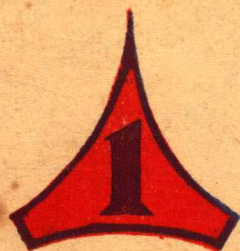


英 中 对 照 本

国外医学译丛

TRANSLATED SERIES OF
FOREIGN MEDICAL ARTICLES



1 9 8 1 年 1 月

英中对照本
国外医学译丛

下城区卫生局
浙江医科大学杭州分校 出版
浙江省杭州护士学校

1981年1月

内部发行 成本费2.00元

前 言

为适应当前科学技术现代化的发展需要, 加强科技情报交流、促进医学科研、医学英语学习活动及提高医务人员和医药院校学生的业务水平, 我们特应用英中对照的形式, 陆续编辑最新的较有价值的国外医学科技论文, 包括医学基础理论、临床各科论著报导、病例报告、新技术介绍等内容。这样既有利于学习国外医学技术, 也有利于广大医务工作者及医学生学习医学英语时作参阅。

我们在编写时虽作了一定的努力, 但限于水平与经验, 可能还存在一些缺点和错误, 我们诚恳地希望读者提出宝贵意见, 以便不断改进和提高。

在编辑过程中得到省市主要医疗单位的有关领导同志及吴燮灿、牛镛裕、张超昧、蔡钺侯、马逢顺、朱济平等专家、教授和不少具有丰富临床经验的医师热情的支持与指导。在本刊出刊中承蒙黄良夫、应文辉、高惠荣、姚新福、崔功浩等医师、讲师作了大量的组织编辑工作, 并由浙江医科大学外文教研室作了部份复审, 谨表谢忱。

杭州市下城区卫生局

浙江医科大学杭州分校

浙江省杭州护士学校

一九八〇年十二月

目 录

Surgical treatment of giant intracranial aneurysms	巨大颅内动脉瘤的外科治疗	朱济平译 应文辉 计森祥校	(1)
Microsurgical anatomy of lumbosacral spinal roots	腰骶脊神经根的显微外科解剖	韩国涛译 朱济平校	(7)
Superficial anastomoses of blood vessels in the human heart	人心浅表血管的吻合	姚新福译 俞寿民 袁锦祥校	(13)
Management of acute aortic occlusion	急性主动脉闭塞的处理	周启源译 楼逢英 孙长麟校	(17)
A new method of preclotting fabric prostheses	使用修补织物凝血的一种新方法	许复苏译 陈炳章 吴文烈校	(22)
Transcatheter arterial embolization in urological tumors: the use of isobutyl —2—cyanoacrylate	泌尿系肿瘤经导管动脉栓塞术中异丁—2—丙烯晴的应用	林肇南译 校	(26)
Technique of testicular autotransplantation using a microvascular anastomosis	应用微血管吻合合作睾丸自体移植的技术	卢良洵译 校	(32)
Acute renal failure after major surgery	大手术后急性肾功能衰竭	卢良洵译 应文辉校	(34)
The operative treatment of elbow dislocation in the adult	成人肘关节脱位的手术治疗	周炳辉 黄良夫译 周炳辉校	(37)
Aspiration of infected sacro-iliac joints	感染骶髂关节的穿刺术	黄良夫 李宝庆译 应文辉 吴文烈校	(41)
Resection of the proximal third of the femur from chondrosarcoma in a child: replacement with a metallic prosthesis	一例软骨肉瘤儿童施行股骨近1/3段切除并以金属假体置换术	李政科译 应文辉校	(45)
Spontaneous rupture of the stomach	胃的自发性破裂	应文辉译 黄良夫校	(47)
Gastric carcinoma treated by chemotherapy after resection	胃癌切除后的化学疗法	张瑞麟译 周孝增校	(51)
Parathyroid transplantation: fate of a long-term allograft in man	甲状旁腺移植: 同种异体移植的远期效果	林式炯译 周孝增校	(56)

