Shoulder tuberculosis in children: a report of two cases

Anil Agarwal, Anubrat Kumar, Abbas Shaharyar, Mohd Shafi Bhat
Department of Pediatric Orthopedics, Chacha Nehru Bal Chikitsalaya, India

ABSTRACT

We report 2 children who underwent multidrug antituberculous therapy with rifampicin, isoniazid, ethambutol, and pyrazinamide followed by dedicated physiotherapy for tuberculosis of the shoulder. Both patients regained a range of motion comparable with the contralateral side after 9 to 10 months.

Key words: child; shoulder; tuberculosis, osteoarticular

INTRODUCTION

Tuberculosis of the shoulder accounts for 1 to 2% of skeletal tuberculosis and usually affects adults. Diagnosis in children is often delayed, missed, or misdiagnosed. We report 2 children who underwent multidrug antituberculous therapy and dedicated physiotherapy for tuberculosis of the shoulder.

CASE REPORTS

Patient 1

In July 2011, a 7-year-old girl presented with an 8-month history of progressively deteriorating, insidious, dull, aching pain in her right shoulder and restricted movement. The patient had no history of fever, weight loss, or night sweats. Clinical examination revealed marked atrophy of the muscles around the shoulder with joint line tenderness. The range of motion was grossly restricted due to pain and spasm. The patient was investigated based on a preliminary diagnosis of peripheral neuropathy (e.g. brachial neuritis). Radiography and computed tomography revealed multiple lytic lesions in the right humeral head and neck and the scapular glenoid, and multiple calcified lymph nodes in the right hilar, pretracheal, and axillary group (Fig. 1). Haematological tests were normal except for a raised erythrocyte sedimentation rate (ESR) of 60 mm/hr.

The patient was suspected to have osteomyelitis.
or chondroblastoma. An open biopsy was performed and histopathology was suggestive of tuberculosis. Multidrug antituberculous treatment was started with an intensive phase for 2 months using rifampicin (10 mg/kg), isoniazid (10 mg/kg), ethambutol (15 mg/kg), and pyrazinamide (25 mg/kg), followed by a continuation phase for 10 months using rifampicin and isoniazid. As soon as the pain decreased, passive pendular and circular movement was encouraged and later intensified to active assisted and active movements.

At postoperative 3, 6, and 9 months respectively, the visual analogue score for pain decreased to 4, 2, and 1, and the ESR decreased to 40, 8, and 7 mm/hr. At 3 months, abduction was 0° at the scapulohumeral region and 30° at the scapulothoracic region. The range of motion improved to 70° at 6 months and was comparable with the contralateral side at 9 months. At 2 years, the patient had no complaints or deformities.

**Patient 2**

In September 2012, a 5-year-old boy presented with a 3-month history of progressive, persistent, and diffuse pain at the left shoulder with gradually increasing swelling, and a 2-month history of painful swelling at the right ankle. The patient had undergone drainage and broad-spectrum antibiotic therapy elsewhere 3 weeks earlier; there had been an initial decrease in symptoms for a week followed by recurrence at both sites. Cultures from both sites had been reported sterile. Nonetheless, there was persistent sero-purulent discharge from the indurated posterior shoulder incision (2x1 cm) for 2 weeks. The range of motion of the left shoulder and the right ankle was grossly restricted due to pain and swelling. Radiography revealed lytic lesions over the acromion and talus (Fig. 2). Repeat cultures from the shoulder wound grew no bacteria. In view of the persistent discharge and negative cultures, re-debridement and open biopsy was performed at both sites for acid fast staining, conventional solid media culture, and histopathology. Histopathology was positive for tuberculosis, and cultures from the ankle grew *Mycobacterium tuberculosis*.

