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Case Report

Tubercular osteomyelitis of the spine of scapula: A rare case report with review of literature

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ABSTRACT

Isolated tuberculosis of the flat bone is very rare. Only a few such cases involve the scapular bone, and spine of the scapula is rarely involved. This condition is mostly misdiagnosed and wrongly treated. Scapular involvement in tuberculosis leads to decreased range of motion, clinically mimicking the frozen shoulder. Because of the presence of lytic lesions with marginal sclerosis, radiologically, it mimics tumors, which results in misdiagnosis. Moreover, lack of constitutional symptoms is the cause of delayed diagnosis. Isolated tuberculosis can be managed successfully with excellent prognosis without any complications if identified and treated early.

Here, we report a very rare case of tuberculosis of the spine of the scapula in a 22-year-old female. The patient presented with pain and swelling in right scapular region from 6 months without any constitutional symptoms. Initially, the condition was misdiagnosed as traumatic hematoma. X-ray showed osteomyelitic changes in the spine of scapula and ultra-sonograph showed collection in the trapezius muscle. On magnetic resonance imaging, focal osteomyelitis of the medial part of the spine of scapula, with collection and multiple axillary lymph nodes involvement, was noted. The patient was managed with anti-tubercular drugs along with surgical debridement and curettage and the diagnosis was confirmed with biopsy. On serial follow-up, the patient recovered completely without any complications or recurrence.

Although rare, tuberculosis should be suspected in patients presenting with a chronic swelling without constitutional symptoms in the scapular region, particularly in the developing countries. Early diagnosis and treatment result in excellent prognosis and outcome without any complication. This case highlights the salient features of scapular tuberculosis.

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1. Introduction

Tuberculosis bacterium infects about one-third of the world population, causing 1.7 million deaths per year. In developing countries, tuberculosis is the main cause of skeletal infections. Only 2–3% of all tuberculosis cases and 10–35% of the cases of extra pulmonary tuberculosis are attributed to skeletal tuberculosis and less than 1% have scapular involvement.^{1,2} It is extremely uncommon for tuberculosis to develop in flat bones devoid of any

other foci. The scapula is susceptible to congenital, traumatic, neoplastic, and infectious processes similar to any other bone but is rarely a site for tubercular osteomyelitis.³ Tuberculosis of the scapula may involve its different parts, such as the acromion process, body, glenoid, inferior angle, and spinous process. Tuberculosis of the spine of the scapula, a triangular flat bone, is a rare diagnosis.⁴ Its atypical presentation at this unusual site and nonspecific radiological features leads to delay in diagnosis or misdiagnosis. The main complaint, typically in young adults, is long-standing pain and swelling in the shoulder region. Isolated involvement of this flat bone

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without any primary focus confuses the surgeons with other pathologies, leading to delay in actual diagnosis. Sometimes treating surgeon, biased by history of trauma, suspect it to be post-traumatic hematoma due to lack of awareness and nonspecific radiological picture.

Here, we report the case of a patient with tuberculosis of the spine of the scapula. We highlight the salient features of scapular tuberculosis. Based on our findings and perusal of literature, we emphasize that a high index of suspicion is mandatory to avoid delayed diagnosis and extensive involvement due to insidious onset, paucity of constitutional symptoms, insignificant and early radiographic findings, and a presentation similar to that of frozen shoulder.

2. Case Report

A 22-year-old female patient presented with intermittent dull aching pain and swelling in the right scapular region for six months. The patient had a history of trauma nine months prior to the presentation and reported minor skin abrasions at the time of injury for which she had consulted a local doctor who treated her with analgesic and topical anti-inflammatory medication for discomfort and swelling in the scapular region area. Although the symptoms were not completely relieved, the patient could manage daily routine activities with analgesic on demand. After 6 months, she again had complaints of pain and swelling over the scapular region, and the pain increased on moving the shoulder and when sleeping in supine position. There was no history of fever, loss of weight or appetite, and chronic cough. The patient had no chest pain or other constitutional symptoms. There was no history of tuberculosis.

