

主编 张绍祥 刘正津

# 人体颅底部薄层断面MRI、CT 对照图谱

四川科学技术出版社

SICHUAN PUBLISHING HOUSE OF SCIENCE AND TECHNOLOGY

# 人体颅底部薄层断面 MRI、CT对照图谱

Atlas of Skull Base Thin  
Sections in Comparison  
with MRI and CT

张绍祥 刘正津 主编

Chief Editors Zhang Shaoxiang Liu Zhengjin

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## 序 言

由于颅底之深及其错综复杂的解剖结构,使得传统的手术入路及肿瘤切除技巧造成较高手术死亡率和致残率。这些问题,过去很长时间内困扰着神经外科工作者,以致从伦理学方面是否开展,如何开展颅底外科手术,曾经得到广泛讨论。

近 20 年来,随着神经影像学、显微外科技术的发展,医疗器械的改进,特别是接触性激光刀的出现,为开展颅底外科工作创造了良好的条件。临床方面,神经外科医生与五官科、口腔科和颌面外科医生的广泛合作,改进了颅底外科手术入路及肿瘤切除技巧,大大提高了手术的成功率,降低了致残率。

当然,熟悉地了解这个区域的解剖结构,是开展颅底外科的基础。《人体颅底部薄层断面与 MRI、CT 对照图谱》(中英文对照)就是为了配合这项工作,向有关人士奉献的一本好书。作者们经多年努力,将颅底按蝶鞍斜坡区、枕大孔区、颞区和眶区四个区域,以横、矢、冠三维影像断层和实际解剖标本断层进行对照,详细介绍了颅底细微的解剖结构,并分别注有标准的中英文对照名词,这对进一步提高我国颅底外科的水平是大有裨益的。

衷心感谢同道们所付出的辛勤劳动。

王忠诚  
1996.3.27

# Introduction

Because of the deep location and the complicated anatomical structures of the skull base, the traditional operative entry and the conventional technique of tumor resection usually bring about high rate of operative mortality and disability. Neurosurgeons have long been perplexed by these problems and discussed extensively whether and how to develop skull base surgery from the view of medical ethics.

In the past twenty years, the rapid development of neuro-imagiology and microsurgery and the advancement of medical instruments especially the invention of contact laser knife lay down an excellent foundation for the advances of skull base surgery. Clinically, the cooperation of neurosurgeons with otorhinolaryngologists, stomatologists and facio-maxillary surgeons has modified the operative entry for skull base surgery and improved the techniques of tumor resection. Consequently, the rate of successful operation is greatly increased and that of disability decreased.

To have good knowledge of the anatomical structures of the skull base is essential for the neurosurgeons to develop skull base surgery. "Atlas of Skull Base Thin Sections in Comparison with MRI and CT" with Chinese and English illustrations is a good reference presented to the neurosurgeons for this purpose. The authors, after hard working for several years, succeed in giving minute descriptions of the anatomical structures of the sella turcica and clivus, foramen magnum, temporal and orbital regions of the skull base with serial transverse, sagittal and coronary sections. This atlas will be beneficial to advance skull base surgery further in our country.

Sincere thanks to the authors for their efforts in the preparation of this valuable book.

Wang Zhongcheng

March 27, 1996.

# 前 言

人体颅脑部解剖结构复杂,是脑的重要结构和生命中枢所在地,过去一直被视为手术禁区。近年来,随着医疗器械、设备的进步和显微外科技术的提高,这一禁区正在被打开。中国工程院院士、我国著名神经外科专家王忠诚教授在 1993 年 5 月召开的全国首届颅底外科会议上指出:“要想推动我国颅底外科的发展、进步和提高,首先应该大力加强颅底外科各个具体部位解剖学的学习和研究,对重要结构所在的区域、血管走向、口径、神经分布以及它们之间的关系亟待阐明。”

微小病灶特别是肿瘤的早期诊断和手术治疗在现代外科学中具有划时代的意义。现已投入临床使用的 MRI 和 CT 已能作出薄至 1.5~2.0mm 的连续断层图像。但已有的断面图谱中,断面厚度多在 10mm 以上,不能适应影像诊断的新要求,临床上亟需与影像诊断相适应的薄层断面图谱以作为正常对照。作者从德国海得堡大学引进生物塑化(Plastination)新技术,在国内率先制作出了人体颅底部薄层连续断面标本(厚度 1.2mm,锯路损耗 0.3mm,层间距 1.5mm),完全能与 CT 和 MRI 的连续断层一一对应。

