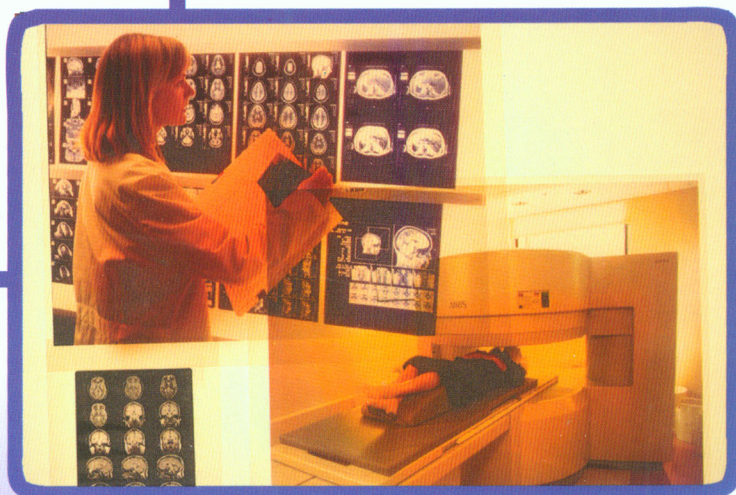


放射诊断学英语

English in Radiodiagnostics

侯仲军 主编



科学出版社
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侯仲军 主编

科学出版社

北京

内 容 简 介

本双语教材密切结合放射诊断学临床实践,以英语写作和听力为突破口,逐步深化英语学习,提高英语应用能力。从2003年开始,它作为广州医学院医学影像学系双语课程试用教材,获得良好教学效果。本书适合于医学影像学系双语教学和英语教学,也为放射科医生和技术人员提供参考。

This bilingual textbook links closely with the clinical practice in radiodiagnosics, focusing on writing skills and depth of listening comprehension, in order to facilitate the learning process so that learners can easily improve their capability of comprehensively utilizing English in radiodiagnosics. This book has been tried out as a bilingual teaching manual in the medical imaging department of Guangzhou Medical College since 2003 and has achieved a satisfactory result. It is suitable for bilingual teaching and English teaching in a medical imaging department. Also, it can meet the requirement of a reference for radiologists and radiological technicians.

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序

科学是没有国界的,因此,作为传递科学信息的语言也是没有国界的。今天和以后,医学科学信息的主要语言文字载体——英语,就像计算机已悄然进入百姓家一样,已经成为医生日常工作中的常备工具。不能使用这个工具就如同不会应用网络系统一样,终将被抛出主流信息之外,这位医生也必然不会是合格的医生。

相对于公共英语来讲,专业英语的表达更为规范,语法更为严谨,对于已经有了相应公共英语基础的大学生或研究生来讲,翻译和理解应不困难。但专业英语的特点是大量的专业词汇具有其特定的词源,大多不用于日常口语中;很多专业词汇有特定的读音,甚至在英语和美语(美式英语)中的读音与重音都不一致。此外,和八股文一样,医学英语在论文的行文、专业领域的表述上也有自己较为特定的格式。这些,都要求医学生只能通过多看、多读、多听的方式来掌握,最终还要能以约定俗成的方式在口头和书面上表达。

侯仲军副教授集自己学习的体会和多年的教学经验,编写的这套专业英语视、听教材是一本适用于解决上述需求的入门读物,可以较好地满足医学生尽快跨入专业英语门槛的需求。该书的听力训练部分专门请外籍英语教师朗读,可以从开始即掌握正确的发音。

语言的学习同样是无止境的,但在一个较好的平台上起步,则可以通过阅读大量的英文专业杂志与参考书,以及和他国医生的直接交流,使自己的语言能力更快地提升。

中华医学会放射学分会 主任委员

中华放射学杂志 总编辑

天津医科大学第一中心临床学院 放射科主任

祁吉



2007年12月18日

前 言

本双语教材内容分两部分,第一部分为放射诊断学报告的中英文书写;第二部分为放射诊断学听力理解,立足于全方位训练和增强读者在放射诊断学领域中使用英语的能力,全书以中英文对照的形式编排,专业知识和英语学习相得益彰。

第1部分共12章,内容包括X线检查、胃肠道造影、心血管造影、介入放射学、多排螺旋CT和磁共振成像。根据教学病例和解剖学图谱绘制线条图304幅,对放射诊断学报告的基本要求,各系统基本病变的描述,结合具体病例,进行总结和分析。目的是使读者从实际出发,逐步养成全面分析,而又突出重点的良好习惯,正确认识和解释放射学征象,并能书写合格的放射诊断学中英文报告,也便于临床医师对放射诊断学实践的中英文表达有进一步的了解。

第2部分共4章,第13章放射学发展简史,简要介绍在放射诊断学发展史上里程碑式的重大事件。第14章放射诊断学检查技术,介绍放射诊断学各种检查的过程、检查注意事项和主要设备的基本结构。第15章放射诊断学实例分析,对20个实例的40幅插图(见光盘)进行简要的解释。第16章收录了750个放射诊断学教科书和专著中常用的单词和短语,以其常见的应用形式出现,附音标、读音和中英文解释。由美国英语教师Chris Beckdolt朗读,通过Authorware软件制成电脑学习课件。第2部分课件以常用的句型、表达方式和常用词汇为核心,语音清晰、自然。第13至第15章附有阅读进度条,便于反复学习和模仿,提高听力理解能力。本着“先治聋、后治哑”的原则,循序渐进,水到渠成。

为保证教材英语部分的准确性和质量,邀请中山大学北校区(医学部)外语中心曹素贞老师和美国英语教师Mr. Ivan R. Harris为英语审校,聘请Mr. Chris Beckdolt担任英语顾问。

由于我们的水平有限和放射诊断学的不断发展变化,书中难免存在不足或错误,敬请有关专家、学者和读者指正。

衷心感谢中华医学会放射学分会主任委员、中华放射学杂志总编辑、著名放射学家祁吉教授为本教材作序,并对编写工作提出有针对性的建议,这将激励我们以更饱满的热情投入双语教学,不断提高教学水平。

在教材编写过程中,周庸儒医师和李力美术师细心描绘线条图;广州医学院吴铭宗实验师精心录音;中山大学外语学院林福音教授热情指导;广州医学院第二附属医院和天津市第三中心医院同事们积极帮助,特别是陈姣护士为第2部分第16章电子文档整理付出了辛勤劳动,在此一并表示衷心感谢。

衷心感谢北京凯思轩达系统工程有限公司和天津安克医疗器械销售有限公司为本教材出版给予的大力支持。

侯仲军
2007年12月

Preface

There are two parts in this book, namely, the writing of radiodiagnostic reports in Chinese and English in Part 1, and listening comprehension in radiodiagnostics in Part 2. This textbook is intended to be an efficient bilingual teaching tool to help learners improve their English in listening, speaking, reading and writing skills in the field of radiodiagnostics. The contents of this book have been arranged in Chinese and English, so that professional knowledge and English can be brought out the best in each other.

Part 1 of this book covers the writing of radiodiagnostic reports in Chinese and English in 12 chapters, including X-ray plain radiography, contrast examination in the gastrointestinal tract, cardiovascular angiography, interventional radiology, multidetector-row Computed Tomography (MDCT) and MRI. Based on the radiological teaching radiographs and anatomical atlas in each system, there is in-depth coverage of general considerations of radiodiagnostic reports, descriptions of basic pathological changes and their corresponding findings on radiographs, as well as examples of radiodiagnostic reports including 304 line drawings. Our aim is to facilitate and standardize the writing of radiodiagnostic reports in Chinese and English for learners, and to cultivate their analytical and incisive minds in reading and interpreting radiographs completely and systematically. Similarly, for clinical physicians, it can help them better understand the radiological examinations and diagnoses as expressed in both Chinese and English.

In Part 2, four chapters are dedicated to listening comprehension. In chapter 13, the brief introduction to the radiological history covers some very important historical events in radiology. In chapter 14, techniques in radiological examinations, involve radiological examination processes, cautions in each procedure and the basic structure of radiological equipment. The following chapter, 15, presents 20 practical cases with 40 images (on CD) illustrated with brief interpretations in the radiological field. Lastly, in chapter 16, seven hundred and fifty words and phrases have been selected from radiological textbooks and monographs in their common applied forms. Each word has been attached phonetic symbol, pronunciation, and interpretations in Chinese and English. All the documents were read by an American English teacher, Chris Bechdolt. A corresponding computer-aided instruction (CAI) has also been produced by means of Authorware software. After clicking the sound button on each slide, a natural and clear sound will be heard. In addition, an indicator of progress has been set up on the bottom of each slide from chapter 13 to chapter 15. Through repeated listening and imitating, the listeners can hopefully improve their listening comprehension. With an objective to cure the deaf before treating the dumb symptoms in language learning, we intend to guide students in the proper course step by step and achieve success.

To ensure a better accuracy and properness in English, we invited Ms Suzhen Cao, a lecturer from the Foreign Languages Center of Sun Yat-sen University, Northern Campus (for medical colleges), and an American English teacher Mr. Ivan R. Harris to act as English revisers, and Mr. Chris Beckdolt to be an English consultant.

