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Isolated chronic osteomyelitis of fibula in a child: A case report and review of literature

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Abstract

Introduction: Osteomyelitis is one of the oldest diseases known. Hematogenous osteomyelitis is common in metaphysis of long bones like tibia and femur. Isolated osteomyelitis of fibula in diaphyseal region is un common and has been rarely reported.

Case Presentation: 8 year old male child presented to us with discharging sinus and granulation tissue over lower lateral aspect of left leg. He had a history of trauma 8 months back and had an open wound at the site of injury. The patient kept on doing daily dressings but was not relieved. The patient developed acute pain at the site of injury accompanied with fever and chills and was referred to us. We did sequestrectomy along with debridement and excision of sinus tract followed by a course of intravenous and oral antibiotics. At 12 months follow up, patient is completely symptom free and ambulating with full weight bearing on the affected leg.

Conclusion: Our case reports describes a rare case of isolated osteomyelitis of fibula in a child which occurred secondary to trauma and highlights the importance of a multi-disciplinary approach to deal with osteomyelitis.

Keywords: osteomyelitis, fibula, infection

Introduction

Osteomyelitis is an inflammation of bone caused by a pyogenic organism. Acute osteomyelitis develops within two weeks after disease onset, subacute osteomyelitis develops within one to several months and chronic osteomyelitis after a few months. The Wald Vogel classification divides osteomyelitis into 3 types as hematogenous, contiguous and chronic ^[1]. Acute hematogenous osteomyelitis occurs predominantly in children with metaphysis of long bones the most site. Besides local signs like tenderness over involved area and raise of temperature there are also signs of systemic illness. The diagnostic signs of sub acute and chronic osteomyelitis include sinus tracts, deformity and instability. Chronic osteomyelitis can occur secondary to trauma or via hematogenous spread from distant focus of infection. In our case there was a positive history of trauma to the patient 8 months back before presenting to us with chronic osteomyelitis of fibula.

Case report

A 8 year old male child presented to our outpatient department with discharging sinus along with sprouting granulation tissue over the lower lateral aspect of left leg since 8 months (FIGURE 1). History dates back to 8 months back when the patient while playing in an open field fell on the ground after being pushed by his fellow mates. At that time he sustained an open wound over the involved area. The patient went to a local practitioner who did local dressing of the wound. The patient was put on oral antibiotics at that time and was advised to daily dressings with oral antibiotics being stopped after 7 days. The wound never healed completely and serous discharge kept on continuously coming from the wound. Gradually with passage of time the open wound got covered with granulation tissue. Patient had a history of on and off fever. Around 10 days before presenting to us, the patient started developing pain and swelling over the lower lateral aspect of the involved leg. The pain was acute in onset. The pain was sharp piercing. This was followed by appearance of a swelling over the lateral aspect of leg. With the appearance of swelling, the intensity of the pain further increased.

On examination the swelling was tense and shiny. A discharging sinus with frank pus coming out from it was present. Bony tenderness was present on deep palpation. In the lower one third, fibula appeared to be irregular on palpation. A radiograph of the involved extremity was obtained which showed a pathological fracture at the junction of middle one third and distal one third of fibula with large piece of dead bone above fracture present with thickening and broadening of the majority of the fibular shaft (figure 2). Routine investigations were sent which showed as: Hb: 10.2 gm %, TLC: 12000/ cumm, ESR: 60 after one hour and CRP was 40 mg/l. A magnetic resonance imaging of the involved extremity was obtained which showed the presence of a large sequestrum with normal tibia and no adjacent joint involvement (figure 3). A decision was made to operate the patient. After getting consent and pre anesthetic clearance, fibula was opened through a lateral approach and the free lying dead piece of bone was removed along with debridement and excision of sinus tract. All dead and debrided tissue was sent for culture sensitivity. After thorough washing the wound was closed with the negative suction drain in situ which was removed 48 hours after the surgery. The bony specimen was sent for histopathological examination. Culture sensitivity came out to Methicillin Sensitive Staphylococcus Aureus sensitive to cefazolin and linezolid and histopathological examination revealed chronic inflammatory cells surrounding the necrotic bone which proves it to be chronic osteomyelitis. Post operatively the patient was put on intravenous Cefazolin for 2 weeks followed by oral linezolid for 4 weeks. At 12 months follow up, patient is having no relapse of symptoms and he is ambulating with full weight bearing on the affected leg (figure 4), although a small suspicious focus is noted in upper one third fibula (figure 5) but the patient is clinically asymptomatic. So the patient has been kept under strict observation and was told to do regular follow ups.

