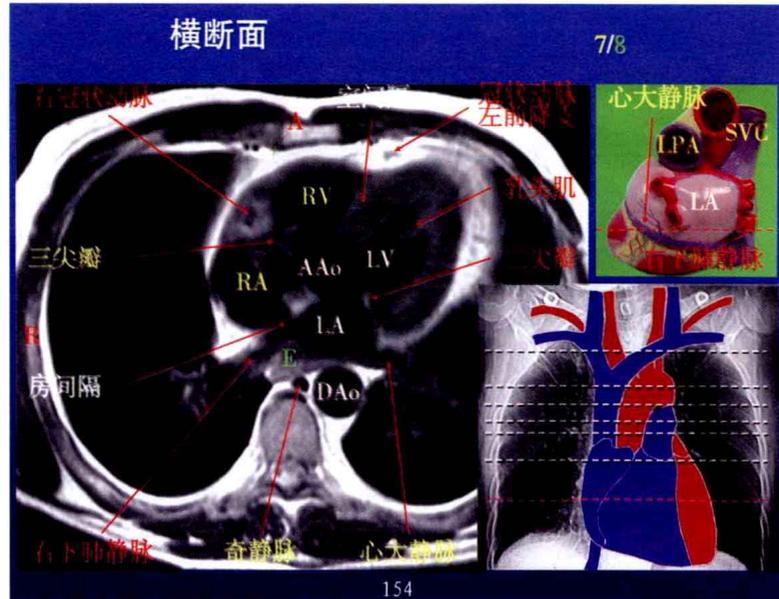
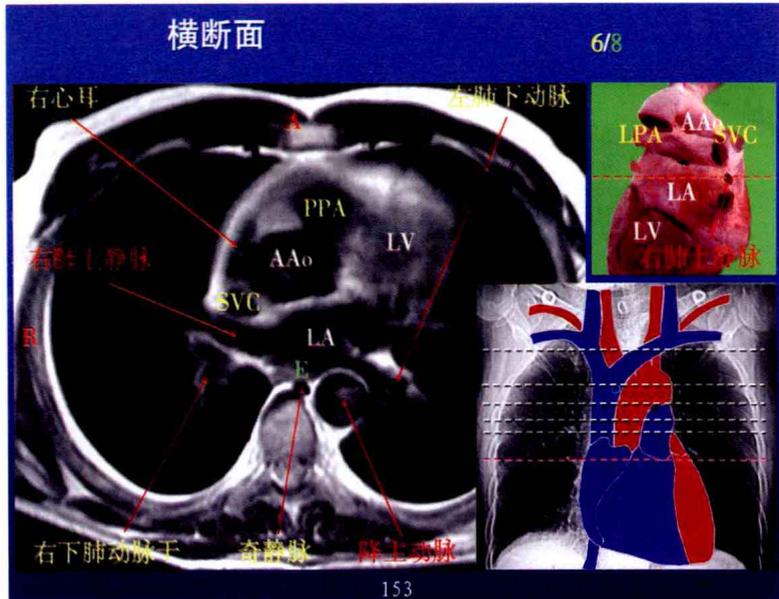
### 1. 横断面

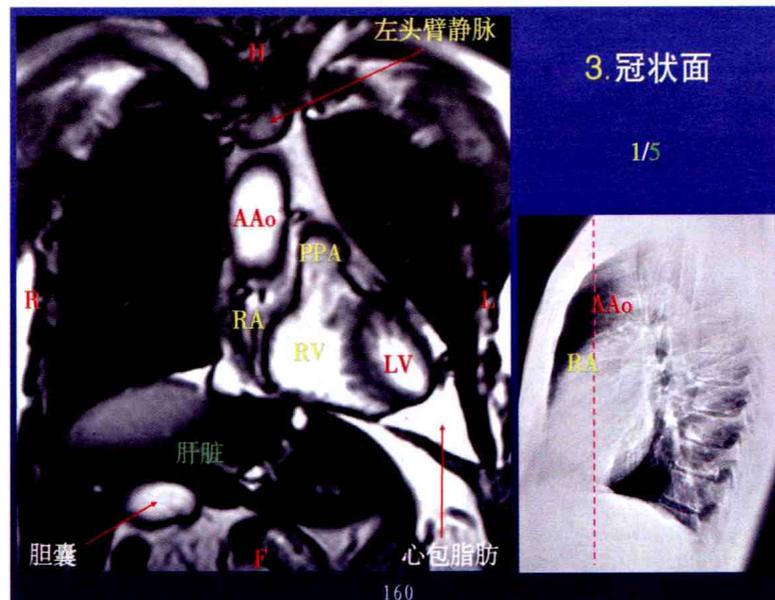
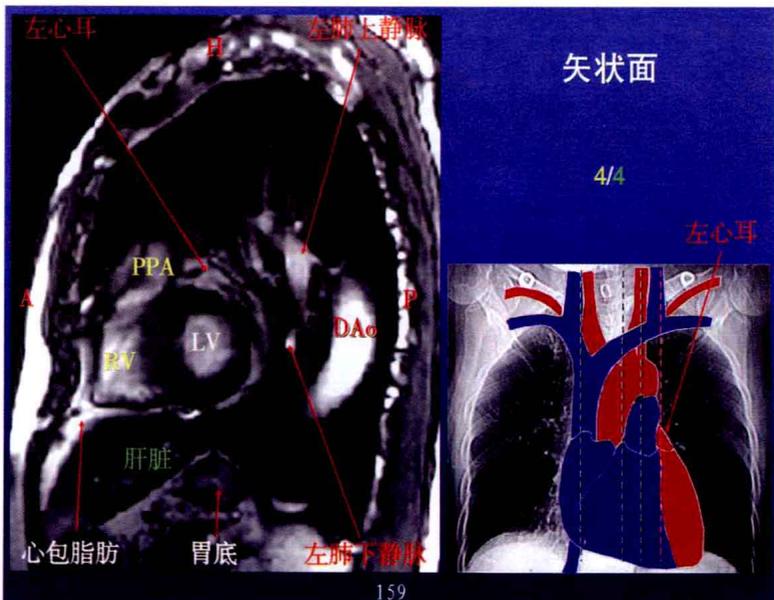
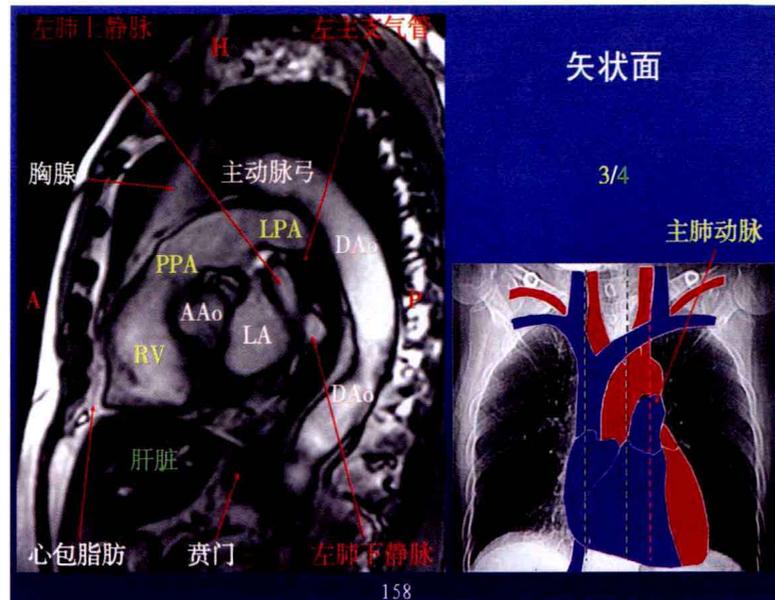
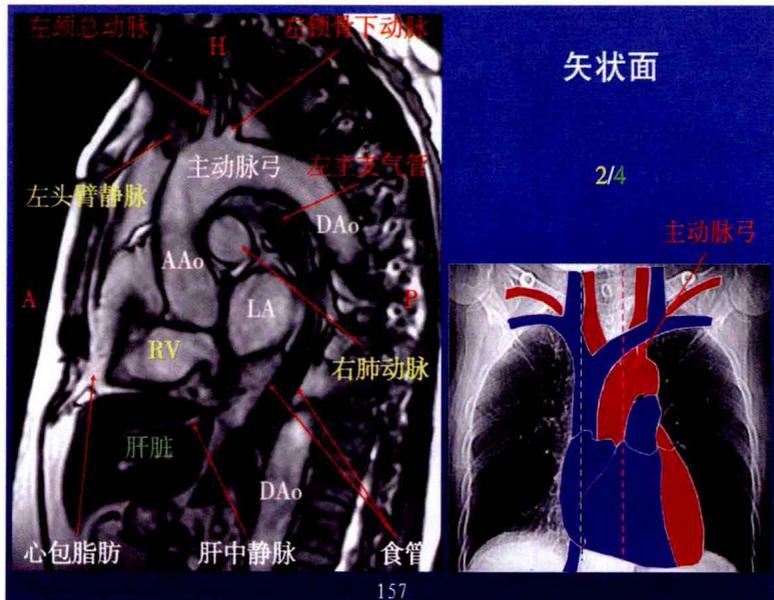
1/8

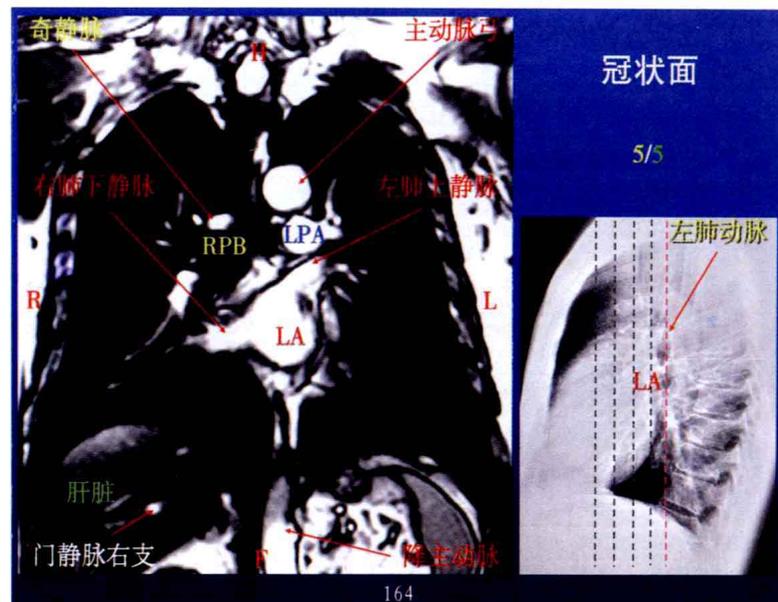
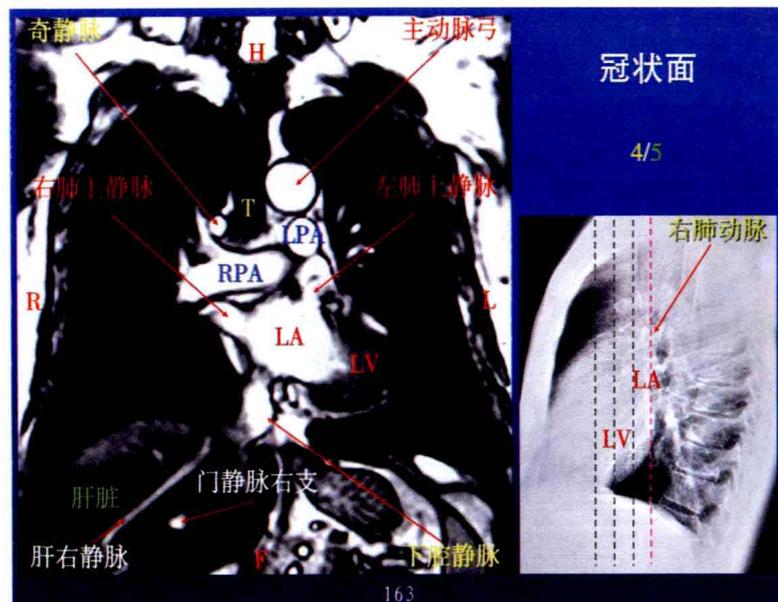
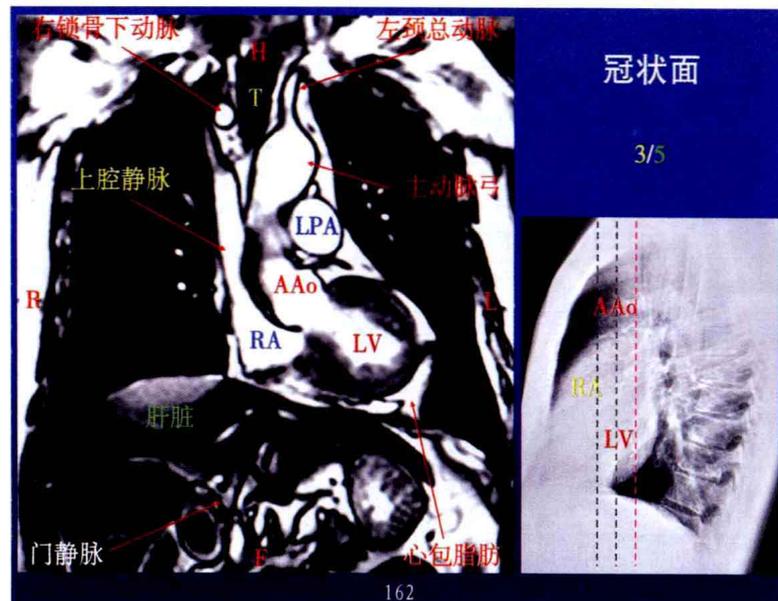
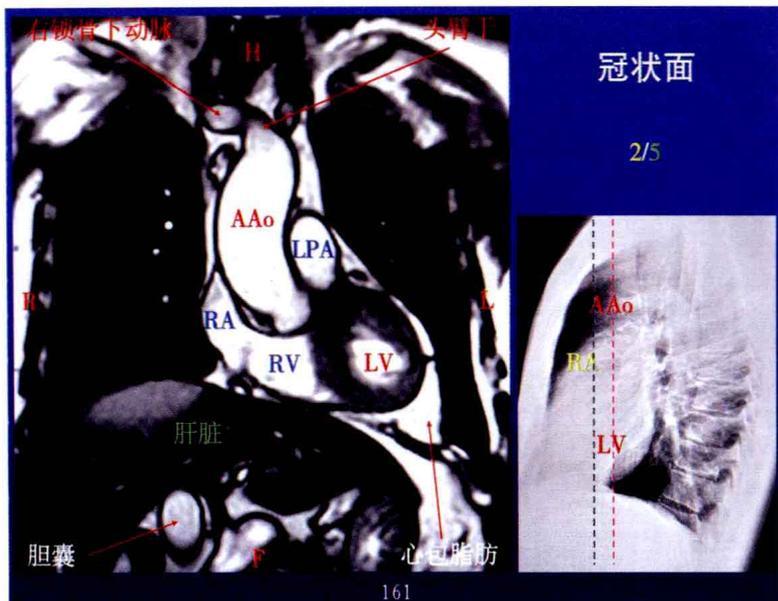


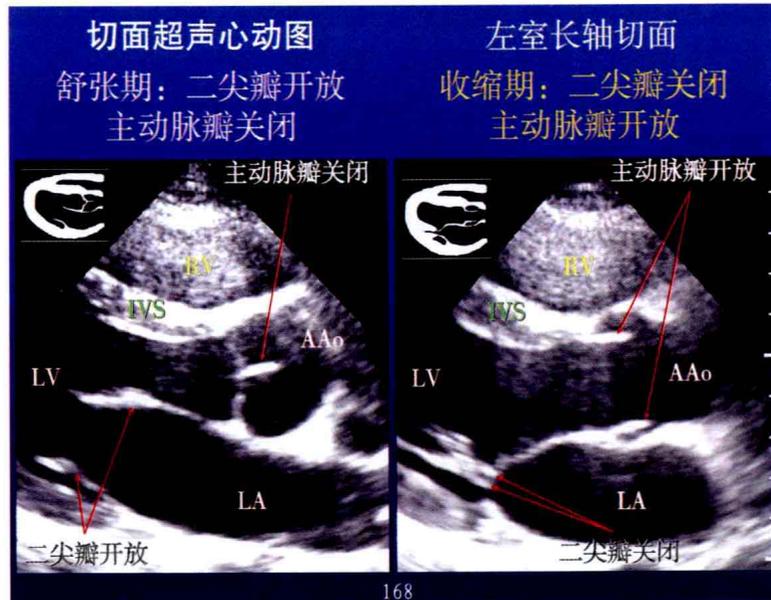
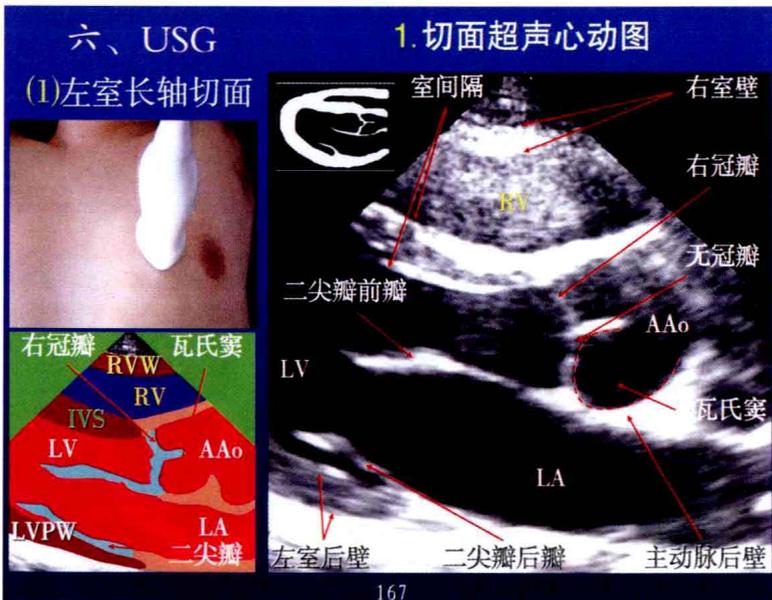
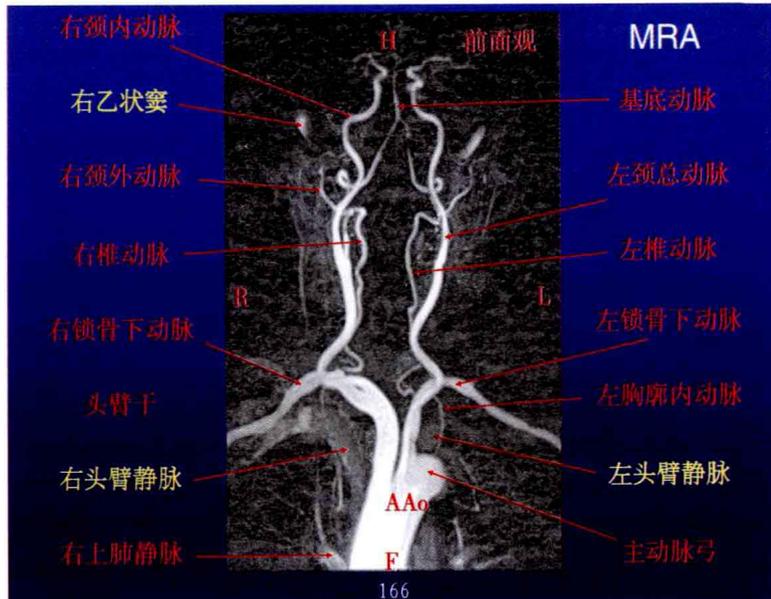
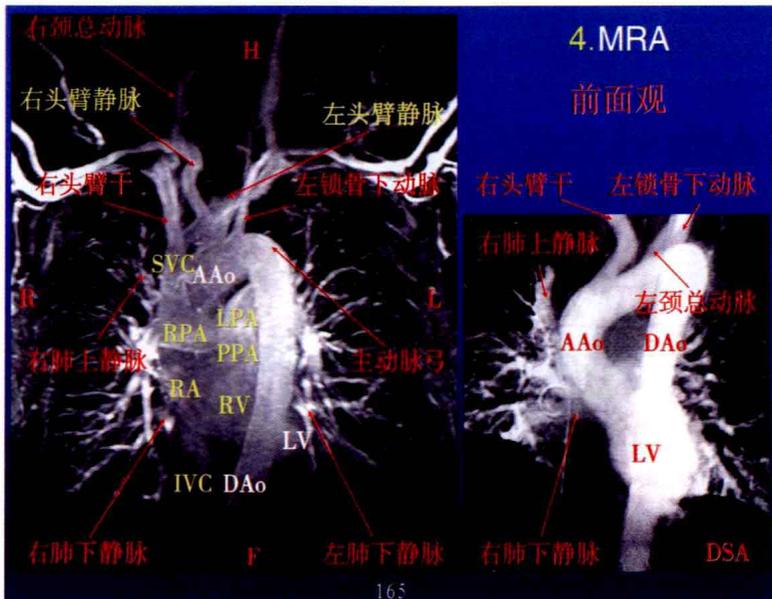
148









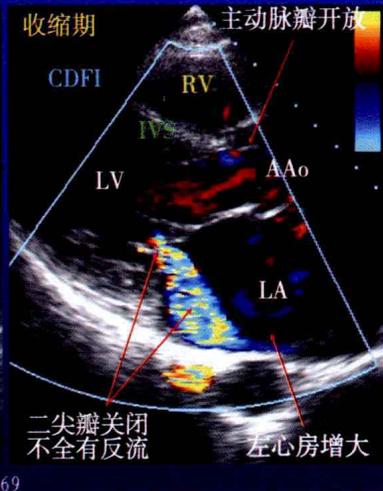


切面超声心动图  
二尖瓣狭窄

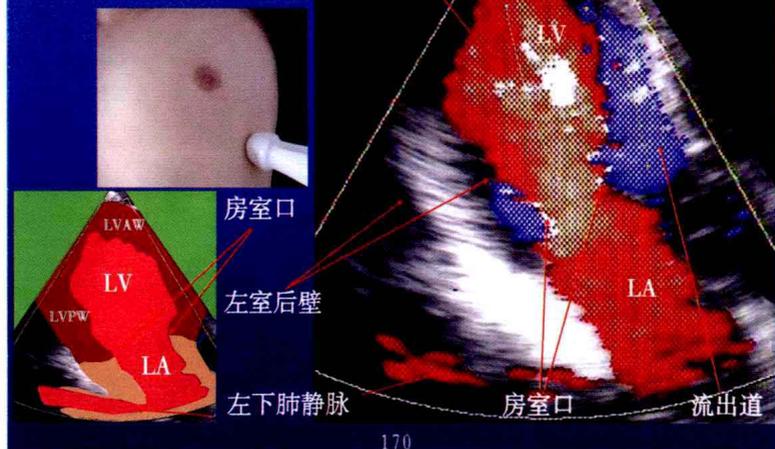


169

左室长轴切面  
二尖瓣关闭不全



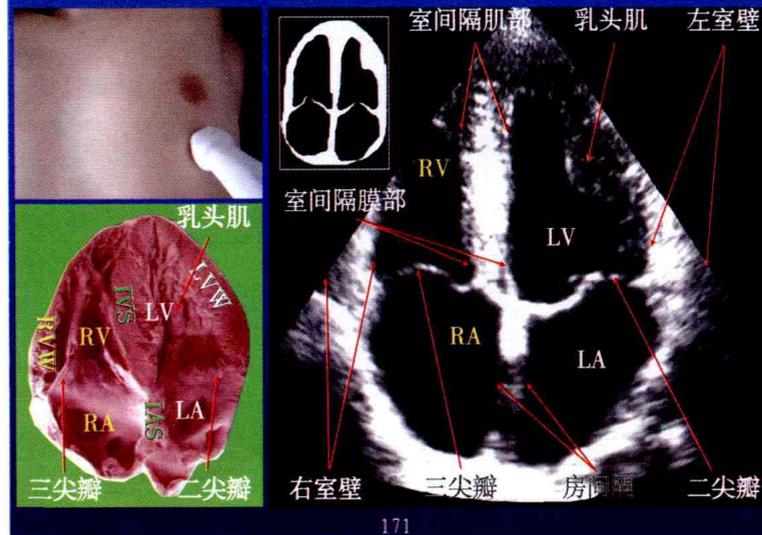
切面超声心动图  
(2)二腔心切面



170

切面超声心动图

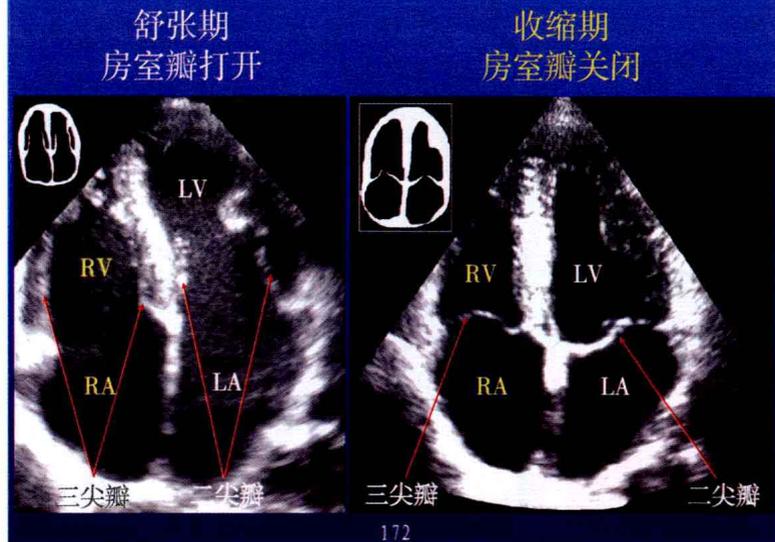
(3)心尖四腔心切面



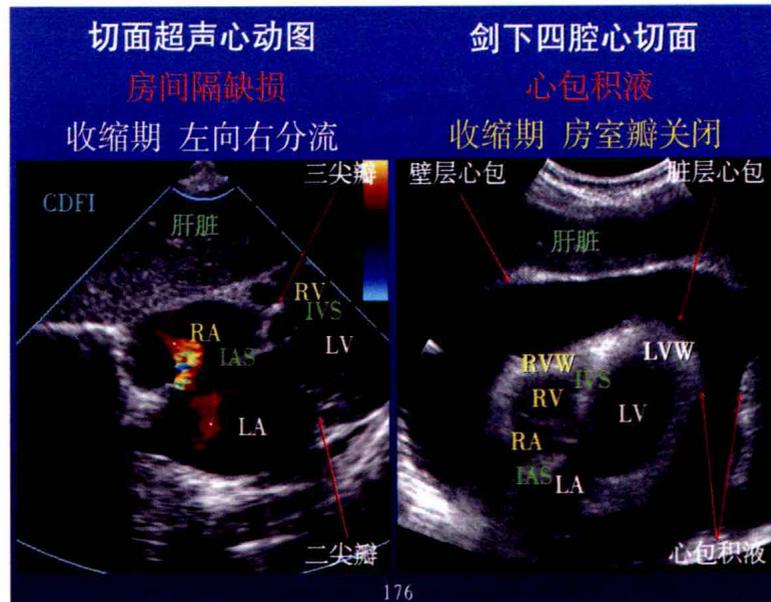
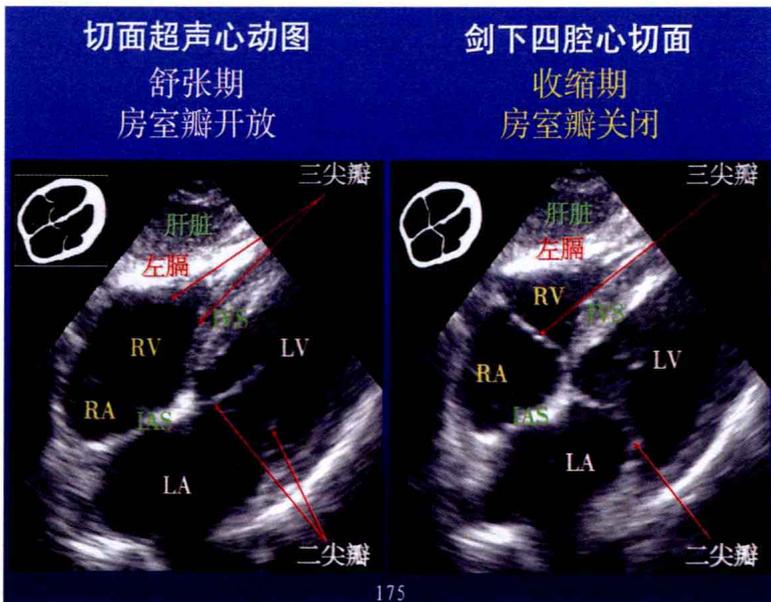
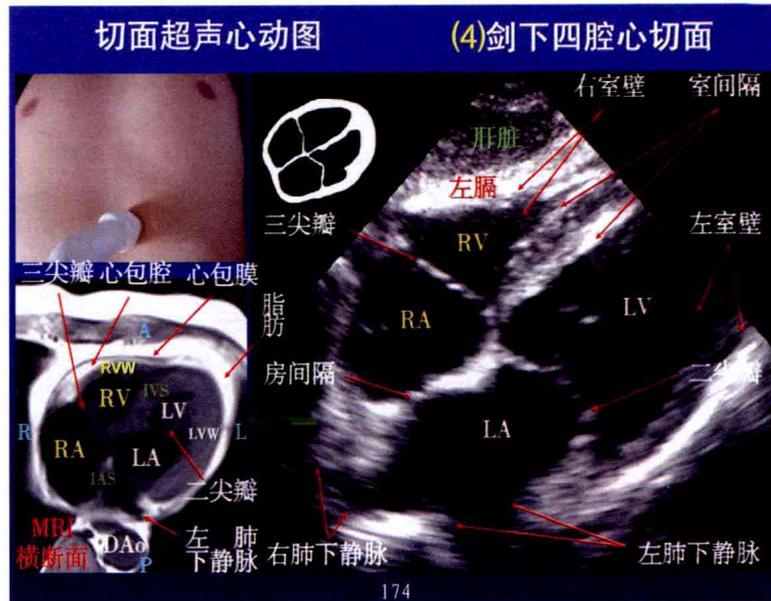
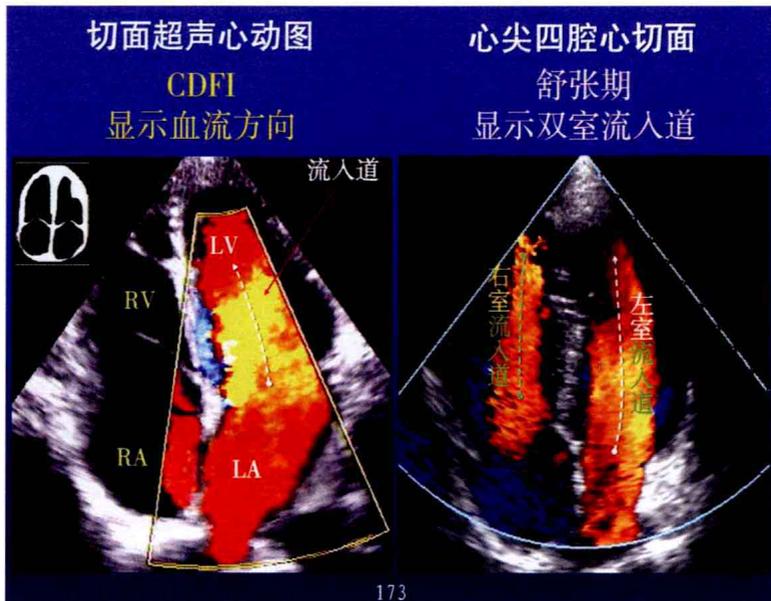
171

切面超声心动图

心尖四腔心切面

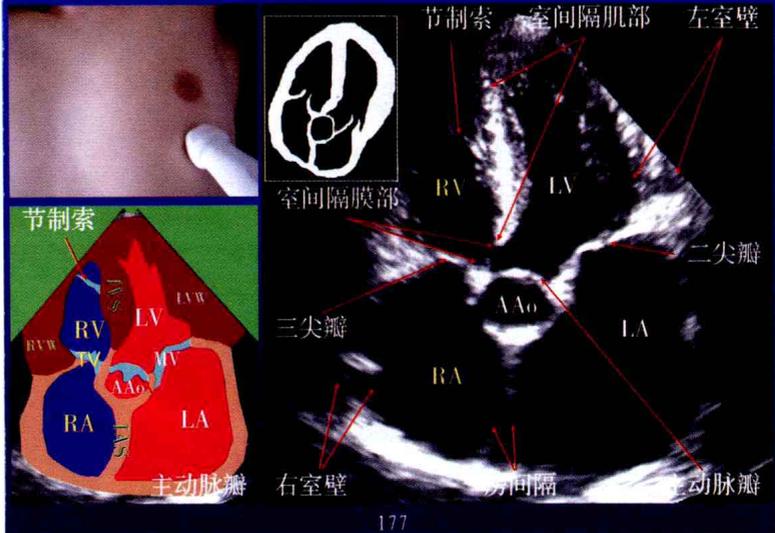


172



切面超声心动图

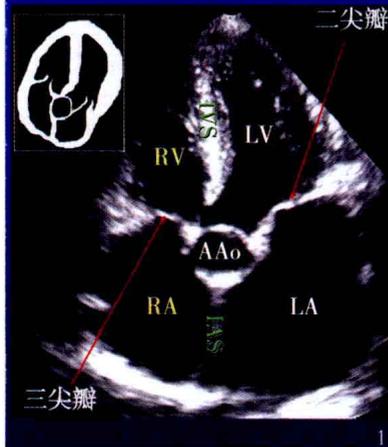
(5)心尖五腔心切面



177

切面超声心动图

收缩期  
房室瓣关闭



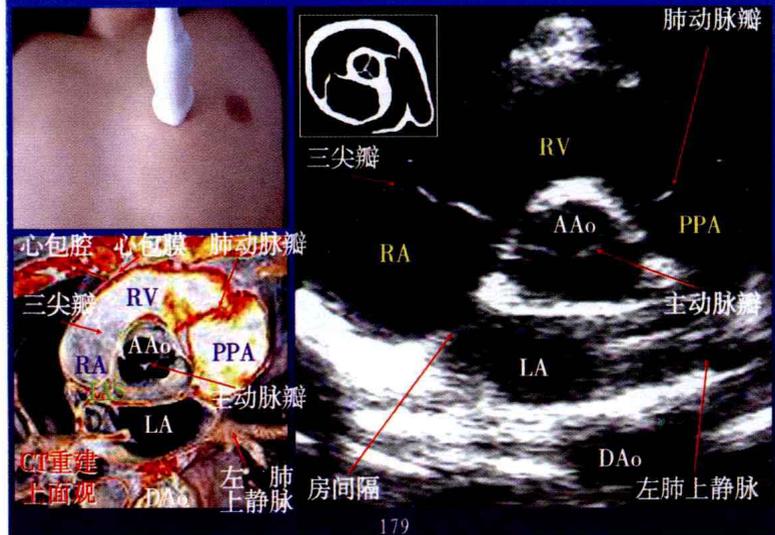
心尖五腔心切面  
CDFI 收缩期  
显示双室流出道



178

切面超声心动图

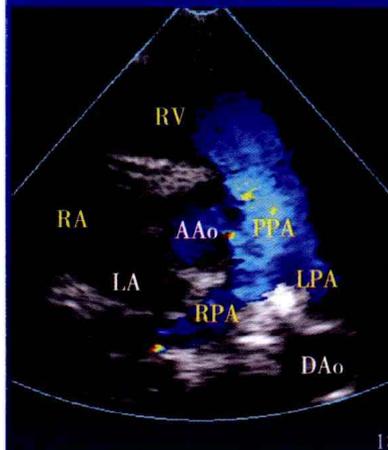
(6)心底短轴切面



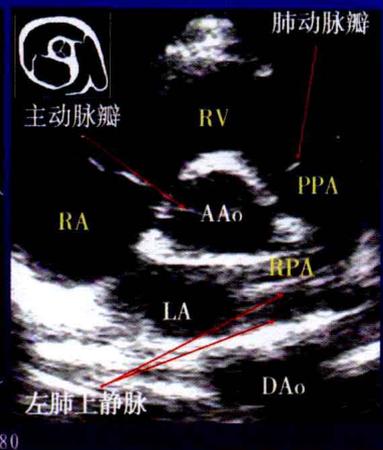
179

切面超声心动图

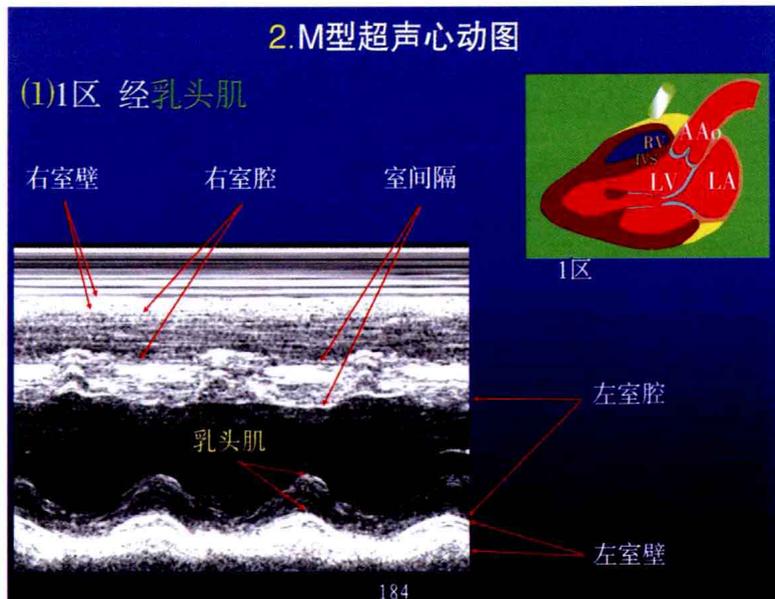
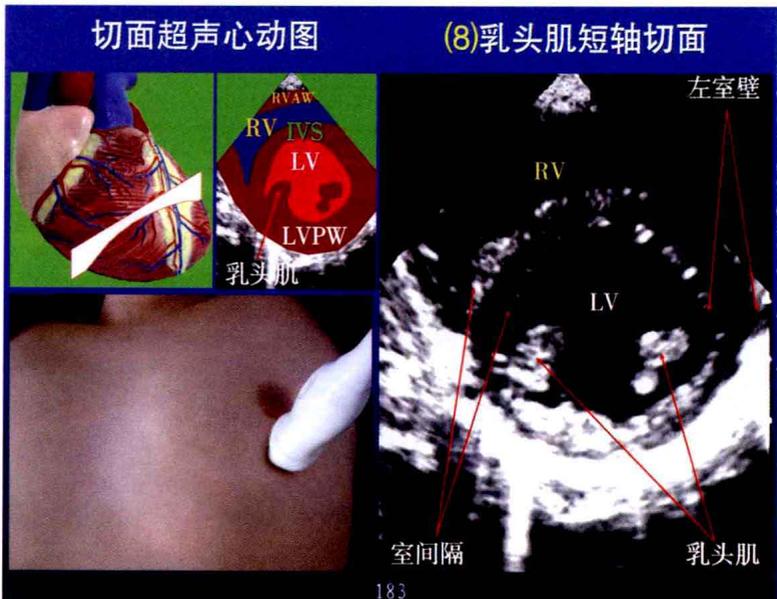
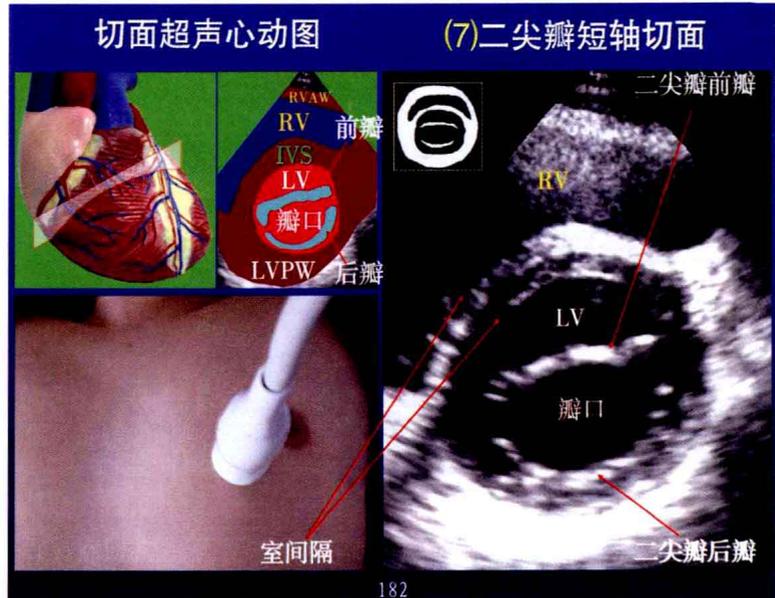
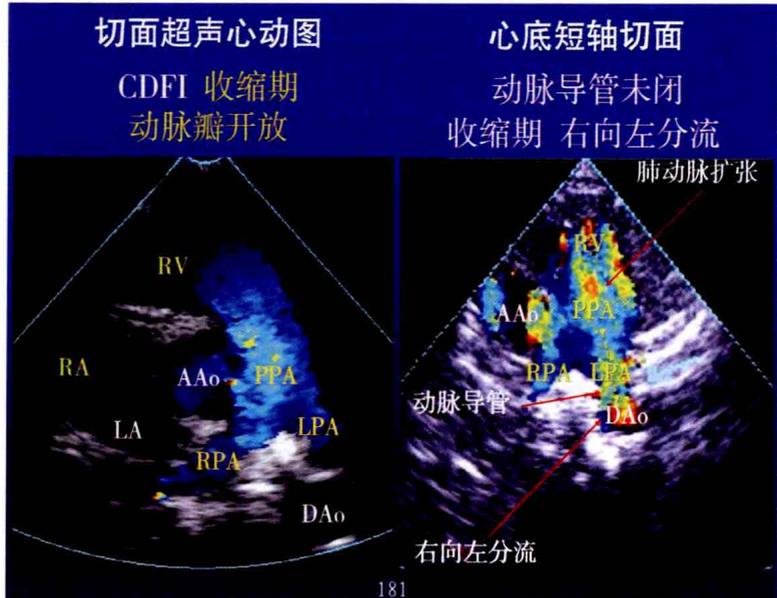
CDFI 收缩期  
动脉瓣开放



心底短轴切面  
舒张期  
动脉瓣关闭

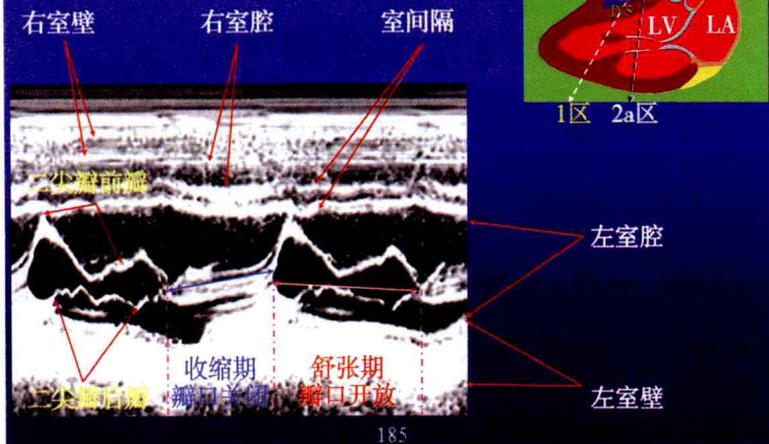


180



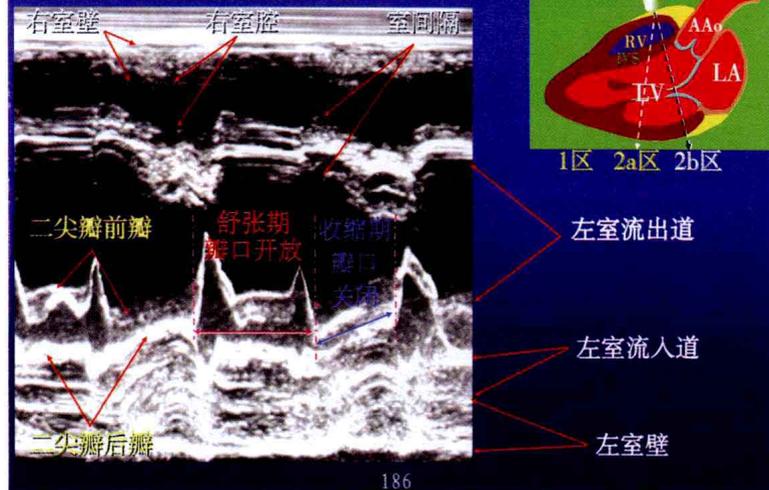
### M型超声心动图

#### (2)2a区 经二尖瓣腱索



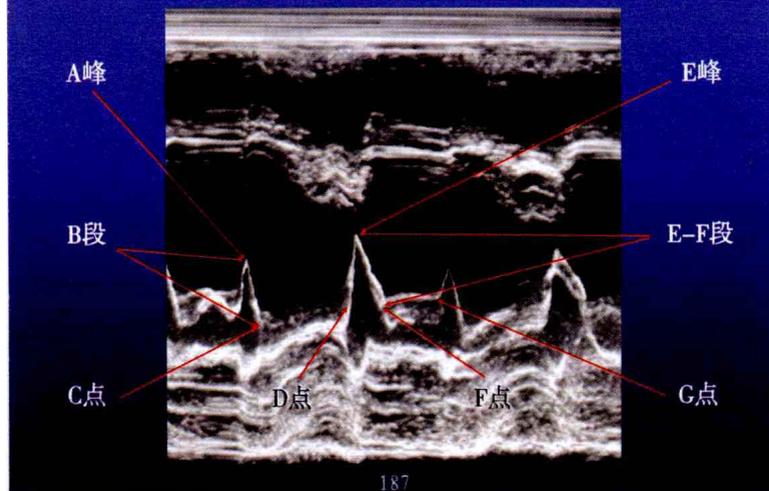
### M型超声心动图

#### (3)2b区 经二尖瓣瓣膜



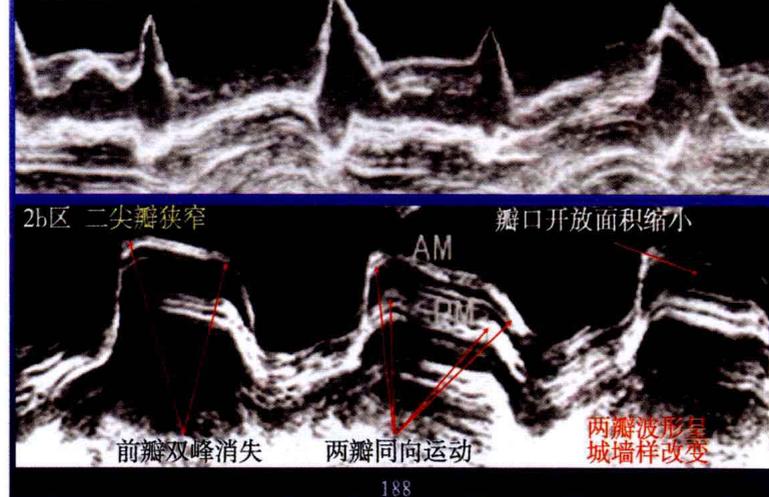
### M型超声心动图

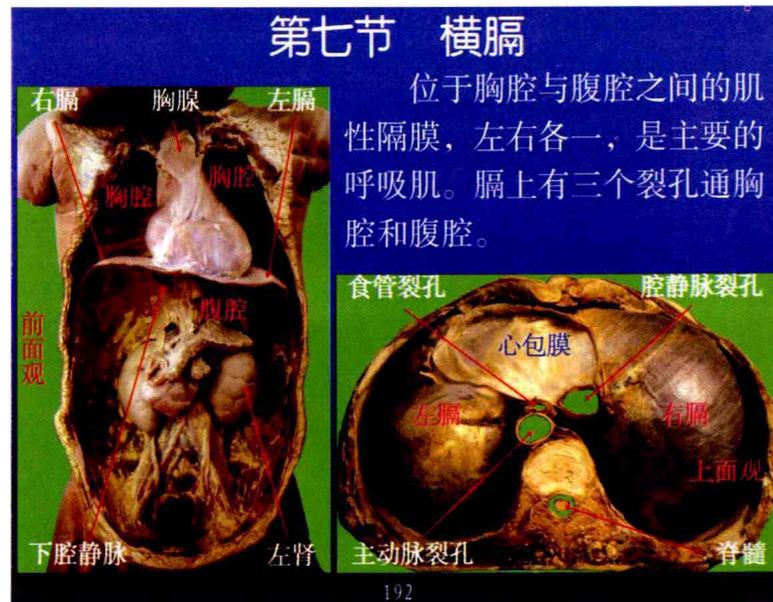
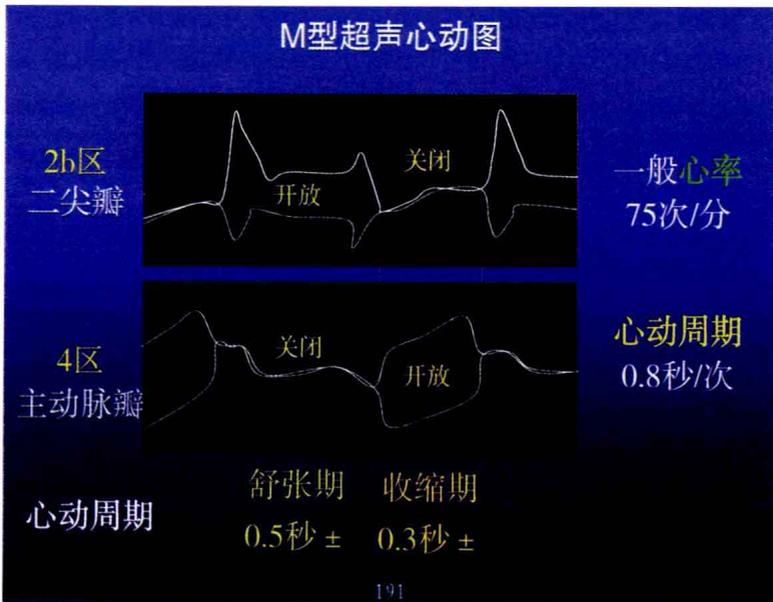
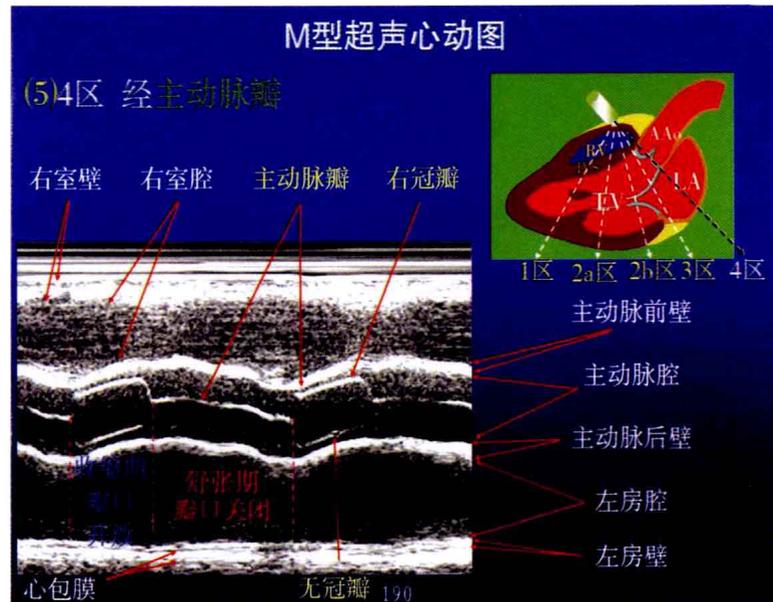
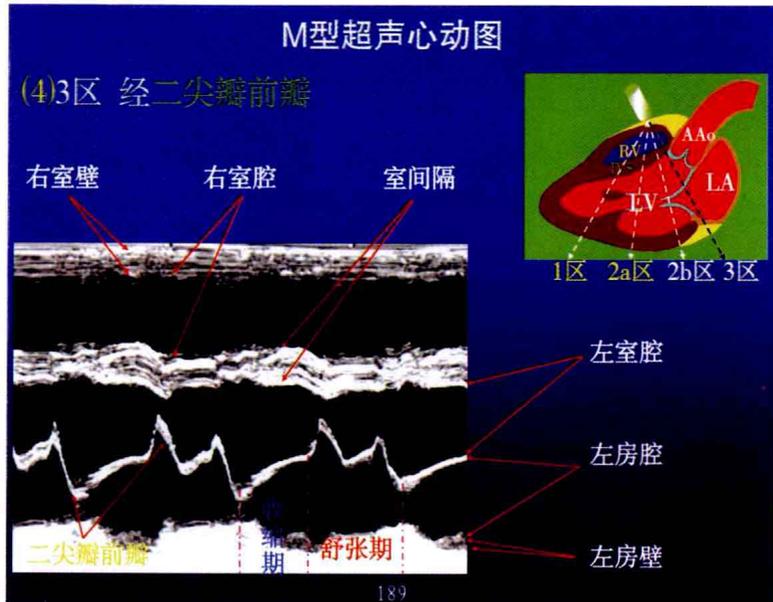
#### 2b区 经二尖瓣瓣膜



### M型超声心动图

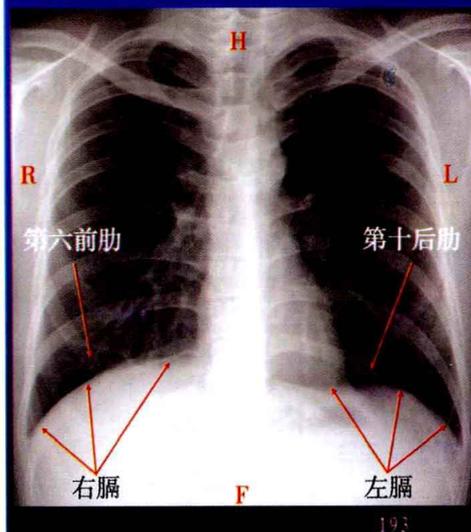
#### 2b区 经二尖瓣瓣膜





# 一、胸片

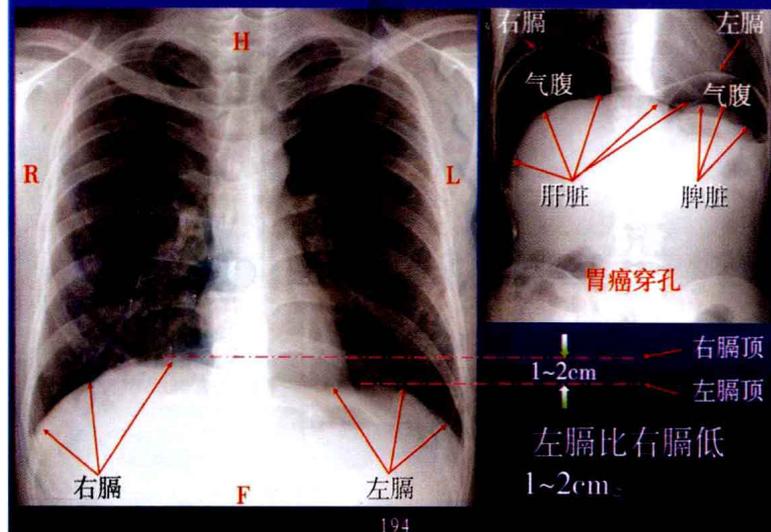
## 1. 正位片



膈顶平第九、第十后肋，或者平第六前肋。左膈比右膈低1~2cm。

透视下膈活动度：平静呼吸3cm左右；深呼吸3~6cm。

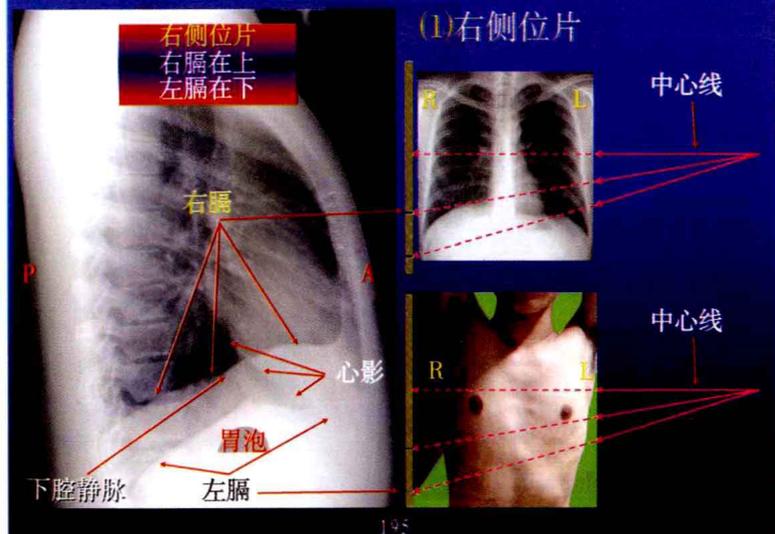
## 正位片



右膈顶  
左膈顶  
1~2cm  
左膈比右膈低1~2cm

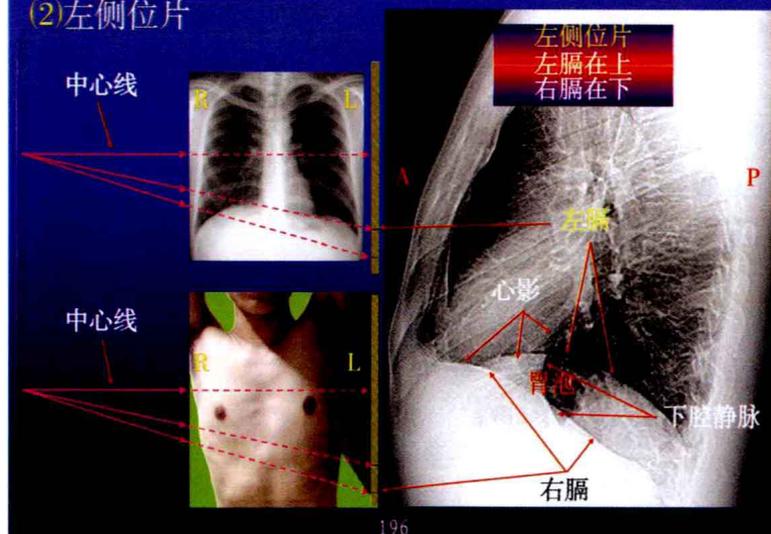
## 2. 侧位片

### (1) 右侧位片

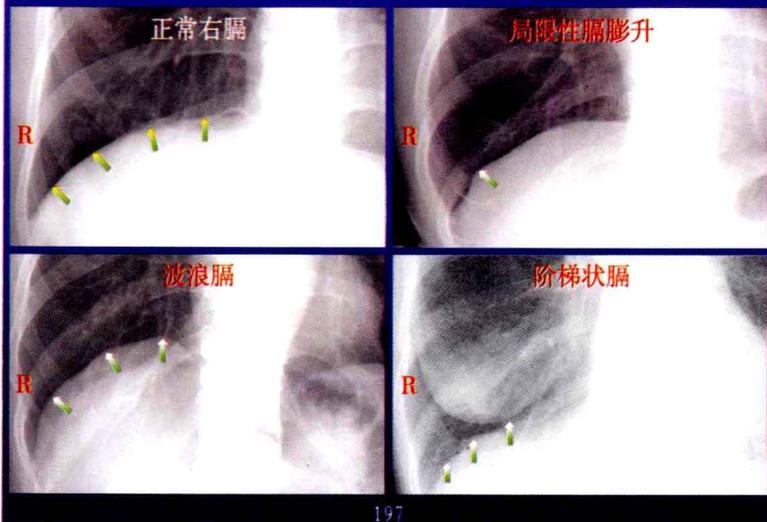


## 侧位片

### (2) 左侧位片

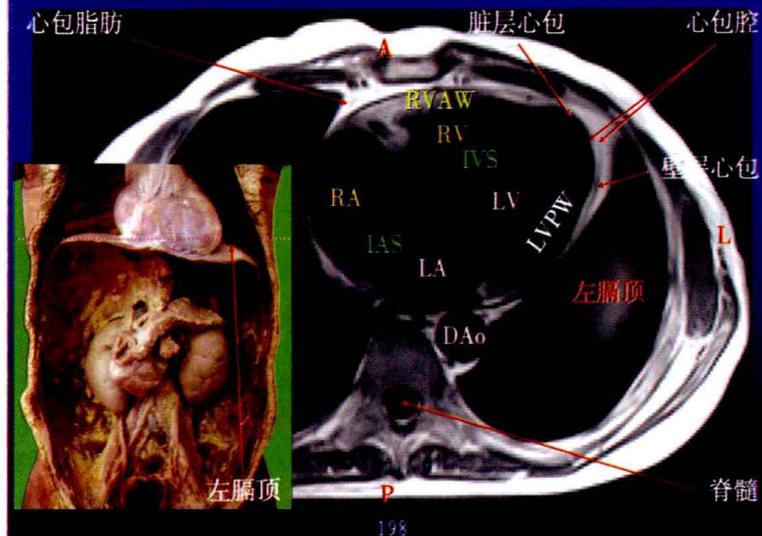


### 3. 膈肌变异

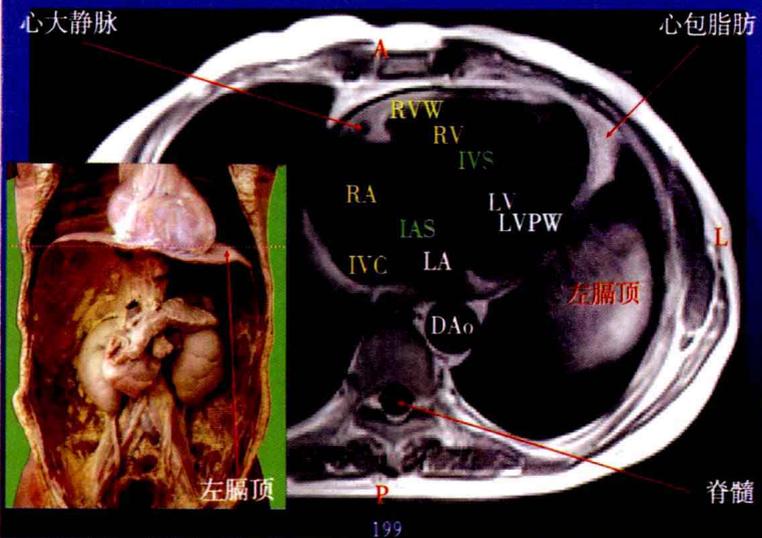


### 二、MRI

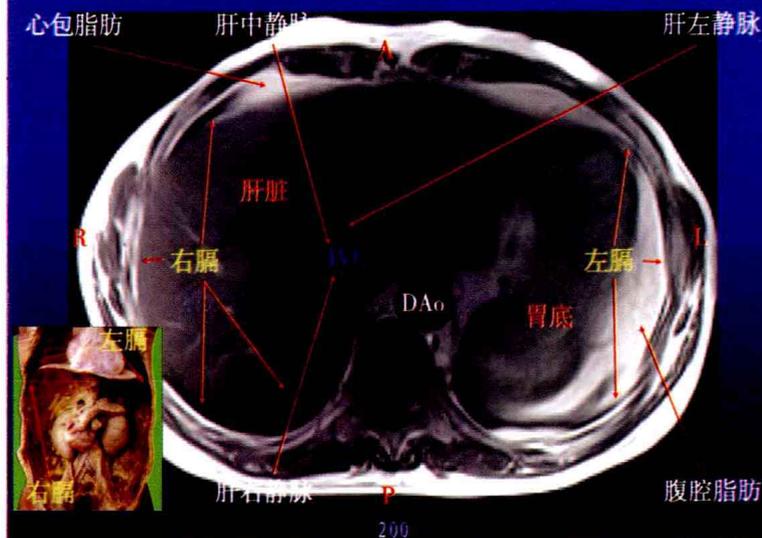
#### 1. 横断面



#### 横断面



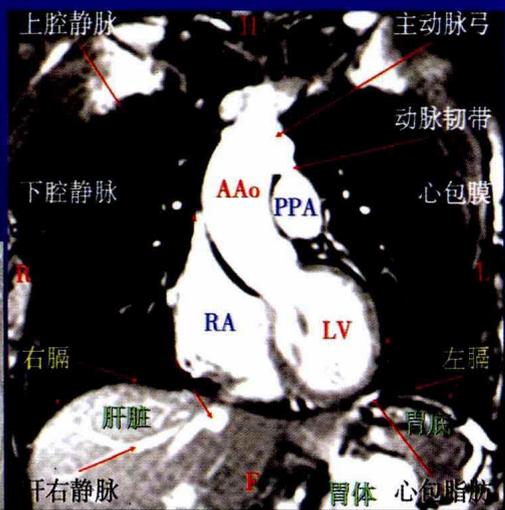
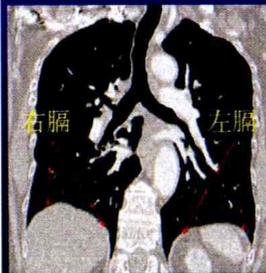
#### 横断面



