Tuberculous Osteomyelitis of Parietal Bone in a Child: A Case Report with Brief Literature Review

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Abstract

Tuberculous osteomyelitis of skull is a rare entity. It is also reported in healthy person without any evidence of tuberculosis elsewhere in the body, therefore diagnosis is not suspected. However, we rarely come across tuberculous osteomyelitis of right frontal bone following trauma. We present a case of left parietal tuberculous osteomyelitis who presented with headache, scalp swelling and discharging pus from over left parietal scalp region following trauma. Patient was managed by excision of lesion with diseased bone and mesh cranioplasty, and ant-tubercular therapy. Diagnosis of tuberculous osteomyelitis was made on the basis of histopathology report of biopsy specimen.

Key Words: Trauma, Skull osteomyelitis, Tuberculous, Excision, cranioplasty

Introduction

Skull Tuberculosis is a rare manifestation of extra-pulmonary diseases with occurrence of 1 in 10,000 cases of tuberculosis.[1] Reid first reported about calvarial tuberculosis in 1842.2 Malnutrition, poor socioeconomic conditions and immune deficiency syndrome are common issue in developing countries therefore it is major health problem however it is rare disease. Frontal, parietal bones are more common site because of having enough cancellous diploid spaces as compared to temporal and sphenoid bone.2 Tuberculous osteomyelitis of skull usually occurs due to hematogeneous spread of bacilli from primary active focus in the lung or latent infection.[3] It usually present with headache, fever, painless scalp swelling, discharging sinus from scalp. CT scan demonstrates the destruction of skull with involvement of scalp. We report a case of left parietal tuberculous osteomyelitis with discharging pus following trauma in a child.

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purulent discharge since 2month. Patient had history of traumatic injury 5 month ago. The child was conscious, oriented. He had no history fever and no any past history of tuberculosis and chronic illness along with his any family members. On examination there was local scalp swelling and draining sinuses. Complete blood picture, chest x-ray, liver function tests and renal function tests all were within normal limits. Computed tomography (CT) scan revealed hypo to iso-dense extra-axial collection in left parietal convexity with erosive loss of small part of parietal bone (Figure 1A and 1B). The excision of lesion along with involved thickened dura and diseased bone was removed (Figure 1C).Surgical side was cleaned with hydrogen peroxide and vancomycin. Pericranial layer was used for duraplasty and mesh cranioplasty was done (Figure 1D). Postoperative period was uneventful. Histopathology report showed extensive area of necrosis and many caseating as well as langerhans type giant cell, lymphatic cuff surrounded the granuloma (Figure1E).

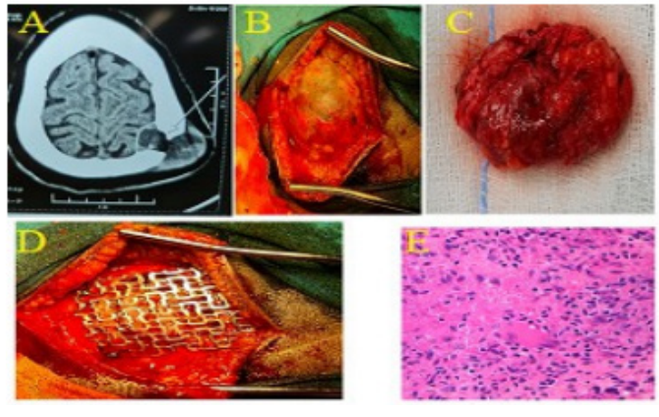

Figure 1: Axial section of CT scan of head showing bone defect in left parietal region with

lesion (4cm x 3.5 cm 3cm) noted in sub parietal region with irregular bone destruction and growing outside of skull (A, B, C)); Mesh cranioplasty after duraplasty and removing diseased bone part (D); Histopathology analysis of specimen obtained from lesion showing multiple epitheloid granulomas with central caseation and epitheloid cells and langerhans giant cells (E)

Final diagnosis of skull tuberculous osteomyelitis was done based on histopathology report. Patient was discharged on 4th day of procedure under antitubercular therapy. Patient was followed on first and second month after procedure and he was symptomless with wound healed well. Repeat CT scan of head was unable to not perform because of financial issue.

