Other full case

Isolated tuberculous osteomyelitis of the scapula

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Summary

Isolated tuberculous osteomyelitis involving flat bones such as the scapula is extremely rare. The diagnosis is generally delayed due to non-specific complaints and radiographs mimicking pyogenic osteomyelitis, especially in those with no lung involvement. The authors report a case of isolated tuberculous osteomyelitis of the scapula in a 44-year-old woman. A review of the English literature revealed only 11 cases of isolated tuberculous osteomyelitis involving the scapula. The management is outlined and the difficulties in diagnosis are highlighted.

BACKGROUND

Although skeletal tuberculosis is common in endemic areas such as Asian countries and the southern Saharan regions, the spread of HIV-AIDS has seen an increased global incidence of tuberculosis associated with increased resistance and poor response to drug therapy.^{1 2}

Osteoarticular involvement occurs in 1–3% of patients with extrapulmonary tuberculosis with about a third having concomitant active pulmonary disease.^{1 3} Haematological spread is generally considered key in those with pulmonary or other concomitant organ involvement.³ Vertebral involvement occurs in nearly 50% of all cases of bone and joint involvement in tuberculosis.³ *Mycobacterium tuberculosis* lodges in the bones via haematogenous spread from previously acquired disease in the lungs, gut or nodes. It may also invade the bones directly from the para-aortic lymph nodes.⁴

CASE PRESENTATION

A 44-year-old woman was referred by her family physician with a 2-month history of painful movement of the right shoulder associated with progressive swelling. She was treated by her family physician for presumptive interscapular myositis with anti-inflammatory drugs, cold packs and rest. The pain was localised to the right interscapular region, intensifying with movement of the right shoulder. The patient denied any constitutional symptoms and had no cough. Clinically, she was found to have a tender swelling along the lateral border of the right scapula with limited movement of the right shoulder. Spinal examination was essentially normal. A trial course of antibiotics, painkillers and rest to the right shoulder by means of a sling was started with a presumptive diagnosis of pyogenic osteomyelitis.

INVESTIGATIONS

Her laboratory investigations were significant for a raised erythrocyte sedimentation rate of 58 mm in the first hour;

all other haematological and biochemical investigations were within reference ranges. Chest x-ray revealed a lytic lesion alongside the lateral border of the right scapula and normal lung shadows.

Since her symptoms did not improve, she underwent a CT of the right shoulder region which revealed an osteolytic lesion of the right lower scapular body and lateral border with a small sequestrum (figure 1). Aspirates under CT guidance were subjected to smears for gram staining, acid fast bacilli and routine culture tests apart from cytological analysis. Smears were negative for bacteria and acid fast bacilli and the cytological analysis showed a few necrotic polymorphonuclear leucocytes. Culture yielded no growth. Serum immunoglobulin G (IgG), IgM and IgA antibodies to *M tuberculosis* revealed an equivocal IgG level of 187 serounits, a negative IgA level and a positive IgM level of 1.13 serounits. A Mantoux tuberculin skin test using five units of purified protein derivative resulted in an induration of 12 mm.

Histopathological examination of the curetted tissue revealed a granulomatous lesion with giant cells suggestive but not conclusive of tuberculosis (figure 2). The culture report revealed growth of *M tuberculosis*.

DIFFERENTIAL DIAGNOSIS

The diagnosis is often delayed due to the non-specific clinical features and mistaken treatment for pyogenic osteomyelitis. Other conditions which may mimic skeletal tuberculosis are pyogenic or fungal osteomyelitis, multiple myeloma, eosinophilic granuloma and bone metastasis. Certain features such as sequestration, periosteal reaction and more pronounced reactive new bone formation are often seen in pyogenic osteomyelitis, thus helping differentiate it from tubercular osteomyelitis. Imaging studies characteristically show osteopenia and rare sequestra formation in tuberculosis.⁴ A high index of clinical suspicion along with multimodal imaging may help early diagnosis, enabling timely and appropriate therapy.⁵

Figure 1 Lytic lesion in the scapula with soft tissue cystic mass on CT.

Figure 2 Granulomatous reaction with Langhans type and foreign body giant cells (H&E staining ×400).

TREATMENT

The patient was offered a trial course of antitubercular chemotherapy. After 6 weeks of antitubercular therapy consisting of four drugs (rifampicin, ethambutol, pyrazinamide and isoniazid hydrazide), clinical re-evaluation showed no improvement and she preferred surgical

debridement. An exploration under general anaesthesia revealed a cavity with multiple openings occupying the lateral border of the scapula in its distal aspect. The cavity was filled with yellow, purulent fluid, granulation tissue and sequestra. The surrounding periscapular muscles were inflamed, oedematous and densely adherent to the cavity.

Table 1 Published cases in the English literature of isolated tuberculosis of the scapula

Authors	Year	Lesion	ATT	Surgery
Lafond ¹¹	1958	NA	Yes	NA
Martini <i>et al</i> ¹²	1986	Acromion L	NA	NA
Mohan <i>et al</i> ¹⁰	1991	Body of scapula R	Yes	Yes
Vohra <i>et al</i> ²	1997	Body of the scapula R	Yes	Yes
Kam <i>et al</i> ⁸	2000	Acromion R	Yes	Yes
Greenhow and Weinrub ¹³	2004	Inferior angle scapula L	Yes	Yes
Husen <i>et al</i> ⁹	2006	Spine of the scapula L	Yes	No
Srivastava and Srivastava ⁷	2006	Angle of scapula L	Yes	No
Solav ⁴	2007	Medial margin, spine of scapula L	Yes	No
Singh <i>et al</i> ⁵	2009	Body of scapula R	Yes	No
Jain <i>et al</i> ⁶	2009	Inferior angle scapula L	Yes	Yes
Present	2010	Lateral margin of scapula R	Yes	Yes

ATT, alternating triple therapy; L, left; R, right.