## 2. 冠状面

增强

CT重建



201



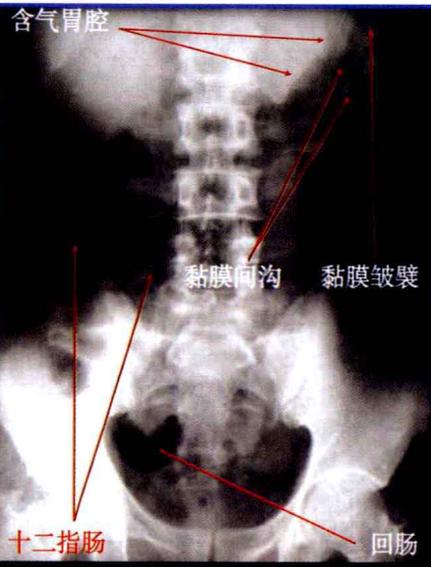
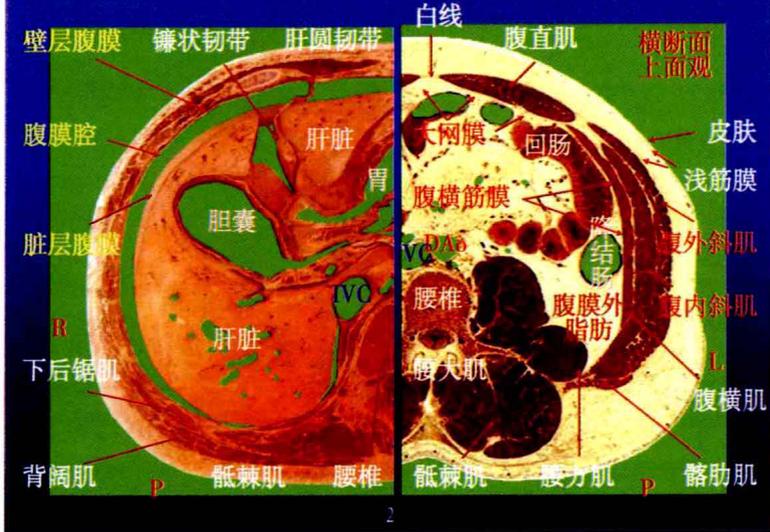
# 第五章 腹部

本章重点介绍消化道的影像解剖、消化腺的影像解剖、泌尿和生殖系统的影像解剖三部分内容。

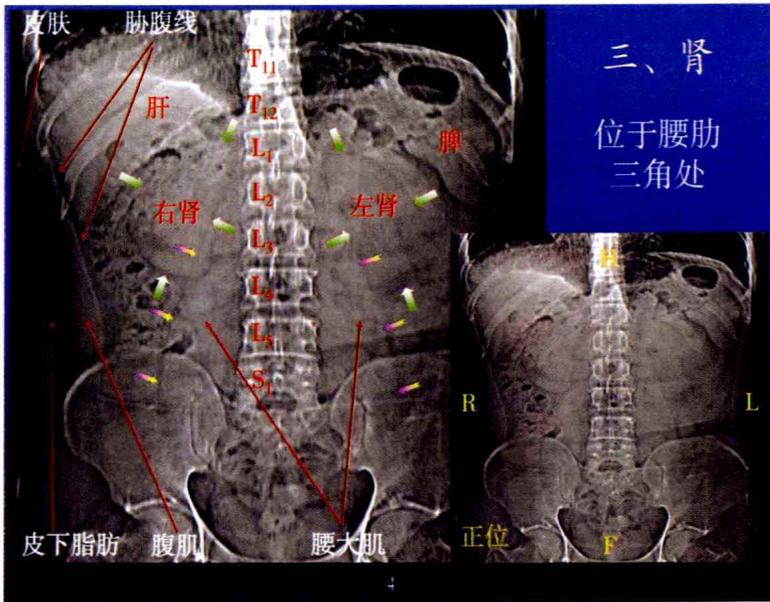
简要介绍腹部平片和腹部血管造影的正常影像表现。

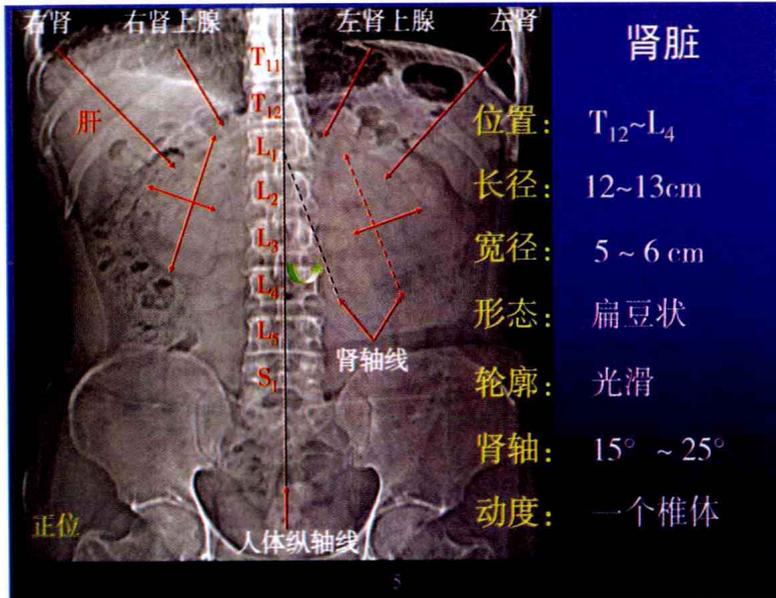
## 第一节 腹平片

### 一、腹壁结构



### 二、胃肠道 正位

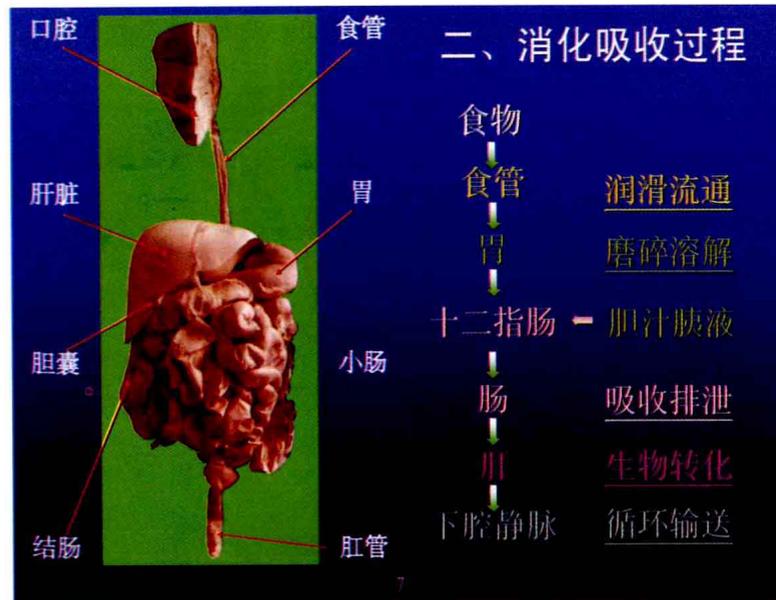




## 第二节 消化道钡餐检查

### 一、造影检查范围

1. 食管钡餐检查      口腔 → 胃
2. 上消化道钡餐检查      口腔 → 十二指肠
3. 全消化道钡餐检查      口腔 → 肛门
4. 结肠气钡双对比检查      肛门 → 回肠



### 三、造影检查方法

#### 1. 黏膜相

用少量钡剂显示胃肠道黏膜皱襞形态。

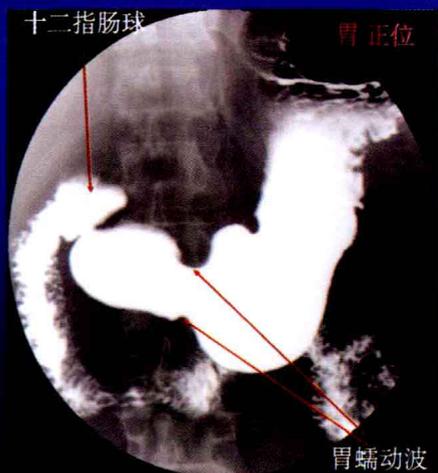
观察有无黏膜中断、增粗、僵直等异常改变。



## 2. 充盈相

使用较多的钡剂使受检部位完全充盈。

显示其轮廓、形态和蠕动。



9

## 3. 气钡双重相

使黏膜表面附着的钡剂与腔内气体产生良好对比。

清晰显示微细结构，观察胃壁的伸展性。

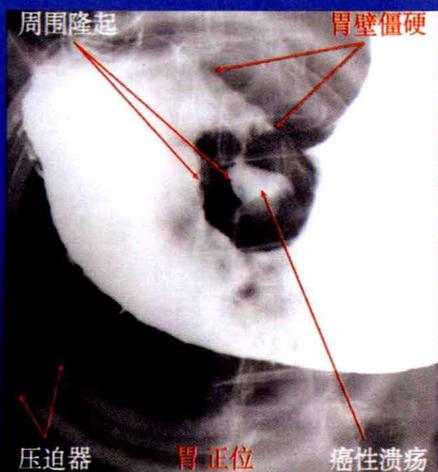


10

## 4. 压迫相

通过压迫，观察管壁的柔软度和黏膜皱襞的形态。

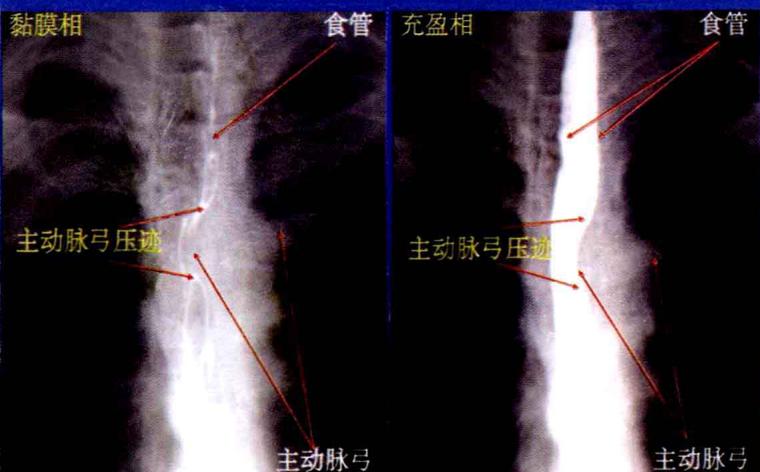
对隆起性病变的检查具有重要价值。



11

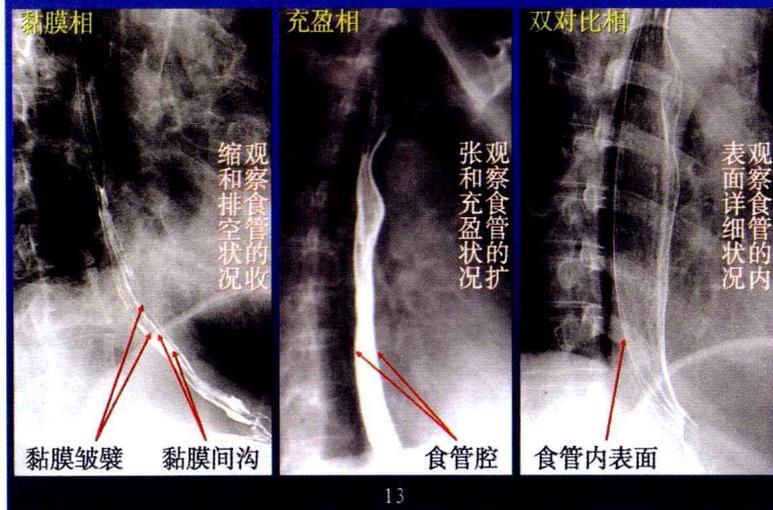
## 四、食管钡餐检查

### 1. 正位

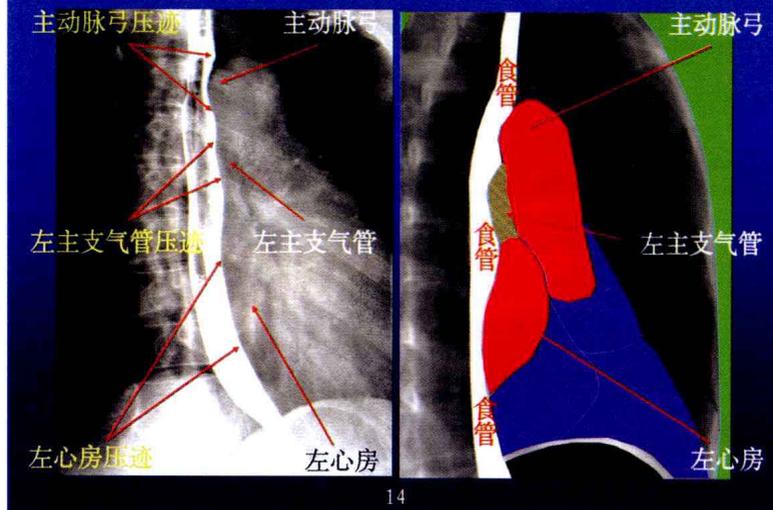


12

## 2. 右前斜位

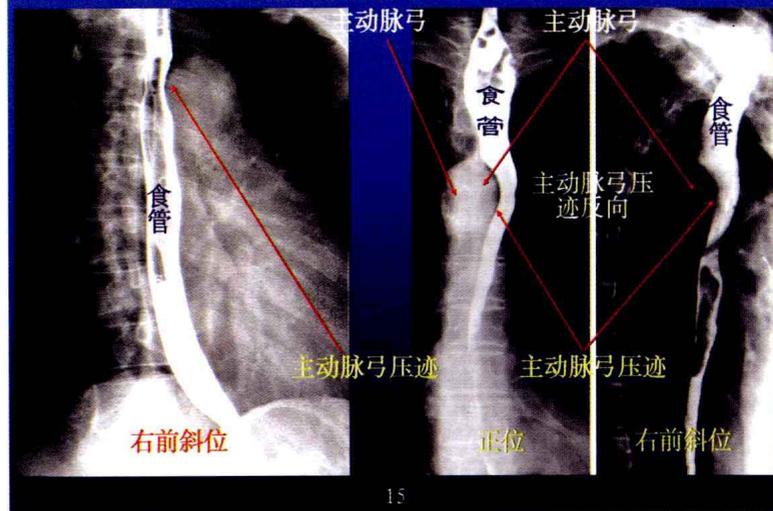


## 右前斜位



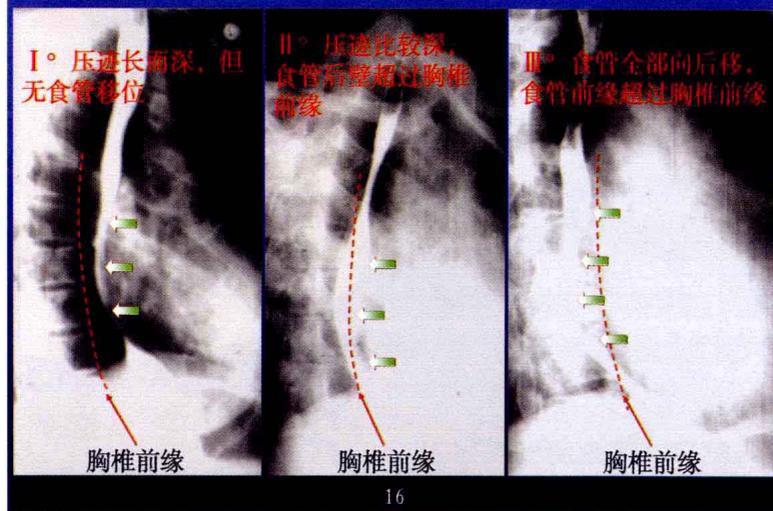
## 正常主动脉弓

## 右位主动脉弓



## 右前斜位

## 左心房增大分度



右前斜位

食管分段



以胸椎为标记

T<sub>4</sub>下缘上方为：上段

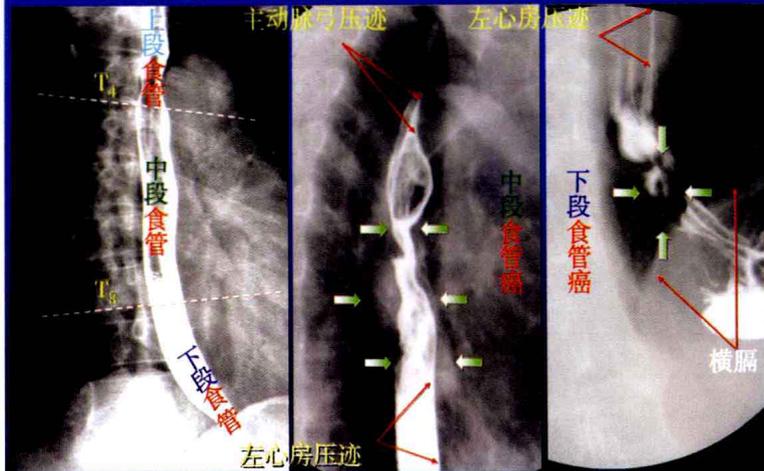
T<sub>4</sub>到T<sub>8</sub>下缘间：中段

T<sub>8</sub>下缘下方为：下段

17

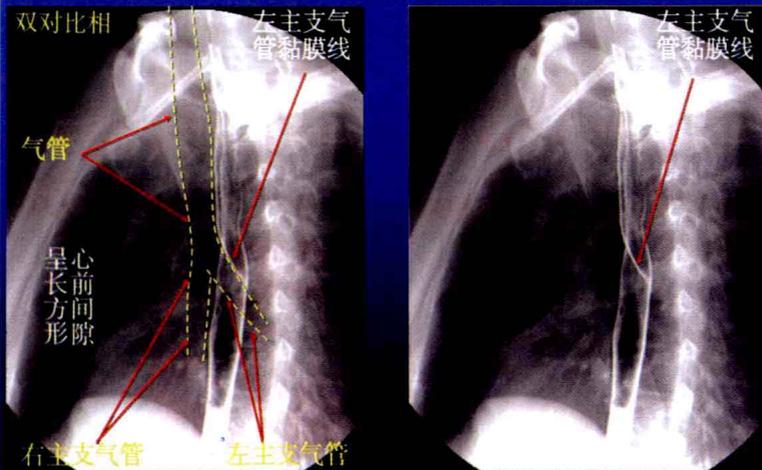
右前斜位

食管病变定位



18

3. 左前斜位



19



食管第三收缩波

常见于中下段食管。

食管边缘呈不均匀的波浪状或锯齿状；也可以是一段食管痉挛性收缩。

一般持续数秒至数分钟。

老年人为生理性的

青年人为病理性的

20

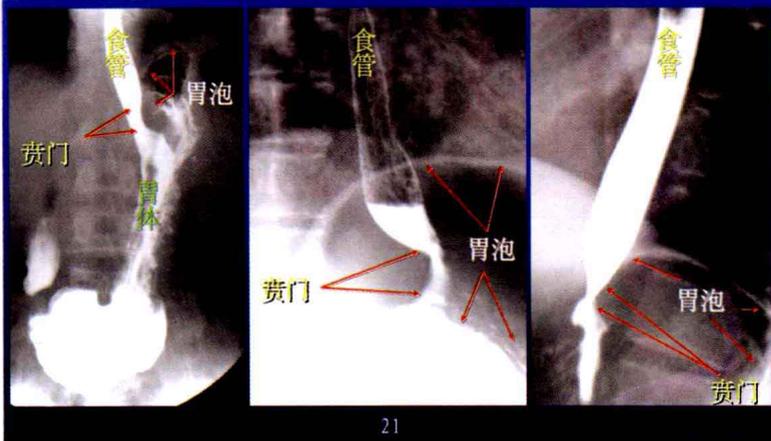
### 五、贲门钡餐检查

#### 1. 充盈相

正位

右前斜位

左前斜位

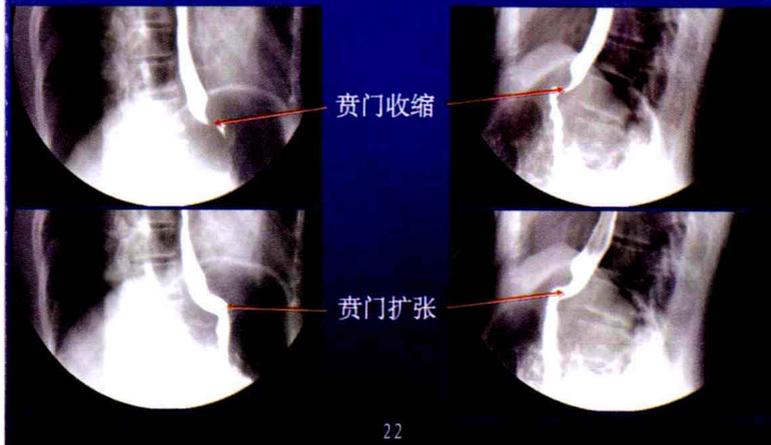


### 贲门钡餐检查

#### 充盈相

右前斜位

左前斜位



### 贲门钡餐检查

#### 2. 黏膜相

右前斜位

贲门环

左前斜位

贲门星



### 贲门悬吊肌

右前斜位

左前斜位

充盈相

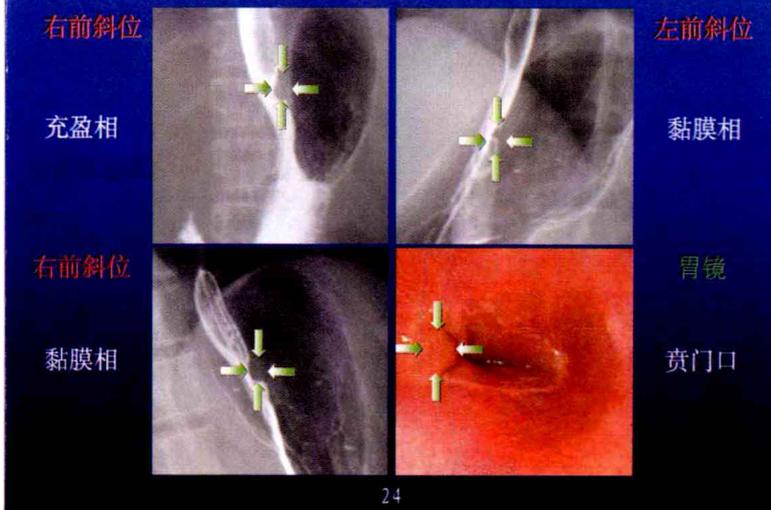
黏膜相

右前斜位

胃镜

黏膜相

贲门口



### 贲门悬吊肌和贲门癌鉴别

	悬吊肌	贲门癌
贲门形态	不变	呈7字征
块影边缘	光滑	毛糙
块影形态	规则	不规则
邻近管壁	连为一体	忽然截断
扩张度	很好	受限
上方钡剂	通过顺利	有滞留

25

### 六、胃钡餐检查

#### 1. 正位

站立位 充盈相

食管 贲门  
胃小弯 胃底  
十二指肠球部 胃体 胃大弯  
幽门管 胃窦  
蠕动波 胃下极 胃角

肝脏 胃小弯 胃底  
幽门管 胃角 胃体  
胆囊 胃窦 胃大弯  
CT重建冠状面 胃下极

26

### 胃钡餐检查

#### 正位

站立位 充盈相

十二指肠球部 十二指肠球部  
幽门管 胃体  
胃窦 胃体  
幽门管收缩 幽门管扩张

27

#### 正位

#### 胃轮廓的改变

胃小弯溃疡 充盈缺损

龛影 充盈缺损

28

### 胃钡餐检查

### 2.胃型

多见于肥胖者。



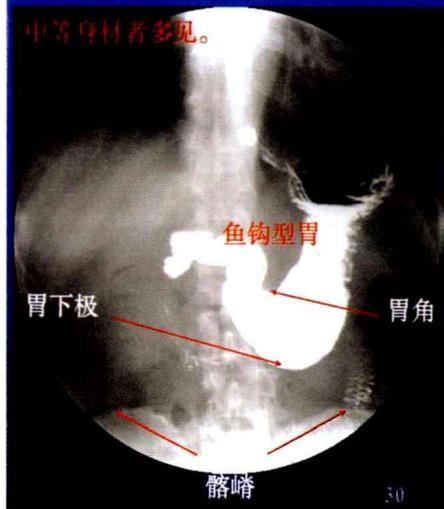
位置高；  
张力高；  
横位；  
胃角不  
明显。

29

### 胃钡餐检查

### 胃型

中等身材者多见。



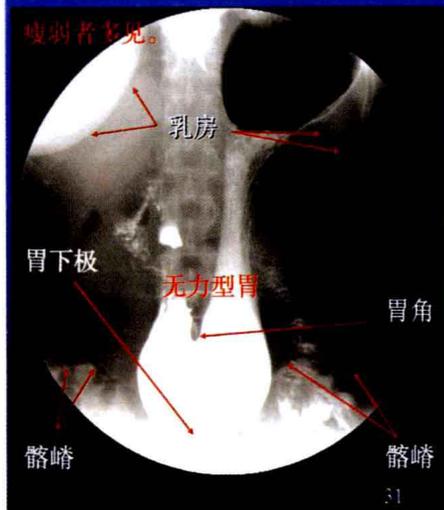
位置中等；  
张力中等；  
胃下极接  
近髌嵴；  
胃角明显。

30

### 胃钡餐检查

### 胃型

瘦弱者多见。



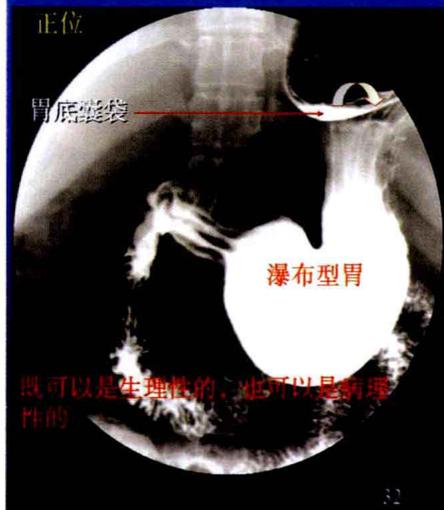
胃下极低于  
两髌嵴连线；  
  
胃的张力低；  
  
胃体上窄下  
宽呈水袋状。

31

### 胃钡餐检查

### 胃型

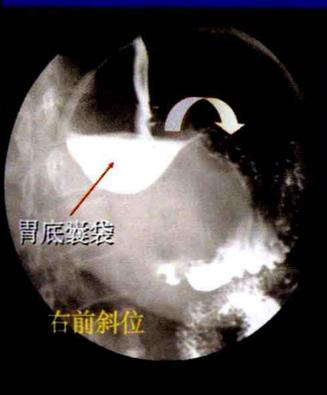
正位



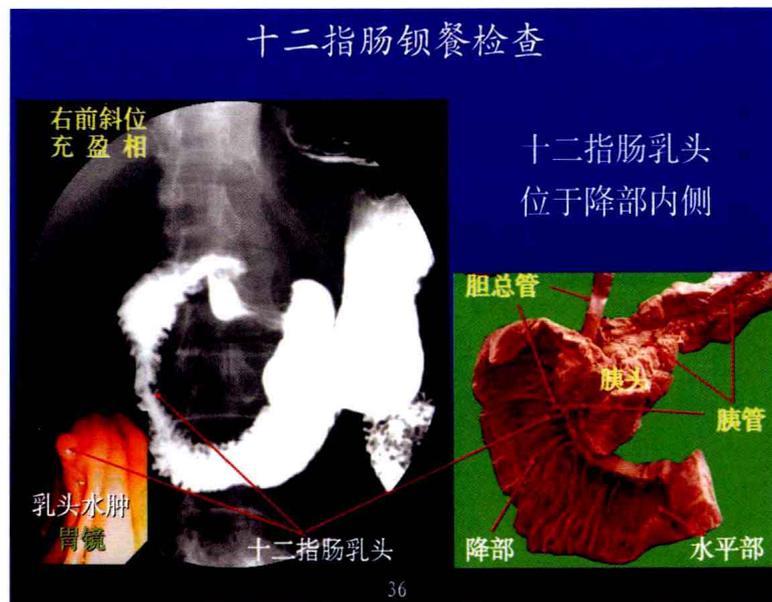
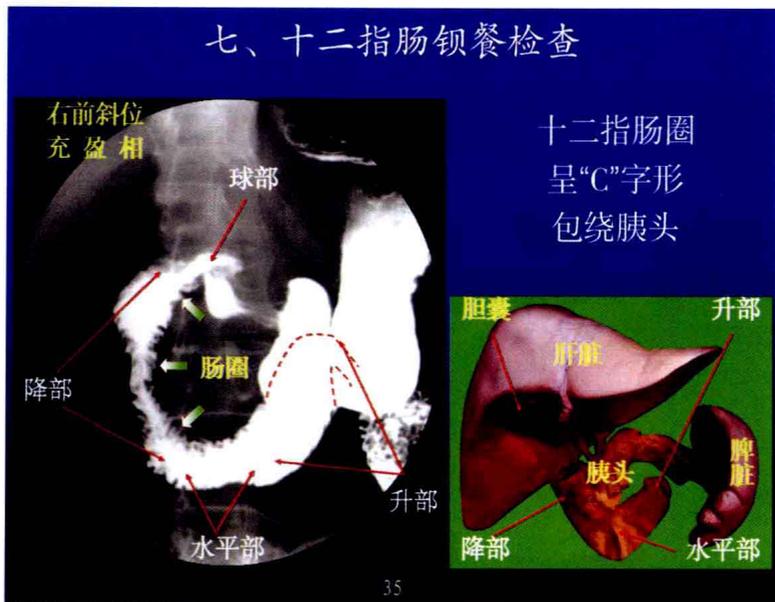
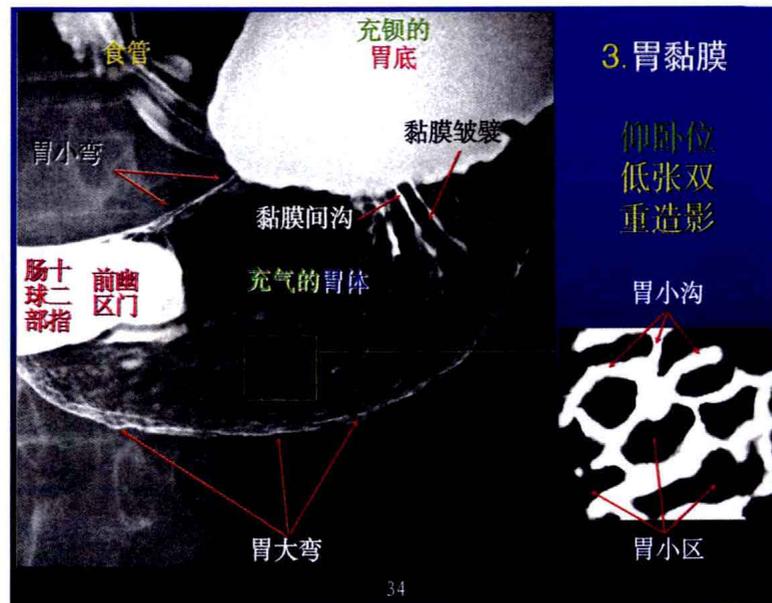
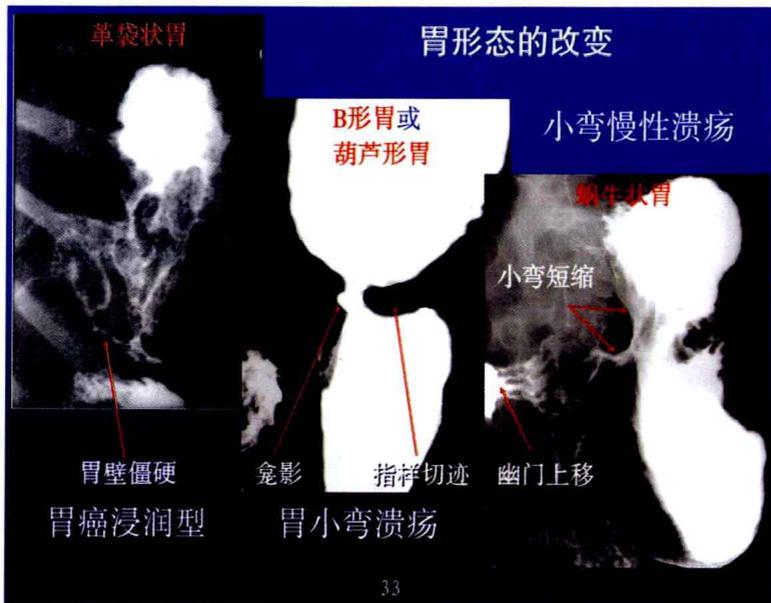
胃底呈囊袋状

既可以是生理性的，也可以是病理性的

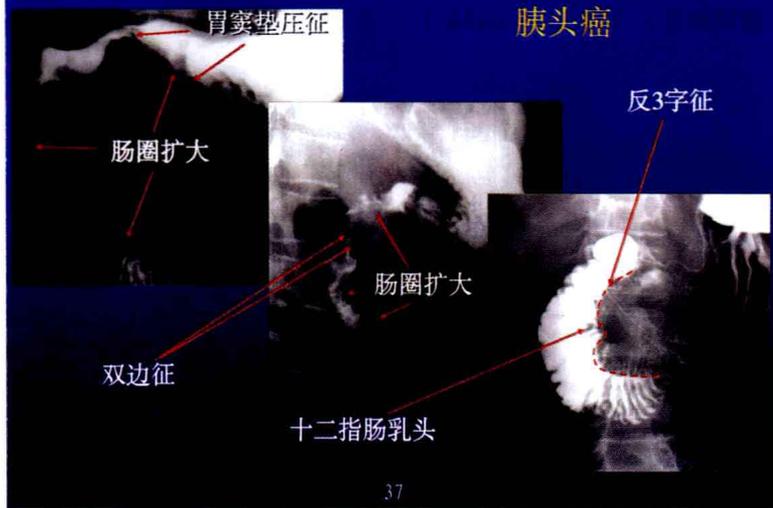
32



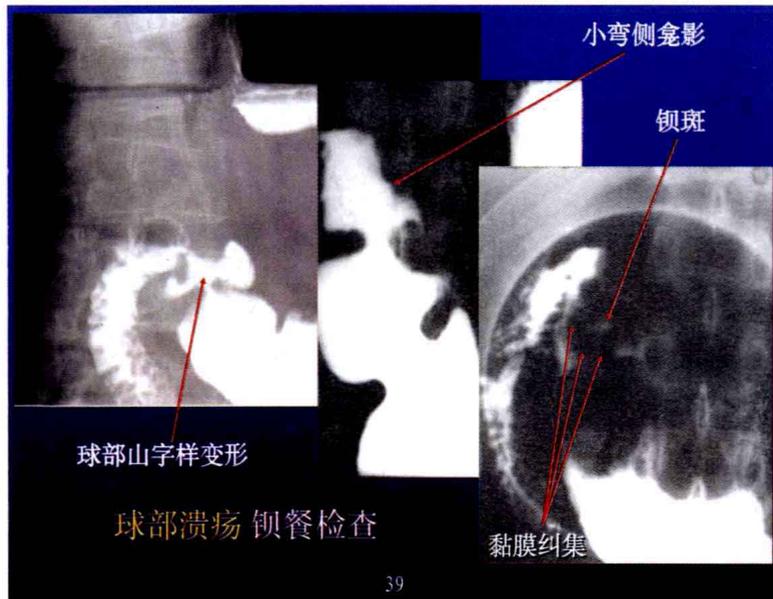
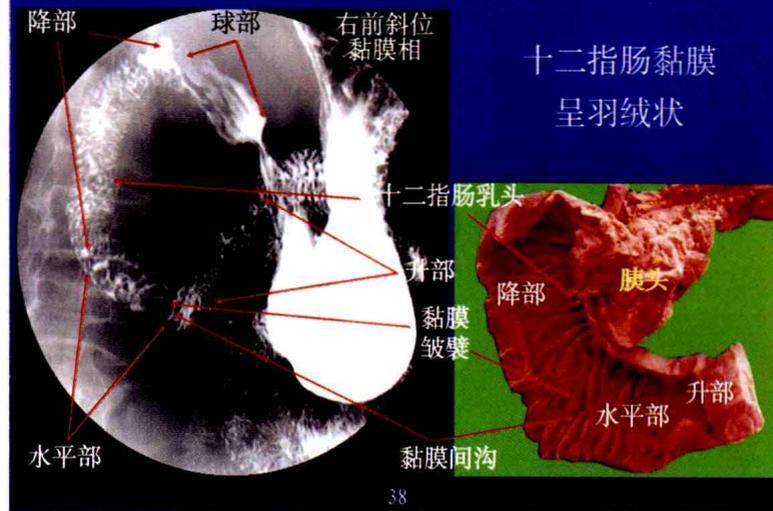
右前斜位



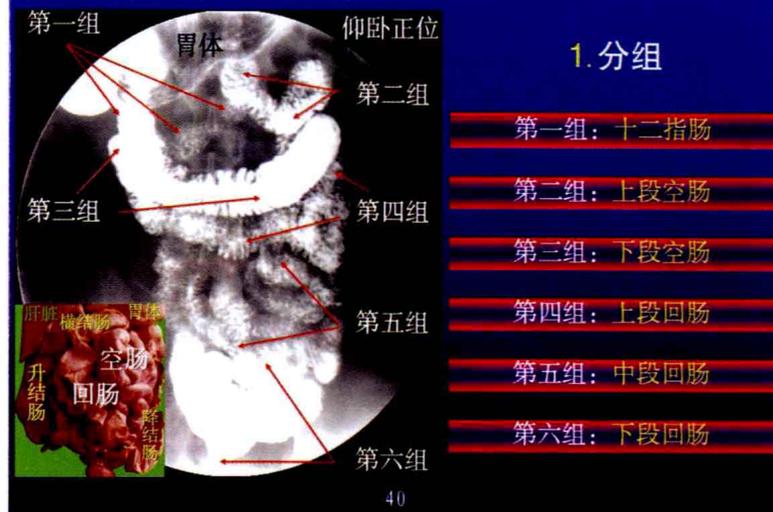
### 上消化道钡餐检查



### 十二指肠钡餐检查



### 八、小肠钡餐检查



## 2. 黏膜皱襞

### 全消化道钡检

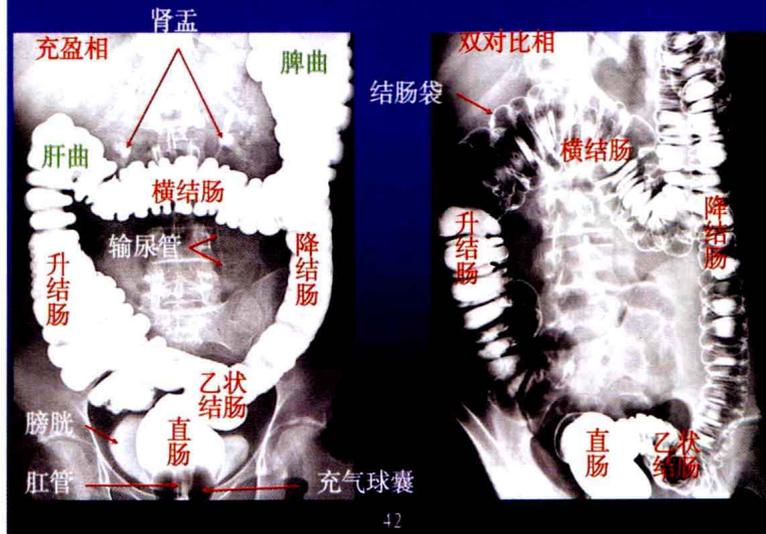


### 低张双重造影



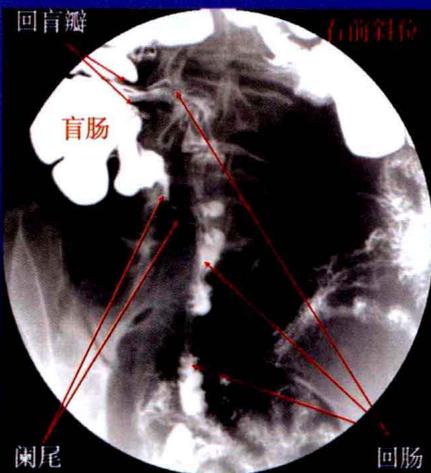
41

## 九、结肠造影



42

## 结肠造影



43

## 回盲部

### 前面观



## 第三节 胆系造影

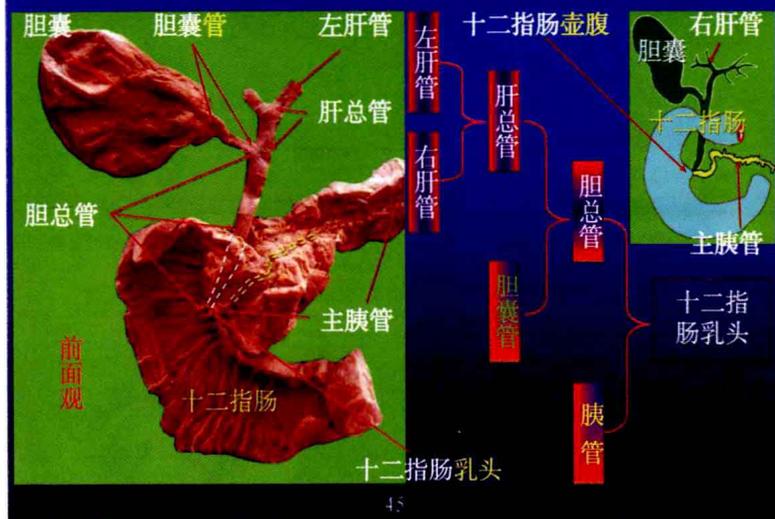
胆系包括胆管和胆囊，它们介于肝和十二指肠之间。

肝内分泌的胆汁先在胆囊中贮存浓缩，然后再经过胆管引流到肠腔。

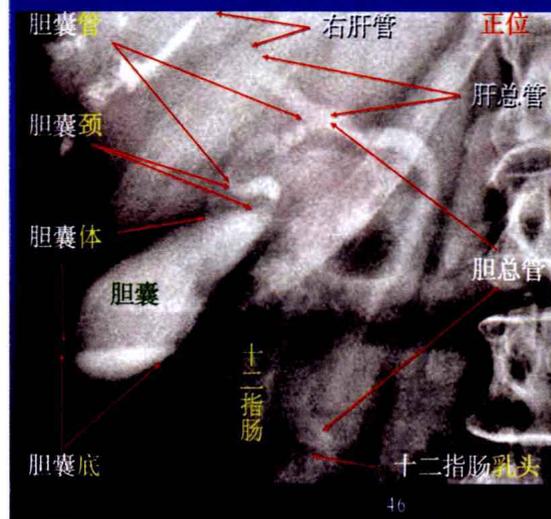
胆系排泄胆汁，胆汁有助于肠道吸收脂肪。

44

## 一、胆道构成

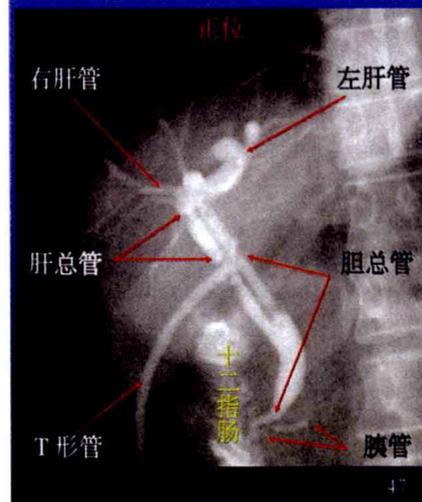


## 二、胆囊造影



直接显示胆系解剖形态和功能变化。

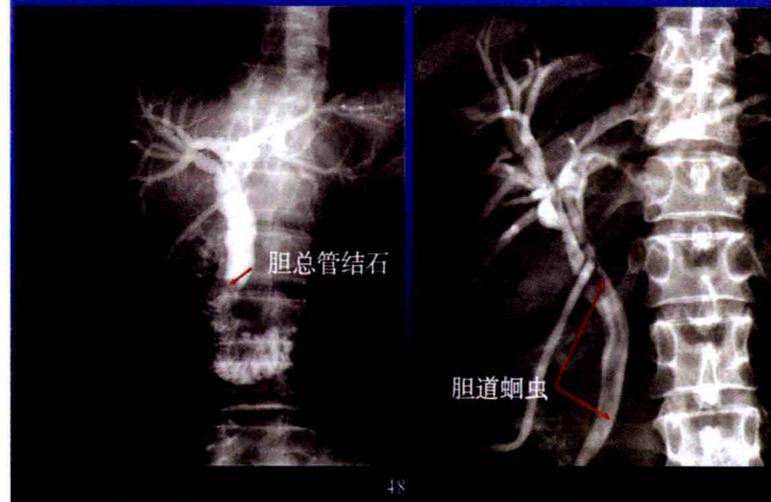
## 三、胆囊术后T形管造影



胆总管、左右肝管、肝内胆管显示清晰，造影剂进入十二指肠。

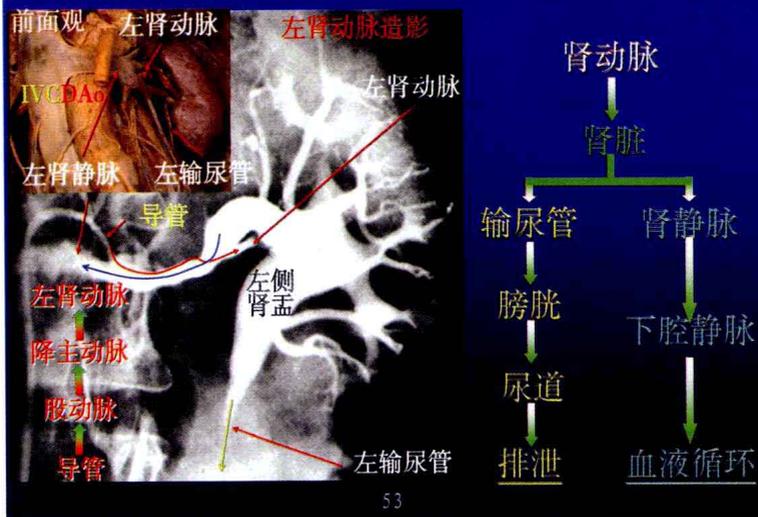
胆囊缺如（已切除），胆总管及左肝管扩张。

## 胆管术后T形管造影

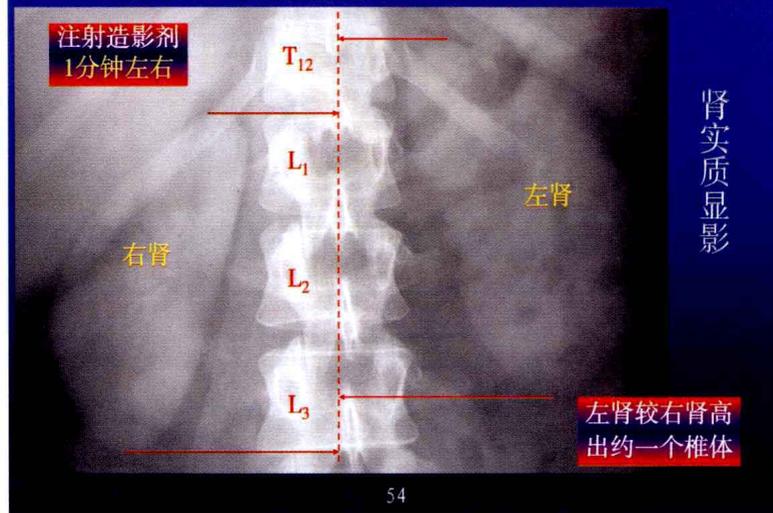




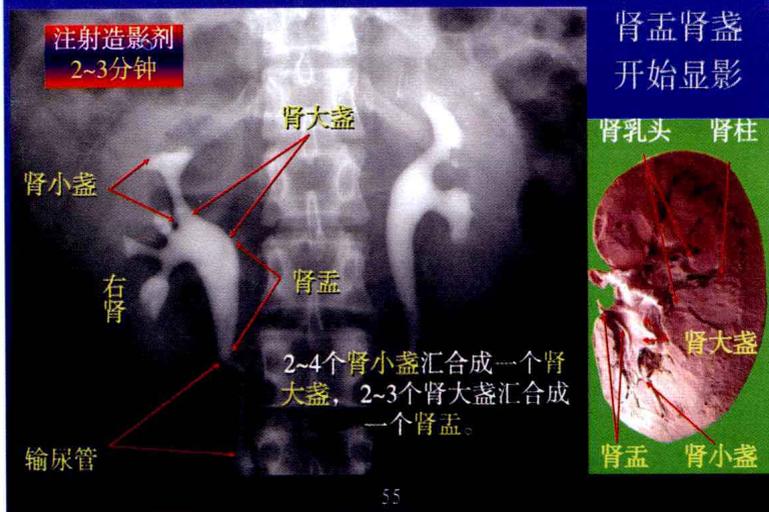
### 一、泌尿过程



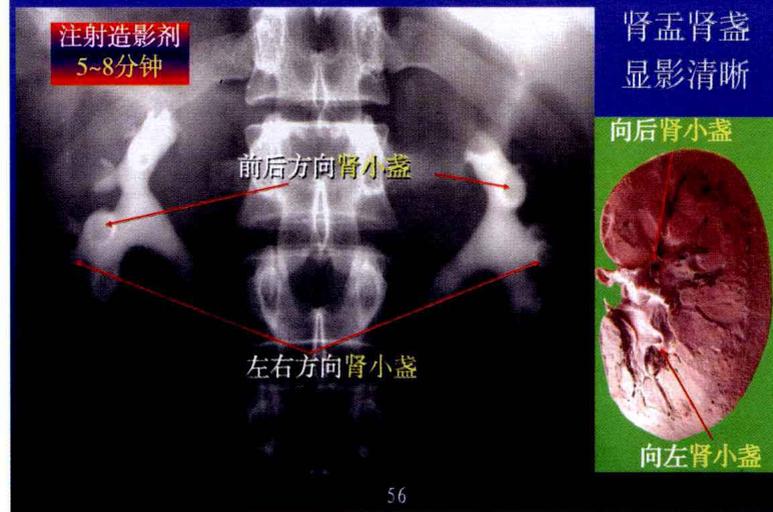
### 二、静脉尿路造影



### 静脉尿路造影



### 静脉尿路造影



## 静脉尿路造影



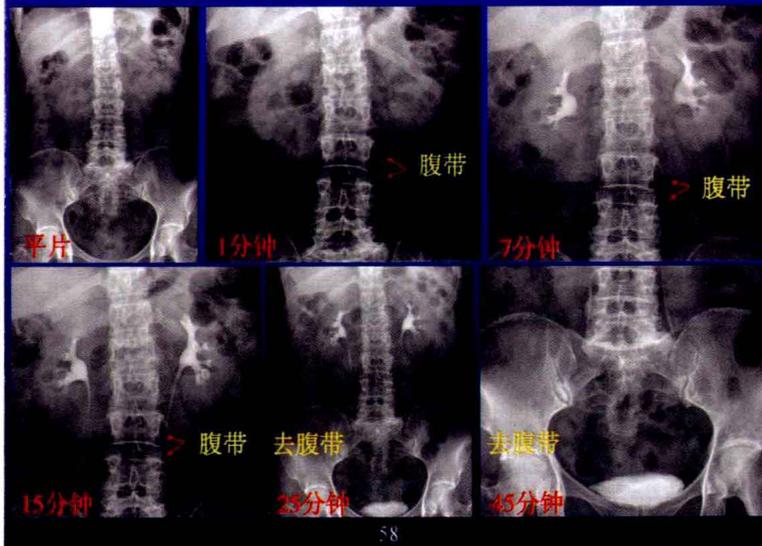
注射造影剂  
15~30分钟

从肾小盏到膀胱  
全显影

输尿管有三个生理性  
狭窄，它们是：肾盂输尿管移行处、跨越小骨盆入口处、进入膀胱壁内处。

57

## 静脉尿路造影 (同一患者)

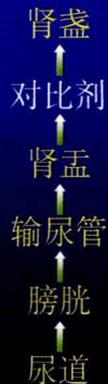


58

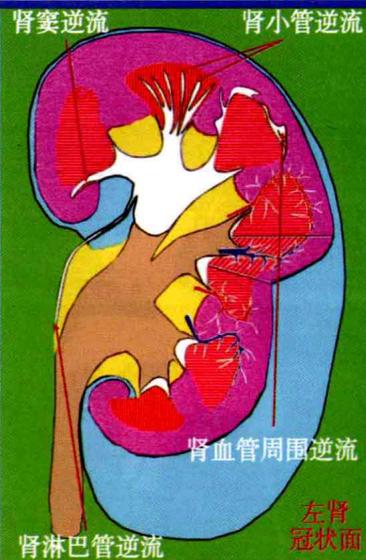


## 三、逆行尿路造影

### 1. 逆行肾盂造影



59

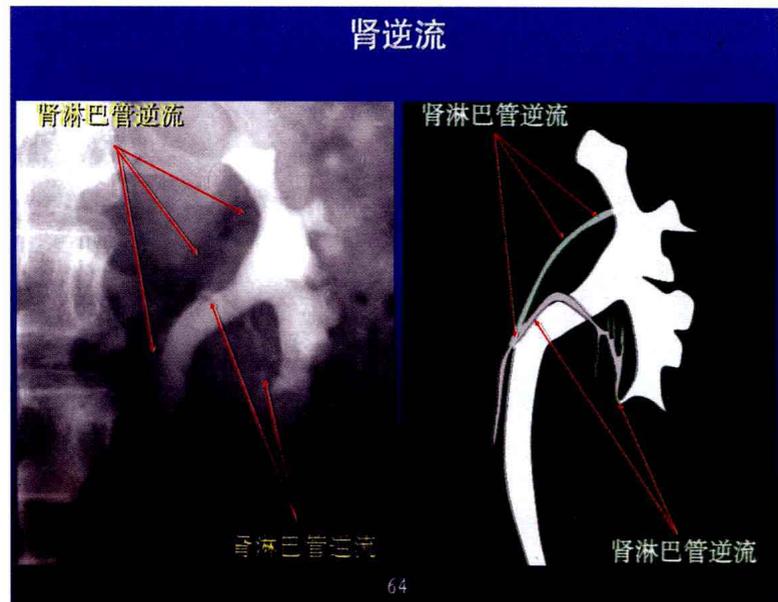
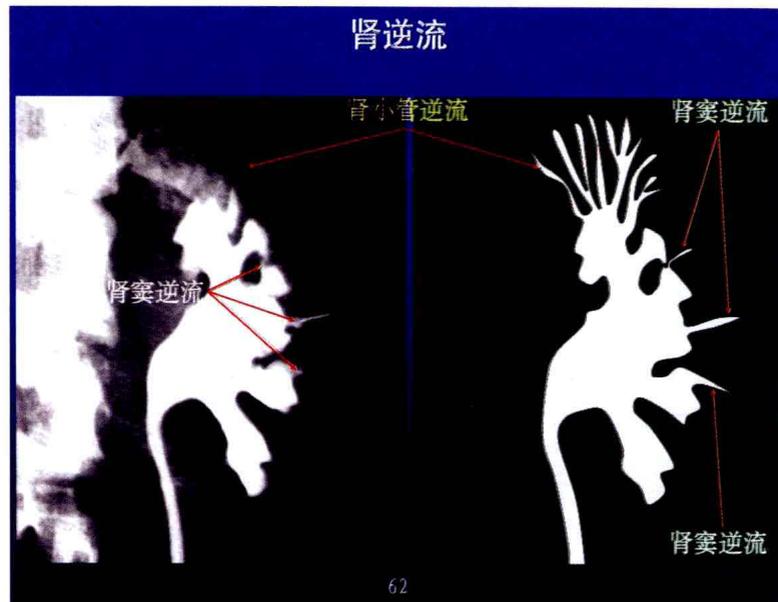
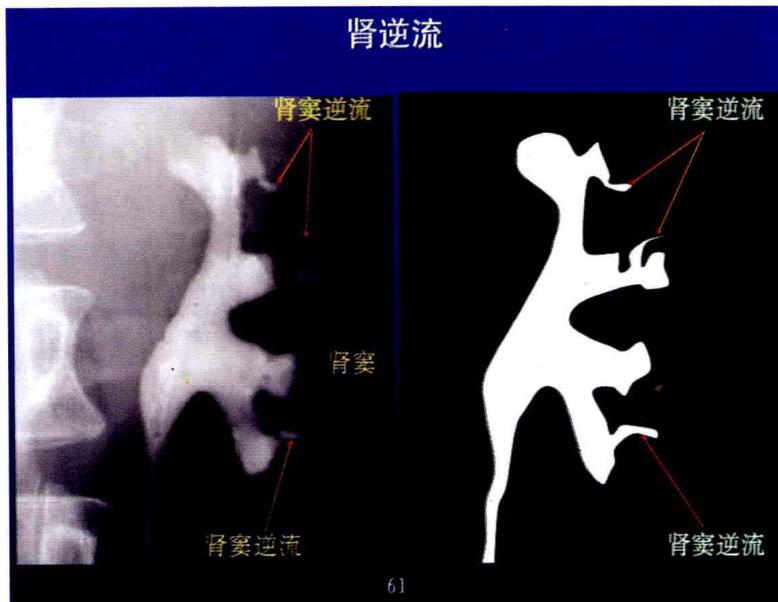


### 2. 肾逆流

逆行肾盂造影时如果注射压力过高，对比剂可以从肾盂、肾盏逆流入肾实质，称为肾逆流。

认识各种逆流征象  
以免误诊。

60

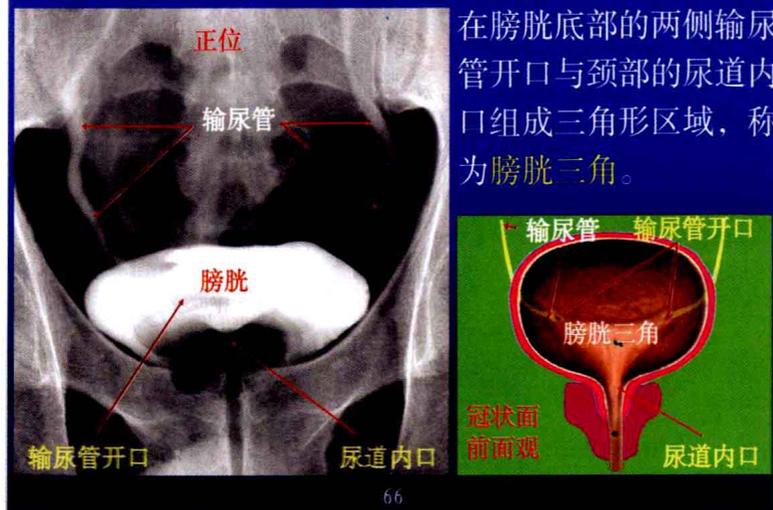


### 3. 膀胱造影



65

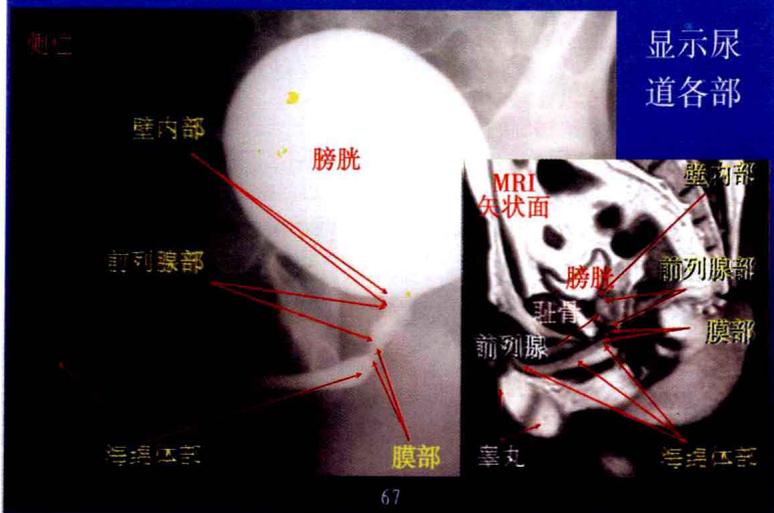
### 膀胱三角



在膀胱底部的两侧输尿管开口与颈部的尿道内口组成三角形区域，称为膀胱三角。

66

### 4. 尿道造影



显示尿道各部

67

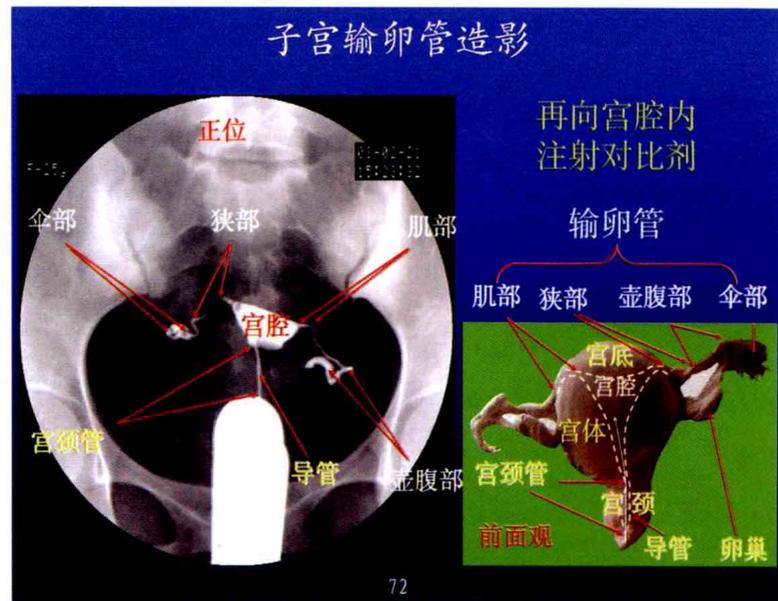
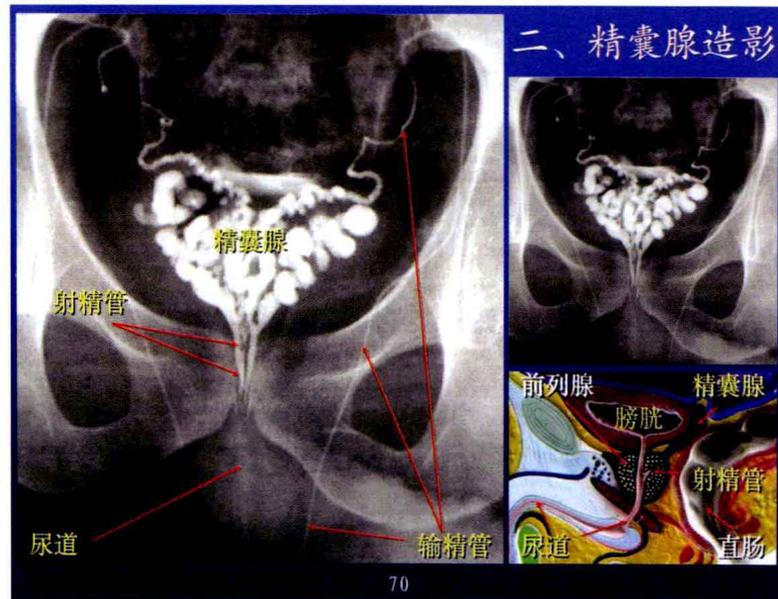
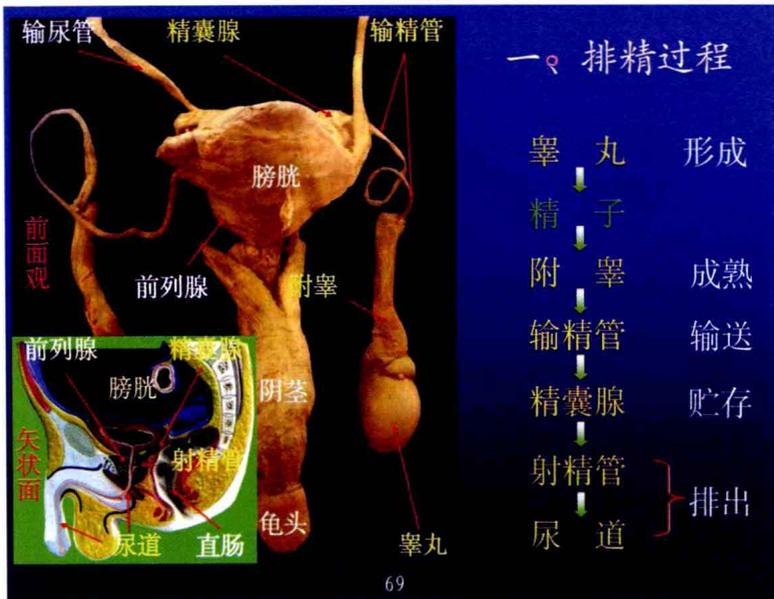
## 第五节 生殖道造影

