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CASE REPORT

Spontaneous cerebrospinal fluid rhinorrhea associated with empty sella: a transnasal-transsphenoidal repair of the fistula

Empty sellalı bir olguda spontan serebrospinal rinore: Fistülün transnazal transsfenoidal onarımı

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Spontaneous cerebrospinal rhinorrhea is a rare clinical condition. More commonly it develops due to cerebral tumours or hydrocephalus; it is seldom seen in association with empty sella syndrome. A sixty-three-year-old woman who presented with left nasal discharge was hospitalized on the suspicion of CSF rhinorrhea. Analysis of the nasal fluid revealed a clear colour, a positive Pandy's test, and a positive result for glucose (72%). On magnetic resonance scans, herniation of the suprasellar cistern was observed into the sellar cavity, and the left sphenoid sinus was filled with contrast medium. The repair of the fistula was performed via a transnasal and transsphenoidal approach. The patient was followed-up for five years without any symptoms or recurrences.

Key Words: Cerebrospinal fluid rhinorrhea/complications/surgery; fistula/complications/surgery; magnetic resonance imaging; sella turcica; sphenoid sinus/surgery; subarachnoid space.

Spontan serebrospinal rinore nadir görülen bir durumdur; daha sıklıkla serabral tümörlere veya hidrosefalusa bağlı olarak gelişir. Empty sella sendromu ile birlikte görülmesi daha da nadirdir. Sol nazal akıntı şikayetiyle başvuran 63 yaşındaki kadın hasta, serebrospinal sıvı rinoresi öntanısı ile yatırıldı. Nazal sıvı incelendiğinde renksiz olduğu görüldü; Pandy testi pozitif, glukoz %72 düzeyinde bulundu. Manyetik rezonans görüntülemede suprasellar sisternanın sellar kaviteye herniye olduğu ve sfenoid sinüsün orta derecede kontrast tuttuğu izlendi. Fistülün onarımı transnazal ve transsfenoidal yolla gerçekleştirildi. Hastanın beş yıllık takibi süresince herhangi bir semptom ya da nüksle karşılaşılmadı.

Anahtar Sözcükler: Beyin omurilik sıvısı rinoresi/komplikasyon/cerrahi; fistül/komplikasyon/cerrahi; manyetik rezonans görüntüleme; sella turcica; sfenoid sinüs/cerrahi; subaraknoid boşluk.

Cerebrospinal fluid (CSF) rhinorrhea, an escape of CSF through an ensuing passage between the subarachnoid space and the nasal cavity, is a rare clinical condition. In some cases it may pose difficulties in regard to diagnosis and management. Cerebrospinal fluid rhinorrhea may either follow a direct route from the anterior cranial fossa, or an indirect route from the middle and posterior cranial fossa through the Eustachian tube.[1] It may lead to recurrent attacks of meningitis and severe complications resulting in death.[2-5]

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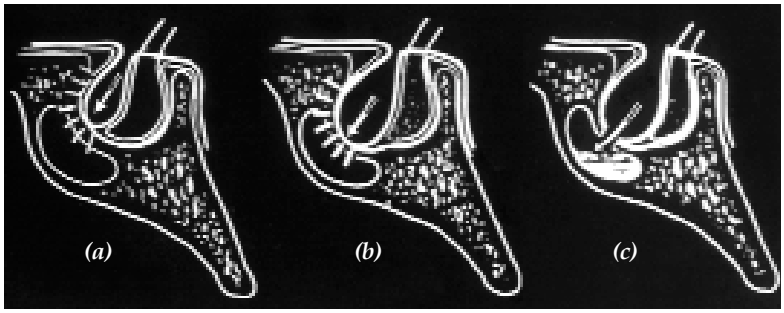

Fig. 1 - *Empty sella is an anatomic condition in which the sella is largely occu - pied by the arachnoid diverticulum containing cerebrospinal fluid.*

Cerebrospinal fluid rhinorrhea may be associated with traumatic or non-traumatic causes.[6] The majority of cases (80%) is due to traumas. Rhinorrhea may occur as a complication of 2-3 percent of all cranial traumas, among which are traffic accidents and operations involving the cranial base.[4,7,8] Operations for the nose, paranasal sinuses, and the cranial base account for 16%, while 3-4% of cases may be non-traumatic and spontaneous.[7]