The patient underwent the same multidrug antituberculous treatment. The ESR decreased from 55 to 11 mm/hour at one year. The left shoulder wound healed at 3 months. The visual analogue score for pain decreased from 8 to 5 at 3 months and to one at 6 months. Within 10 months, the boy regained shoulder and ankle range of motion comparable with

![Figure 1](image)

**Figure 1** Patient 1: radiography and computed tomography showing (a) multiple lytic lesions in the right humeral head and neck and scapular glenoid with localised osteopenia at presentation, (b) no significant recovery at 3 months, (c) only a solitary lytic lesion at one year, and (d) healed lytic lesions at 2 years.
Tuberculosis of the shoulder is rare (Table).\(^1\)\(^-\)\(^6\) There are 2 varieties of shoulder tuberculosis: caries sicca (dry form) and caries exudata (abscess form).\(^7\) Caries sicca manifests as marked wasting and painful movement restriction, whereas caries exudata manifests as cold abscess and swelling and is more common in children.\(^7\)\(^,\)\(^8\) In patient 1, caries sicca manifested as chronic pain, which was suspected to be peripheral neuropathy. In patient 2, caries exudata manifested as inflammation and was suspected to be septic arthritis. The exudata variety may also mimic acute osteomyelitis or osteogenic sarcoma.\(^2\)\(^,\)\(^9\) Radiology may reveal osteoporosis, subchondral erosions with round/oval radiolucent lesions, diminished joint space, and progressive joint destruction.\(^5\)\(^,\)\(^10\) The differential diagnosis of shoulder tuberculosis includes eosinophilic granuloma, chondroblastoma, clear cell chondrosarcoma, sarcoidosis, brucellosis, fungal infections, metastases, and pyogenic osteomyelitis.\(^10\) Thus, a high level of clinical suspicion and histopathological study are needed. Multiple samples from skin, pus, granulation tissue, synovium, and bone curetting should be obtained for acid fast staining, culture, and histopathology when a tubercular diagnosis is suspected. Although the positive detection rate of these tests is low (acid fast staining: 10–30%; culture on conventional solid media: 30–40%; histopathology: 72–97%), when multiple samples are obtained from different tissues for multiple tests, the yield is quite high.\(^11\) In addition, the use of automated liquid broth media such as the mycobacterial growth indicator tube 960 system can reduce the culture and drug susceptibility time to just 2 to 4 weeks with 97% sensitivity and 82% specificity.\(^12\)

Treatment modalities for shoulder tuberculosis include multidrug antituberculous treatment, repeated arthrotomies, debridement and irrigation, and immobilisation. The main sequela of shoulder tuberculosis is movement restriction.\(^1\)\(^,\)\(^2\)\(^,\)\(^7\) In our patients, recovery of range of motion was slow initially, but once the pain subsided, recovery was

**DISCUSSION**

Tuberculosis of the shoulder is rare (Table).\(^1\)\(^-\)\(^6\) There are 2 varieties of shoulder tuberculosis: caries sicca (dry form) and caries exudata (abscess form).\(^7\) Caries sicca manifests as marked wasting and painful movement restriction, whereas caries exudata manifests as cold abscess and swelling and is more common in children.\(^7\)\(^,\)\(^8\) In patient 1, caries sicca manifested as chronic pain, which was suspected to be peripheral neuropathy. In patient 2, caries exudata manifested as inflammation and was suspected to be septic arthritis. The exudata variety may also mimic acute osteomyelitis or osteogenic sarcoma.\(^2\)\(^,\)\(^9\) Radiology may reveal osteoporosis, subchondral erosions with round/oval radiolucent lesions, diminished joint space, and progressive joint destruction.\(^5\)\(^,\)\(^10\) The differential diagnosis of shoulder tuberculosis includes eosinophilic granuloma, chondroblastoma, clear cell chondrosarcoma, sarcoidosis, brucellosis, fungal infections, metastases, and pyogenic osteomyelitis.\(^10\) Thus, a high level of clinical suspicion and histopathological study are needed. Multiple samples from skin, pus, granulation tissue, synovium, and bone curetting should be obtained for acid fast staining, culture, and histopathology when a tubercular diagnosis is suspected. Although the positive detection rate of these tests is low (acid fast staining: 10–30%; culture on conventional solid media: 30–40%; histopathology: 72–97%), when multiple samples are obtained from different tissues for multiple tests, the yield is quite high.\(^11\) In addition, the use of automated liquid broth media such as the mycobacterial growth indicator tube 960 system can reduce the culture and drug susceptibility time to just 2 to 4 weeks with 97% sensitivity and 82% specificity.\(^12\)

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good following dedicated physiotherapy. Long-term follow-up is needed to monitor any late-onset deformity or recurrence.

DISCLOSURE

No conflicts of interest were declared by the authors.

REFERENCES