Congress reports

International Symposium on Surgery for Cerebral Stroke

Sendai, Japan, May 24-27, 1987

The International symposium on Surgery for Cerebral Stroke was held in Sendai, Japan, on May 24 to 27 1987. This symposium was the first of its kind and was organised and chaired by Professor Jiro Susuki, neurosurgeon. One thousand specialists in vascular diseases of the brain and spinal cord were present in Sendai, one third coming from the western world; 242 papers were presented and 40 round table discussions were organized around special guest lecturers. Advances in neurosurgery and recent developments in surgical neuroradiology were discussed, 14 special lectures covered the state of the art of surgical treatment of vascular diseases of the central nervous system. During this symposium some papers dealing with anatomy were presented. The abstracts are reproduced by permission of Professor J Susuki.

P Lasjaunias

The presence and absence of vasa vasorum

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Arteries and arterioles, with wall sizes of less than 0.5 mm in diameter, have been found to have a vasa vasorum located on the adventitial and sternal layers of the vessel. Controversy has occurred regarding the presence and/or absence of these structures of the arteries of the brain. To further investigate this occurrence of vasa vasorum, twenty superficial temporal arteries (STA), and eight middle cerebral arteries (MCA) were obtained at extracranial-intracranial (EC-IC) bypass, prepared for light microscopy, stained for collagen and endothelial cells, and transmission electron microscopy. Vasa vasorum were present in all STA segments, and were not seen in MCA segments, although there were fenestrations or stoma (7-9μ) in the outer adventitial layers of the MCA segments. These ellipsoid stomata are regularly distributed in slit-like arrangements, in contact with the CSF. The vasa vasorum may play a part in physiopathological association with increased intracranial pressure, inflammation, subarachnoid hemorrhage following aneurysms, and AV vasa vasorum and vessel nourishment.

Microsurgical anatomy of the lenticulostriate system from the middle cerebral artery to its terminal supply and its surgical reconstruction

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The importance of the lenticulostriate arterial system is cerebral ischemia, intracerebral hemorrhage, AV- and aneurysm surgery requires a thorough understanding of its anatomy. 73% lenticulostriate arteries (LSA) or perforating branches (PFB's) from 29 unfixed human brains (58 hemispheres) were injected with polyester resin and studied. The following parameters were evaluated: outer diameter (OD), site of origin, branching patterns, length, and their pattern of distribution in the anterior perforated substance (APS). 12% (91 vessels) of the PFB's originated from A-1 through the short central artery (ShCA) and 9% (69 vessels) from the Recurrent Artery of Heubner (RAH) both forming the medial group of PFB's. 79% (613 vessels) of the PFB's originated from the middle cerebral artery (MCA). Almost all of these PFB's formed the lateral and intermediate group of perforators. 42% of these PFB's formed the lateral group, most of which arose as single arteries while the remainder came from common stems. In the intermediate group most (72%) of the PFB's arose from common stems.

<table>
<thead>
<tr>
<th>Branch Site</th>
<th>Mean OD</th>
<th>Mean Length</th>
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</thead>
<tbody>
<tr>
<td>Medial Group</td>
<td>0.52 mm</td>
<td>17.8 mm</td>
</tr>
<tr>
<td>Intermediate Group</td>
<td>0.62</td>
<td>11.2</td>
</tr>
<tr>
<td>Lateral Group</td>
<td>1.0</td>
<td>15.4</td>
</tr>
<tr>
<td>Medial Group</td>
<td>0.94</td>
<td>9.4</td>
</tr>
<tr>
<td>Intermediate &amp; Lateral Group</td>
<td>1.1</td>
<td>1.2</td>
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Surgical microanatomy of the anterior clinoid process region

M Dujovny, JT Ausems, FG Diaz, SK Berman, F Holzer, HK Mirchandani, Department of Neurological Surgery, Henry Ford Hospital, Detroit, Michigan, U.S.A.

