

Frontal Mucocele following Contralateral Orbitopterional Craniotomy for Optic Nerve Sheath Meningioma: A Short Report

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ABSTRACT

Unilateral skull base craniotomy provides reasonable exposure for orbital tumors, especially involving optic nerve sheath lesions. Such a surgical approach requires disturbance of sanctity of rhinological spaces, inviting unusual complications. The authors report contralateral mucocele formation 4 years after such a craniotomy performed for optic nerve sheath meningioma.

Keywords: Skull base craniotomy, Mucocele, Endoscopic marsupialization.

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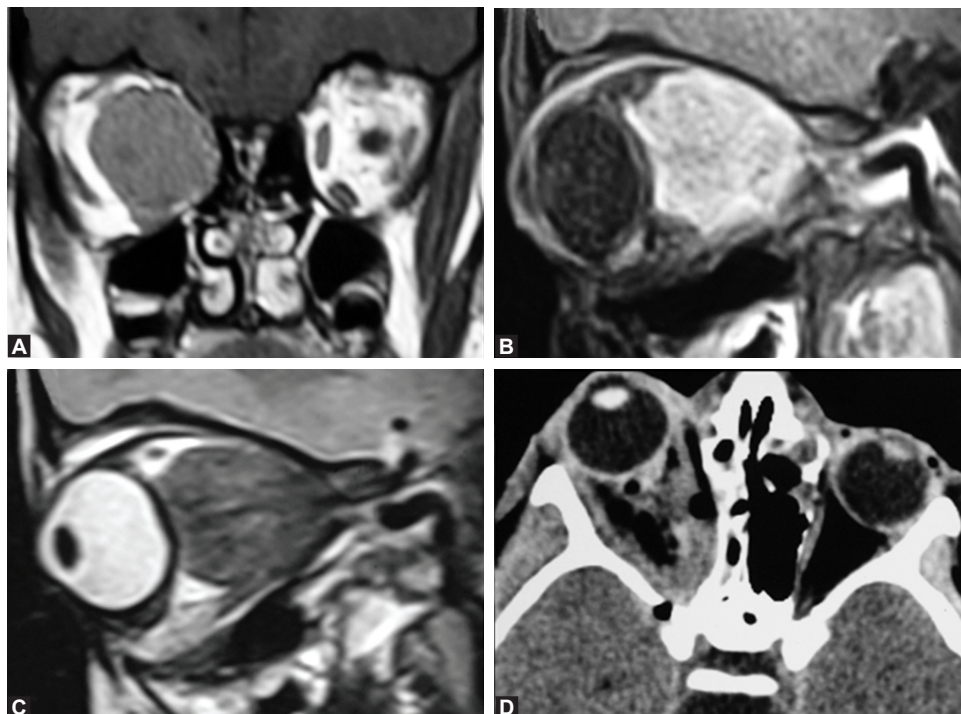
INTRODUCTION

Skull base craniotomy (orbitopterional) provides satisfactory exposure for orbital tumors. Such an approach exposes entire

orbital roof, which can be nibbled off or drilled so as to bare the entire optic nerve sheath. As rhinological regions are entered via this approach, entire new set of complications need to be tackled by the operating surgeons. Reported complications include CSF rhinorrhea, loss of olfaction, meningitis, encephalocele and cosmetic morbidity. In the present communication, authors describe contralateral mucocele formation, a delayed complication after orbitopterional craniotomy.

CASE REPORT

A 5-year-old female presented with vision loss from right eye for 9 months and proptosis for 2 months. On examination, her vision was 6/9 on left side, while there was mere perception of light on right side. CT scan and MRI scans showed right optic nerve sheath meningioma (Figs 1A to D). She underwent right sided orbitopterional craniotomy, using high speed craniotome, osteotome and chisel. There was no dural breach. Both anterior and posterior ethmoid sinuses got de-roofed and orbital roof was drilled using high speed



Figs 1A to D: (A) MRI scan (coronal section) showing right-sided intraorbital tumor, (B) MRI scan (sagittal section, contrast-enhanced) showing intensely enhancing intraorbital mass lesion, abutting the optic nerve sheath, (C) MRI scan (sagittal section, T2-weighted), showing mass lesion with hypointense signal, (D) Postoperative CT scan (axial section) showing near-total removal of optic nerve sheath meningioma

burr, making whole of optic nerve sheath bare. A large firm tumor encircling the optic nerve sheath was excised. Post-operative course was uneventful and her vision remained same, but proptosis disappeared.

