Case Series

A Rare Case of Idiopathic Frontal Bone Osteomyelitis

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Abstract

Osteomyelitis, although seen usually in long bones, shows a rare occurrence in the frontal bone as well. Acute osteomyelitis mostly presents as a soft, tender and fluctuant swelling on the forehead, known as Pott's puffy tumour when subperiosteal abscess is present, first described by Sir Percival Pott. Whereas chronic osteomyelitis presents as a forehead lump with or without fistula. We present a case of a 70 year old female who presented with a long-term history of forehead swelling and right upper eyelid fistula without any prior history of sinusitis, trauma or sinus surgery. She underwent surgical debridement of the necrotic bone and sequestrum with an uneventful post operative period.

Keywords: Osteomyelitis, frontal bone, fistulae, sequestrum, pott's puffy tumor

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Introduction

Blood Frontal bone osteomyelitis is a rare occurrence in the post antibiotic era which usually occurs secondary to frontal bone sinusitis, trauma or hematogenous spread [1]. Frontal bone is a diploic bone and has a marrow cavity which makes it vulnerable for development of osteomyelitis [2]. Younger population is more at risk for frontal sinus osteomyelitis as they tend to have higher flow rates in diploic veins and the anterior table of the frontal bone is relatively thinner. This allows for an easier transfer of sinus infections into the frontal bone and leads to the formation of Pott's puffy tumor, orbital and intracranial complications. Whereas in an older patient, there would be a lesser chance for development of frontal sinus osteomyelitis or associated complications without a history of predisposing factors such as immunocompromise, trauma, or prior surgery [3,4]. The frontal sinus lies in a close proximity to the anterior cranial fossa endangering it to the intracranial spread of infection. This necessitates early and aggressive treatment for its prevention. The imaging modality of choice for diagnosis of frontal sinus osteomyelitis is CT scan nose and paranasal sinuses along with CT head for detection of complications [5,6]. Treatment includes antibiotics for control of acute infection and surgery for its drainage.

CASE PRESENTATION

A 70 year old female presented with the complaints of forehead swelling and cutaneous fistula above right upper eyelid for the past 8 months. There was a preceding history of fever, headache and mucopurulent discharge from the fistula but no history suggestive of sinusitis or trauma. Examination revealed a hard, globular, non-tender swelling on the forehead of size 1.5x1 cm in midline observed on palpation but not on inspection. A

cutaneous fistula was observed above right upper eyelid (Fig.1) with crusting but no active discharge could be expressed. Rest of the ENT examination including diagnostic nasal endoscopy was within normal limits. CT scan showed features suggestive of frontal bone osteomyelitis with right orbital extension (Fig.2).

The patient underwent surgical debridement under general anaesthesia. After tarsorrhaphy and local infiltration, a spindle shaped incision was made around the supraorbital fistula. Subperiosteal dissection was done and multiple fistulae were observed on the orbital rim and anterior table of right frontal bone (Fig.3). The necrotic bone was debrided with kerrison punch and sequestrum removed. Using 0 and 30 degree Hopkin's rigid endoscopes cavity was widened further to remove all the necrotic bone and unhealthy mucosa from superior and lateral extensions of the disease. Cavity was saucerized by drilling with cutting and diamond burrs. Continuation of cavity was established into the frontal sinus and recess (Fig.4) to ensure drainage and wound was closed.

Fig 1:
Clinical picture showing fistula above right eyelid

Fig 2: NCCT Nose and PNS showing right frontal bone osteomyelitis with sequestrum

Fig 3: Multiple fistulae on the orbital rim and anterior table of right frontal bone

Fig 4: Continuation of cavity with frontal sinus for drainage

DISCUSSION

Acute frontal sinus osteomyelitis when occurs as a complication of frontal sinusitis typically presents with fever, headache, and purulent nasal discharge [2]. When infection of the frontal bone leads to subperiosteal abscess formation, it is known as Pott's puffy tumour [7]. These cases commonly present with additional symptoms of forehead swelling, photophobia, orbital pain, and periorbital edema [8]. A chronic presentation of the disease is in the form of a forehead lump. It can also present in the form of a draining cutaneous fistula, which can occur even in the absence of direct trauma to the sinus as seen in this case [2.9].

The aetiology of frontal sinus osteomyelitis is said to be secondary to frontal sinusitis, trauma, as a complication of sinus surgery, or hematogenous spread. The diagnostic modality of choice remains to be computed tomography of nose, paranasal sinuses and head [5,6].

The surgical treatment has been described in the literature as being debridement and removal of the sequestrum [10]. This can be done by an external fronto-ethmoidectomy to clear the frontal and ethmoid sinuses and an additional fronto-nasal drainage tube is needed sometimes. If the maxillary sinus also needs to be cleared, Caldwell-Luc approach can be used [11]. In case of an intracranial abscess, it needs to be drained as well [12]. An osteoplastic flap with a frontal craniotomy is seldom required for this. With the introduction of functional endoscopic sinus surgery, combined endonasal and percutaneous endoscopic surgery can be utilized for the surgical treatment of frontal sinus osteomyelitis secondary to frontal sinusitis [13]. We treated our patient via an external approach with the adjuvant percutaneous use of endoscope to eradicate lateral and superior extension of the disease obviating the need for enlarging the incision or using an osteoplastic flap approach. This provided a better cosmetic result and eliminated the morbidity and need for shaving associated with an osteoplastic flap. Endoscopes provided a comprehensive view of the cavity which ensured a complete removal of the disease. Also, since there was no involvement of the frontal recess and the medial part of the frontal sinus was disease free, intranasal endoscopic sinus surgery was not performed. A continuity of the final cavity was simply established with the frontal sinus and recess to assist with its drainage. The cavity was well saucerized with diamond burr to further ensure healing and drainage.

CONCLUSION

In conclusion, a complete removal of the necrotic bone and sequestrum, and formation of a smooth cavity with adequate drainage is crucial to the management of chronic frontal sinus osteomyelitis. The eradication of lateral extension of disease can be achieved by percutaneous use of endoscope with minimal surgical morbidity.

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