Spontaneous CSF rhinorrhea refers to cases that are not attributable to operations or trauma.[7] It may occur in congenital anomalies, hydrocephalus, cerebral tumors, frontoethmoidal meningocele or encephalocele, specific granulomatous diseases, chronic paranasal sinus infections or tumors, and empty sella syndrome.[5-7,9]

The term empty sella refers to an anatomic condition in which the sella is largely occupied by an arachnoid diverticulum containing CSF. Empty sella cases rarely present with CSF rhinorrhea accompanied by recurrent meningitis attacks.[3,10] The cerebrospinal fistula is usually situated in the antero-inferior wall of the sella where the floor of sella has the least strength and is, to a great extent, vulnerable to pulsations.[3,10] The CSF pulsations in the intersellar arachnoid diverticulum cause progressive cortical erosions on the sella floor; bone erosions further lead to the perforation of dura and rupture of the arachnoid diverticulum, providing a passage to the sphenoidal sinus and the nasal cavity (Fig. 1).[10]

We present a case of CSF rhinorrhea of empty sella origin in which a successful repair was performed via a transnasal and transsphenoidal approach.

CASE REPORT

A sixty-three-year-old housewife had left nasal discharge that became noticeable following influenza. She received medical treatment for rhinosinusitis. Upon the persistence of the discharge, she applied to our clinic and was hospitalized on the suspicion of CSF rhinorrhea. Physical examination showed no neurological deficit. Range of vision was influenced by nasal depression on the right, and temporal on the left. A nasal discharge was observed when she bent her head. Routine blood and serum parameters and hormone levels were normal. Analysis of the nasal fluid revealed a clear colour, positive Pandy's test, and a positive result for glucose (72%). Magnetic resonance imaging showed herniation of the suprasellar cistern into the sellar cavity (empty sella) (Fig. 2); a fluid-like appearance of CSF density was noted in the left sphenoid sinus (Fig. 3), which was shown to be filled after administration of contrast medium (Fig. 4). A decision for operation was made. The sphenoid sinus was reached via a transseptal/transnasal-transsphenoidal approach and the floor of the sella

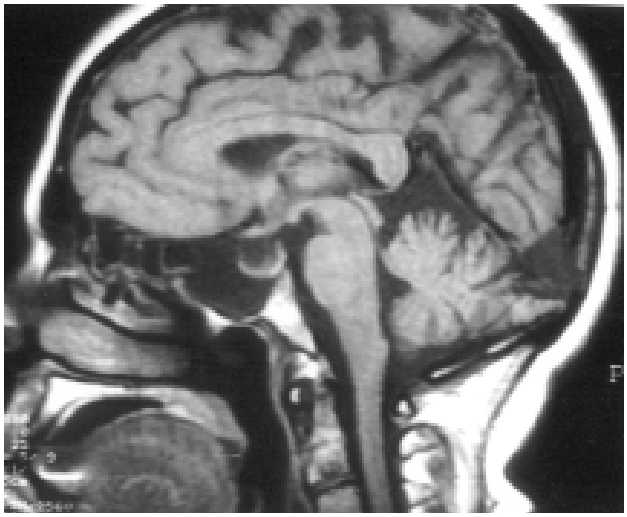

Fig. 2 - *Magnetic resonance view showing the herniation of the suprasellar cistern into the sellar cavity (empty sella).*