我们与临床影像诊断学、神经外科学、神经内科学等有关学科的专家合作,历时数年完成了这部图谱,期望能对相关读者的影像诊断和外科手术的开展与提高有所帮助。全书共分 4 章 12 节,包括人体颅底部蝶鞍、斜坡区、枕大孔区、颞区和眶区四个区域横、矢、冠三个方位的断层,共计 266 幅断面图。每幅断面图均配以相应的 MRI、CT 图和断面简图,并规则地排印在同一视野的左右两页中,方便对照和查阅。中英文对照既方便国外读者阅读,又方便国内读者查阅有关的解剖学名词。

本图谱采用的是肉眼观察正常的中等身材中年男性标本,分左、右侧的标本均用右侧,先作 CT、MRI,再进行生物塑化断面标本制作。定位标志为:横断面以过眦耳线(眼外眦至外耳门中点的连线)的层面为



基准,统一采用下面观;矢状断面以正中矢状面为基准,统一采用左面观;冠状断面以垂直于横断面并过后床突的层面为基准,统一采用前面观。断面照片所对应的 MRI、CT 图像中的区域均用方框标出,便于对照。

本书使用的解剖学名词均以 1991 年全国自然科学名词审定委员会公布的《人体解剖学名词》为准。重点突出、清新流畅、方便实用是本书编写时所追求的风格。该图谱不仅适合于临床影像诊断学工作者和解剖学工作者使用,对临床医师,特别是脑外科、神经内科、耳鼻咽喉科、眼科、颈部外科医师进行手术设计和借助 MRI、CT 诊断具有重要参考价值。同时,也适合于医学院校师生查阅使用。

在本书编写过程中,德国波恩大学校长卡儿·弗莱希哈瓦教授和该校解剖学研究所所长汉斯·马丁·西米得教授、第一军医大学钟世镇教授和重庆医科大学姜均本教授给予了热情指导;著名神经外科专家、中国工程院院士王忠诚教授在百忙中欣然为本书作序;本校李荟元校长和大坪医院秦银和院长给予了大力支持;我校沈锡庚教授在组稿、审阅和编辑等诸方面做了大量工作;解剖学教研室张正治副教授及谭立文、孙建森、宋林等同志均给予了许多帮助。在此,我们谨代表全体编审者表示衷心感谢!

由于水平有限,书中不足之处,恳请有关专家和广大读者批评指正。

张绍祥 刘正津

1996 年 3 月于第三军医大学

# Preface

The skull base of the human body was considered as the “forbidden” zone of surgery in the past since its anatomical structures are rather complicated and it comprises many important organs and vital centers. Along with the development of sophisticated medical instruments and other facilities and the refinements of microsurgical techniques in the recent years, the skull base is no more forbidden but open to the neurosurgeons. However, much remains to be done. Professor Wang Zhongcheng, a distinguished expert of neurosurgery, pointed out on the First National Conference of Skull Base Surgery of China held in May 1993 that if skull base surgery is to be developed and advanced in our country, it is essential to intensify our study of surgical anatomy of many important regions of the skull base and to clarify the courses of blood vessels and their calibers, the distribution of nerves and the relationship of vessels with nerves in the important structures of the skull base.

The achievements of the early diagnosis and prompt operative intervention for malignant disease of the brain especially those for the minute lesions are of epoch-marking significance in modern surgery. MRI and CT scanning, which have already found wide clinical application, are able to make serial tomographic figures with a thickness of 1.5—2.0 mm. Nevertheless, the figures in the old anatomical atlas were based on the sections with a thickness more than 10 mm. Clinicians are in urgent needs of atlas books of thinner sectional figures for their reference in the clinical work. The authors have introduced the plastination technique from the Heidelberg University of Germany and are the first in China to prepare thin serial sections (thickness: 1.2 mm, sawing pathway consumption: 0.3 mm and intersectional distance: 1.5 mm) of the 4 regions of human skull base with corresponding tomographic pictures of MRI and CT scanning.

