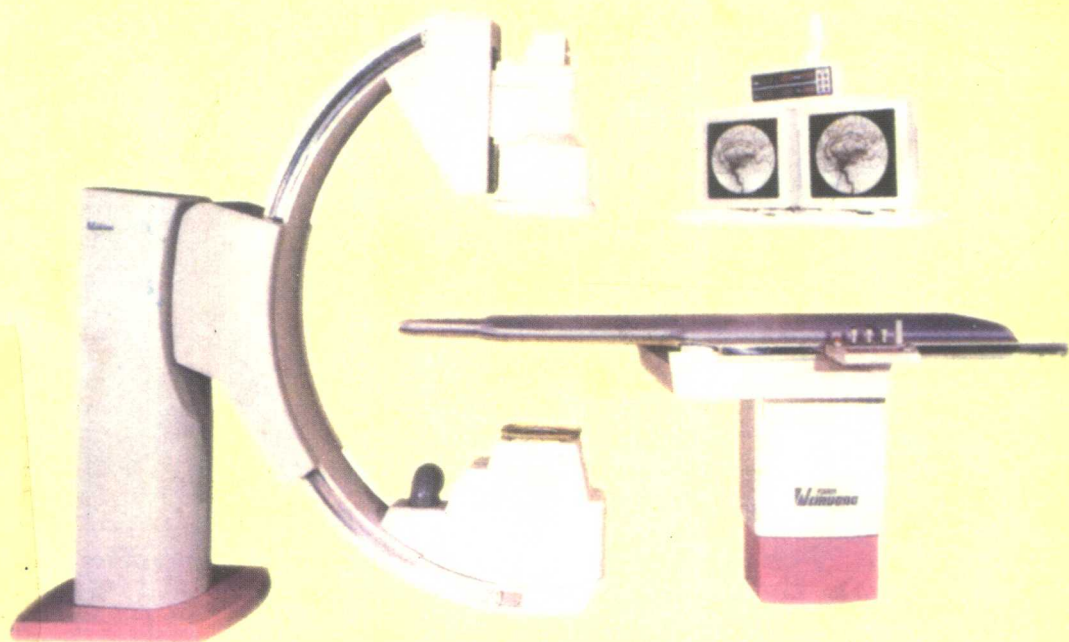


医学影像学英语阅读

ENGLISH READING FOR MEDICAL IMAGEOLOGY

主编 彭卫斌 梁长生
主审 王 绪



第二军医大学出版社

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内 容 提 要

本书取材于近年出版的美英著名医学影像学教科书和著名医学影像学杂志。本书除可作为大学本科、专科及成人高校的高年级医学影像学专业学生的英语教材外,还可供具有一定英语基础的医学影像学专业及其他相关专业的在职医务人员自学参考。

图书在版编目(CIP)数据

医学影像学英语阅读/彭卫斌编. —上海:第二军医大学出版社,2002.2

ISBN 7-81060-228-4

I. 医… II. 彭… III. 英语—对照读物,医学—英、汉 IV. H319.4:R

中国版本图书馆 CIP 数据核字(2002)第 003192 号

医学影像学英语阅读

主 编: 彭卫斌 梁长生

责任编辑: 吴 进

第二军医大学出版社出版发行

(上海市翔殷路 818 号 邮政编码: 200433)

全国各地新华书店销售

徐州医学院印刷厂印刷

开本: 787 mm×1 092 mm 1/16 印张: 18.75 字数: 480 000

2002 年 3 月第 1 版 2003 年 3 月第 1 次印刷

印数: 1~3 000 册

ISBN 7-81060-228-4/R·165

定价: 29.80 元

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序

为了使医学影像专业的学生和从事本专业的人员更好地适应医学影像学迅速发展的需要,尽快了解和掌握国外先进技术,国内部分医学院校的影像学专业先后设置了《影像专业英语阅读》课程。实践证明,这对学生阅读专业文献,借鉴和学习国外先进经验,了解本专业最新动态起了一定的作用。