Primary carcinoma of the gallbladder	
原发性胆囊癌	应文辉译 黄良夫校 (60)
Primary neoplasms of the small bowel	
小肠原发性肿瘤	陈群英译 林伟翰校 (68)
Cysts of the esophagus	
食道囊肿	应文辉译 校 (73)
Low anterior resection for rectal cancer	
直肠癌的低位前切除术	陈群英译 林伟翰校 (74)
Tetralogy of fallot in adults	
成人的法乐氏四联症	高惠荣译 严志焜 吴文烈校 (78)
Treatment of the patient after myocardial infarction	
心肌梗塞后患者的治疗——十年来和最近的综述	张朱甫译 张超昧 吴文烈校 (81)
New developments in ventricular tachycardia	
室性心动过速的新进展	朱毓仁译 计森祥校 (88)
Bone marrow transplantation	
骨髓移植	马逢顺译 校 (96)
Treatment of septic shock	
脓毒性休克的治疗	张国祥译 朱毓仁校 (105)
What is appropriate nonoperative treatment of acute pancreatitis?	
急性胰腺炎的非手术治疗	寿水木译 孙长麟校 (113)
Of the digoxin-diuretic cardiomyopathy	
地高辛和利尿剂所致的心肌病	周家仪译 朱伯伟校 (116)
The three syndromes of iliac osteomyelitis in children	
儿童髂骨骨髓炎的三种综合症	黄良夫译 牛镛裕校 (118)
Ectopic pregnancy: Current clinical trends	
宫外孕: 近代临床动向	周惠恩译 蔡继绍校 (125)
Abnormal fetal heart rate associated with congenital abnormalities	
和先天性异常有关的异常胎心率	应文辉译 校 (136)
Long term results of treatment of carcinoma of cervix	
宫颈癌治疗的远期效果	应文辉译 校 (136)
A case of benign intracranial hypertension in pregnancy	
妊娠期出现良性颅内高压的一例报导	应文辉译 校 (137)
Dystrophies related to the pigment epithelium	
视网膜色素上皮营养障碍性疾病	张小益译 吴燮灿校 (138)
Respiratory vasculitis	
呼吸道血管炎	王辉萼译 蔡钺候校 (156)

- Secondary angle-closure glaucoma in cicatricial
retrolental fibroplasia
疤痕性晶体后纤维增生症继发闭角型青光眼……………方 臻译 应文辉校 (166)
- The otolaryngologic presentation of myasthenia gravis
重症肌无力在耳鼻喉科的表现……………王辉萼译 蔡钺候校 (167)
- Systemic lupus erythematosus Association
with psoralen ultraviolet A treatment of psoriasis
治疗银屑病时并发系统性红斑性狼疮……………段秀麟译 应文辉校 (176)
- Mycosis fungoides with underlying epidermoid cysts
蕈样肉芽肿并发表皮样囊肿……………庄亦仁译 段秀麟校 (183)
- Hemangioma of gingiva-a case report
牙龈血管瘤一例报告……………应文辉译 校 (184)
- Aspirin-induced gastric mucosal damage in rats: cimetidine
and deglycyhrrhizinated liquorice together give greater
protection than low doses of either drug alone
在鼠内阿司匹林诱发的胃粘膜损伤: Cimetidine和D.G.L.合并用药
比小剂量的单独用药具有较大的保护作用……………应文灿译 应文辉校 (187)
- The radiologic significance of the left pulmonary ligament
右肺韧带的放射学意义—26例报告……………周伯年译 孙长麟校 (189)
- Buckling of the innominate artery simulating
a right apical lung mass
无名动脉的弯曲类似右肺尖肿物……………姜 琪译 姜树铭校 (195)
- Percutaneous transhepatic portography. 1. technique and application
经皮经肝门静脉造影—1 技术和应用……………崔功浩 许梦梨译 应文辉校 (201)
- Computer tomography of the head in children
儿童头部计算机扫描断层摄影技术部分……………金 冠译 校 (209)
- Ascending cholangitis in choledochoduodenal fistula
secondary to duodenal peptic ulcer
续发于十二指肠溃疡的胆总管十二指肠瘘所致上行性
胆管炎……………张瑞麟译 周孝增校 (115)
- Unusual smooth muscle change in the prostate
罕见的前列腺平滑肌改变……………丁育康译 卢良洄校 (219)
- Amebic liver abscess with hemobilia
阿米巴肝脓肿并发胆道出血……………应文辉译 校 (220)

Surgical treatment of giant intracranial aneurysms

BETWEEN 1961 and 1975, we have treated at our clinic 1080 cases of saccular aneurysms, of which 32 cases (3.0%) were found to have aneurysms with a maximum diameter of 2.5 cm or more, based upon findings at surgery and cerebral angiograms. In general, direct surgery on giant aneurysms is difficult, and carotid artery ligation is currently thought to be expedient, depending upon the location. At our clinic, however, we have been actively pursuing a policy of direct surgery in these cases; the rate of surgical treatment has now reached 75%. We report the symptoms, treatment, and follow-up results of these 32 patients with giant aneurysms, and the appropriateness of surgery.

