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Precallosal Interhemispheric Approach for the treatment of osteomeningeal defects In the Cribriform Area



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Introduction:

The endoscopic endonasal approach has become the standard corridor to treat osteomeningeal defects of the anterior cranial base.

Nonetheless, the transcranial route is still needed in some patients, and the subfrontal is the approach most frequently used.

We have observed that, when using this corridor, it is difficult to preserve the first cranial nerve and the frontal paranasal sinus. For this reason, we have been using an interhemispheric precallosal approach to the cribriform area in some selected cases.



Figure 1. The central anterior skull-base in a dry skull

Methods:

With the background of anatomical studies and surgical experience with others interhemispheric approaches, we have planned a precallosal interhemispheric approach to the etmoido-fronto-esfenoidal area of the anterior skull base to treat a series of eight patients sustaining post-traumatic or spontaneous CSF leak originating in that area.

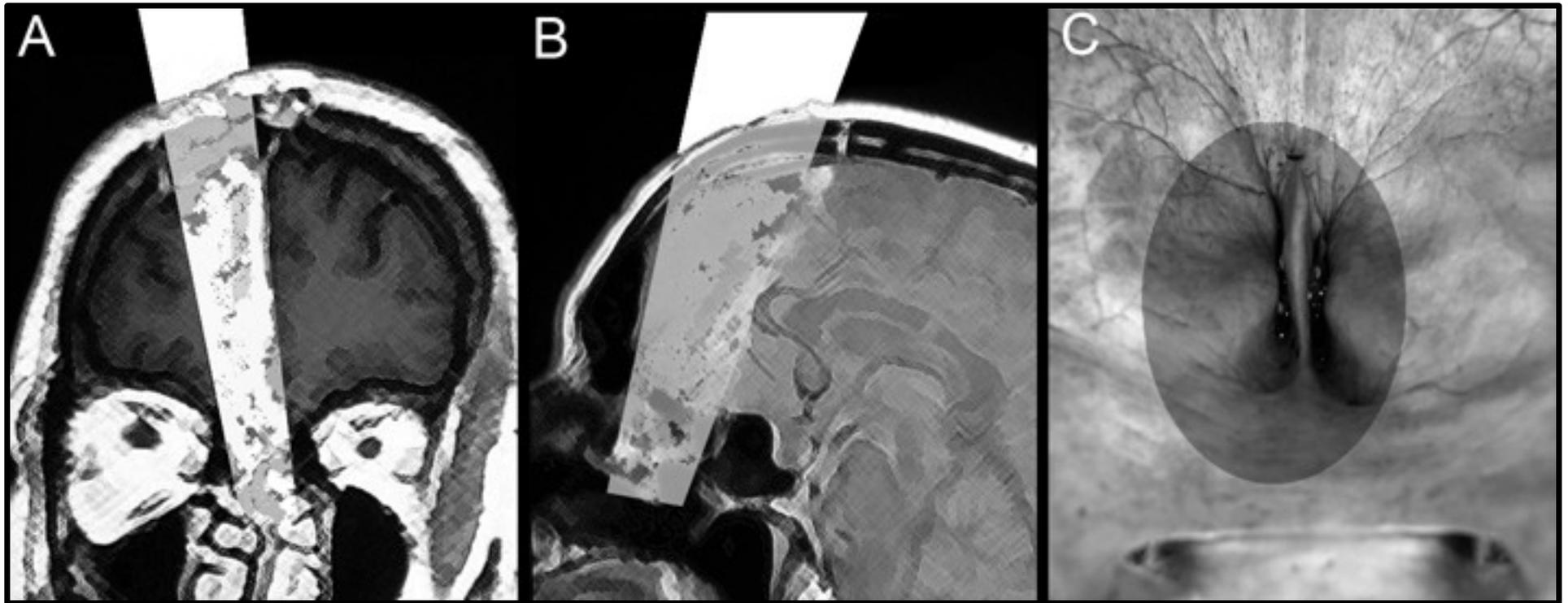


Figure 2. Direction and scope of the right interhemispheric precallosal approach to the cribriform plate and its surroundings. (A) and (B) are collages in coronal and sagittal projections depicting the trajectory of the approach. (C) The central anterior skull-base in a dry skull. The main area overlooked by this approach has been shadowed.

Results:

Six patients showed post-traumatic and two spontaneous leaks. Immediate sealing of the leak was achieved in seven patients. One patient with persistent leak after surgery required an additional procedure. Contralateral first cranial nerve was anatomically preserved in all cases, while it was not possible to preserve the ipsilateral olfactory nerve by this approach. Unilateral olfactory function was preserved in four cases.