但是,由于国内目前尚无内容比较系统、形式比较规范、内容覆盖面广的统一教材,学生在学习过程中难免有较多困难,而且学习效果参差不齐。有鉴于此,以彭卫斌、梁长生教授为主编的编写人员,在收集并参阅了大量外文资料的基础上,克服重重困难,在繁重的工作和教学之余,精心编撰,历时1年多,终于向大家奉献出面前的这本新书——《医学影像学英语阅读》。该书分二部分,内容大多选自近年美英出版的著名医学影像学教科书和著名医学影像学杂志。编者的译文准确流畅。为方便阅读和理解,他们还对相关医学及医学影像学专业名词注上音标、词性及中文解释,并对部分难点或语法点加以注释,使学生学习起来较为方便。本书内容十分丰富,专业名词覆盖面广,可见编者付出了大量心血和精力。

我相信,广大医学影像专业的同学们通过对本书的学习,一定能提高对本专业英语书刊的阅读能力。在此我还想向从事医学影像专业的医技人员推荐此书,相信这对他们提高专业英语水平,顺利阅读专业英语文献,更好地适应国内外医学影像专业技术突飞猛进发展的需要有很大帮助,我想这也是编者们的初衷和最大心愿吧。

吴恩惠

2001年8月

前言

《医学影像学英语阅读》是为了适应当今我国医学影像学专业教学的需要、为了使医学影像学专业的学生紧跟迅速发展的医学影像学的发展步伐而编写的。本书大多取材于国外医学影像学英语教科书和美英著名医学影像学专业期刊,专业英语词汇及内容覆盖面广。在编写过程中,我们参考了部分英语专业书籍和语法书籍,对课文中的部分语法难点加上了注释,旨在提高读者的医学影像学专业英语阅读和理解水平。此外,我们还对相关的专业英语单词注上了音标、词性及中文解释,以便于读者学习。书末所附参考译文仅供读者参考,建议读者在学习本书过程中尽量发挥自己的主观能动性来阅读和理解其中的内容。

全书教学时数拟定为 148 学时,各学校可根据自己的情况选择其中的内容安排教学时数。授课时宜多发挥学生的主观能动性,提倡他们多读多问,教师在其中进行辅导和答疑,这样可望达到更好的教学效果。

本书不仅可作为在校的医学影像学专业的学生学习使用,还可供从事医学影像学专业的医技人员和其他医学专业的医技人员学习使用。

本书在编写过程中得到了不少放射学界老前辈的鼓励和支持,特别是德高望重的吴恩惠教授的鼓励和支持,他在百忙之中给了我们热情的鼓励和具体的指导,并亲自给本书作序,使我们倍受鼓舞。徐州医学院的王绪教授对本书进行了审校。此外,我们也得到不少有医学影像学专业的高等医学院校的领导和同道们的支持。在编写过程中,梁长生、毛旭升两同志自始至终参加了本书的编写工作,对本书的编写、计算机排版和校对付出了大量心血,使本书的编写效率极大提高。对上述支持本书编写的放射学界老前辈、各校领导、同道及为本书编写付出辛劳的全体同志,我们表示衷心感谢!

因时间紧迫,本书词汇部分在标注音标时,相关弱读音标未用斜体,一律使用正体,特此说明。

尽管我们全体编写人员尽心尽力,历时年余编成了本书,但当她呈献给读者的时候,我们心里仍深感不安。由于我们的学术水平有限,本书的缺点及疏漏之处在所难免,敬请同道们批评指正,争取再版时修正。

彭卫斌

2001 年 10 月

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第一部分

Unit 1

Methods of Investigation and Interpretation of the Chest Radiograph (Part 1)