Summary of Cases

Case Material

The 32 patients all harbored aneurysms of a saccular type, measuring at least 2.5 cm at their largest diameter. There were 16 males and 16 females. Their ages at the time of hospitalization ranged from 16 to 69 years, averaging 49.1 years, with a peak in the fifth decade. The average age at the onset of symptoms was 45.7 years. Initial symptoms were due to subarachnoid hemorrhage (SAH) in 23 cases (71.9%). In nine cases (28.1%) symptoms were due to the aneurysm itself, leading to pressure phenomena in eight cases (including diplopia, eyelid ptosis, and visual acuity and visual field impairments); in the ninth case, hypopituitarism was found. On admission, 26 patients had SAH, and 21 patients had pressure phenomena; all of the latter patients presented some sort of ocular symptoms as well. Details of the symptoms are presented at Table 1. The locations of the aneurysms were as follows: the internal carotid artery in 15 cases (including seven cases of infraclinoid aneurysms, some intracavernous); the anterior communicating artery in nine; the basilar artery in four; the middle cerebral artery in three; and the anterior cerebral artery in one. Two patients with anterior communicating artery aneurysms and one with an anterior cerebral artery giant aneurysm had multiple aneurysms.

Treatment

Surgical treatment was undertaken in 28 cases (87.5%), 24 (75%) by direct operation and four (12.5%) by common carotid ligation. Conservative therapy was instituted in four cases. Direct surgery was applied whenever possible on all aneurysms except those on the infraclinoid portion of the internal carotid artery. Neck ligation and clipping were performed in 12 cases, excisions in 10 cases, and trapping in two cases. Ligation and clipping were performed primarily on aneurysms of the internal carotid arteries, and excision in most cases of anterior communicating artery aneurysms and basilar aneurysms. Of the four cases treated conservatively, one patient had a basilar artery aneurysm which consequently disappeared, and three had internal carotid artery aneurysms, two of which were of the infraclinoid portion.

Direct surgery was carried out under hypothermic anesthesia or under the administration of 500 to 1000 cc of 20% mannitol with normothermic, normotensive anesthesia for prolongation of the permissible occlusion time of cerebral arteries. Treatment of the aneurysm neck was accomplished during temporary occlusion of afferent arteries.

Surgical exposure was planned to visualize and identify the afferent and efferent arteries. For aneurysms of the anterior communicating artery,

TABLE 1

Presenting symptoms and signs of giant aneurysms*

Site of Aneurysm	SAH		Local Pressure Phenomenon		Cranial Nerve Palsy							Cereb-Hypotellar pitui- Signs	Visual Field Deficits	Motor Deficits
	Yes	No	Yes	No	I	II	IV	V	VI	VII	VIII			
ICA (15 cases)	11	4	7	4	2	5	1	1	1	0	0	1	1	2
ACoA (9 cases)	7	2	4	3	2	4	1	0	3	0	0	1	1	1
basilar (4 cases)	4	0	4	2	1	3	1	1	0	1	0	1	1	1
MCA (3 cases)	3	0		3										1
ACA (1 case)	1	0		1										
total	26	6	21	11	11	12	3	2	4	1	1	1	5	4

*SAH = subarachnoid hemorrhage; ICA = internal carotid artery; ACoA = anterior communicating artery; MCA = middle cerebral artery; ACA = anterior cerebral artery.

bilateral frontal craniotomy was employed. The subtemporal approach using a keel-form incision in the temporal region has been used for aneurysms of the terminal portion of the basilar artery, and special care was taken with regard to compression of the temporal lobe. In this type of case, temporary occlusion of the basilar artery was performed for an extended period, so the patient's age, and the degree of arteriosclerotic change and its relation to blood flow had to be considered in determining the applicability of surgery.

Since giant aneurysms are characteristically mass lesions, extirpation subsequent to neck treatment was generally our first choice. However, in cases of broadnecked aneurysms, partial ligation and clipping followed by muscle wrapping were sometimes necessary to prevent kinking. In cases where severe arteriosclerotic changes were found in the parent artery, carotid ligation was undertaken to avoid vessel obstruction due to the kinking or release of an atheromatous plaque caused by occlusion of the neck.

TABLE 2

Operative procedures and results on discharge

Procedure	No. of Cases	Results			
		Excel- lent	Good	Fair	Poor Dead*
clipping & ligation	12	5	3	1	2
excision	10	1	3	2	1
trapping	2	0	0	0	2
total	24	6	6	3	5

*Operative mortality: 20.8%.

Results of Treatment

The results of direct surgery at discharge in the 24 cases showed: six excellent results, six good, three fair, and four poor; five patients died, a mortality rate of 20.8%. The morbidity rate (poor cases and deaths) amounted to 37.5% (Tables 2 and 3).

Except for one patient who was operated on while in a coma, death during hospitalization was due to problems with the treatment of the aneurysm neck. Two deaths followed kinking of the internal carotid artery after ligation; one patient with a broad-necked aneurysm died from edema following trapping of the internal carotid artery. The remaining patient died after an extirpation procedure in which treatment of the aneurysm neck was incomplete and hemorrhage occurred postoperatively.

