Cerebrospinal fluid rhinorrhea from an empty sella: transsphenoidal obliteration of the fistula

Technical note

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A case of cerebrospinal fluid rhinorrhea developing in a progressively enlarging empty sella is described in which the fistula was successfully obliterated via a transsphenoidal approach. A modification of the standard closure for transsphenoidal hypophysectomy enabled reconstruction of the dural floor of the sella.

Key Words · CSF rhinorrhea · empty sella · transsphenoidal repair

In their review of 18 cases of non-traumatic cerebrospinal fluid (CSF) rhinorrhea in 1968, Ommaya, et al., described two patients who developed rhinorrhea in association with an "empty sella" and therein introduced this concept to the English literature. Subsequent authors have reported additional cases and have postulated pathophysiological mechanisms possibly underlying the evolution of this unusual problem. To date, operative attempts at obliteration of the fistula have been via a transfrontal intradural approach to the sella. Our experience with the transsphenoidal approach to the sella for pituitary surgery suggested that modification of this alternative technique could be used to repair a spontaneous CSF leak from an empty sella. We are reporting the successful use of this technique in a patient with CSF rhinorrhea associated with an empty sella.

Case Report

A 53-year-old woman was admitted to University Hospitals in 1970 with a 3-day history of spontaneous watery nasal discharge. An extensive radiographic evaluation confirmed the diagnosis of an empty sella, including positive contrast demonstration of a fistula from the floor of the sella to the sphenoid sinus. For 3 weeks the patient continued to drain copious amounts of CSF despite repeated lumbar punctures. Having failed with conservative measures, we felt that a direct attempt at surgical closure of the fistula was indicated.

Operation. The sphenoid sinus was entered
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through a sublabial, transnasal approach. The ballooned floor of the sella was noted to have eight to 10 1-mm perforations through which CSF could be clearly observed to be pulsing. The paper-thin sellar floor was easily opened, exposing the underlying attenuated dura which had perforations matching those in the bone and through which CSF was flowing freely.

The dura was then opened in a cruciate fashion and the contents of the sella were readily inspected. The diaphragma sellae was virtually absent, and a small normal-appearing pituitary could be seen on the left side of the inferoposterior portion of the sella occupying certainly no more than 5% to 10% of this grossly enlarged structure. The remainder of the sella contained arachnoidal tissue and CSF. The optic chiasm was not herniated into the empty sella.

Subsequently, a graft of fascia lata was placed in the empty sella, filling about 80% of its volume. A suture-ligature of No. 3-0 chromic catgut was placed through the fascia, both ends being brought out through the sphenoid sinus. The bony opening in the floor of the sella was then occluded by cartilage (from the quadrangular cartilage) wedged between the bone and the fascial graft. The sphenoid was filled with muscle, and the chromic suture was then tied over the inferior pole of the sphenoid muscle pack to bring the fascial graft and muscle pack in snug apposition along the reconstructed floor of the sella (Fig. 1). The sublabial incision was closed in the usual fashion.

Postoperative Course. Recovery was uneventful. The neurological and endocrine status was unchanged, and the patient was discharged on the eighth postoperative day. In the 2 years since surgery, there has been no recurrence of rhinorrhea, and the neurological examination remains unchanged.

Discussion

Nontraumatic CSF rhinorrhea may be associated with lesions in any of the cranial fossae, including the sella turcica. Cases related to disorders of the pituitary fossa have been most commonly described in association with tumors or cysts of the hypophysis, infection, previous surgery, yttrium seed implantation, or high-dose x-ray therapy. More recently, interest was focused on progressive "non-tumorous" enlargement of the sella. Kaufman has related this condition to a deficient diaphragma sellae that permits arachnoid to herniate into the sella. The progressive bone remodeling is thought to be a consequence of continuous CSF pulsatile forces within this enlarged subarachnoid space. In our case the dura surrounding the arachnoidal diverticulum was apparently sufficiently thinned to permit further arachnoidal herniations into the sphenoid sinus.

Our surgical objective was to reinforce or re-establish the dural barrier lining the floor of the sella. There was no partial diaphragma against which we could buttress a fascial seal, and we were concerned that a free fascial pack might migrate into a suprasellar position and compromise the patient's visual apparatus. We consequently secured the fascial pack within the sella against the floor intradurally, utilizing this "cuff-link" closure by which a suture ligature through the fascia could be secured beyond the cartilage in the bone opening and the muscle in the sphenoid. This

Fig. 1. Drawing of the left lateral view of the sella turcica. A = fascia in the sella; B = muscle in the sphenoid sinus; C = suture-ligature through the fascia secured around muscle; D = cartilage interposed between fascia and muscle.
allowed us to perform a three-layer-closure and maintain the graft material in snug apposition.

Olson, *et al.*, have recently advocated the transsphenoidal approach to correct symptomatic descent of the chiasm into an empty sella. We feel, as they, that the ease of surgical exposure, the generally benign postoperative course, and the low operative mortality commend this approach as an alternative in the surgical obliteration of such CSF fistulas.

References


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