METHODS OF INVESTIGATION

PLAIN FILMS

Standard Views

Posteroanterior View. The patient is positioned erect with his anterior chest wall against the film and scapulae rotated forwards so that they are clear of the lungs¹. A short exposure time minimizes blur caused by cardiac pulsation. A voltage of about 70 kVp produces good bone detail and demonstrates abnormal calcification. Mediastinal detail and the lung posterior to the heart, however, are not well demonstrated. On films taken at higher voltage (120 – 150 kVp), the bones and abnormal calcification are poorly demonstrated, but the pulmonary and mediastinal detail is improved. Although the chest film is a fundamental investigation in suspected pulmonary or mediastinal disease, it is important to remember that a normal chest radiograph does not exclude significant disease. For example, most patients with chronic bronchitis have a normal chest radiograph; small pleural effusions may not be visible on the standard film. Computed tomography (CT) often shows small pulmonary nodules or evidence of pulmonary fibrosis not apparent on the chest film. Patients with severe bronchiectasis, significant chronic obstructive airways disease, or pulmonary emboli may also have a normal chest radiograph.

lateral view. The lateral view may provide further information on the location, size, and morphology of abnormalities seen on the posteroanterior (PA) view. Occasionally the lateral film will reveal an abnormality not visible on the other view, especially in the retrosternal and retrocardiac areas.

Many manufactures of x – ray equipment are currently developing digital chest radiography units. These units will not only provide easier storage, retrieval, and transmission of images but also improve image quality. Theoretically, all images will be of good technical quality, and the observer will be able to manipulate the data to produce the sort of image that is required.

In recent years there has been increasingly widespread use of AMBER technology (Automatic Multiple Beam Equalization Radiography). This technique utilizes a slit – collimated x – ray beam that scans the chest from base to apex, with the image recorded on a standard film screen combination. During the period of exposure, which is less than one second, the amount of irradiation penetrating each part of the chest is measured by an array of detectors situated between the patient and the film cassette. This information is fed back to the x – ray tube, and so output is continually modified to provide optimum exposure. The result is a radiograph that provides excellent detail of mediastinal and lung pathology on a single film, something that has always been difficult to achieve with conventional techniques².

Phosphor plate technology records the image on a cassette containing a phosphor plate, which is then

electronically read and processed as digital information. This information can then be manipulated in a variety of ways to provide an optimal image which is recorded by a laser imager onto x – ray film³. Since the latitude of the system is so wide there is very little need for repeat radiographs as a result of inadequate exposure factors, a feature⁴ that makes this technology particularly suitable for adult and pediatric intensive care units.

Other Views

Anteroposterior View. Most chest films taken with mobile equipment are anteroposterior (AP) views; compared with the PA view the heart is magnified. On occasion, a PA film shows a nodule that is completely overlaid by a rib. In these instances an AP film, by altering the projection of lungs and ribs, will determine if the nodule is within rib or lung.

Supine Film. In patients not fit enough for an erect film, a supine film may be taken. In this position, compared with an erect film, the upper zone vessels appear enlarged and may mimic pulmonary venous hypertension. Free pleural fluid, if present, may settle posteriorly and cause extensive opacification.

Expiratory Film. A standard PA film should be taken at end – inspiration. However, a PA film at end – expiration may be useful to demonstrate air trapping or a small pneumothorax.

Apical and Lordotic Views. These views may demonstrate the lung apices more clearly than the standard PA view by projecting the clavicles above the lung.

Decubitus Views. Lateral decubitus films may be used to demonstrate small pleural effusions; to differentiate between elevation of the diaphragm and subpulmonic pleural effusion; and to differentiate between free fluid and other pleural shadowing⁵.

Oblique Views. Oblique films are useful to demonstrate or confirm the presence of pleural plaques. They are best produced with fluoroscopy so that the optimum degree of obliquity may be selected.