Discussion

Tuberculosis is major health problem in developing countries. Skeletal tuberculosis accounts for 1% of tuberculous infection, but skull tuberculosis are found to suffer in approximately 0.3-1.2%.[3,4] The first case of calvarial tuberculosis was reported by Reid in 1842 from Germany.[6] The skull tuberculosis is most common in young age with 50% of patient are less than 10 years, and 75-90% of patients are younger than 20 years.7 Patient usually present with headache, painless scalp swelling, discharging sinuses, seizure and motor deficit are rare presentation.[2,3, 8, 9] Our case presented with headache, painful scalp swelling and discharging pus through sinus since 2month following trauma. Strauss and Scoggin et al. hypothesized that trauma is predisposing factors in the formation of bony lesion.[10, 11] Increased vascularity, uncovering of latent infection and immunosupression secondary to trauma are thought to be predisposing factors. It may aid lodging of bacilli which are facilitated by inflammatory cells that lead to attraction to the trauma site and acts as vectors for bacilli.[12] Meng and Wu 2 questioned the significance of trauma, reasoning that was supported by Barton,13 who found no patient with a history of head injury. But, in our study patient had history of head trauma. Skull tuberculous osteomyelitis is found to be spread by hematogeneous route from primary focus, usually lungs,3, 14 where lymphatic dissemination is uncommon due to poor lymphatics of the skull.[15] Origin of skull tuberculosis usually occurs with deposition of tubercular bacilli in the diploic space during hematogeneous spread. Highly virulent tubercular bacilli in the presence of compromised host immunity may lead to proliferation of bacteria, granuloma tissue/abscess formation with subsequent destruction of the bone. Scalp swelling and sinus formation are noticed after destruction of outer table and extra-dural granuloma tissue formation is reported with inner table destruction. The dura acts an excellent protective barrier and if persistent infection occurs it may lead to subgaleal or exta-dural collection.

Plain x-ray images of the skull are helpful in screening high risk patients, where lytic lesion can be seen.[16] Nevertheless CT scan is standard which reveals bony destruction and degree of parenchymal and meningeal involvement and presence of extra-dural soft tissue.2 Depending upon skull destruction, three types of skull tuberculosis has been described at conventional radiological images: (1) perforating tuberculosis of skull involving both inner and outer table with granulation tissue,17 (2) diffuse tuberculosis of skull characterized by wide –spread destruction of inner table and epidural granulation,18 and (3) circumscribed sclerotic tuberculosis of skull characterized by marked thinning of bone.3 Our case was perforating tuberculosis of skull, which is similar to other report.[17]

Radiological and clinical findings are not always conclusive, therefore microbiological or histopathological confirmation is necessary before starting chemotherapy and surgery. Surgical excision was backbone for treatment of skull tuberculosis before arrival of anti-tuberculosis chemotherapy.[19] However, surgery is now mandatory in case of large extra-dural collection with neurological deficits or large scalp swelling with sinus formation.[12] In our case, we removed involved dura and pericranium was used for duroplasty. We excised diseased bone and granulation tissue with extirpation of sinus; and mesh-cranioplasty was done. Sometimes, diagnosis of tuberculosis of skull makes doubtful in case where persistent discharge occurs from non healing wound especially after local trauma. Therefore it is important to differentiate tubercular osteomyelitis from the more common pyogenic osteomyelitis after trauma. The demonstration of acid-fast bacilli in pus smear by using Ziehl Nelson stain or isolation of tubercular bacilli from culture is diagnostic tool.[20] Microscopic examination in case of skull tuberculous osteomyelitis reveals a preponderance of caseation, lymphocites, Langerhans giant cell, and multiple epitheloid and polymorphonuclear cell with proliferating blood vessels. However our case improved well this paper has limitations like it is one case retrospective study with short term follow up period. To validate this report, large numbers of traumatic tubercular osteomyelitis are needed to be studied with longer follow up period.

Conclusions

Our case report shows that patient can be managed successfully by excision of lesion with diseased bone and mesh cranioplasty, and followed by ant-tubercular therapy for traumatic calvarial tubercular osteomyelitis associated with destructive skull bone with granulomatous lesion and discharging sinus. Diagnosis of tuberculous osteomyelitis was made on the basis of histopathology report of biopsy specimen.

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