On physical examination, a swelling, 3×3 cm in size, was palpable in the right supraspinous area. There was no discharging sinus or pointing abscess. The swelling had soft cystic consistency. Bruit or pulsation was not present in the swelling. The temperature of the swelling was normal. All cardinal signs of inflammation, except pain and swelling, were absent. There was slight painful restriction in the range of shoulder motion compared to that feasible for the opposite side of the shoulder. Blood investigations revealed that the patient was immunocompetent; the detected parameters were as follows: hemoglobin, 10.1 gm%; C-reactive protein (CRP), 16 mg/dL; erythrocyte sedimentation rate (ESR), 100 mm/h; and total leukocyte count, 6,600. There was no history of intake of any immunosuppressant drug. On ultrasonography, collection in the trapezius muscle was noted. Anteroposterior radiographs of the left shoulder showed osteomyelitic changes in the spine of scapula. X-ray of the chest was normal.

Aspiration of the swelling done, and it was found culture negative. After 3 months, the patient again developed swelling and pain. Magnetic resonance imaging (MRI) revealed osteomyelitis of the medial part of the spine of

the scapula with moderate sized associated multiloculated collection, $7.5 \times 1.1 \times 7$ cm in size, in deep subcutaneous plane in the right scapular region closely abutting the underlying infraspinatus, teres minor, teres major, and deltoid muscles with mild adjacent subcutaneous tissue edema (Figure 1 (A, B, and C)) and multiple prominent right axillary lymph nodes, the largest of which was approximately 18×9 mm in size. No intrathoracic extension or shoulder joint involvement was noted.

Incision and drainage were performed along with curettage and the tissue sample was sent for culture and histopathology. Biopsy showed typical epithelioid cell granuloma, suggestive of tuberculosis. Cartridge-based nucleic acid amplification test revealed sensitivity to rifampicin and isoniazid. The culture examination for pyogenic bacteria did not grow any organisms.

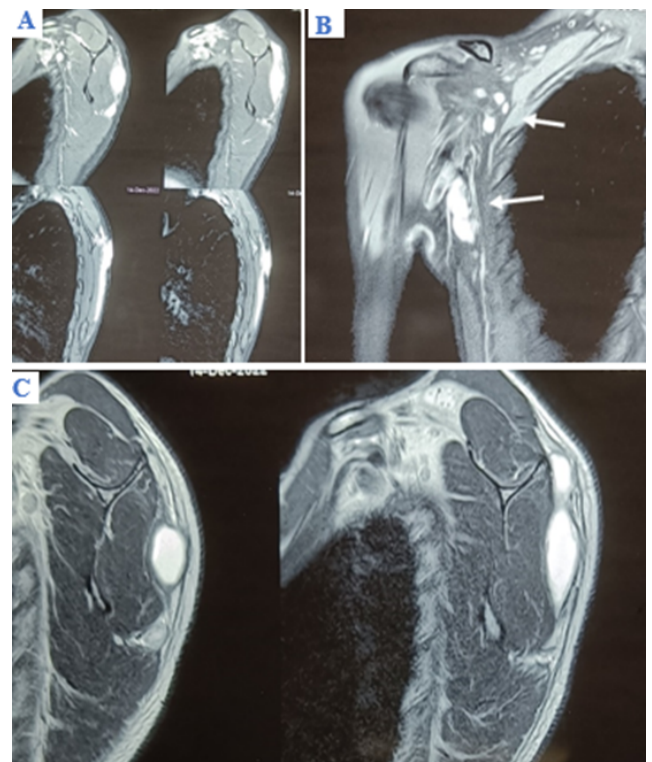


Figure 1: (A,B, and C) : MRI showing osteomyelitis of the medial part of the spine of scapula with moderate sized multiloculated collection in the deep subcutaneous plane in the right scapular region closely abutting the underlying infraspinatus, teres minor, teres major, and deltoid muscles, with mild adjacent subcutaneous edema.

Table 1: Reported cases of tuberculosis of the scapula.