Seventy anterior clinoid process regions obtained from routine autopsy were studied by microdissection after the injection of the carotid arteries of 40 of them with tinted polyester resin. The remaining 30 were studied with injection of silicone compound for microdissection of coronal, sagittal and axial sections following decalcification. The anterior clinoid process varied in size and shape and was often asymmetrical on both sides. It had a coronal diameter of 7.9 ± 2.00 mm (range 4-15 mm), a vertical diameter of 4.3 ± 0.8 mm (range 3-6 mm), and a sagittal diameter of 8.0 ± 1.6 mm (range 4-11 mm). It was separated from the posterior clinoid process by a distance of 1.5-14 (mean 6.7 ± 3.1) mm. The optic nerve and chiasm and the internal carotid artery, together with the ophthalmic and superior hypophyseal arteries are medial relations while the cranial nerves III, IV, V and VI are inferolateral to it. Our study suggests that the anterior clinoid process may be visualized by bony fusion with the posterior clinoid process (78%). The use of the anterior clinoid to classify aneurysms of the internal carotid into supraclinoid and infraclinoid may not always be reliable.

Importance of perforating branches in surgery of basilar artery aneurysm ---microsurgical anatomy of the posterior communicating and proximal posterior cerebral arteries (P-1)---

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In order to improve surgical outcome of basilar artery aneurysms, it is important to have precise knowledge about topographical vascular anatomy around the basilar artery bifurcation with special reference to the posterior communicating artery (POCA), proximal posterior cerebral artery (P-1), and their perforating branches. Forty hemispheres taken from cadavers were used and these vessels were examined under the operative microscope. Special attention was paid to the number, diameter, site of origin and termination of the perforating arteries. The optico-carotid space, through which the basilar artery aneurysms is occasionally approached, was also studied. Results: The average number of arteries arising from P-1 was 3 ± 1 with the average diameter of 0.46 mm. The perforating arteries arose mainly from the superior or posterior aspect of the P-1. The average number of branches from the POCA was 8.6 with the average diameter of 0.25 mm. Among them, 5 ranched terminated in the premamillary area, and 1.9 in the posterior perforated substance. Clinical implications of the results in an actual approach to the basilar bifurcation aneurysm will be discussed.

Double middle cerebral artery associated with "unilateral" Moyamoya disease

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Double middle cerebral artery is a rare anomalous vessel originating from the distal portion of the internal cerebral artery. Moyamoya disease is known to show occlusive process of the supraclinoid portion of the internal carotid artery. To our knowledge, only two cases with Moyamoya disease associated with double middle cerebral artery which may serve as a collateral channel have been reported. The purpose of this paper is to discuss the unusual vascular anomaly. A 9 year-old boy presented with sudden onset of transient hemiparesis and numbness on the left limbs during hyperventilation. EEG showed rebuilt-up phenomenon after hyperventilation in the right fronto-temporal region. The right carotid angiography showed a "rete mirabile" in the basal ganglia, and complete occlusion of C-1 portion of the internal carotid artery and proximal portion of the M-1. The distal M-1 and M-2 were opacified through double middle cerebral artery branching from C-1 in a retrograde fashion. The rCBF study with 133 Xe inhalation method demonstrated a decrease in blood flow in the right hemisphere (77 ml/100g/min) compared with that in the contralateral hemisphere (82 ml/100g/min). The ischemic symptoms of the present case could have been more augmented without collateral blood supply through the double middle cerebral artery.

Anatomy of the cavernous sinus and dural AM

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Anatomy of the cavernous sinus is in question even in the standard textbooks of anatomy and neurosurgery. The cavernous sinuses are situated at the complicated skull base and it is difficult to evaluate the detailed anatomy. Furthermore, the difference of methodology may result in different findings concerning of the cavernous sinus. If definite normal variations of this sinus could be clarified, the etiology of dural AM around the cavernous sinus and how to treat thin disease could be ascertainment. Materials were taken from autopsy cadavers. Tissue blocks including cavernous sinuses on both sides were fixed with 10 % formalin solution, and decalcified with 10 % formic acid solution. After dehydration with ethanol and celloidin embedding, these blocks were sectioned serially. These sections were stained by H-E, Zn stain and Bielschowsky's silver impregnation and analyzed microscopically and three-dimensionally by the computed system "Cosmozone 2C". Some adult cavernous sinuses were traversed by a few thin trabeculae while cavernous sinuses of dural AM and fetus had very thick trabeculae and were divided into many small portions of venous sinuses. Some cavernous sinuses of normal adult had thick trabeculae which were composed largely of fatty tissue. Trabeculae of dural AM and fetus were composed of connective tissue without fatty tissue. Trabeculae of fetal cavernous sinus include mesenchymal connective tissue which can develop into various interstitial tissues including vessels. This tissue may develop into abnormal vessels of dural AM.