Intrasellar Fat Graft Gains Weight with the Patient: Imaging Features

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SUMMARY – We describe a 56-year-old man with an intrasellar craniopharyngioma who underwent transphenoidal resection and abdominal fat grafting of the dural opening. Follow-up MRI showed hypertrophy of the sellar fat graft concurrent with the patient's weight gain. To our best of knowledge sellar fat graft hypertrophy has not been reported before.

Case Report

A 56-year-old African-American man presented to the emergency department after suffering a blow to the head. CT examination revealed an incidental mass in the sella turcica. Follow-up MRI study with and without contrast showed a $2.1 \times 1.5 \times 1.5$ cm bilobed heterogeneously enhancing mass with internal cystic areas arising from the sella turcica and extending into the lower third ventricle. Mass effect caused upward displacement of the optic chiasm. Ophthalmic examination confirmed bitemporal visual field defects.

The lesion was approached transphenoidally and after total tumor resection an abdominal free fat graft was placed in the dural opening. Surgical pathology later identified the mass as an intrasellar craniopharyngioma. In the postoperative period the patient suffered severe panhypopituitarism and was placed on levothyroxine, hydrocortisone, and testosterone replacement therapy, in addition to desmopressin for diabetes insipidus.

Follow-up MRI studies performed at six months and two years thereafter were consistent with postoperative changes and did not demonstrate any residual or recurrent tumor. However, the two-year MRI examination demonstrated an increase in size of the sellar fat graft compared to the previous examination (Figure 1). The increase in size of the fat graft was concordant with an increase in the pa-

tient's weight (eight kilograms since the previous MRI study).

Discussion

MRI before and after gadolinium administration is considered the best way to detect craniopharyngioma. Distinguishing between an intrasellar craniopharyngioma and a hemorrhagic pituitary macroadenoma or a Rathke cleft cyst can be challenging. Multiple treatment modalities including surgical resection, radiotherapy and intracystic chemotherapy can be used to treat craniopharyngioma. Surgical resection remains the standard therapy in most patients and is often achieved through a transphenoidal approach^{1,2}. Minimally invasive pituitary surgery techniques have markedly improved in the last decade making it possible to resect tumors without affecting normal brain tissue. Dural reconstruction is often necessary after tumor resection to prevent cerebrospinal fluid (CSF) leak and encephaloceles especially in larger lesions where more cranial base tissue is disrupted to expose the lesions. Different materials such as nonvascularized autografts, vascularized mucosal flaps, bovine flaps, and adhesives can be used for dural reconstruction. The most commonly used autograft is fat, which can be easily acquired from the lower abdominal quadrant or the lateral thigh. The fact that it is easy to harvest coupled with its malleability

Figure 1 Intrasellar fat hypertrophy. A) Non contrast mid sagittal MR T1-weighted image six months after total resection of intrasellar craniopharyngioma shows post-operative changes in the sinonasal cavities from the transphenoidal approach and bright fat graft in the sella (maximum height: 6 mm). B) Corresponding image during 2-year follow-up shows that the intrasellar fat graft is more prominent (now measuring 9 mm in height). Note that the extracranial subcutaneous fat has also increased as the patient gained weight during this period of time (8 kg).

makes it effective in forming a good seal and preventing neural tissue prolapse and CSF leaks³.

Our patient underwent transphenoidal resection with abdominal fat grafting which increased in size on MRI as a result of his weight gain. Without knowledge of the specific type of surgery and graft used it is conceivable that this appearance can be confused with recurrent craniopharyngioma in the case of patients with adenomas with hemorrhage into the tumors.

Although to the best of our knowledge, hypertrophy of sellar fat grafts has not been described, this has occurred elsewhere in the body. In one patient after gaining weight, a lower lid fat graft grew leading to severe diplopia and the excess fat had to be removed⁴. In a different report, obstructive apnea developed after the patient gained weight following

fat injection for velopharyngeal incompetence⁵. Antiretroviral therapy is known to cause fat graft overgrowth⁶.

Adipocytes remain viable when transplanted and tend towards hypertrophy rather than hyperplasia explaining why these grafts may become hypertrophied (or gain weight)⁴. Fat cells obtained from the gluteal-femoral regions appear to have increased lipogenic activity over those obtained from other sites but all of them have the capacity of hypertrophy⁷.

In conclusion, we present a patient in whom a fat graft used to close the defect following transphenoidal tumor resection became hypertrophied as the patient gained weight. It is practical to keep this in mind so not to confuse it with recurrent tumor or hemorrhage when using MRI in the follow-up.

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