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THE MICROSURGICAL ANATOMY OF THE TEMPORAL LOBE: ITS RULE IN EPILEPSY SURGERY

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The temporal lobe is the most heterogeneous of the human brain. Complex partial seizures of the temporal lobe origin corresponds to around 70% of all patients with refratary epilepsy referred to surgical treatment. The surgical procedures to treat epilepsy disorders had a powerful impact in the quality of life of epiletical patients. The deep anatomical knowledge is paramount to perform a safe resection of the temporal lobe structures. When different angles of view, not only conventional anatomy but also microsurgical anatomy perspective, are studied, and unconventional dissection techiniques, as fiber dissection, are performed, the safety of the procedure is increased due to the improvement of the see-through X-ray knowledge. The purpose of this paper is to show the relevant anatomy regarding the selective amygadalohippocampectomy via unconventional and conventional techniques dissections of the brain. Material and Methods: Twenty human brains fixed in formalin and six cadaveric heads fixed in Carolina's perfect solution® (Carolina Biological Supply company, NC) were dissected using 3X to 40X magnification of the surgical microscope. Ten brains and all heads were injected with colored silicone. The non-injected brains were used to perform the Klingler fiber dissection technique in five brains and coronal, sagittal, and axial slices for the other five brains. Each cadaveric head was placed in a head-holder to simulate the surgical position. The pterional craniotomy and the selective amigdalohippocampectomy was performed according to previous description (Yaşargil). Results: The temporal lobe and its relationships are presented and the epilepsy sugical procedures are discussed based on this anatomy. Conclusions: The temporal lobe anatomy regarding the selective amygadalohippocampectomy and its variations must be understood through different anatomical perspectives to avoid damage to vital structures.

SKULL BASE APPROACHES TO TREAT PITUITARY ADENOMAS WITH CAVERNOUS SINUS EXTENSION: A MICROSURGICAL ANATOMY STUDY

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The cavernous sinus invasion by pituitary adenomas represents one of the biggest challenges to skull base surgeons. To achieve total tumor resection, conventional approaches, such as transsphenoidal and pterional are often inadequate. Skull base approaches such as extended transsphenoidal/transmaxillary and cranio-orbital-zygomatic approach provides anatomical corridors to the cavernous sinus from below and above, respectively. The purpose of this poster is to present the microsurgical anatomy of these approaches and discuss its technical nuances and indications. Material and Methods: Eighteen of nine cadaveric heads fixed in formalin were dissected using 3X to 40X magnification of the surgical microscope. The heads were injected with colored silicone and the combined transmaxillary/extended transsphenoidal approach and a cranio-orbital-zygomatic approach were performed to access the midlle and lateral wall of the cavernous sinus respectively. Each cadaveric head was placed in a Sugita head-holder, turned 30 to 40 degrees and extended slightly to simulate the surgical position. In the heads, a cranioorbitozygomatic approach was made. Results: The surgical perspectives of each approach are presented as well as the indications of each one. Conclusions: for pituitary tumor invading the cavernous sinus but medial to the intracavernous segment of the internal carotid artery the combined transmaxillary/extended transsphenoidal approach is indicated. This approach os better also when thereis tumor extendion in the upper clivus. On the other hand, when the tumor is lateral to this artery, inside the cavernous sinus, a cranio-orbital-zygomatic is more suitable.

THE PARADIGM OF SKULL BASE APPROACHES TO TREAT CENTRAL NERVOUS SYSTEM TUMORS: PART III: THE SKULL BASE RECONSTRUCTION

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One of the biggest problems after skull base surgery occurs when the intracranial space cannot be isolated from the adjacent areas. To address this, along with the evolution of skull base surgery, there has been a great evolution in the reconstruction techniques to the skull base. The anatomy of the skull base is described with classification into the anterior, medial and posterior skull base. The purpose of the authors is to described local skull base reconstruction techniques in a neurosurgical patients series (15 patients) performed by one neurosurgeon and review the literature regarding skull base vascularization, grafts and myocutaneous flap. The various methods of reconstruction based on the principle of the reconstructive ladder are described, starting with synthetics and free grafts to myocutaneous flaps. Our series shows that skull base reconstruction techniques are paramount to avoid postoperative complications in the surgical field, as well as, decrease the high level of complications such as LCR leak and infection described when this armamentarium in not used.

THE OPTIC RADIATIONS PERSPECTIVE UNDER THE WHITE FIBER DISSECTION TECHNIQUE: THE RULE IN EPILEPSY SURGERY

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OBJECT: The purpose of this anatomical study was to define more fully the 3D relationships between the optic radiations and the temporal horn and superficial anatomy of the temporal lobe by using the Klingler fiber dissection technique. The results of our dissections were correlated with established surgical trajectories to this region. METHODS: Fifhteen human cadaveric hemispheres were dissected by one of the authors in two different microsurgical laboratories (Hospital Beneficência Portuguesa (SP) e University of Arkansas for Medical Sciences by using a modification of the Klingler method). Spatulas were used to strip

away the deeper layers of white matter progressively in a lateromedial direction, and various association, projection, and commissural fibers were demonstrated. As the dissection progressed, photographs of each layer were obtained. Special attention was given to the optic radiation and to the sagittal stratum of which the optic radiation is a part. Our observations agree with two articles published previously: 1) The optic radiation covered the entire lateral aspect of the temporal horn as it extends to the occipital horn. 2) The anterior tip of the temporal horn was covered by the anterior optic radiation along its lateral half. 3) The medial wall of the temporal horn was free from optic radiation fibers, except at the level at which these fibers arise from the lateral geniculate body to ascend over the roof of the temporal horn. 4) The superior wall of the temporal horn was covered by optic radiation fibers. 5) The inferior wall of the temporal horn was free from optic radiation fibers anterior to the level of the lateral geniculate body. CONCLUSIONS: The study of optic radiations through fiber dissection technique is paramount to understand the complex anatomical knowledge necessary in temporal lobe procedures, such as amygdalohippocampectomy.