女性生殖道较简单，包括输卵管、子宫和阴道。

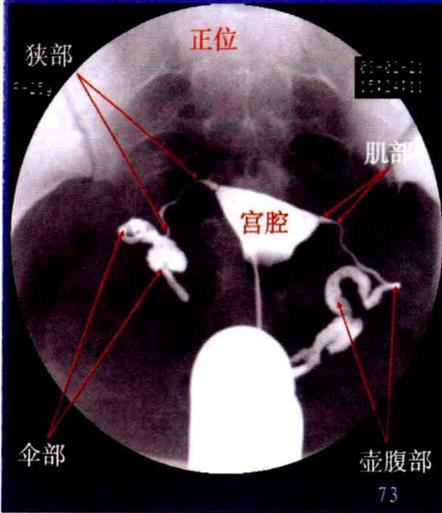
男性生殖道较复杂，包括附睾输精管、精囊腺、射精管和尿道。

多选逆行性造影检查。

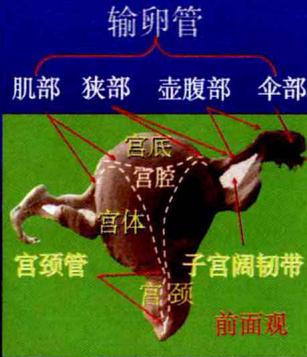
68



### 子宫输卵管造影

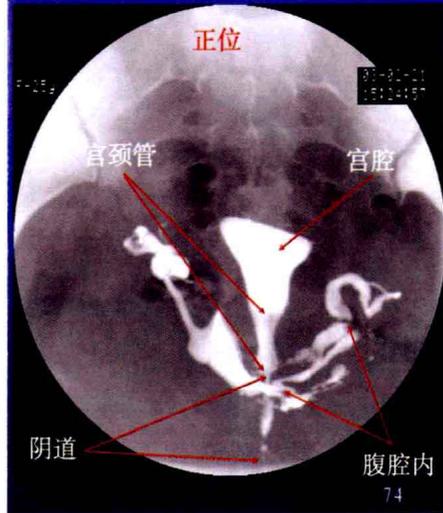


继续注射  
对比剂

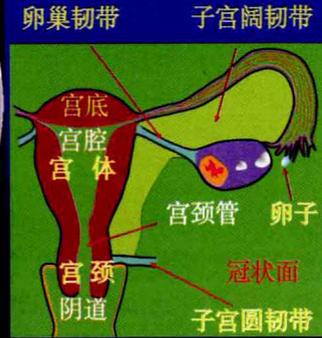


73

### 子宫输卵管造影



对比剂  
进入腹腔



74

### 子宫输卵管造影



第二天复查  
对比剂在  
腹腔内弥散

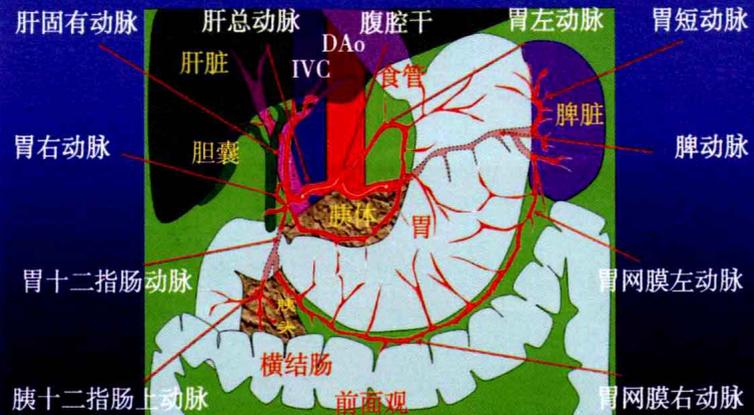


75

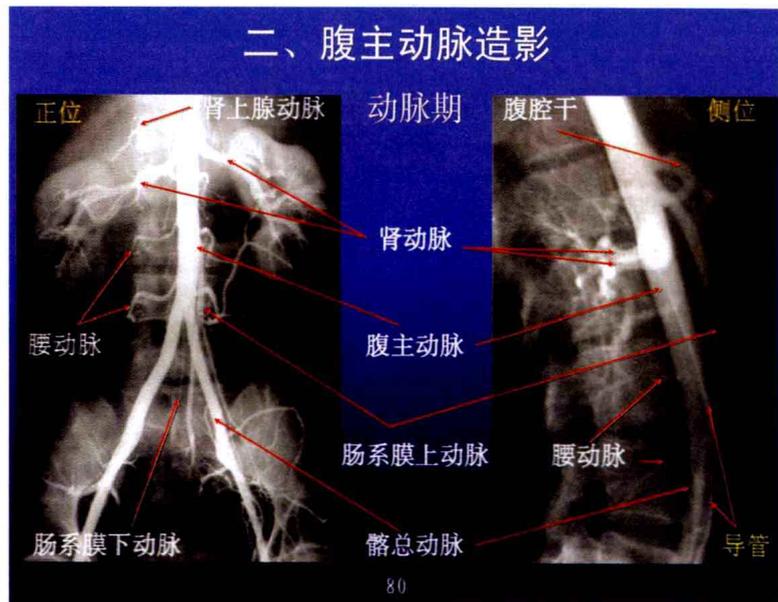
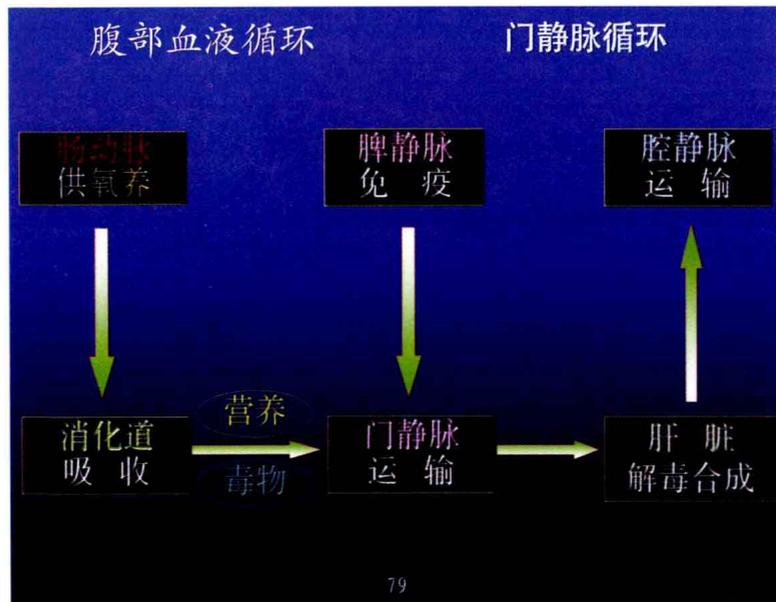
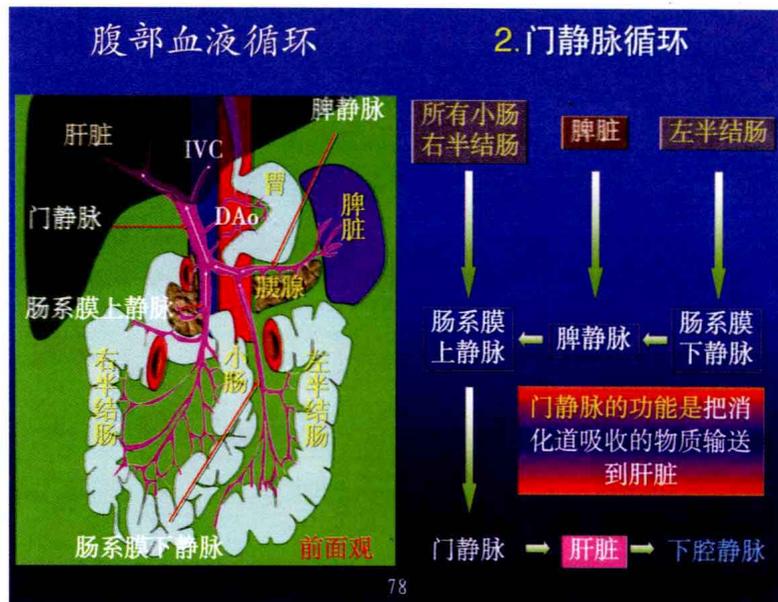
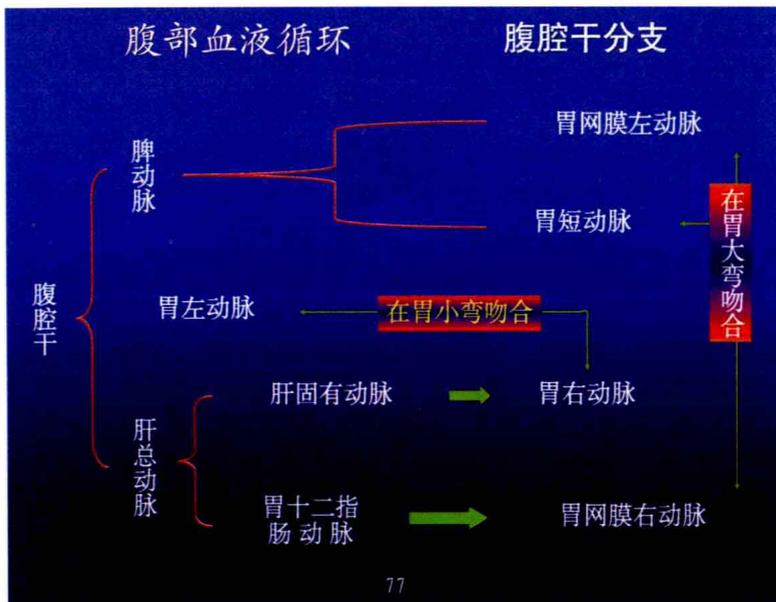
## 第六节 腹部血管造影

### 一、腹部血液循环

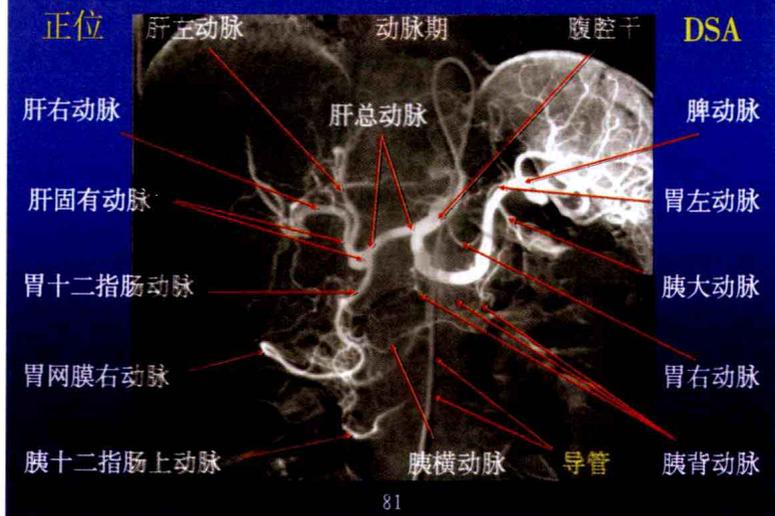
#### 1. 腹腔干分支



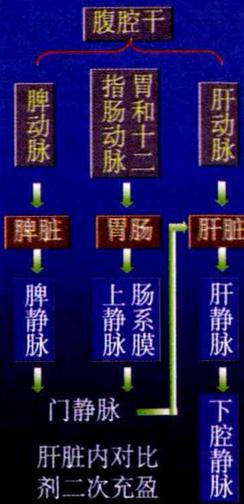
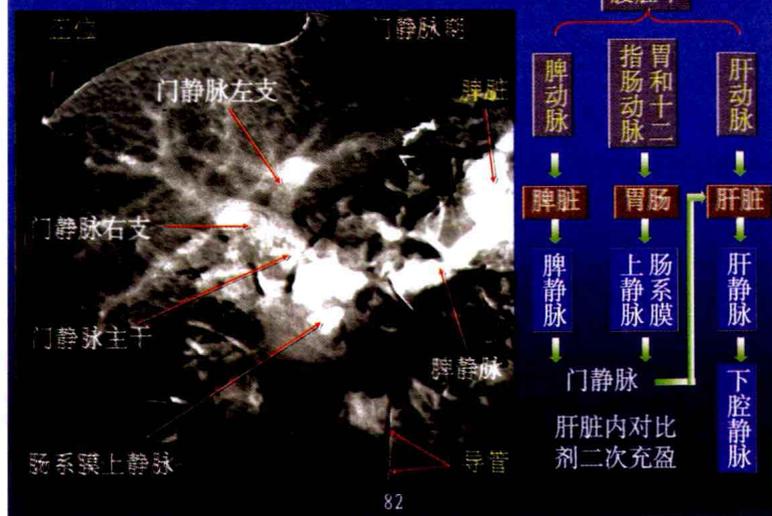
76



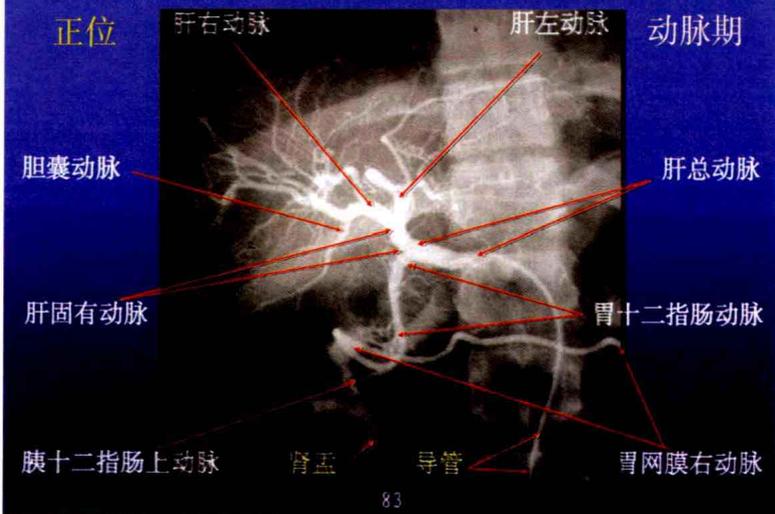
### 三、腹腔干造影



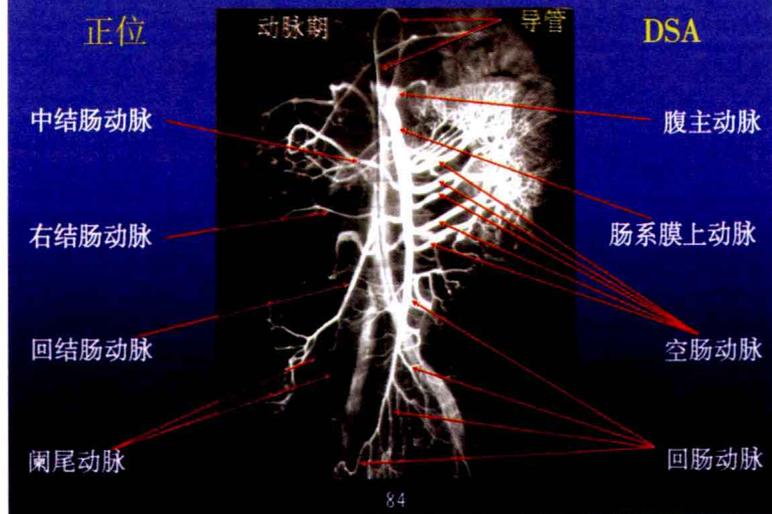
### 腹腔干造影



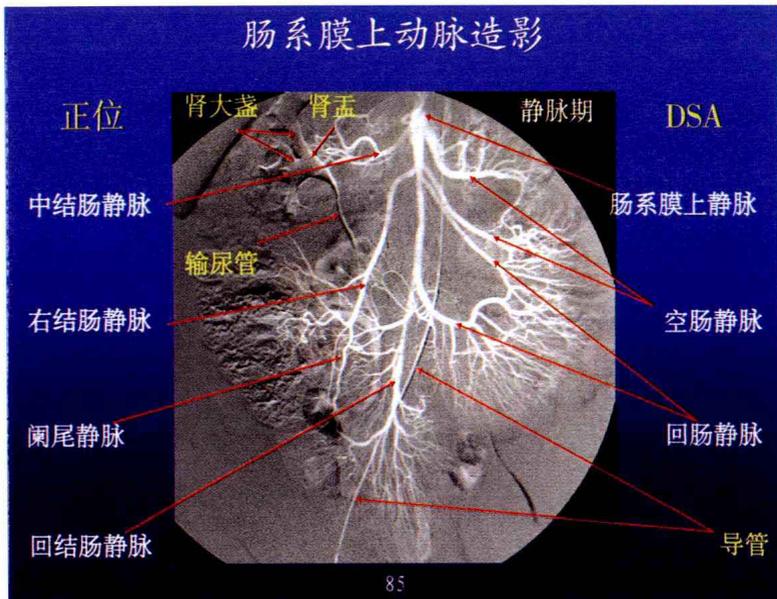
### 四、肝总动脉造影



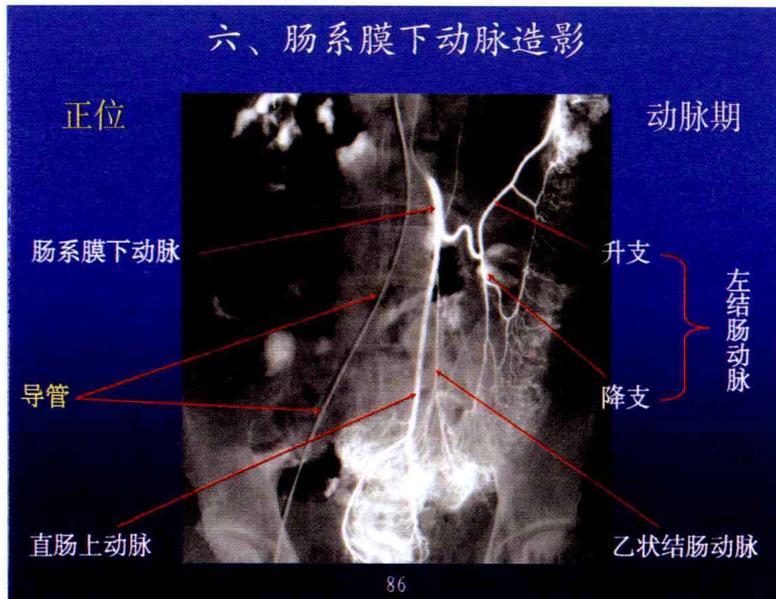
### 五、肠系膜上动脉造影



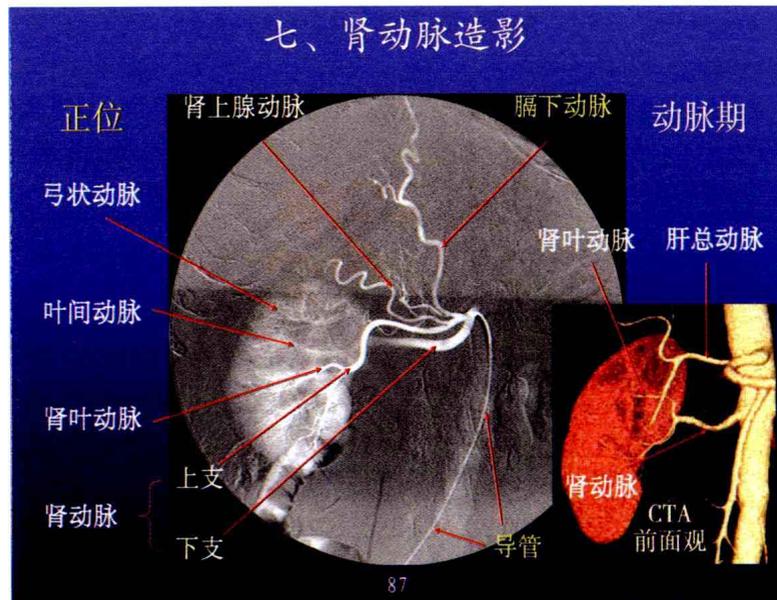
### 肠系膜上动脉造影



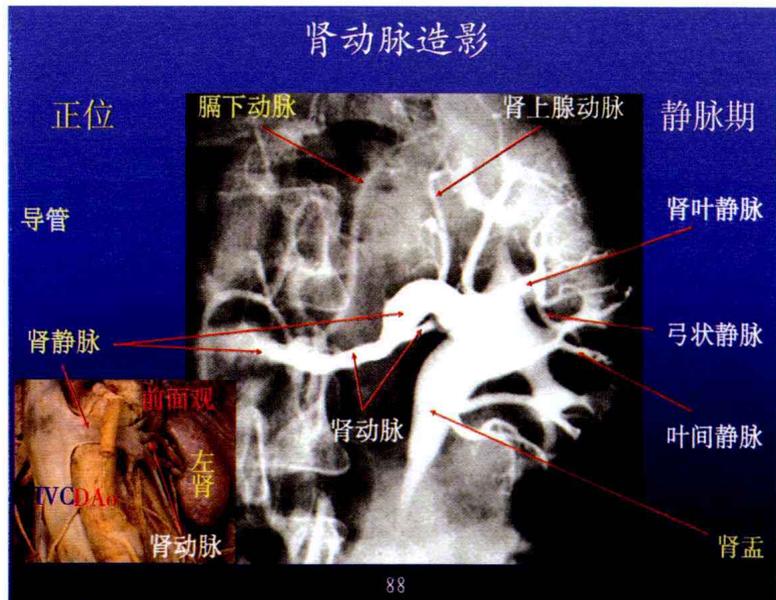
### 六、肠系膜下动脉造影



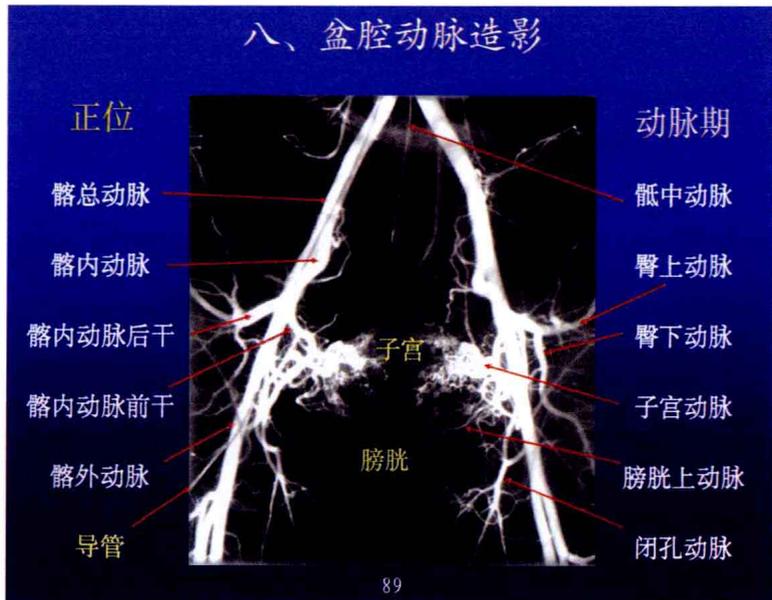
### 七、肾动脉造影



### 肾动脉造影

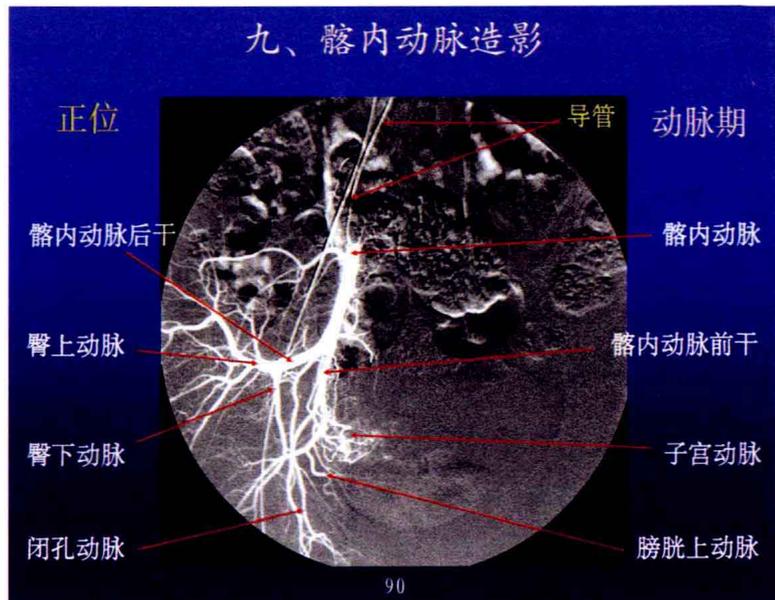


### 八、盆腔动脉造影



89

### 九、髂内动脉造影



90

### 第七节 腹部CT

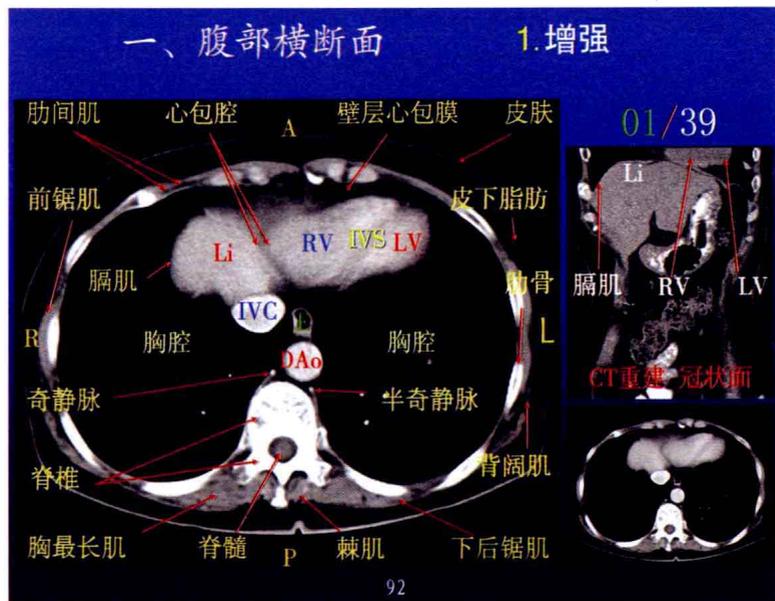
#### 标注说明

肝脏 Liver; 前列腺 Prostate; 胰腺 Pancreas;  
 脾脏 Spleen; 肾脏 Kidney; 膀胱 Bladder;  
 胃 Stomach; 子宫 Uterus; 卵巢 Ovary;  
 肾上腺 Adrenal Gland; 门静脉 Portal Vein;  
 十二指肠 Duodenum; 胆囊 Gall Bladder;  
 精囊腺 Vesicula Seminalis;  
 肠系膜上动脉 Superior Mesenteric Artery;  
 肠系膜上静脉 Superior Mesenteric Vein.

91

### 一、腹部横断面

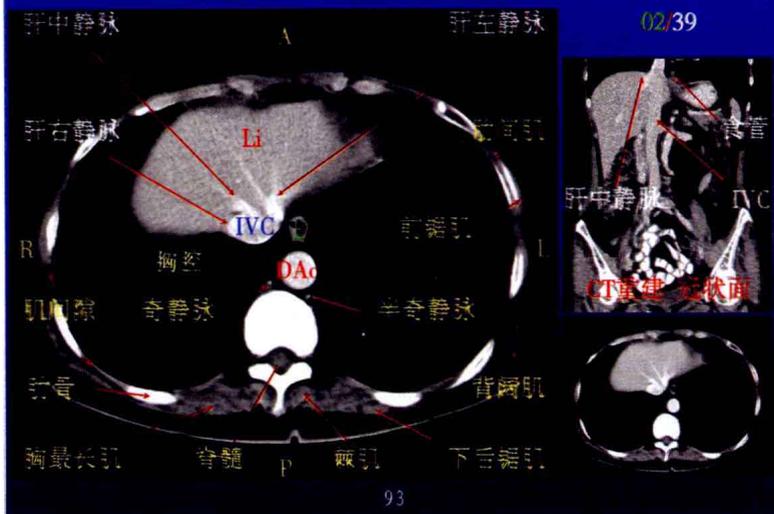
#### 1. 增强



92

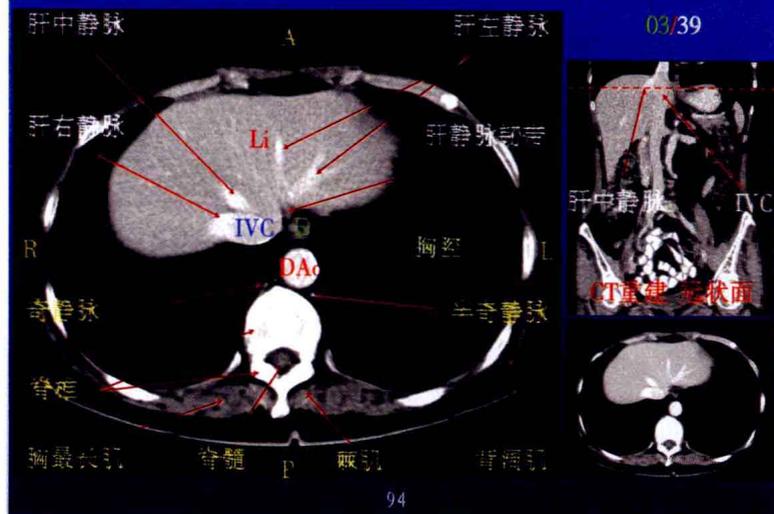
腹部横断面

增强



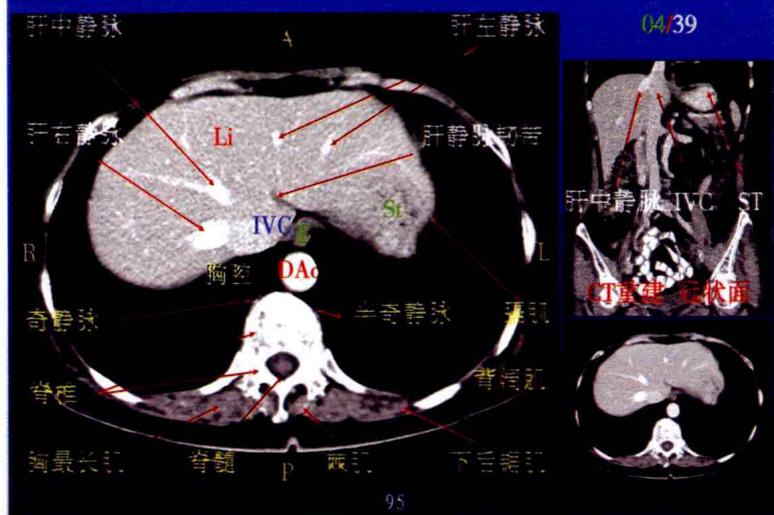
腹部横断面

增强



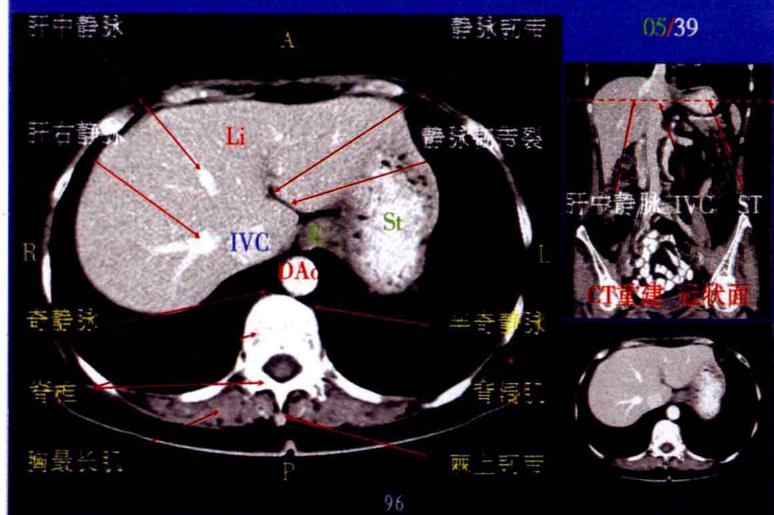
腹部横断面

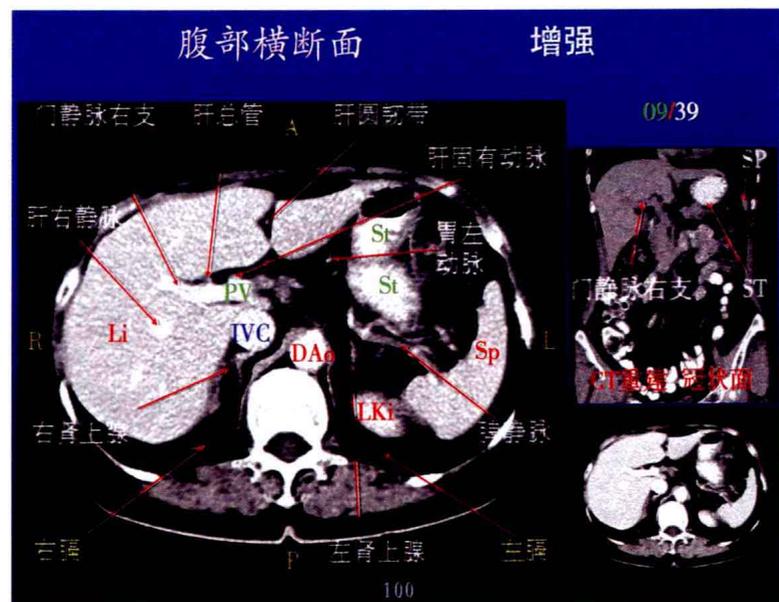
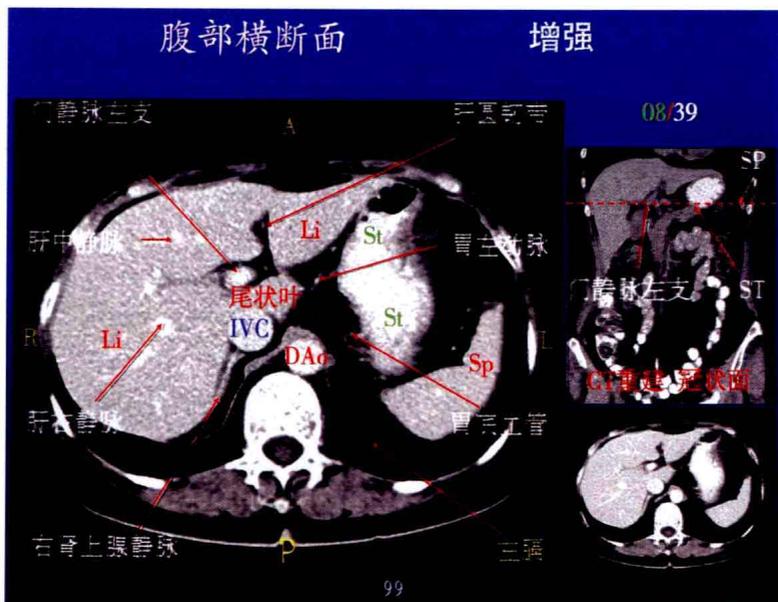
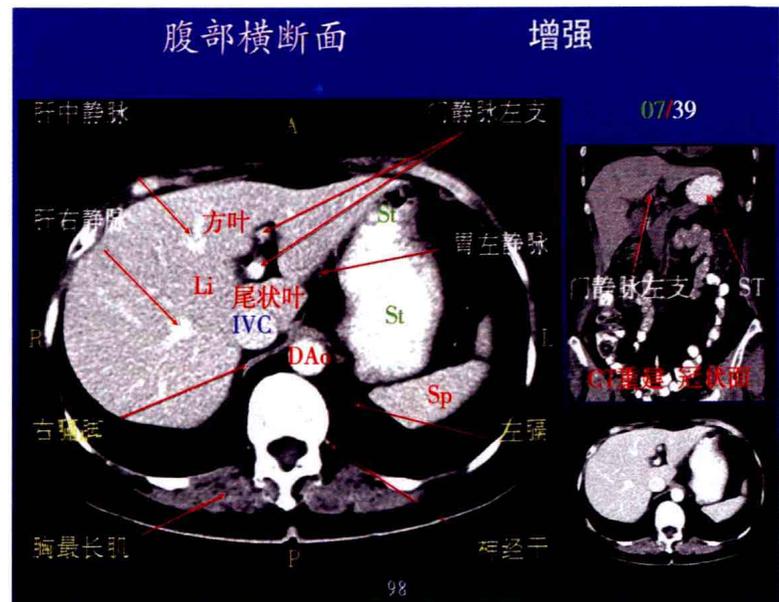
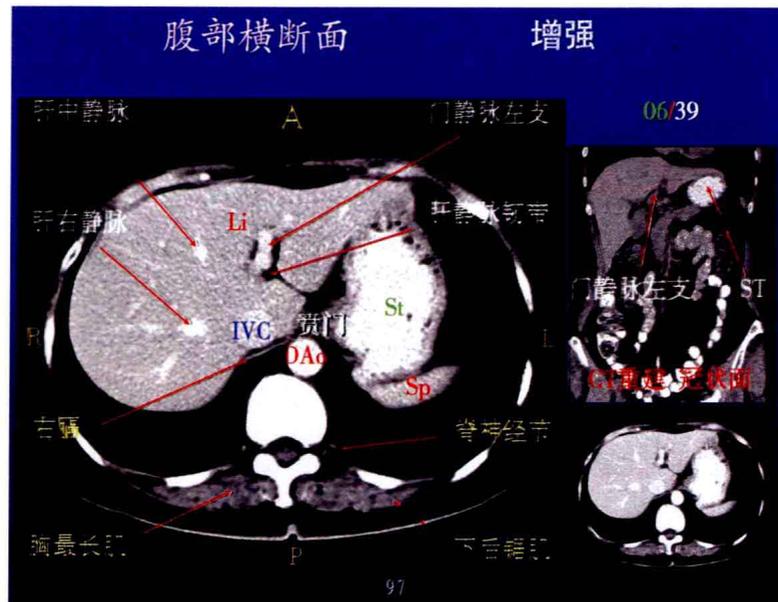
增强



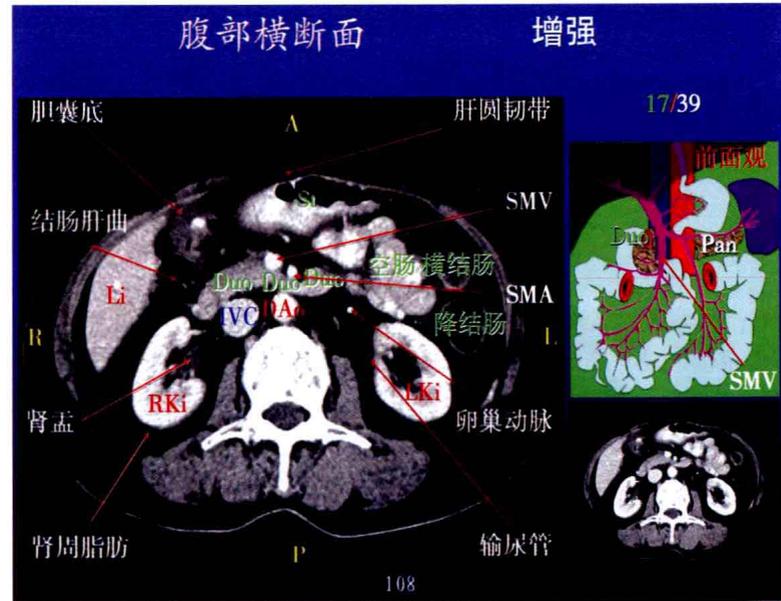
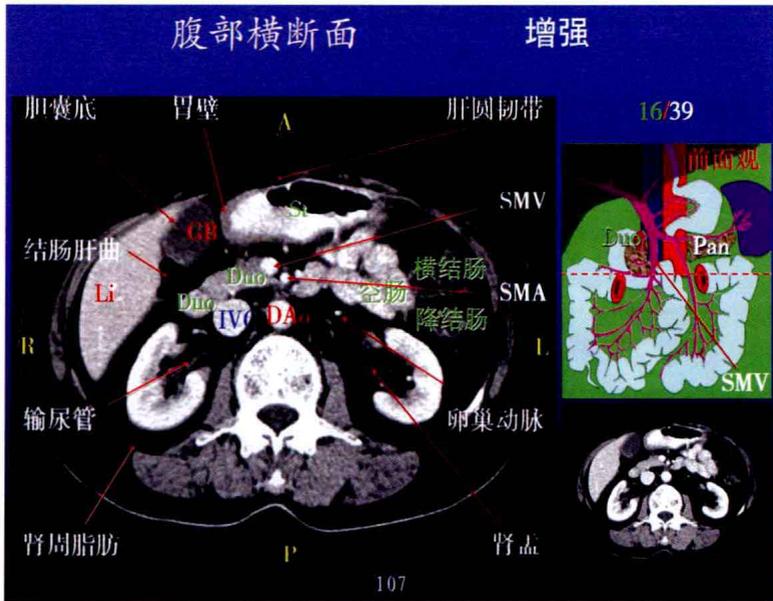
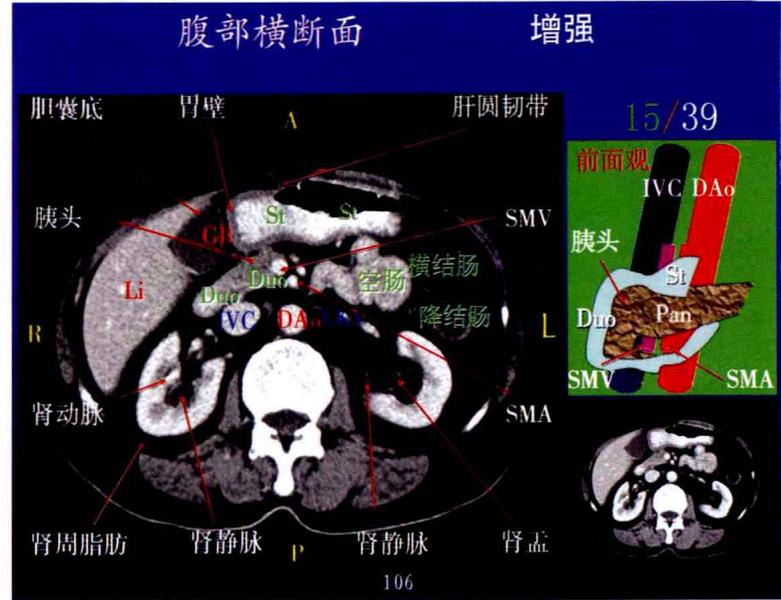
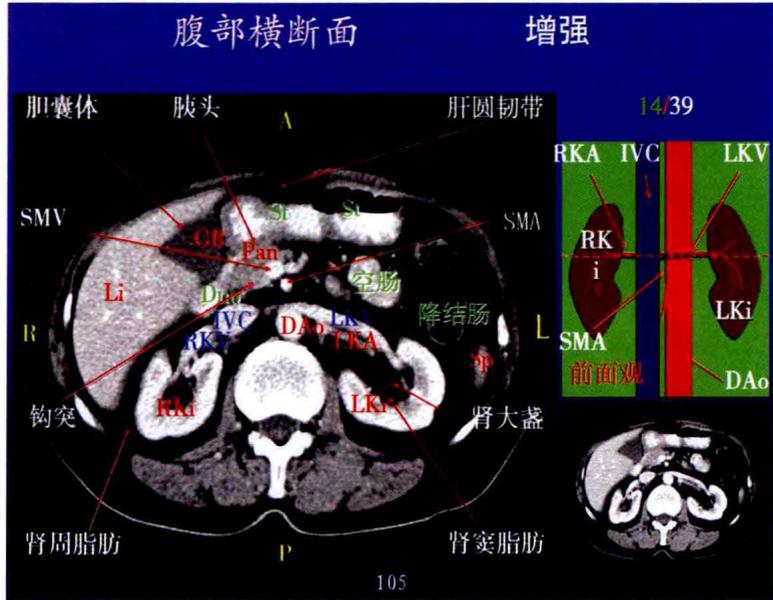
腹部横断面

增强



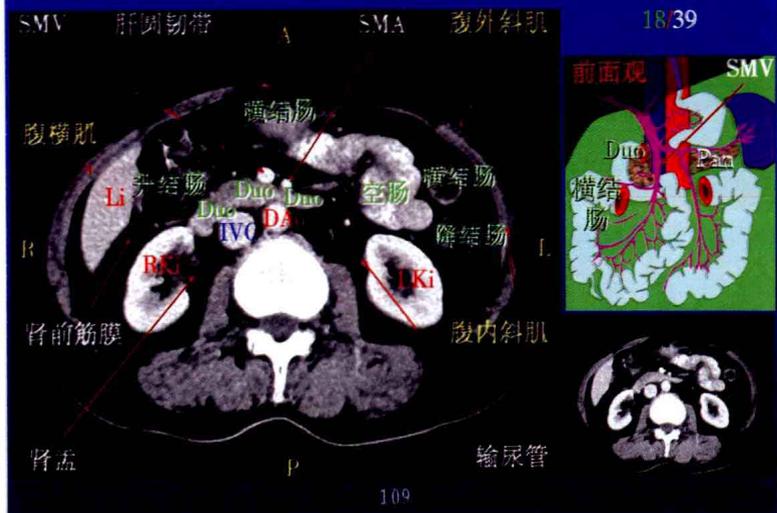






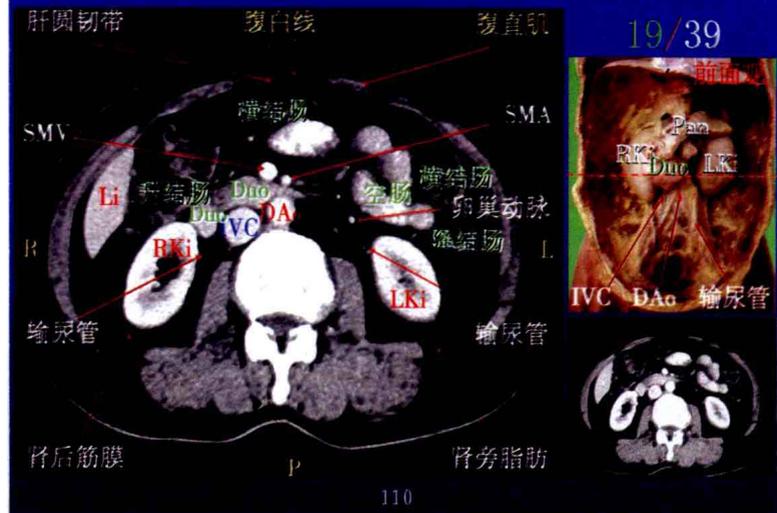
腹部横断面

增强



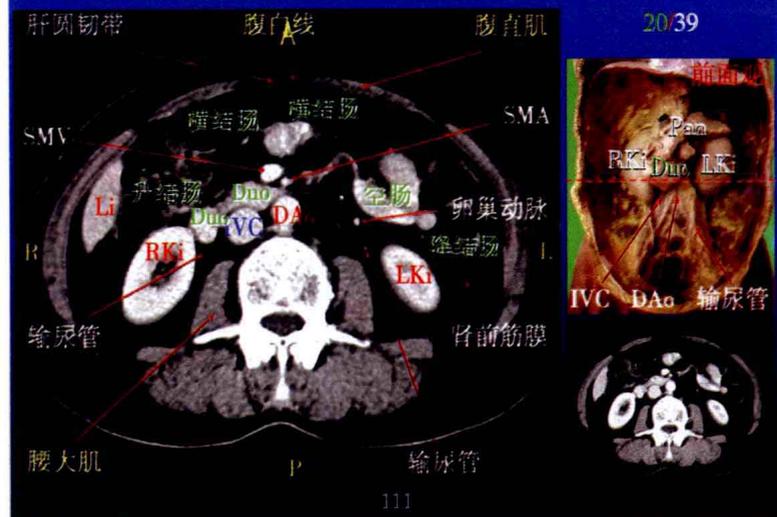
腹部横断面

增强



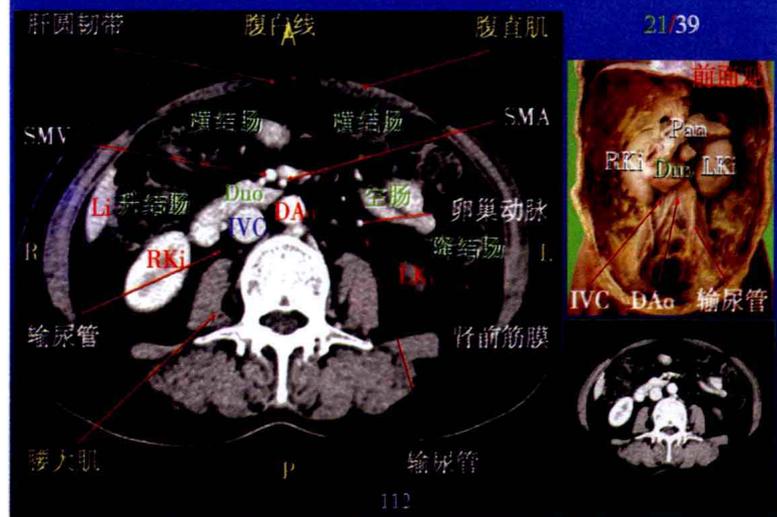
腹部横断面

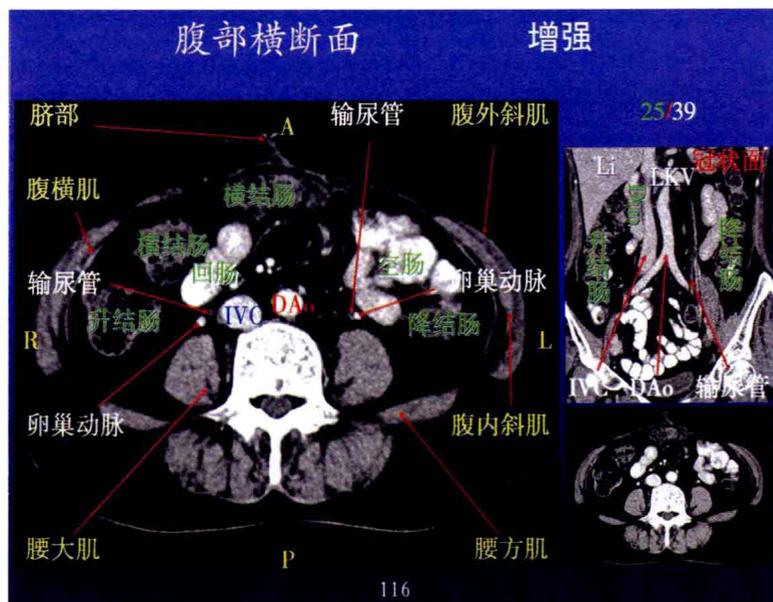
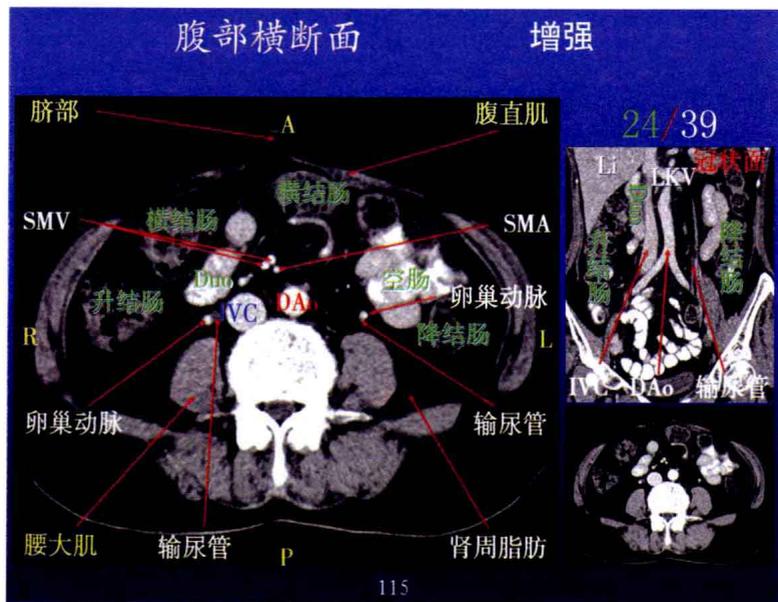
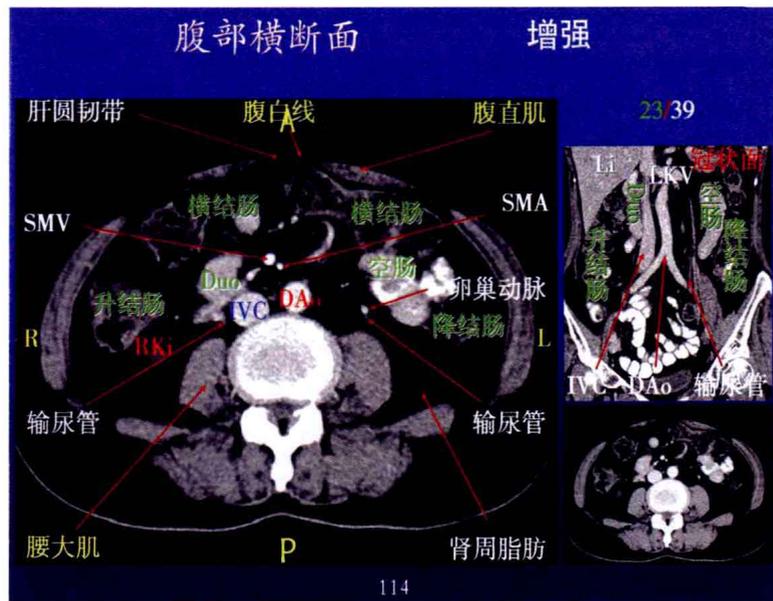
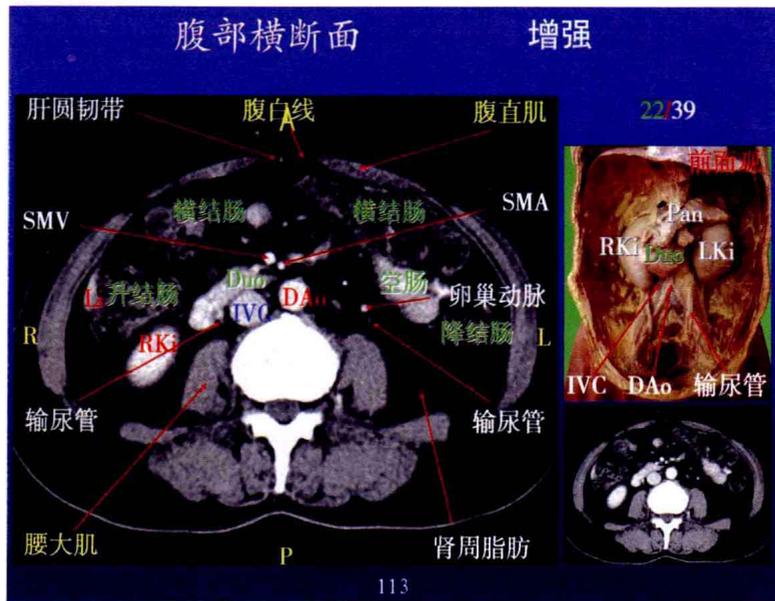
增强



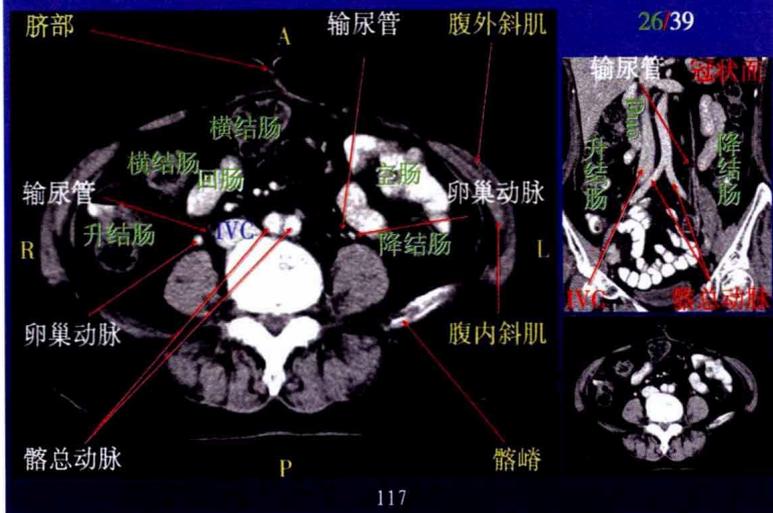
腹部横断面

增强

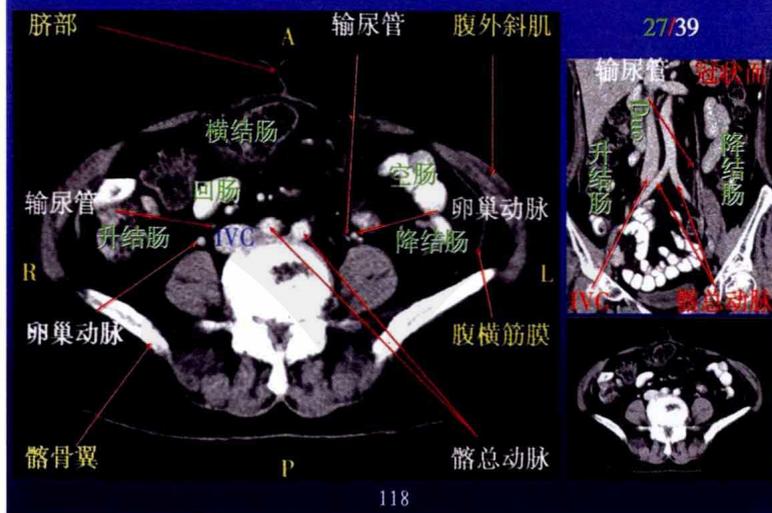




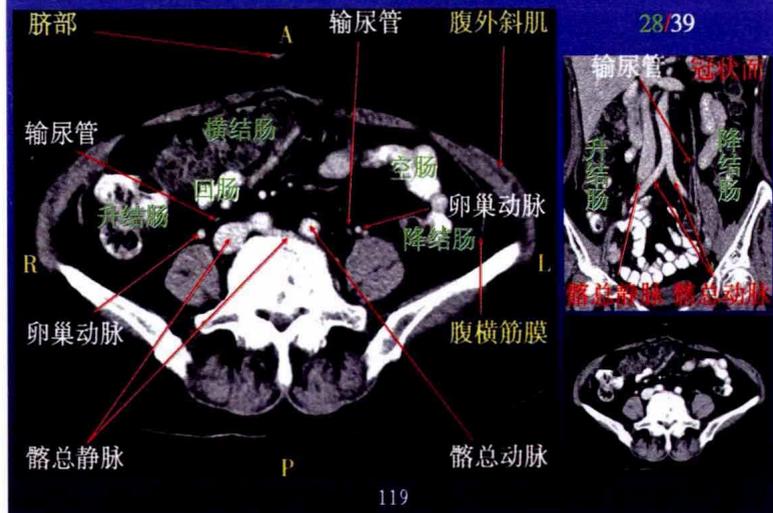
腹部横断面 增强



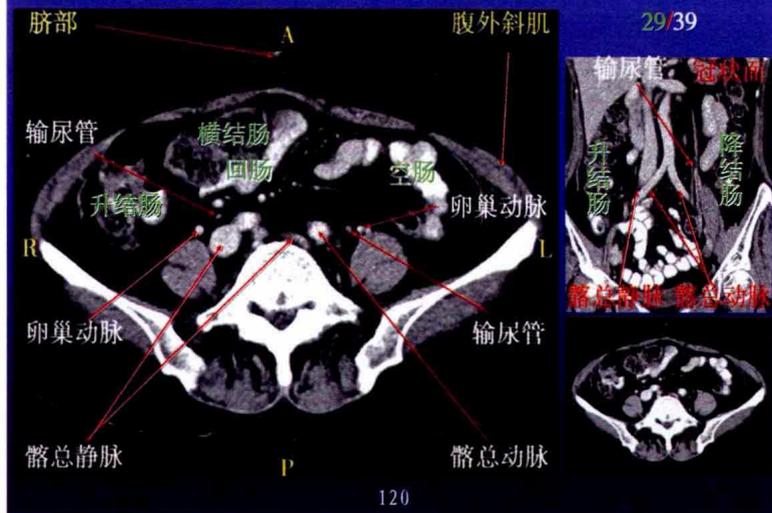
腹部横断面 增强

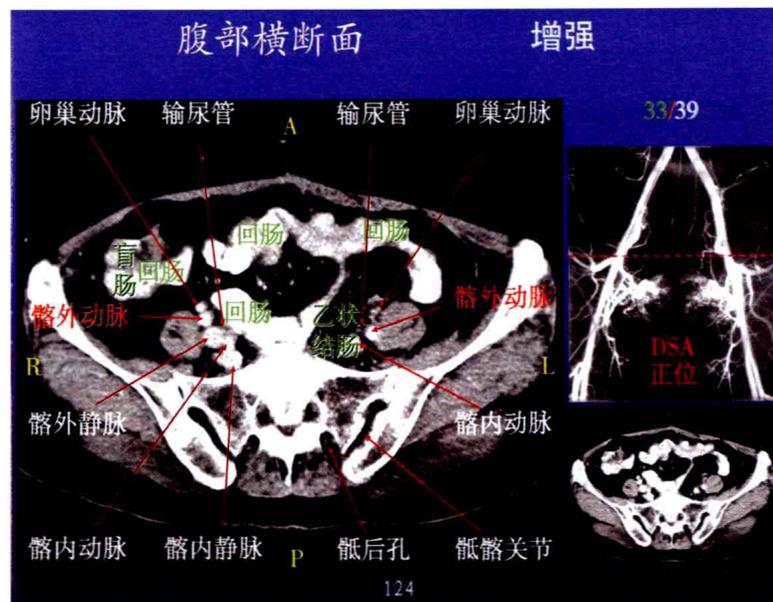
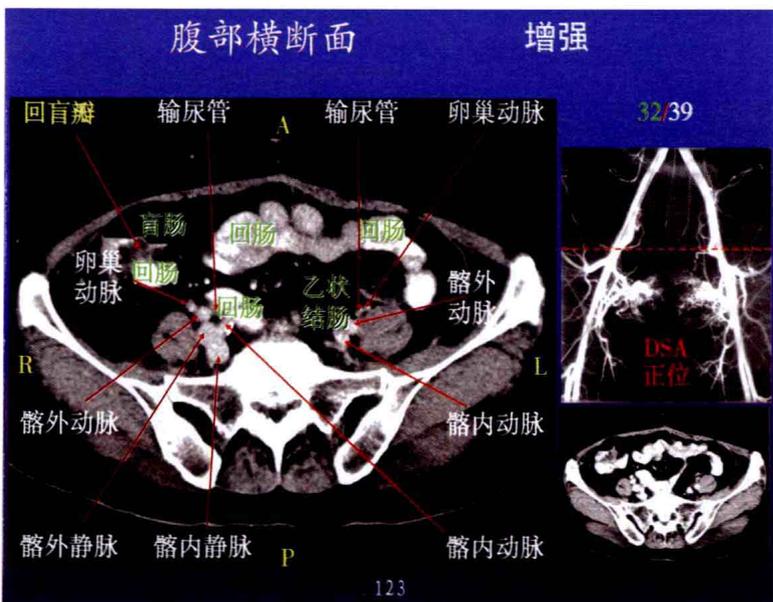
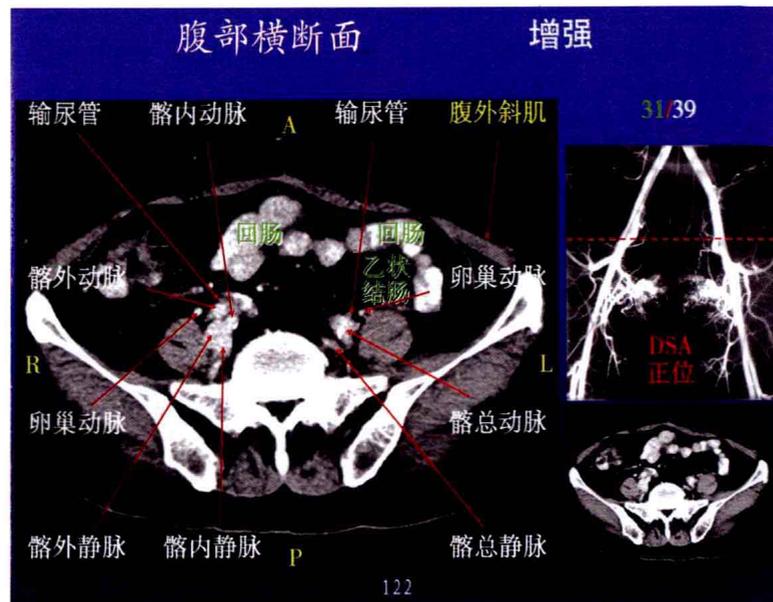
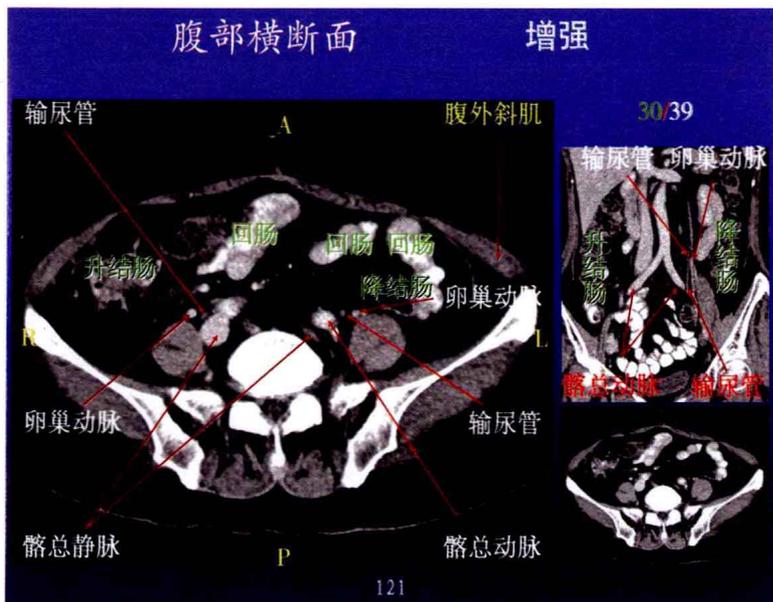