Discussion

Isolated chronic osteomyelitis of fibula in paediatric population is a rare entity. After extensive search of literature it was found that very few such cases have been reported in the literature. Two such cases were reported from the Indian sub continent [2, 3]. In one such reported case [2] a 6 year old male child while walking in Himalayan villages came in contact with a local shrub called as Bichu grass (*Urtica Dioica*) and subsequently developed cellulitis, blister formation and ultimately osteomyelitis. He was treated with debridement, sequestrectomy followed by 5 week course of antibiotics. In another case [3] 8 year old female child presented with pain and swelling over left leg since 6 months. No improvement in symptoms was seen after giving a trial of antibiotics. Ultimately she was treated with debridement, removal of 13 cm long sequestrum followed by a course of antibiotic therapy. We are the third one reporting a case of isolated chronic osteomyelitis of fibula in a paediatric population from Indian subcontinent.

We have found another three case reports of isolated chronic osteomyelitis of fibula, however these presentation were in adult population [4, 5, 6].

The term osteomyelitis was first introduced by Nelaton in 1844 [7]. Chronic osteomyelitis is a long standing infection that progresses over months or even years characterized by low grade inflammation and presence of dead bone called sequestrum, new bone called involucrum and sinus tracts [8].

The involucrum generally has holes called cloaca through which pus pours out. A bone abscess found during the sub acute or chronic stage of hematogenous osteomyelitis is called Brodie's abscess.

The diagnosis of osteomyelitis is based on history and physical examination with laboratory tests serving as a parameter to monitor the response to treatment. Leukocytosis and elevation of erythrocyte sedimentation rate and C – reactive protein is generally noted. The C – reactive protein appears more reliable to monitor the response to treatment. Its concentration is increased within hours of infection and returns to normal within a week after the treatment has begun [9].

The most important step in any osteomyelitis is to isolate the causative pathogen. The gold standard to diagnose osteomyelitis is bone biopsy. The sample bone must be sent for aerobic, anaerobic, fungal as well as mycobacterial cultures [10, 11]. It has been observed that the cultures of sinus tracts are not reliable for identifying the causative pathogen [12]. Plain x rays, bone scan, computed tomography as well as magnetic resonance imaging are the tools commonly used to diagnose osteomyelitis. Bone destruction caused by osteomyelitis may not appear until two weeks after onset of infection on plain x rays. Plain x rays generally show soft tissue swelling, periosteal thickening, focal osteopenia. A sequestrum often appears as a dense bone surrounding a lucent area of bone destruction.

Computed tomography scan is especially used to identify sequestra while magnetic resonance imaging is better for soft tissue involvement. In case of bone scan technetium methylene diphosphonate Tc-99 is the agent of choice [13].

While evaluating suspected osteomyelitis other diagnosis should also be considered. Acute leukemia, cellulitis, malignant bone tumors like Ewing's sarcoma and osteosarcoma can have same presentation and mimic osteomyelitis thus posing a significant diagnostic challenge for the surgeon. Special consideration should be given to Ewing's sarcoma as differential diagnosis in a child having similar history of swelling, pain, palpable mass, pathological fracture, fever, sometimes history of initial trauma [14]. Absence of typical findings of Ewing's sarcoma and Magnetic resonance imaging in our case clearly pointed towards osteomyelitis of fibula.

The causative pathogens in osteomyelitis vary according to the age of the patient as well as the clinical situation. Staphylococcus aureus is responsible for majority of cases of acute hematogenous osteomyelitis in children [15, 16].

Acute hematogenous osteomyelitis is treated with a parenteral course of antibiotics for four to six weeks [15]. Surgery is generally not required for hematogenous osteomyelitis where as chronic osteomyelitis is essentially a surgical disease and can not be eradicated without surgery. It requires a multi-disciplinary involving orthopaedic surgeon, radiologist, pathologist as well as microvascular surgeon. Surgical debridement can be sometimes quite challenging. Radical debridement which involves removal of all non viable skin, soft tissue and bone is the key to success [17, 18]. Debridement when done properly leaves a large dead space that can be managed by various methods like bone grafting, antibiotic impregnated polymethyl methacrylate bead, local muscle flaps and microsurgical free tissue transfer.

We in our case did sequestrectomy along with removal of dead necrotic bone without any reconstructive methods as tibia is not involved and distal end of fibula is not involved.

There are studies which support our management and emphasize that only distal resection of fibula require reconstruction as lateral malleolus is a part of ankle stability [19, 20]. At the end of follow up our patient was full weight bearing with no complaints.



Fig. 1: Showing discharging sinus and granulation tissue over lateral aspect of leg



Fig. 2: Showing pathological fracture and a piece of dead bone in lower end of fibula



Fig.3: Magnetic resonance imaging showing a sequestrum in the fibula with normal tibia and no adjacent joint involvement.



Fig.4: Clinical pictures showing patient bearing full weight on the involved extremity.



Fig.5: Showing a small suspicious focus in upper end of fibula.

Conclusion

Chronic osteomyelitis of fibula has been seldom reported. It must be diagnosed and treated as early as possible to prevent the spread of infection causing serious complications in a growing child. Aggressive surgical debridement followed by appropriate antibiotic therapy based on culture reports are the mainstay of treatment.

Conflict of Interest

The author(s) declare that they have no conflict of interest.

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