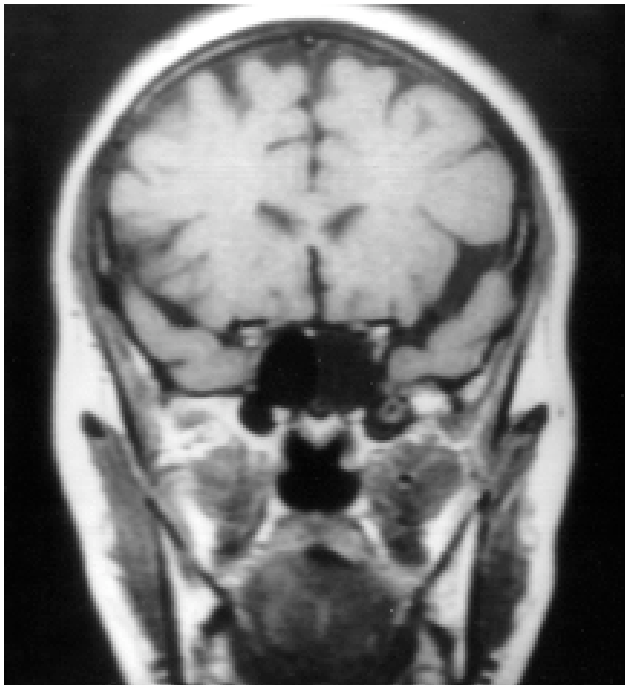

Fig. 3 - *Magnetic resonance view showing the presence of cere - brospinal fluid in the left sphenoidal sinus.*

was exposed. Multiple bone defects due to bone erosions were identified on the left side of the sella floor and on the medial side of the cavernous sinus. Upon aspiration, there was a leakage of fluid from these bone defects.

The sella floor was removed and the sellar cavity was exposed. The repair of the empty sella and the fistula was accomplished using muscle, fat, fascia lata, and a nasal septal cartilage graft. Postoperative period was uneventful. A control radionuclide cisternography examination was normal. The patient has been free from symptoms for five years.

DISCUSSION

Spontaneous CSF rhinorrhea due to empty sella is a rare condition.[3,10] Loew et al.[7] found no empty sella cases among 13 patients with spontaneous CSF rhinorrhea. Other investigators reported that rhinorrhea was associated with empty sella in 10% of cases.[9]

Antibiotic administration, which was the only treatment modality for a long time, proved to give unsatisfactory results in CSF rhinorrhea. Attempts to decrease high CSF pressure by lumbar puncture or performing shunt may prevent the release, but the ultimate solution seems to be surgical.

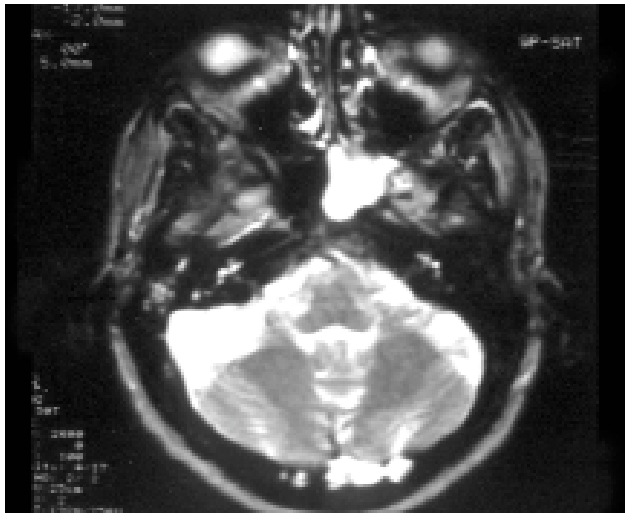

Fig. 4 - *Magnetic resonance view showing the left sphenoidal sinus filled with contrast material.*

Surgical approach may vary depending on the localization of the fistula; hence extracranial frontal osteoplastic flap,[7,11,12] external frontal ethmoidectomy,[1,8] transsphenoidal approach,[7,13] intracranial fronto-temporal craniotomy,[5,7,14] and endoscopic repair.[15,16]

Satisfactory results were reported in the management of CSF cases, the recurrence rate being 6%, and the mortality rate approximately 1-3 percent.[7]

Compared with the intracranial approach, the extracranial approach seems to have more advantages. Even though the intracranial approach provides a better exposition, it may lead to brain retractions, and to prolongation of both the operation and hospitalization of the patient.[7,14]

In our case, we applied a transnasal/transseptal-transsphenoidal approach in the repair of CSF fistula. Not only did we have an adequate exposition, but also a successful outcome with the use of muscle, fat, fascia lata, and septal cartilage. No cosmetic defects, complications, or recurrences were encountered within a follow-up period of five years.

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