腹部横断面 增强



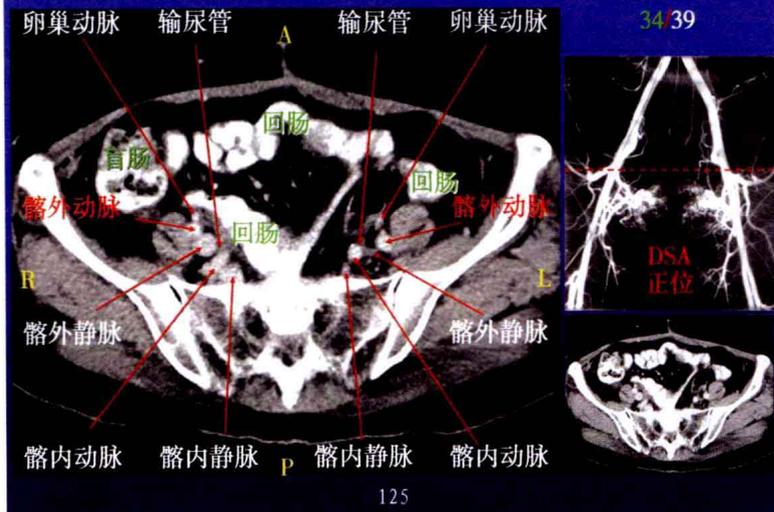
腹部横断面 增强





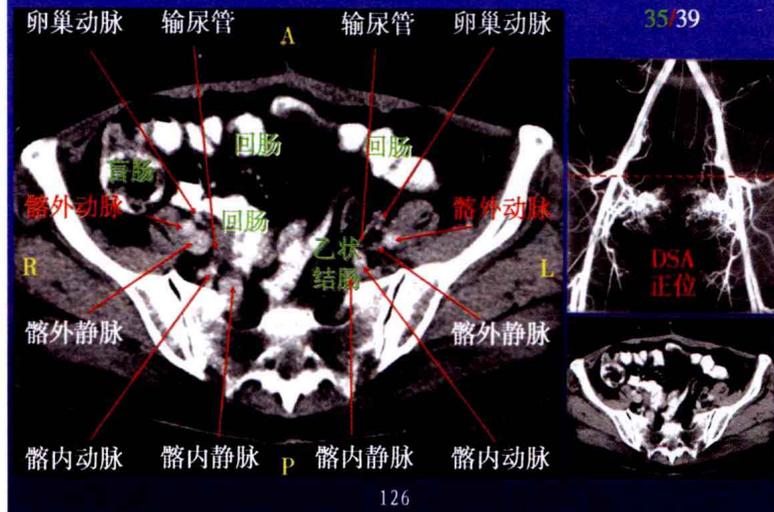
腹部横断面

增强



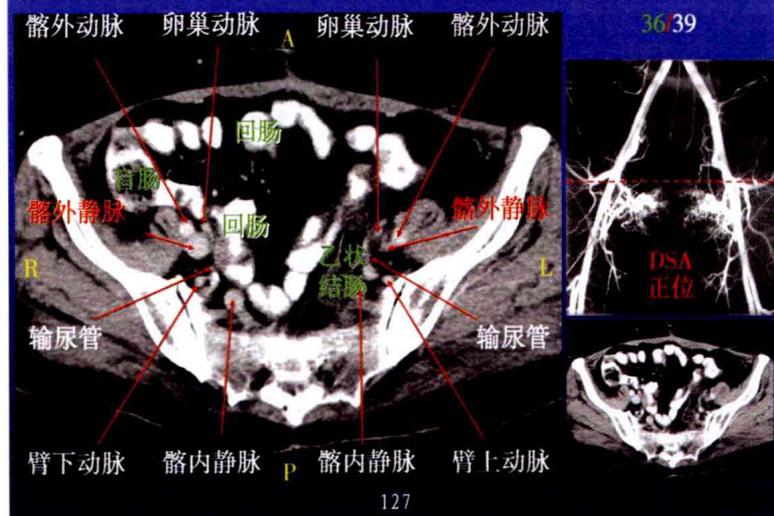
腹部横断面

增强



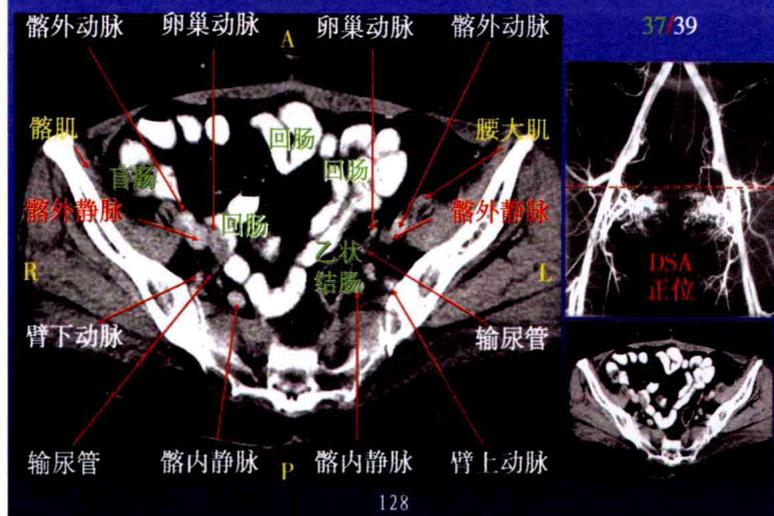
腹部横断面

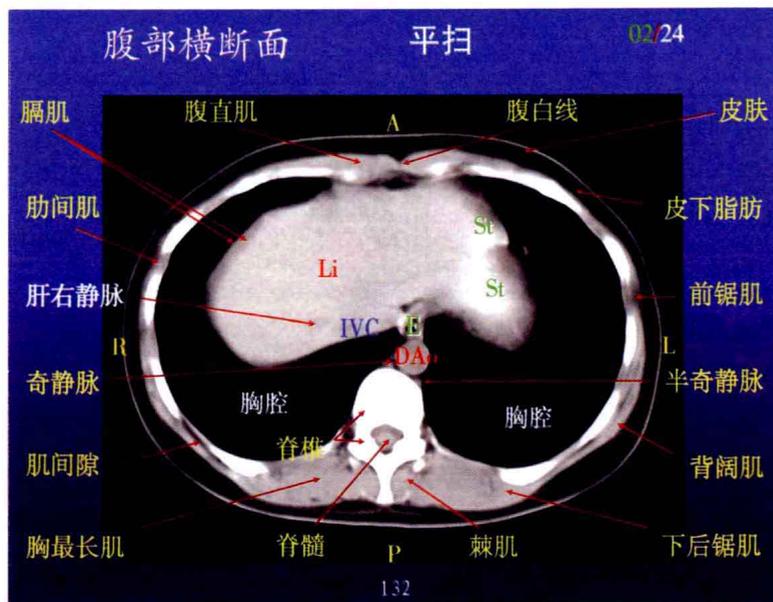
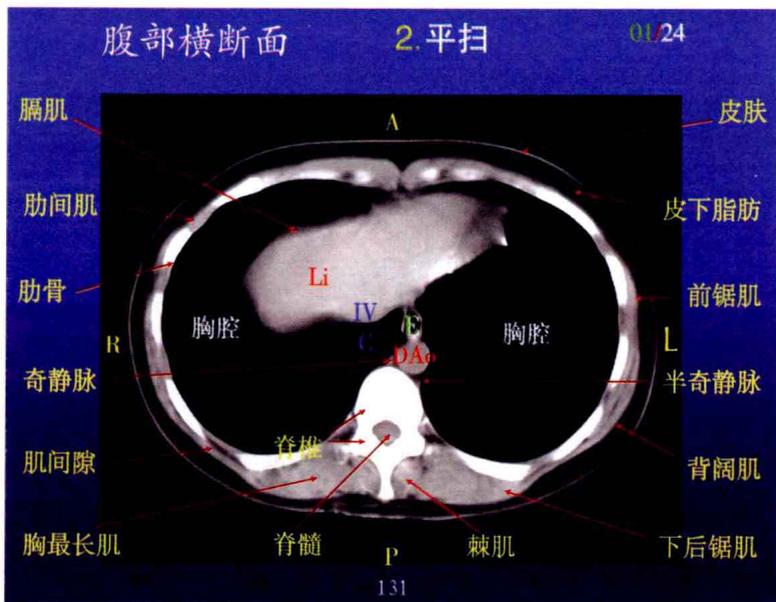
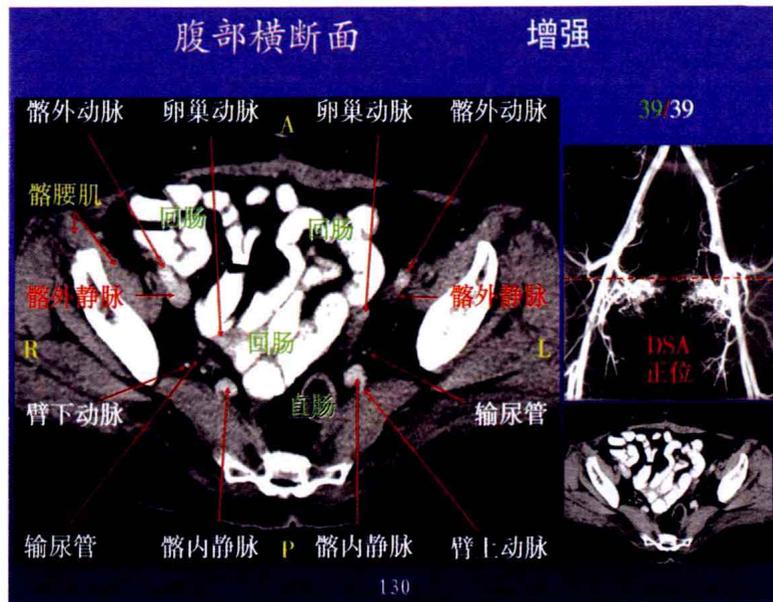
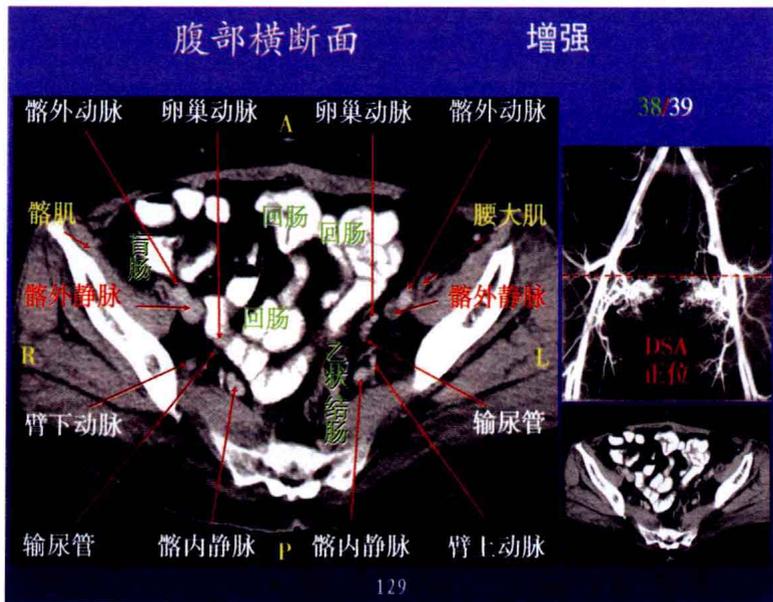
增强

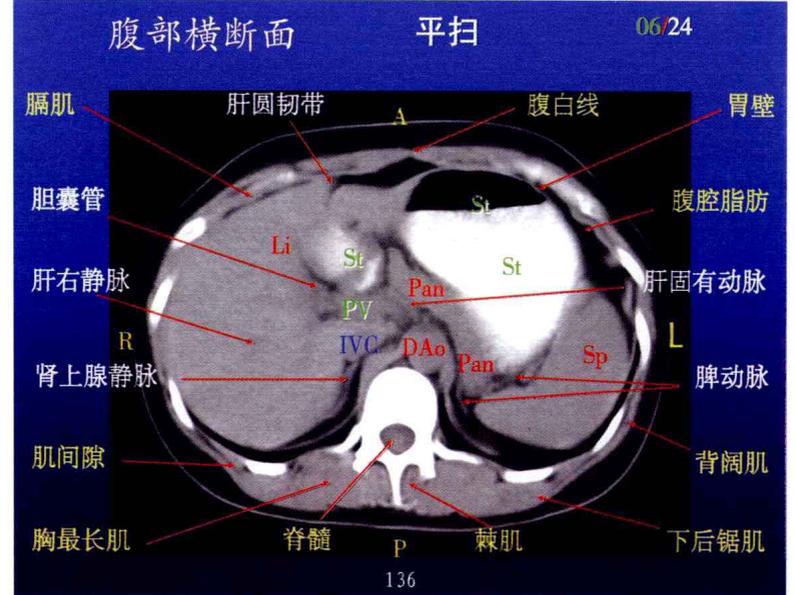
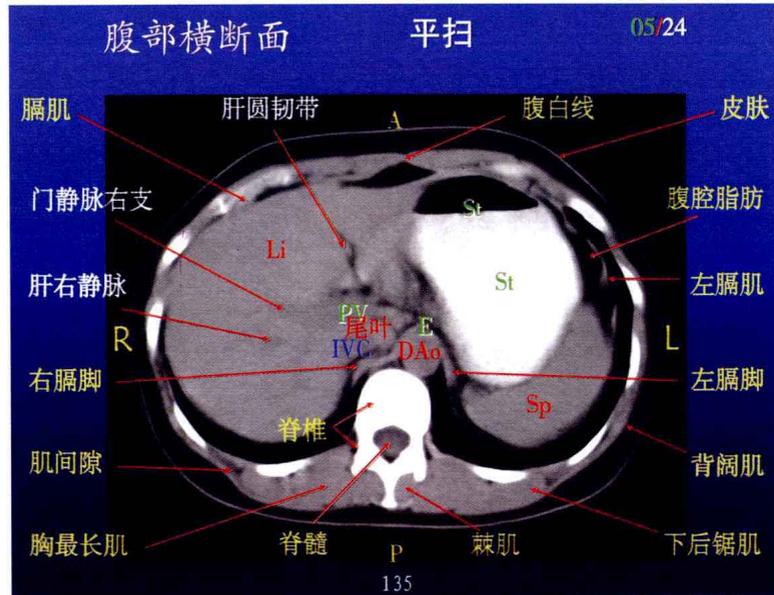
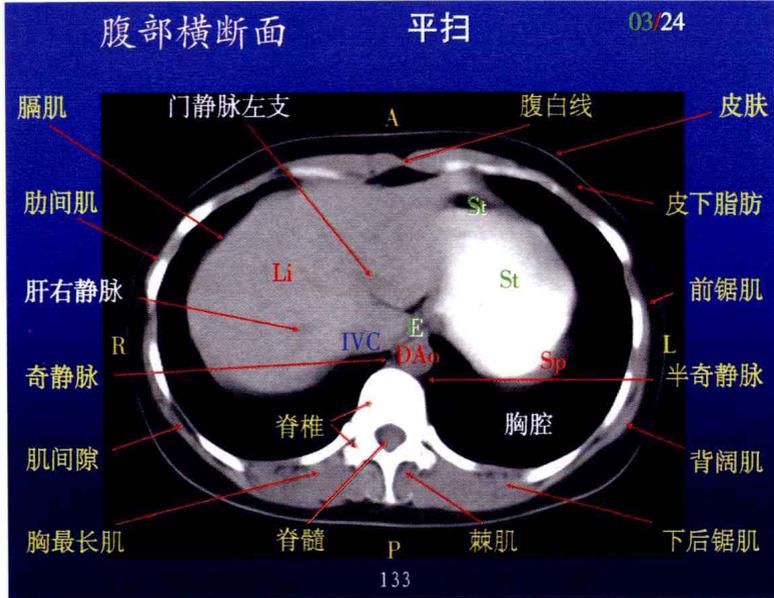


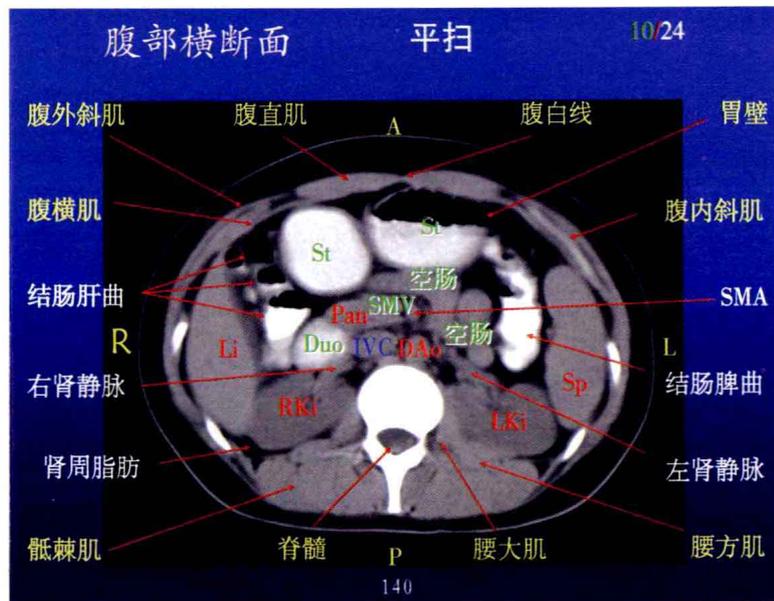
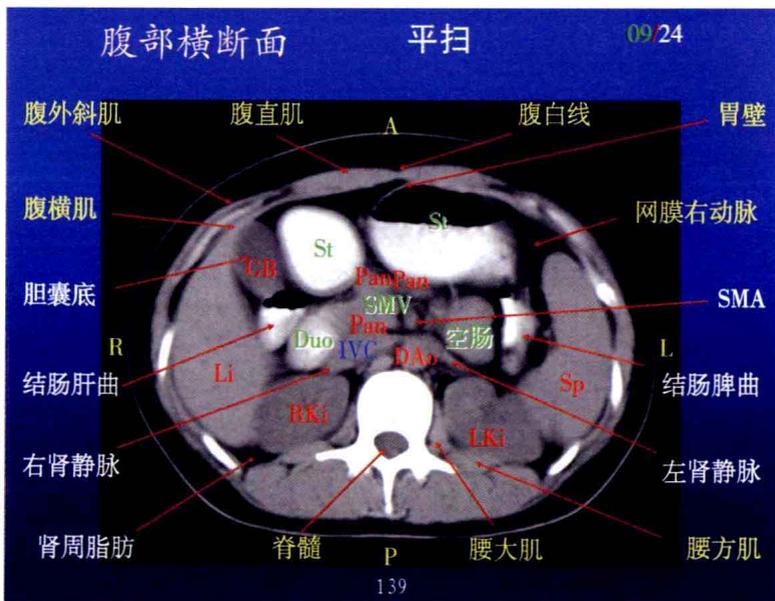
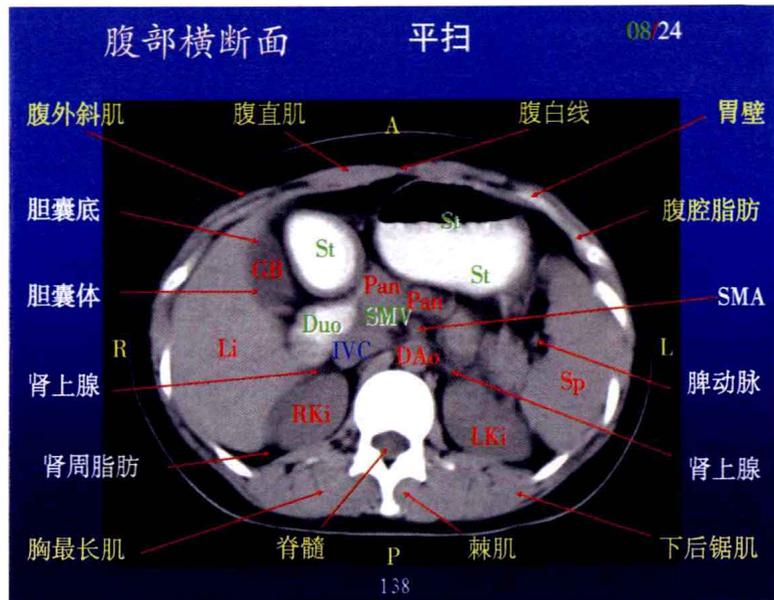
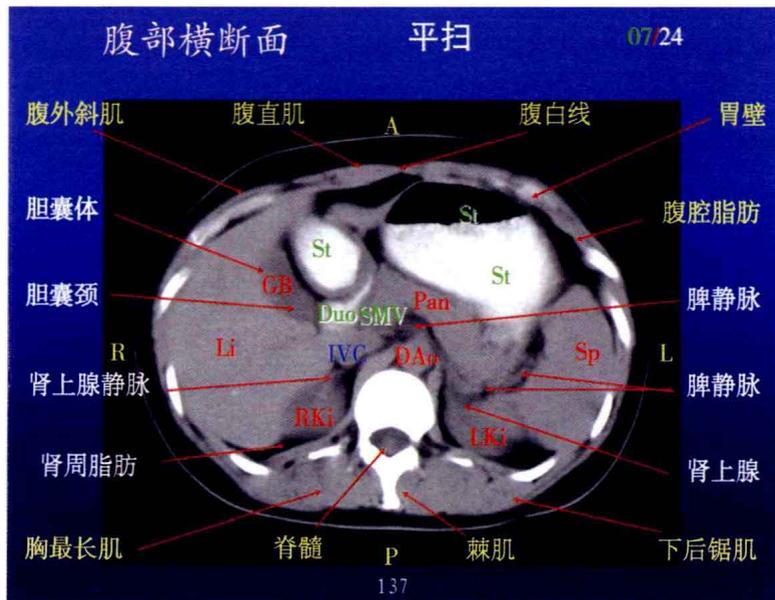
腹部横断面

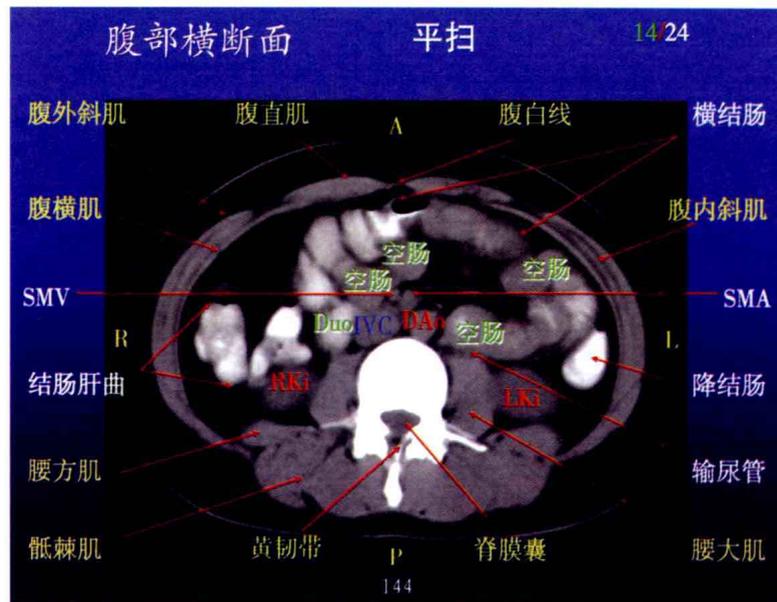
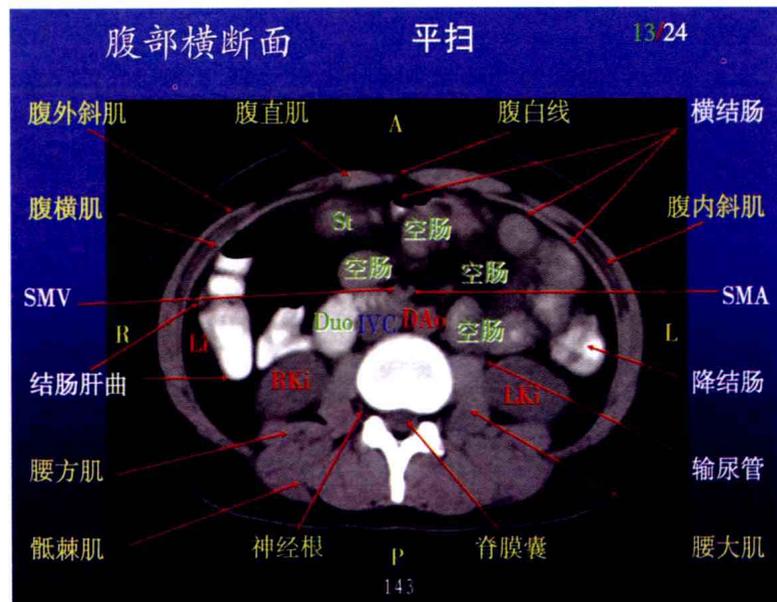
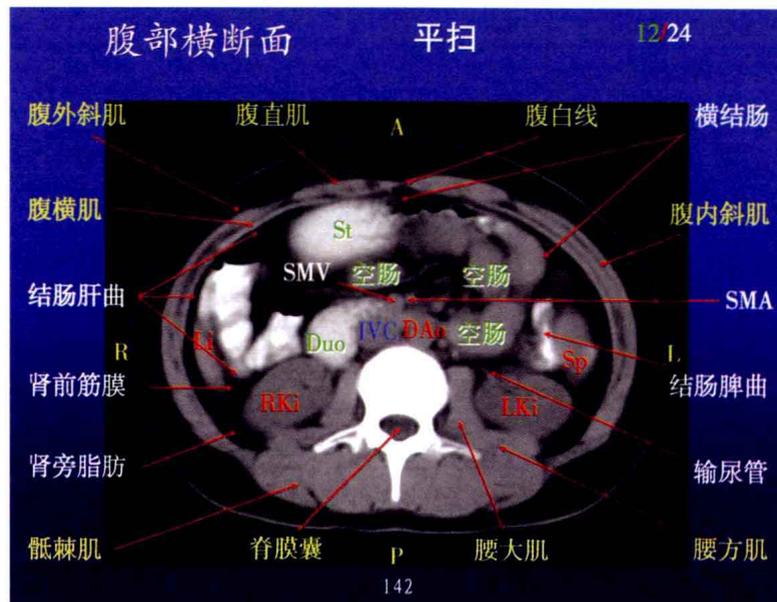
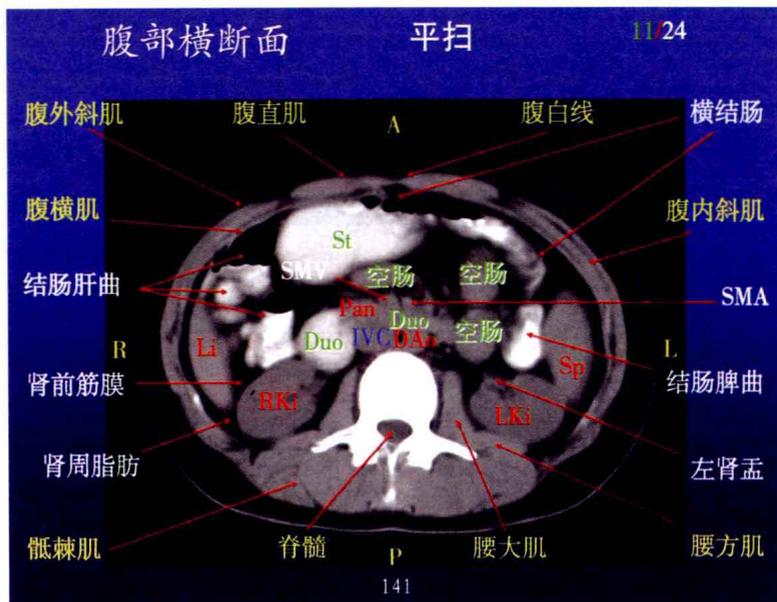
增强

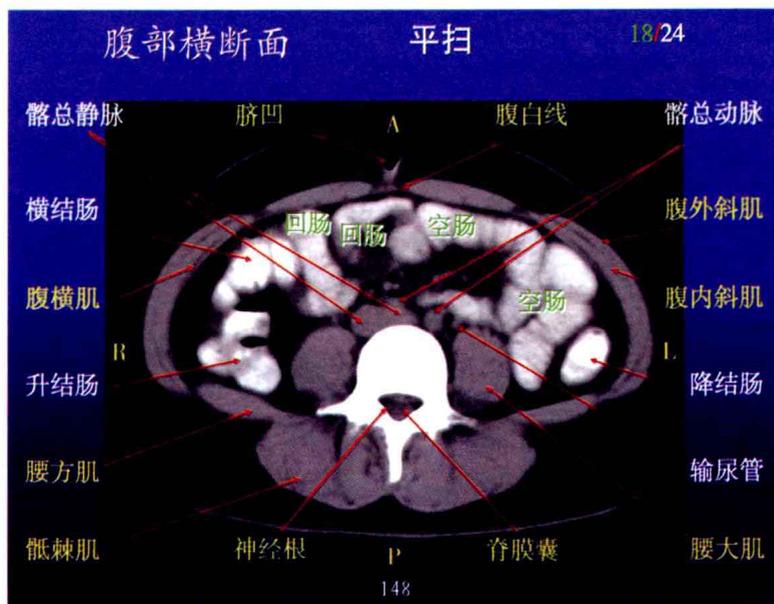
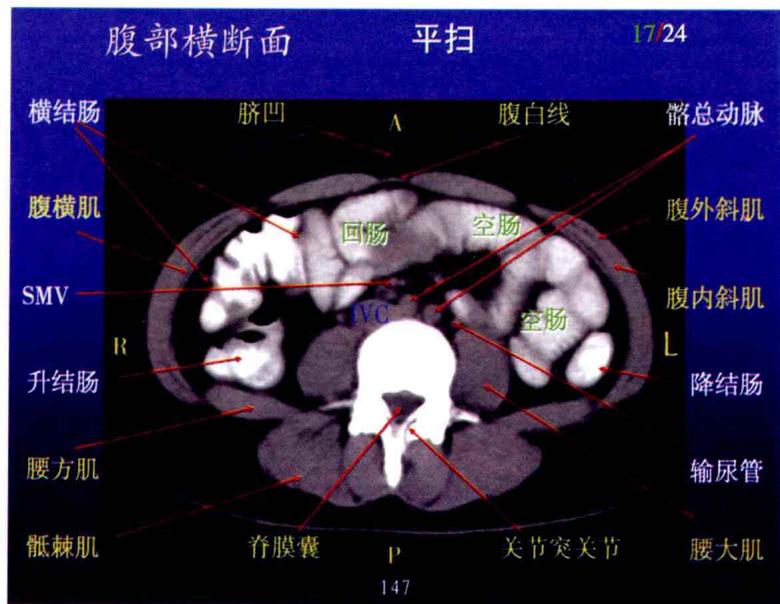
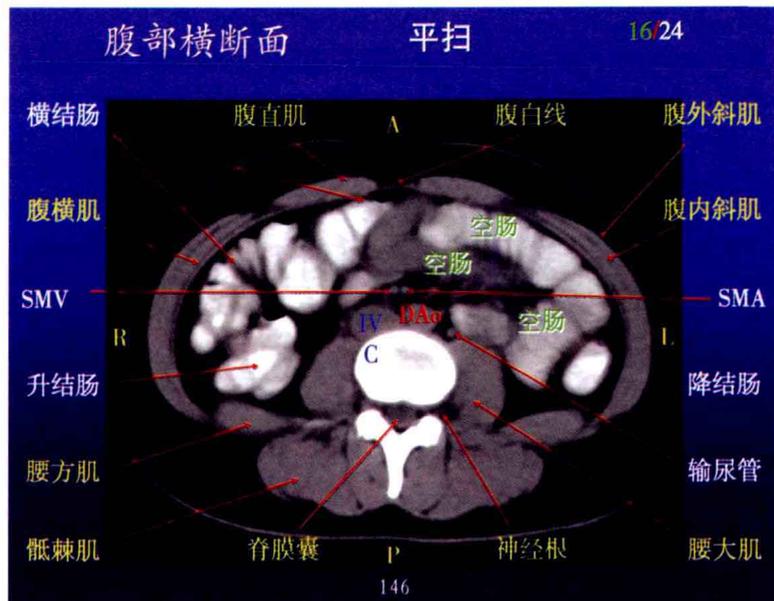
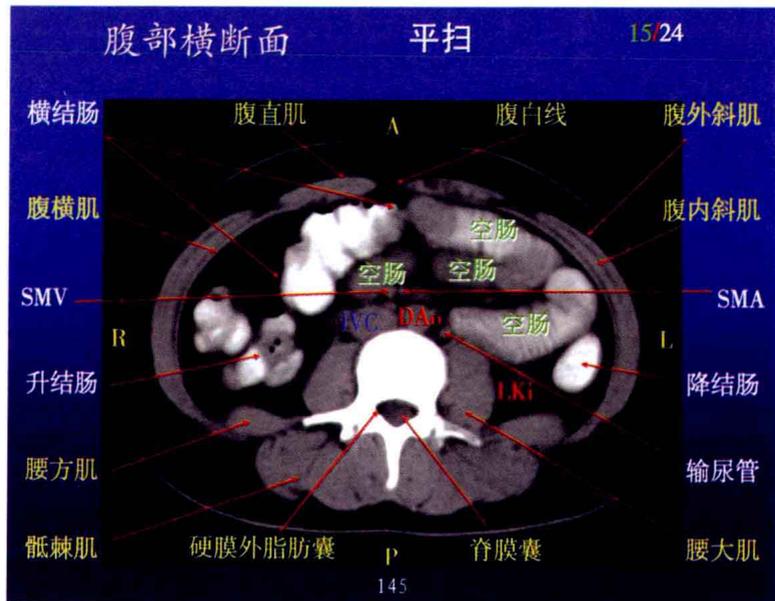


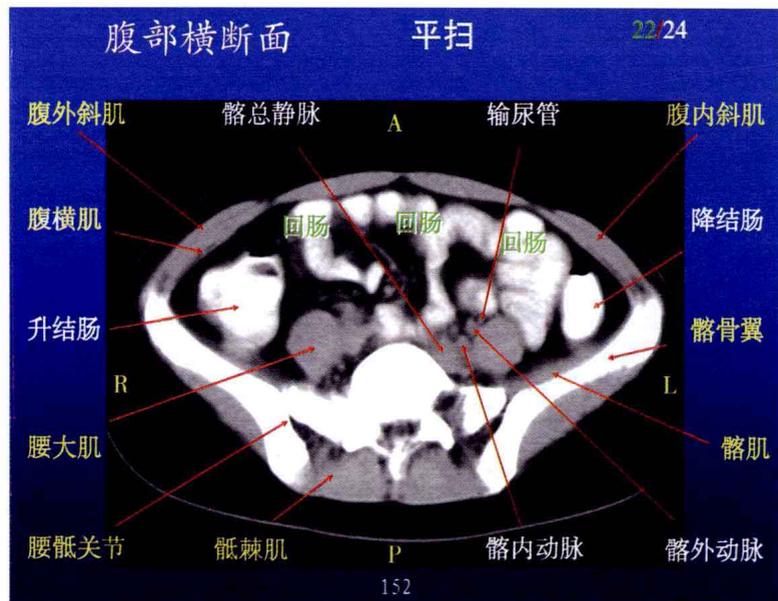
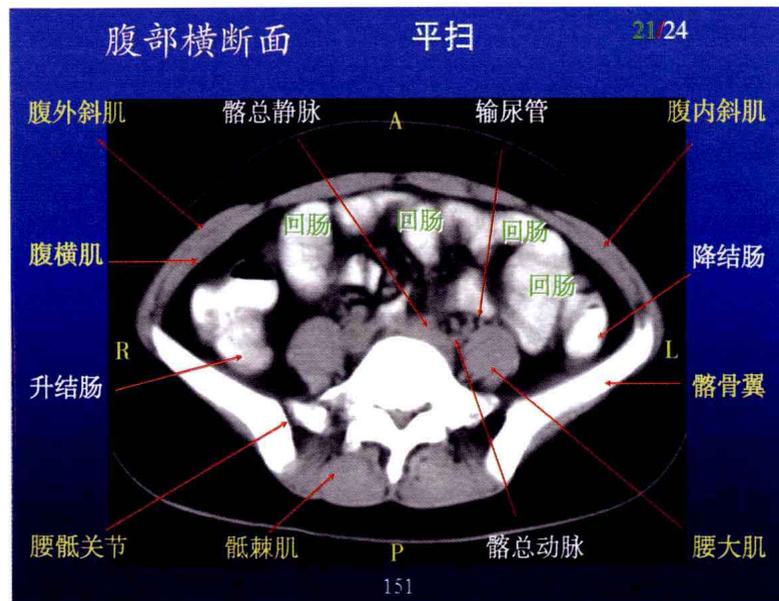
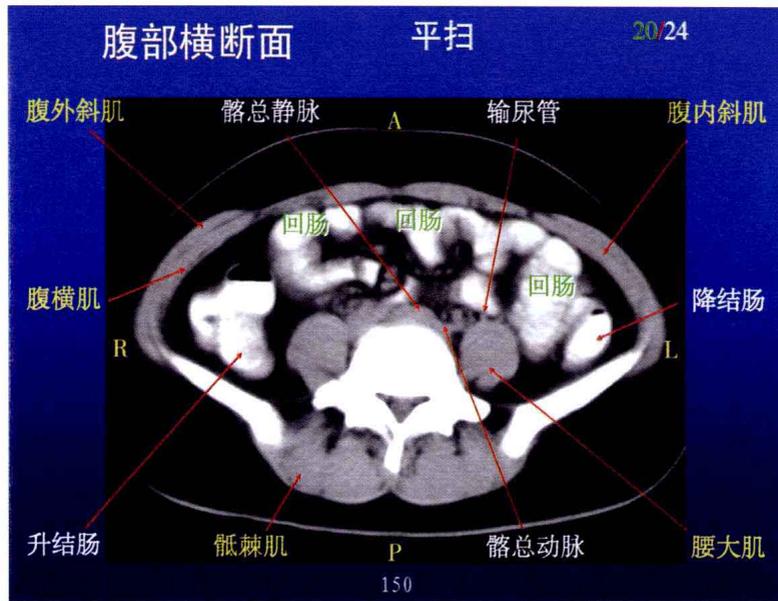
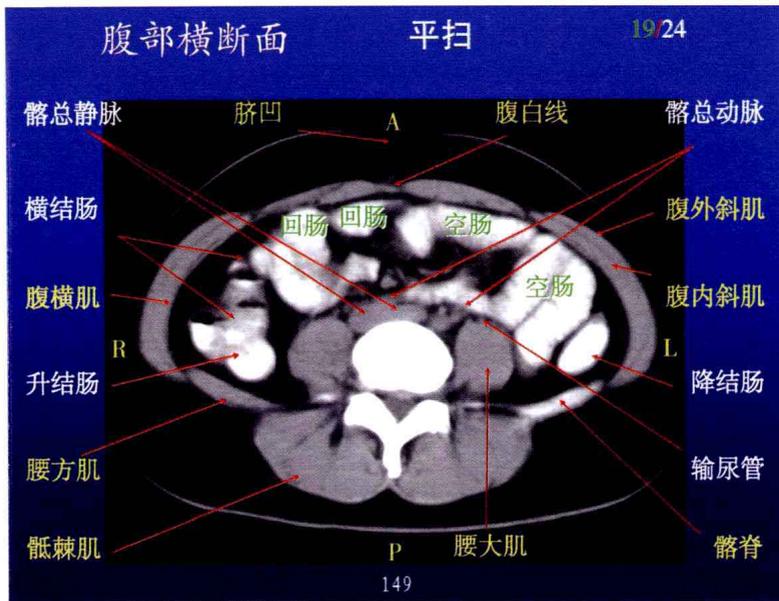


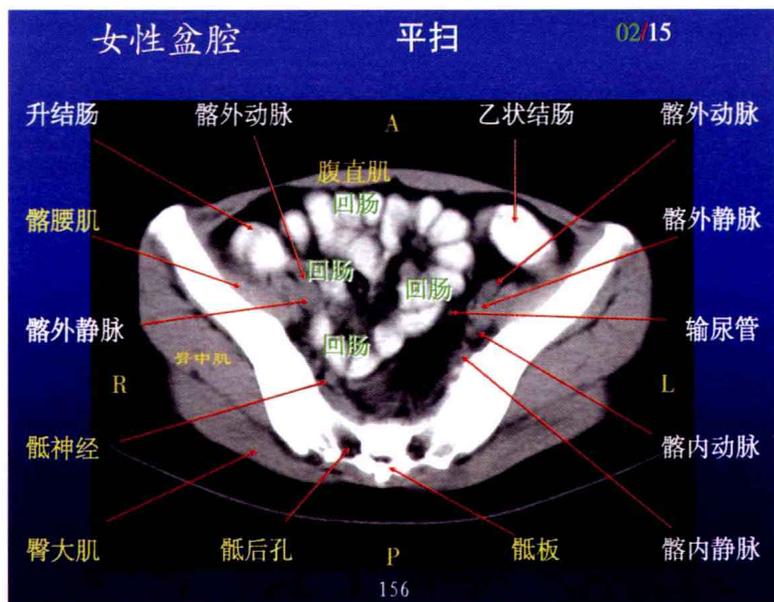
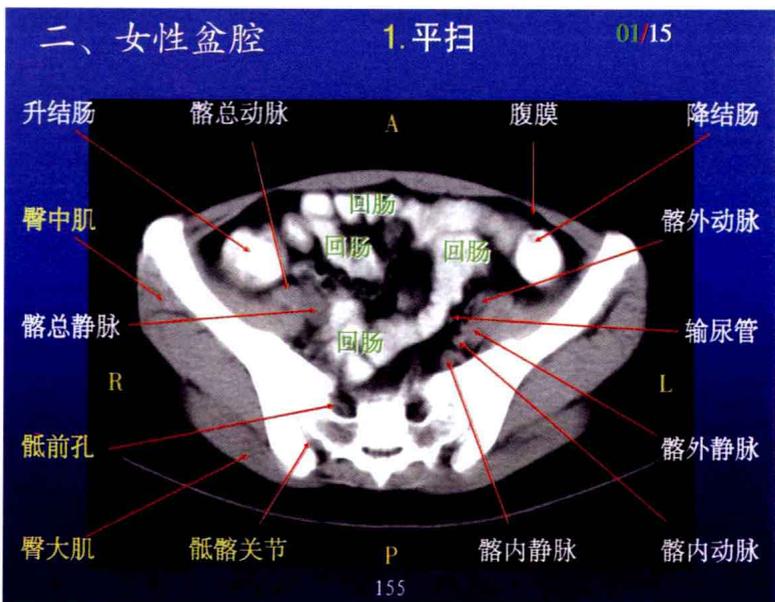
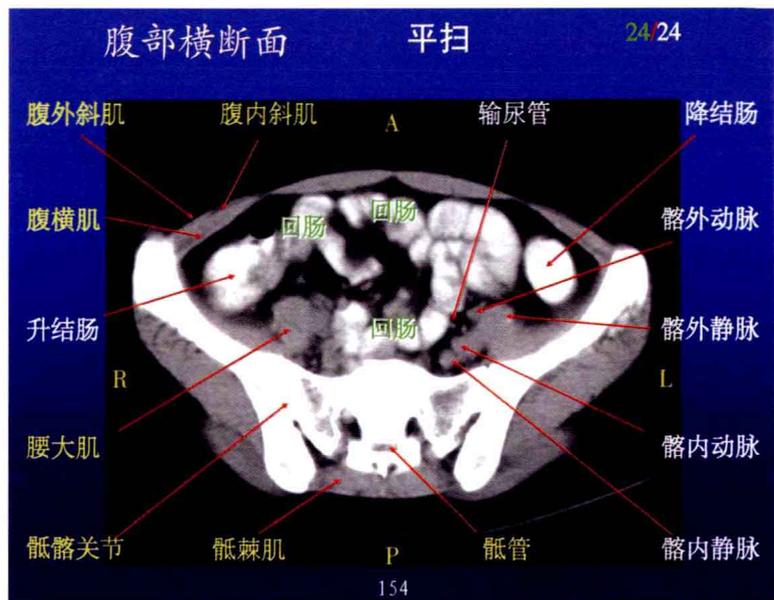
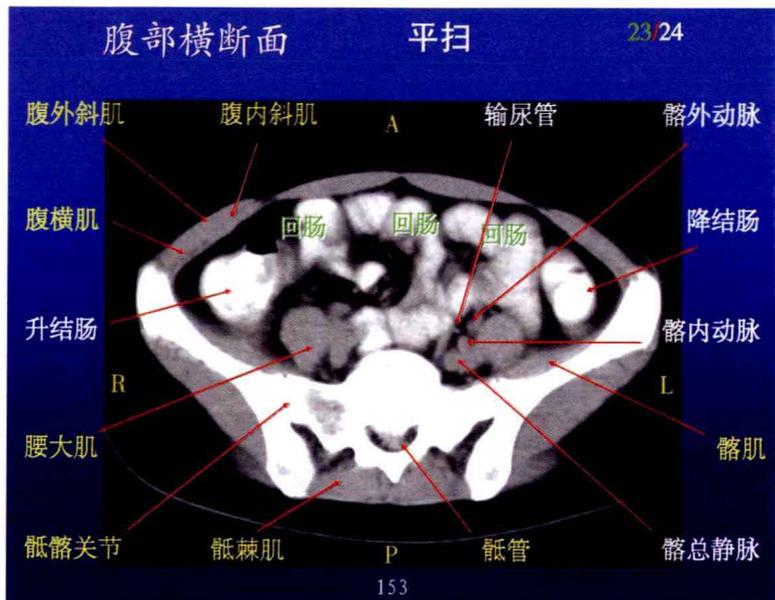


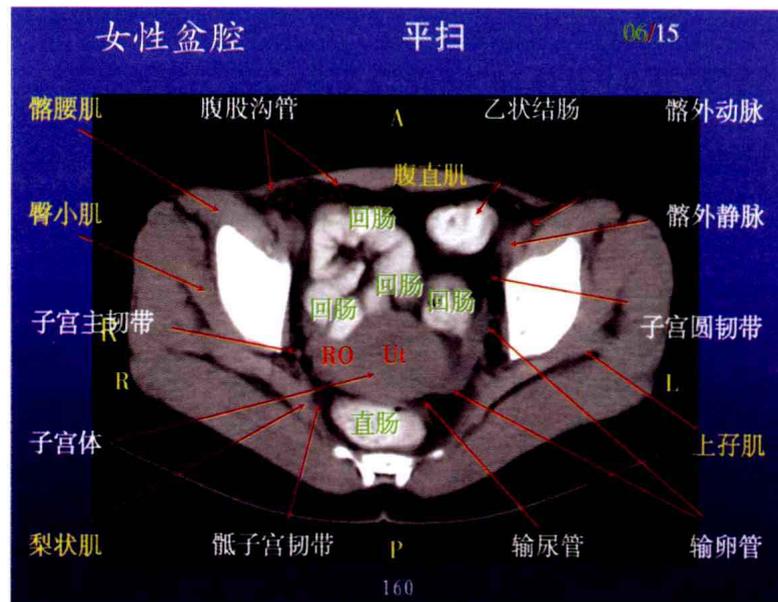
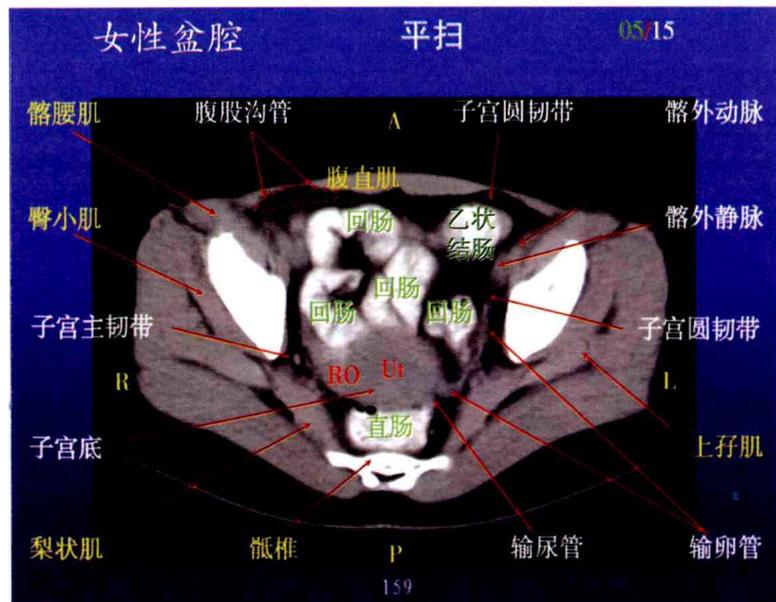
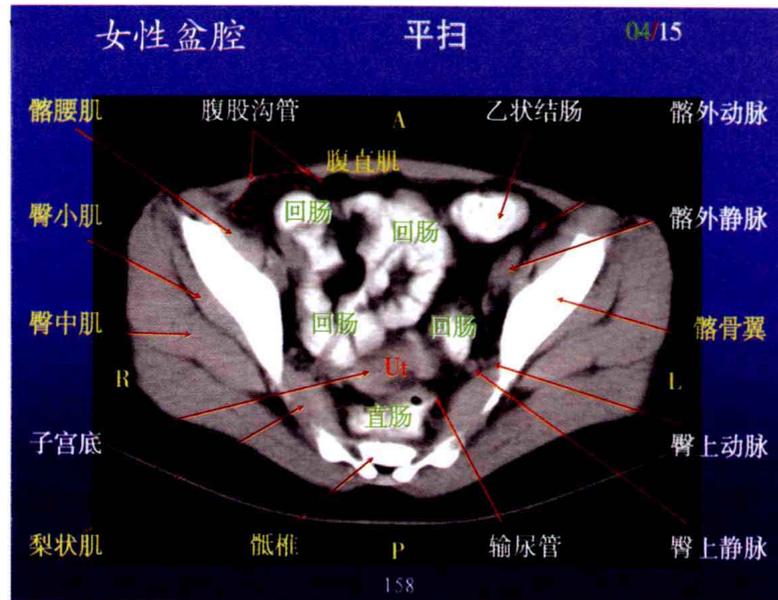
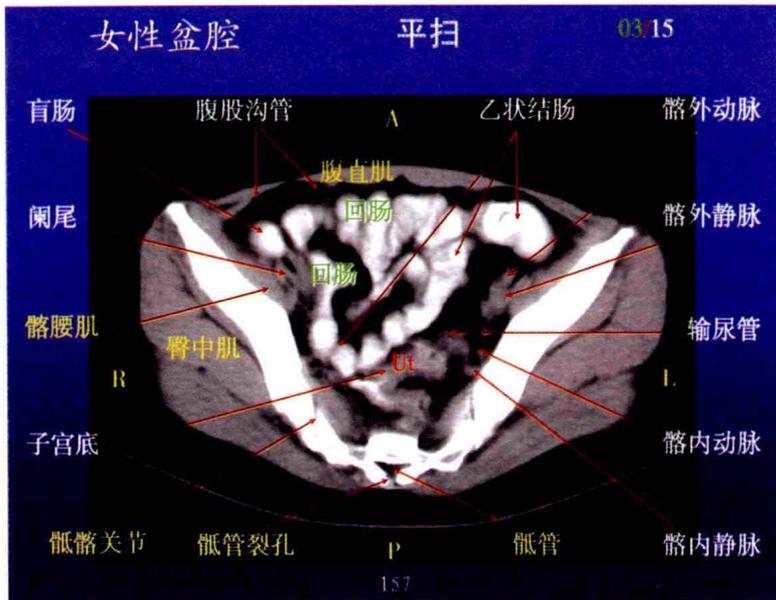


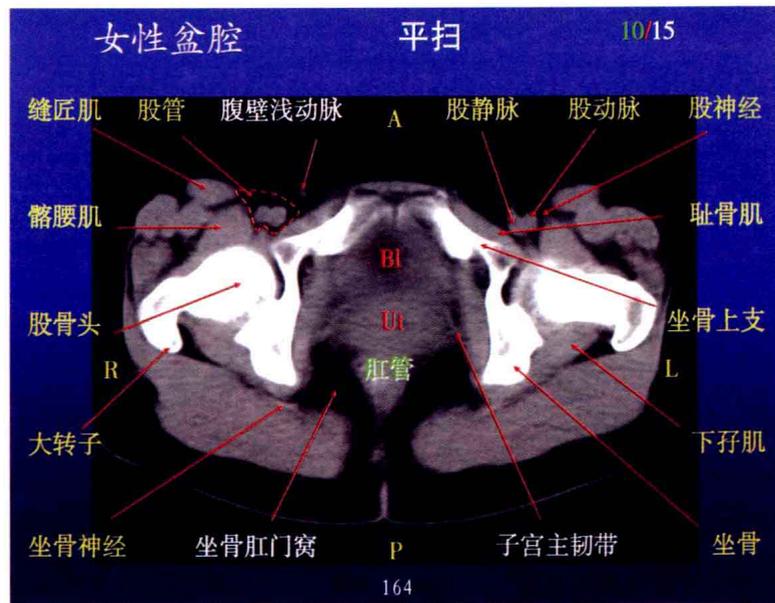
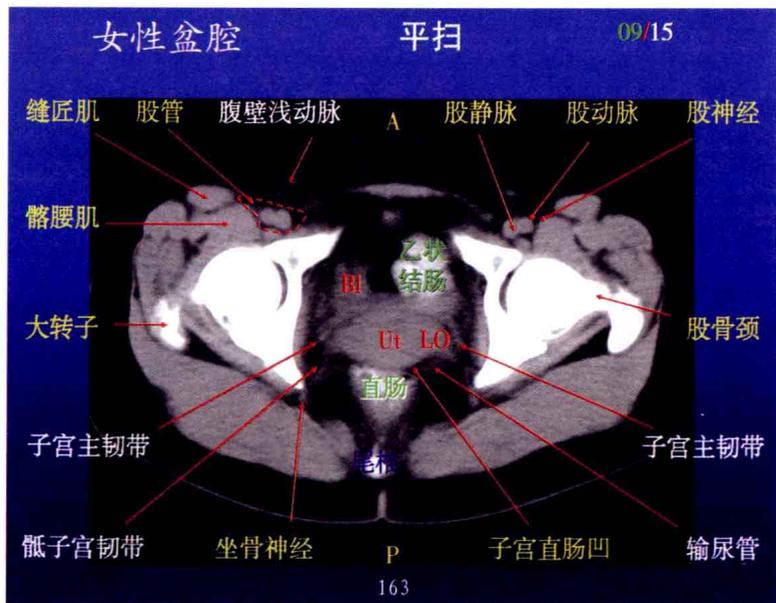
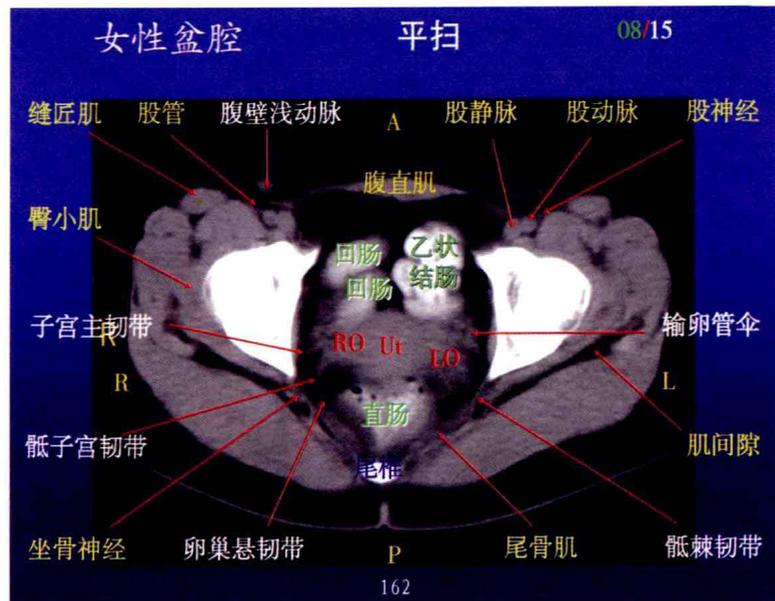
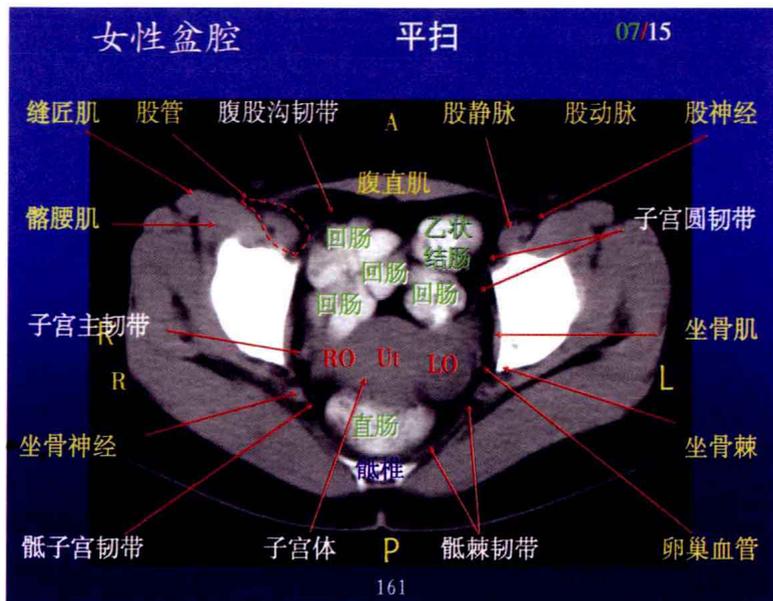