Upon publication of the book, we would like to express our sincere gratitude to Professor Ji Qi, the chief commissioner of the Society of Radiology of the Chinese Medical Association, and the

editor in chief of the Chinese Journal of Radiology, and a well-known radiologist, for writing the prelude and presenting pertinent suggestions for this book. His kindness will encourage us to go still further in the bi-lingual medical education.

Our sincere acknowledgments are bestowed on Doctor Yongru Zhou and an artist Li Li for the line drawings for this book. Also, we will never forget the painstaking work given by an experimentalist from Guangzhou Medical College, Mingzong Wu who was engaged in the recording for this book. Meanwhile, we gratefully thank Professor Yuyin Lin from the School of Foreign Languages, Sun Yat-sen University, who provided enthusiastic instructions for this book. Moreover, our wholehearted gratitude would go to our colleagues in The Second Affiliated Hospital of Guangzhou Medical College and The Third Central Hospital of Tianjin for their energetic help, especially a praiseworthy nurse, Ms Jiao Chen who put in a lot of hard work in sorting out electronic files in chapter 16, Part 2 of this book.

Indeed, we heartily appreciate the generous support for the publication of this book from Beijing Casstar Engineering Systems. Inc. and Tianjin Anke Sales Company in Medical Instruments. Inc.

December 2007.

Zhongjun Hou

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第 1 部分 放射诊断学报告的中英文书写

Part 1 The Writing of Radiodiagnostic Reports in Chinese and English

第 1 章 放射诊断学报告概要

Chapter 1 Outline of Radiodiagnostic Reports

第 1 节 放射诊断学报告的原则

Section 1 The Principle of Radiodiagnostic Reports

从事放射学诊断的医生应全面、客观地依据患者的放射学所见, 密切结合临床和其他相关检查作出判断。

以下几点很重要:

(1) 以人体解剖学和生理学为基础, 熟悉正常放射学影像。

(2) 以病理学、医学诊断学和放射诊断学为基础, 认识异常放射学影像。

(3) 结合临床、实验室检查和其他影像学检查及治疗经过, 还要考虑检查部位、体位、技术方法和设备方面的因素, 养成全面观察和综合分析的良好习惯, 才能得出可靠的放射学诊断结论。

Radiologists should make rational and reliable conclusions based on radiodiagnostic findings combined with the clinical data and the other related and corresponding tests and examinations of a patient in detail.

The following are essentials in radiodiagnosis.

(1) Normal radiodiagnostic findings are familiarized on the basis of anatomy and physiology of the human body.

(2) Abnormal radiodiagnostic findings are identified in accordance with the knowledge of pathology, medical diagnostics and radiodiagnostics.

(3) The radiodiagnostic findings should be combined with the clinical symptoms and signs, tests, other medical imaging information and therapeutic effectiveness to make a reliable diagnosis (or diagnoses). Meanwhile, all technical factors in the examination should be taken into consideration, such as postures, projections, regions of the body, examination techniques and imaging equipment. Only through cultivating a good habit of analyzing radiographs in a certain order and interpreting the radiological findings as an interrelated whole, then, radiologists can reach reliable conclusions in radiodiagnosis.

第 2 节 放射诊断学报告的书写方法

Section 2 The Method of Radiodiagnostic Reports

放射学诊断一般采取先定位、定量, 后定性的方法, 前二者是条件, 后者是结论。观察每幅图像, 首先要了解它的技术条件, 然后按一定顺序, 如从患者的右侧至左侧, 从上方至下方仔细观察、对比, 或按自己的习惯全面分析, 特别注意不要遗漏图像边缘的病变。

The tasks of radiodiagnosis are intended to resolve 3 kinds of questions which contain localization, quantification and characterization of lesion(s). The first two steps are prerequisites and the final step leads to a diagnosis (or diagnoses). For each radiograph, technical factors are considered firstly. Then, careful observations will be explored from the right to the left of a patient, from upward to downward or in some particular individual order. Be sure, nothing is ignored especially in the margins of images.

1. 病变的分布

有些病变常好发生于人体的某个(些)部位,病变分布有一定的规律性,在范围上呈广泛性或局限性分布;在结构上呈散在分布或密集分布。

2. 病变的数目

病变的数目常与病变的性质有关。

3. 病变的形状与边缘

边缘模糊的片状影常为急性渗出性炎症;边缘整齐的条带影常为慢性增殖性病变。

4. 病变的密度

与周围正常组织对比,病变的密度增高、减低或相同。

5. 病变周围组织

有无“卫星”病灶;病变周围的正常结构有无改变。

1. Distribution of lesions

Some diseases often predispose in a certain part (parts) of the human body. There are some rules of thumb for them. Distributions of lesions are depicted as an extensive or localized range, scattered or dense structure.

2. Numbers of lesions

These often relate to the characterization of lesions

3. Shapes and margins of lesions

A fuzzy margin on a patchy shadow often represents an acute inflammation, while a clear margin in a stripe-like substance usually suggests a chronic proliferation.

4. Changes in density

In comparison with the normal surrounding tissues, lesions are described as high density, low density or isodensity.

5. Surrounding tissues

It is important to verify whether there are scattered “satellite” nidi and alterations of the surrounding normal structures.

第 3 节 放射诊断学报告的结构

Section 3 The Structure of Radiodiagnostic Reports

放射诊断学报告是放射科医师的会诊意见,应高度重视。它作为医疗记录的一部分,也是医疗诉讼的依据。所以要用词准确、恰当,层次清楚,分析合理,绝不能草率从事。放射诊断学报告应包括以下内容:一般资料、描述部分、诊断部分和医师签名。

1. 一般资料

一般资料包括患者的姓名、年龄、性别;检查日期;投照部位、投照体位、X线检查号、CT检查号、MRI检查号以及胶片序号、住院号、送检科室和临床诊断。

2. 描述部分

一般按摄片的部位、范围,受检器官的组织结构顺序进行描述。当发现病变时,按先重后轻,先因后果,用 X 线术语描述,避免诊断用语,如脓肿或骨折等。

The writing of a radiodiagnostic report has to be a precise work because it is not only a consulting suggestion for clinicians but also a medicolegal document. The radiologists should choose words carefully and exactly and try to make the report in clarity of description and a reasonable analysis. Carelessness is always avoided at any condition. A radiodiagnostic report should include the following items of common information, description, diagnosis (or diagnoses) and signature of the radiologist(s).

1. Common Information

Filling out the header line by line, such as Name, Age, Sex of the patient; Date of X-ray examination, Regions of examination, Positions of X-ray radiographs, the Number of X-ray examinations, the Number of CT examinations, the number of MRI examinations, and Serial number of films, the Number of the inpatient and the department of a patient and the Clinical diagnosis (or diagnoses).

2. Descriptive Part

Based on the order of regions of examination, ranges and structures of the radiographs, description of radiodiagnosis abides by that sequence. If disorders happen, the description goes in a decreasing order of severity, (that is from serious illnesses to less serious ones), or in a cause-effect manner. Professional and radiological normative terms should be applied, while the names of diseases must be avoided, such as abscess or fracture, and etc.

为避免遗漏,各系统描述时主要包括以下内容:

(1) 呼吸系统:胸廓、肺部、纵隔、膈肌。

(2) 循环系统:心脏大血管、肺部、膈肌、胸廓。

(3) 骨关节系统:骨质、关节、生理弧度、软组织。

(4) 腹部平片:膈肌、腹部器官、气体、气-液平面、结石、异物、腰大肌、腹膜外脂肪线、骨骼。

(5) 头颅五官:骨质、鼻窦、乳突、骨缝、脑回压迹、牙齿、软组织。

(6) 造影检查:造影检查器官的形态及功能改变。

3. 诊断部分

经全面描述之后,以放射学所见和征象为依据,参考临床资料(年龄、性别、症状和体征、职业、接触史、居住地区、既往史等)及相关检查(化验、超声、核医学、心电图和脑电图等)进行综合分析,并做出判断,应注意以下几点:

(1) 描述部分与诊断部分前后呼应,逻辑性强。

(2) 层次分明,先主要病变,后次要病变,不应千篇一律。

(3) 针对临床医师提出的问题予以解释和回答。

(4) 必要时去病房查阅病历和检查患者,并对照病理所见和诊断。

依据放射学所见和征象进行逻辑推理、判断,可分为以下几种情况:

(1) 诊断明确者,直接提出诊断,如线样骨折;如有几个诊断,可按先重后轻,先主要病变,后次要病变,先天性变异通常放在最后。

To reduce as much as possible the chance of neglecting any information, systemic description should cover the following key points respectively.

(1) Respiratory system; thoracic cage, lungs, mediastinum, and diaphragm.

(2) Circulatory system; heart and great vessels, lungs, diaphragm, thoracic cage.

(3) Skeletal system; bones, joints, physiological curvature, and soft tissues.

(4) Abdominal plain radiograph; diaphragm, shadows of abdominal organs, gases, air-fluid level(s), stones, foreign body (bodies), psoas, extraperitoneal fatty lines, and bones.

(5) Skull and five sensory organs; bones, paranasal sinuses, mastoid processes, sutures of bones, joints, soft tissues, tooth (teeth).

(6) Contrast examination; alterations of shapes and functions in the examined organs.