After having cooperated with the experts of imaging diagnostics, neurosurgery and neurology for several years, we have finished the compilation of this atlas of thin serial sections of the structures of the human skull base and the book consists of 4 parts and 12 chapters and includes 266 pictures of the transverse, sagittal and coronary sections of the sella turcica and clivus region, foramen magnum region, temporal region and orbital region of the skull base. Every sectional picture is coupled with MRI and CT figures and a diagram. Besides Chinese illustrations, English illustration is also used for every picture to facilitate the readers of other countries.

Grossly normal middle-aged cadavers of medium stature were used as the specimens. MRI and CT scanning were performed first and serial sections with the plastination technique were made. The orientational markers are as follows: The canthus-ear plane (the plane passes through the lateral canthus of the eyes and the center of the external acoustic pores) is the marker for transverse sec-

tions and the inferior view is used; the median sagittal plane is the marker for sagittal sections and the left viwe is used; and the plane vertical to the transeverse plane and passing through the posterior clinoid processes is the marker for coronary sections and the frontal view is used. The black frame on the MRI or CT figures indicates the region where there is a corresponding anatomical sectional figure.

The authors try their best to emphasize the important points and present the materials in a clear, easy and smooth style in order that the readers will be convenient in reading and using the atlas. This atlas can be used not only by such clinical workers as radiodiagnosticians, neurosurgeons, neurologists, ENT doctors, and ophthalmologists but also by anatomists and even the medical students as well.

In the compilation of this atlas, Professor Dr. K. Fleischhauer, President of the University of Bonn, and Professor Dr. H. —M. Schmidt of the Institute of Anatomy of the University of Bonn, rendered us valuable help. Plastination equipment was donated by them ("Fritz und Hildegard Berg-Stiftung"). Professor Zhong Shizhen of the First Military Medical University and Professor Jiang Junben of the Chongqing University of Medical Science gave us useful directions. Professor Wang Zhongcheng, Academician of the National Engineering Academy of China, though very busy at his teaching and medical practice, has been very kind to write an introduction for the book. Professor Li Huiyuan, President of our University and Mr. Qing Yinghe, Director of the Third Teaching Hospital of our University warmly encouraged and supported our work. Professor Shen Xigen, Chief Editor of the Medical Journal of our University, has done a great amount of work in the compilation, revision and edition of this atlas. The members of the teaching staff of our Department such as Zhang Zhengzhi, Tan Liwen, Sun Jiansen, Song Ling and others did a lot of work to help us. To all professors and colleagues mentioned above, the authors express their hearty gratitude.

Readers are warmly requested to point out and criticize the possible mistakes in the atlas in order that we can do corrections in the next edition.

Prof. Dr. Zhang Shaoxiang and Liu Zhengjin

Mar. 1996

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P. R. China

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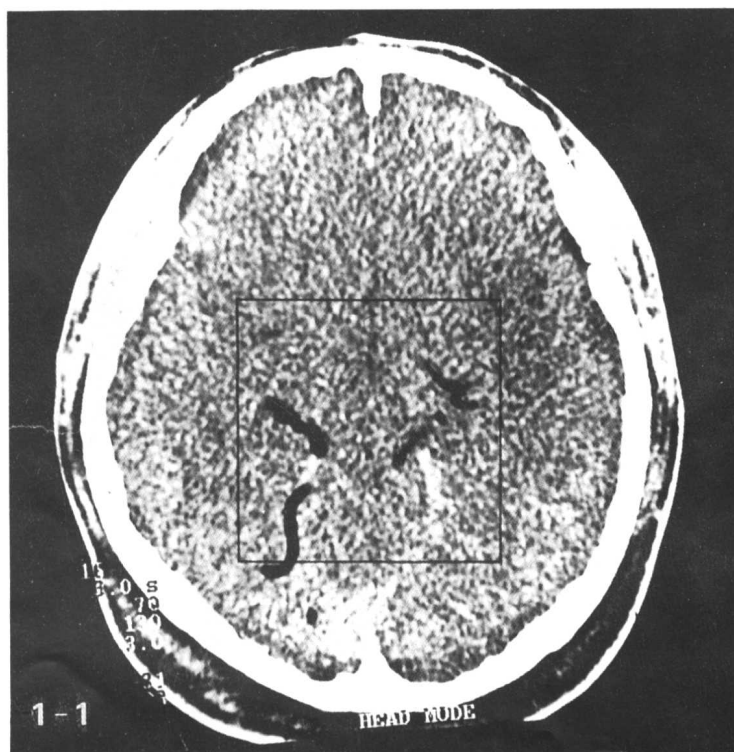
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# **第一章 蝶鞍、斜坡区**

