Surgical Cures in Hormone-Secreting Cavernous Sinus Pituitary Macroadenomas: First Reported Cases

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Introduction

Hormone-secreting cavernous sinus (CS) pituitary macroadenomas are treated with partial resection followed by radiation and/or medication. This results in treatment failures and/or radiation related complications. We present, for the first time, microsurgical cures in hormone-secreting CS pituitary macroadenomas using a predominantly epidural pretemporal transcavernous approach to the sellar and parasellar region.

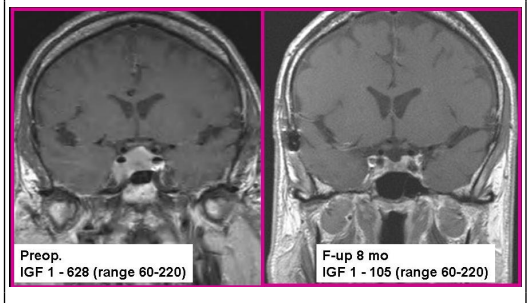
Methods

42 microsurgically treated CS pituitary macroadenomas were prospectively followed and retrospectively analyzed. The pretemporal, predominantly epidural, transcavernous approach was utilized. Patients' hormonal, clinical, endocrine, immuno-histopathological, and radiological outcomes were studied. Our microsurgical approach differs from previous reported approaches by accessing all the different CS anatomical compartments. In cases where cures were not achieved, this approach minimized the post-surgical adjuvant treatment to very small radiosurgical volume. Average follow-up = 47.08 +/-44.54 with median of 36 months).

Results

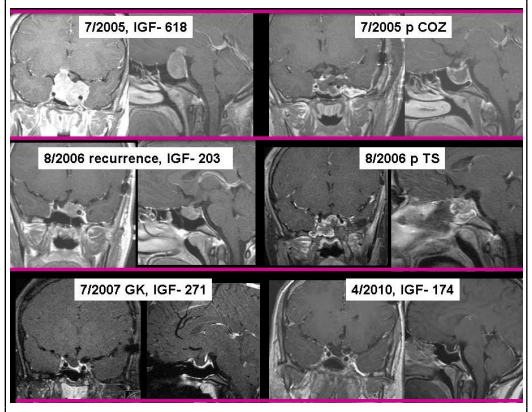
Of 42 (F/M=19/23) patients with CS pituitary macroadenomas treated with microsurgical resection, 25 % were recurrent tumors. 23 (55 %) were hormonally active. 37 tumors were histopathologically benign and 5 were either atypical or malignant. Of the 23 hormonally active tumors (Growth hormone=10, Prolactin=5, Gonadotropic=4, ACTH=2, TSH=2), hormonal cures were achieved in 43 % of patients (Growth Hormone=5, ATCH=1, Prolactin=3, Gonadotropic=1). The cures were more frequent in the non-recurrent, non-malignant, more recently operated cases. There was no surgical mortality. Cranial neuropathies were transient in all patients except for the malignant cases.

Invasive, GH- secreting pituitary adenoma with the right cavernous sinus involvement



Resection of tumor using right middle fossa skull-based modified cranio-orbital zygomatic approach with epidural approach to the cavernous sinus

Invasive, GH- secreting pituitary adenoma.

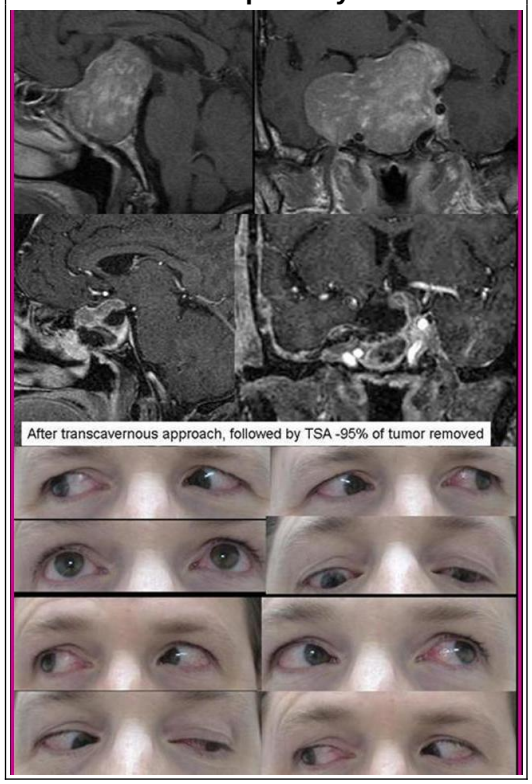


F- 22. After two surgeries (COZ/Transcavernous approach and transsphenoidal approach) her GH and IGF-1 level improved, but did not normalize, and a small area around left CA was treated with GK.

Conclusions

Mastering the microanatomy of the CS and understanding the pathological anatomic changes can help achieve safe and radical resection of cavernous sinus pituitary macroadenomas. This is the first time microsurgical cures are reported in hormonally-active CS pituitary macroadenomas. We consider this a surgical breakthrough that will positively impact the future treatment of a large population of patients who suffer from these debilitating diseases.

Giant invasive pituitary adenoma



Learning Objectives

To understand new surgical approaches for treatment of cavernous sinus pituitary adenomas. To understand the management of invasive cavernous sinus pituitary adenomas.

References

Krisht AF: Transcavernous approach to diseases of the anterior upper third of the posterior fossa. Neurosurgical FOCUS 19:1-10, 2005.