Of the four poor results, three patients had basilar artery aneurysms and developed hemiparesis postoperatively, and two of them also showed psychiatric disturbances. The fourth patient with a poor result had an aneurysm of the middle cerebral artery and developed an obstruction of the artery peripheral to the site of the aneurysm after excision.

Follow-up study ranging from 6 months to 12 years revealed a general tendency of improvement. The one death occurring during the follow-up study was attributed to pneumonia. Results at discharge and on follow-up study according to the sites of the aneurysms are presented in Tables 3 and 4.

Of the four cases treated conservatively, three patients had internal carotid artery aneurysms, two of which were of the infraclinoid portion. One patient died of hemorrhage during hospitalization, one had diplopia as the only deficit 2 years after rupture, and one patient with supraclinoidal aneurysm was hospitalized in a comatose state and died shortly thereafter. The remaining case had a giant ruptured basilar artery aneurysm, 4.9 cm in diameter, but after 16 months angiograms revealed that it had disappeared.

TABLE 3

Sites and results of direct operation on discharge

Site	No. of Cases	Results				
		Excellent	Good	Fair	Poor	Dead
ACoA, ACA	10	2	5	2	0	1
ICA	8	4	0	1	0	3
MCA	3	0	1	0	1	1
BA	3	0	0	0	3	0
total	24	6	6	3	4	5

Discussion

Reports of giant aneurysms, including discussions of size, symptoms, and angiographic features, are frequently seen in the literature, but the precise definition of the size of giant aneurysms has not yet been decided. In the cooperative study reported by Locksley and the report of Morley and Barr, aneurysms were defined as giant when the largest diameter was 2.5 cm or more. According to Morley, the incidence of giant aneurysms was 4.2% (28 giant aneurysms among 658 aneurysm cases). In our institute, we have found an incidence of 3% (32 giant aneurysms among 1080 cases). It is generally believed that giant aneurysms are more frequently found in women, but in our series we found equal numbers of male and female patients. We found considerable differences in aneurysm location; of the 15 internal

carotid aneurysms, two were found in males and 13 in females, but of the nine patients with anterior communicating artery aneurysms, all were male. Although it is thought that giant aneurysms are numerous in patients over 50 years of age, we found a peak in the fourth and fifth decades with a distribution similar to that of normal aneurysms.

Giant aneurysms, as distinctive space-occupying lesions, induce pressure symptoms other than SAH, but are sometimes mistaken for brain tumors such as parasellar, pituitary, and posterior fossa tumors. The incidence of pressure symptoms is high according to Morley and Barr (24 out of 28 cases). On the other hand, rupture of giant aneurysms is generally thought to be rare since calcifications are relatively frequent and laminated thrombi protect against rupture. Morley and Barr reported that eight of 28 such cases bled (one of 11 intracavernous cases and seven of 17 extracavernous cases). Bull also reported a low incidence of hemorrhage with only six hemorrhages in 22 cases. Nonetheless, Morley and Barr emphasized that, in contrast to

TABLE 4
Follow-up results of operation on giant aneurysms

Site*	No. of Cases	Results					
		Excel- lent	Good	Fair	poor	Dead	Un- known
ACoA,							
ACA	9	5	3	0	0	0	1
ICA	5	4	0	0	0	1	0
MCA	2	0	1	1	0	0	0
BA	3	1	0	0	1	0	1
total	19	10	4	1	1	1	2

*ACoA = anterior communicating artery; ACA = anterior cerebral artery; ICA = internal carotid artery; MCA = middle cerebral artery; BA = basilar artery.

intracavernous cases, there is a danger of hemorrhage in extracavernous cases, even in giant aneurysms. We have found a high incidence of hemorrhage (81.3%). Furthermore, a detailed study of their medical histories indicated that in 15 of the 26 rupture cases, patients experienced two or more hemorrhages over an extended period of years. Pressure symptoms, normally preceding those of hemorrhage itself, present opportunities for early discovery, and thus may give the impression of a low incidence of hemorrhage. Besides hemorrhage, death can be caused by increased intracranial pressure manifested by symptoms relating to declining visual acuity, psychiatric disturbance, the lower cranial nerve, and brain-stem pressure.

The prognosis of conservative treatment for extracavernous giant aneurysms is clearly poor considering the effects of pressure symptoms and the fact that, although giant aneurysms are not thought to rupture easily, hemorrhage has occurred unexpectedly often. Finally, since most reports of death due to hemorrhage have mentioned the existence of laminated thrombi, and since Taveras and Wood have reported a patient whose death may have been caused by hemorrhage from a calcified aneurysm, the view that aneurysms that have formed a thrombus or have calcified do not hemorrhage is not entirely correct. We feel that there is a danger of rupture and recommend

radical surgery whenever possible for cases of extracavernous giant aneurysms.