Debridement was carried out and the cavity curetted and washed with copious amounts of saline.

OUTCOME AND FOLLOW-UP

The present case was treated initially as interscapular myositis by a family physician; the patient was subsequently seen by her orthopaedic surgeon who after an initial trial of anti-inflammatory drugs found a scapular lesion. Further investigations proved inconclusive and so the patient was treated with antitubercular therapy as a presumptive diagnosis. Since there was no clinical improvement despite 6 weeks of alternating triple therapy (ATT), she underwent surgical exploration for persistent unrelenting pain. The aspirated pus did not yield acid fast bacilli on initial examination; however, culture of the fluid and tissue grew *M tuberculosis*. The continuation of ATT completely resolved the patient's symptoms and she was pain free by 6 months. Three years later, she is asymptomatic, has no recurrence and has a complete range of shoulder movements.

DISCUSSION

Pure or isolated tuberculous osteomyelitis of the flat or membranous bones such as the scapula is extremely rare and only 12 cases of isolated scapular involvement have been reported (see table 1).^{13–15}

While plain radiography may be normal in the initial phases of the disease, CT reveals abnormality earlier than plain radiographs and permits guided needle aspiration cytological examination. MRI is more sensitive and specific than either radiography or CT scans and may reveal diagnostic changes as early as 4–6 months compared to conventional methods. Skeletal scintigraphy using technetium-99m-methylene diphosphonate helps in early detection and localisation if the entire skeleton is not scanned⁴ for detection of multiple foci.

Identification of acid fast bacilli on Ziehl–Neelsen staining and giant cells with granuloma formation on histological examination with tubercular bacilli culture are the final investigations of choice in diagnosing skeletal tuberculosis since imaging studies by themselves cannot rule out the presence of other infections or neoplasms.⁴

Most authors contend that the lesion responds well to antitubercular chemotherapy and surgery should be

offered only for those cases with giant sequestra or those that do not respond to a trial period of 4–6 weeks of antitubercular therapy.^{13–15}

Learning points

- ▶ Isolated tuberculosis of the scapula is extremely rare; the differential diagnosis includes pyogenic or fungal osteomyelitis, multiple myeloma, eosinophilic granuloma and metastasis.
- ▶ The diagnosis is difficult and needs a high degree of clinical suspicion and awareness; multimodal imaging may help diagnosis.
- ▶ MRI is more specific and sensitive than other imaging modalities which rarely show osteopenia and sequestra formation in tuberculosis.
- ▶ Confirmation of acid fast bacilli on Ziehl–Neelsen staining of the specimen or giant cells with granuloma formation on histology and tubercular bacilli culture are the final tests of choice in diagnosis.
- ▶ Most lesions respond well to antitubercular therapy and surgery should be offered only for those cases which do not respond to 4–6 weeks of antitubercular therapy; recurrence is rare.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. Adesiyun OAM, Abdulkadir AY, Akande HJ. Fulminant tuberculosis: simultaneous shoulder and pulmonary involvement. *Int J Shoulder Surg* 2007;**1**:114–16.
2. Vohra R, Kang HS, Dogra S, *et al*. Tuberculous osteomyelitis. *J Bone Joint Surg (Br)* 1997;**79-B**:562–6.
3. Sankaran B. Tuberculosis of bones and joints. *Ind J Tub* 1993;**40**:109–18.
4. Solav S. Correlative imaging in skeletal tuberculosis with special emphasis on radionuclide bone scintigraphy: a pictorial essay. *World J Nucl Med* 2007;**6**:19–28.
5. Singh A, Chatterjee P, Pai CM, *et al*. Tuberculous osteomyelitis of the scapula masquerading as metastasis. *J Radiol Case Reports* 2009;**3**:27–31.
6. Jain D, Jain VK, Singh Y, *et al*. Cystic tuberculosis of the scapula in a young boy: a case report and review of the literature. *J Med Case Reports* 2009;**3**:7412.
7. Srivastava P, Srivastava S. Tuberculosis of the scapula. *Indian J Surg* 2006;**68**:27–9.

8. **Kam WL**, Leung YF, Chung OM, *et al*. Tuberculous osteomyelitis of the scapula. *Int Orthop* 2000;**24**:301–2.
9. **Husen YA**, Nadeem N, Aslam F, *et al*. Tuberculosis of the scapula. *J Pak Med Assoc* 2006;**56**:336–8.
10. **Mohan V**, Danielsson L, Hosni G, *et al*. A case of tuberculosis of the scapula. *Acta Orthop Scand* 1991;**62**:79–80.
11. **Lafond EM**. An analysis of adult skeletal tuberculosis. *J Bone Joint Surg Am* 1958;**40**:346–64.
12. **Martini M**, Adjrad A, Boudjemaa A. Tuberculous osteomyelitis. A review of 125 cases. *Int Orthop* 1986;**10**:201–7.
13. **Greenhow TL**, Weinrub PS. Scapular mass in an adolescent. *Pediatr Infect Dis J* 2004;**23**:84–5.

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