## **PART I SELLA TURCICA AND CLIVUS REGION**

### **第一节 蝶鞍、斜坡区横断面 (图 1—1~图 1—30)**

### **Chapter 1 Transverse Sections of Sella Turcica and Clivus Region (Fig 1—1 ~ Fig 1—30)**



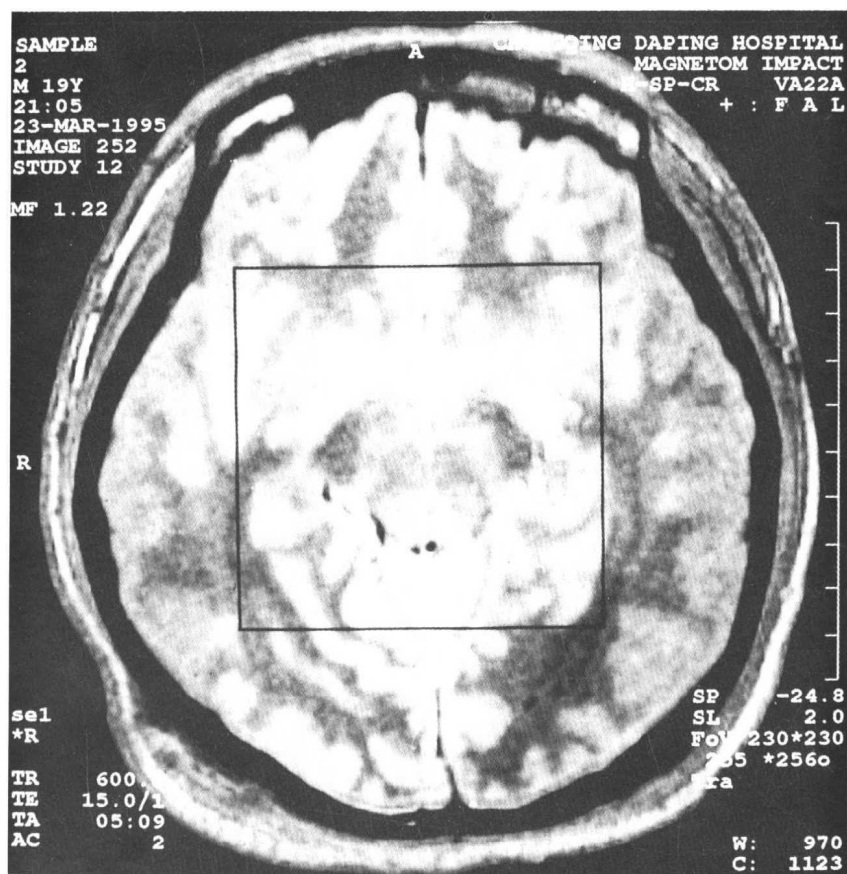


图 1-1

- |          |       |         |       |       |
|----------|-------|---------|-------|-------|
| 1. 大脑前动脉 | 2. 终板 | 3. 第三脑室 | 4. 黑质 | 5. 红核 |
| 6. 中脑水管  | 7. 小脑 | 8. 枕叶   | 9. 额叶 |       |

该断层位于毗耳线平面上方 36.0 mm, 在前联合下方。第三脑室为一前后狭长的缝隙, 其前方为终板。在中脑导水管的前外方依次可见红核和黑质。

Fig 1-1

- |                         |                      |                           |
|-------------------------|----------------------|---------------------------|
| 1. Anterior cerebral a. | 2. Lamina terminalis | 3. Third ventricle        |
| 4. Substantia nigra     | 5. Red nucleus       | 6. Mesencephalic aqueduct |
| 7. Cerebellum           | 8. Occipital lobe    | 9. Frontal lobe           |

This section, inferior to the anterior commissure, is 36.0 mm above the canthus-ear plane. The third ventricle is an anterioposteriorly oriented long narrow space and the lamina terminalis is in front of the third ventricle. The red nucleus and substantia nigra can be seen successively in the anteriolateral side of the mesencephalic aqueduct.