3. Diagnostic Part

After a detailed description, a comprehensive analysis will be made based on the radiodiagnostic findings and signs, the clinical data (Age, Sex, Symptoms and physical signs, Profession, Contact history, Populated area, Past history) and corresponding tests (Laboratory tests, Ultrasound, Nuclear Medicine, ECG and EEG examinations). Then, conclusions or diagnoses can be derived. However, the following points should be always considered:

(1) The described contents must be in accordance with logical diagnostic conclusions.

(2) The most serious disease should be emphasized and analyzed first, and then, the less serious and the least serious diseases. They can not be lumped together.

(3) Radiological diagnoses interpret and answer directly the questions the clinicians raise.

(4) Sometimes, radiologists should go to the wards, look up the illness record and examine the patients personally. Sometimes, it is necessary to compare the pathological observations and diagnosis (diagnoses).

Diagnostic conclusions must be induced from objective findings and logical analyses. The following are common patterns of diagnostic conclusions.

(1) A specific diagnosis can be given in a straightforward manner, such as linear fracture. If there are several diagnoses, they should be listed according to the severity or possibility of illnesses. The most serious disease and the most likely disease will be set at the beginning and then next to more slight or less likely diseases. Congenital variation(s) should always be put at the end.

例 1(从重至轻)

右上肺大叶性肺炎;
左上肺陈旧性肺结核;
左侧第四肋骨前端叉状肋。

例 2(从原因到结果)

风湿性心脏病;
二尖瓣狭窄;
急性左心功能衰竭;
双侧胸腔积液。

2) 治疗后复查的患者(内科治疗或手术治疗),通过对照治疗前后的图像变化,判断病变的演变过程。应明确回答病情痊愈、好转、无改变或恶化。同时,放射科医师要熟悉手术后改变对放射学成像的影响,以便能及时发现肿瘤残留和肿瘤复发。

3) 对于疑难病历,一时难以做出明确结论,可采用讨论方式。结合放射学所见和征象及有关资料,提出某种或几种疾病的可能性及相关的鉴别诊断,按先重后轻排列,作为临床进一步检查和诊断的基础。

4. 签名

签名是放射诊断学报告的最后一个环节,是放射科医师在核对放射诊断学检查和报告的各个方面准确无误后,对报告内容和结果的充分肯定,所以要认真对待,特别是在电子版的放射诊断学报告中,签名更加重要。它一方面代表了放射科医师严谨的工作态度,另一方面明确了这份报告的直接责任人。

(侯仲军 何以一)

Example 1(from serious illnesses to less serious ones)

Pneumonia in the right upper lobe;
Old tuberculosis in the left upper lung;
Bifurcation at the anterior end of the left fourth rib.

Example 2 (from cause to effect)

Rheumatic heart disease;
Mitral stenosis;
Acute failure of the left heart;
Bilateral pleural effusion.

2) For patients with follow-up examinations after treatment (conservative or operative treatment), the present radiographs must be compared with the previous ones. To make sure that any changes have occurred in the disease(s), such as complete recovery, improvement, unchanged or deterioration, the radiographs must be assessed definitely and correctly. In addition, radiologists should be familiar with typical postoperative changes in radiological films, so that they can distinguish those from residual tumors, or recurrent tumors as early as possible.

3) For some more sophisticated cases, sometimes, it is difficult to get a clear diagnosis in a moment. Usually, radiologists adopt a discussional approach in the report, listing possible diseases and relative differential diagnoses based on the X-ray findings, X-ray signs and clinical data. These can be a basis for further examinations and more definite diagnoses.

4. Signature

This is the last step before delivering a report. The signature represents the radiologist has checked all the aspects of the radiodiagnostic examination(s) and the content of the report carefully and completely, thus, it must be earnest. The signature has been more important in the electric version of a radiodiagnostic report. On the one hand, it typifies a precise and methodical mind of a radiologist. And on the other hand, it is a fact that the signing radiologist has to be responsible for the report.

(ZJ Hou YY He)

第 2 章 呼吸系统 X 线诊断

Chapter 2 Radiodiagnosis in the Respiratory System

第 1 节 肺 部

Section 1 The Lungs

A. 肺部基本病变概述

(Fig. 2-1~Fig. 2-17)

气管和支气管:炎症、结核、肿瘤、支气管扩张、先天性发育不良等。

肺血管:充血、淤血、栓塞、动静脉瘘等。

肺野:渗出、增殖、纤维化、钙化、肿块、空洞、空腔、肺不张和肺实变等。

按上述变化,一般分四个方面描述。

1. 胸廓

双侧是否对称,肋骨及其他所见骨质是否正常,有无骨质破坏、畸形、变形等。肋间隙是否对称、有无增宽、狭窄。有无胸壁软组织异常。双侧胸廓不对称常见于肺不张、胸膜病变、肺先天性发育不良、脊柱侧弯、肺硬变等。

2. 肺

(1) 肺门:有无增大、缩小、结节、肿块、钙化,肺门与纵隔的关系,密度改变(增高或减低),移位。(注:正常肺门宽度 $\leq 1.5\text{cm}$,高度约占 2 个肋间隙。肺门增大常见于肺癌、肺门淋巴结结核、先天性心脏病、后天性心脏病、肺动脉高压、结节病、淋巴瘤等;肺门缩小常见于肺动脉狭窄和先天性心脏病;肺门移位常见于肺不张、肺硬变、肺纤维化、胸膜病变等)。

A. Overview of Basic Pathological Changes in the lungs

(Fig. 2-1~Fig. 2-17)

Trachea and bronchus: inflammation, tuberculosis, tumor, bronchiectasis, congenital dysplasia and etc.

Pulmonary blood vessels: pulmonary arterial pleonaemia, pulmonary venous pleonaemia, pulmonary embolism, pulmonary arteriovenous fistula and etc.

Lung fields: pulmonary exudation, proliferation, fibrosis, calcification, mass, cavity, air containing space, atelectasis and consolidations, and etc.

As usual, there are 4 aspects of descriptions in the chest grounded on the basic pathological lesions mentioned above.

1. The thoracic cage

The thoracic cage is in symmetry or not. The ribs and the other bones seen, appear to be normal, or in destruction, or malformation, and deformation. Meanwhile, the intercostal spaces are symmetrical or not, broadened, or narrowed in the intercostal spaces. Soft tissues seem normal or abnormal. Asymmetry of the thoracic cage is often seen in pulmonary atelectasis, pleural disease, pulmonary dysplasia, scoliosis, pulmonary sclerosis and etc.

2. The lungs

(1) The pulmonary hilum: Pathological changes of the pulmonary hilum deal with hilar enlargement, decrease, nodules, mass, calcification, relationship with mediastinum, alteration of density (increase or decrease), and displacement (Note: A normal pulmonary hilum occupies no more than 15.0 mm in width and 2 intercostal spaces in height. Enlargement of the pulmonary hilum often derives from lung cancer, tuberculosis of hilar lymph nodes, congenital heart disease, acquired heart disease, pulmonary arterial hypertension, sarcoidosis, lymphoma; decrease of the pulmonary hilum is often caused by stenosis of the pulmonary artery and congenital heart disease; displacement of the pulmonary hilum often occurs in pulmonary atelectasis, pulmonary cirrhosis, pulmonary fibrosis, pleural disease).

(2) 肺纹理:正常肺纹理呈树枝状结构,边缘清晰。肺纹理增多、粗乱常见于慢性支气管炎、慢性肺纤维化、支气管扩张、间质性肺炎;肺纹理模糊且呈磨砂玻璃状改变,常见于肺淤血、水肿、间质性肺炎;肺纹理变少、变细常见于肺栓塞、先天性心脏病、重度肺气肿;肺纹理消失常见于肺不张、气胸、肺实变、胸膜病变、占位性病变;肺纹理扭曲、并拢、移位常见于纤维瘢痕性病变、肺纤维化、气胸和肺大泡压迫等。

(3) 肺野:如能确定病变发生在某肺叶或某肺段,按肺叶或肺段进行定位描述。如病变范围广泛、边界不清,可按上、中、下肺野和内、中、外带描述(以第2肋骨前端和第4肋骨前端的下缘水平线将肺野分为上、中、下肺野;由肺门至肺野外缘,把一侧肺野分为内、中、外三带;另外,若肺组织被压缩变形,如气胸或胸腔积液,胸部病变和被压缩肺组织的定位,以第2和第4肋骨前端的下缘水平线将一侧胸腔分为上、中和下三部,由肺门至侧胸壁内缘,把一侧胸腔分为内、中和外三份)(Fig. 2-1)。

(2) The lung markings: Normal lung markings are clear in their arboroid structures and margins in the lung fields. In the pathological states, the lung markings become thickened, coarse, reticular, which usually happens in chronic bronchitis, chronic pulmonary fibrosis, bronchiectasis, interstitial pneumonia; When the lung markings grow vague or ground glass like, they often indicate pulmonary venous pleonaemia, pulmonary edema and interstitial pneumonia. If the lung markings are thin, pulmonary embolism, congenital heart disease, serious pulmonary emphysema may have developed; Disappearance of the lung markings often relates to pulmonary atelectasis, pneumothorax, pulmonary consolidation, pleural diseases, space occupying diseases; When the lung markings are distorted, coalesced, or displaced, these findings may be caused by pulmonary scar tissues, pulmonary fibrosis, pulmonary cystic fibrosis, compression of the pneumothorax and pulmonary bullae, and etc.