Conclusions

Except for, giant aneurysms of the infraclinoid region and those on the basilar artery, we believe that safe, effective treatment of intracranial giant aneurysms can be obtained by exposing and treating the aneurysm neck during temporary occlusion of the afferent arteries under the administration of 500 to 1000 cc of 20% mannitol with normotensive, normothermic anesthesia. Radical surgery is recommended whenever possible.

巨大颅内动脉瘤的外科治疗

1961至1975年,经我们临床治疗1080例囊状动脉瘤病人,其中32例(3.0%)根据手术和脑血管造影的发现,动脉瘤的最大直径在2.5厘米或2.5厘米以上。一般而言,对巨大动脉瘤施行直接手术是困难的,而依据解剖部位施行颈动脉结扎通常认为是一种简便的方法。但我们在临床工作中,对这些巨大动脉瘤的处理是积极采取直接手术治疗的方针,目前外科手术的治疗率已达到75%。为此本文报导该32例巨大动脉瘤患者的症状,治疗和随访结果及手术治疗的合理性。

病例摘要

资料

32例均为隐匿性囊状型动脉瘤,瘤的最大直径至少有2.5厘米。男性和女性各16例。患者住院时的年龄从16至69岁不等,平均年龄49.1岁,51至60岁是发病年龄的高峰。初发症状的平均年龄为45.7岁。在23例(71.9%)中最初症状是由蛛网膜下腔出血(SAH)引起。有9例(28.1%)由于动脉瘤本身而产生症状,其中8例引起压迫现象(包括复视,上睑下垂,视敏度降低和视野缺损);第9例病人发现垂体功能减退。入院时26例有蛛网膜下腔出血;21例有压迫现象,并均出现某种类型的视觉症状。症状的详细描述见表1。动脉瘤的位置分布如下:位于颈内动脉的15例(包括床突下动脉瘤7例;有一些位于海绵窦内);前交通动脉9例;基底动脉4例;大脑中动脉3例和大脑前动脉1例。两例前交通动脉动脉瘤和一例大脑前动脉巨大动脉瘤均有多发性动脉瘤存在。

治疗

28例(87.5%)进行外科治疗,24例(75%)施行直接手术疗法,4例(12.5%)采用颈总动脉结扎。保守治疗的有4例。直接手术治疗除了那些位于颈内动脉床突下部的动脉瘤外,对所有动脉瘤不论何时只要条件允许均可施行。12例行颈部结扎和钳闭法,10例行截除法,2例用圈套夹闭法。对颈内动脉的动脉瘤最初均施行结扎和钳闭法,前交通动脉和基底动脉的大多数动脉瘤行截除法。行保守治疗的4例中,1例基底动脉动脉瘤因而消失不见,另3例为颈内动脉动脉瘤,其中2例为颈内动脉床突下动脉瘤。

直接手术在低温麻醉或常温正压麻醉和输入20%甘露醇500至1000毫升的条件下进行,从而延长大脑动脉可允许的阻断时间。在输入动脉短暂的阻断时间内完成动脉瘤的颈部处理。

手术暴露是设法显现和辨明输入和输出的动脉。对前交通动脉动脉瘤,使用双额部开颅术。对基底动脉终末端的动脉瘤,在颞区采用船形切口颞下入路,但应特别注意颞叶的受压。在这类病例中,进行基底动脉短暂的阻断术要稍长的时间,所以在确定手术是否适用时,应考虑患者的年龄和动脉硬化性病变的程度以及和血流的关系。

由于巨大动脉瘤是以团块状损害为特征,故先处理瘤颈后再摘除动脉瘤是我们常用的首选方法。但对一些阔颈动脉瘤的病例,为了防止扭结,有时必要在用肌肉包裹后再施行部分结扎和钳夹。在起源动脉发现有严重动脉硬化性病变的一些病例,施行颈动脉结扎以避免由于扭结或由于颈部闭塞引起的动脉粥样硬化斑脱落所致的血管阻塞。

治疗结果

24名出院病例的直接手术治疗结果为:6例优良,6例良好,3例中等,4例不良;5例死亡。死亡率为20.8%。发病率(疗效差和死亡的病例)总计为37.5%(见表2和表3)。

除一例患者在昏迷状态下手术由于动脉瘤颈处理的问题在住院期内死亡外,两例因在结扎后引起颈内动脉扭结而死亡;一例阔颈动脉瘤因圈套夹闭颈内动脉后引起脑水肿而死亡。余下一例因在摘除动脉瘤过程中处理瘤颈不完全和发生术后出血而死亡。