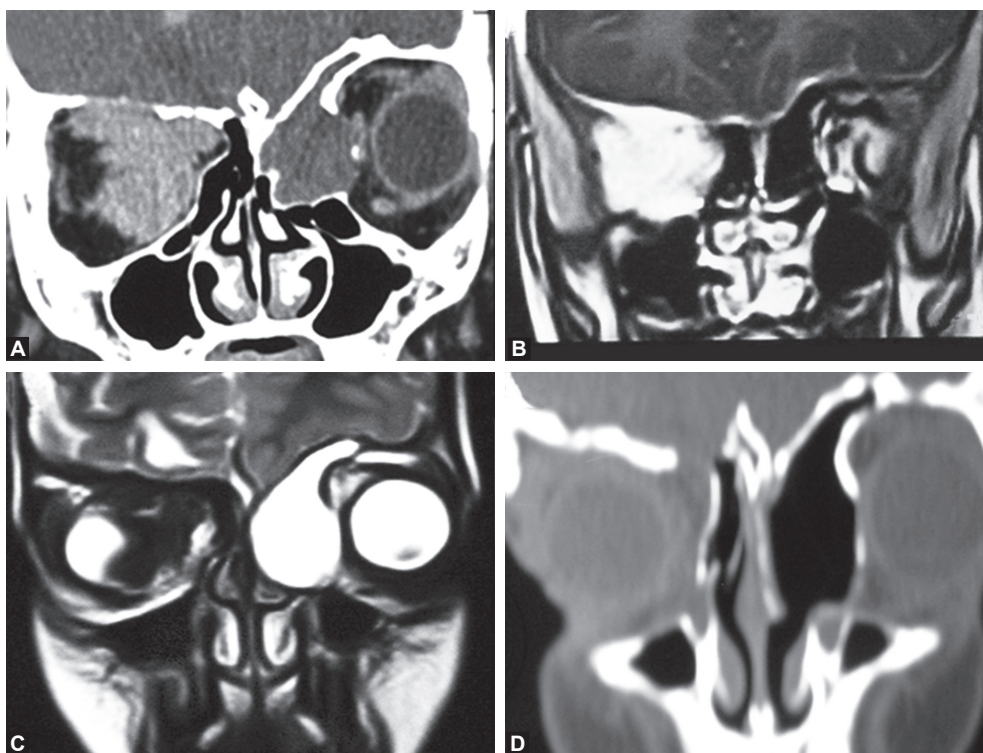
Four years later, she presented again with similar complaints (nonaxial proptosis in outward and downward direction), but an associated finding of firm swelling at left medial canthus. There was no movement of right eyeball in all directions. Left eye was normal in position, movement and vision. Radiological evaluation included CT scan and MRI scans which showed recurrence of right sided optic nerve sheath meningioma and a nonenhancing, ballooned left frontal sinus (Figs 2A to D). Left frontal sinus lesion was hypointense on T1, while hyperintense on T2 scans. With a diagnosis of recurrent right optic nerve meningioma and left frontal mucocoele, child underwent redocraniotomy and near-total tumor excision. Endoscopic route was undertaken, so as to marsupialize the frontal mucocoele. At 1 year of follow-up, the child continues to do well.

DISCUSSION

Orbitopterional craniotomy combines pterional craniotomy with supraorbital osteotomy, exposing the orbit from above. This approach provides sufficient surgical exposure for

excising orbital tumors. This is a safe gateway to perform optic nerve decompression and deroofting the optic canal, using high speed drills or fine nibblers. This approach has got the distinct advantage of carrying out optic nerve surgery under complete vision. Complications include CSF leak(rhinorrhea), pseudomeningocele, pulsatile proptosis, loss of olfaction or cosmetic morbidity.

Frontal mucocoele formation has been reported as a long term complication of anterior cranial base trauma involving fractures through the frontal sinuses.¹ The latent period may be as long as 19 years. Establishing patent frontonasal duct carries utmost importance while managing frontal sinus fractures. Iatrogenic frontal mucocoeles may also develop after transnasal endoscopic repair of traumatic anterior skull base CSF fistulas.² The present communication describes a patient who developed frontal mucocoele after orbitopterional craniotomy. Such a craniotomy warrants skull base osteotomy utilizing chisel, cutting away at orbital and ethmoidal roofs. This chiselling is undertaken at the external mark of nasal bones, which cuts through frontonasal duct. The rudimentary state of frontal sinuses and frontonasal duct at the time of craniotomy also carries importance. Further, the vertical drainage tract of frontonasal duct and its superficial location makes frontal sinus as the most vulnerable sinus



Figs 2A to D: (A) CT scan (coronal section) showing recurrence of tumor in right orbit and left frontal sinus mucocoele, (B) MRI scan (coronal section, contrast-enhanced) showing intensely enhancing right optic nerve sheath recurrent meningioma. Left frontal mucocoele is nonenhancing, (C) MRI scan (coronal section, T2-weighted), showing hypointense right orbital tumor, while hyperintense signal of left ballooned frontal sinus suggests mucocoele formation, (D) Postoperative CT scan (coronal section), showing adequately drained mucocoele

for mucocele formation. Henceforth, such a complication, albeit rare should be considered while following a patient who has undergone skull base craniotomy.

In addition to CT scan, coronal sections of both T1 and T2 scans should be obtained to rule out such complication. Endoscopic marsupilization of frontal sinus remains the management of choice with favorable long-term results.

CONCLUSION

Formation of frontal sinus mucocele is a rare complication after skull base craniotomies, involving osteotomies through nasal bones. Such a complication is more likely in children who are in first decade of their lives. A regular follow-up should keep a close watch for any swelling occurring at medial canthus. Radiological investigations should include coronal sections. Endoscopic marsupilization of frontal sinus remains the treatment of choice.

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