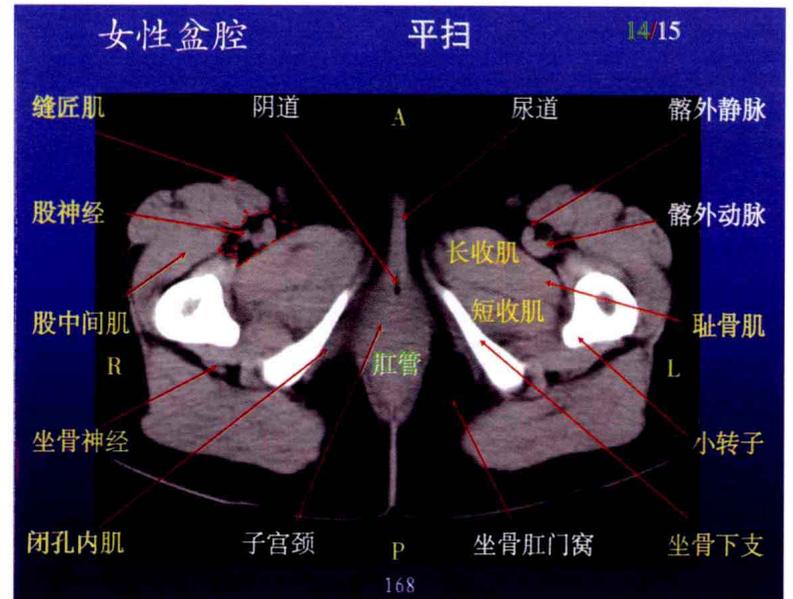
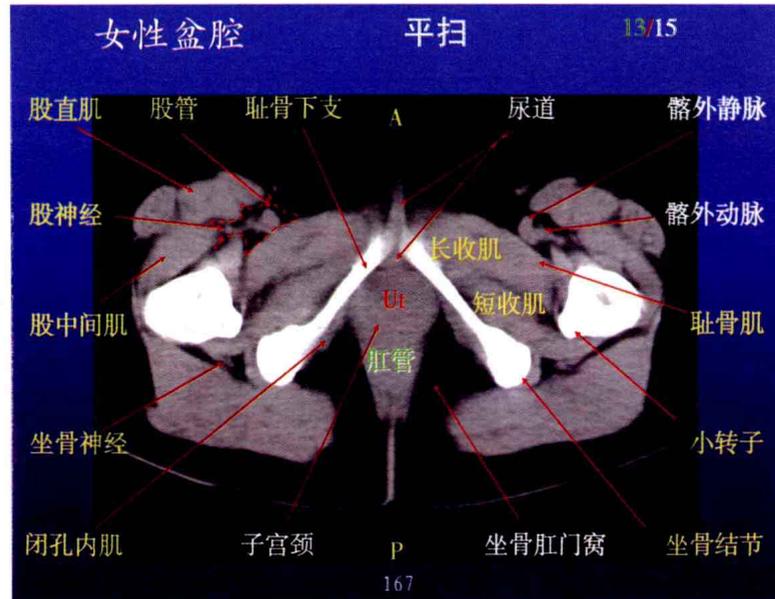
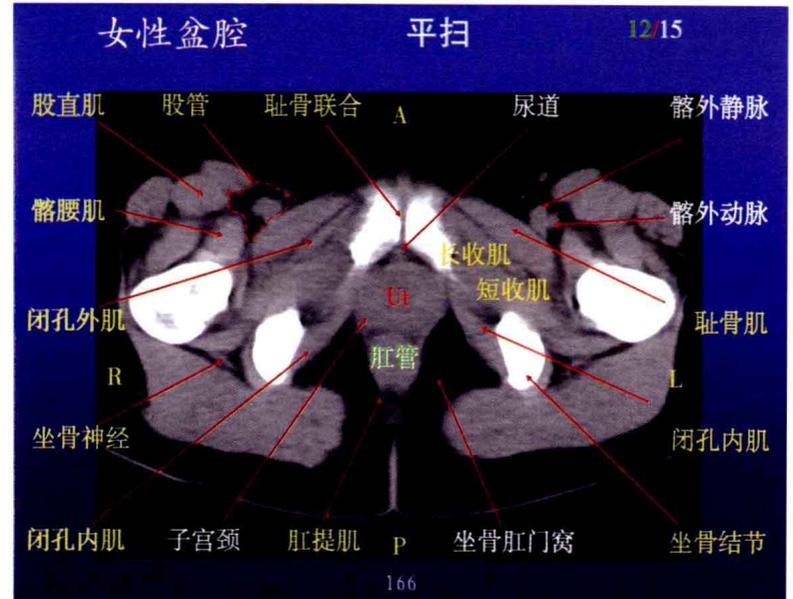
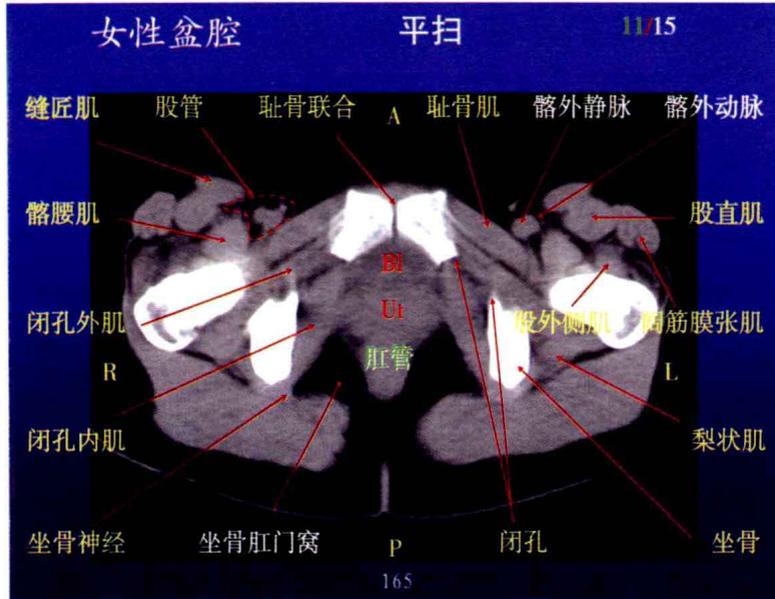


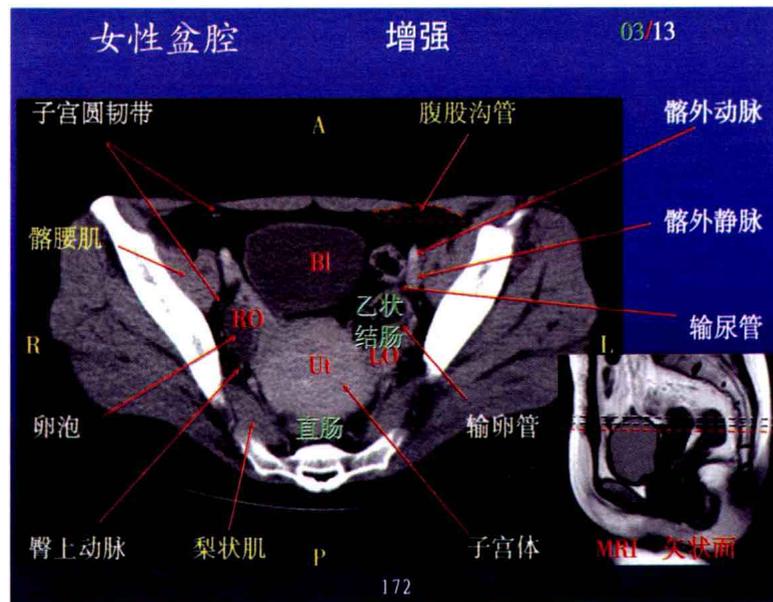
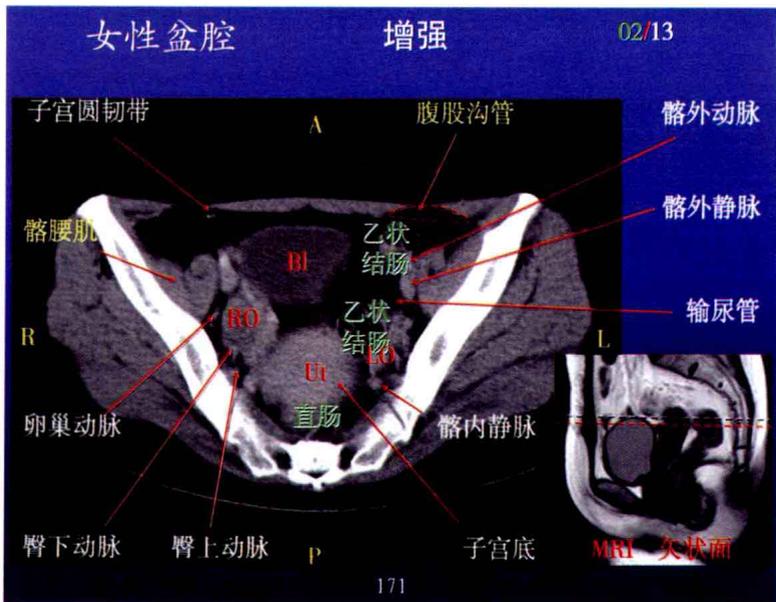
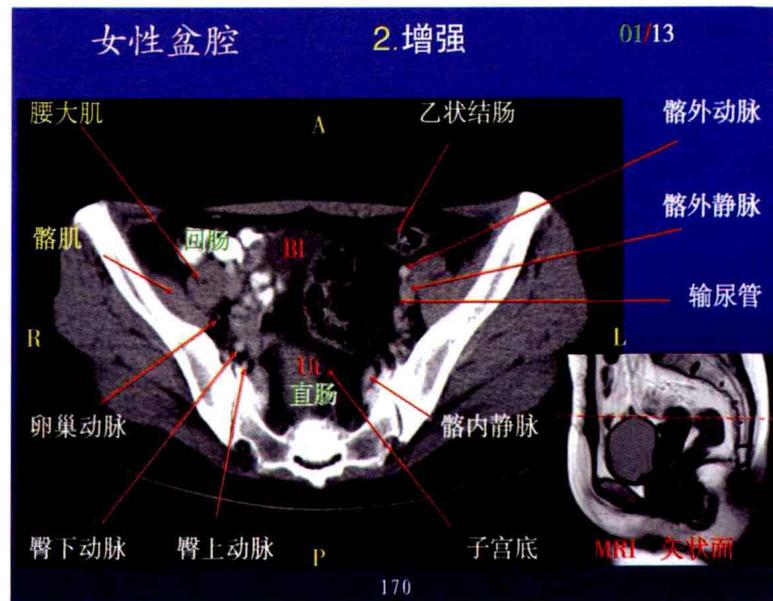
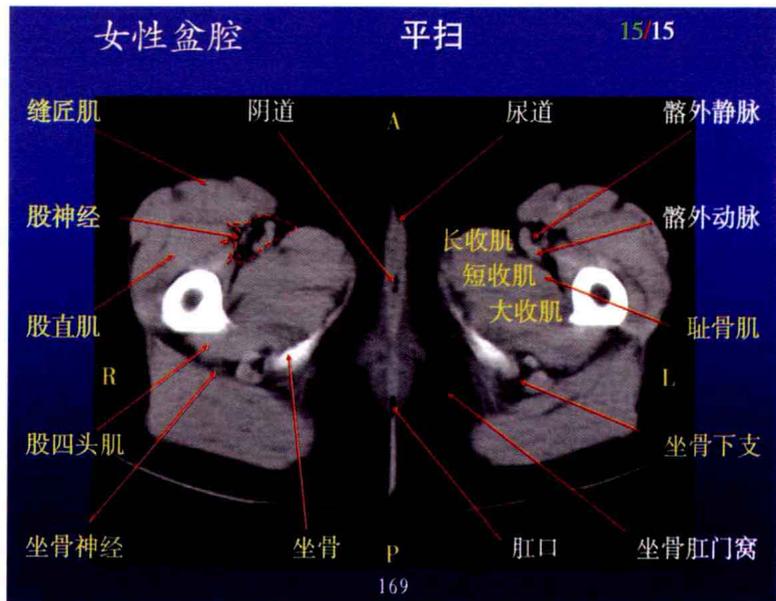








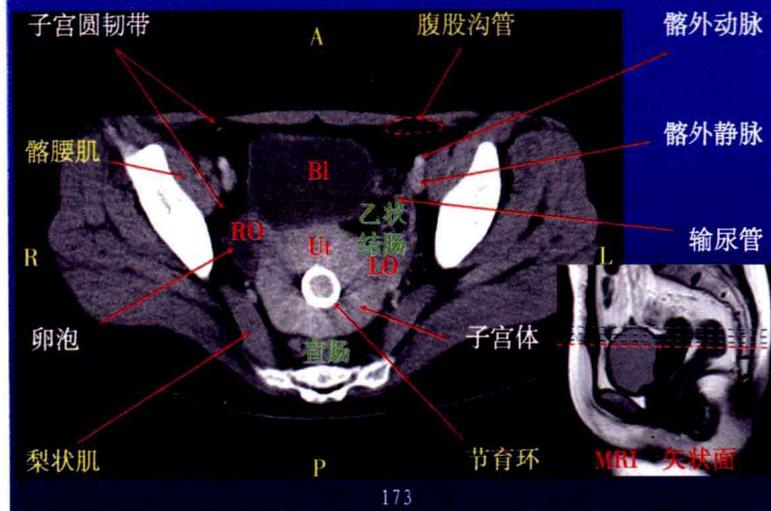




女性盆腔

增强

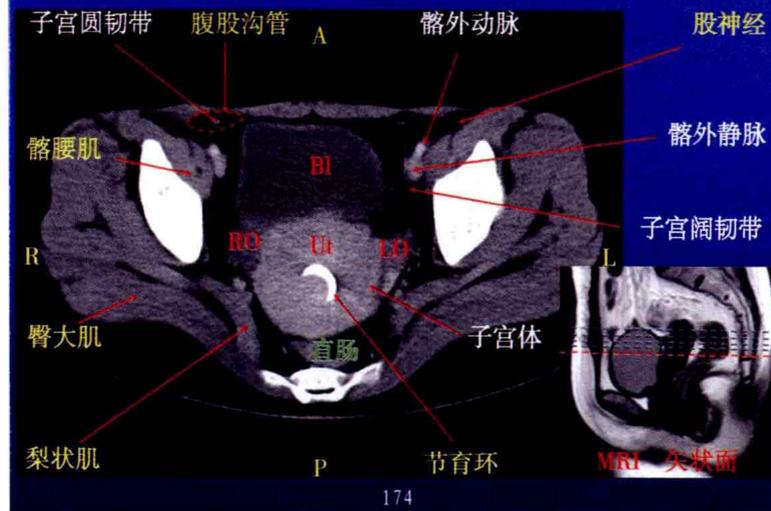
04/13



女性盆腔

增强

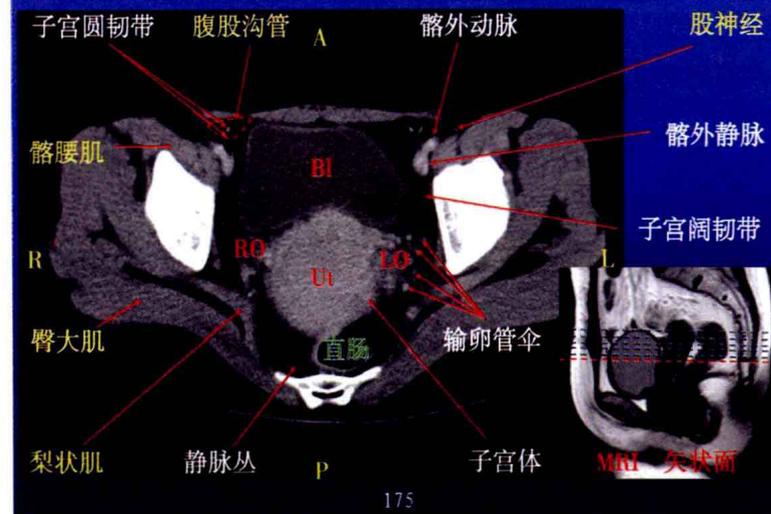
05/13



女性盆腔

增强

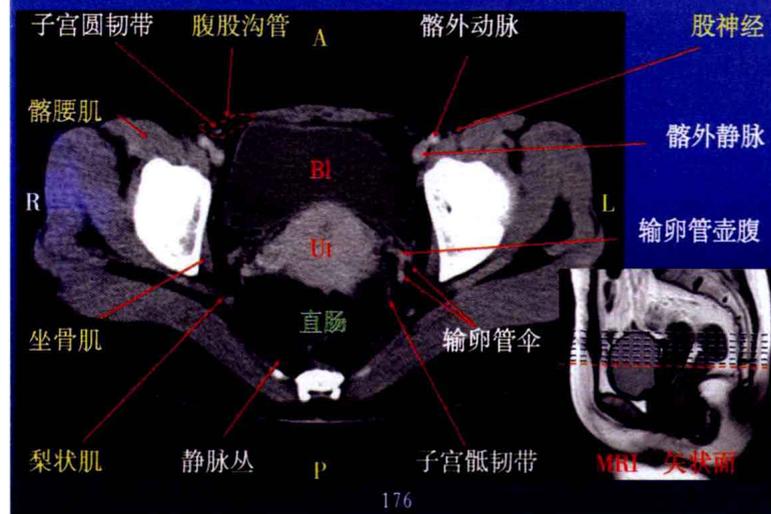
06/13

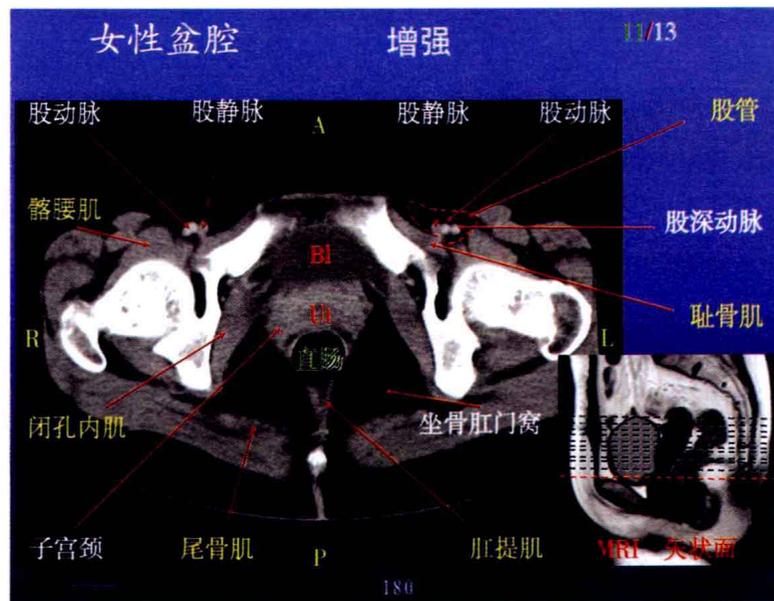
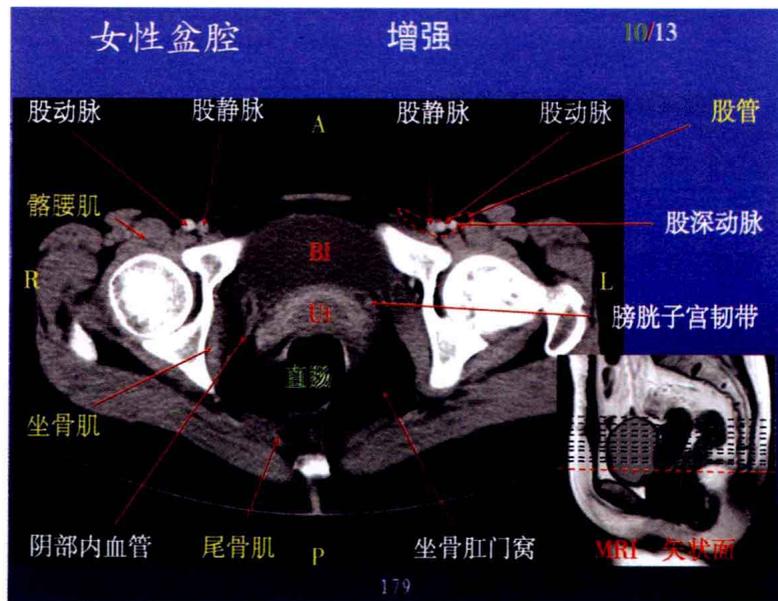
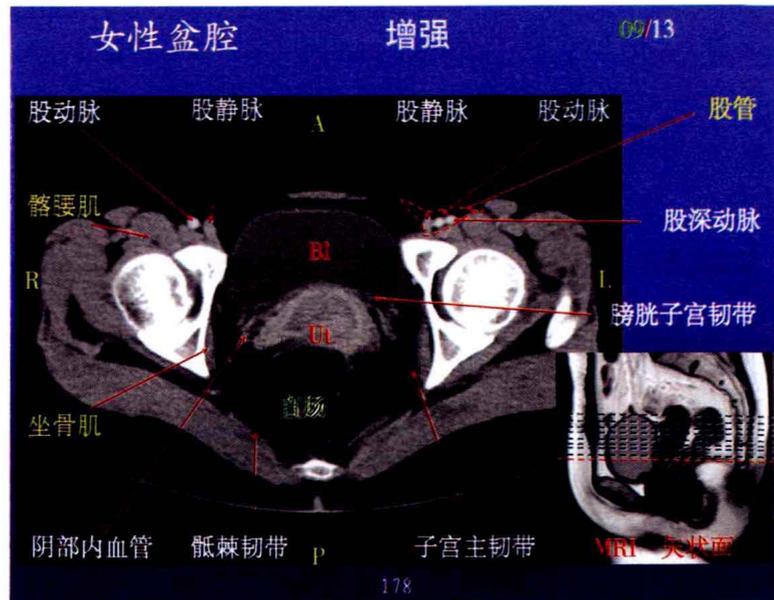
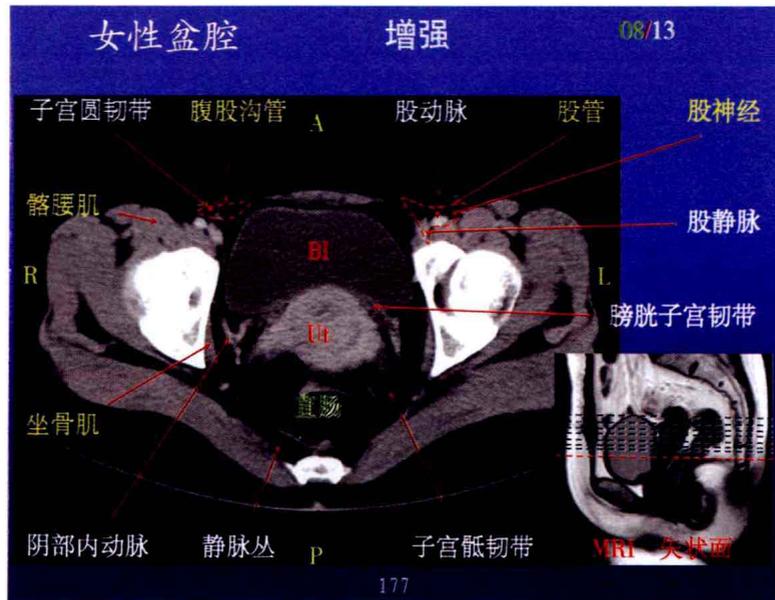


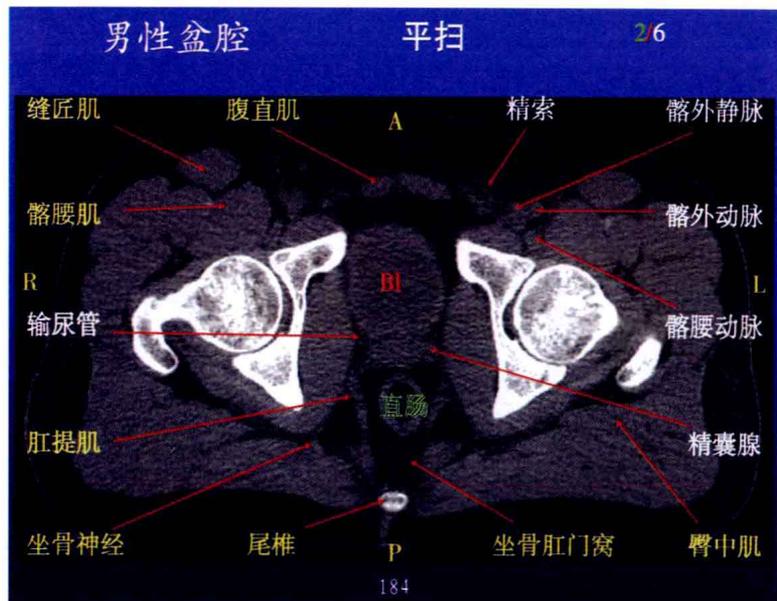
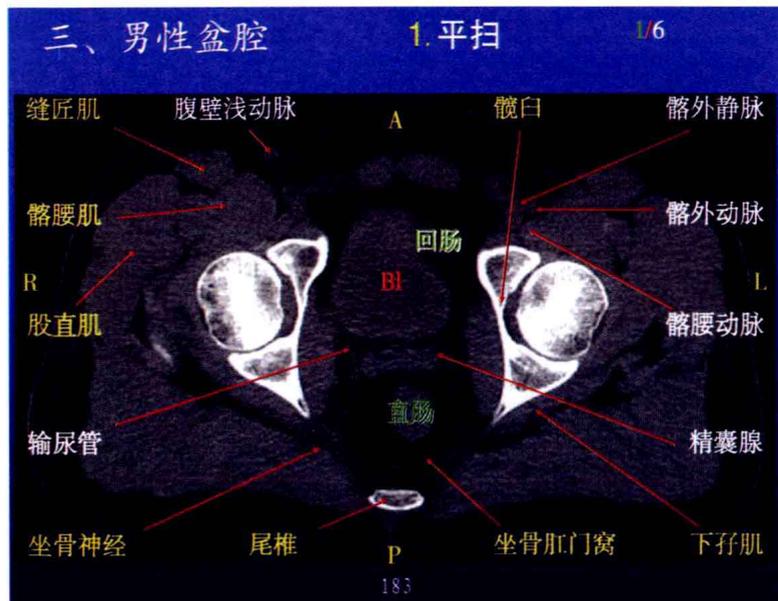
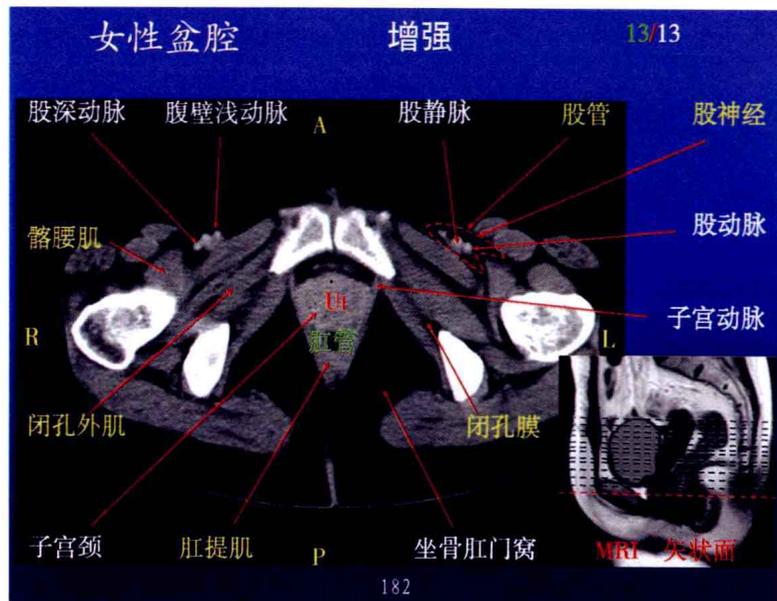
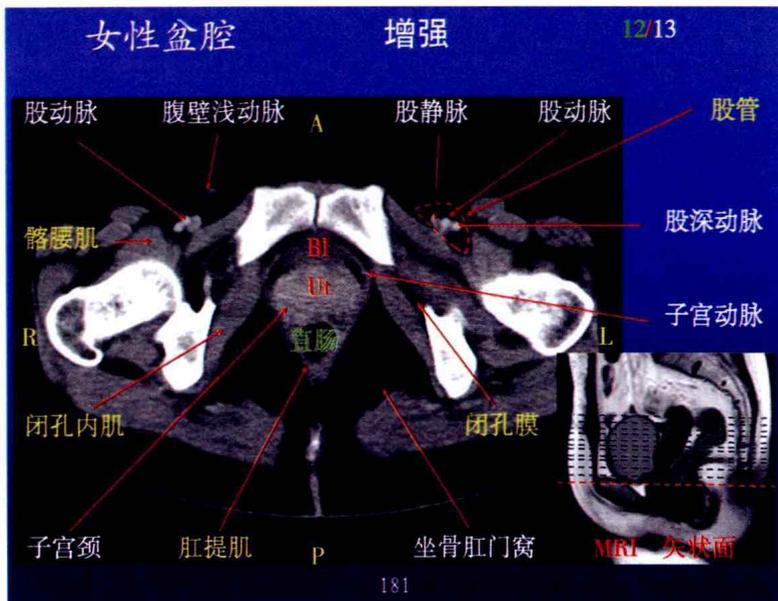
女性盆腔

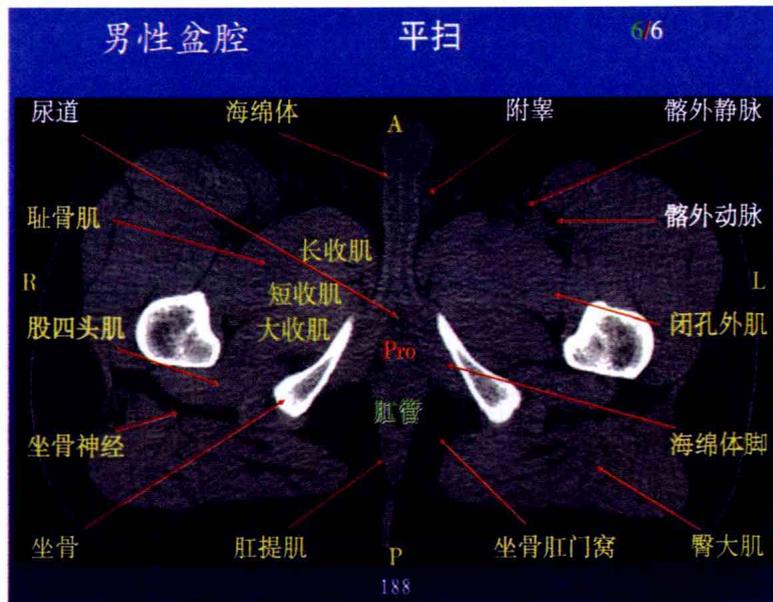
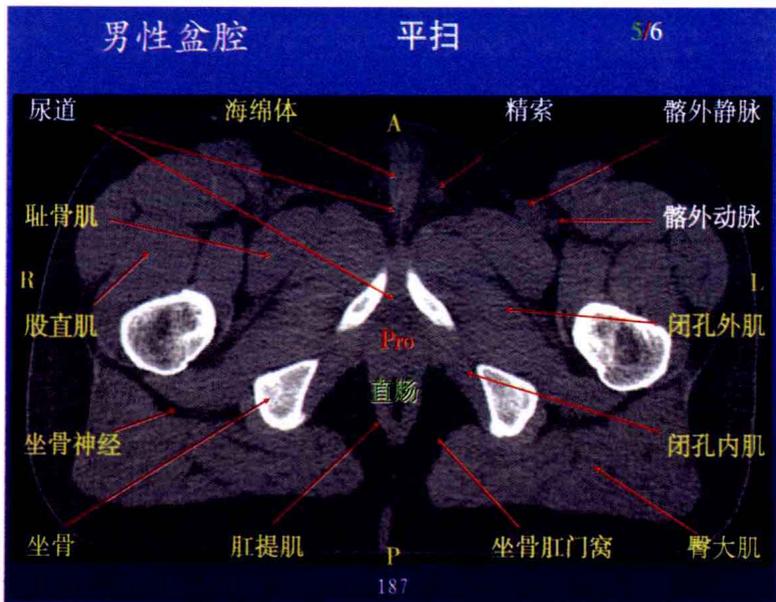
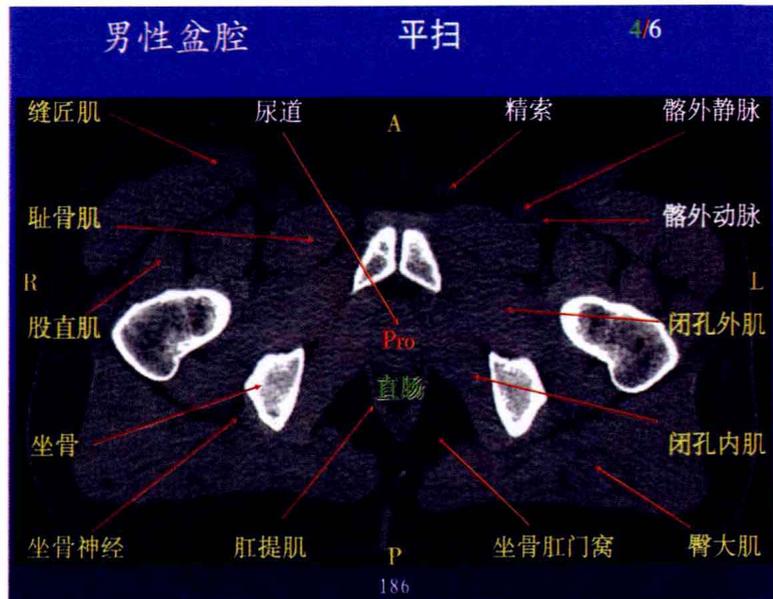
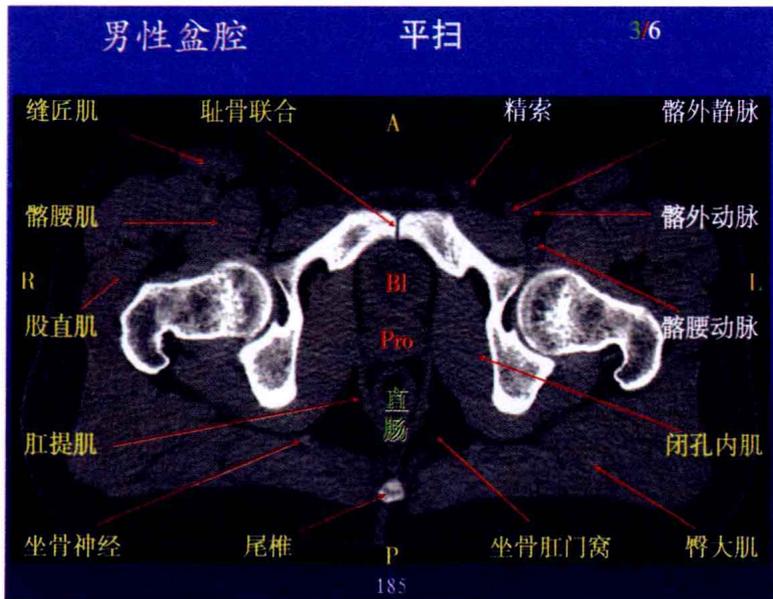
增强

07/13





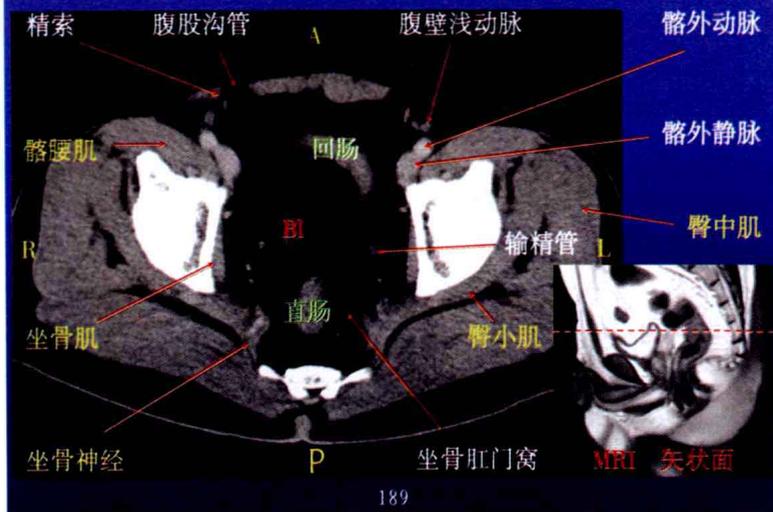




男性盆腔

2. 增强

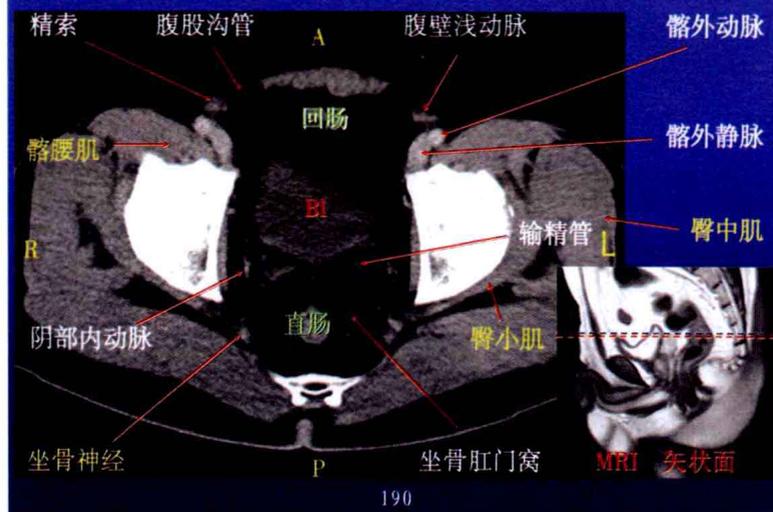
1/9



男性盆腔

增强

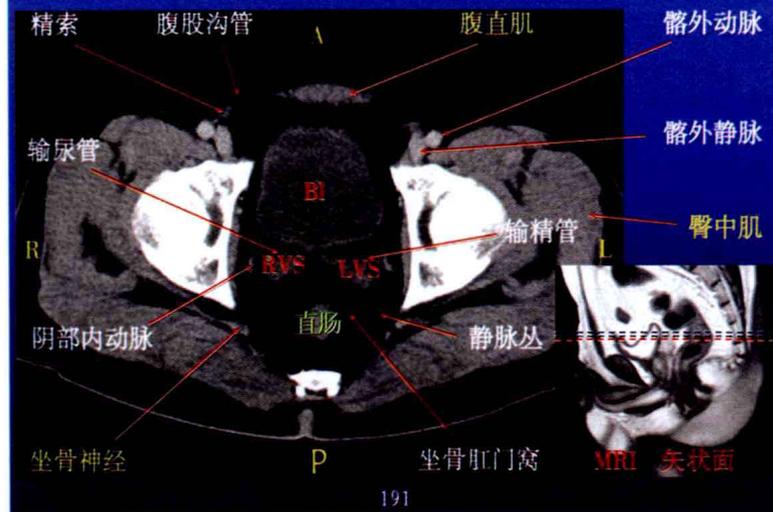
2/9



男性盆腔

增强

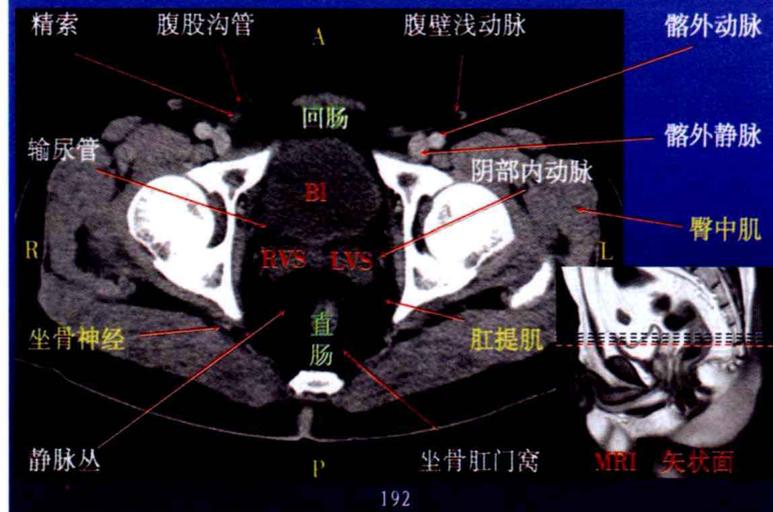
3/9

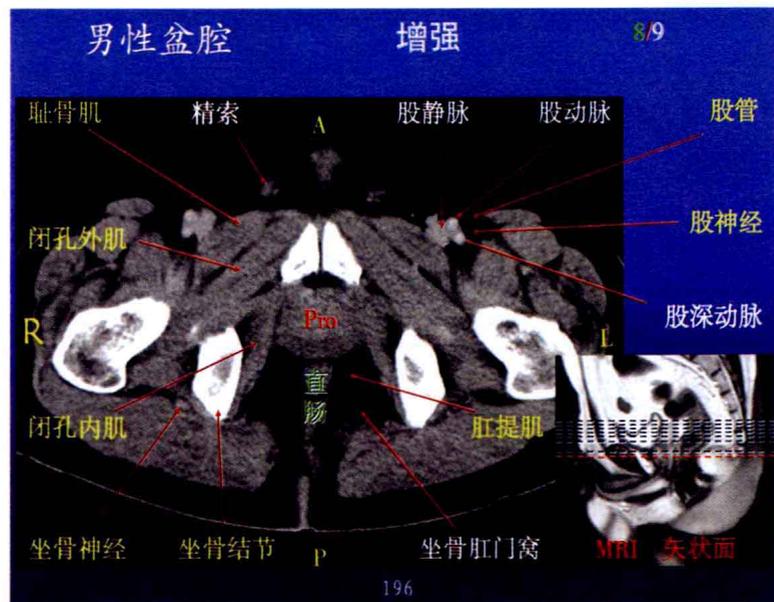
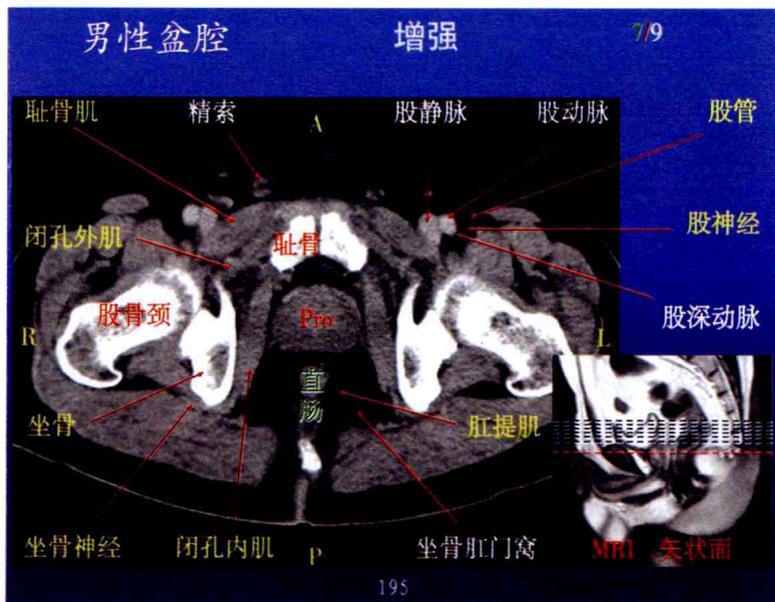
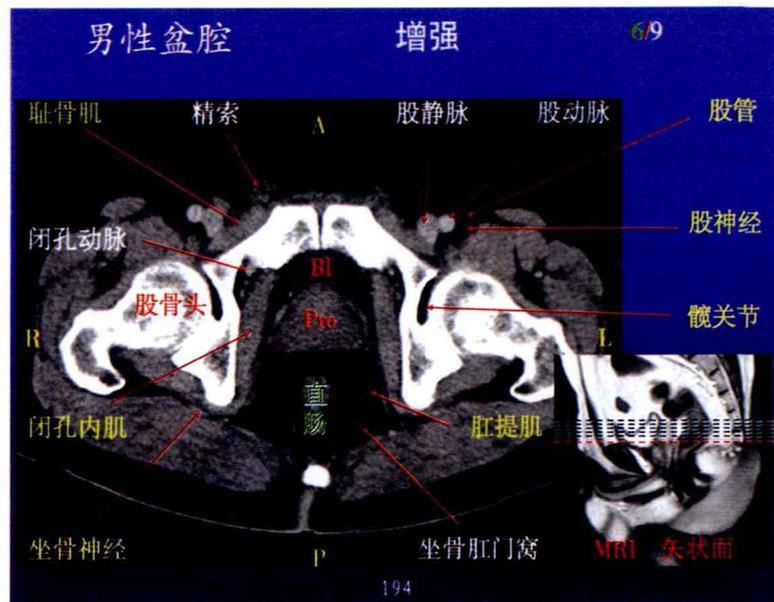
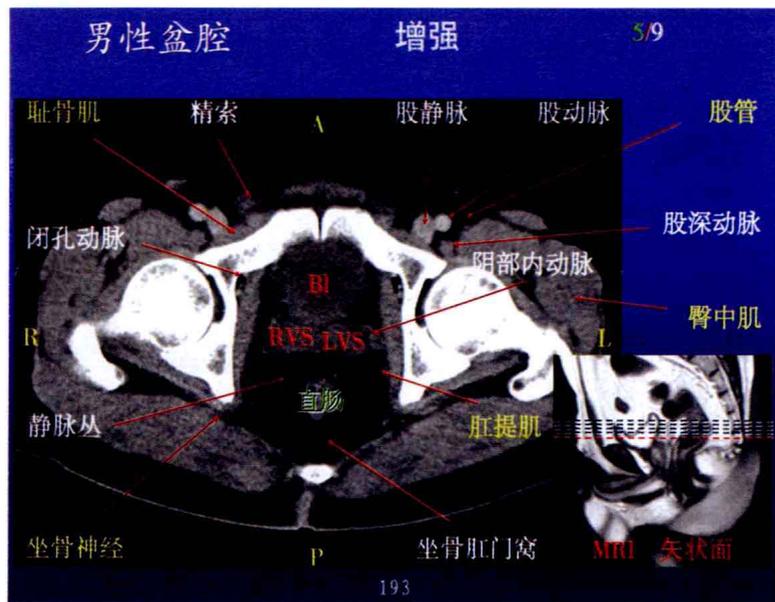


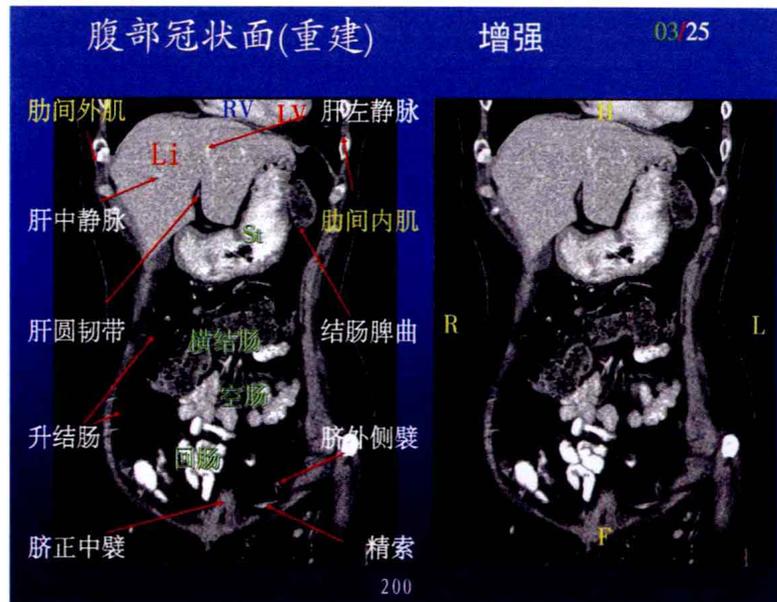
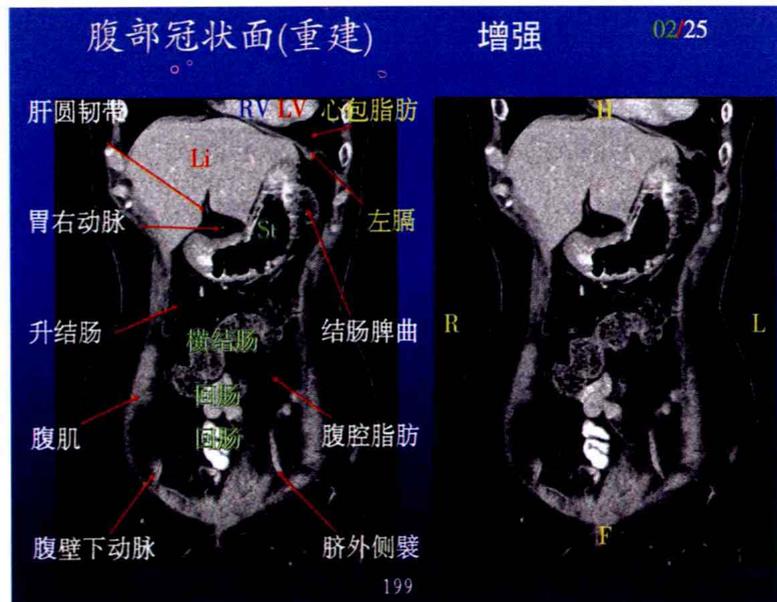
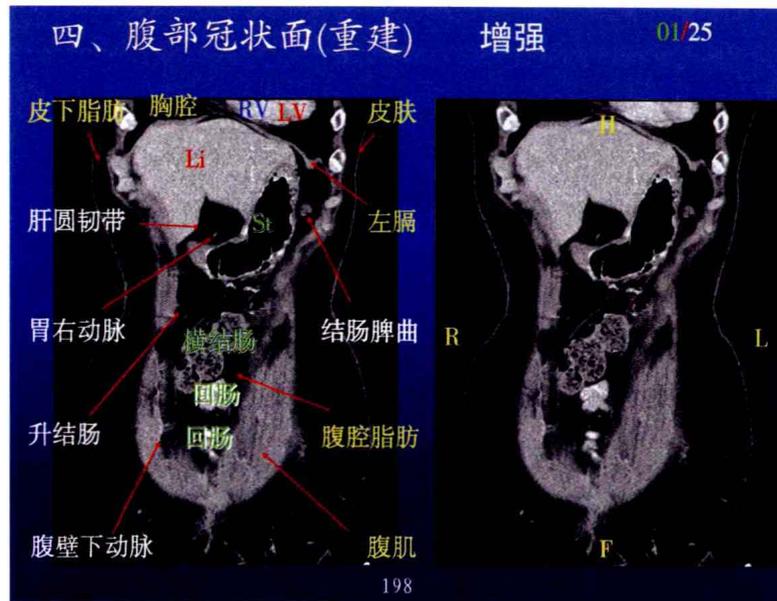
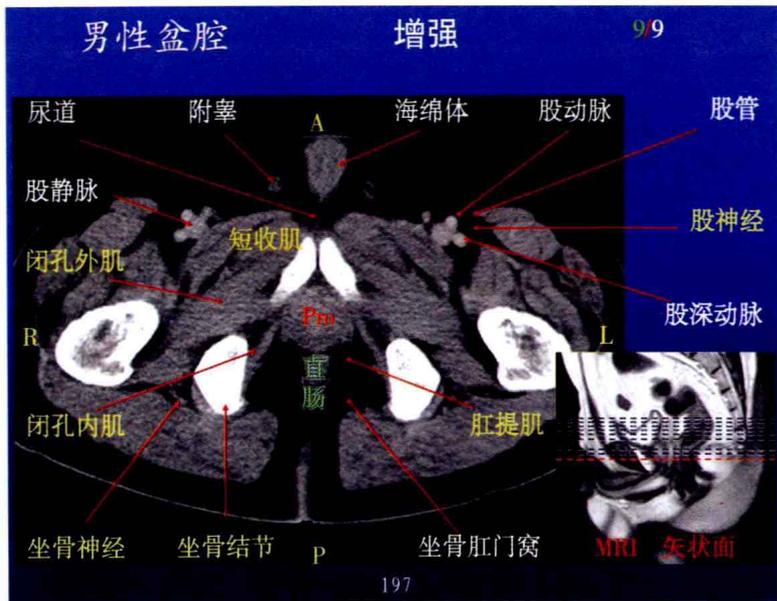
男性盆腔

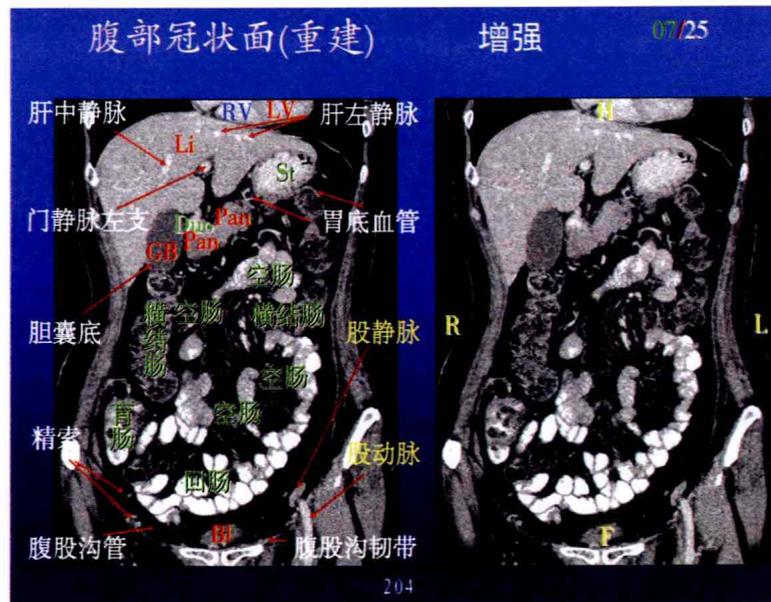
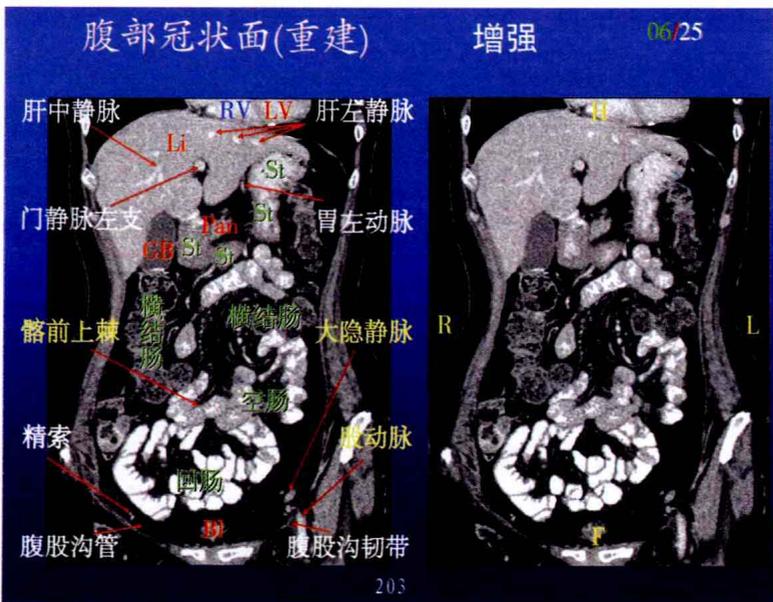
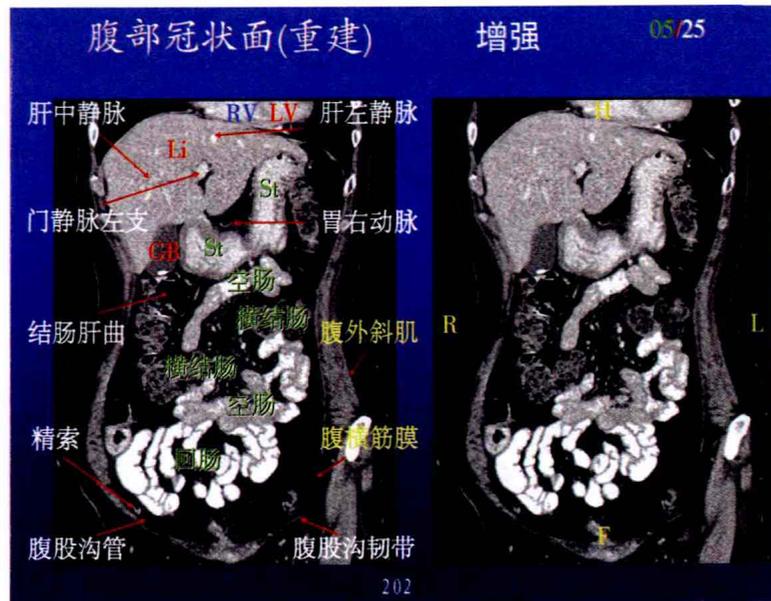
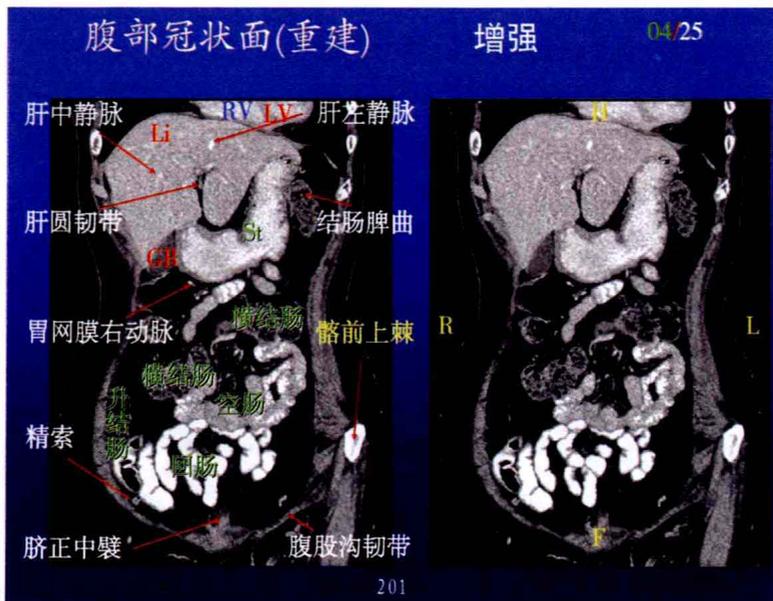
增强

4/9





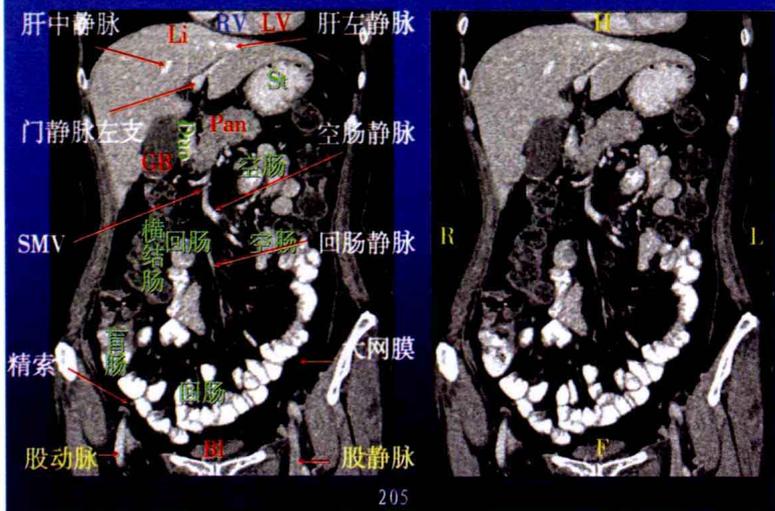




腹部冠状面(重建)

增强

08/25

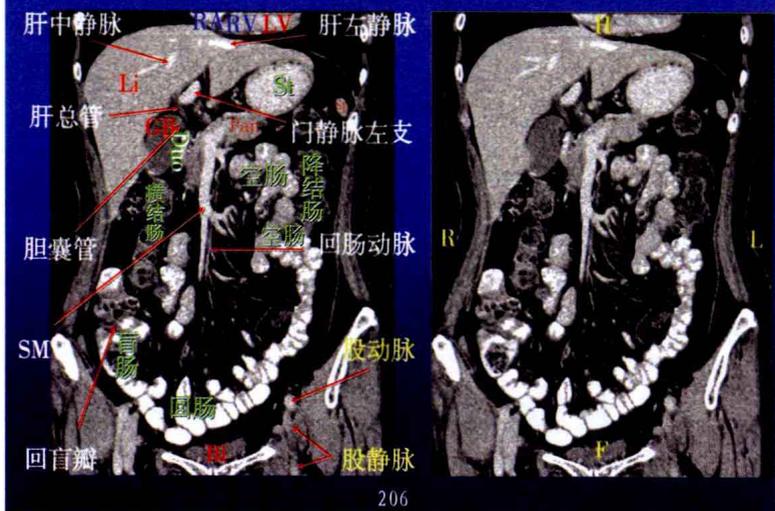


205

腹部冠状面(重建)

增强

09/25

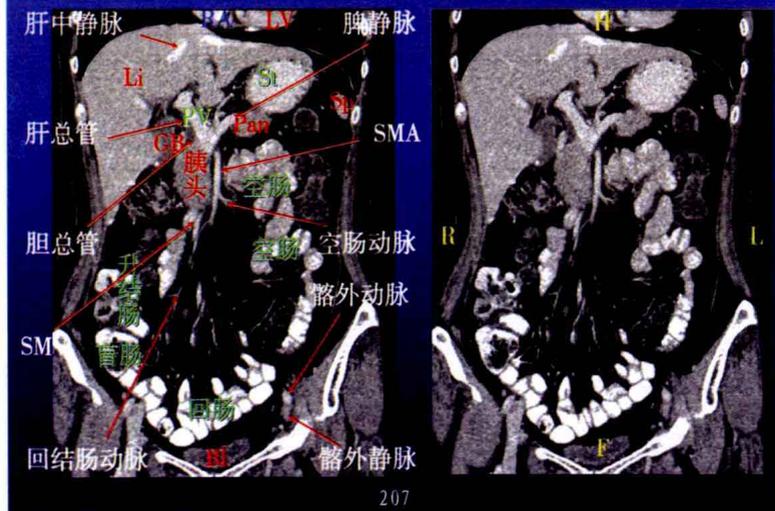


206

腹部冠状面(重建)

增强

10/25

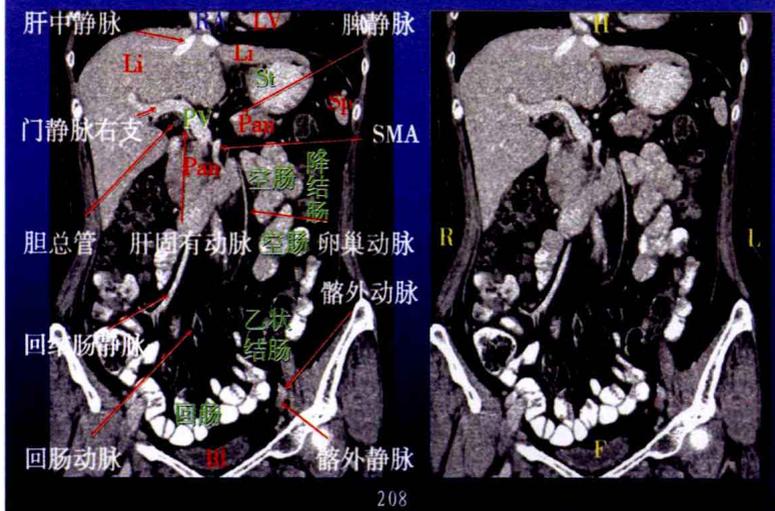


207

腹部冠状面(重建)

增强

11/25



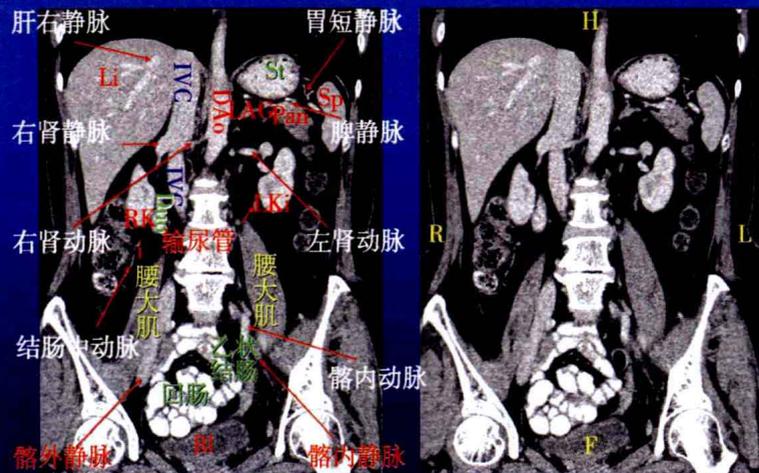
208



腹部冠状面(重建)

增强

16/25

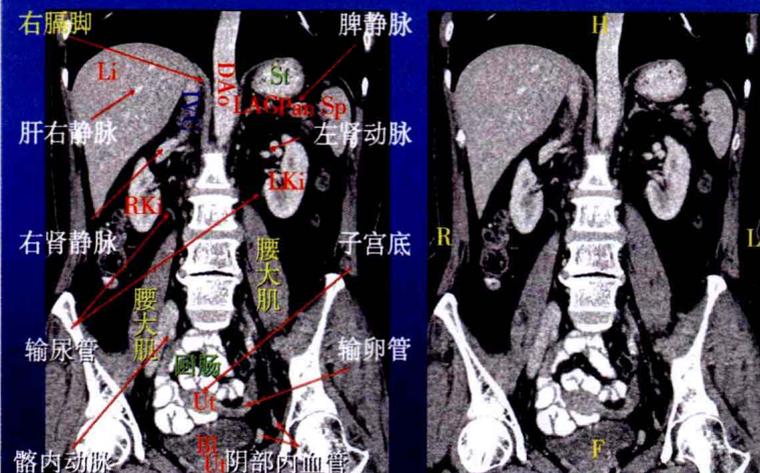


213

腹部冠状面(重建)