Common Phrases for the Techniques of imaging chest

Plain Films

Standard views

PA

lateral

Other views

AP

supine

expiratory

apical

lordotic

decubitus

oblique

Linear Tomography

Fluoroscopy

Barium Studies

Bronchography

Angiography

Pulmonary arteriography

Aortography

Bronchial arteriography

Venography

Lymphangiography

Computed Tomography

Radionuclide Imaging

Ultrasound

Magnetic Resonance Imaging(MRI)

Percutaneous Biopsy

Nonimaging techniques for investigating the chest

Respiratory Function Tests

Sputum Examination for Organisms and Abnormal Cells

Skin Tests and Serology

Bronchoscopy

Transbronchial biopsy

Bronchoalveolar lavage

Thoracoscopy

Mediastinoscopy and Mediastinotomy

Thoracotomy and Open Lung Biopsy

Unit 1

Glossary

1. plain film / plein film / 平片
2. posteroanterior / ,pɒstərəʊæntiəriə / a. 后前位的
3. view / vju: / n. 观察,影像
4. scapulae / 'skæpjuli: / n. (pl)肩胛(骨)
5. lung / lʌŋ / n. 肺
6. exposure / iks'pəʊʒə / n. 曝光
7. cardiac / 'kɑ:diæk / a. 心脏的
8. pulsation / pʌl'seɪʃən / n. 搏动
9. voltage / 'vɒltidʒ / n. 电压
10. calcification / ,kælsifi'keɪʃən / n. 钙化
11. mediastinal / ,mi:diæs'tainl / a. 纵隔的
12. pulmonary / 'pʌlmənəri / a. 肺的
13. radiograph / 'reɪdiəʊgrɑ:f / n. X线片
14. bronchitis / brɒŋ'kaitis / a. 支气管炎

15. pleural / 'pluərəl / *a.* 胸膜的
16. effusion / i'fju:ʒən / *n.* 积液
17. computed tomography / kəm'pi:jʊtid tə'mɒgrəfi / 计算机断层
18. fibrosis / fai'brəʊsis / *n.* 纤维化
19. bronchiectasis / ,brɒŋki'ektəsis / *n.* 支气管扩张
20. emboli / 'embəlai / *n.* (pl)栓子
21. morphology / mɔ:'fɒlədʒi / *n.* 形态学
22. abnormality / ,æbnɔ:'mæliiti / *n.* 异常
23. retrosternal / ,retərə'stərnəl / *a.* 胸骨后的
24. retrocardiac / ,retərə'kɑ:diæk / *a.* 心后的
25. digital / 'didʒitəl / *a.* 数字的
26. retrieval / ri'tri:vəl / *n.* 检索,恢复
27. manipulate / mə'nɪpjuleit / *v.* 控制,操纵
28. slit / slit / *n.* 裂隙,狭缝
29. collimated / 'kɒlimeitid / *a.* 准直的
30. screen / skri:n / *n.* 屏(幕)
31. detector / di'tektə / *n.* 探测器
32. cassette / kə'set / *n.* 贮片盒
33. feedback / 'fi:dbæk / *v.* 反馈
34. pathology / pə'θɒlədʒi / *n.* 病理学
35. phosphor / 'fɒsfə / *n.* 荧光体
36. latitude / 'lætɪtju:d / *n.* 宽容度
37. nodule / 'nɒdjʊl / *n.* 结节
38. rib / rib / *n.* 肋骨
39. supine / sju:'pain / *a.* 仰卧的
40. venous / 'vi:nəs / *a.* 静脉的
41. hypertension / ,haɪpə(:)'tenʃən / *n.* 高血压,张力过高
42. opacification / əp,æsi'fɪkeɪʃən / *n.* 浑浊化
43. expiratory / ɪks'paɪəətəri / *a.* 呼气的
44. inspiration / ,ɪnspe'reɪʃən / *n.* 吸气
45. trapping / 'træpiŋ / *n.* 抓捕,诱捕
46. pneumothorax / ,nju:məu'θɔ:ræks / *n.* 气胸
47. lordotic / lɔ:'dɒtɪk / *a.* 前弓位的,脊柱前突的
48. clavicle / 'klævɪkl / *n.* 锁骨
49. decubitus / di'kjʊ:bɪtəs / *n.* 卧位
50. diaphragm / 'daɪəfræm / *n.* 膈
51. oblique / ə'blik / *n.* 斜位
52. fluoroscopy / ,fluə'rɒskəpi / *n.* 透视
53. linear tomography / 'liniə tə'mɒgrəfi / 线性断层
54. barium study / 'beəriəm 'stʌdi / 钡剂检查

