Twenty-years experience of craniopharyngioma surgery in 111 cases: the evolution towards minimally invasive surgery

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Introduction: Surgery of craniopharyngiomas still represents a challenge even for more experienced surgeons. In the last decades multiple surgical strategies have been developed, but criteria of choice for the single case are far to be standardized.

Objective: To review our experience in the last twenty years in order to highlight the evolution in surgical approaches to craniopharyngiomas with a particular attention to the role of minimally invasive surgery.

Patients and methods: Between January 1991 and October 2011, 111 patients underwent surgery for craniopharyngioma at our neurosurgical department. Population included 65 females and 46 males; age ranged between 5 and 84 years, with the two characteristic peaks during infancy and after the 5th decade. Presenting symptoms and signs included: headache, visual impairment, endocrinological imbalance, diabetes insipidus, delayed sexual development and obesity. The surgical approaches used were: transnasal transphenoidal (26%), pterional (42%), lateral supraorbital (8%); supraorbital eyebrow (5%); interhemispheric fronto-basal (14%), stereotactic biopsy/cyst evacuation/cystoventriculostomy/cystocysternostomy (5%).

Results: During the first decade (1991-2001) 49 patients underwent surgery. The approaches were: pterional 82%, interhemispheric fronto-basal 12%, microscopic transnasal transphenoidal 2%. Stereotactic biopsy or/and cyst drainage were performed in 4% of cases. In the second decade (2002-2011) 62 patients were operated. The approaches used consisted of: pterional 10%; interemispheric fronto-basal 14%; microscopic or endoscopc (four hands-four eyes endoscopic transphenoidal approach with double team - Otorhinolaryngologist/Neurosurgeons - cooperation) 46%; lateral supraorbital 14%; supraorbital eyebrow 10%. Stereotactic biopsy, cyst evacuation or cystoventricular/cystocysternostomy were performed in 6% of cases. During the period reviewed, the minimally invasive frontobasal and the endoscopic endonasal approaches gradually replaced the pterional approach as a first surgical option.

Conclusions: Our experience shows how the use of pterional approach decreased in the last decade in favour of less invasive, customized, image guided approaches. Several factors influence the surgical planning which should be individualized after careful evaluation of the topography of the lesion. Recently, the “four hand-four eyes” endoscopic extended transnasal approach has widely spread. In cases where the transcranial approach is indicated, less invasive routes may be used such as the unilateral fronto-lateral supraorbital and its eyebrow variant. The eyebrow approach is suitable mainly for small lesions and may benefit from the endoscopic assistance. The standard pterional approach is still indicated in case of middle fossa extension. Cystoventriculostomy/cystocysternostomy represent mini-invasive alternatives options to treat cystic craniopharyngiomas.