增强

17/25

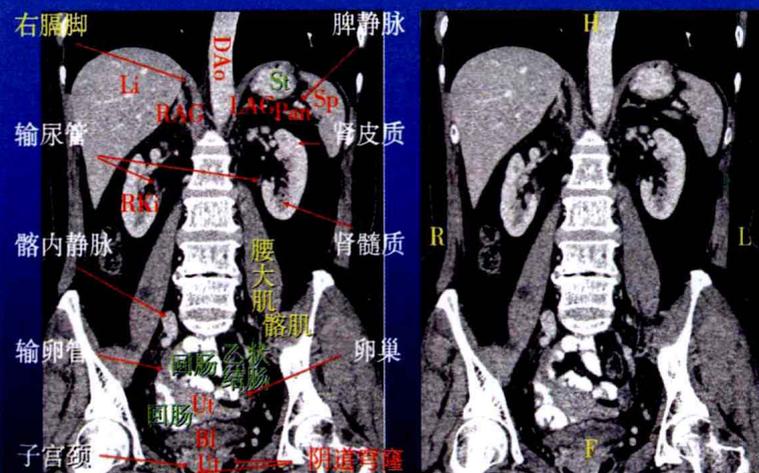


214

腹部冠状面(重建)

增强

18/25

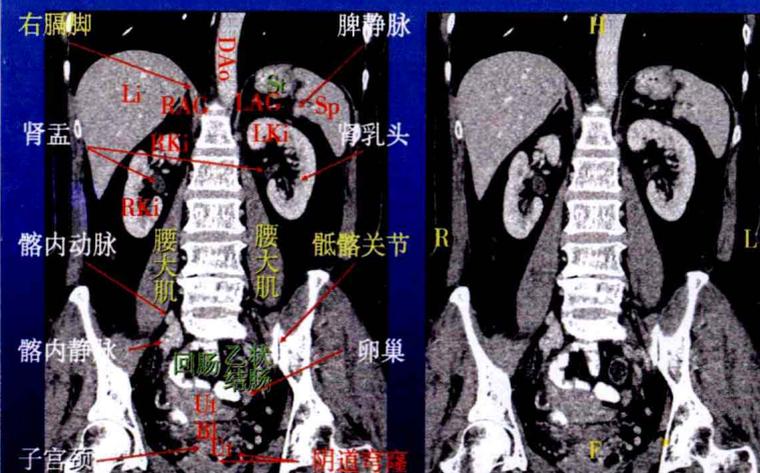


215

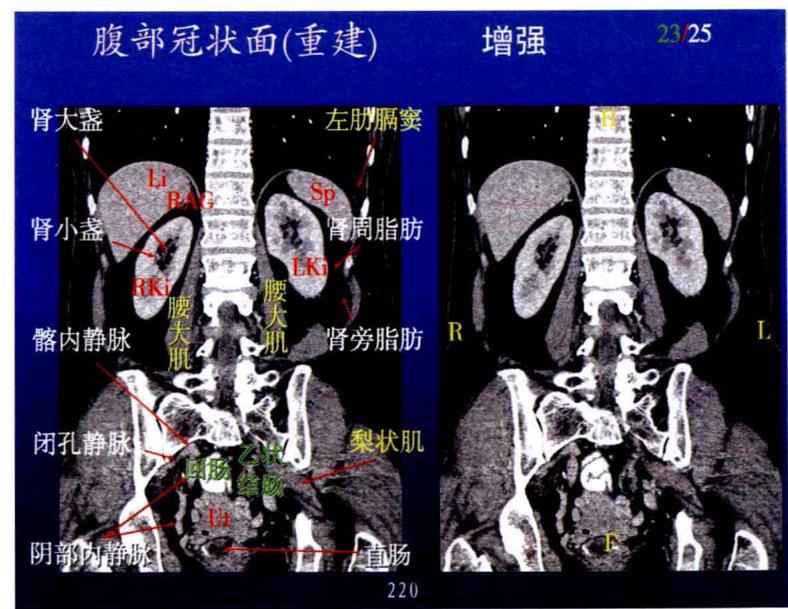
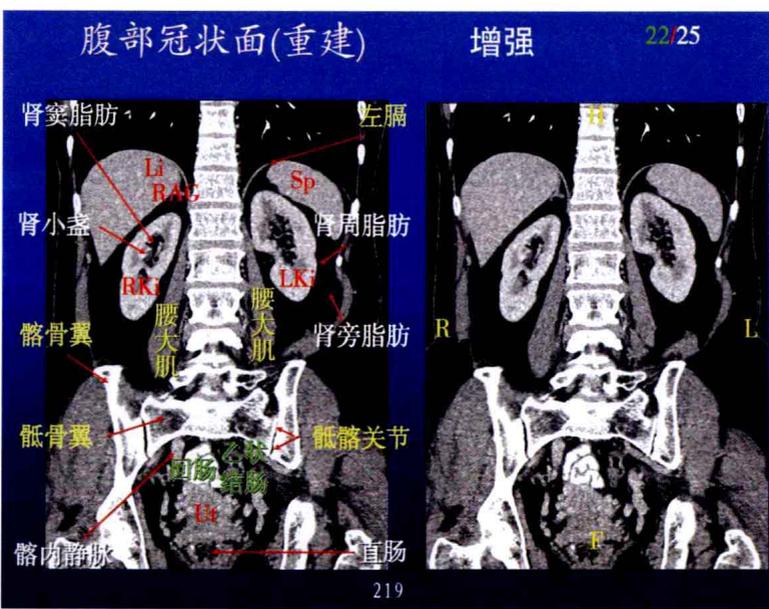
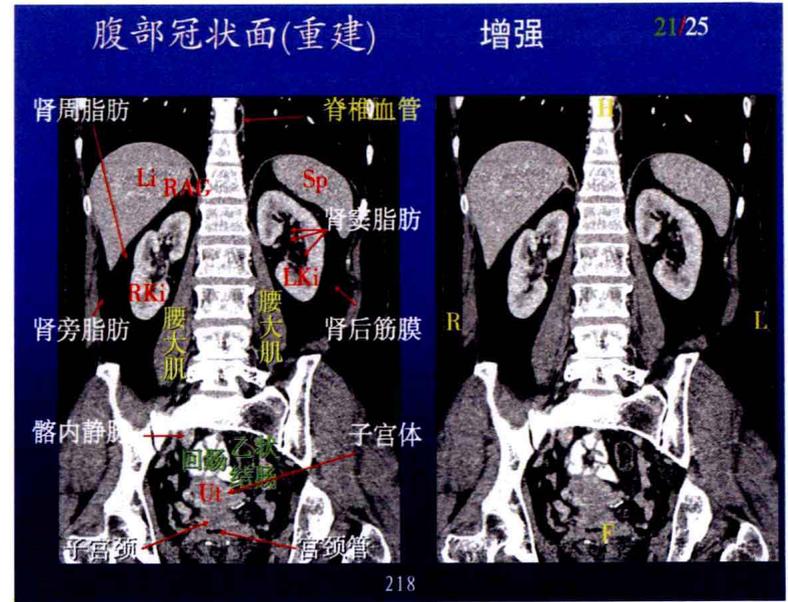
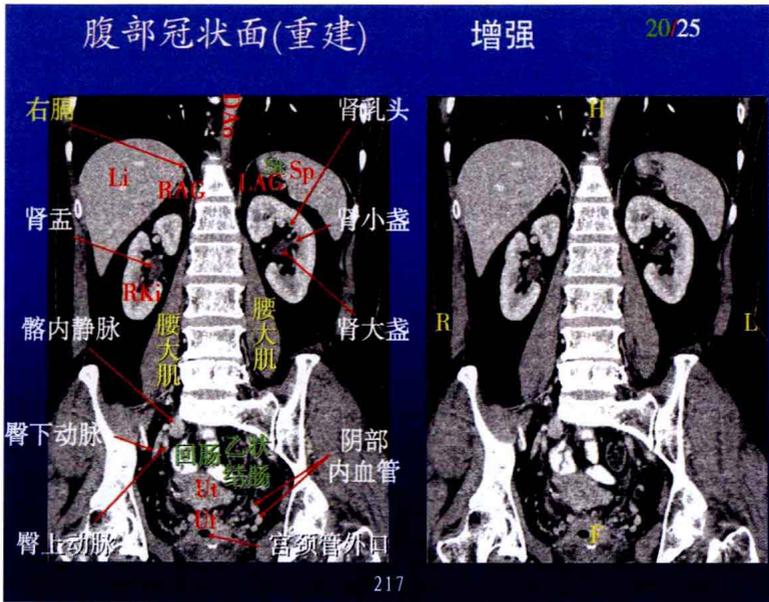
腹部冠状面(重建)

增强

19/25



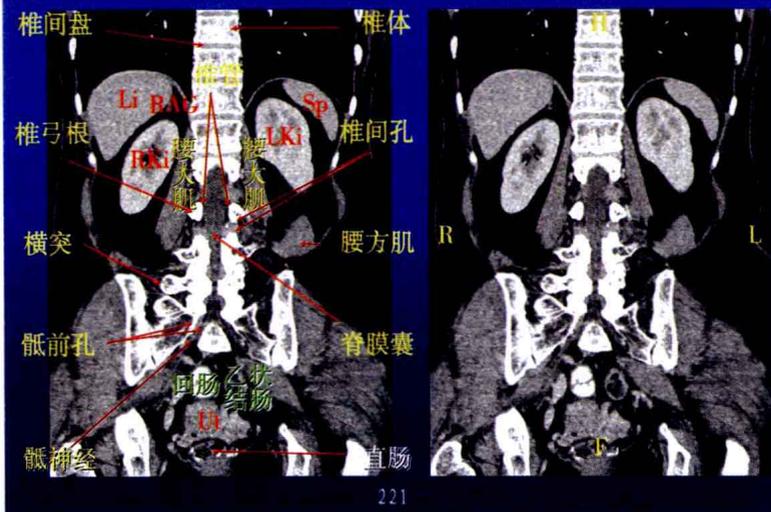
216



腹部冠状面(重建)

增强

24/25

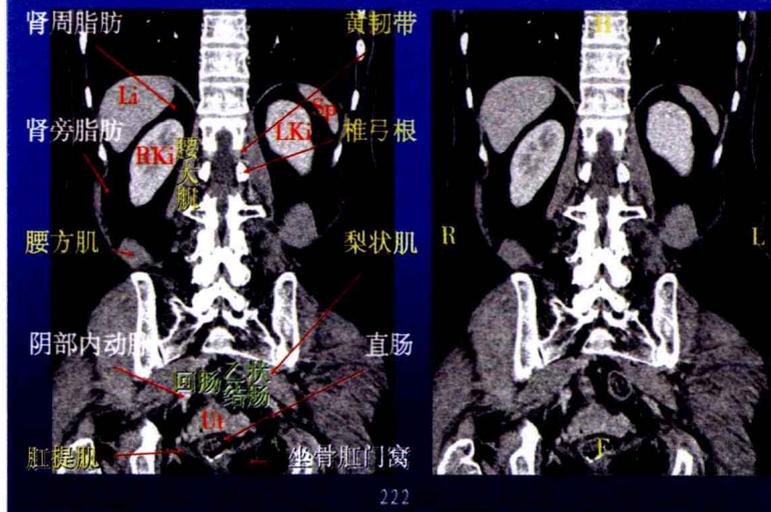


221

腹部冠状面(重建)

增强

25/25

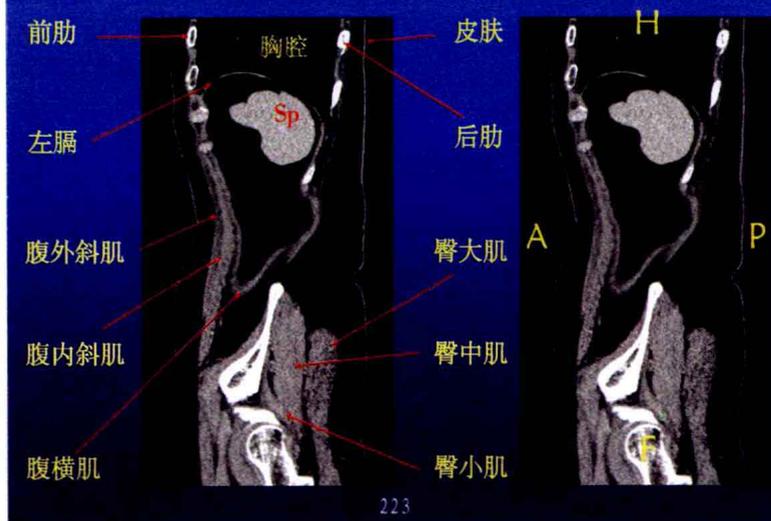


222

五、腹部矢状面(重建)

增强

01/36

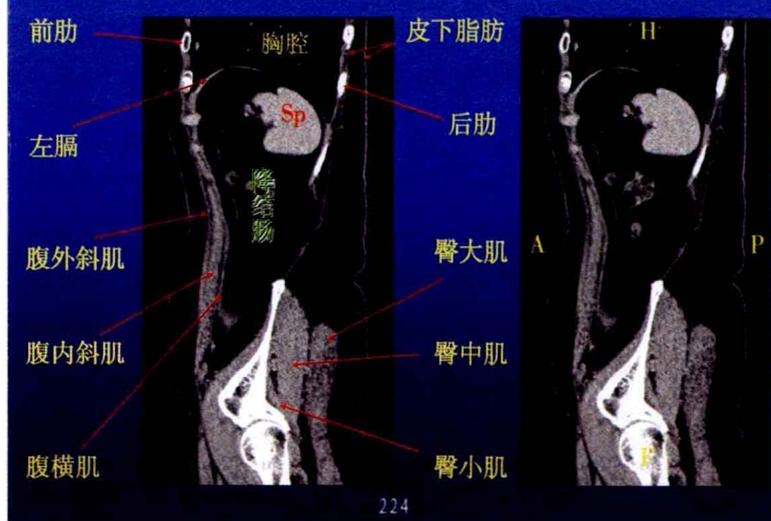


223

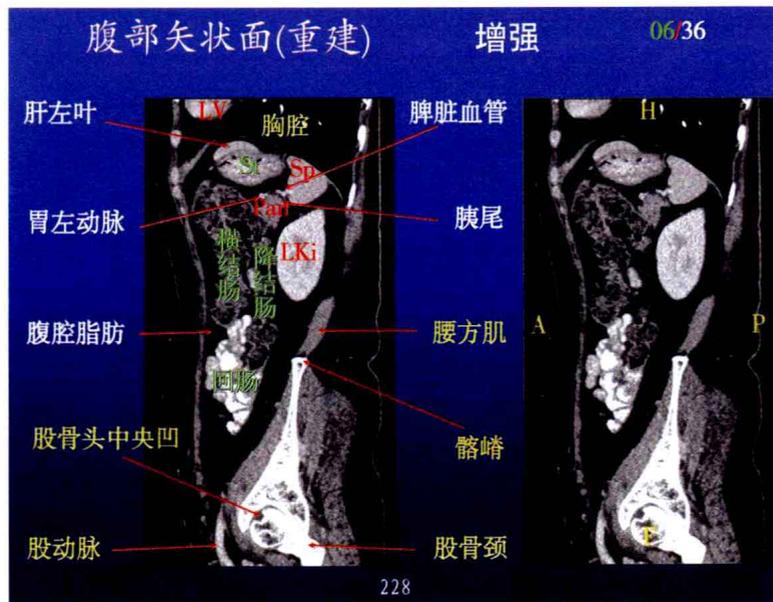
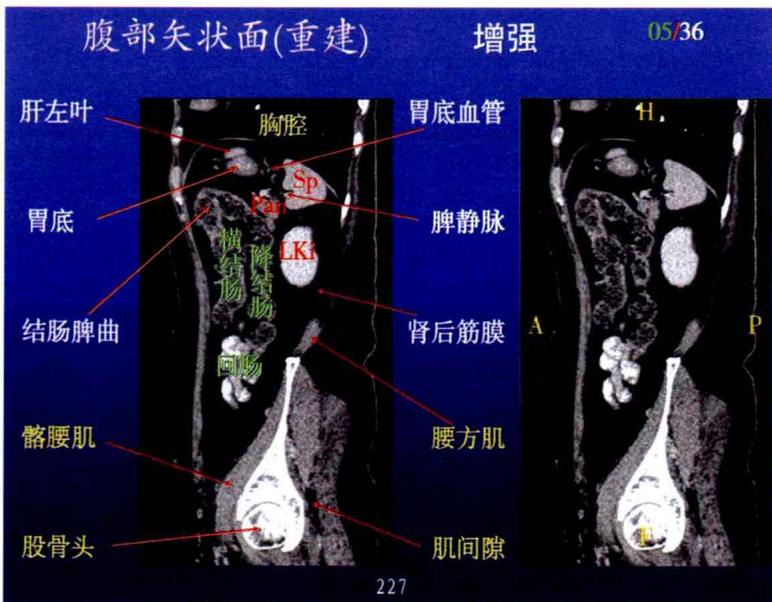
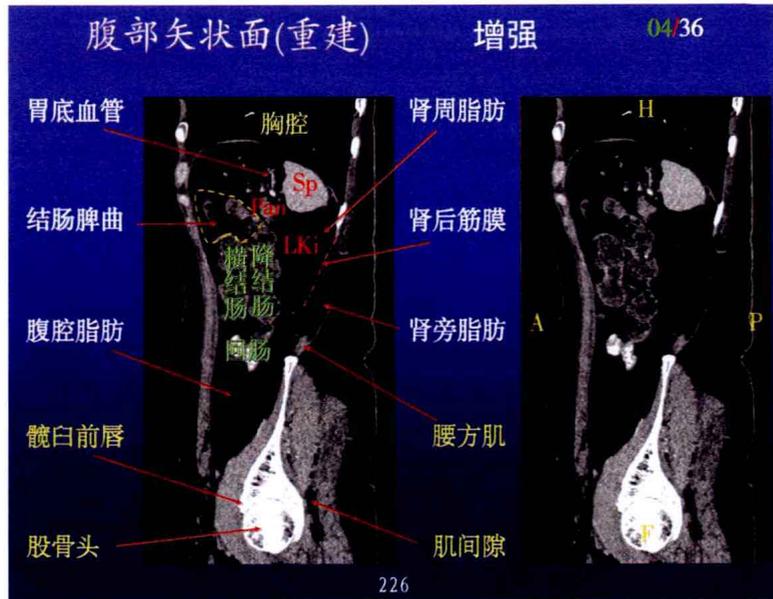
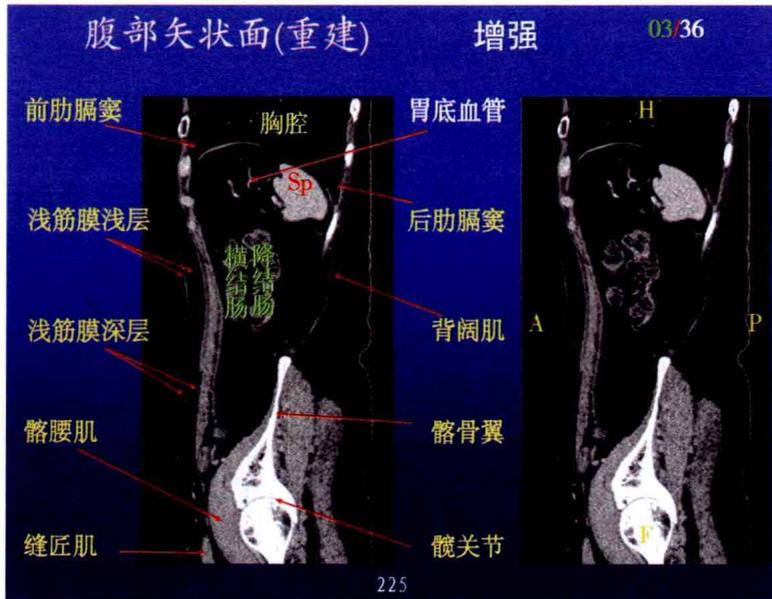
腹部矢状面(重建)

增强

02/36



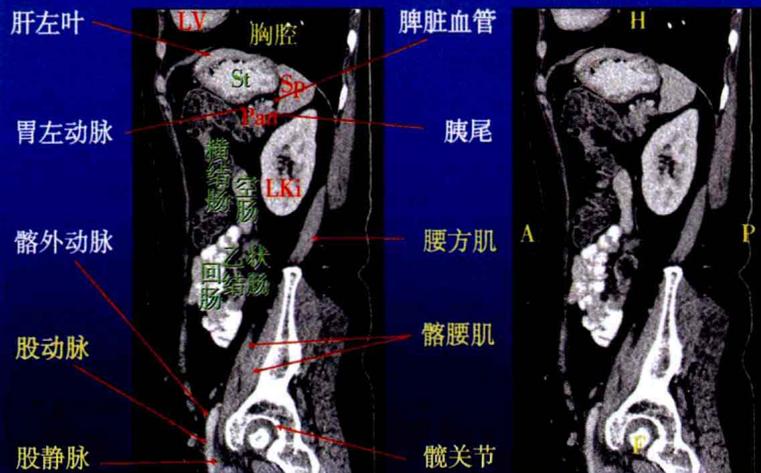
224



腹部矢状面(重建)

增强

07/36

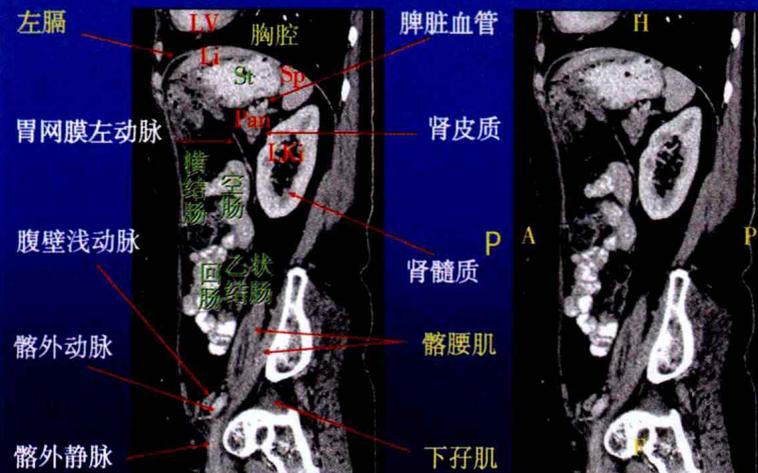


229

腹部矢状面(重建)

增强

08/36

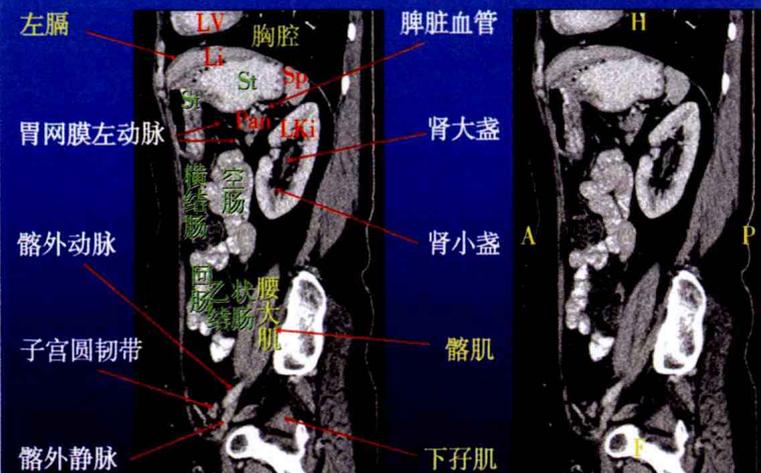


230

腹部矢状面(重建)

增强

09/36

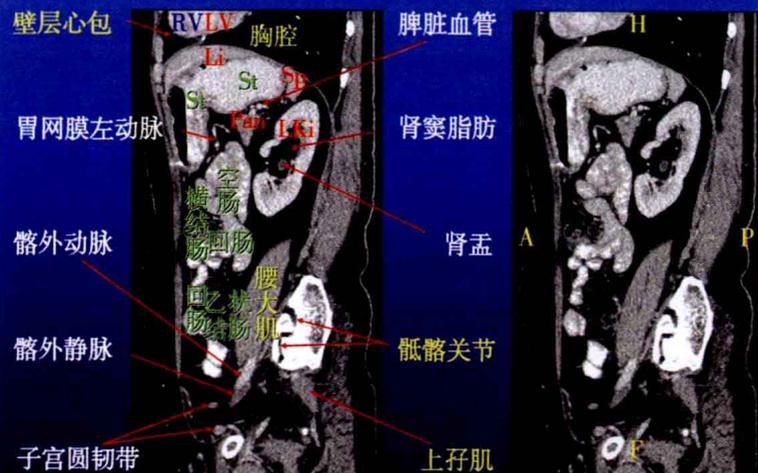


231

腹部矢状面(重建)

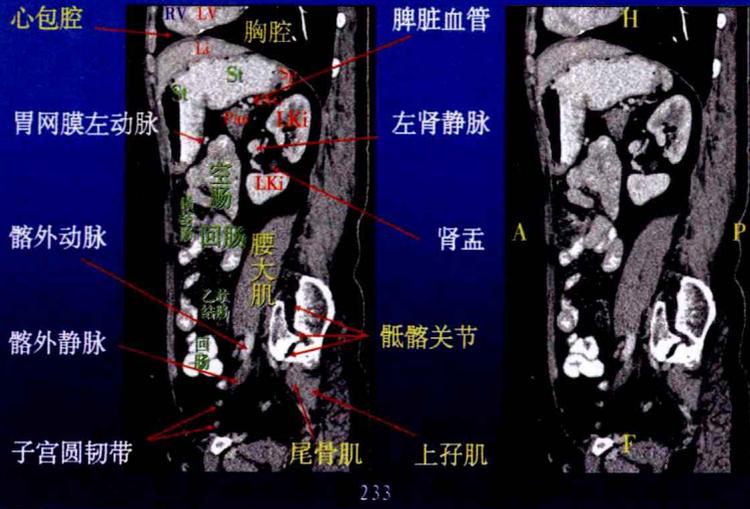
增强

10/36

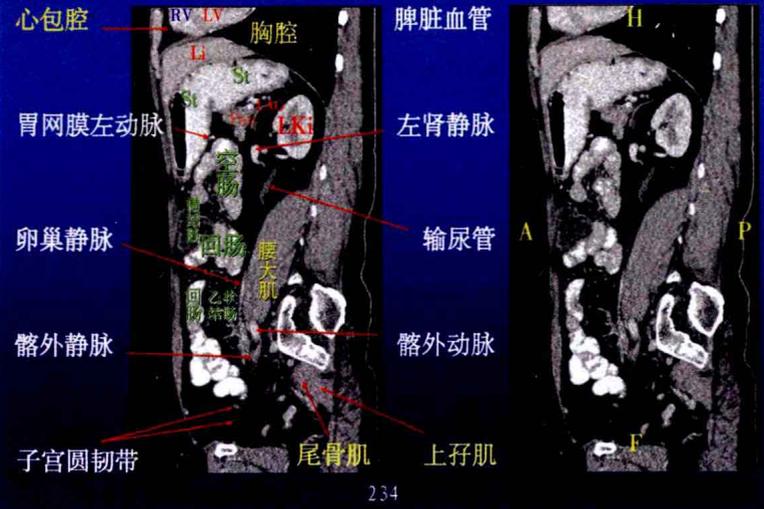


232

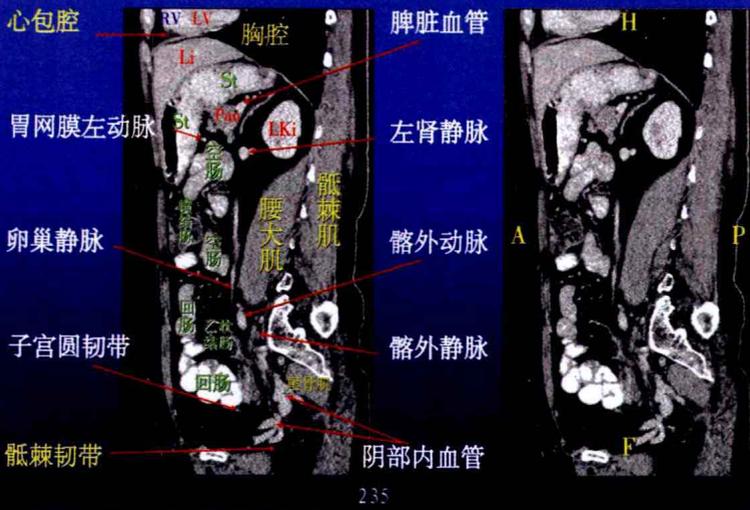
腹部矢状面(重建) 增强 11/36



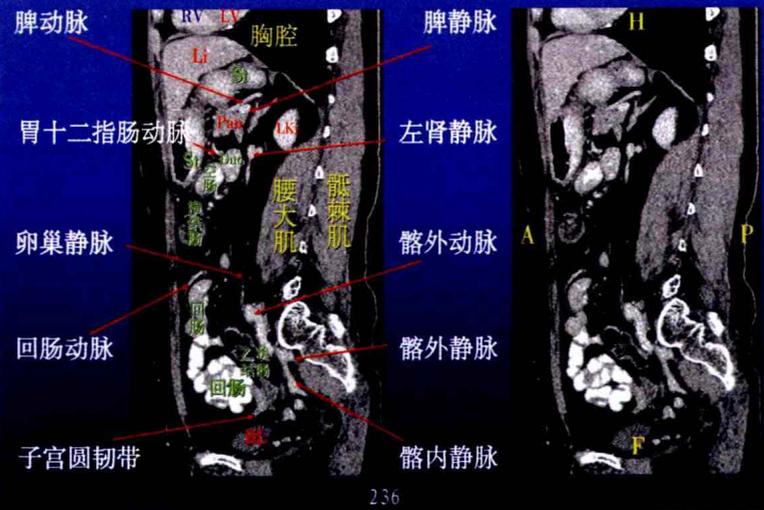
腹部矢状面(重建) 增强 12/36



腹部矢状面(重建) 增强 13/36



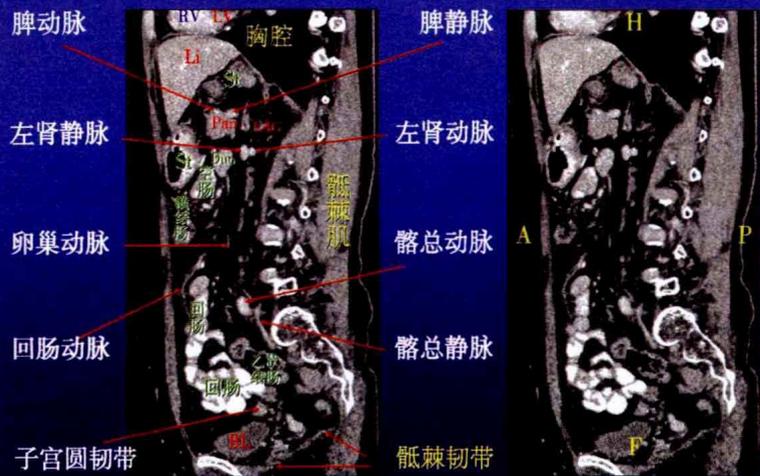
腹部矢状面(重建) 增强 14/36



腹部矢状面(重建)

增强

15/36

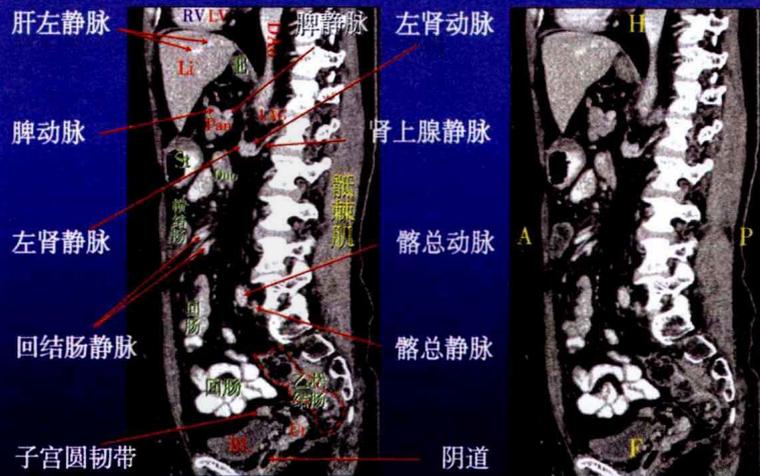


237

腹部矢状面(重建)

增强

16/36

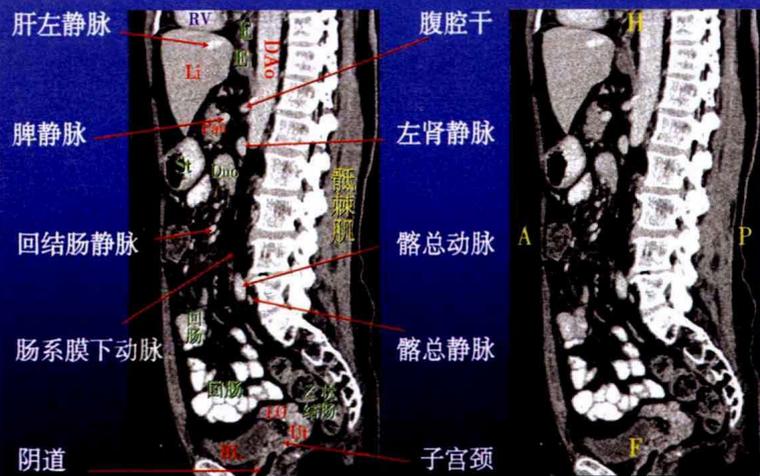


238

腹部矢状面(重建)

增强

17/36

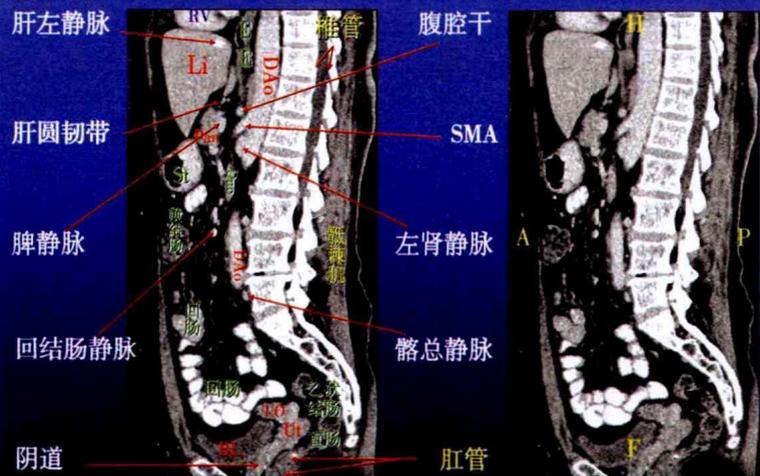


239

腹部矢状面(重建)

增强

18/36

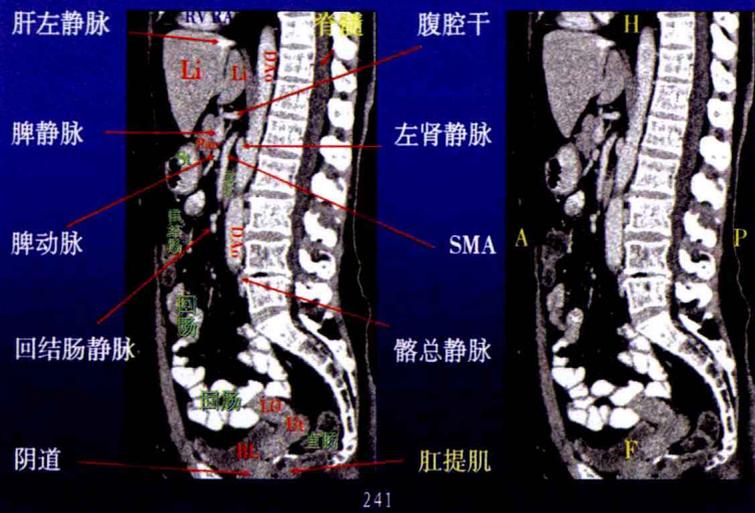


240

腹部矢状面(重建)

增强

19/36

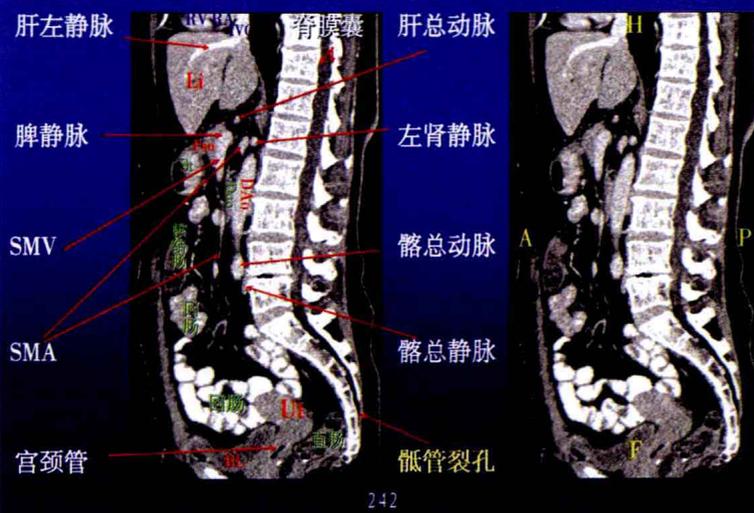


241

腹部矢状面(重建)

增强

20/36

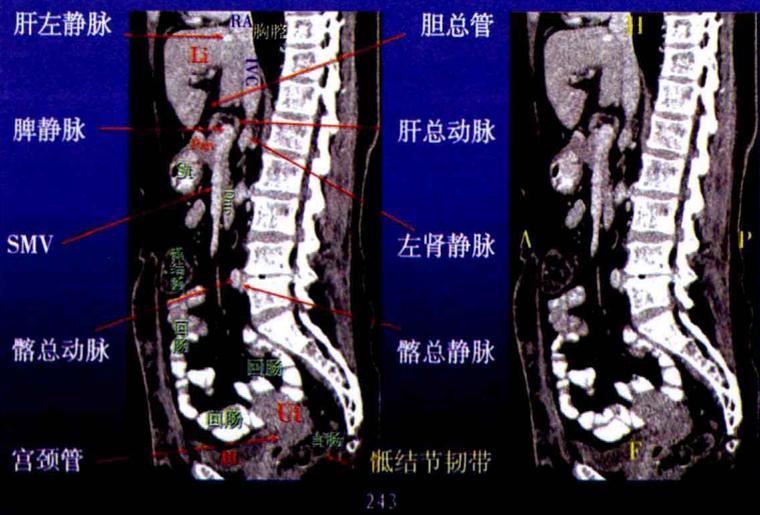


242

腹部矢状面(重建)

增强

21/36

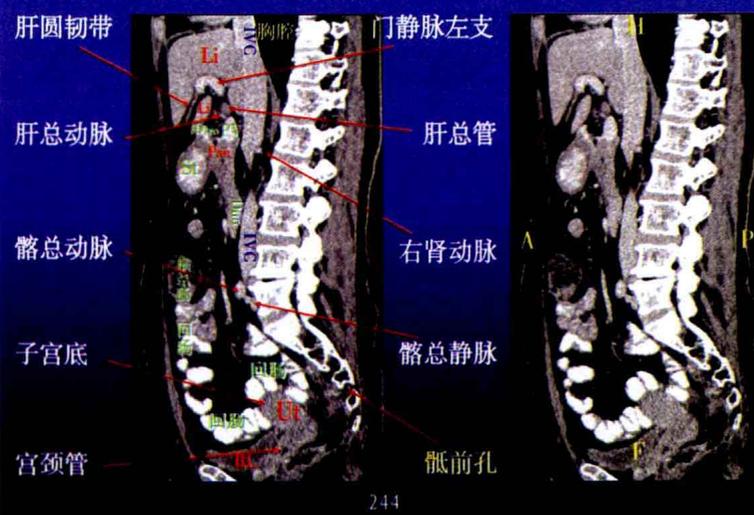


243

腹部矢状面(重建)

增强

22/36

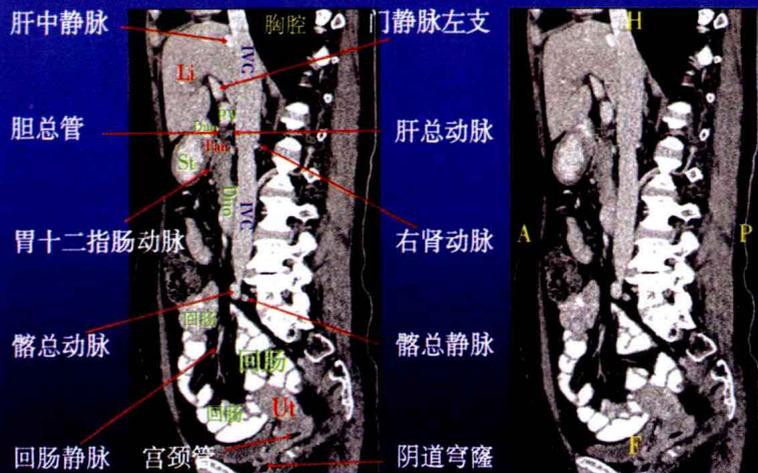


244

腹部矢状面(重建)

增强

23/36

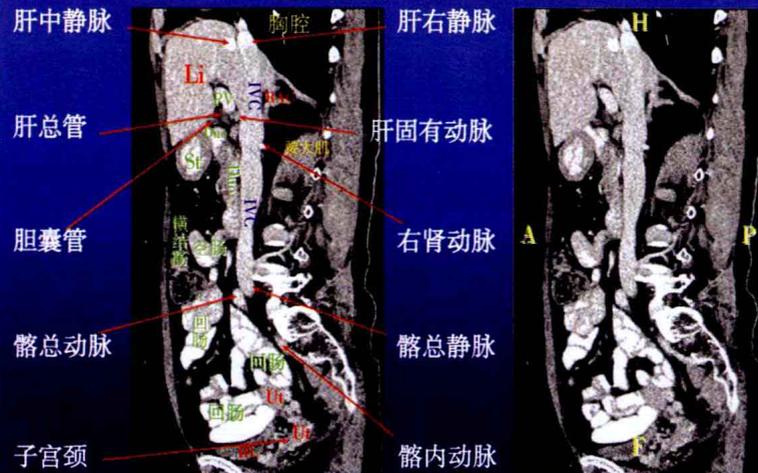


245

腹部矢状面(重建)

增强

24/36

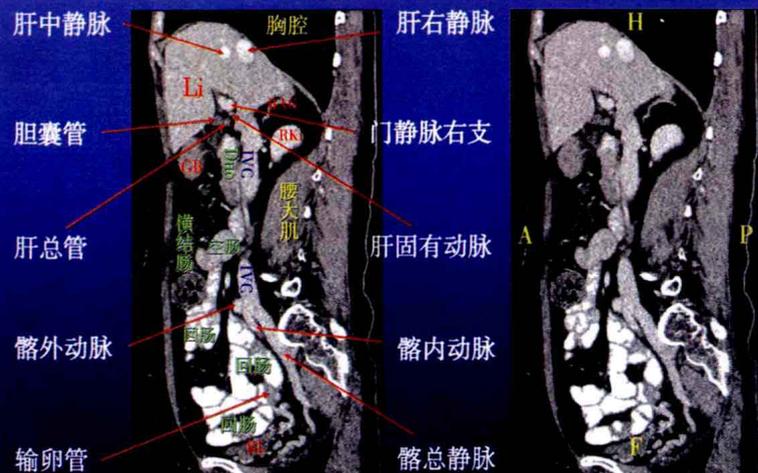


246

腹部矢状面(重建)

增强

25/36

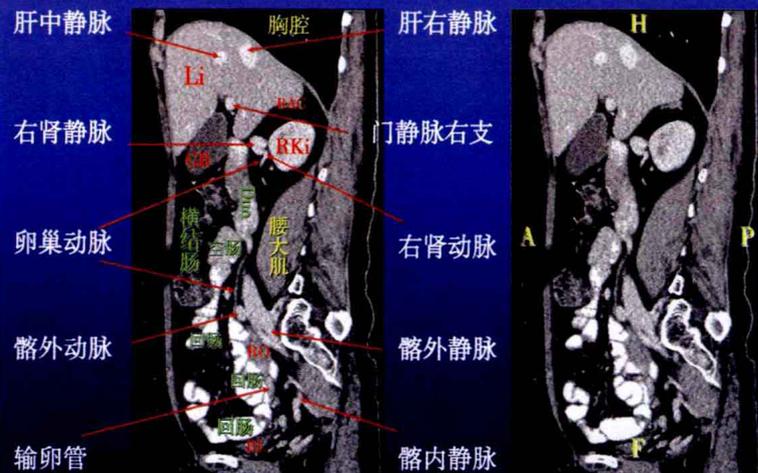


247

腹部矢状面(重建)

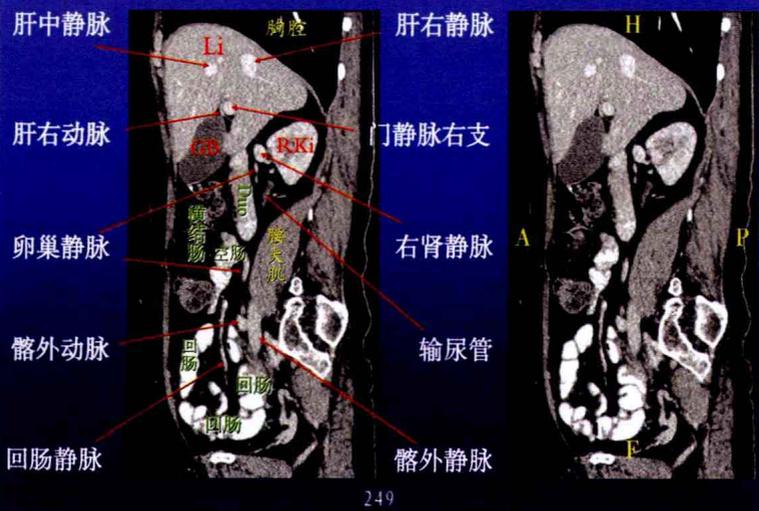
增强

26/36

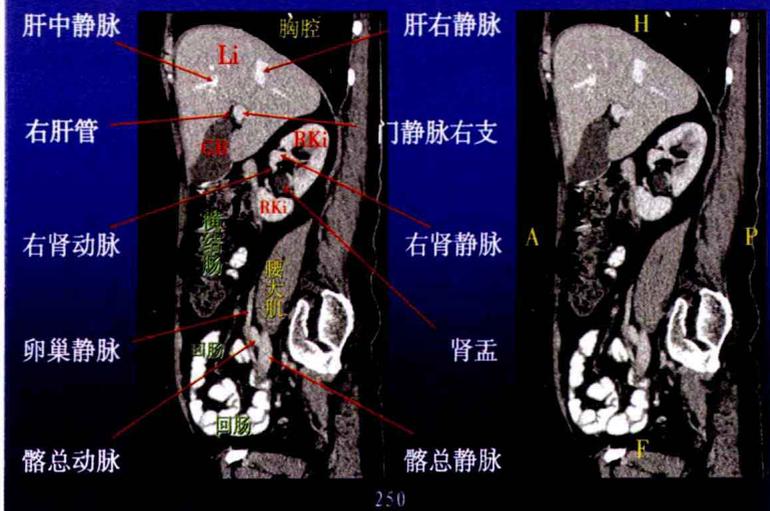


248

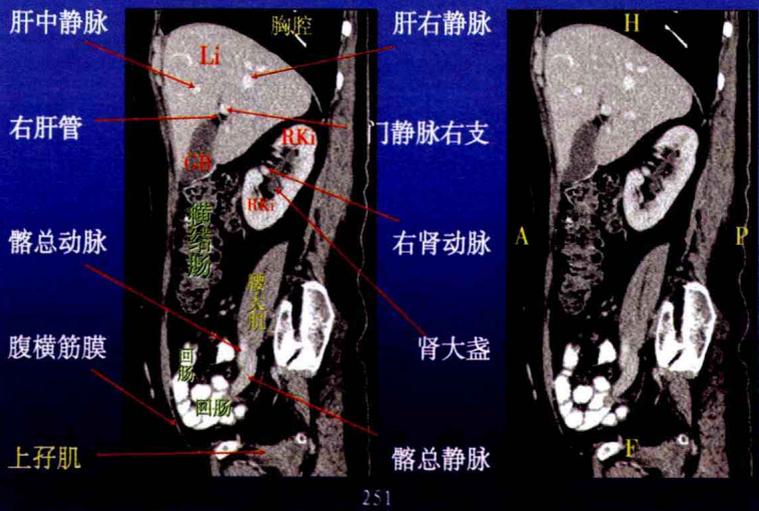
腹部矢状面(重建) 增强 27/36



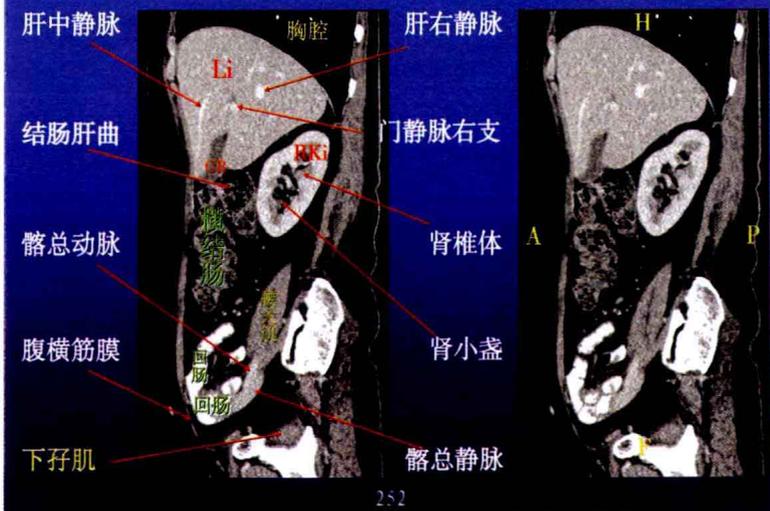
腹部矢状面(重建) 增强 28/36



腹部矢状面(重建) 增强 29/36



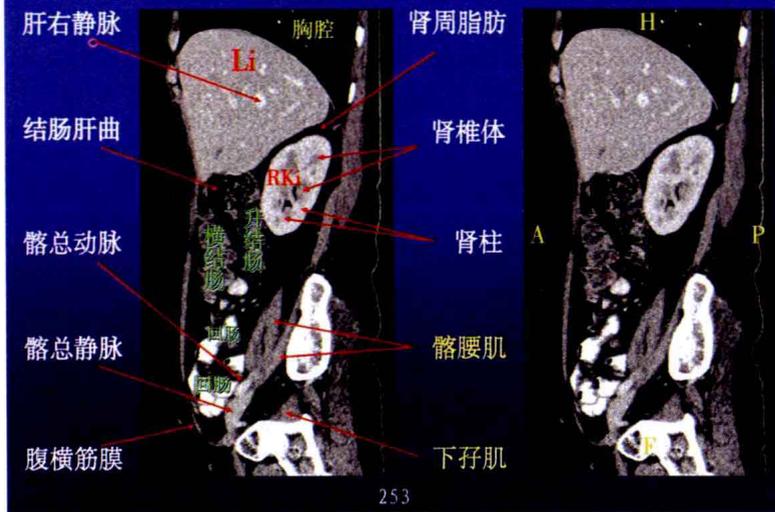
腹部矢状面(重建) 增强 30/36



腹部矢状面(重建)

增强

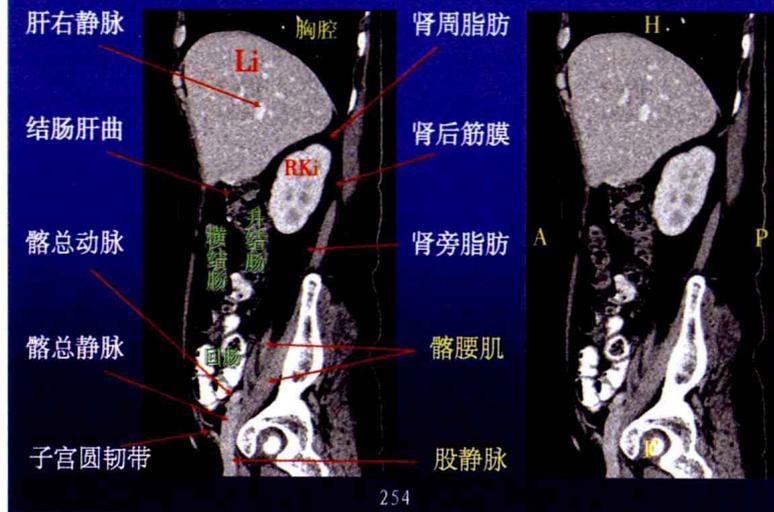
31/36



腹部矢状面(重建)

增强

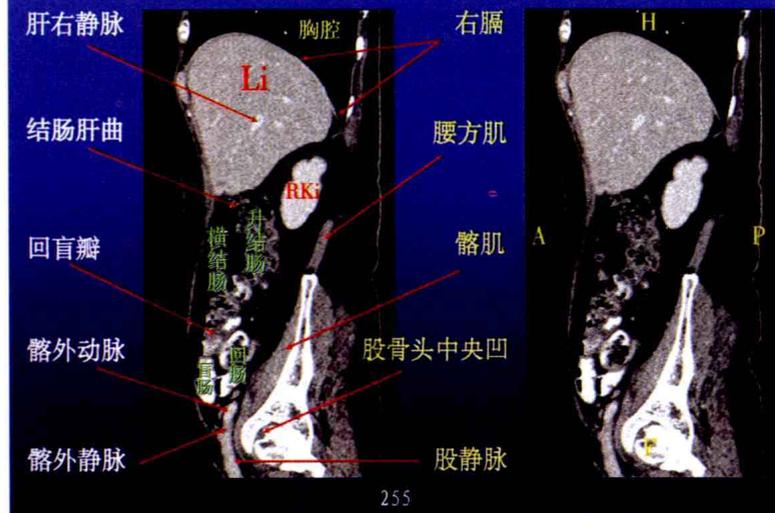
32/36



腹部矢状面(重建)

增强

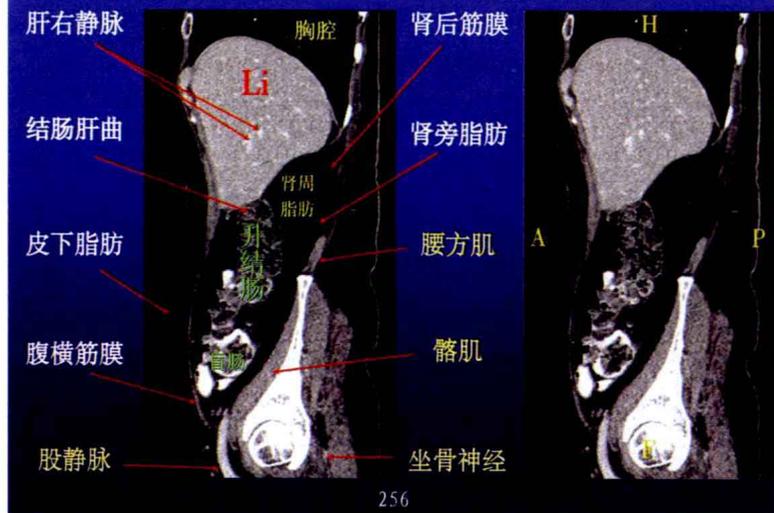
33/36

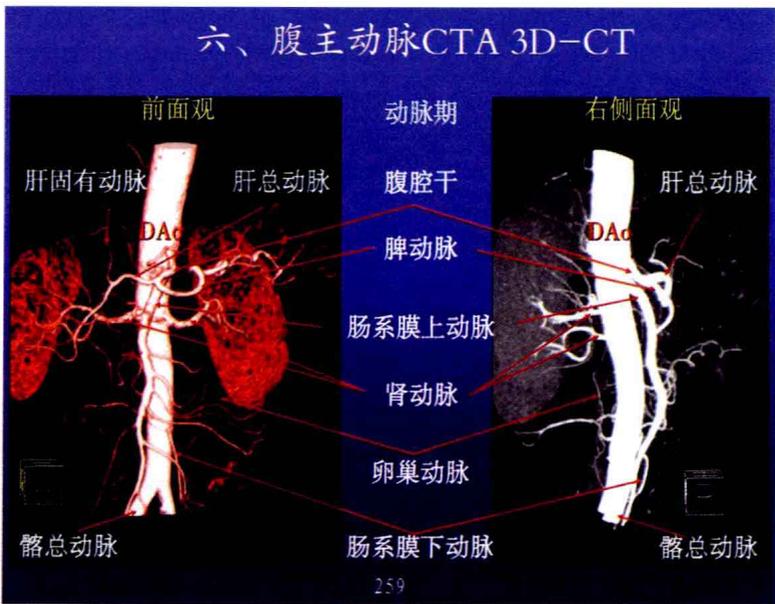
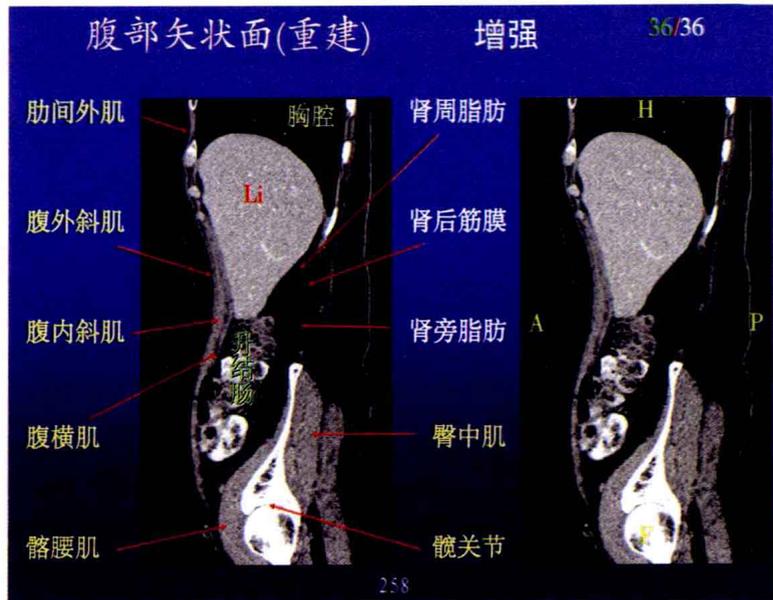
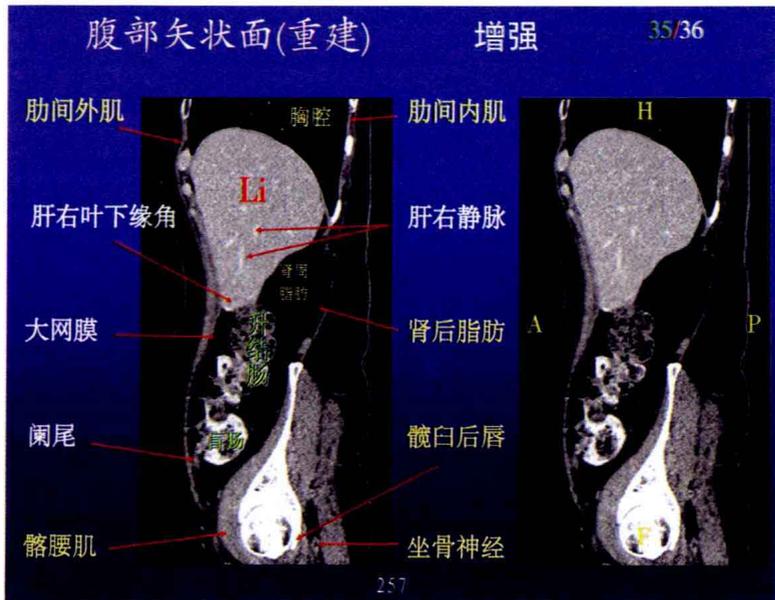


腹部矢状面(重建)