四例疗效差的病例,3例为基底动脉瘤并在术后发生轻瘫,其中2例还出现精神性紊乱。第4例为大脑中动脉动脉瘤患者,在动脉瘤摘除后发生瘤周围的动脉阻塞。

经6个月至12年的随访,表明有普遍改善趋向。1例在随访期内患肺炎死亡。各种不同部位动脉瘤出院时的疗效和随访结果见表3和表4。

保守治疗的四例病人,3例为颈内动脉瘤,其中2例位为床突下部动脉瘤。1例在住院期内因出血死亡。1例在瘤破裂后不到两年出现复视,1例床突上动脉瘤住院期处于昏迷状态并在短期内死亡,余下1例为巨大而破裂的基底动脉瘤,其直径有4.9厘米,但在16个月作脑血管造影显示动脉瘤消失。

讨 论

关于巨大动脉瘤的报导,包括瘤的大小、症状和脑血管造影特征,经常可在文献中见到,但对巨大动脉瘤大小的确切定义至今尚未明确。在Locksly报导的协作研究及Morley和Barr的报导中,均明确规定当最大直径在2.5厘米以上者即为巨大动脉瘤。根据Morley的资料,巨大动脉瘤的发病率为4.2%(658例动脉瘤中有巨大动脉瘤28例)。本研究所发现巨大动脉瘤的发病率为3%(1080例中有32例)。一般认为巨大动脉瘤在妇女中更为常见,但本组发现男性和女性患者相等。我们还发现动脉瘤的位置有很大差异:在15例颈内动脉瘤病人中,2例为男性,13例为女性;但9例前交通动脉动脉瘤病人却均为男性。虽然一般认为巨大动脉瘤病人的年龄大多数在50岁以上,但我们发现41~50岁和51~60岁是发病年龄的高峰,这和一般动脉瘤发病的年龄分布相似。

巨大动脉瘤作为特殊的占位性病变可引起压迫症状而不是蛛网膜下腔出血。但有时

被误诊为诸如蝶鞍旁、脑垂体和后颅窝的脑肿瘤。根据 Morley 和 Barr 的资料,压迫症状的发生率是很高的(28例中出现24例)。另一方面,巨大动脉瘤的破裂,一般认为是较少发生的,这是由于钙盐沉积相对较常见以及形成薄片的凝血酶可以保护动脉瘤以防破裂。Morley 和 Barr 报导28例这样的病例中有8例出血(11例海绵窦内有1例和17例海绵窦外中有7例)。Bull 也报导出血率较低,在22例中仅6例出血。然而, Morley 和 Barr 强调指出,对照海绵窦内动脉瘤病人,海绵窦外的动脉瘤,即使是巨大的动脉瘤也存在出血的危险性。我们发现的出血发病率是高的(81.3%),而且对他们内科病史的详细研究表明,26例瘤破裂中有15例患者在持续数年的时间内已经历两次或两次以上的出血。压迫症状,通常出现在出血症状之前,给早期发现提供了机会,所以可获得一个出血率低的印象。颅内压增高除引起出血外,还可导致死亡,它表现为与视敏度降低、精神性紊乱、低位颅神经和脑干受压有关的症状。

鉴于考虑到压迫症状的后果以及虽然巨大动脉瘤被认为是不易发生破裂的,但出血却意外地多这一事实,所以海绵窦外的巨大动脉瘤行保守疗法的预后是很差的。最后,由于大多数的关于出血引起死亡的报导都提及形成薄片的凝血酶以及由于 Taveras 和 Wood 报导一例,其死亡原因可能由一个已钙化的动脉瘤破裂出血所致,因此认为已形成血栓或已钙化的动脉瘤不会出血的观点是不完全正确的。我们认为巨大动脉瘤有破裂的危险性,因而建议对海绵窦外的巨大动脉瘤的病人只要条件允可均应施行根治性手术。

结 论

除了位于床突下部和基底动脉的巨大动脉瘤外,我们认为对颅内巨大动脉瘤的治疗,只要在常温正压麻醉下给输入20%甘露醇500至1000毫升,并在良好暴露和对输入动脉采取短暂阻断的条件下处理好动脉瘤颈,就可得到安全和有效的治疗结果。因此建议只要条件允可均应施行外科根治性手术。

〔外科主任 朱济平译自 Journal of Neurosurgery 51(1):33,

1979, 外文教研室主任 计森祥 外科医师 应文辉校〕

Microsurgical anatomy of lumbosacral spinal roots

THE theoretical pattern of innervation of the peripheral nervous system often does not correspond with data obtained from clinical observation of neurosurgical patients. In effect, selective section of an anterior or posterior spinal root frequently results in different neurological deficits. Although variations from the "normal" dermatome pattern may be explained by variation in makeup of the plexuses and by peripheral nerve overlap, other anatomical factors of variability must be sought.