(3) The lung fields: If lesions are limited by boundaries of a lobe or a segment, the location of the lesion is defined and described directly with the specific lobe(s) or segment (s). If the lesion has a massive range and vague margin, it can be described according to the upper, middle or lower regions from top to bottom, and inner, middle or outer zones from inside to outside of the lung fields (Based on the anterior ends of the 2nd and 4th ribs, a lung is demarcated into 3 sections, named upper, middle and lower lung fields respectively. From the hilum to the outer margin of a lung, the lung is separated into 3 zones called inner, middle and outer zones respectively. In addition, if a lung has been compressed and deformed, such as in pneumothorax and pleural effusion, the localization of the lesion and lung tissue is described as upper, middle and lower regions of the hemithorax according to the anterior ends of the 2nd and 4th ribs, and inner, middle and outer parts from the hilum to the inner margin of the hemithorax) (Fig. 2-1).

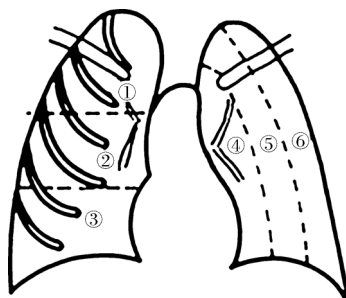


Fig. 2-1

- ①上肺野;②中肺野;③下肺野;④肺内侧带;⑤肺中间带;⑥肺外侧带。
① upper lung field; ② middle lung field; ③ lower lung field; ④ inner pulmonary zone;
⑤ middle pulmonary zone; ⑥ outer pulmonary zone.

a. 部位: 右肺分为上叶、中叶和下叶,共 10 个肺段,上叶包括尖段、前段和后段;中叶包括内侧段和外侧段;下叶包括背段、前基底段、后基底段、外基底段和内基底段。左肺分为上叶和下叶,共 8 个肺段,上叶包括尖后段、前段、上舌段和下舌段;下叶包括背段、前内基底段、后基底段和外基底段(Fig. 2-2, Fig. 2-3, Fig. 2-4)。

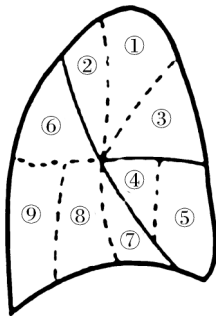


Fig. 2-2

①右肺上叶尖段;②右肺上叶后段;③右肺上叶前段;④右肺中叶外侧段;⑤右肺中叶内侧段;⑥右肺下叶背段;⑦右肺下叶前基底段;⑧右肺下叶内基底段和外基底段;⑨右肺下叶后基底段
①apical segment of superior lobe of right lung;②posterior segment of superior lobe of right lung;③anterior segment of superior lobe of right lung;④lateral segment of middle lobe of right lung;⑤medial segment of middle lobe of right lung;⑥posterior segment of inferior lobe of right lung;⑦anterior basal segment of inferior lobe of right lung;⑧medial and lateral basal segments of inferior lobe of right lung;⑨posterior basal segment of inferior lobe of right lung

b. 大小:病变占几个肋间隙,几个肺段或几个肺叶,和(或)直接测量。如果病变是圆形的,可用直径代表病变的大小。

c. 形态:

(a) 粟粒状影(Fig. 2-5)为直径 1.0~2.0mm 的细点状、多发病变。见于急性粟粒性肺结核、肺尘埃沉着病、粟粒状肺转移瘤、肺泡癌、含铁血黄素沉着症等。

a. Location: The right lung is divided into the superior lobe, middle lobe and inferior lobe. It contains 10 pulmonary segments, such as the apical, anterior and posterior segments of the superior lobe; the medial and lateral segments of the middle lobe; the posterior, anterior basal, posterior basal, lateral basal and medial basal segments of the inferior lobe. The left lung encloses the superior lobe and inferior lobe, including 8 pulmonary segments, namely the apicoposterior, anterior, superior lingular and inferior lingular segments of the superior lobe; and the posterior, anteromedial basal, posterior basal, and lateral basal segments of the left inferior lobe (Fig. 2-2~Fig. 2-4).

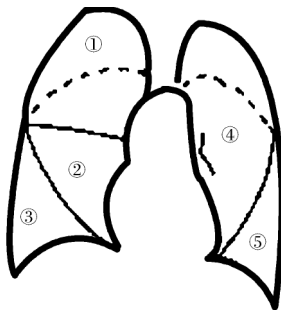


Fig. 2-3

①右肺上叶;②右肺中叶;③右肺下叶;④左肺上叶;⑤左肺下叶
①superior lobe of right lung;②middle lobe of right lung;③inferior lobe of right lung;④superior lobe of left lung;⑤inferior lobe of left lung

b. Sizes of opacities: Sizes of opacities can be described according to the number of intercostal spaces, lobes and segments and/or direct measurements (cm, mm). If a lesion is round, the diameter can indicate its size.

c. Shapes of shadows:

(a) Miliary shape (Fig. 2-5), A lesion is defined from 1.0 to 2.0 mm in size spreading all over the lungs. It usually occurs in acute miliary tuberculosis, miliary pulmonary metastases, alveolar cell carcinomas, pulmonary hemosiderosis and etc.

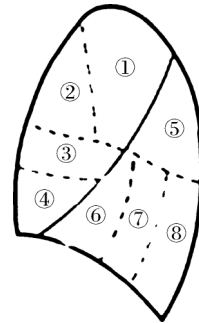


Fig. 2-4

①左肺上叶尖后段;②左肺上叶前段;③左肺上叶上舌段;④左肺上叶下舌段;⑤左肺下叶背段;⑥左肺下叶前基底段和内基底段;⑦左肺下叶外基底段;⑧左肺下叶后基底段
①apicoposterior segment of superior lobe of left lung;②anterior segment of superior lobe of left lung;③superior lingular segment of superior lobe of left lung;④inferior lingular segment of superior lobe of left lung;⑤posterior segment of inferior lobe of left lung;⑥anteromedial basal segment of inferior lobe of left lung;⑦lateral basal segment of inferior lobe of left lung;⑧posterior basal segment of inferior lobe of left lung

(b) 斑点状或斑片状影(Fig. 2-6):斑点状或斑片状较高密度影,边缘参差不齐,常见于肺炎、支气管肺炎、过敏性肺炎、肺结核、支气管扩张症,肺挫伤等。

(c) 单发小结节状影(Fig. 2-7):病变呈圆形或卵圆形,边缘清晰,直径在 2.0cm 以下,密度中等且均匀。常见于肺腺瘤、肉芽肿、小的原发性或继发性恶性肿瘤等。

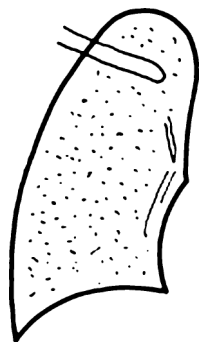


Fig. 2-5



Fig. 2-6



Fig. 2-7

(d) 多发结节状影(Fig. 2-8):呈圆形或类圆形,边缘清楚或模糊,大小不一,直径在 2.0~3.0cm 之间。常见于多发结节状转移瘤、多发性血源性肺脓肿、肺泡癌、寄生虫病、真菌病、结节病、硅沉着病、结缔组织疾病等。

(e) 团块状影(Fig. 2-9):直径在 3.0cm 以上的软组织肿块,如边缘有毛刺、切迹、分叶或脐样征为恶性肿瘤。常见于原发性恶性肿瘤,也见于脓肿、转移瘤、炎性假瘤、错构瘤、血肿、含液囊肿、胸膜肿瘤、肉芽肿、寄生虫等。

(d) Multiple nodules (Fig. 2-8): Foci are round or circle-shaped in different sizes, varying from 2.0 to 3.0 cm with a clear or fuzzy margin. They are frequently pinpointed in multiple nodular metastases, multiple blood born pulmonary abscesses, alveolar cell carcinomas, pulmonary parasites, pulmonary nosomycosis, pulmonary sarcoidosis, pneumosilicosis, connective tissue disease and etc.

(e) Mass (Fig. 2-9): A soft tissue mass is often larger than 3.0 cm in diameter. If the margin reveals the spiculation, incisural, lobulated, or umbilication sign, it often indicates a primary malignant tumor. Except for this, some other diseases can also be involved such as pulmonary abscess, metastasis, inflammatory pseudotumor, hamartoma, hematoma, liquid-containing cyst, pleural tumor, granuloma, pulmonary parasite and etc.



Fig. 2-8



Fig. 2-9

(f) 云雾样阴影(Fig. 2-10):片状、边缘模糊的淡薄阴影,常见于早期急性渗出性炎症、出血、水肿等,可见含气支气管征。

(g) 肺段、肺叶或一侧肺实变(Fig. 2-11):密度均匀,常能显示肺段、肺叶的部分边缘。常见于肺炎、肺不张、肺结核、肺发育不良、肺纤维化、胸膜肥厚等。

(h) 钙化影(Fig. 2-12):呈边缘清晰,形态规则或不规则的高致密影。常见于肺结核、淋巴结结核、硅沉着病、肺泡微石症、含铁血黄素沉着症、寄生虫等。

(f) Fog-like shadow (Fig. 2-10): A fog-like shadow indicates an irregular opacity in a dim density with a fuzzy margin. It represents an early acute exudative lesion, hemorrhage or edema. Sometimes, an air bronchogram can be seen.