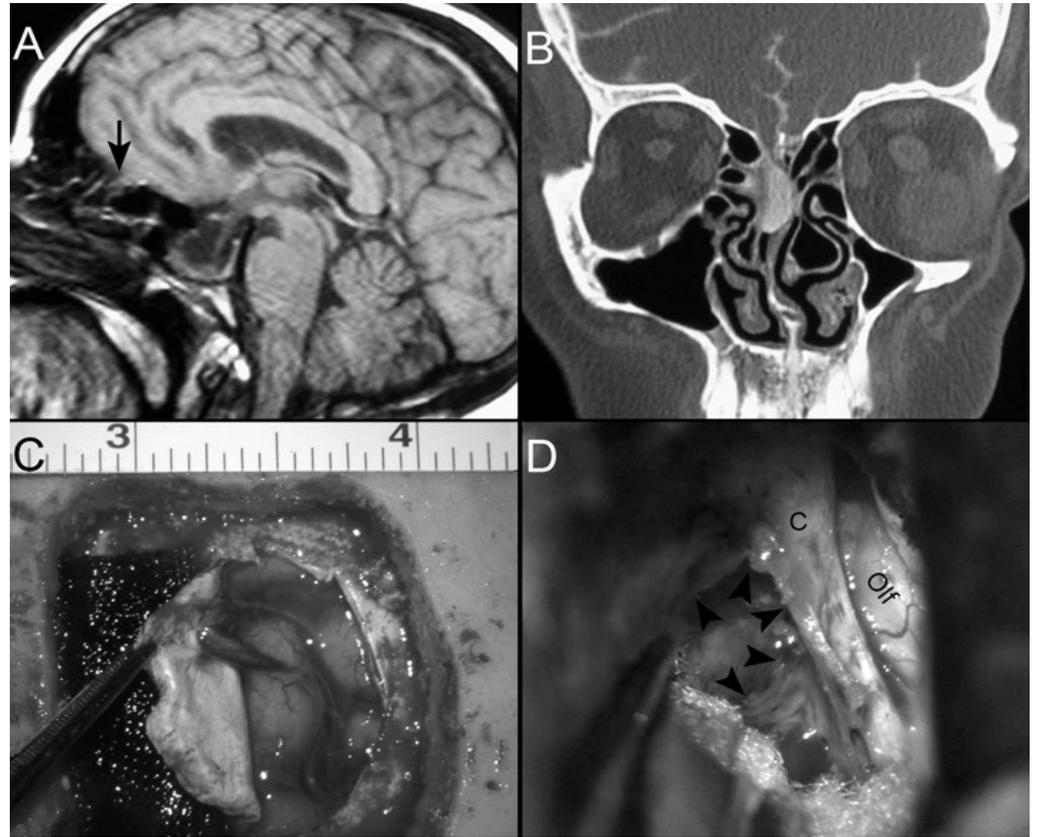


Figure 3. Illustrative case. A 56 years-old woman presented repeated rhinorrhea and the empty sella syndrome was diagnosed. (A) MRI in parasagittal projection showing a large empty sella occupied by an arachnoid sac, along with a small etmoidal meningo-cephalocele (arrow). (B) CT cisternography in coronal projection showing an osteo-meningeal defect in the left cribriform plate. (C) Right parasagittal precoronal craniotomy the dura has been opened, the middle frontal vein is strongly attached to the dura and it is located in the middle of the operative route. In this case the vein could not be preserved. (D) Intraoperative image showing the left osteo-meningeal defect (arrows heads), the crista galli (C) and the preserved right olfactory nerve (Olf).

Conclusions:

The interhemispheric precallosal approach to osteo-meningeal defect in the cribriform area may be an alternative when the transcranial route is needed and olfactory function and frontal paranasal sinus preservation is desirable.

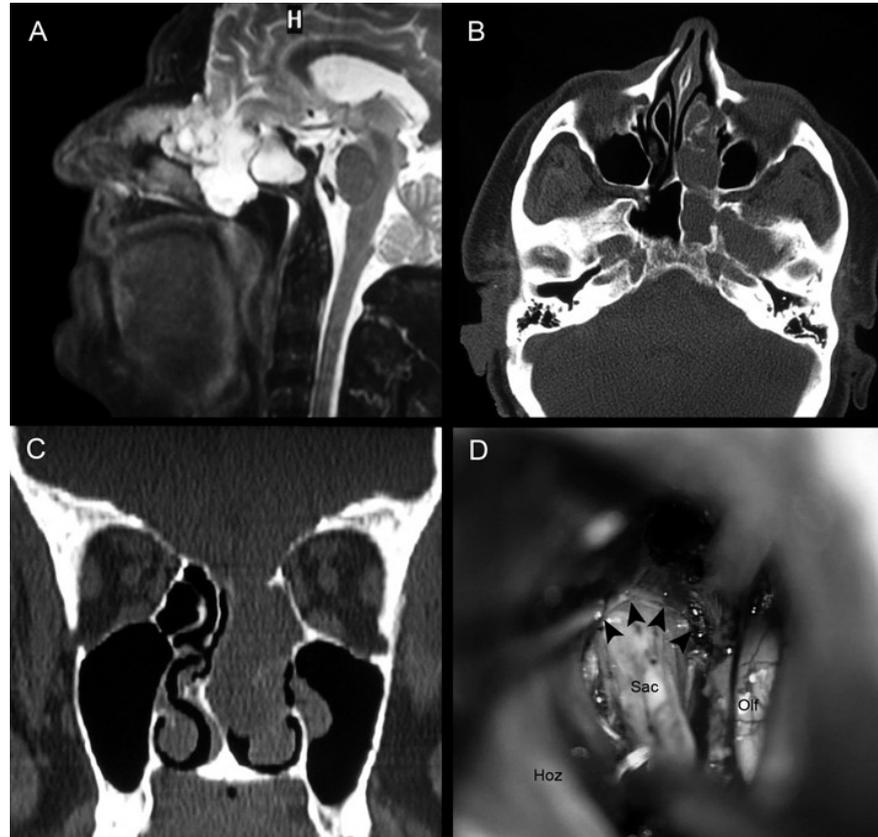


Figure 4. Illustrative case. Basilar cephalocele in a 72 years-old man with history of meningitis and left frontal brain abscess. Rinoscopy showed a large polypoid mass in the left nasal fossa. (A) MRI in sagittal projection showing the gyrus rectus of the frontal lobe herniating through an osteo-meningeal defect. The cephalomeningeal sac protrudes to the ethmoidal sinus, nasal fossa, and sphenoid sinus. (B) CT-scan showing complete obliteration of the left paranasal spaces. (C) CT-scan coronal projection showing the lack of cribriform plate in the left side. (D) operative view of the right interhemispheric precallosal approach showing the osteo-meningeal defect (arrows heads), the falx cerebri (Hoz) and the right olfactory (Olf) nerve which is preserve.