Frontal Sinus Mucocele with Intracranial and Intraorbital Extension: A Case Report

Shanker Mohan

Received: 3 January 2009 / Accepted: 28 December 2010 / Published online: 22 March 2011
© Association of Oral and Maxillofacial Surgeons of India 2011

Abstract We present an unusual case of a frontal sinus mucocele with intracranial and intraorbital extension. We also discuss the diagnosis and current management principles of this unusual lesion.

Keywords Frontal sinus mucocele · Proptosis · Intracranial extension and intraorbital extension

Introduction

Frontal sinus mucocèles can develop when the ostium becomes obstructed due to chronic sinusitis, polyps, tumors, trauma or after surgical interventions. The mucocele which is caused by continuing secretion and accumulation of mucus enlarges in size causing erosion of the sinus walls due to increased pressure. The mucocele tends to expand in the path of least resistance and may erode into the orbit, nasal cavity, skin or even have an intracranial extension [1].

We present an unusual case of frontal sinus mucocele with both intracranial and intraorbital extension.

Case Report

A 54 year old man presented to the Maxillofacial Department with a history of diplopia, proptosis and severe headache for the past 6 months. History revealed that he had a FESS done (Functional Endoscopic Sinus Surgery) three years ago for chronic sinusitis. On clinical

examination, he had proptosis of the right eye (Fig. 1) and diplopia in straight and upward gazes. Visual acuity was 6/6 in both eyes and eye movements were normal and an ophthalmologic examination was otherwise normal with no evidence of intraocular pathology.

MRI and CT scans showed a large cystic mass in the right frontal sinus with erosion of the orbital roof and floor of the cranium creating a direct communication between the orbit and the brain (Figs. 2, 3).

The patient was advised to have the cystic mass removed and he was operated by a joint surgical team comprising of neurosurgical and maxillofacial specialists. To reach the cystic mass, A bicoronal flap was raised, frontal craniotomy was done to expose the cystic lesion (Fig. 4). Mucocele was enucleated and the roof of the orbit was obliterated with cranial bone grafts while the frontal sinus was obliterated with bone chips and pericranial flap (Fig. 5). The craniotomy access opening was then closed and two suction drains placed. The wound was then closed in layers. Routine antibiotic cover (Amoxycillin and clavulanic acid 1.2 g TDS IV) was prescribed.

Postoperatively the drains were removed in the third postoperative day. The patient made an uneventful recovery. His diplopia and headaches had completely disappeared and he had a full range of eye movements. Visual acuity was 6/6 in both eyes. Histopathological examination confirmed an infected sinus mucocele (Fig. 6). Six months follow-up had shown no signs of recurrence and he is currently once in 6 months (Fig. 7).

Discussion

Mucocèles are mucus secreting expansile masses which when infected are called muco-pyocèles. They are capable

S. Mohan (✉)
Shanker Dental and Craniofacial Centre, 17/33 Rajaji Street,
Gandhi Nagar, Madurai, Tamil Nadu, India
e-mail: shankermohan@gmail.com

Fig. 1 Pre-operative Proptosis seen in the left eye

Fig. 4 Frontal sinus exposed via a bicoronal flap and craniotomy

Fig. 2 CT scans showing intracranial and intraorbital extension

Fig. 3 MRI scan showing the lesion abutting the frontal lobe

of resorbing bone and causing pressure symptoms. The presenting symptoms are based on the site of extension: orbital extension [2] (pain, proptosis, loss of vision, ocular motility disturbances, tearing), cranial extension (meningitis, headaches, epidural abscess, subdural empyema, brain abscess, cranial nerve palsies), nasal expansion (nasal blockage and loss of sense of smell), skin extension (a soft

Fig. 5 Cranial bone grafting and pericranial flap demonstrated. Cranial bone graft used to reconstruct orbital roof and pericranial flap used to obliterate frontal sinus

Fig. 6 Lesion removed measuring 4 cm in length. Biopsy confirmed and infected mucocoele

Fig. 7 Proptosis resolving now after lesion removed. Diplopia and headaches have completely disappeared

or fluctuant swelling over the forehead). Recently a case was reported of a frontal mucocoele presenting as an inflammatory pseudotumor caused by an immune reconstitution inflammatory syndrome in a HIV seropositive patient treated with highly active antiretroviral therapy [3]. Frontal mucocoeles are benign and curable but early diagnosis and treatment is vital to prevent any untoward complications.

CT scans are much better at delineating the extent of the lesion and its relations to the surrounding structures as compared to an MRI [4]. A lack of contrast between the cortical bone margins and the adjacent air in the sinus exists in the MRI scan, which can be misleading. Open surgery is the recommended approach as compared to a

closed nasal approach [5]. As the prognosis for visual function depends upon the period of visual impairment, it is important that prompt surgical intervention is carried out to achieve a good postoperative outcome.

Long term follow-up is warranted as recurrences are rare [6].

Acknowledgments I thank Dr Veera Rajkumar, Consultant Neurosurgeon, Shenbegam Hospital, Madurai for his collaboration in this case.

References

1. Tan CSH, Yong VKY, Yip LW, Amrith S (2005) An unusual presentation of a giant frontal sinus mucocoele manifesting with a subcutaneous forehead mass. *Ann Acad Med Singapore* 34(5): 397–398
2. Yap SK, Yap EY (1998) Frontal sinus mucocoeles causing proptosis—two case reports. *Ann Acad Med Singapore* 27(5): 744–747
3. Colebunders B, Claes G, Vlieghe E, Demeester R, Moerman F, Colebunders R (2008) A frontal mucocoele caused by an immune reconstitution inflammatory syndrome in a patient with HIV infection. *Rhinology* 46(5):243–245
4. Bilnuk LT, Zimmerman RA (1980) Computer assisted tomography: sinus lesions with orbital involvement. *Head Neck Surg* 2(4): 293–301
5. Wang KW, Hsu HC, Lu K, Chen HJ, Liang CL (2004) Outer table craniotomy for frontal sinus mucocoele. *J Craniofac Surg* 15(5): 869–874
6. Constantinidis J, Steinhart H, Schwerdtfeger K, Zenk J, Iro H (2001) Therapy of invasive mucocoeles of the frontal sinus. *Rhinology* 39(1):33–38