(g) Consolidation in a pulmonary segment, a pulmonary lobe or a whole lung in a hemithorax (Fig. 2-11): Segmental, lobular or sided pulmonary consolidation shows a uniform opacity which often delineates a part of the margin of the pulmonary segment or lobe. It is often found in pneumonia, atelectasis, tuberculosis, pulmonary dysplasia, pulmonary fibrosis and pleural thickening.

(h) Calcification (Fig. 2-12): The shadow of hyperdensity or high density delimits the margin(s) of the nidus (or nidi) in regular or irregular form. Calcification usually happens in pulmonary tuberculosis, tuberculosis of the lymphatic nodes, pneumosilicosis, pulmonary microlithiasis, pulmonary hemosiderin, pigmentation, pulmonary parasites and etc.



Fig. 2-10



Fig. 2-11



Fig. 2-12

(i) 絮状阴影(Fig. 2-13):多发片状影重叠且边缘不清时,称为絮状阴影,为渗出病变。常见于浸润性肺结核、肺炎(支原体肺炎、过敏性肺炎、支气管肺炎)、肺出血、肺水肿等。

(j) 索条状影(Fig. 2-14):常出现在炎症愈合阶段,特别是慢性炎症愈合阶段,代表瘢痕形成。病变呈边缘清楚、中等致密的条索状阴影。常见于肺结核、肺炎和肺脓肿的愈合期、长期的支气管扩张症、盘状肺不张等。

(i) Flocculent opacities (Fig. 2-13): When an amount of patchy opacities has a tendency to coalesce in ill margins, they are called flocculent shadows or cloudy opacities, which represent acute exudation, such as infiltrative pulmonary tuberculosis, pneumonia (mycoplasmal, allergic, lobular pneumonia), pulmonary hemorrhage, pulmonary edema, and etc.

(j) Stripe-like opacities (Fig. 2-14): They represent the healing of inflammation, especially in chronic inflammation. These have clearer margins with a medium density, as found in pulmonary tuberculosis, the healing stages of pneumonia and pulmonary abscess, long-term bronchiectasis, disc pulmonary atelectasis and etc.



Fig. 2-13



Fig. 2-14

(k) 空洞影(Fig.2-15):单发或多发、圆形或类圆形透光区,以 3mm 为界,分为薄壁空洞和厚壁空洞。肺空洞常见于肺癌(偏心空洞)、肺结核、肺脓肿(空洞内气-液平面)、败血症化脓性多发肺脓肿、金黄色葡萄球菌肺炎、寄生虫等。

(l) 蜂窝状影(Fig. 2-16):多个小透光区聚集,呈蜂窝状或泡沫状。常见于支气管扩张症、肺囊性纤维化、弥漫性肺气肿、弥漫性肺纤维化、结缔组织疾病、慢性支气管炎等。

(m) 网状阴影(Fig. 2-17):多为小叶间隔或肺间质纤维化,常见于慢性支气管炎、间质性肺炎、毛细支气管炎、间质性肺水肿、癌性淋巴管炎和肺尘埃沉着病等。

d. 密度:炎症、肿瘤、胸膜增厚和胸腔积液时肺野密度的增高,按密度增高的程度不同,描述为云雾样阴影(如早期炎症或水肿)、致密阴影(如肿瘤、肺实变)和高致密阴影(如钙化);局部肺含气量增加时,肺野密度减低,称为透光区,如肺大泡等。

e. 边缘:病灶边缘可表现为模糊、清晰、锐利、光整、不规则(如放射状或毛刺状)等。

f. 与周围组织的关系:肺不张可使纵隔向患侧移位;肺癌可侵犯胸椎、肋骨等。

3. 纵隔

气管的位置,纵隔的宽度,心脏大血管的位置和大小及形态有无改变。若纵隔内出现肿块,其位置、形态、大小,有无钙化,边缘及其与周围组织的关系应逐一描述。

(k) Cavity shadows (Fig. 2-15): These often appear radiolucent in round or round-like shape with single or multiple cystic lesions. The shadows are divided into 2 groups called a thick wall cavity and a thin wall cavity, based on the thickness of 3 mm in the wall of a cavity. They are commonly seen in pulmonary cancer (eccentric cavity), pulmonary tuberculosis, pulmonary abscess (air-fluid level), multiple pulmonary abscesses secondary to septicemia, staphylococci aureus pneumonia, pulmonary parasites and etc.

(l) Honeycomb shadows (Fig.2-16): There are a lot of small radiolucencies coalescing to honeycombs or foam-like shadows, which frequently occur in bronchiectasis, pulmonary cystic fibrosis, diffuse pulmonary emphysema, diffuse pulmonary fibrosis, pulmonary connective tissue disease, chronic bronchitis and etc.

(m) Reticular shadows (Fig. 2-17): The shadows are often formed in fibrosis of interlobar septa or pulmonary interstitium, as in chronic bronchitis, interstitial pneumonia, bronchiolitis, interstitial edema, carcinomatous lymphangitis, pneumoconiosis and etc.

d. Densities: Densities will be increased in the lung fields because of inflammation, tumors, pleural thickening, and pleural effusion. Opacities can be described as shadows in fog-like density (such as an early inflammation, edema), medium density (such as tumor, atelectasis) and high dense or hyperdense density (such as calcification) based on the degree of increased density. Due to an increasing volume of air in a localized lung field, the density will be decreased and the area is called a low-density or hyperlucent area, such as pulmonary bullae.

e. Margins: The margins of lesions can be manifested as fuzzy, clear, sharp, smooth, irregular (such as radiating, spiculation), and etc.

f. Relationship between lesions and the surrounding tissues: Pulmonary atelectasis pulls adjacent mediastinum to the affected side. Lung cancer can infiltrate thoracic vertebrae and adjacent ribs.

3. The mediastinum

Observation should include location of the trachea, width of the mediastinum; location, size, shape, displacement of the heart and great vessels. Neoplasm, however, should be pinpointed in its location, size, shape, calcification, margin and relationship with surrounding tissues.

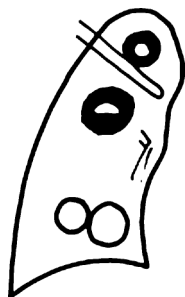


Fig.2-15

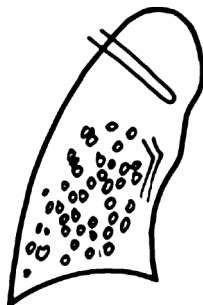


Fig.2-16



Fig.2-17

4. 膈肌

膈肌表面是否光滑,肋膈角是否锐利,膈肌位置高低,膈肌曲度与移位情况,结合透视动态观察。

B. 肺部病例

例 1. 胸部后前位

双侧对称,所见肋骨及其他骨骼边缘清晰,颈根部及胸壁软组织未见异常改变。气管居中,双肺清晰,肺纹理分支自然,双侧肺门影不大。心脏和大血管位置、大小、形态未见异常。膈肌表面光滑,双侧肋膈角锐利。

诊断:心、肺、膈正常。

例 2. 胸部后前位和左侧位

(Fig. 2-18, Fig.2-19)

后前位和左侧位示左下肺后基底段多个相互融合的小类圆形影,病变密度不均匀,边缘呈波浪状,与周围正常肺组织界限清晰,最大径约 9.0cm。双侧肺门不大,余肺野清晰。心脏、大血管形态和位置正常,双侧膈肌表面光滑,双侧肋膈角锐利。

诊断:左下叶后基底段病变,考虑肺隔离症或肺囊肿可能性大,建议 CT 或血管造影确诊。

4. The diaphragm

Assessment should involve shape of surface, sharpness of the costophrenic angles, height, curvature, displacement, and motion of the diaphragm under fluoroscopy.

B. Cases in the Lungs

Case 1. Posteroanterior Projection of the Chest

The thoracic cage remains symmetrical. All the seen bones are nothing remarkable. The soft tissues are completely intact in the root of the neck and thoracic wall. The trachea locates centrally without deviation. The lungs are clear, while the lung markings are natural and regular. Both pulmonary hila show neither enlargement nor decrease. The heart and great vessels appear normal in their position, size and shape. The diaphragm has a smooth surface with sharp costophrenic angles.

Diagnosis: Normal in the lungs, heart, and diaphragm.

Case 2. Posteroanterior and Left Lateral Projections of the Chest (Fig. 2-18, Fig.2-19)

On the PA and left lateral radiographs, a shadow is composed of multiple small round opacities in the posterior segment of the left lower lobe. The whole lesion has an inhomogeneous density with an undulating margin, but clear of the surrounding pulmonary tissue. The entire opacity reaches 9.0 cm in size. Neither of the pulmonary hila is increased. The other lung fields show clearly. No abnormal shadows are found in the heart and great vessels. The diaphragm is smooth with sharp costophrenic angles.

