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Letter to the Editor: Postoperative Rhinorrhea without Intraoperative Cerebrospinal Fluid Leak after Endoscopic Transnasal Transphenoidal Surgery for Pituitary Macroadenomas

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Dear Editor,

Reviewing the pituitary literature, cerebrospinal fluid (CSF) leakage is a common and major complication of transphenoidal surgery. Rates of postoperative CSF rhinorrhea increase with surgery for macroadenomas, transphenoidal reoperation and intraoperative leak [1,2]. Several techniques of sellar floor reconstruction have been described for the reduction of rate of postoperative CSF rhinorrhea after the occurrence of an intraoperative leak [3,4], while simple closure following transphenoidal surgery has been proposed in the absence of an intraoperative CSF leak.

We present three patients from our early series subjected to endoscopic transnasal transphenoidal removal of pituitary macroadenomas. During surgery and after a thorough endoscopic visual inspection and induction of Valsalva maneuver, there was no evidence of CSF leak. After removal of the macroadenoma, a layer of surgicel was left over the tumor bed for hemostasis. Postoperatively, CSF rhinorrhea was noticed and all patients were successfully managed with the placement of CSF lumbar drainage.

Couldwell *et al.*, in their technical note, report no incidence of postoperative CSF rhinorrhea if no intraoperative leak is encountered during transphenoidal surgery. Furthermore, all procedures were performed without reconstruction of the sellar floor and no late CSF leak was observed [5]. The results of the above mentioned study raised concerns about the possible causative factors that led to postoperative rhinorrhea in our three patients.

Enlarged sella from a macroadenoma leads to expansion and possible incompetence of diaphragma sellae and exposed arachnoid membrane. With meticulous surgical technique the integrity of arachnoid can be preserved and a Valsalva maneuver can elicit a subtle leak. However, either the constant force applied to the weakened diaphragma sellae from the continuous pulsatile flow of CSF or tearing of a herniated (**Figure 1**) diaphragma sellae through the sella opening from bony chips could explain postoperative CSF leak in this scenario.

An autologus fat graft harvested from the lower abdomen or the lateral thigh can be inserted in the emptied sella after removal of a macroadenoma buttressed in place with multiple layers of surgicel or a fascia graft. With this technique the incompetent diaphragma sellae is reinforced and also prevented from herniation through the opened sellar floor. We now routinely use this tech-

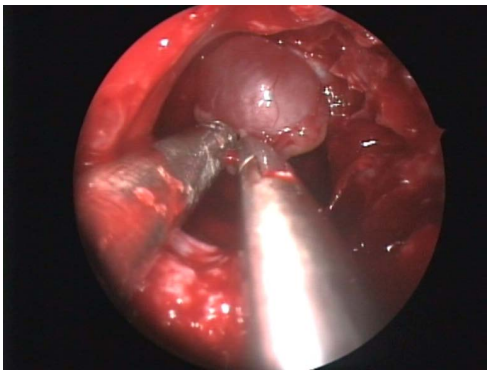

Figure 1. Endoscopic image of herniation of the diaphragma sellae through the sellar floor opening that occurred after Valsalva maneuver during the final stages of a pituitary macroadenoma removal. This rare condition could potentially predispose to postoperative CSF rhinorrhea, unless the diaphragma is buttressed back into place with the insertion in the emptied sella of autologus fat graft.

nique in every case of macroadenoma surgery with occurrence of herniation of the diaphragma sellae through the opened sellar floor and negative inspection for intraoperative CSF leak after Valsalva maneuver, with excellent results in our late series.

Usage of autologus fat or fascia graft is suggested for the sellar floor reconstruction in cases of intraoperative CSF leak during transphenoidal removal of pituitary macroadenomas. Furthermore, no reconstruction at all is proposed in cases where no intraoperative CSF leak is noted. Nevertheless, postoperative CSF rhinorrhea without intraoperative leakage, although rare is not uncommon. Insertion of autologus fat graft in the sella turcica can be a feasible and effective surgical method for the prevention of postoperative CSF rhinorrhea in the setting of endoscopic transanal transphenoidal removal of pituitary macroadenomas without intraoperative leak, especially when herniation of the diaphragma sellae through the opened sellar floor occurs intraoperatively.

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