MICROSURGICA ANATOMY OF THE CAVERNOUS SINUS TRIANGLES WITH CASE ILLUSTRATION OF A CAVERNOUS SINUS MENINGEOMA

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OBJECTIVES: Parkinson´s and Dolenc's descriptions of surgical entry points into the cavernous sinus have been adopted by most surgeons operating in this region. However, authors differ in naming and describing some of the triangular spaces. The purpose of this study is to present the detailed anatomy of the ten triangles cavernous sinus area and report a case of a patient with cavernous sinus meningeoma METHODS: Eight formalin cadaveric heads and four skull bases were dissected using 3X to 40X magnification of the microscope. In the heads, a cranioorbitozygomatic approach was made and a combined extra- and intradural approach was performed and triangles identified. A 63 years-old female presented with headache, partial third nerve palsy, V1 hypoesthesia and visual impairment on the right side in the last year. MRI showed a right parasellar tumor involving right cavernous sinus with orbital and small clivus invasion. A cranio-orbital-zygomatic with middle cranial fossa peeling was performed to obtain proximal control of the intrapetrous internal carotid artery. The anterior clinoid process and the orbital roof were drilled out. The tumor was almost totally ressected (except the part adherent to the oculomotor nerve) through parkinson's, oculomotor and Mullan triangles. There were no postoperative complications. There were no new deficits except the third nerve palsy which was partial and now, after a month, is total . The right eye visual impairment improved considerably. RESULTS: The triangles were identified, delimited and described. CONCLUSIONS: The normal anatomy of the CS triangles is important in the approach of the CS lesions because these spaces are natural corridors through which the lesions inside CS can be reached. Whenever the CS triangles can be distorted by pathology or surgical maneuvers, the surgeon must have a precise knowledge about these spaces.

MICROANATOMY AND SURGICAL APPROACHES TO THE INFRATEMPORAL FOSSA - AN ANAGLYPHIC THREE-DIMENSIONAL STEREOSCOPIC PRINTING STUDY

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The infratemporal fossa (ITF) is a continuation of the temporal fossa between the internal surface of the zygoma and the external surface of the temporal bone and greater wing of the sphenoid bone that is sitting deep to the ramus of the mandible. In this study, we describe the microsurgical anatomy of the ITF, as viewed by step by step anatomical dissection and also trough the perspective of three lateral and one anterior surgical approach. METHODS: Eight cadaver specimens were dissected. In one side of all specimens an anatomical dissection, where a wide preauricular incision from the neck on the anterior border of the sternoclidomastoid muscle at the level of the cricoid cartilage to the superior temporal line was done. The flap was displaced anteriorly and the structures of the neck were dissected followed by a zygomatic osteotomy and dissection of the ITF structures. The anatomical dissections were documented on the three-dimensional (3D) anaglyphic method to produce stereoscopic prints. RESULTS: The anatomical structures are presented. In our dissections the maxillary artery was lateral to the buccal, lingual and the inferior alveolar nerves. We found the second part of the maxillary artery superficial to the lateral pterygoid muscle in all specimens The anterior and posterior branches of the deep temporal artery supply the temporal muscle. In two cases we found a middle deep temporal artery. CONCLUSIONS: The IFT is a complex region on the skull base that is affected by benign and malignant tumors. Although the authors have shown four approaches, there are a variety of approaches and even the combination among these can be used. This type of anatomical knowledge is paramount to choose the best approach to treat lesions in this area.

AVALIAÇÃO DO ENVOLVIMENTO DE CÉLULAS-TRONCO AUTÓLOGAS DE MEDULA ÓSSEA NA REGENERAÇÃO DO NERVO TIBIAL DE COELHOS MEDIANTE TÉCNICA DE TUBULIZAÇÃO COM PRÓTESE DE SILICONE

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Neste estudo é apresentado um modelo experimental de defeito agudo em nervo periférico para avaliação da regeneração nervosa mediante técnica de tubulização associada à inoculação de células-tronco autólogas de medula óssea. Foram utilizados 12 coelhos Nova Zelândia albinos, submetidos à secção bilateral do nervo tibial e posterior reparo mediante utilização de câmara de silicone. Internamente à prótese de tubulização do nervo tibial esquerdo em todos os animais, foram inoculadas células-tronco autólogas de medula óssea, coletadas a partir do úmero. Como grupo controle (nervo tibial direito), mediante aplicação de mesma técnica de reparo, solução de NaCl 0,9% foi administrada internamente à prótese. Após 30 dias de observação, os animais foram eutanasiados e procedeu-se à avaliação histológica dos segmentos nervosos através das colorações de hematoxilina-eosina, luxol fast blue e azul de toluidina. Com os resultados, foi possível concluir que o transplante de células-tronco autólogas associado à técnica de tubulização apresenta vantagens no processo de regeneração nervosa periférica.