Diagnoses: The disease is possible for pulmonary sequestration or pulmonary cysts in the posterior segment of the left lower lobe. A decisive diagnosis can be derived from CT or angiography.

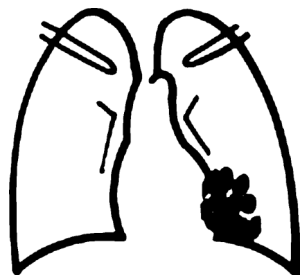


Fig.2-18

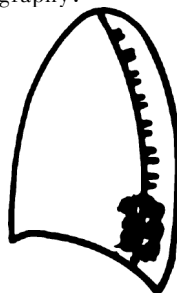


Fig.2-19

例 3. 胸部后前位和左侧位

(Fig. 2-20, Fig. 2-21)

左下肺大片均匀的致密阴影,上缘较模糊,与左侧肺门及左心缘重叠,左侧膈肌影被覆盖。左肺下叶含气影消失,余肺野清晰。右侧肺门影不大,心脏大血管及右侧膈肌未见异常。

诊断:结合病史,考虑左肺下叶肺炎,建议治疗后复查。

例 4. 胸部后前位(Fig. 2-22)

双侧中下肺野的内中带肺纹理增多,其内夹杂散在的、边缘模糊的斑点、斑片状阴影。双侧肺门较模糊,但无明显增大。心脏大血管和双侧膈肌未见异常。

诊断:支气管肺炎。

Case 3. Posteroanterior and Left Lateral Projections of the Chest (Fig. 2-20, Fig. 2-21)

There is a large patchy homogeneous opacity in the left lower lobe with a slightly fuzzy upper margin. It covers the left pulmonary hilum, left heart margin, and left hemidiaphragm. The intrapulmonary gas has been replaced in the left lower lobe, while the rest of the lungs remain clear. The right pulmonary hilum has no enlargement. No suspected signs are found in the heart and great vessels. The right hemidiaphragm is smooth with a sharp costophrenic angle.

Diagnosis: Combining with the clinical data, pneumonia is considered in the left lower lobe. Reexamination is suggested after treatment.

Case 4. Posteroanterior Projection of the Chest (Fig. 2-22)

Thickenings of the lung markings are distributed in the inner and middle zones of bilateral middle and lower lung fields. Some scattered patch-like infiltrations mix with the thickened lung markings. Their margins appear vague. The contours of both pulmonary hila show blurred, but not in evident enlargement. There is nothing remarkable in the heart and great vessels. The diaphragm remains smooth with sharp costophrenic angles.

Diagnosis: Bronchopneumonia.

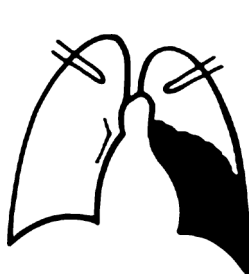


Fig. 2-20

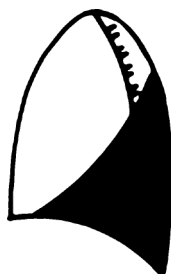


Fig. 2-21

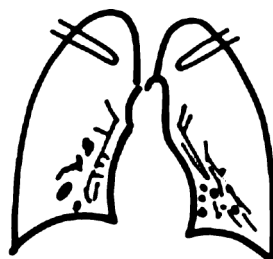


Fig. 2-22

例 5. 胸部后前位(Fig. 2-23)

双肺纹理增多、粗乱,呈索条状及网状阴影,双肺门影增浓。双侧膈肌升高且略变平,膈肌表面光滑,肋膈角锐利。心脏影略呈三角形、各弓影变浅、变直。所见骨骼无异常。

诊断:结合病史,考虑为结缔组织病心肺改变。

Case 5. Posteroanterior Projection of the Chest (Fig. 2-23)

The lung markings become enriched and coarse in both lungs, with stripes or reticular shadows. The density has increased in both pulmonary hila. Both hemidiaphragms are slightly elevated and flattened with smooth surfaces and sharp costophrenic angles. The shadow of the heart seems a triangular shape, while its arches fade off. Bones have nothing remarkable in the chest.

Diagnosis: With reference to the history, the observations are in accordance with changes of connective tissue disease in the lungs and heart.



Fig. 2-23

例 6. 胸部后前位(Fig. 2-24)

双肺纹理增多,达肺野外带,边缘模糊,互相交织成网状,其间散在斑点状致密阴影和小透光区,以中下肺野为著。心脏大血管及双侧膈肌未见异常。

诊断:双肺弥漫性间质性纤维化,合并间质性肺炎。

例 7. 胸部后前位和右侧位

(Fig. 2-25, Fig.2-26)

右肺下叶背段类圆形致密阴影,边缘模糊,有长毛刺形成。阴影中含 $4.0\text{cm}\times 4.0\text{cm}$ 的空洞,伴气-液平面。右侧肺门增大、增浓,肺纹理增粗。左肺清晰,心脏和膈肌未见异常。

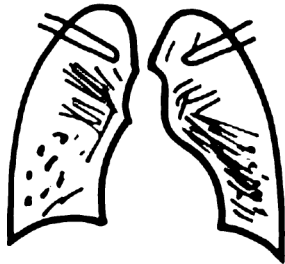


Fig.2-24

诊断:结合临床,患者10天来高热、咯大量黄痰和血液中白细胞升高,考虑右肺下叶背段肺脓肿。

例 8. 胸部后前位(Fig. 2-27)

双肺多发、大小不等的结节状阴影,边缘较清楚。右下肺野密度均匀增高,上界呈反抛物线状,右侧膈肌影被遮掩消失。心脏影向双侧扩大,部分弓影消失。左侧膈肌正常。所见骨骼无骨质破坏。

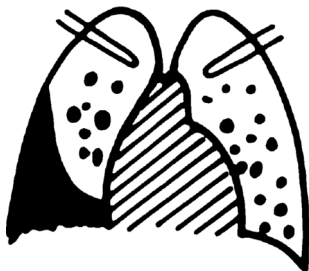


Fig. 2-27

诊断:结合患者肝癌病史,考虑双肺多发转移瘤;右侧胸腔积液;心包积液。

Case 6. Posteroanterior Projection of the Chest (Fig. 2-24)

The lung markings have been condensed and disarranged, reaching the outer zone of bilateral lungs with blurred margins. Some spot-like opacities and small radiolucencies are mixed together, especially in bilateral middle and lower lung fields. Nothing is special in the heart and great vessels. The diaphragm appears smooth with sharp costophrenic angles.

Diagnoses: Diffuse interstitial pulmonary fibrosis associated with interstitial pneumonia.

Case 7. Posteroanterior and Right Lateral Projections of the Chest (Fig. 2-25, Fig.2-26)

A large round-like opacity locates in the posterior segment of the right lower lung in fuzzy demarcations. There are some long corona-like speculations in its margin. A cavity of $4.0\text{cm}\times 4.0\text{cm}$ can be found with an air-fluid level in the shadow, which involves the right pulmonary hilum and adjacent lung. Nothing is special in the heart, diaphragm and left lung.

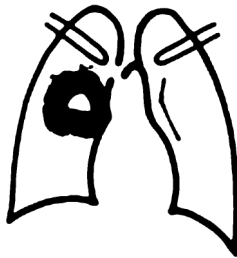


Fig.2-25



Fig.2-26

Diagnosis: Considering the combination of the clinical symptoms and lab tests, a pulmonary abscess is considered in the posterior segment of the right lower lung.

Case 8. Posteroanterior Projection of the Chest (Fig. 2-27)

Multiple nodules with clear margins are displayed diffusely in both lungs in different sizes. A large patchy density appears in the right lower lung field with a curve in reverse parabola in its upper boundary. The right hemidiaphragm can not be seen, but nothing remarkable is found on the left one. The shadow of the heart has enlarged to both sides. Parts of the cardiac arches fade out in the borders. All bones seen remain intact.

Diagnoses: Based on the history of hepatic cancer, multiple pulmonary metastases are linked with malignant effusion in the right pleural cavity and pericardial space.

例 9. 胸部后前位(Fig. 2-28)

双肺多发粟粒状阴影,夹杂少许斑点状中等密度区,部分边缘清晰,部分不甚清晰。心脏大血管影无改变。双侧膈肌表面光滑,肋膈角锐利。胸廓对称,骨质结构正常。

诊断:双肺广泛粟粒状阴影,结合患者的年龄,考虑肺泡癌或肺转移瘤可能性大,但需与血行播散型肺结核相鉴别,建议进一步检查。

例 10. 胸部后前位和左侧位

(Fig. 2-29, Fig. 2-30)

后前位示左肺门区一分叶状肿块阴影,约 $4.0\text{cm} \times 5.0\text{cm}$,边缘不光滑,有毛刺形成。左上肺体积缩小,呈尖端指向肺门的扇形,出现横“S”征。左上叶肺纹理消失,下叶肺纹理分散、上移。左斜裂位置上移,左下叶透过度增大。右肺清晰,右肺门不大。心脏和右侧膈肌位置和形态未见异常。左侧膈肌轻度升高,肋膈角锐利。所见骨骼骨质正常。

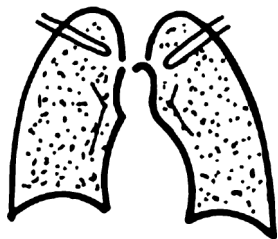


Fig. 2-28

左侧位示左上叶阴影略呈尖端指向肺门的扇形,除肺门区肿块外,于气管旁可见一结节状阴影。余肺野未见异常,所见脊柱正常。体层摄影:左上叶支气管呈截断征。

诊断:左上叶中央型肺癌合并肺不张,左下叶代偿性肺气肿。结合患者声音嘶哑及纵隔淋巴结肿大,提示纵隔内转移瘤压迫左侧喉返神经。建议支气管镜活检。

Case 9. Posteroanterior Projection of the Chest

(Fig. 2-28)

There are numerous miliary shadows mixed with some patchy opacities in both lungs. A part of them has a clear margin, while the others have not. Nothing can be seen in the heart and great vessels. The diaphragm remains smooth with sharp costophrenic angles. Bones appear normal in texture and the thoracic cage exhibits symmetry on both sides.