增强

34/36

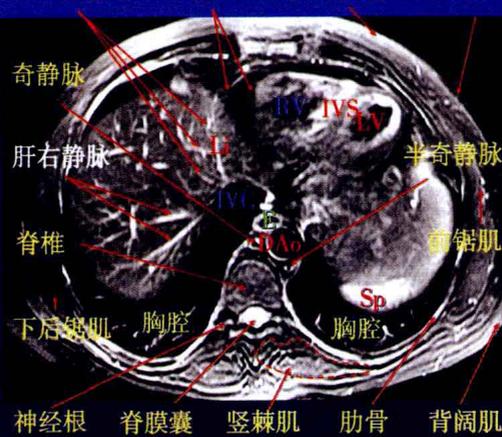




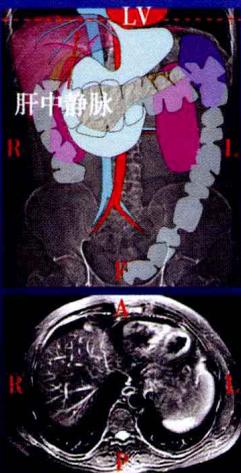
一、上腹部MRI 1.横断面

01/12

肝中静脉 心包腔 皮下脂肪 皮肤



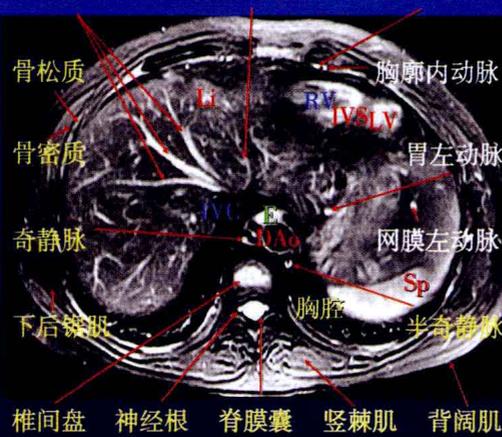
261



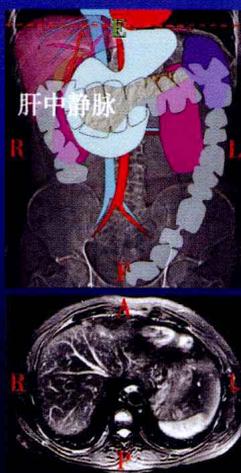
上腹部MRI 横断面

02/12

肝中静脉 肝左静脉 胸廓内静脉



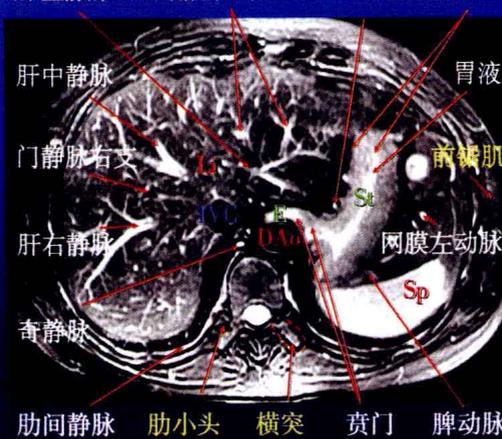
262



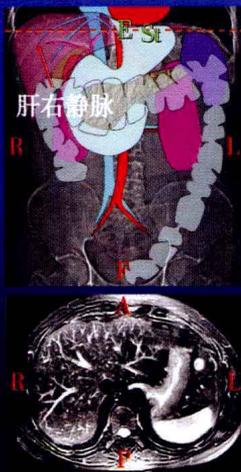
上腹部MRI 横断面

03/12

肝左静脉 门静脉左支 胃左动脉 胃壁



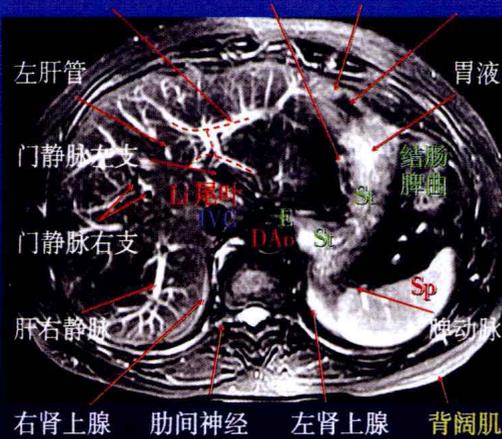
263



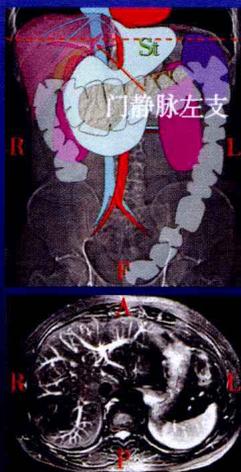
上腹部MRI 横断面

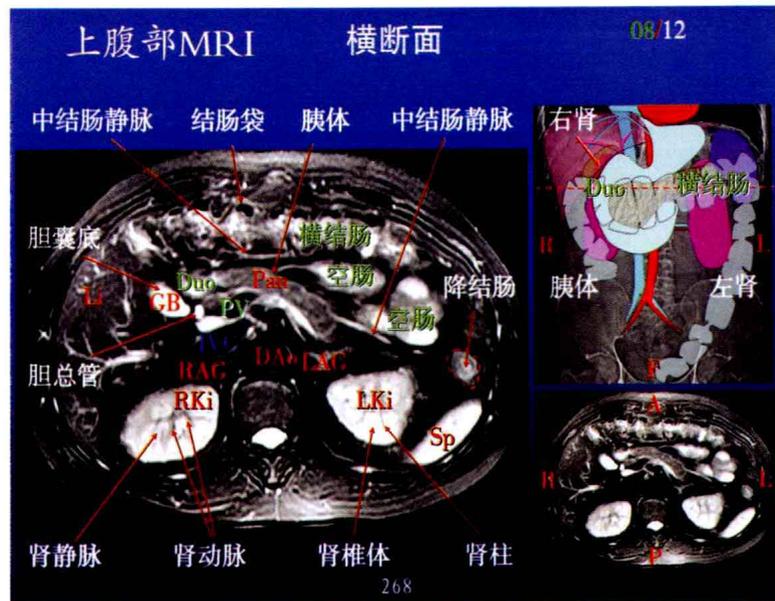
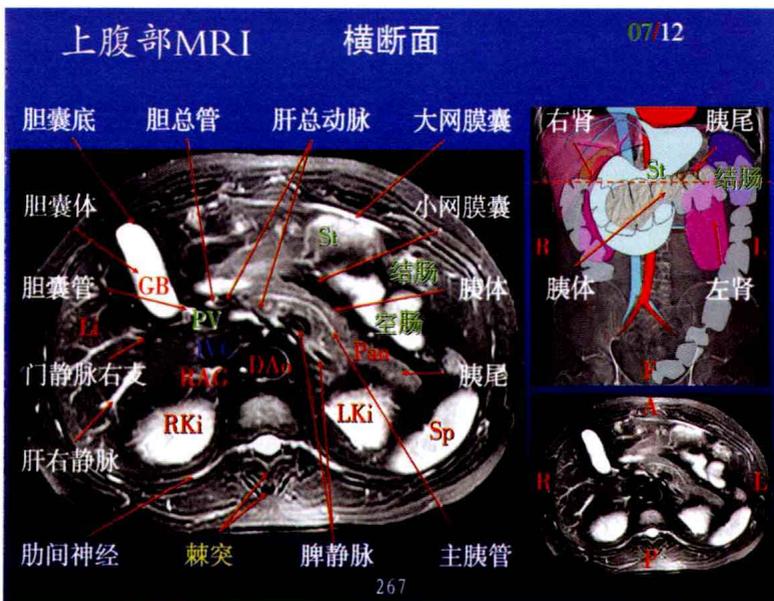
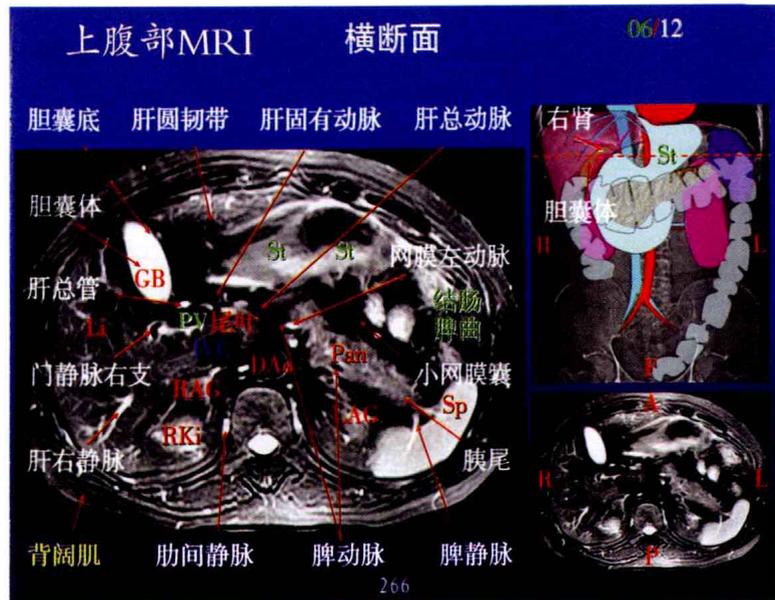
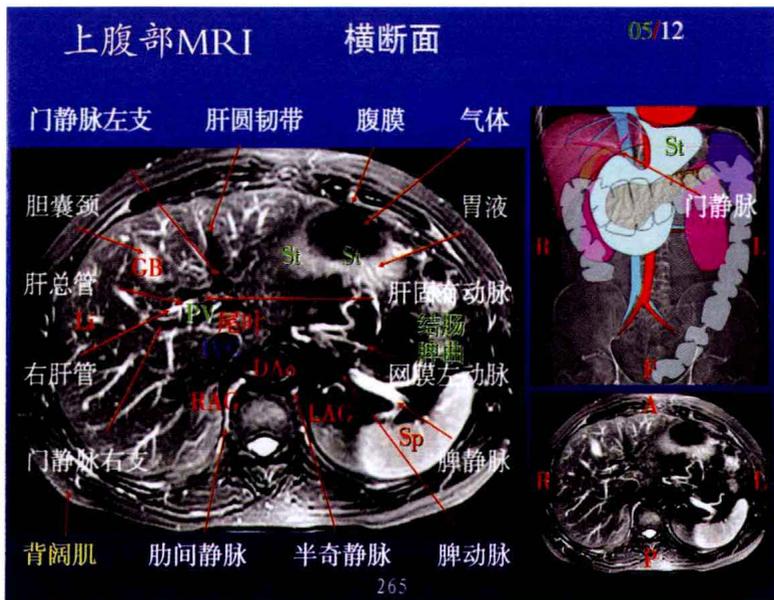
04/12

门静脉工字部 胃左动脉 胃壁 气体



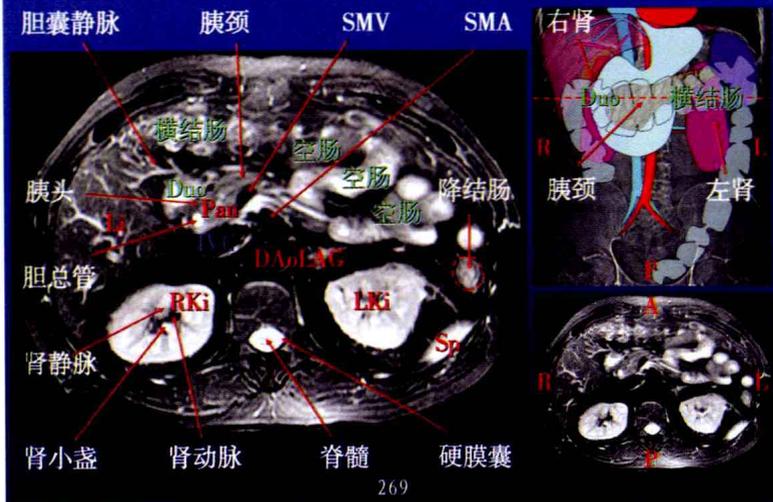
264





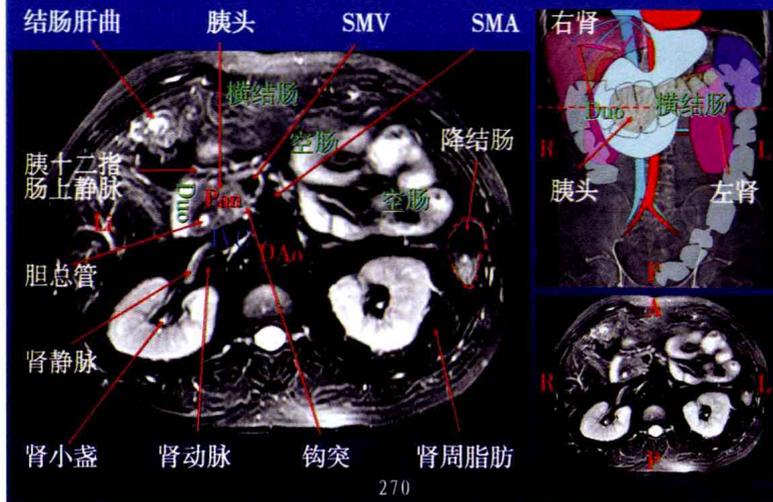
上腹部MRI 横断面

09/12



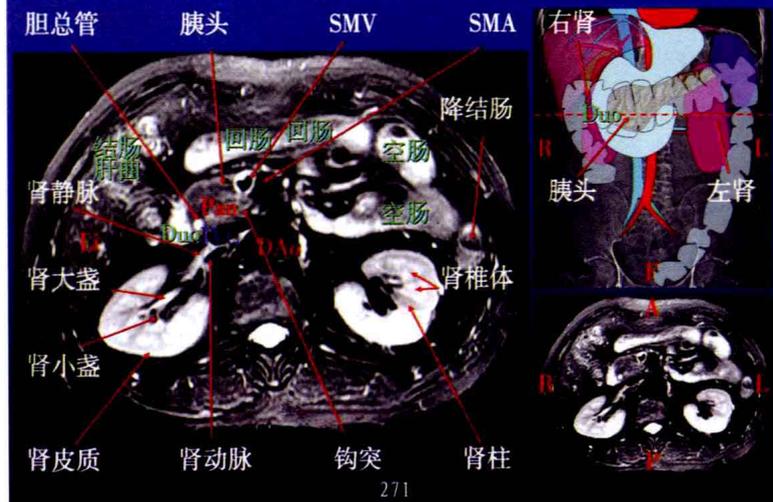
上腹部MRI 横断面

10/12



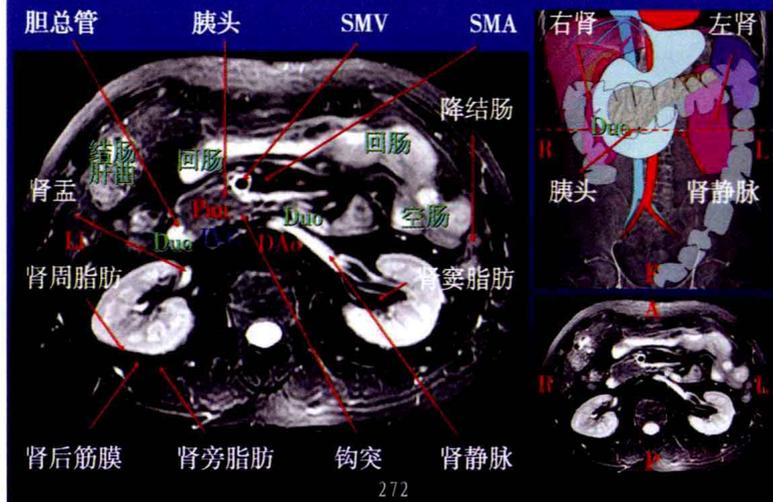
上腹部MRI 横断面

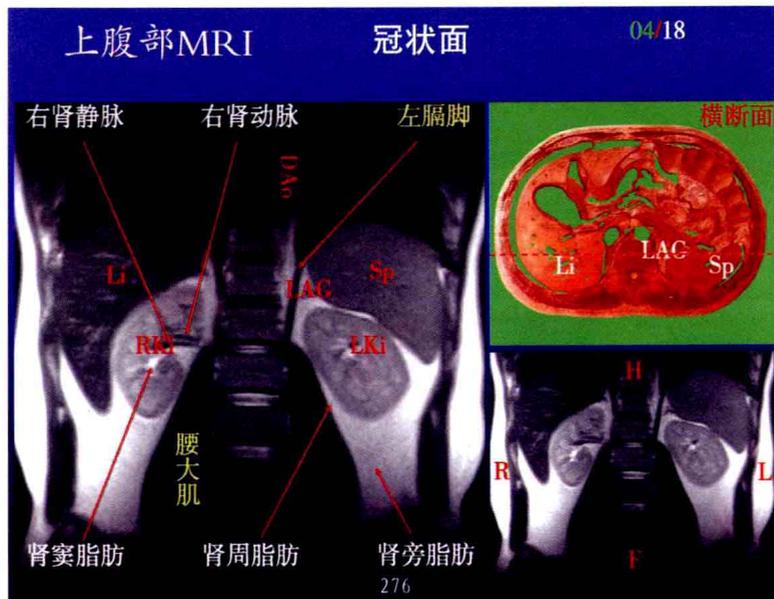
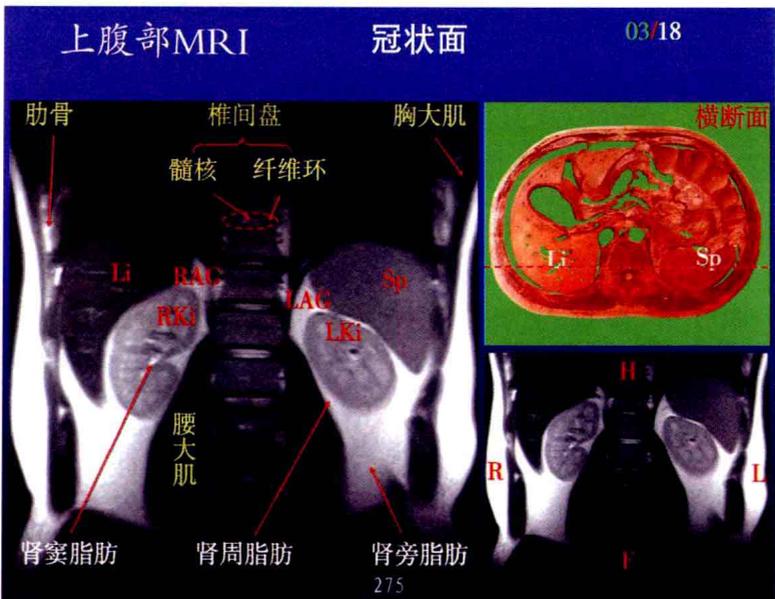
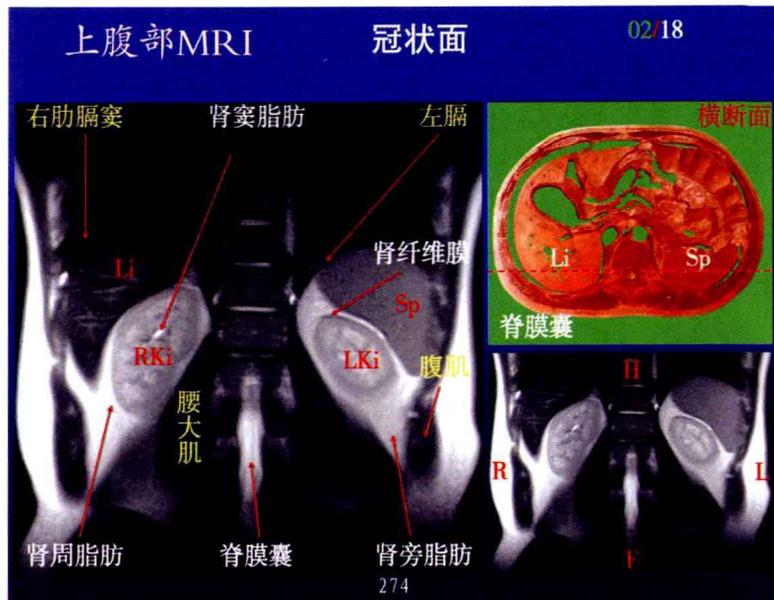
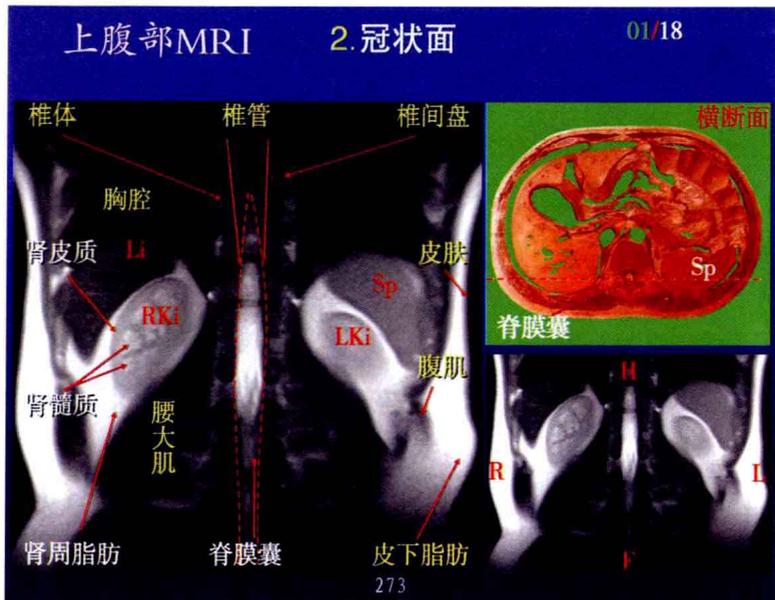
11/12

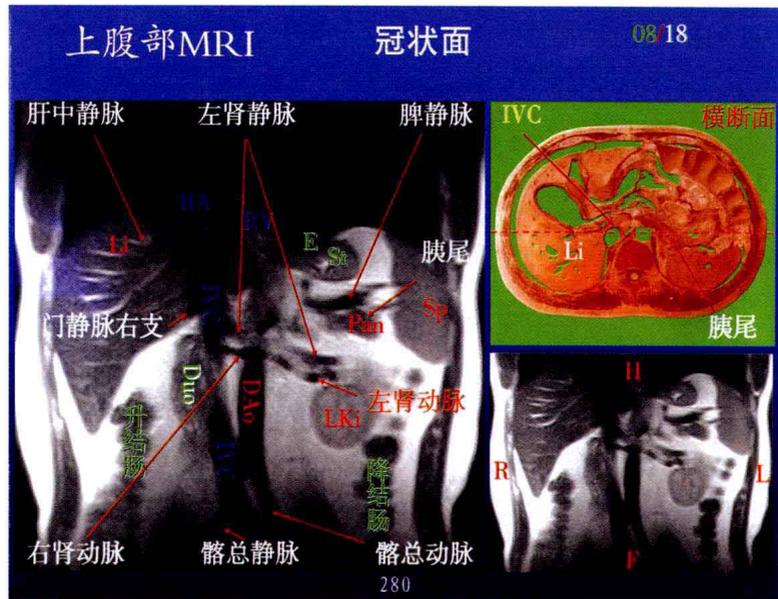
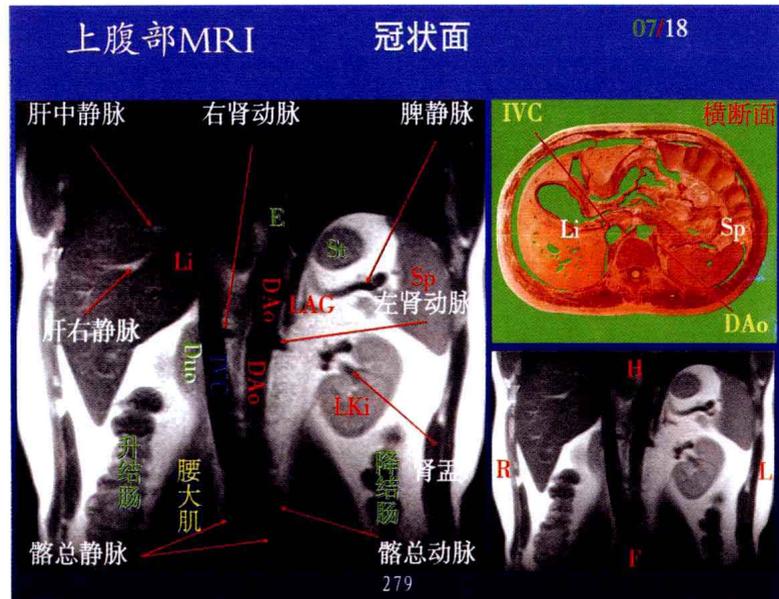
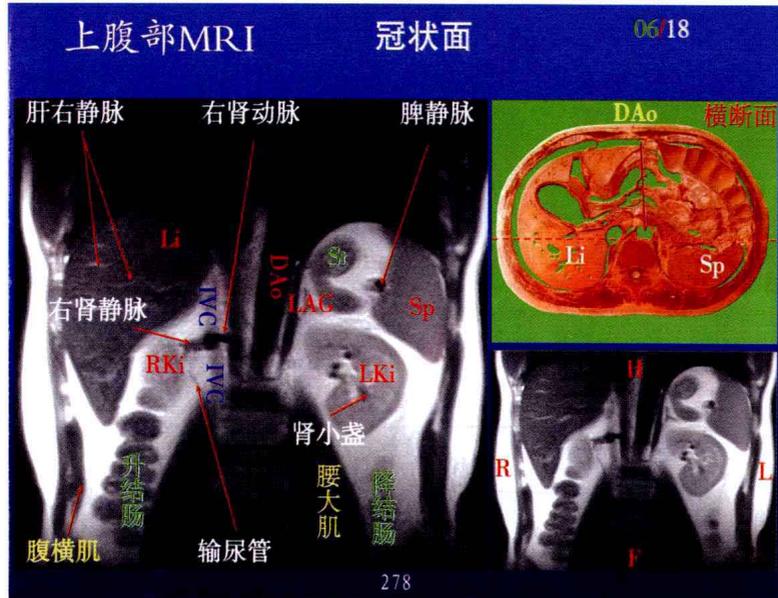
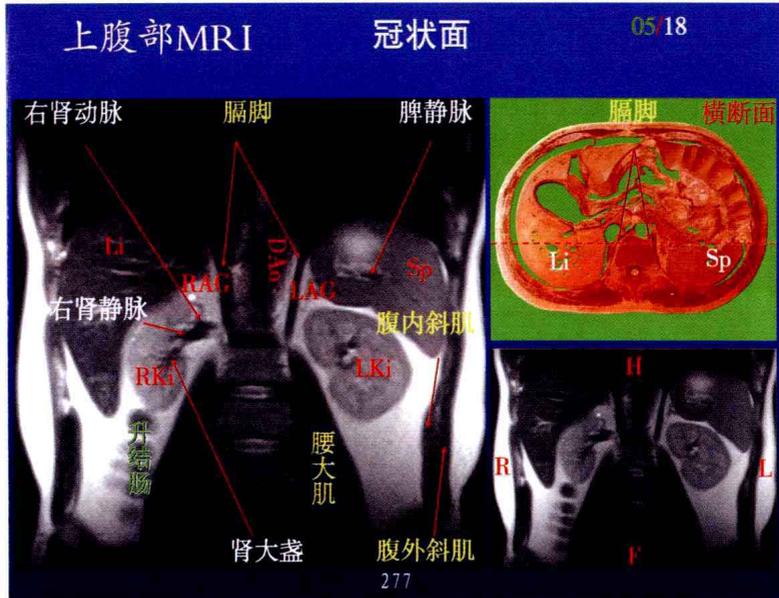


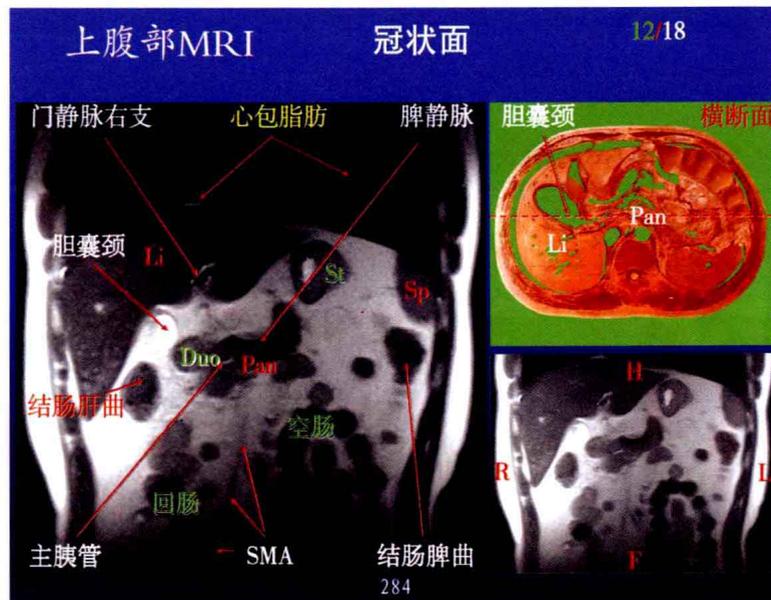
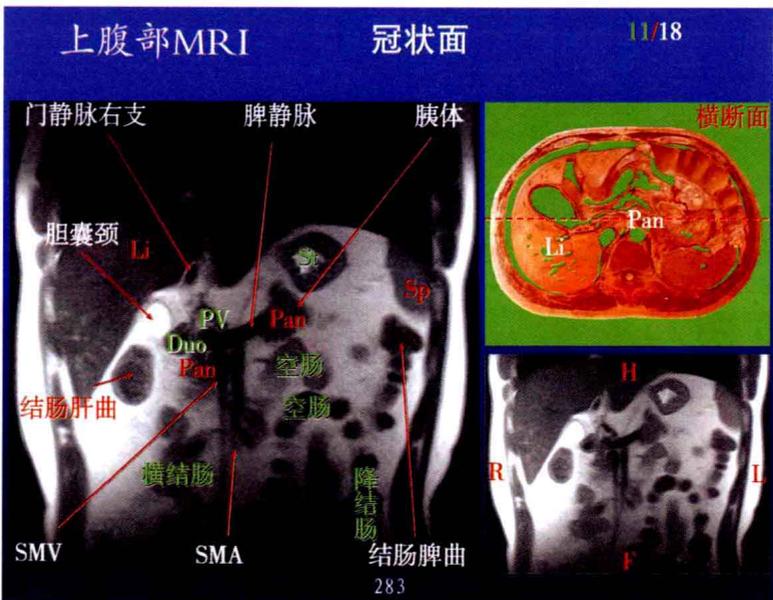
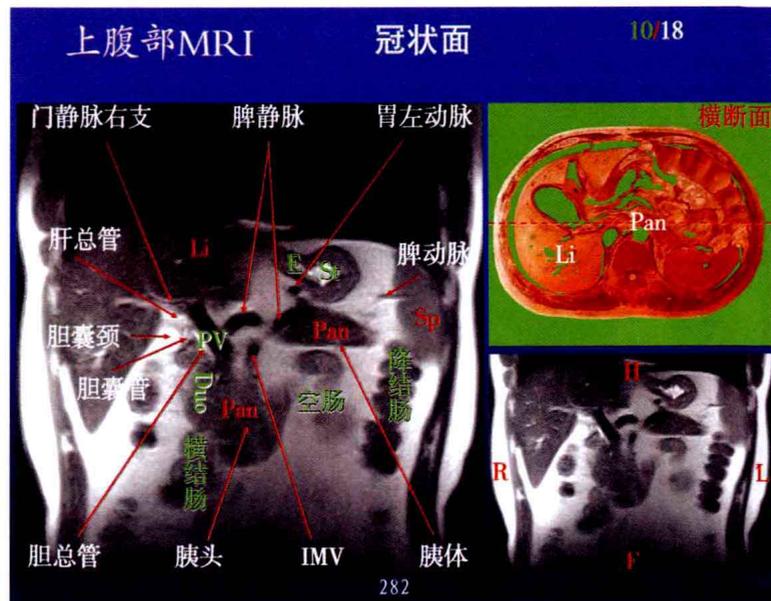
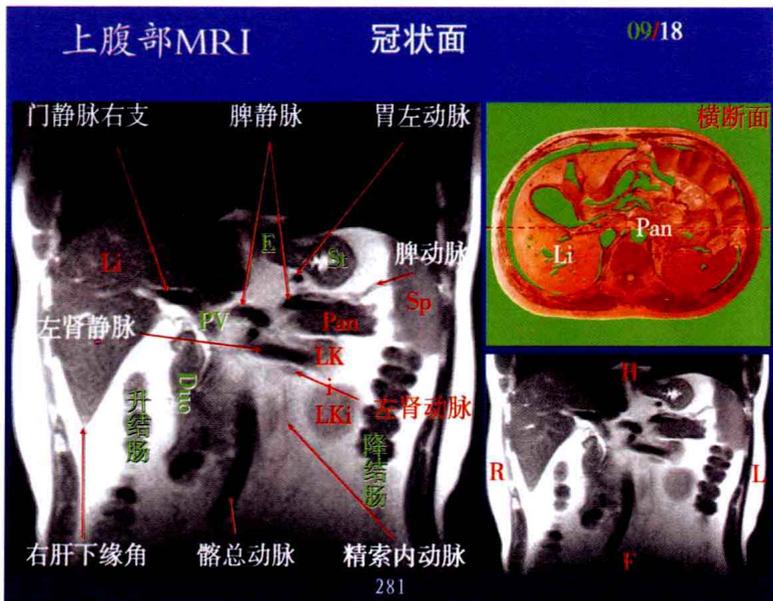
上腹部MRI 横断面

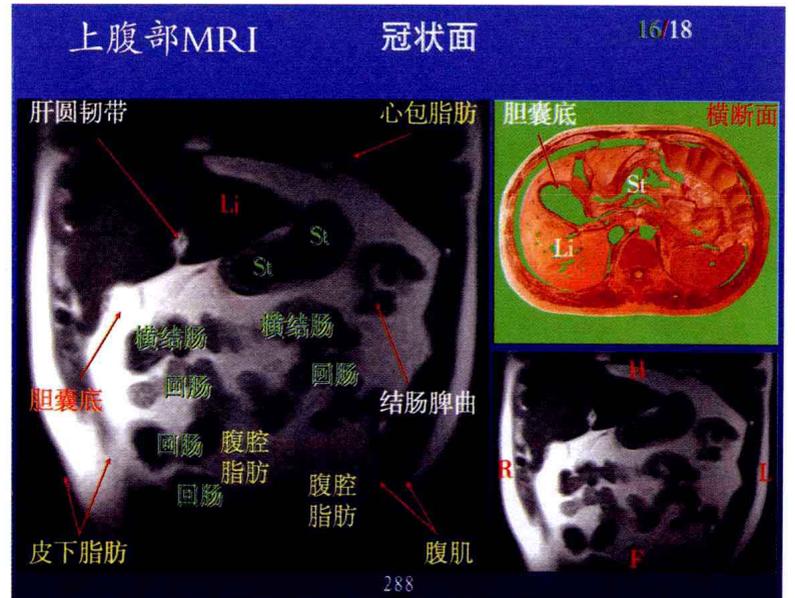
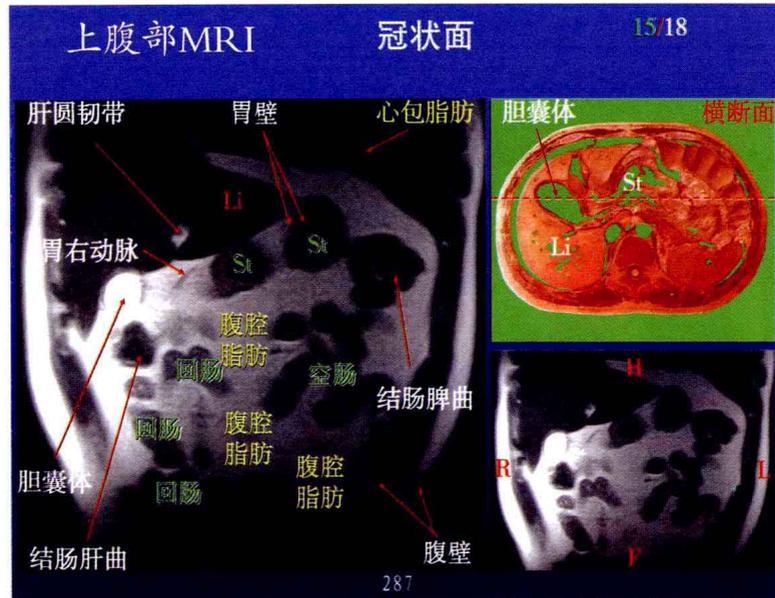
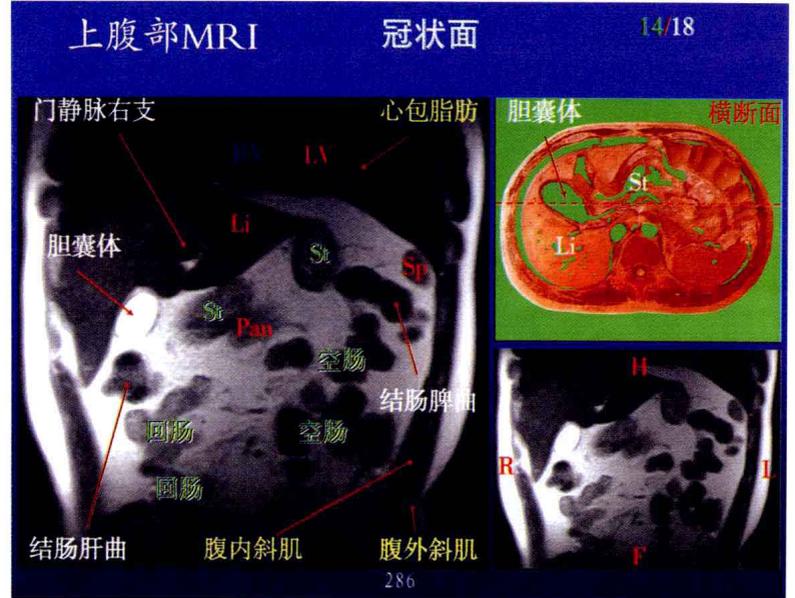
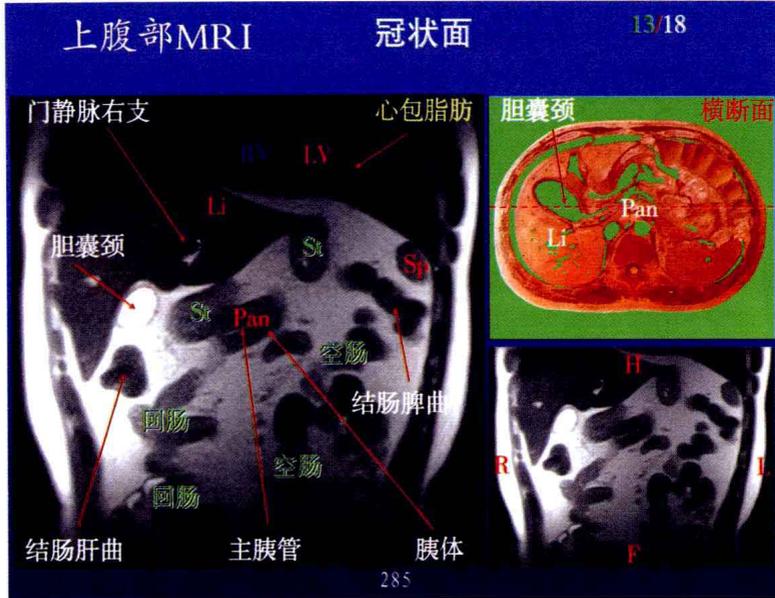
12/12

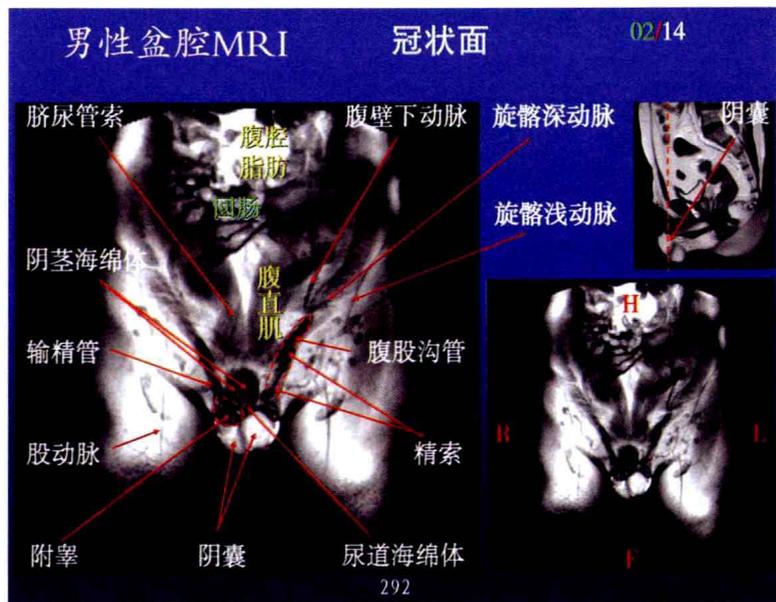
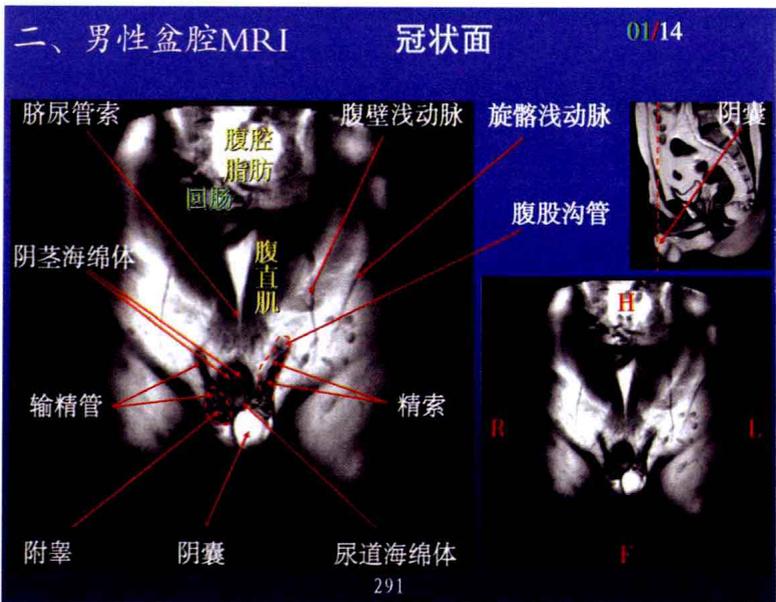
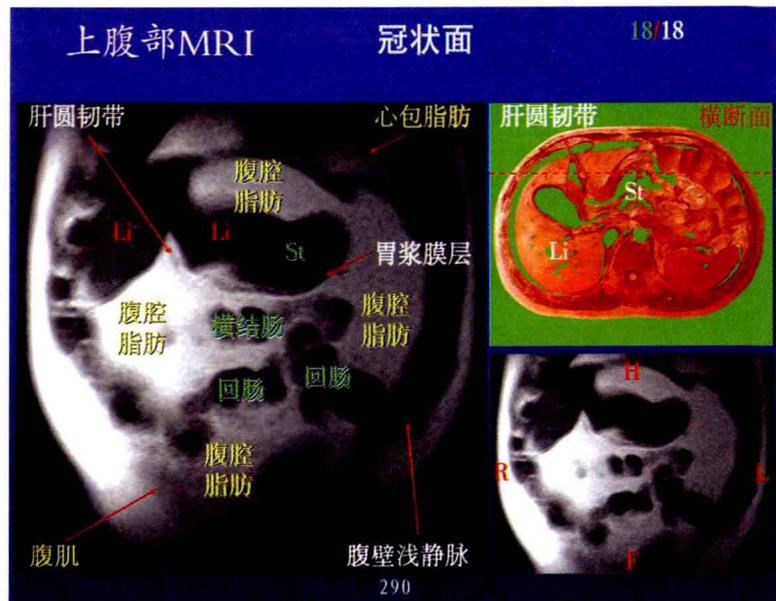
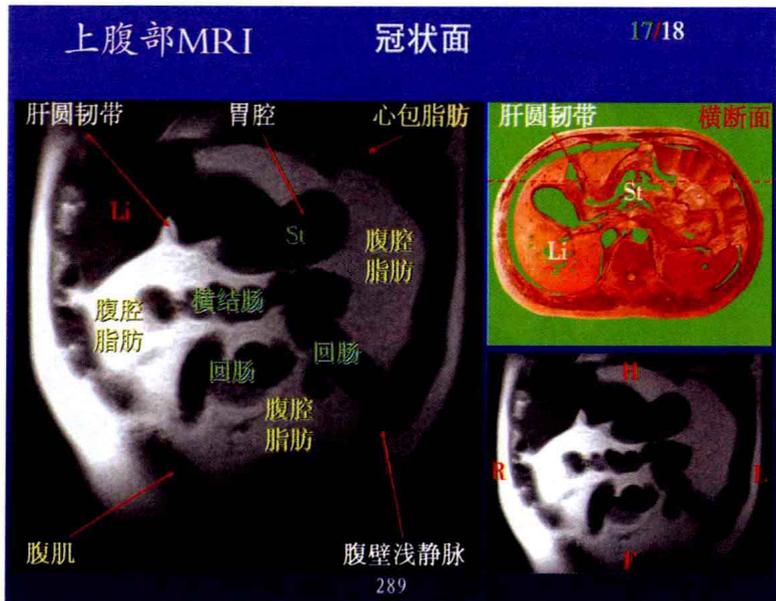








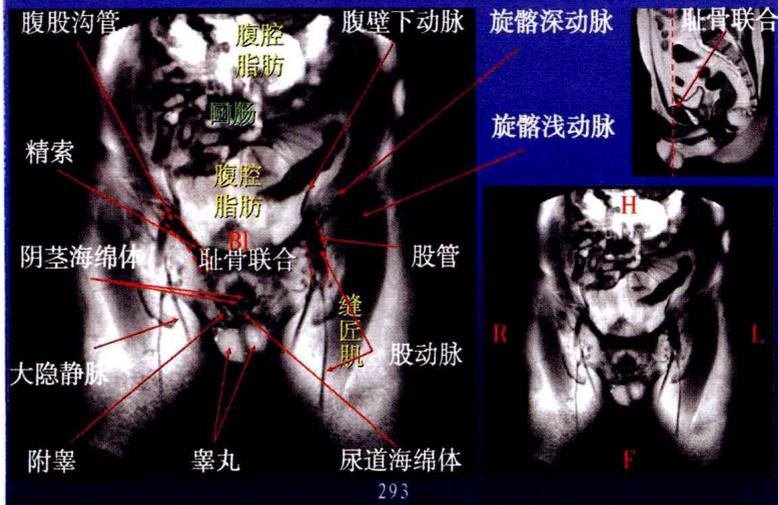




男性盆腔MRI

冠状面

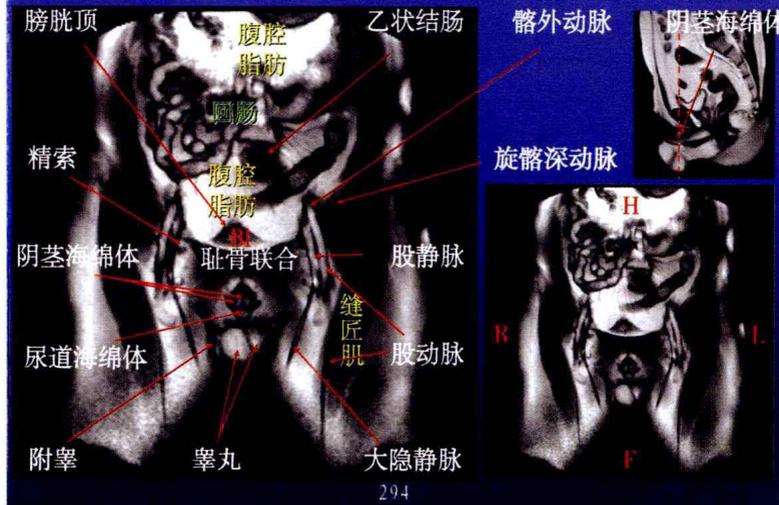
03/14



男性盆腔MRI

冠状面

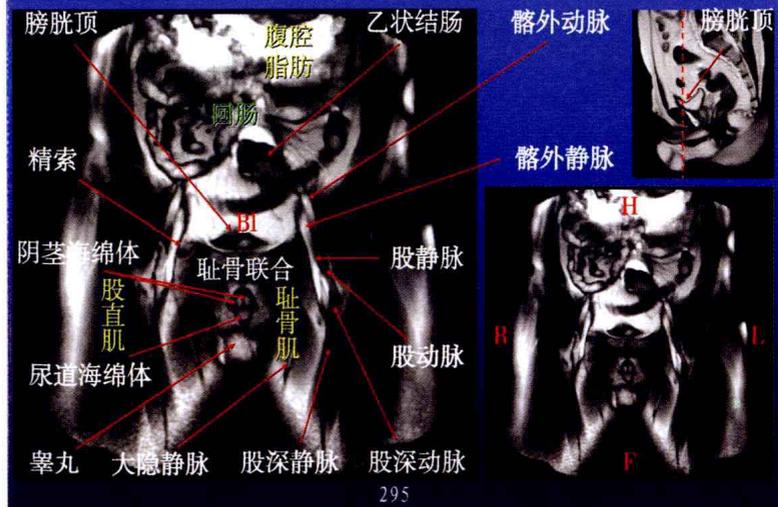
04/14



男性盆腔MRI

冠状面

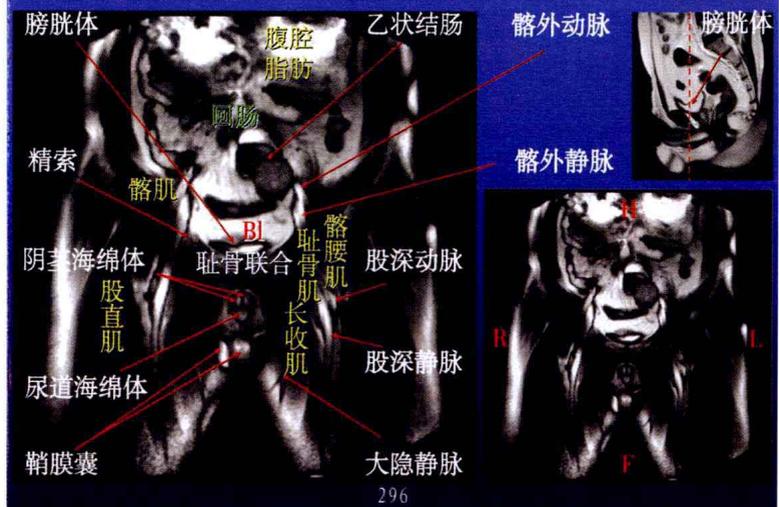
05/14

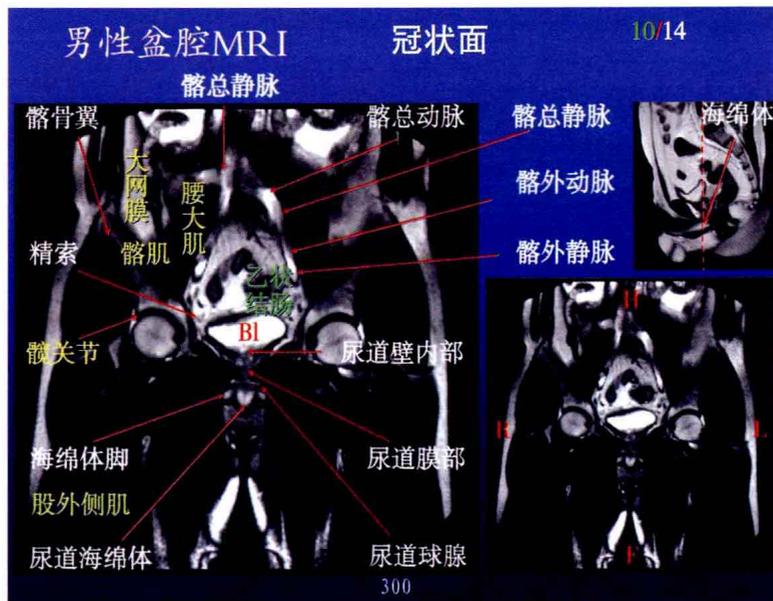
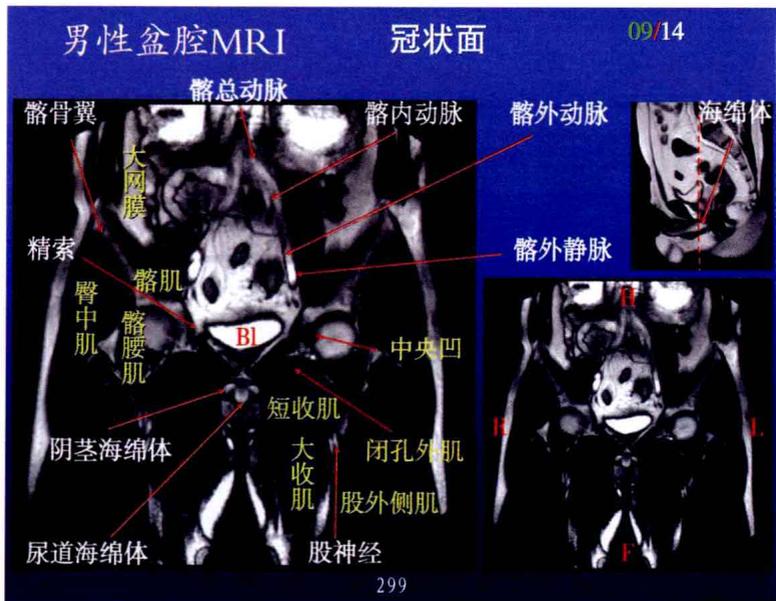
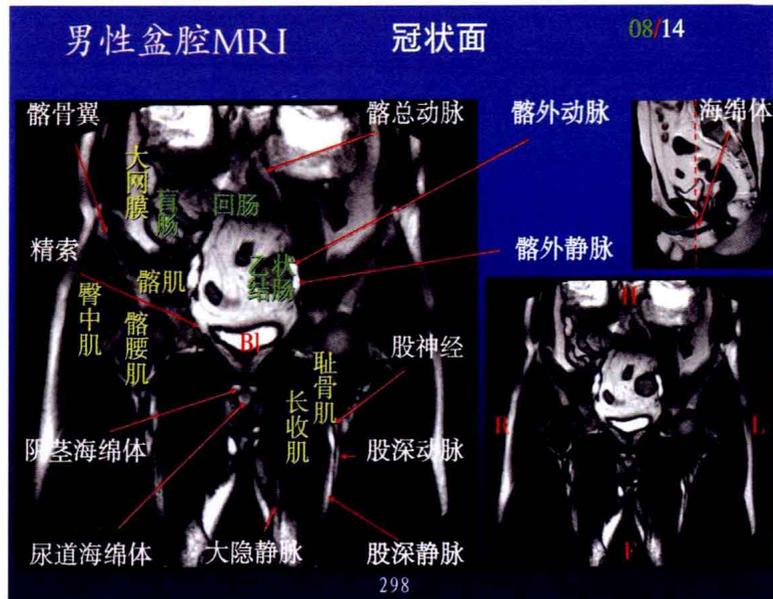
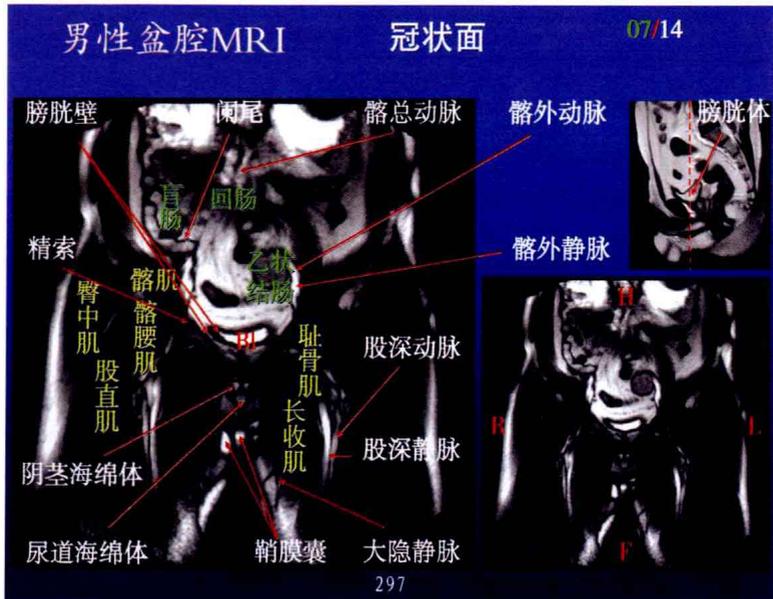


男性盆腔MRI

冠状面

06/14

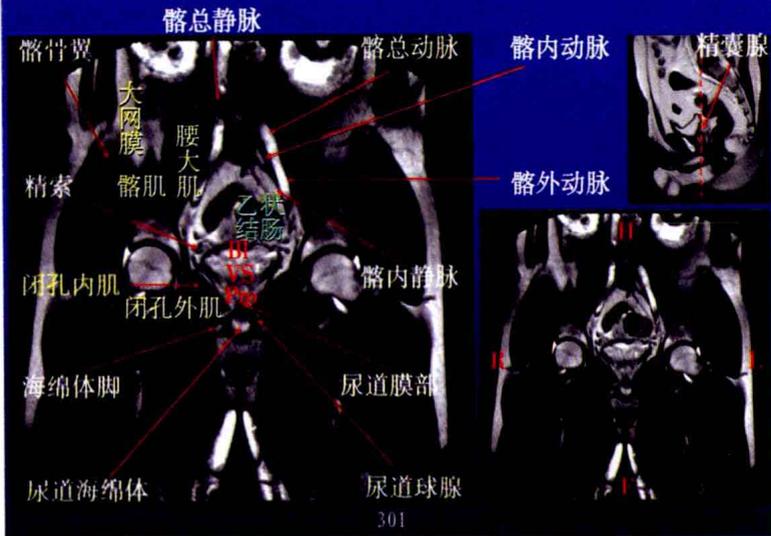




男性盆腔MRI

冠状面

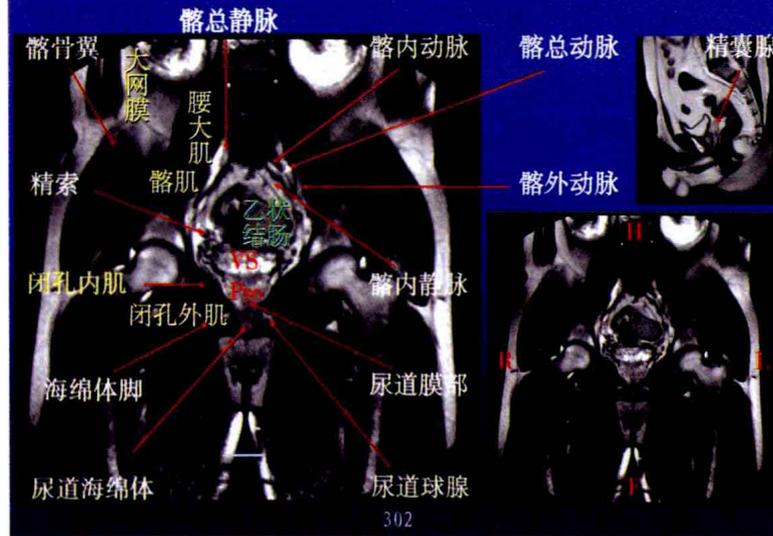
11/14



男性盆腔MRI

冠状面

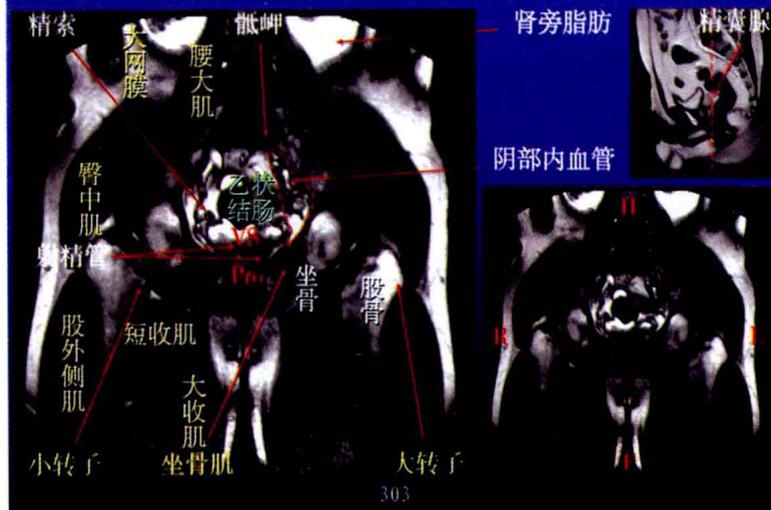
12/14



男性盆腔MRI

冠状面

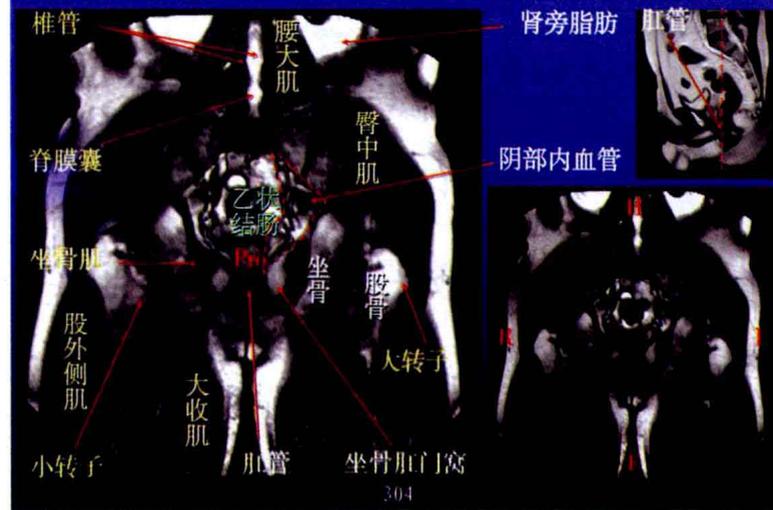
13/14

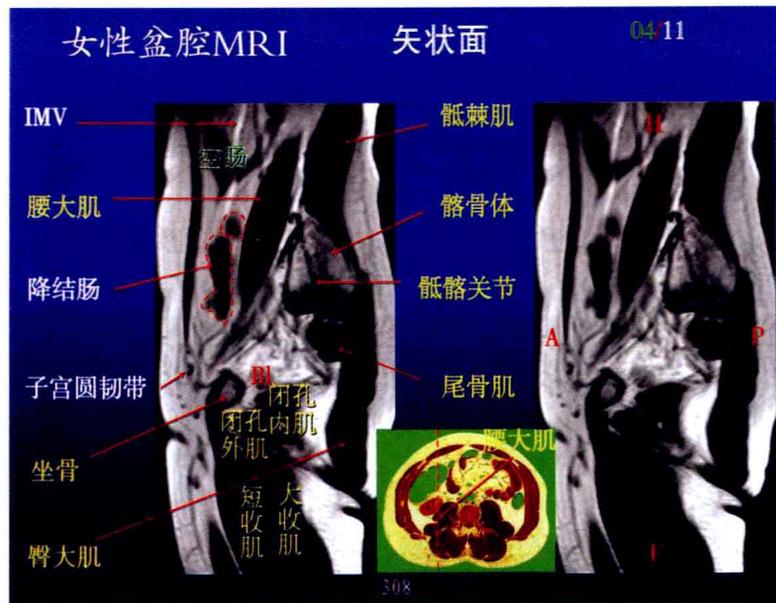
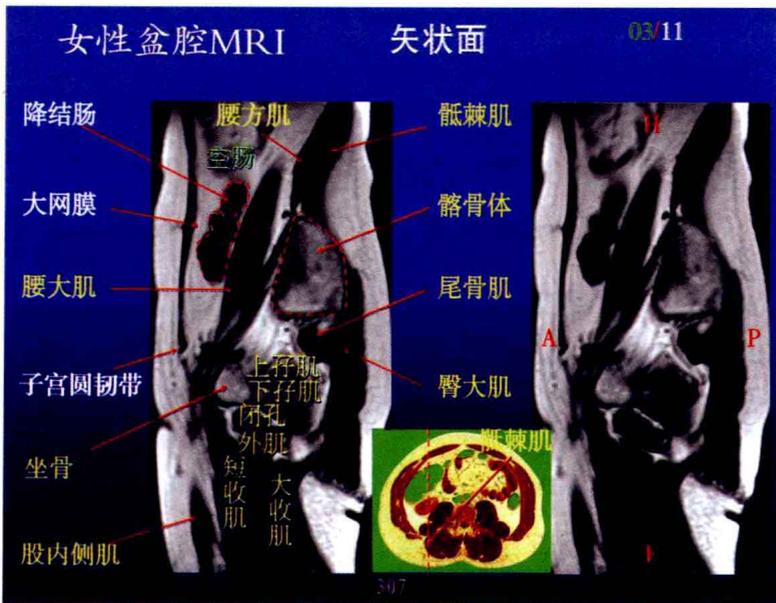
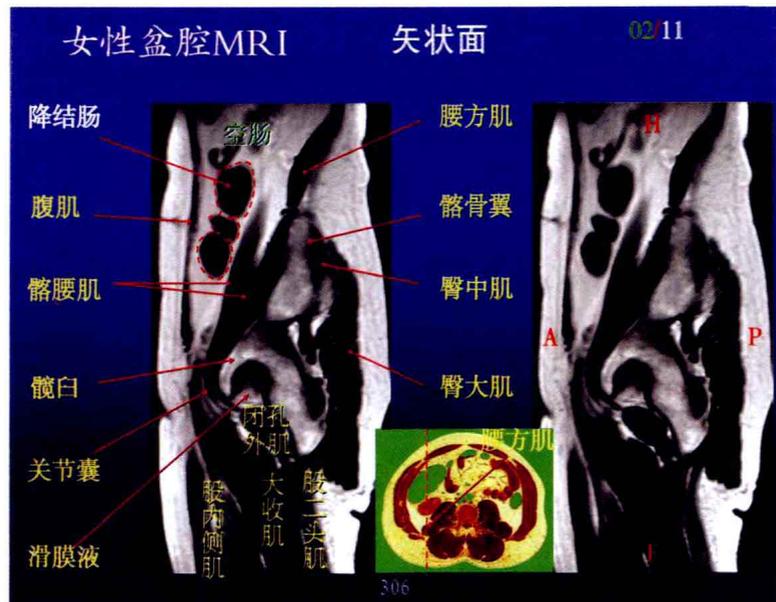
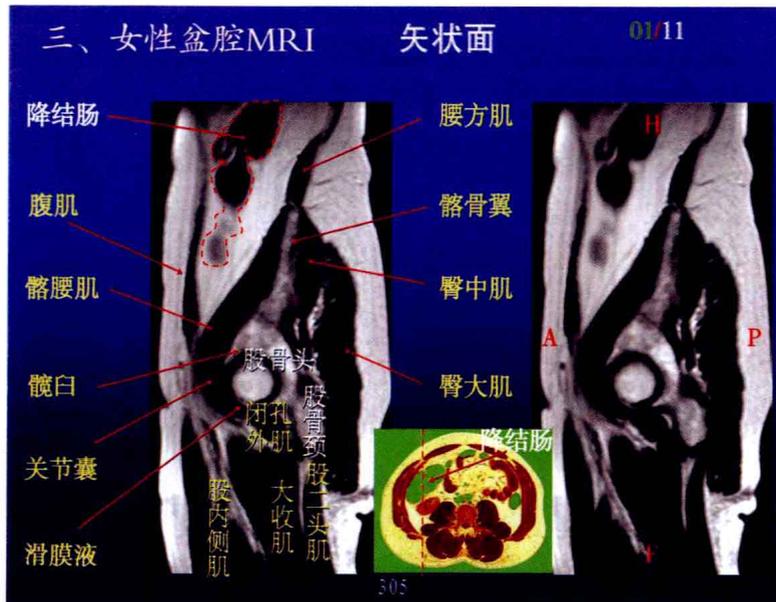