55. bronchography / brɒŋ'kɒgrəfi / n. 支气管造影
56. angiography / ,ændʒi'ɒgrəfi / n. 血管造影
57. pulmonary arteriography / 'pʌlmənəri ,ɑ:təri'ɒgrəfi / 肺动脉造影
58. aortography / ,eiə'tɒgrəfi / n. 主动脉造影
59. bronchial arteriography / 'brɒŋkiəl ,ɑ:təri'ɒgrəfi / 支气管动脉造影
59. venography / vi'nɒgrəfi / n. 静脉造影
60. lymphangiography / lim'fændʒi'ɒgrəfi / n. 淋巴管造影
61. radionuclide / ,reidiəu'nju:klaɪd / n. 放射性核素成像
62. ultrasound / 'ʌltrəsəʊnd / n. 超声
63. Magnetic Resonance Imaging (MRI) / mæɡ'netik 'rezənəns 'imidʒɪŋ / 磁共振成像
64. percutaneous / ,pɜ:kju(:)'teɪnjəs / a. 经皮的
65. biopsy / 'baɪɒpsi / n. 活检
66. serology / siə'rɒlədʒi / n. 血清学
67. bronchoscopy / brɒŋ'kɒskəpi / n. 支气管镜检查
68. transbronchial / trænz'brɒŋkiəl / a. 经支气管镜的
69. bronchoalveolar lavage / ,brɒŋkəʊæl'viələ læ'vɑ:dʒ / 支气管肺泡灌洗
70. mediastinoscopy / ,mi:di'æsti'nɒskəpi / n. 纵隔镜
71. mediastinotomy / ,mi:di'æsti'nɒtəmi / n. 纵隔切开
72. thoracotomy / θɔ:rə'kɒtəmi / n. 胸廓切开术
73. open lung biopsy / 'əʊpən lʌŋ 'baɪɒpsi / 开胸肺部活检

Notes

1. ...so that they are clear of the lungs. 句中 they 指 scapulae, 即二侧肩胛骨, are clear of 意为“避开了”。
2. The result is ... with conventional technique. 句中 something 为复合不定代词, 指 radiograph, 在句中作同位语。
3. This information can then be ...onto x-ray film. 句中 in a variety of 意为“种种”, which 引导一限制性定语从句, onto x-ray film 为主语补足语。
4. ...a feature that makes this... 句中 a feature 为同位语, 说明其前的整个句子。
5. Lateral decubitus films...other pleural shadowing. 句中 to demonstrate...; to differentiate...; and to differentiate between...为三个动词不定式短语, 作 Lateral decubitus films 的主语补足语。

Unit 2

Methods of Investigation and Interpretation of the Chest Radiograph (Part 2)

INTERPRETATION OF THE CHEST RADIOGRAPH

Correct analysis of the chest radiograph requires an orderly approach to the film and a knowledge of normal criteria.

Clinical Data

It is essential to check the film for the name of the patient and the date of the examination. It is also important to know the age and sex of the patient and other clinical data that will make various diagnoses more or less likely.

Technical Data

1. Look for the right or left marker. Abnormal situs is of greater importance in congenital heart disease than in pulmonary disease, but there is an association between bronchiectasis and situs inversus.

2. Is the film properly centered? The medial ends of the clavicles should be equidistant from the midline. Rotation of the patient may distort the mediastinum, and the side to which the patient is rotated may appear hypertransradiant.

3. Is the film properly exposed? An overexposed film may need examination with a bright light to reveal low-density shadows, while an underexposed film may conceal overlapping structures.

4. Has the patient taken a full inspiration? The midpoint of the right hemidiaphragm should lie between the anterior ends of the 5th and 7th ribs. An expiratory film may give a false impression of cardiomegaly and abnormal basal pulmonary shadowing.

