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A Rare Case of Calvarial Tuberculosis

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Abstract: Involvement of calvarium by Tuberculosis is a very rare occurance even in endemic areas. We report a rare case of calvarial tuberculosis occuring in a 11 year old child with probable spread from the orbit. There was no evidence of pulmonary tuberculosis in the child. A high index of suspicion and awareness of the condition may lead to early diagnosis. Mantoux test and ESR serve as good markers. Definitive tissue diagnosis is valuable. Treatment is predominantly medical with Anti-tuberculous therapy.
Keywords: Calvarial tuberculosis, orbit, ESR, tissue diagnosis, culture

INTRODUCTION

Tuberculosis involving the calvarial bones is a very rare occurance even in endemic areas [1]. The reported incidence of calvarial tuberculosis is 0.2 to 1.3% of all cases of skeletal tuberculosis [2]. Even in countries like India, where occurance of tuberculosis is common, skull bone involvement is rarely reported [3]. A high index of clinical suspicion and awareness of the condition may lead to early diagnosis [1].

CASE REPORT

A 11 year old male child coming from lower socioeconomic status presented to the OPD of Sarojini Devi Eye Hospital with the complaint of two swellings, one beneath the left lower eye lid and the other on the scalp since one year, with history of loss of appetite, low grade fever and malaise from the past six months. The patient gave a history of minor trauma prior to the onset of the swellings. There was no history of pain or chronic cough. The child was on prophylactic anti tuberculous therapy (ATT) two years prior to the onset of the swellings as there was a family history of Kochs in the father and grandfather who were treated with full course of ATT.

On examination, the orbital swelling was well defined measuring 3 x 2 cm located beneath the lateral half of the lower lid. The swelling was non-tender without any signs of inflammation. The scalp swelling was 2 x 1 cm, located over the left frontal bone. The swelling was soft, fluctuant and non-tender. Skin over the swelling appeared normal. Ocular examination was normal. On general examination, the child appeared ill-nourished. There were multiple tiny palpable lymph nodes in the posterior triangle of the neck and preauricular region. Tiny palpable submandibular lymph nodes were also noted. Lab investigations revealed total WBC count within normal limits. Differential count showed 36% lymphocytes. ESR (by Westergren method) was elevated; it measured 65mm at the end of first hour and 105mm at the end of second hour. Mantoux test was positive with an induration of 16 mm at 72 hours. Routine biochemical parameters were within normal limits. X-Ray Chest was normal. X-Ray skull showed a well-defined osteolytic area over the frontal bone (Fig. 1). CT scan of the skull showed a lytic skull lesion of the frontal bone (Fig. 2) and a left infraorbital mass (Fig. 3). FNAC of the scalp swelling yielded thin straw colored fluid about 0.5ml in quantity which was sent for culture. Culture of the material did not reveal any growth on common media, but Mycobacterium tuberculosis was grown on Lowenstein-Jensen medium, confirmed by Zeihl Neelsen Stain. Biopsy of the orbital swelling was performed. Histological examination showed caseating granulomas composed of epithelioid histiocytes and multinucleated Langhans giant cells and plenty of lymphocytes (Fig. 4 and Fig. 5). A final diagnosis of tuberculosis of the calvarial bone and left orbital soft tissue was made. The patient was put on 4 drug ATT regimen - INH, Rifampicin, Ethambutol and Pyrazinamide as per the RNTCP protocol. Follow up at intervals of one month, three months, six months and one year showed rapid clinical improvement, supported by laboratory evidence of decreasing ESR. At the end of one year the patient showed complete clinical improvement with ESR measuring 8mm. The patient has been on follow up for 2 years after treatment and did not show any relapse of

the disease.