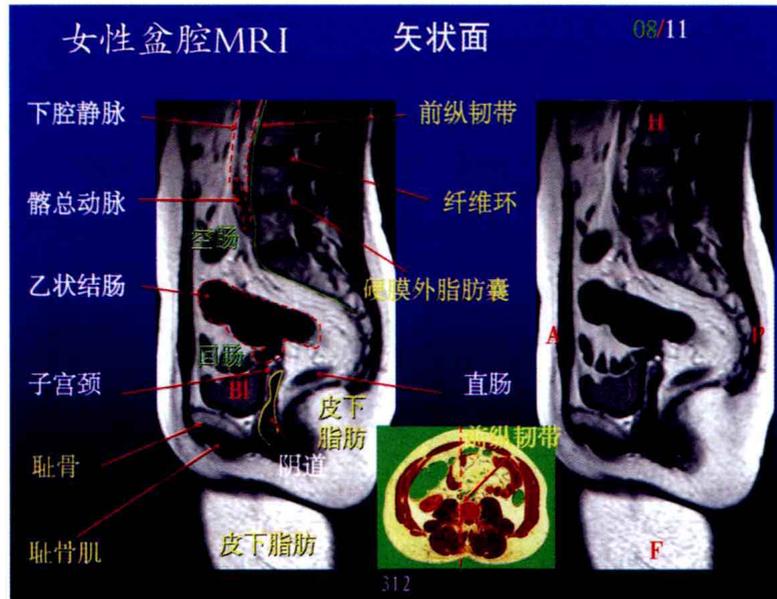
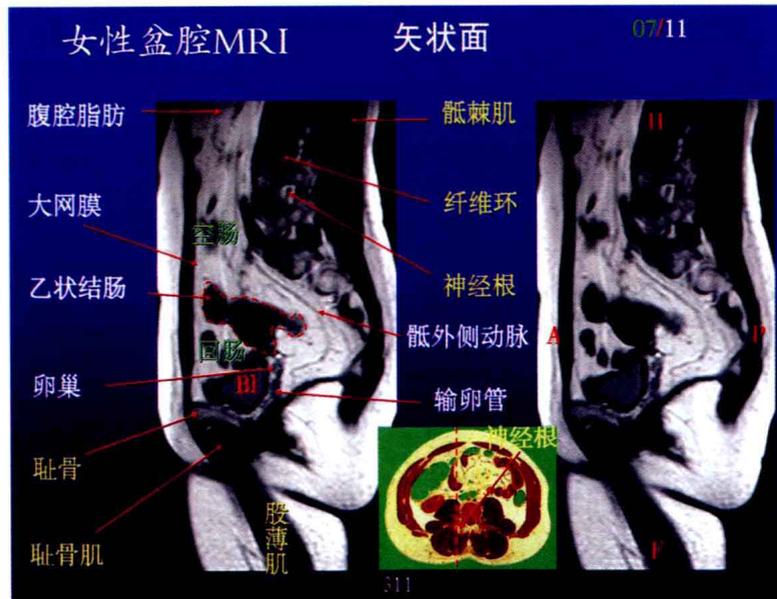
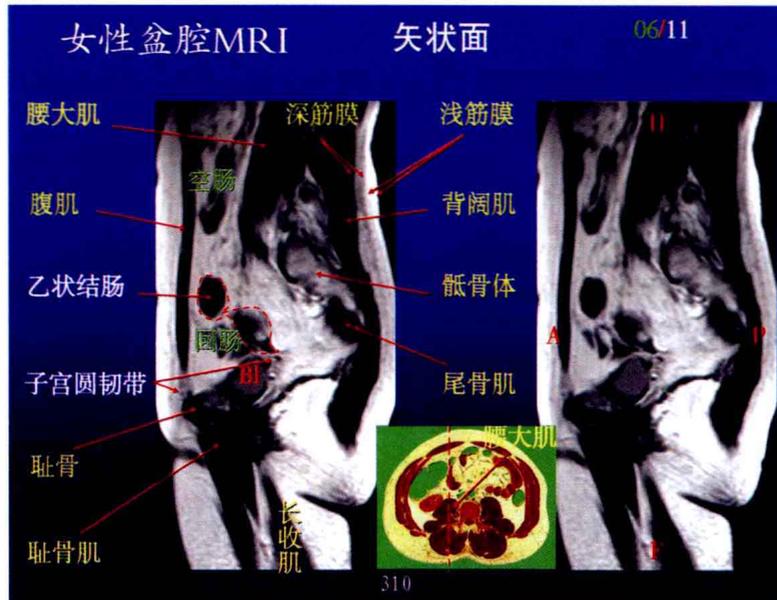
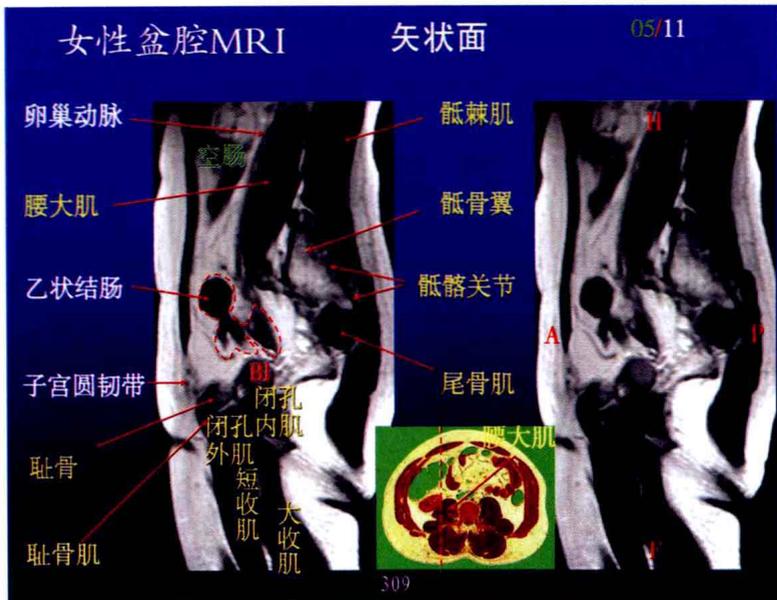
男性盆腔MRI

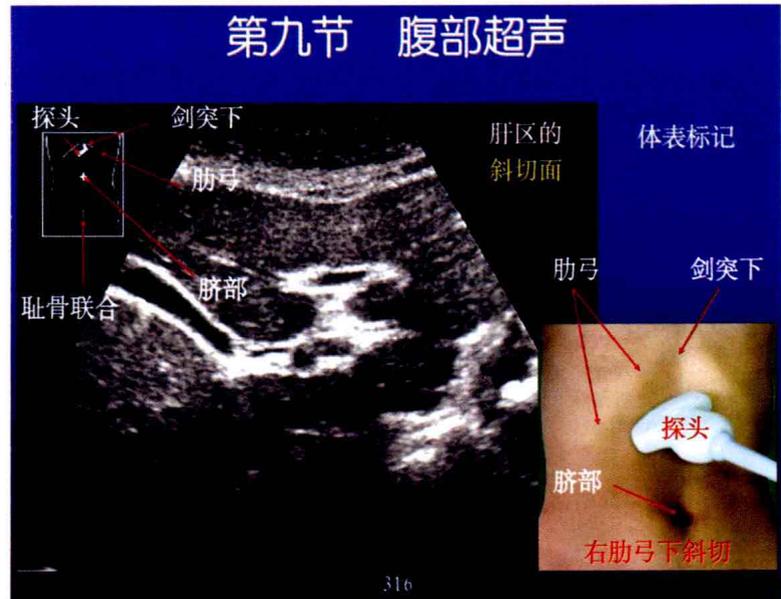
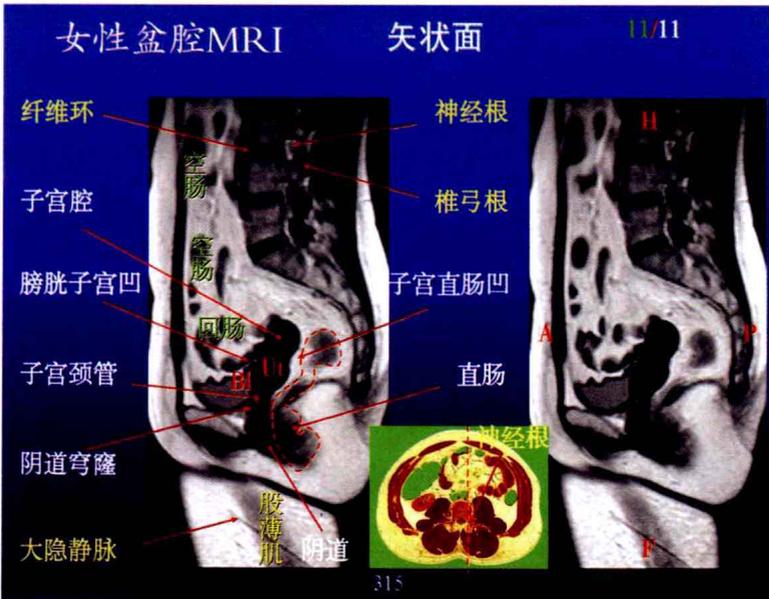
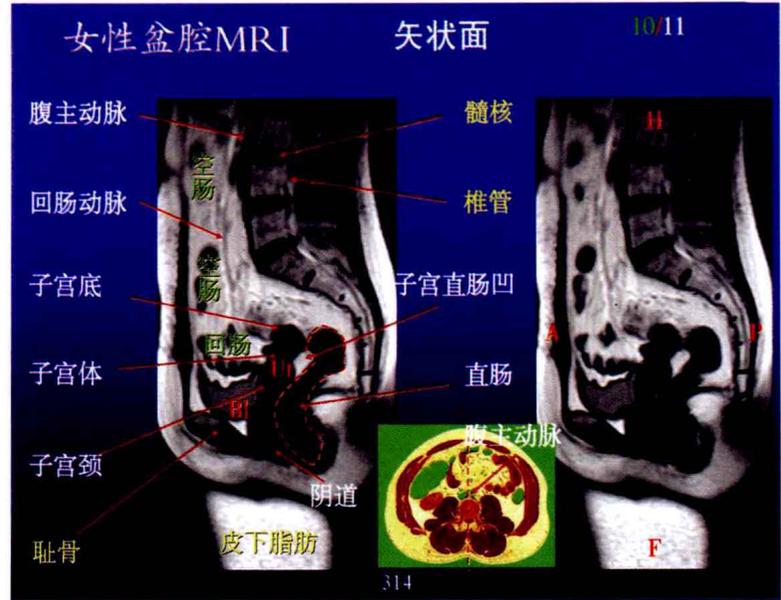
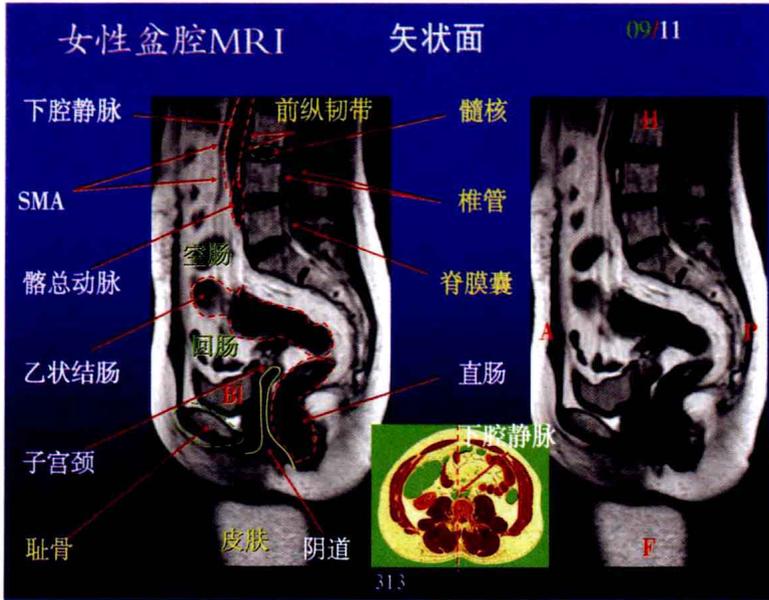
冠状面

14/14

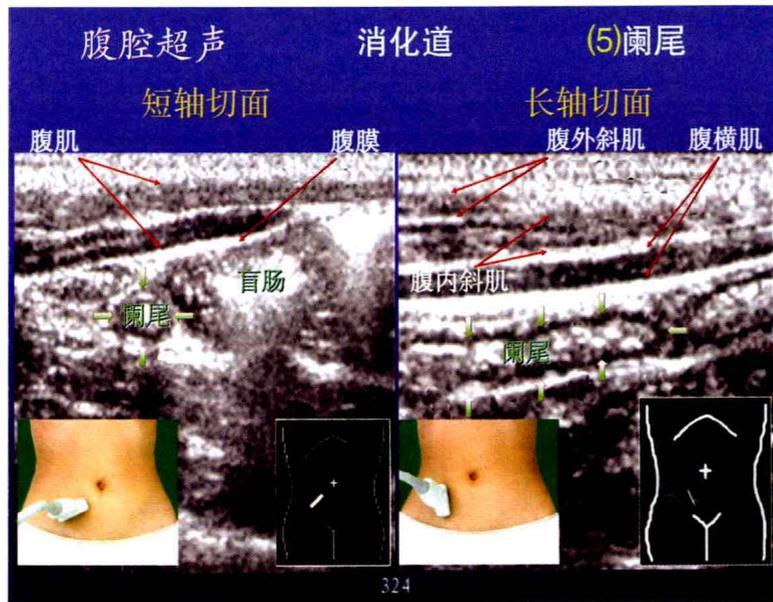
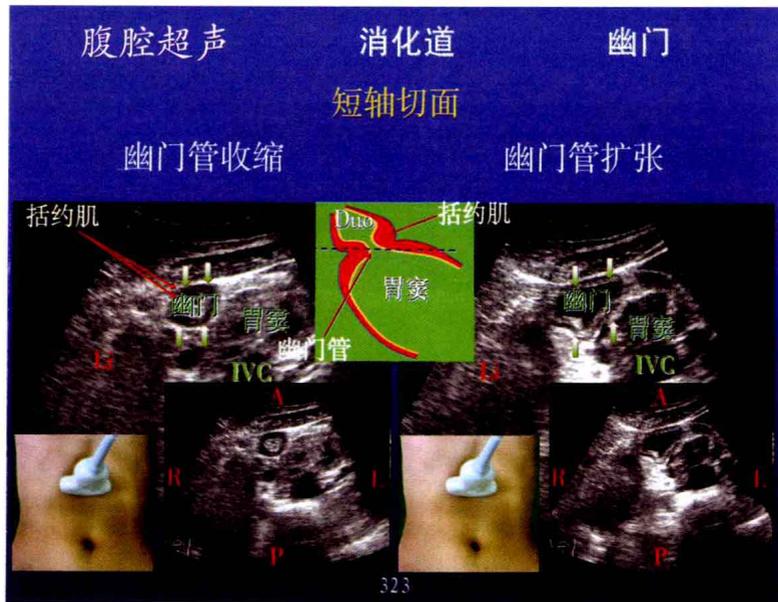
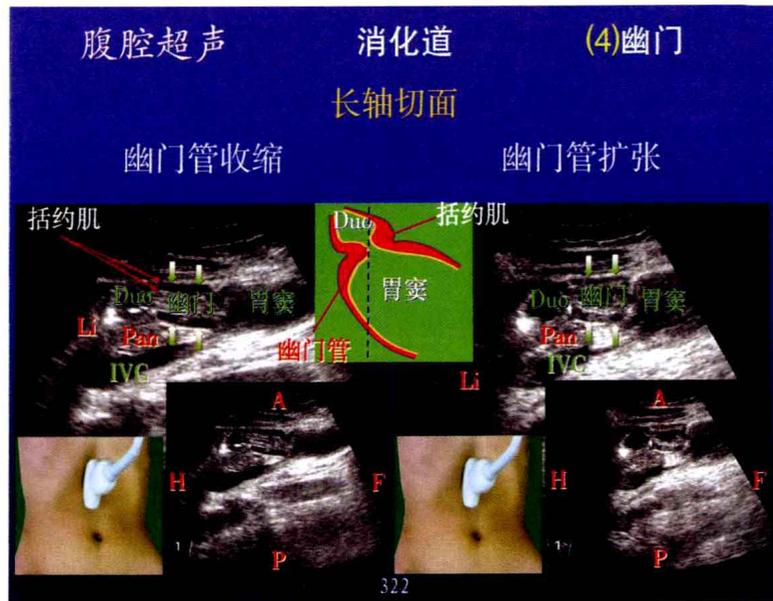
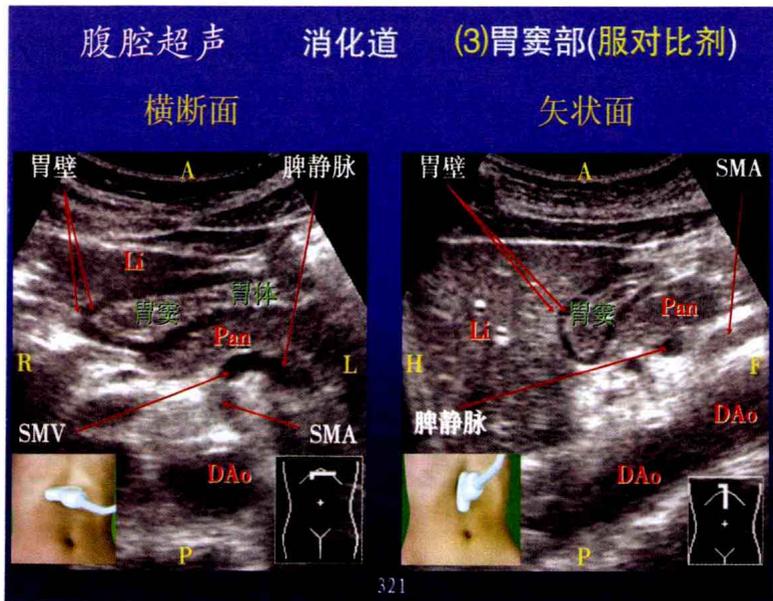








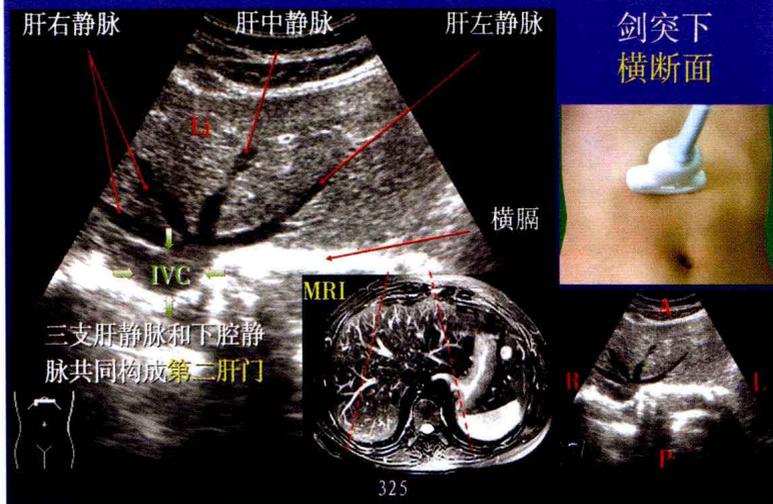




腹腔超声

2. 消化腺

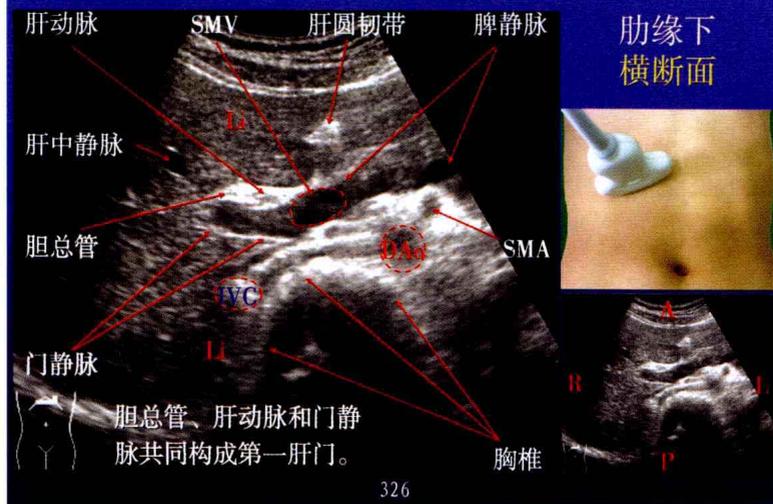
(1) 肝区



腹腔超声

消化腺

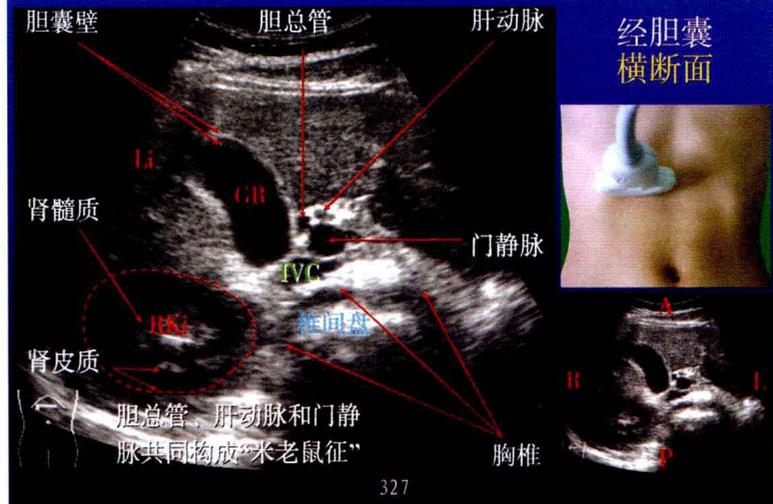
肝区



腹腔超声

消化腺

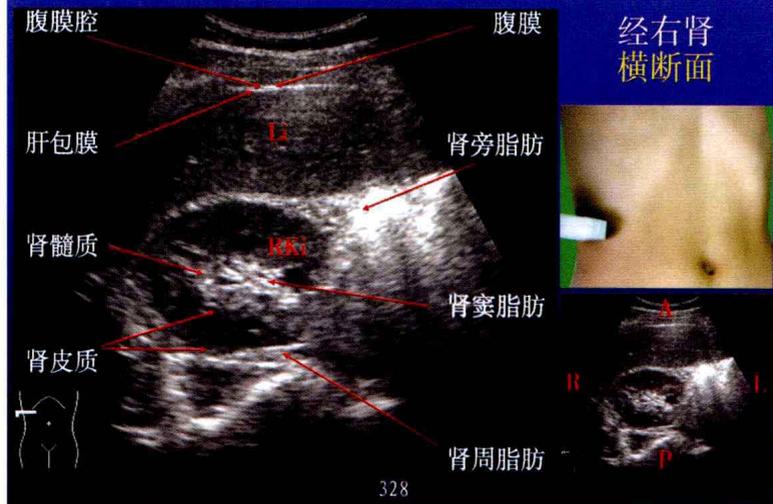
肝区

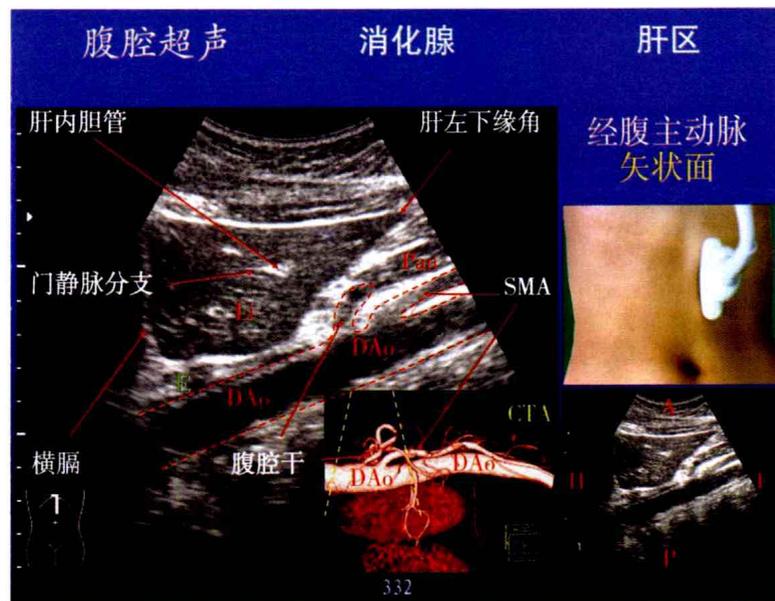
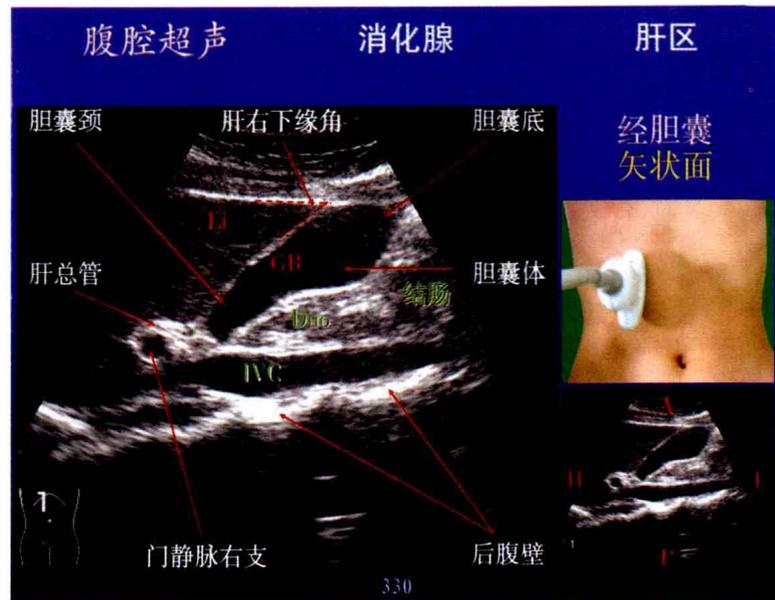
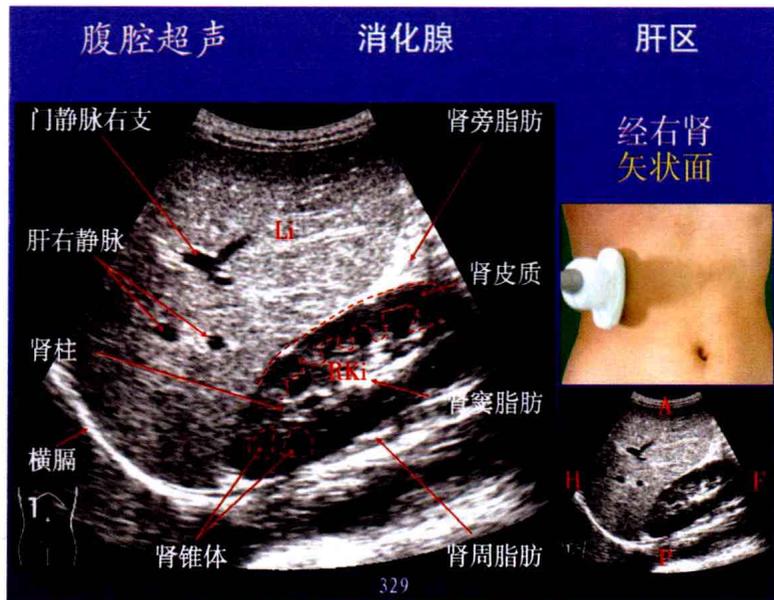


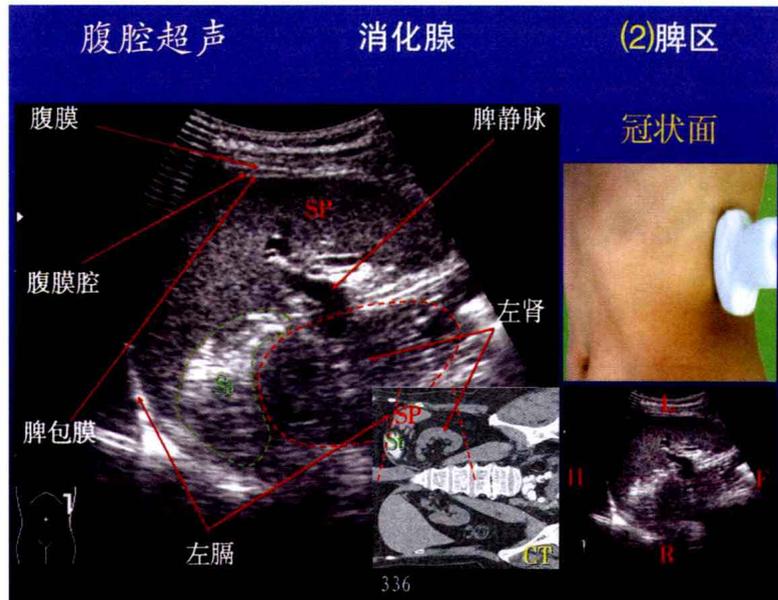
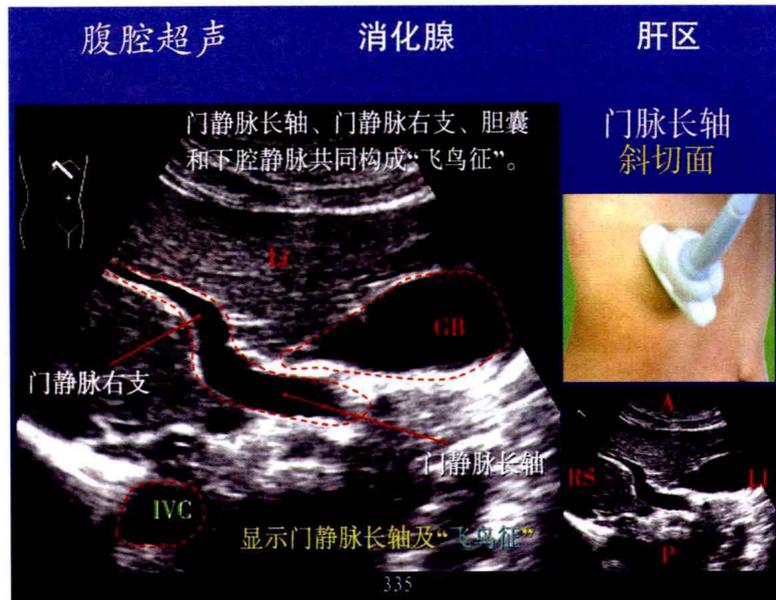
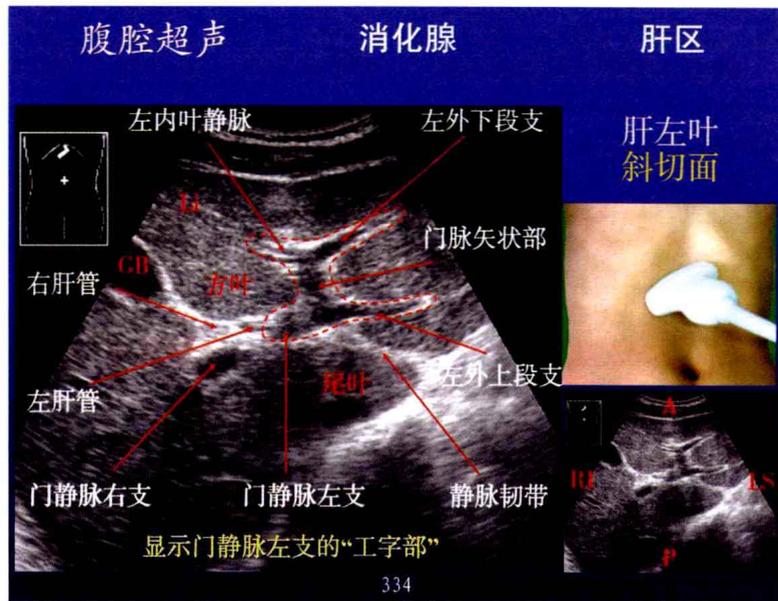
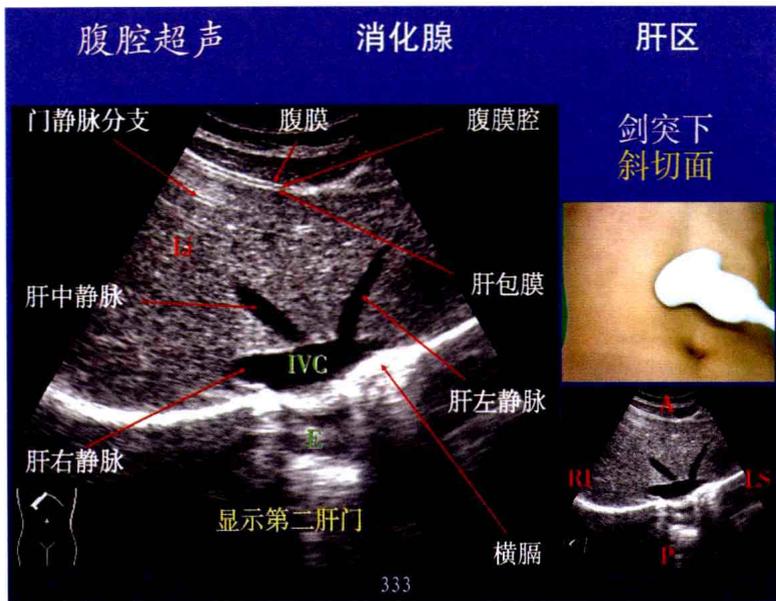
腹腔超声

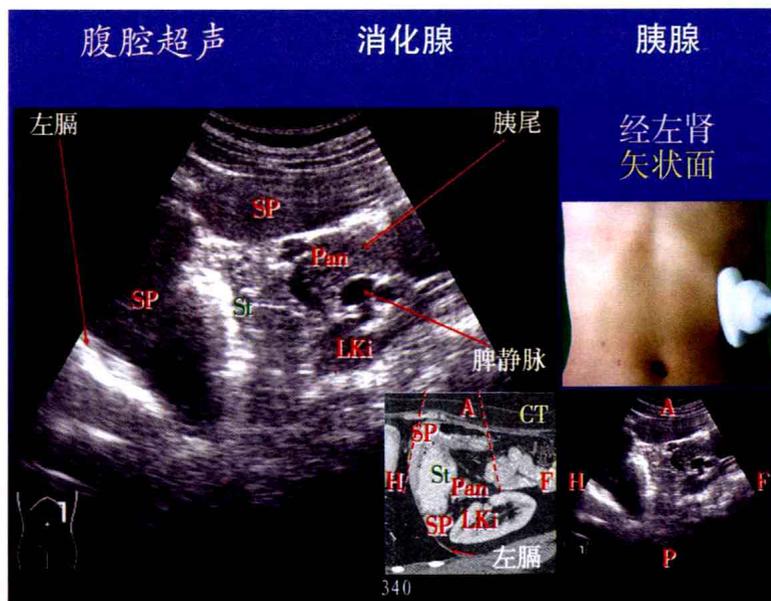
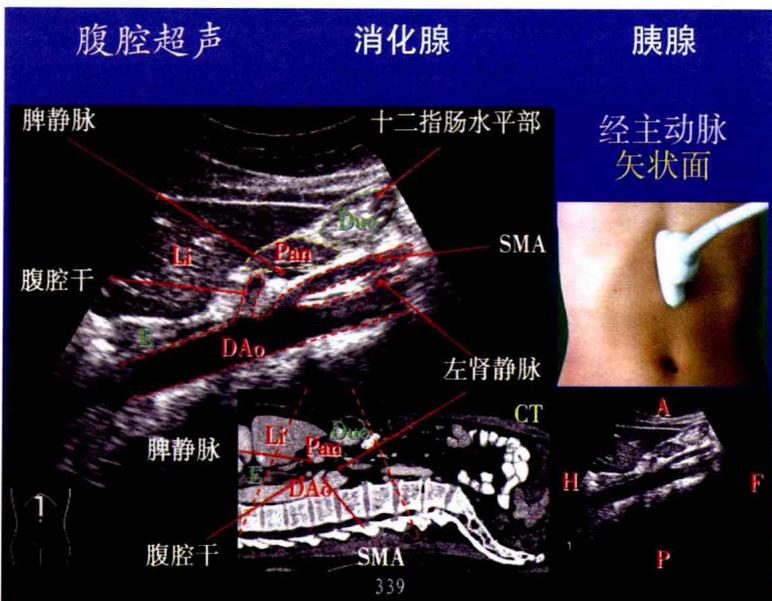
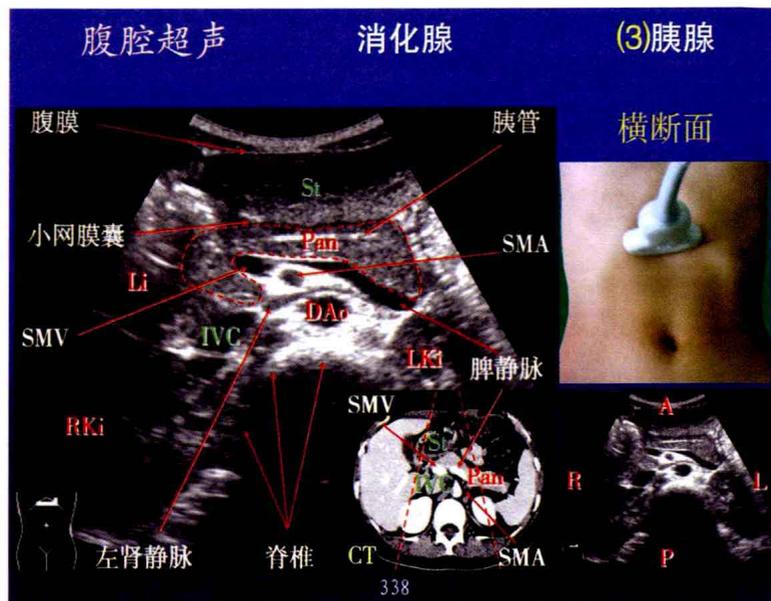
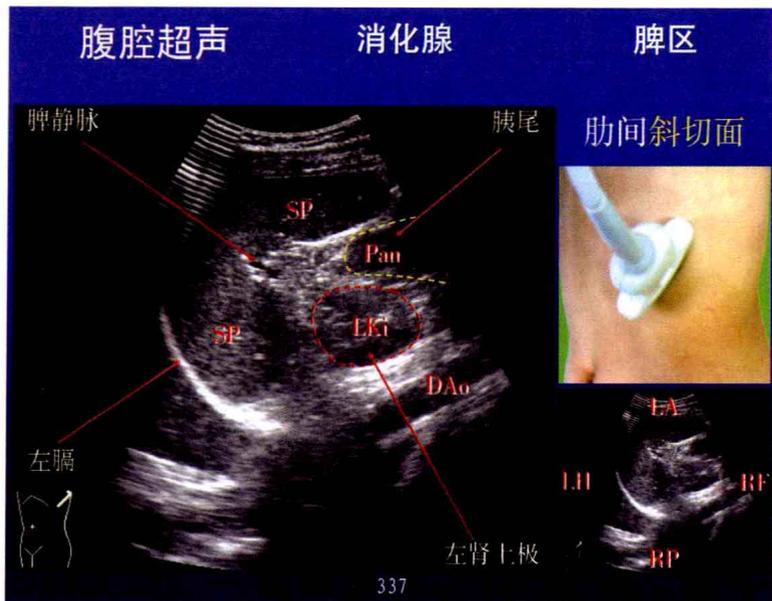
消化腺

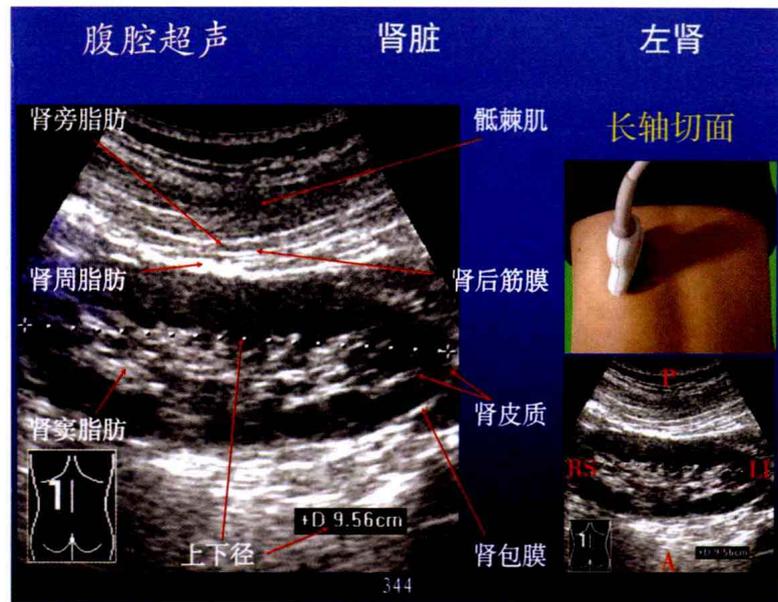
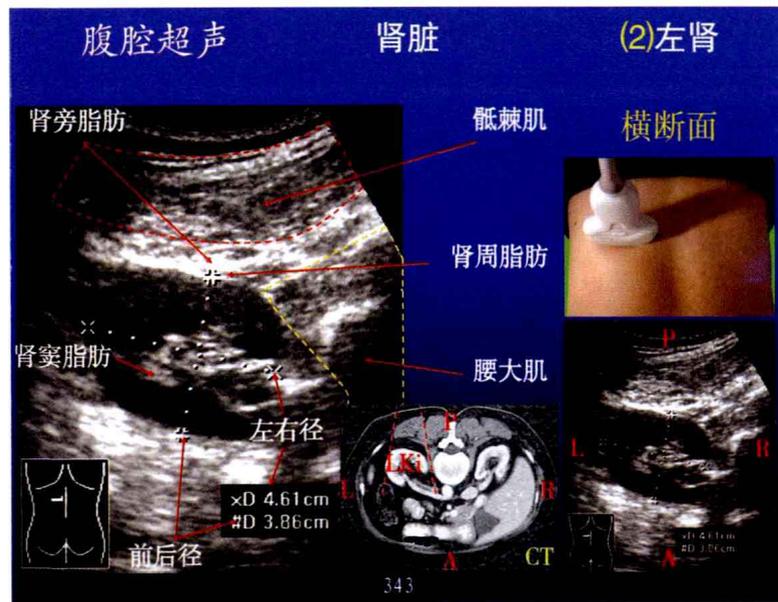
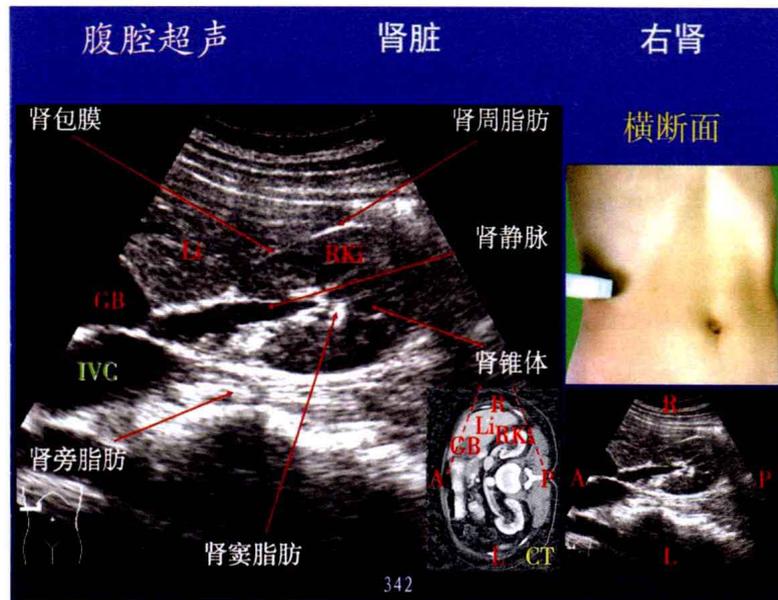
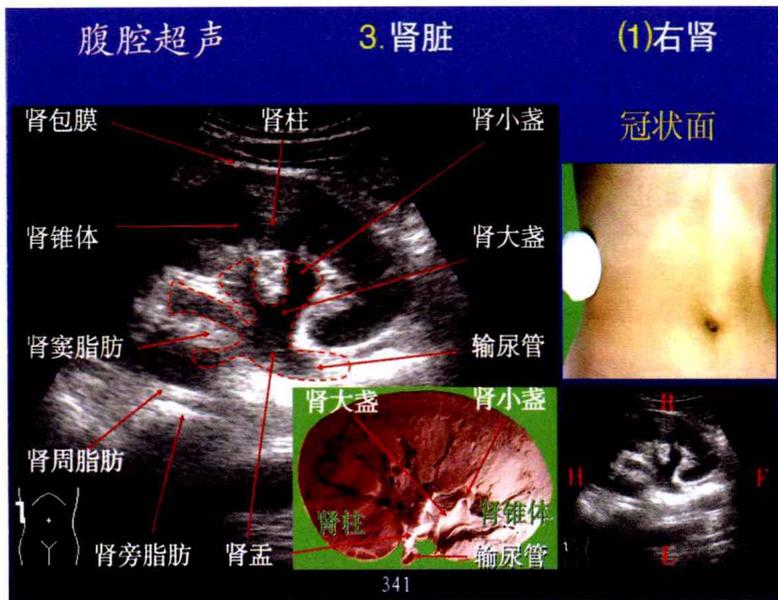
肝区







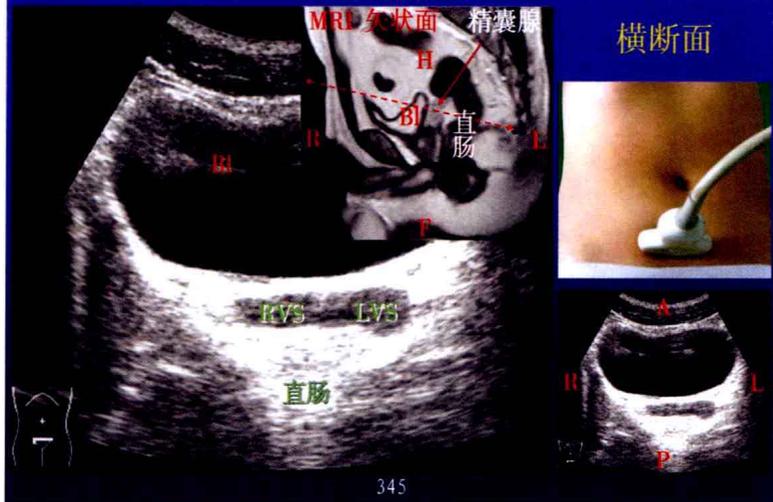




二、盆腔超声

1. 男性

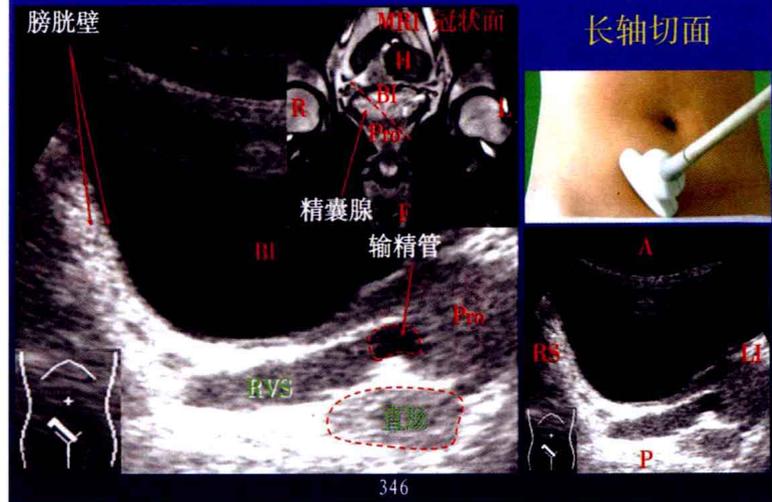
(1) 精囊腺



盆腔超声

男性

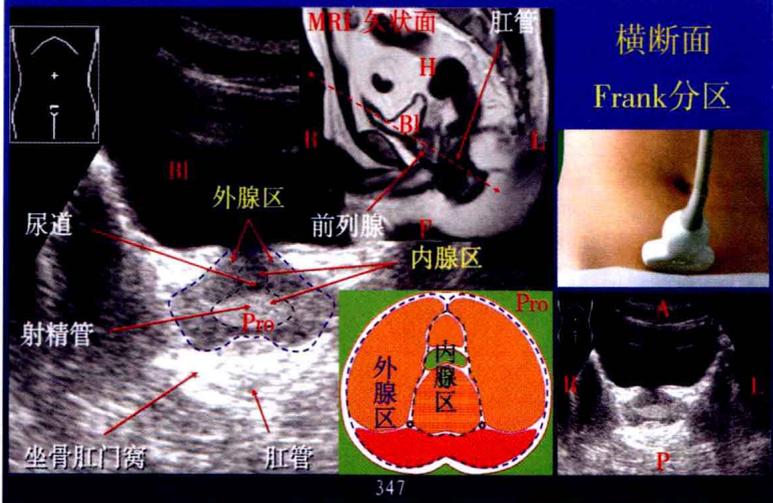
精囊腺



盆腔超声

男性

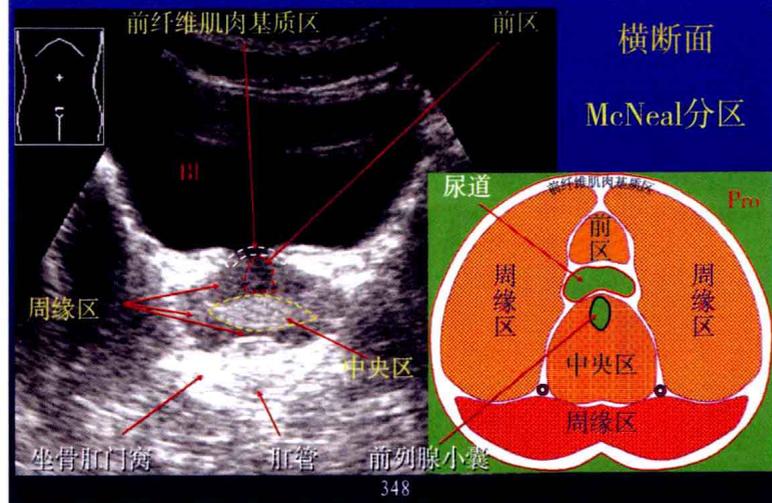
(2) 前列腺



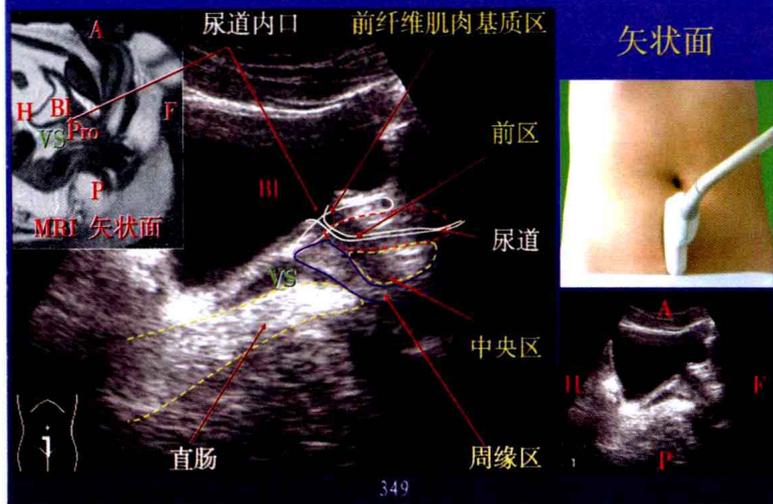
盆腔超声

男性

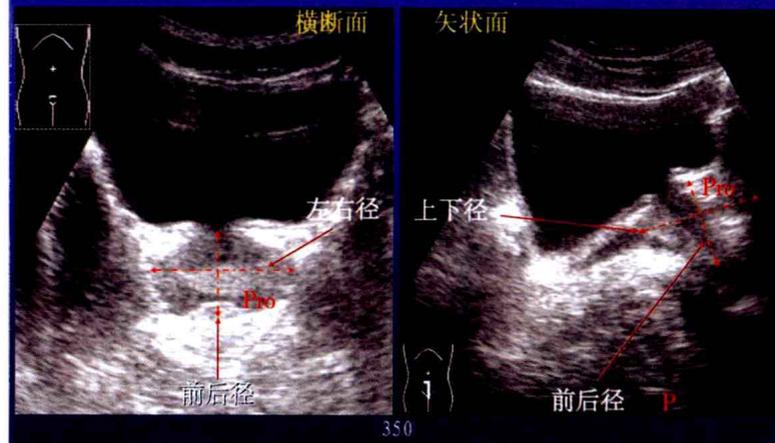
前列腺



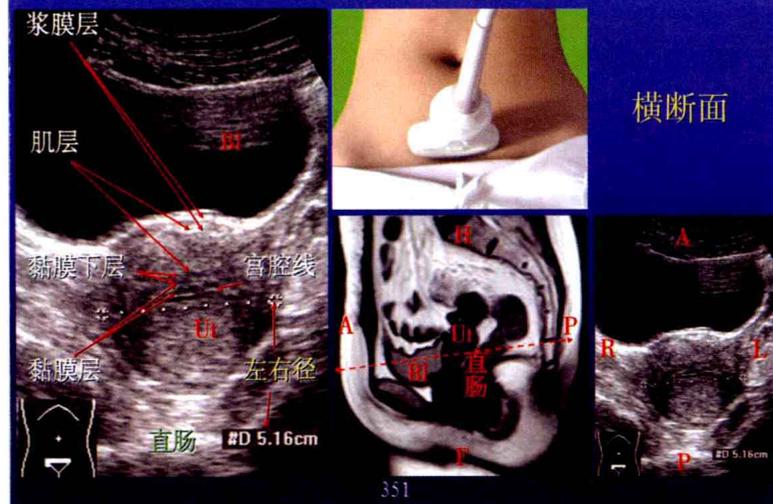
盆腔超声 男性 前列腺



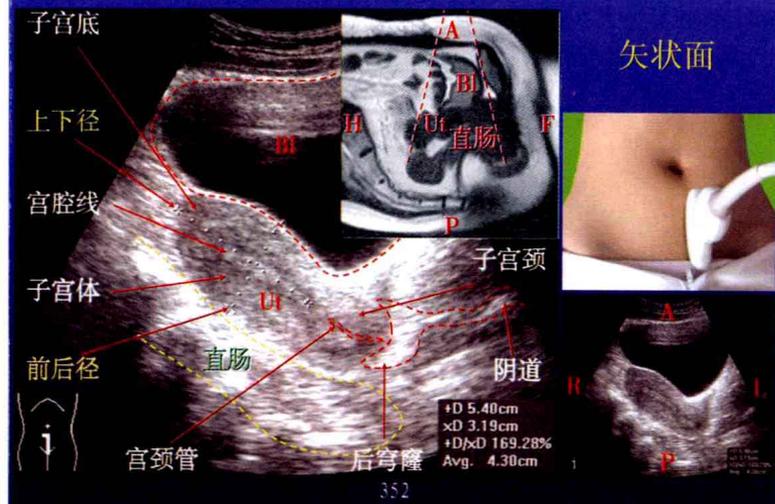
盆腔超声 男性 前列腺

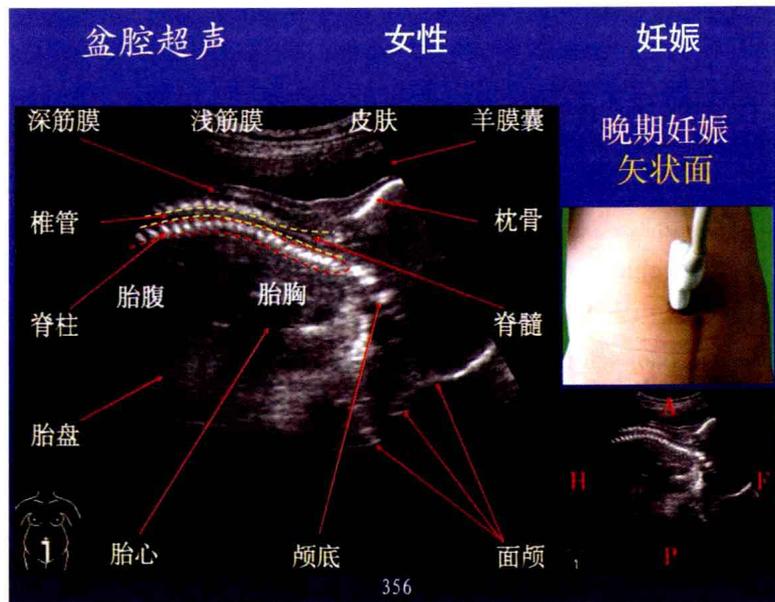
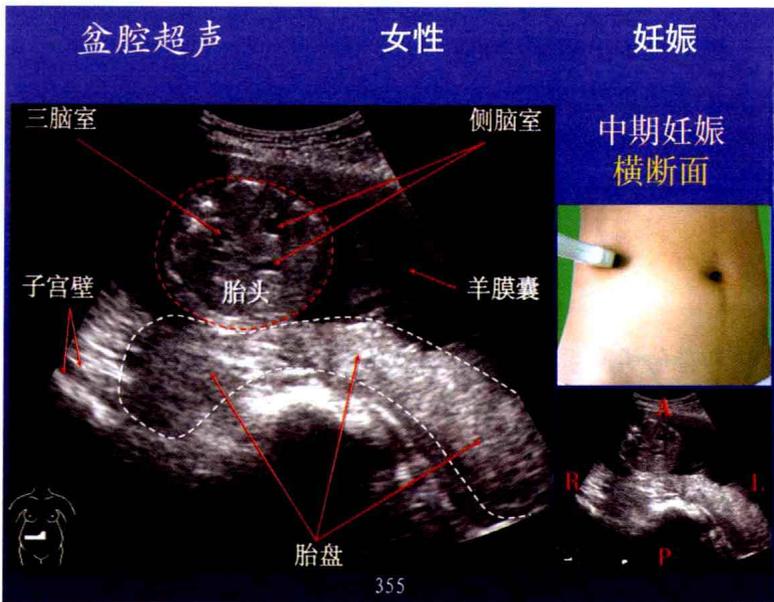
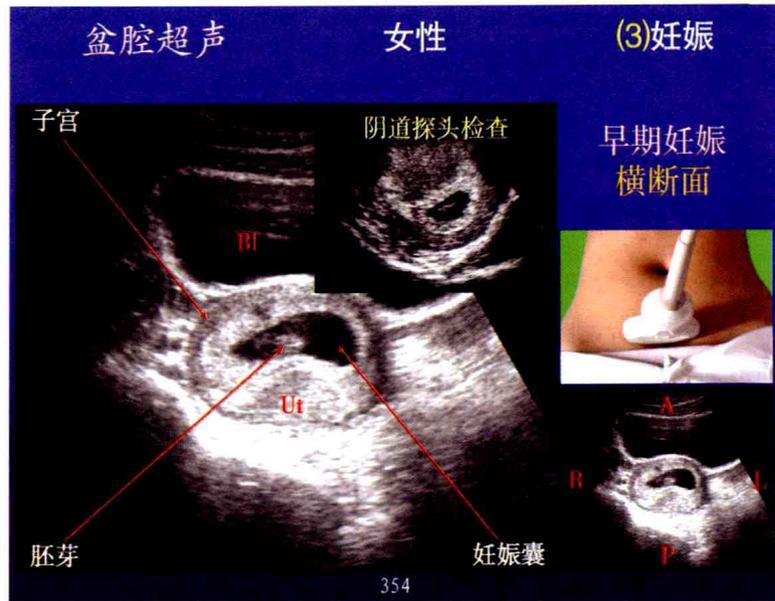
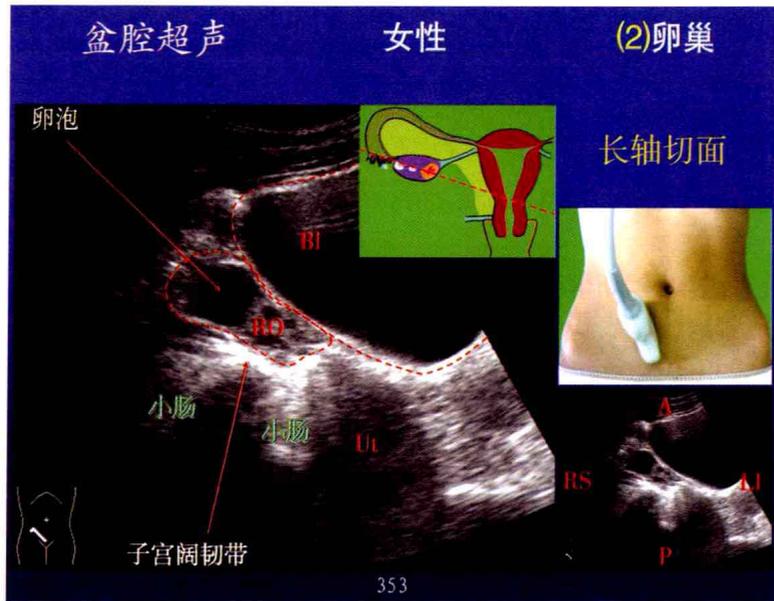


盆腔超声 2. 女性 (1) 子宫



盆腔超声 女性 子宫





## 参考文献

- [1] 张益英. 骨与关节X线图解——正常、正常变异与损伤. 北京: 北京大学医学出版社, 2007.
- [2] 任华, 赵云. 医学影像解剖学. 北京: 科学出版社, 2006.
- [3] 基茨, 安德森. 肖慧译. 正常X线变异图谱. 7版. 福州: 福建科学技术出版社, 2005.
- [4] 龚声蓉, 刘纯平, 王强. 数字图像处理与分析. 北京: 清华大学出版社, 2006.
- [5] 谭理连, 李扬彬. 实用CT诊断学. 北京: 清华大学出版社, 2007.
- [6] 刘树伟. 人体断层解剖学. 北京: 高等教育出版社, 2006.
- [7] 顾晓松. 人体解剖学. 北京: 科学出版社, 2006.
- [8] 周永昌, 郭万学. 超声医学. 北京: 科学技术文献出版社, 2006.
- [9] David L. Felten, Ralph F. Jozefowicz. 奈特人体神经解剖彩色图谱. 北京: 人民卫生出版社, 2006.
- [10] 姜树学, 马述盛. 断面解剖与MRI、CT、ECT对照图谱. 沈阳: 辽宁科学技术出版社, 2006.
- [11] 基思·L·莫尔, 阿瑟·F·达利. 临床应用解剖学. 郑州: 河南科学技术出版社, 2006.
- [12] Richard L. Drake, Wayne Vogl, Adam W. M. Mitchell. 格氏解剖学 (教学版). 北京: 北京大学医学出版社, 2006.
- [13] 初国良, 汪华侨. 人体解剖学标本彩色图谱. 系统解剖学. 北京: 北京科学技术出版社, 2005.
- [14] 李瑞祥. 实用人体解剖彩色图谱. 北京: 人民卫生出版社, 2001.
- [15] C. c. chumbley. 人体实地解剖彩色图谱. 北京: 人民卫生出版社, 1994.
- [16] 刘执玉, 田铎. 人体解剖彩色图谱. 北京: 科学出版社, 2003.
- [17] Michael schuenke, Erik Schulte, et al. THIEME解剖图谱: 解剖总论和骨骼肌肉系统. 北京: 中国医药科技出版社, 2006.
- [18] 胡春洪. 门急诊放射影像解图手册. 南京: 江苏科学技术出版社, 2006.
- [19] 姜树学. 人体断面解剖学. 北京: 人民卫生出版社, 2005.
- [20] Jamie Weir, Peter H. Abrahams. 陈宏颀等译. 影像解剖图谱Imaging Atlas of Human Anatomy (3rd Ed). 福州: 福建科学技术出版社, 2006.
- [21] 赵汉英. 医学影像检查技术. 北京: 高等教育出版社, 2005.

- [22] 蒋烈夫. 影像诊断学. 北京: 高等教育出版社, 2006.
- [23] 江浩. 骨与关节MRI. 上海: 上海科技教育出版社, 1999.
- [24] 陈星荣. 全身CT和MRI. 上海: 上海医科大学出版社, 1999.
- [25] 吴恩惠. 医学影像学. 北京: 人民卫生出版社, 2006.
- [26] 余建明. 医学影像技术学. 北京: 科学出版社, 2004.