In ossiculum terminale, there is failure of fusion of odontoid process. We report a case of torcular encephalocele with OS-terminale and split atlas.

**Case Report**

An 18-year-female patient, admitted in our unit, with complaints of a swelling at the back of head since birth. The swelling was increasing in size slowly, almost rounded in shape 8 cm in diameter and 21 cm in circumference. Consistency of swelling was soft, non pulsatile. Over laying skin was normal. Headache was present at the back of head for the last two years.

Patient was born at a hospital by normal vaginal delivery; her mother died just following her birth, and perinatal period was uneventful. No history of unconsciousness, visual disturbance, seizure, limb weakness, dysphasia, nasal regurgitation, bladder and bowel dysfunctions. Her developmental milestones were normal. Pupil was bilaterally normal, equal in size and reacting to light. The visual acuity and field of vision and fundi were normal. Other cranial nerves were normal. There was no sensory and motor deficit. Clinical and radiological diagnosis was Torcular encephalocele with pro-atlas defect and os-terminale. Magnetic resonance imaging of brain showed encephalocele and brain tissue herniated into the sac [Figure 1].

**Surgical procedure**

Under general anesthesia with prone position excision and repair of sac was done [Figures 2 and 3].

**Comment during discharge**

Patient prognosis appeared good in view of minimal gliosed parenchyma present in sac. Patient should continue to wear hard cervical collar. Patient will need posterior fixation for C1 abnormalities. Hence, she must be on regular follow-up in Neurosurgery Out Patient Department.
**Discussion**

True os-odontoideum is rare. Ossiculum terminale is nonunion of the apex at the secondary ossification center is much more common. Two anatomic types are orthotopic: Ossicle moves with the anterior arch of C1 and dystopic: Ossicle is functionally fused to the basion, and may subluxate anterior to the C1 arch.
Presentation of os-odontoideum included occipitocervical/neck pain, myelopathy and intracranial signs and symptoms.[9]

Most patients are neurologically intact and present with atlantoaxial instability which may be discovered incidentally. Many symptomatic and asymptomatic patients have been reported with no new problems over many years of follow-up.[8] Conversely, cases of precipitous spinal cord injury after seemingly minor trauma have been reported.[9]

Generally, patients with an occipital encephalocele are operated in the prone position with controlled ventilation and close temperature monitoring. Aspiration of the cerebrospinal fluid prior to incision in patients with large encephalocele helps in dissection of the sac. For a circular encephalocele with a small occipital bone defect, a transverse incision is ideal. The sac is separated from the flap. Patients in whom the encephalocele extends above and below the posterior fossa need a vertical incision. Sometimes, the brainstem and occipital lobe are present in the sac. Care must be taken to identify the contents of the sac. Rarely, the sagittal sinus torcular and the transverse sinus are in the vicinity of the sac. It is preferable to preserve the neural tissue. The dura is repaired meticulously to get a water tight closure. The dural defect can be repaired by using the pericranium as a graft. In neonates and infants, no attempt should be made to cover the bone defect by a bone graft.[10,11]

A large number of factors influence the outcome in patients with occipital encephaloceles. These are the site, the size, the amount of brain herniated into the sac, the presence of brainstem or occipital lobe with or without the dural sinuses in the sac and the presence of hydrocephalus.[12-15]

Previous authors described a 4-day-old boy was admitted with a large posterior fontanelle encephalocele. The baby had a small head with a circumference of 30 cm only and a large posterior fontanelle encephalocele. The baby in the sac and the presence of hydrocephalus.[12-15]

There was no hydrocephalus. X-ray of the cervical region showed os-terminale (Figure 4), split atlas, both anterior and posterior arch defect (Figure 5a and b).

The patient was operated in a prone position, and immobilized neck by hard cervical collar during surgery. At operation, there was gliosed brain inside the sac, which was excised. Bone defect was 3 cm in diameter. Dura was closed using 5-0 vicryl and wound was closed in multiple layers.

Patient had an uneventful recovery was discharged on 8th postoperative day. She was followed-up after 15 days, when she had no problem.

We advised use a cervical collar and regular monthly follow-up at neurosurgery outpatient department, for os-terminale, which may need a surgery, if required.

Conclusion

There is a rare association between torcular encephalocele and pro-atlas defect with Os-terminale. So this will bring attention to the world neuro scientist. Neural tube defect sometime presented with different type of congenital anomaly.

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How to cite this article: Nath HD, Mahapatra AK, Gunawat P. A torcular encephalocele with proatlas defect and os-terminale. Asian J Neurosurg 2012;7:94-6.

Source of Support: Nil, Conflict of Interest: None declared.