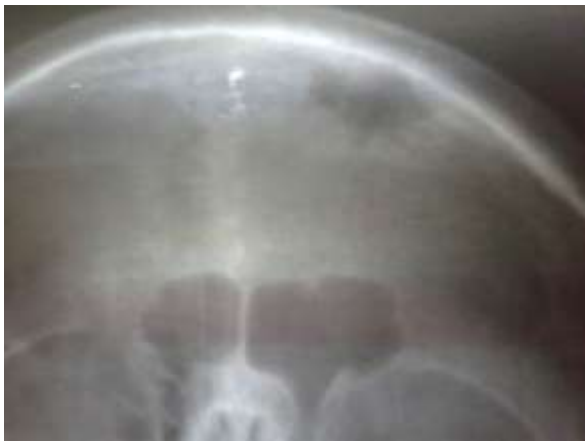

Fig. 1: X-Ray PNS showing lytic lesion on the frontal bone

Fig. 2: CT scan showing lytic lesion on the frontal bone

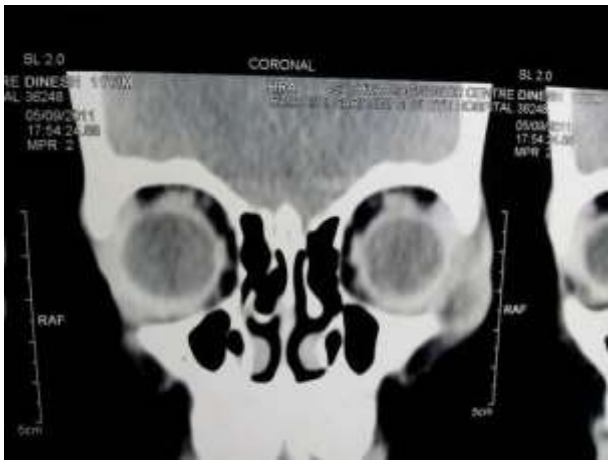

Fig. 3: CT scan showing infraorbital mass

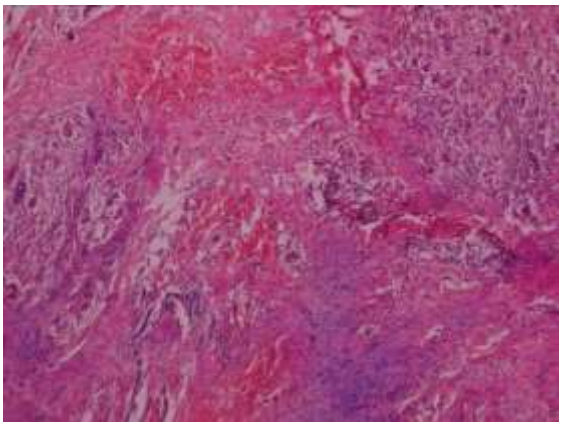

Fig. 4: Histopathology showing caseating granulomas and necrosis

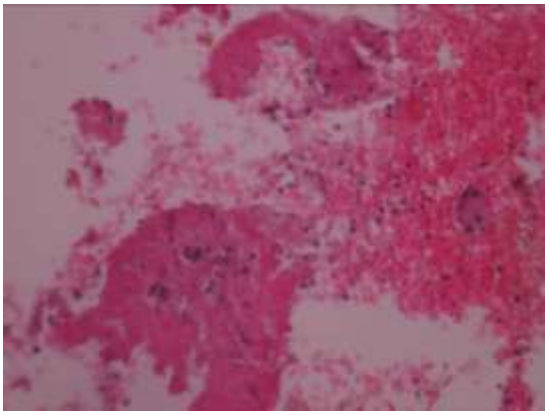

Fig. 5: Histopathology showing necrosis and giant cells

DISCUSSION

Involvement of calvarium by tuberculosis is uncommon even in areas where TB is endemic [1] The condition constitutes 0.2 to 1.3% of all cases of skeletal tuberculosis [2]. The condition was first described in literature by Reid in 1842 [2]. According to Chambers, the involvement of the flat bones is rare because of the peculiar blood supply of the flat bones which makes it difficult for the M tuberculosis to settle there [3]. Most cases of Calvarial tuberculosis occur in the first two decades of life. But infants are rarely affected because of the paucity of cancellous bone in the skull [4]. Both the sexes are affected equally [2]. Isolated calvarial tuberculosis is rare but can occur in association with pulmonary tuberculosis, TB osteomyelitis, TB involving other bones, cervical lymphadenitis or renal and intestinal tuberculosis [5]. Among the skull bones, the frontal and parietal bones are more commonly involved because they have a greater area of diploic space and more cancellous bone [5, 6]. The rarity of calvarial tuberculosis may be partially explained by the fact that lymphatic spread from the primary focus is not possible because the skull is deficient in lymphatic supply [2]. The factors influencing further development or spread are host resistance and virulence of the

bacillus [2, 4]. Extradural lesions are more common as duramater is more resistant to penetration by Tuberculous bacilli [4] Extensive area of destruction usually occurs before clinical presentation [5]. Trauma as a possible cause of skeletal tuberculosis can be explained by the fact that post traumatic inflammation may attract mycobacterium rich inflammatory cells thus initiating the lesion [2] Though the clinical presentation depends on the immunity of the patient [4] a soft fluctuant swelling of the scalp, with erosion of the bone, but without reactionary bone formation is a characteristic feature of skeletal tuberculosis [2]. ESR is elevated in most cases [4]. CT picture of tuberculous osteomyelitis is not very specific. Similar picture is also seen in pyogenic osteomyelitis, hemangioma, aneurysmal bone cyst and eosinophilic granuloma [5]. Because a conclusive diagnosis is not possible on clinical and radiological findings, microbiological or histological confirmation is required before starting treatment [4]. The absolute criterion for the diagnosis is isolation of TB bacilli in Lowenstein-Jensen medium or demonstration of acid fast bacilli in pus smears or tissue sections by Ziehl Neelson stain [5]. The histological features of caseous granulomas are the only clue to diagnosis in some cases along with radiological features. Raised ESR and extracalvarial tuberculosis act as supporting evidence [4, 5]. The management of flat bone tuberculosis is generally conservative with ATT, rest and good nutrition [3]. Though some authors feel that surgical excision of the involved bone should be done, [1] most authors feel that the sequestrum of tuberculous osteomyelitis gets absorbed under adequate ATT and surgical treatment is not necessary, [3] as noticed in our case. Surgical intervention may be necessary for large epidural symptomatic cases [2].

CONCLUSION

The diagnosis of Calvarial Tuberculosis, a rare presentation of the disease requires a high index of clinical suspicion especially in endemic areas. Relevant history and simple investigations like ESR give a clue to the diagnosis. Mantoux test serves as a good marker. X ray and CT scan support the diagnosis. Histopathology and demonstration of AFB in tissues, or culture on specific media are required for definitive diagnosis. Medical management with appropriate Antituberculous drug regimen is the mainstay of treatment. Surgery should be done where required. Follow up of the patient is required for prolonged period to rule out relapse.

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