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ENDOSCOPIC ANATOMY OF THE SYLVIAN FISSURE

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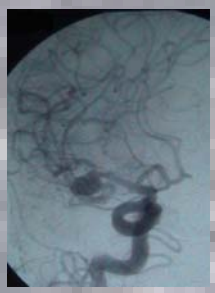
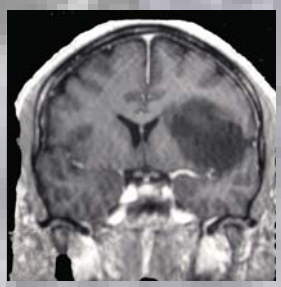
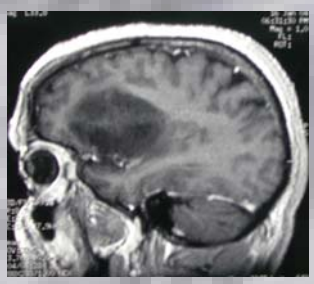
Background

The flourish of application of endoscopic techniques, in an effort to reduce brain retraction, vessels and nerves manipulation and dura and bone resection, need to be guided by a thorough knowledge of the endoscopic anatomy of cerebral spaces and by familiarity with endoscope-assisted surgical maneuvers.

The sylvian fissure (SF) is often involved in pathologic processes and is a privileged site where the endoscope may be used.

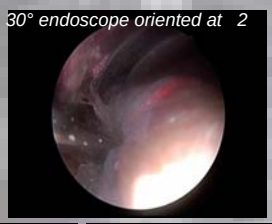






Aim and Methods

At the Institute of Anatomy of the University of Vienna 22 sylvian fissures from 11 cadaver heads, 3 fresh and 8 formalin-fixed, with arteries injected with red silicone through internal carotid and vertebral arteries, were studied. A pterional craniotomy was performed, exposing the sylvian fissure. Rigid endoscopes with 0-, 30-, 45-, and 70-degree rod lens 4 mm in diameter and 18 cm in length (Karl Storz, Tuttlingen, Germany) were introduced to open the superficial SF and enter the deep part of the fissure starting from its origin and then proceeding distally, following the course of the middle cerebral artery (MCA).



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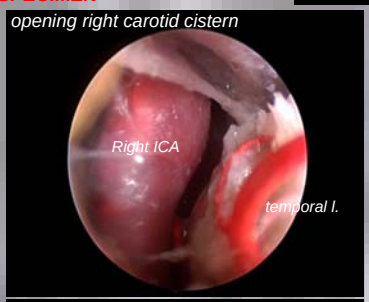

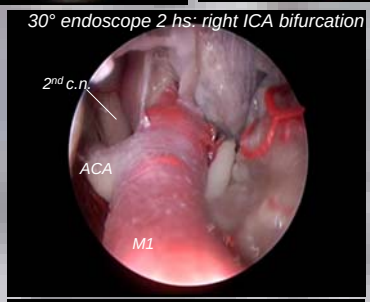

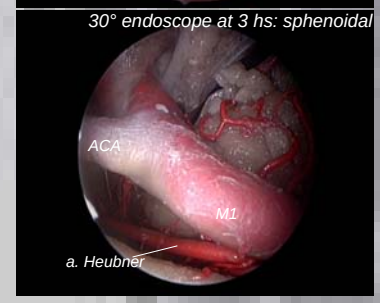

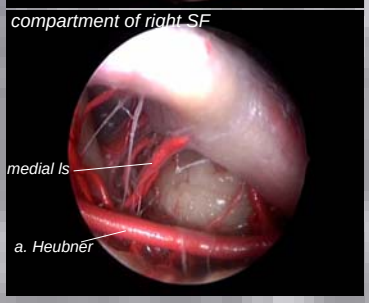

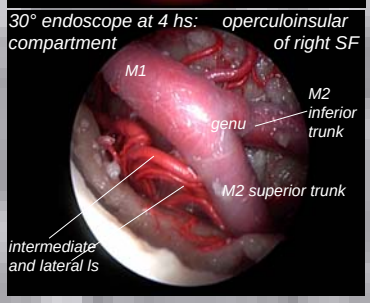

Results

Introducing the endoscopes under the pars orbitalis of the inferior frontal gyrus it was possible to visualize the most favorable place where to start the opening of the sylvian fissure. Without opening widely the arachnoid of the fissure neither retracting the temporal lobe, we managed to identify the vascular tree of the middle cerebral artery and make out its relationships with important surgical landmarks such as the opercular surface of the frontal, parietal and temporal lobes, the limiting insular sulcus, the limen, pole and apex of the insula, the anterior perforated substance. Inspecting circumferentially M1, M2 and M3 with no vessel manipulation, the origin and course of all sylvian branches, including lenticulostiate arteries, were identified. These arose from prebifurcation M1 (80-100% of the whole number), postbifurcation M1 and M2 (0-20%), never just from postbifurcation M1 and M2. Most of lenticulostriates originated around bifurcation: 68.2 % 5 mm or less and 32.8 % 2 mm or less from it. It is noticeable that nearly 100% of lenticulostriates originated from posterior, superior or posterosuperior aspect of vessel.

Conclusion

The use of the endoscope while inspecting the sylvian fissure proved to be a useful tool for studying the anatomy of this region. As a matter of fact, the endoscopic view allows full visualization of an intact anatomy and could be an important adjunct in neurosurgical interventions performed in this area, reducing the need for vessel and nervous tissue manipulation and providing a thorough vision of hide corners.

FRESH SPECIMEN