Diagnoses: For multiple miliary shadows in bilateral lungs, alveolar cell carcinomas and pulmonary metastases have the most possibility due to the age of the patient. These should be differentiated from acute blood born disseminated pulmonary tuberculosis. Further examinations and tests are needed.

Case 10. Posteroanterior and Left Lateral Projections of the Chest(Fig. 2-29, Fig. 2-30)

A mass of $4.0\text{cm} \times 5.0\text{cm}$ manifests in the left pulmonary hilum in unsmooth margin with spiculations. Because of collapse of the left upper lobe, the apex of the shadow points to the left hilum in a fan shape with the Golden sign and the left oblique fissure has been elevated. The lung markings disappear in the left upper lobe. In the left lower lobe, pulmonary volume is over inflated and its lung markings become divergent and move up slightly. The right lung remains clear. There is nothing remarkable in the heart and right hemidiaphragm, but, the left hemidiaphragm is slightly elevated with a sharp costophrenic angle. Bones appear normal in texture in the chest.



Fig. 2-29



Fig. 2-30

On the left lateral projection, the left upper lobe seems a shadow in a fan shape and points to the left pulmonary hilum. Besides the hilar mass, there is also another node near the trachea. The other lung fields have no evidence of intrapulmonary lesions in the left lower lobe. The spinal column has nothing remarkable. On the tomographic radiograph, it displays the amputation sign in the left primary bronchus.

Diagnoses: The lesion can be a central bronchial carcinoma of the left upper lobe associated with pulmonary atelectasis in the left upper lobe and compensatory emphysema in the left lower lobe. Given the symptom of hoarseness of the patient and the enlarged mediastinal lymphatic nodule, the mediastinal metastasis may have compressed the left recurrent laryngeal nerve. Bronchoscopy is recommended.

例 11. 胸部后前位

(Fig. 2-31, Fig. 2-32)

右上肺野及左上中肺野散在密度不均匀、大小不等的斑点状和斑片状阴影,边缘模糊不清。其中,在右锁骨水平及其上方可见两个空洞,壁厚、无液平面,大小分别约为 $2.0\text{cm} \times 3.0\text{cm}$ 和 $2.0\text{cm} \times 1.5\text{cm}$ 。右肋膈角变钝,右侧膈肌轻度上移。右侧胸壁下见宽 2.0mm 条状中等密度阴影,右侧肋间隙变窄。左侧膈肌表面光滑,肋膈角清晰锐利。气管及纵隔轻度向右侧移位,心外形正常。

诊断:双肺上叶浸润型肺结核,伴右上肺空洞形成;右侧胸膜肥厚、粘连。

治疗半年后复查:原系双上肺浸润型肺结核患者,今日摄片与前片比较,双上肺病变的范围明显缩小,病灶边缘变清晰,右锁骨水平及其上方的两个空洞已闭合,遗留索条状阴影。余肺野大致同前。右肋膈角及右侧肋间隙改变基本同前。

诊断:双肺上叶浸润型肺结核较前明显吸收好转。



Fig. 2-31

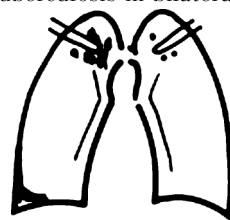


Fig. 2-32

Case 11. Posteroanterior Projections of the Chest (Fig. 2-31, Fig. 2-32)

There are areas of scattered dot-like and patchy inhomogenous opacities in different sizes with hazy margins in bilateral upper lung fields and the left middle lung field. Two areas of hypodensity can be found in the right supraclavicular and clavicular regions, in the size of $2.0\text{cm} \times 3.0\text{cm}$ and $2.0\text{cm} \times 1.5\text{cm}$ individually. There is no air-fluid level in these thick wall cavities. The right costophrenic angle disappears and the right hemidiaphragm moves up. A fine stripe of soft tissue lies on the right lateral thoracic wall in 2.0mm width. The right intercostal spaces become narrow. The left hemidiaphragm still remains smooth with a sharp costophrenic angle. The trachea and mediastinum deviate to the right superior part slightly. The contour of the heart is nothing remarkable.

Diagnoses: Infiltrative pulmonary tuberculosis in bilateral upper lungs accompanied with pulmonary cavitations in the right upper lung. Pleural adhesion and thickening on the right.

Reexamination half a year after treatment.

The patient suffered from infiltrative pulmonary tuberculosis in both upper lungs. At present, the foci are significantly decreased compared with the former radiographs. Their margins have become clear and sharp. The two cavities have been closed in the right supraclavicular and clavicular regions leaving over shadows of cord-like scars. The other findings are almost the same as before.

Diagnosis: Resolving remarkably of infiltrative pulmonary tuberculosis in bilateral upper lungs.

例 12. 胸部后前位 (Fig. 2-33)

双肺纹理粗乱、增多,边缘模糊。双下肺透过度增强,其内可见多个大小不等,圆形囊状透光区。双侧肋间隙增宽,膈肌形态反转,呈波浪状向下突出。双侧肺门影增宽,右下肺动脉宽约 19.0mm 。心脏呈二尖瓣型,向双侧扩大,肺动脉段突出,高度 5.0mm ,长度 63.0mm ,心尖圆隆上翘。

Case 12. Posteroanterior Projection of the Chest (Fig. 2-33)

Both lung markings change into more enrichment and distortion with fuzzy boundaries. Radiolucency of both lungs has increased with enlarged intercostal spaces. There are multiple round hypodensities in different sizes in both lower lung fields. Bilateral hemidiaphragms appear reversed downwardly. Both pulmonary hila are widened and condensed in their densities. The right inferior pulmonary artery reaches 19.0mm in diameter. The heart looks like the mitral type and develops enlargement to both sides. The segment of the pulmonary artery shows prominent with 5.0mm in height and 63.0mm in length. The apex of the heart shows round and upward.

诊断:慢性支气管炎,并严重肺泡性肺气肿和多发肺大泡形成;肺心病。

例 13. 胸部后前位和右侧位

(Fig. 2-34, Fig.2-35)

右肺上叶前段一结节状阴影,约2.0cm×3.0cm,密度较均匀,边缘略呈分叶状。右肺尖区可见数个斑点状高致密影,边缘清晰。双肺门不大,余肺野清晰。胸廓对称,双侧膈肌表面光滑,所见肋骨骨质无异常。胸部 CT 示右肺上叶前段肿块影,边缘见短毛刺和分叶征,CT 值介于 35~39HU 之间,气管前淋巴结肿大。

诊断:右肺上叶前段周围型肺癌,伴纵隔淋巴结转移;右上肺陈旧性肺结核。

综上,在描述部分首先描写肺部病变的直接征象,然后描写由之而产生的继发性改变,如阻塞性肺气肿、肺不张、牵拉或压迫移位等。同时,要注意观察和描述周围肺野和比较对侧肺的情况。在考虑肺肿瘤病变时,要特意观察纵隔和骨骼有无改变。在全面掌握了患者的放射学表现以后,还要注意挖掘有特异性的 X 线征象,如毛刺征、偏心性空洞。复查的胸片,一定要与先前的胸片进行逐一比较,使临床医师对病变的治疗效果与病变的发展变化有明确的了解。

Diagnoses: Chronic bronchitis inducing serious bulbous emphysema, multiple pulmonary bullae and pulmonary heart disease.

Case 13. Posteroanterior and Right Lateral Projections of the Chest(Fig. 2-34, Fig.2-35)

A nodule of 2.0cm×3.0cm appears in the anterior segment of the right upper lobe in homogenous density and slight lobulation in its edge. There are many spot-like calcifications in the right apical region. Both pulmonary hila are in normal size. The other lung fields remain clear. Both hemithoracic cages are symmetrical. The diaphragm shows smooth with sharp costophrenic angles. Bones are normal in texture.

On CT scan, a nodule is found to have short spiculations and incisures in its margin in the anterior segment of the right upper lobe. Its density varies 35~39 HU. Some lymphatic nodes become enlarged in the anterior region of the trachea.

Diagnoses: Peripheral bronchial carcinoma in the anterior segment of the right upper lobe accompanied with mediastinal metastases. Old tuberculosis in the right upper lung.