Bones and Soft Tissues

The bones and soft tissues should be carefully examined for abnormalities. Normal features that may mimic pulmonary disease are nipple shadows, companion shadows related to the ribs and clavicles, clavicular rhomboid fossae, and costal cartilage calcification.

Diaphragm

The right hemidiaphragm is usually 1–2 cm higher than the left, but a large amount of air in the stomach or splenic flexure may alter this relationship. The curve of the diaphragm may be assessed by measuring the distance between the highest point of the diaphragm and a line joining the costophrenic and cardiophrenic angles. This should normally be at least 1.5 cm.

Upper Abdomen

Look below the diaphragm for any abnormal gas shadows. An occasional normal variant is interposition of bowel between the liver and diaphragm—Chilaiditi's syndrome. The position of the stomach, liver, and spleen should be checked if abnormal situs is suspected. Calcified hepatic and splenic granulomas and gallstones are occasionally visible on the chest radiograph.

Lungs

The lungs should be equally transradiant. Pulmonary vessels and interlobar fissures are responsible for the normal lung markings¹. All other opacities overlying the lungs require explanation, and these should be regarded as pathological until proved otherwise. Overlying soft tissues and skeletal opacities, combination shadows and artifacts are a frequent explanation. The costophrenic angles should be clearly defined. There are certain areas where abnormalities are easily overlooked, and they require careful scrutiny. These are the apices, the retrosternal space, the retrocardiac area, the perihilar regions, and the posterior costophrenic recesses. The lateral film is often helpful in assessing these areas.

Pulmonary Vessels. On an erect film the lower zone vessels are larger than the upper zone vessels. Comparison of the lower, mid, and upper zones on either side should show symmetry in both size and number of vessels in each lung. The diameter of the normal right basal artery is 16 mm. Disturbance of the pulmonary vascular pattern may be due to pulmonary or cardiovascular disease.

Hila. On the chest radiograph the normal hilar shadows are formed by the pulmonary arteries and upper lobe veins. Normal lymph nodes are not visible. The left hilum is 0.5 – 1.5 cm higher than the right. They should be of similar radiodensity. Hilar enlargement may be due to enlargement of the hilar vessels or lymph nodes, or to a mass². Vascular enlargement tends to produce a smooth convex outline, but masses and lymphadenopathy often appear lobulated.

Interlobar Fissures. The horizontal fissure separates the right upper and right middle lobes. It is visible on approximately 50% of chest radiographs. The oblique fissure separates the lower lobe from the rest of the lung and is often visible on the lateral film. An azygos fissure is present in approximately 1% of the population. It encloses the azygos vein and separates an azygos lobe from the rest of the right upper lobe³. A superior accessory fissure is rarely seen. It separates the apical segment of the lower lobe from the basal segments.

Mediastinum

Trachea and Main Bronchi. The trachea lies in the midline proximally, but distally it may be deviated to the right by the aortic arch. The lumen appears as a translucent band of uniform width. In adults it is normally 1.5 – 2 cm wide. The right paratracheal stripe is a band of tissue outlined by air in the tracheal lumen and right lung; it is normally less than 5 mm wide. The subcarinal angle, subtended by the main bronchi, is normally 60° – 70°. This angle may be increased by left atrial enlargement and subcarinal lymphadenopathy.

Azygos Vein. The termination of the azygos vein may be seen as it arches anteriorly in the angle between the trachea and right main bronchus. It is normally less than 7 mm in diameter on an erect film and increases in size in congestive cardiac failure and in the supine position.

Aorta. The aortic arch is usually left-sided (i.e., it arches over the left main bronchus). It produces an indentation in the left side of the trachea. A right aortic arch may simulate a right paratracheal mass.

Heart. The cardiovascular silhouette overlies the midline, usually about two thirds being to the left and one third to the right⁴. The left and right borders should be sharply defined. From above down, the right border comprises superior vena cava, right atrium and, sometimes, a short segment of inferior vena cava. In older patients ascending aorta may form part of the upper right cardiovascular silhouette. The left border comprises, from above down, aortic knuckle, pulmonary trunk, left atrial appendage, and left