Some authors have noted the importance of intersegmental anastomoses existing between the posterior spinal roots, and have emphasized their role in the results of posterior rhizotomy for the relief of pain. These anatomical variations have been mentioned only infrequently, or have been described insufficiently in the literature. Only some specific studies give

an accurate description of the anastomoses between posterior roots. Our observations concern the lumbosacral spinal roots, including the anastomoses between the anterior roots, and their real incidence.

Materials and Methods

Dissection of 30 human spinal cords and the corresponding spinal roots was performed at autopsy. The lower part of the spinal cord comprising the anterior and posterior lumbosacral roots was removed by a low-thoracic section and by cutting the spinal roots near the foramina intervertebralis. In order to facilitate the subsequent identification of the roots in the cauda the L-5 root was ligated.

There were no anomalies of the bone in the lumbosacral vertebral segments. After fixation, the anatomic preparation was stripped of the dural and arachnoidal sheaths and placed under the dissecting microscope for observation (Fig. 1). We studied the following structural and topographic aspects of the L1-S5 roots: 1) the longitudinal extent of the medullary segment of origin of each root; 2) the morphological features of the root-spinal cord junction; and 3) the intrathecal anastomoses between the anterior roots and between the posterior roots.

Observations

Longitudinal Extent of Medullary Segment of Origin

The inferior lumbar and sacral roots, both anterior and posterior, are so crowded that it is usually very difficult to determine with the naked eye the segment of origin of a single root. With the dissecting microscope we found the average lengths of the spinal segments of origin of the L1-S1 posterior roots (Tables 1 and 2). These values are in accord with data published by Yamada, et al. who limited their observations to the L1-S1 posterior roots. Our values show considerable variation from one case to another. One reason for this variation is the different heights of the examined subjects; however, it may also be related to the difficulty, particularly in the sacral area, in separating each root from the adjacent ones, and in attributing the roots placed in the middle of two spinal cord segments to one level or another. For example, note that in Fig. 2 an important component of the S-2 right posterior root arises from a medullary segment which, on observing the root-spinal cord junction, seems to belong to S-3. In Fig. 3, a posterior root apparently arises from the medulla exactly in the middle of two adjacent spinal cord segments, and after running for a few millimeters divides in a Y, sending one of its components to the root below and one to the root above. The occurrence of anatomical variations like these suggests that the spinal cord is made by a series of neuromeres overlapping to some extent, and spinal segmentation is only a convenient concept.

Morphological Features of Root-Spinal Cord Junction

The morphological features of the root-spinal cord junction, the number, the diameter, and the penetration pattern of the rootlets in the medulla, are different for each medullary segment.

Superior Lumbar Roots. In the anterior roots at L1-3, the penetration pattern is more frequently filiform, and the number of rootlets making a root varies from two to nine. Their diameter is always less than 0.5 mm. With the posterior roots at L1-3, the filiform type is predominant. The number of rootlets is between four and 12; their caliber is always less than 0.5 mm.

Lumbosacral Roots. In the anterior roots at L4-S3, the most frequent

pattern of rootlets is cylindrical, but particularly at S1-2 it is possible to make out some ribbon-like types and at L-4 some filiform types. The diameter of the rootlets is most commonly between 0.5 and 1 mm, and their number varies from two to six. It is possible to have up to 11 rootlets if their caliber is less than or about 0.5 mm. In the posterior roots at this level, the most frequent type of rootlet is cylindrical; however, particularly in the S1-2 roots, ribbon-like rootlets are also frequently seen. Often the rootlets have

TABLE 1
Distribution of posterior cord segments by length
in each of 30 cases (both sides)

Segment Length (mm)	Cord Segment									
	L-1	L-2	L-3	L-4	L-5	S-1	S-2	S-3	S-4	S-5
16-16.5	1	3								
15-15.5	8	3	2	1						
14-14.5	13	5	1							
13-13.5	8	5	5	1		1				
12-12.5	11	11	5	6			1		1	
11-11.5	6	16	7	4		1				
10-10.5	7	11	20	8	7	1	1	2	2	1
9-9.5	4	4	12	16	12	5	2	1	1	1
8-8.5	1	1	5	17	13	17	13	5	3	1
7-7.5	1	1	2	6	21	14	19	15	7	3
6-6.5			1		5	18	20	24	13	8
5-5.5				1	2	3	3	9	22	15
4-4.5							1	3	7	21
3-3.5								1	2	10
mean	12.5	11.5	10.4	9.5	7.9	7	6.8	6.2	5.2	4.2

a caliber greater than 1 mm, with three to four to each root, or if they are between 0.5 and 1 mm in size, there may be four to six rootlets to each root. Inferior Sacral Roots. The anterior roots at S4-5 have a filiform pattern. The number of rootlets, which are of very small diameter, varies from two to four. The pattern of the posterior roots is cylindrical and filiform. The radicles, of very small diameter (always less than 0.5 mm), are between two and six in number.

