“Four hands-four eyes” extended endoscopic transphenoidal approach versus interhemispheric fronto-basal craniotomy for the treatment of midline suprasellar craniopharyngiomas

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Introduction: Craniopharyngiomas are extremely difficult to treat due both to the location and the high recurrence rate. Surgery represents the first option of treatment. The surgical planning is critical and requires evaluation of the anatomical relationships between the lesion and its boundaries.

Objective: To show the technique of the “four hands-four eyes” extended endoscopic transphenoidal approach and to compare this approach to the interhemispheric fronto-basal approach for the treatment of craniopharyngiomas.

Patients and methods: Two patients, both males, aged 40 and 34 years old were referred to our department. Presenting symptom in case one was chronic headache, while the second patient presented with headache, postural instability, visual impairment in left eye, weight increase, polydipsia and polyuria. In the first patient contrast-enhanced T1-weighted MR images depicted a midline suprasellar infrachiasmatic solid/cystic lesion with extension towards the hypothalamus and the interpeduncular fossa. The pituitary stalk was thinned, displaced and difficult to visualize. In the second case contrast-enhanced T1-weighted MR images depicted a midline suprasellar suprachiasmatic solid/cystic lesion with extension into the third ventricle obliterating both foramen of Monro’s. The first patient underwent extended endoscopic transphenoidal surgery with ENT cooperation. The second patient was treated through an interhemispheric fronto-basal trans-lamina-terminalis approach. The surgical approaches were carefully evaluated and planned by means of a neuronavigation system. Lesions size were 3.8 x 2.5 cm for the first and 4.5 x 2.8 cm for the second one.

Results: The surgical procedure was uneventful for both patients. CT and MRI scans, performed within 48 hours of surgery, excluded surgical complications, confirming a radical excision and showing the pituitary gland back to its normal position. Both patients experienced transitory diabetes insipidus, which was treated with desmopressin until fluid balance normalization. The second patient experienced improvement in left eye vision and gait balance too.

Conclusions: The extended endoscopic endonasal approach is a minimally invasive approach indicated for midline pre-infundibular, infundibular, retroinfundibular craniopharyngiomas. When the lesion is within the third ventricle, the interhemispheric fronto-basal trans-lamina terminalis approach offers an ideal control of the disease margins. Both approaches are technically demanding but safe in the hands of the experienced teams.