In summary for this section, after descriptions of the direct signs of lesions in the lungs, the secondary signs should be traced, such as obstructive pulmonary emphysema, pulmonary atelectasis, traction or compression of adjacent organs. Then, the surroundings of the affected lungs, other parts of the ipsilateral lung, and contralateral pulmonary tissues should be scrutinized carefully. When a lesion is suspected as a tumor, the mediastinum and bones should be interpreted in normal or abnormal. After holding the general radiological findings of a patient, radiologists should explore some specialized radiological signs, such as the spiculation sign or an eccentric cavity. For reexamination of a patient, the present radiographs dated must be compared with the previous ones elaborately. So, clinical physicians can understand more about the therapeutic effectiveness and development of the disease.



Fig. 2-33

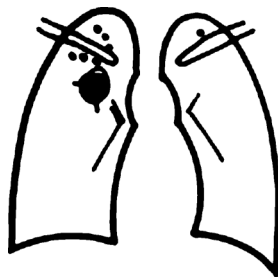


Fig. 2-34

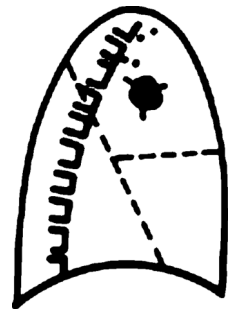


Fig. 2-35

第2节 胸膜腔

Section 2 The Pleural Cavity

A. 胸膜腔基本病变概述

胸膜腔的基本病变包括胸腔积液、积气、液气胸、胸膜肥厚、粘连、钙化、胸膜肿瘤和胸膜包裹性病变等,常需要结合透视观察。

1. 胸腔积液

少量积液时,肋膈角变钝;中等量积液时,第二前肋以下密度均匀一致的增高,其上界为内低、外高的凹弧线形(反抛物线),同侧膈肌影被遮掩消失;大量积液时,第二前肋以上乃至一侧胸腔致密影。

2. 包裹性胸腔积液或肺下积液

后前位和侧位摄片,观察病变的形态、位置,与叶间裂和侧胸壁的关系。肺下积液时,肺下界上升,膈肌最高点外移,结合透视下其形态随体位的变化而改变,明确肺下积液的诊断。

3. 胸膜肥厚、粘连和钙化

膈肌上移、膈肌幕状变形;或形成大片高致密阴影;密度可均匀增高,也可不均匀。可见侧胸壁下软组织影带状增厚,肋间隙变窄,胸廓下陷,纵隔向患侧移位。

4. 气胸或液气胸

胸腔积气区的肺纹理消失,呈均匀一致的透亮影,其内侧为受压萎缩的肺边缘,根据积气的量和胸膜有无粘连,肺边缘的形态多种多样(可呈纵行的带状、波浪状、半圆形)。液气胸时胸腔内出现气-液平面,应明确气-液平面的位置和范围。

5. 胸腔引流管

如有胸腔引流管,说明其位置是否适当。

A. Overview of Basic Pathological Changes in the Pleural Cavity

The basic pathological changes include pleural effusion, pleural pneumatosis, pleural hydropneumothorax, and thickening of the pleural membrane, pleural adhesion, pleural calcification, and pleural tumor, encapsulated lesions of the pleural membrane. The observations should be often combined with fluoroscopy.

1. Pleural effusion

A small amount of pleural effusion can cause blunting in the costophrenic angle, while a medium volume of it appears like a large patchy homogeneous opacity below the second anterior rib, showing a concave upper margin with a highest point laterally and a lowest point medially (a reverse parabola), so that the affected hemidiaphragm vanishes. When a large opacity occupies a unilateral thoracic cavity or above the anterior part of the second rib, it may result in a large quantity of pleural effusion.

2. Encapsulated or subpulmonary effusion

Chest radiographs delineate the shape and location of the lesion, the relationship between the interlobar fissure and the lesion, and between the lesion and lateral thoracic wall in both posteroanterior and lateral radiographs. Due to subpulmonary effusion, the inferior margin of the lung is elevated with the highest point pushed laterally. Together with the changes in shapes and positions of effusion under fluoroscopy, a subpulmonary effusion should be ascertained for it can move in the pleural cavity.

3. Thickening, adhesion and calcification of the pleural membrane

There are several X-ray signs of thickening, adhesion and calcification of the pleural membrane, such as elevation, protrusion like a tent in the hemidiaphragm, diffuse opacities with homogenous or inhomogenous densities, band-like opacity in the lateral thoracic wall, stenoses of the intercostal spaces, collapse of the thoracic cage, displacement of mediastinal organs to the affected side.

4. Pneumothorax or hydropneumothorax

The lung markings disappear as a unique radiolucency in the cumulative area of air in the thoracic cavity (or cavities). Based on the volume of gas and condition of pleural adhesion, the margin of the collapsed lung has varied shapes (such as a longitudinal belt, lobulation, semicircle). In hydropneumothorax, air-fluid level(s) must be assessed in the position(s) and size(s).

5. Drainage tube

If there is a drainage tube, the position should be described.

6. 气胸或胸腔积液的计算方法

a. Kircher 算法 (Fig. 2-36):

肺被压缩的面积 =

$\frac{\text{患侧胸廓面积} - \text{患侧肺的面积}}{\text{患侧胸廓面积}}$

$$\times 100\% = \frac{AB - A'B'}{AB} \times 100\%$$

= 气体占据面积

b. 肺被压缩的程度估计: 气体占据患侧胸腔外 1/4 时, 肺被压缩 35%; 1/3 时, 肺被压缩 50%; 1/2 时, 肺被压缩 75%; 2/3 时, 肺被压缩 90%。

B. 胸膜腔病例

例 1. 胸部后前位 (Fig. 2-37)

右侧胸腔第一前肋以下, 大片致密阴影, 上缘呈外侧高、内侧低的反抛物线状。右侧膈肌影被遮掩消失, 右侧肋间隙略增宽。右侧残余肺和左侧肺清晰。纵隔向左侧轻度移位。左侧膈肌未见异常。

诊断: 右侧胸腔大量积液。

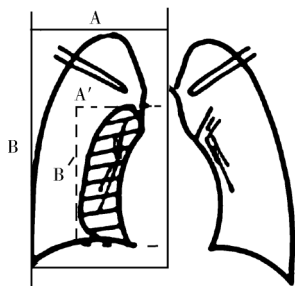


Fig. 2-36

例 2. 胸部后前位和右侧位 (Fig. 2-38, Fig. 2-39)

胸部后前位片示: 双肺多发斑片状和云絮状阴影, 以上中肺野为著。于右锁骨下方, 可见一大小约 2.0cm × 2.0cm 的厚壁空洞, 边缘模糊, 其内未见气-液平面。右下肺野均匀一致的密度增高, 上缘呈外侧高、内侧低的反抛物线状, 肋膈角消失, 右侧膈肌影被掩盖。右侧位片示: 右侧斜裂影增宽, 呈带状, 前、后肋膈窦变平。心脏大血管和左侧膈肌正常。

6. Calculational methods of pneumothorax or hydropneumothorax

a. Kircher method (Fig. 2-36)

area of compressed lung =

$\frac{\text{area of thoracic cage in affected side} - \text{area of collapsed lung}}{\text{area of thoracic cage in affected side}}$

$$\times 100\% = \frac{AB - A'B'}{AB} \times 100\% = \text{area of gas in pleural cavity}$$

b. Estimation of the compressed lung: when gas occupies one-fourth of the thoracic cavity, the compressed lung reaches nearly 35%, and then, one-third corresponding to 50%, one-half corresponding to 75%, two-thirds corresponding to 90% respectively.

B. Cases in the Pleural Cavity

Case 1. Posteroanterior Projection of the Chest (Fig. 2-37)

A large patchy density occupies the right thoracic cavity and reaches the anterior part of the first rib. Its upper margin looks just like a reverse parabola with the highest point laterally and the lowest point medially. The right hemidiaphragm has been effaced. Meanwhile, the right intercostal spaces are slightly enlarged. The lungs seen are clear in the remainder of the right upper lung and left whole one. In addition, the mediastinum shifts slightly to the left. There is nothing unusual in the left hemidiaphragm.

Diagnosis: A large amount of effusion in the right pleural cavity.

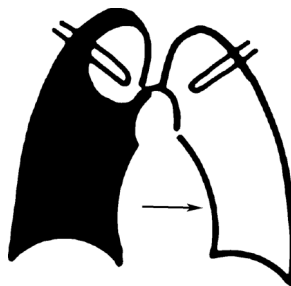


Fig. 2-37

Case 2. Posteroanterior and Right Lateral Projections of the Chest (Fig. 2-38, Fig. 2-39)

On the PA radiograph, there are multiple patchy and flocculent shadows in bilateral lungs, especially in the upper and middle lung fields. A cavity of radiolucency, 2.0cm × 2.0cm in size, has been found in the right infraclavicular area with a vague margin, and without an air-fluid level inside. The right hemidiaphragm is covered by an opacity with an upper border in the shape of a reverse parabola with a high lateral point and a low medial point. The right costophrenic angle vanishes along with effacement of the right hemidiaphragm. On the right lateral radiograph, the hila are in normal size. The right oblique fissure broadens into a long band. The right anterior and posterior costophrenic sinuses are flattened. There is nothing unusual in the heart, great vessels and left hemidiaphragm.