Intrathecal Anastomoses between Roots.

Anastomotic connections were found in all cases examined, and usually consisted of small-caliber rootlets connecting the spinal roots of adjacent segments. In the 30 examined spinal cords the total number of anastomoses was 221, out of a possible maximum of 1080 anastomoses at lumbar and sacral roots of both sides, an incidence of 20.5%. This frequency rises to 30% if anastomoses between posterior roots only are considered, but is 11% for the anastomoses between the anterior roots.

TABLE 2
Distribution of anterior cord segments by length
in each of 30 cases(both sides)

Segment Length (mm)	Cord Segment									
	L-1	L-2	L-3	L-4	L-5	L-1	L-2	L-3	L-4	L-5
15-15.5	4	8	1	2	1					
14-14.5	6	8	2	2						
13-13.5	13	5	5	1	1					
12-12.5	14	11	7	4			1			
11-11.5	8	9	5	4	1	1				
10-10.5	5	10	17	13	7	1	1		2	
9-9.5	4	5	13	11	7	3	1	1		
8-8.5	6	2	8	17	11	13	10	1	1	1
7-7.5		1	1	6	18	19	12	6	13	1
6-6.5		1	1		10	18	28	20	6	1
5-5.5					3	3	5	24	20	12
4-4.5						2	1	6	9	19
3-3.5							1	2	1	21
2-2.5										5
mean	12	11.8	10.4	9.6	7.9	7	6.7	5.6	4.7	3.8

Table 3 shows the distribution frequency of anastomoses for each segment of the spinal cord. Pallie's finding¹ that anastomoses are more numerous in the lumbar than in the sacral region is not confirmed by these data, which show a greater incidence of anastomoses between the sacral roots.

In most cases, anastomotic rootlets are less than 0.5mm in diameter, but it is possible to find anastomoses of greater caliber. Most frequently, anastomoses appear to originate from the ganglion of a posterior root and enter the cord with the fibers of the adjacent rostral root or, less frequently, the caudal root. In 65% of cases, the anastomotic connections are found within 1 to 2 cm from the spinal cord. They are localized among the roots of the cauda equina in 24% of cases, and more peripherally or close to the ganglion in 11% of cases (Fig. 4). More frequently, the anastomoses are simple rami running to join adjacent roots. Less commonly, plexiform or other types of interconnecting patterns are found (Fig. 5 left). Anastomoses may appear in parallel pairs (Fig. 5 right), or intersect in an X pattern (Fig. 6). They can originate from the division of a single rootlet or of a group of very thin rootlets.

Discussion

The clinical experiences reported by Schwartz² show the surgical importance of the anastomoses when performing a posterior rhizotomy. According to White and Sweet,³ pain appears to follow the "all or none" law; unless all of its afferent paths are cut, it is still felt with undiminished intensity.

TABLE 3

Number of anastomotic connections between posterior roots
and between anterior roots for each cord segment

No. of Anastomoses	Cord Segments								
	L1-2	L2-3	L3-4	L4-5	L5-S1	S1-2	S2-3	S3-4	L4-5
between posterior roots	1	3	4	10	19	30	37	32	26
between anterior roots	—	—	2	8	5	11	13	9	11

Therefore attention must be paid to the role that intersegmental anastomoses may play in delieating the peripheral dermatome area subversed. In view of the extreme variability of anastomotic rami, and their shape and position, a rhizotomy performed at the root-spinal cord junction or extradurally may fail to denervate an area. It is advisable to isolate the root that must be cut along its entire subarachnoidal course, "which means a more extensive exposure than generally practised," to interrupt any anastomoses that may exist.

腰骶脊神经根的显微外科解剖

从神经外科病人临床观察所获得的资料与周围神经系统神经分布的理论模式往往并不一致。事实上，对脊神经前后根的选择性切除经常导致各种不同的神经功能缺失。虽然“正常”皮区（后根感觉纤维的分布区）模式的差异可以用神经丛构成的差异和周围神经的重叠来解释，但是必须寻找形成差异的其它解剖因素。

某些作者指出了在脊髓后根之间的节段间吻合的重要意义，并强调了其施行后根切除术止痛疗效方面的作用。这些解剖学的变异很少被提及，在文献上也描述得不多。只有一些专门的研究，对后根之间的吻合作了精确的描述。我们的观察涉及到腰骶脊神经根，包括前根之间的吻合，和它们确实的发生率。

材 料 和 方 法

在30例尸体上进行了脊髓和相应脊神经根的解剖。通过切开后胸髓和切断与椎间孔接近的脊神经根，取下包含腰骶脊神经前后根的下段脊髓。为使其随后易于鉴别尾部的