Endoscopic Management of Congenital Intranasal Meningocele in 3-Month Old Infant

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Abstract Fronto-ethmoidal meningocele is a rare congenital condition with protrusion of meninges through anterior cranial fossa into the facial skeleton, surgical repair should be done in order to resolve nasal obstruction, provide a watertight division between sino-nasal and intra-cranial cavities and minimise injury to any CNS contents (Maddalozzo in *Issue Otolaryngol Clin N Am* 2015). Open approaches may be required but endoscopic endo-nasal repairs can be done in paediatric skull-base defects. A 3 month-old infant with fronto-ethmoidal meningocele operated with endo-nasal approach. In regular follow up and there is no recurrence reported till now. Recent techniques and skills will increase the use of endo-nasal approaches in paediatric skull-base surgery without complications associated with external approaches.

Keywords Meningocele · Endo-nasal · Paediatric skull base · Nasal obstruction

Introduction

Meningocele is lesion in which there is an underlying skull defect associated with herniation of leptomeninges and CSF [2] due to disturbance in separation of neural and surface ectoderm at the site of final closure of the rostral neuropore during the 4th week of gestation [3].

Fronto-ethmoidal meningocele are rare in Western Europe but relatively common in south east Asia [4] with an incidence of 1 in 5000 live births [5].

This study concerns the second youngest patient in India as reported in the literature, operated successfully for nasal meningocele via endoscopic approach by using ear microsurgery instruments.

Case Report

A 3 month-old infant presented with breathing difficulty and nasal obstruction since birth. Examination revealed a grey soft tissue bulge in the left nasal cavity, without history of fever.

CT scan demonstrated a well defined polypoidal mass protruding from roof of left nasal cavity 1.4×1.3 cm extending up to left maxillary infundibulum associated with rt side septal deviation. MRI established diagnosis as left sided fronto-ethmoidal meningocele (Fig. 1).

Endoscopic excision in small nasal cavity was challenging. Patient was operated with 2.7 mm diameter 0° rigid endoscope along with ear microsurgery instruments. After identification the sac was followed up to the attachment with roof of nasal cavity, sac excised with bipolar diathermy and defect was plugged in with fat plugs, fascia lata and oxidised cellulose.

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Fig. 1 Pre operative MRI scan **Fig. 2** Post operative MRI scan

No CSF leak found intra-operatively and repaired structures supported with packing sponge.

Post operative course was uneventful Antibiotic prophylaxis given in post operative period.

The patient was discharged on 5th post operative day without any evidence of meningitis or CSF leak.

Patient is in regular follow up and there is no evidence of recurrence in MRI after 10 months (Fig. 2).

Discussion

Meningocele contains meninges or whereas meningo-encephalocele additionally contains brain parenchyma [6].

Symptom of nasal herniation includes nasal obstruction, feeding difficulty, CSF rhinorrhoea, and sometimes present with meningitis.

Differential diagnosis include nasal polyp, allergic rhinitis, lacrimal duct cyst, nasal glioma, and nasal meningocele.

Biopsy is strongly contraindicated due to risk of infection and meningitis [7].

Endoscopic surgeries has been extensively used in various forms of skull-base lesion and reduces morbidity and post op hospital stay.

In Endoscopic approach There is no effect on facial development, so early intervention can be done [7] with minimal risk of meningitis or CSF leak (meningitis or CSF leak can develop while waiting up to 2–3 years for surgery) [6–9].

Skull base reconstruction can be done with various techniques including underlay and overlay, using cartilage, bone, mucosa, fat, fascia (temporalis fascia or fascia lata) [10–12], Vascularised flaps can also be used, such as naso-septal or posterior pedicle inferior turbinate flap [13]. Large

defects should be reconstructed by using bone taken from the septum or mastoid cortex, applied in underlay, with a soft-tissue graft in over-lay [12]. Follow-up should be prolonged, as growth continues, modifying skull-base geometry [13].

The youngest successfully operated patients for nasal meningocele with Endoscopic approach were 23 [14], 6 [9], 5 [6], 2 months old [15] and 21 days old (India) [16]. The present patient was successfully operated in India at age of 3 months, making him the second youngest case of an endo-nasal approach for nasal meningocele repair so far reported in India.

Summary

Paediatric nasal meningocele/menigo-encephalocele can be treated by an Endoscopic approach. Endoscopic approach avoids the complications associated with external approaches. Advancements of instrumentation, recent technique and skills will increase the use of endo-nasal approaches in paediatric skull-base surgery [6, 14].

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