S. No.	Author	Year	Age/Sex	Side	Site	Size	Type	Treatment	Remark
1	Lafond ⁵	1958	NA	NA	Scapula	NA	NA	Antitubercular treatment	
2	Martini et al. ⁶	1986	NA	NA	Acromion of scapula	NA	NA	NA	
3	Shannon et al. ⁷	1990	4 Y/M	Left	Scapula	NA	Multifocal	Antitubercular treatment	Multifocal cystic tuberculosis of scapula with right ileum involvement.
4	Mohan et al. ⁸	1991	23 Y/F	Right	Body of scapula	NA	Isolated	Drainage and antitubercular treatment	
5	Guasti et al. ⁹	1997	NA	NA	Spine of scapula	NA	Isolated	Drainage and antitubercular treatment	
6	Vohra et al. ¹⁰	1997	NA	NA	Body of scapula	NA	Isolated	NA	
7	Kamet al. ¹¹	2000	33 Y/M	Right	Acromion of scapula	NA	Multifocal	Debridement, curettage, and placement of gentamicin beads	Ziehl–Neelsen stain revealed the presence of acid-fast bacilli and subsequent culture confirmed the organism <i>Mycobacterium tuberculosis</i> , which was sensitive to antitubercular drugs.
			22 Y/F	Right	Body of scapula	NA	Multifocal	Biopsy and antitubercular treatment	Associated with disseminated form of tuberculosis.
8	Greenhow and Weinrub ¹²	2004	14 Y/M	Left	Inferior angle of scapula	3 × 7.5 × 10 cm	Isolated	Debridement, curettage, and antitubercular treatment	Cystic lesion, with a soft tissue component located dorsal to the scapula
9	Stones and Schoeman ¹³	2004	3.5 Y/M	Left	Scapula	NA	Multifocal	NA	Excision of scapular mass. Discharging sinus was present. As part of multifocal tuberculosis involving maxilla, parietal bone, and scapula.

Continued on next page

Table 1 continued

10	Husen et al. ¹⁴	2006	18 Y/M	Left	Spine of scapula	2.5 × 2.5 cm	Isolated	Antitubercular treatment	Classic radiographic features, including a radiolucent lesion with minimal sequestration.
11	Srivastava and Srivastava ⁴	2006	26 Y/F	Left	Inferior angle of scapula	1.8 × 1.1 cm	Isolated	Aspiration and antitubercular treatment	Doppler-assisted high resolution ultrasonography showed cystic lesion having complex fluid near the inferior angle of left scapula with sequestrum formation.
12	Solav ¹⁵	2007	54 Y/F 26 Y/M 40 Y/M	Left	Spine of scapula and medial margin Scapula Scapula	NA NA NA	Isolated Multifocal Multifocal	Antitubercular treatment NA NA	
13	Jain et al. ¹	2009	14 Y/M	Right	Body of scapula near glenoid	NA	Isolated	Antitubercular treatment	Cystic tuberculosis of the scapula.
14	Singh et al. ²	2009	49 Y/F	Left	Body of scapula inferior to spine	12 × 12 × 5 cm	Isolated	Incision, drainage, and antitubercular treatment	Patient was diagnosed as a case of papillary adenocarcinoma of the right ovary 2 years ago and was treated with neoadjuvant chemotherapy followed by interval debulking. Tuberculosis of scapula masquerading as scapular metastasis.
15	Tripathy et al. ¹⁶	2010	22 Y/M	Right	Body of scapula	15 × 10 cm	Isolated	FNAC and antitubercular treatment	Isolated multicystic tubercular lesion of scapula
16	Vijayaraghavan et al. ¹⁷	2010	44 Y/F	Right	Body and lateral margin of scapula	NA	Isolated	Debridement and antitubercular treatment	CT of the right shoulder region revealed an osteolytic lesion of the right lower scapular body and lateral border with a small sequestrum.

Continued on next page

Table 1 continued

17	Sharma et al. ¹⁸	2013	56 Y/F	Right	Inferior angle of scapula	7.3 × 7 × 4 cm	Isolated	Aspiration and antitubercular treatment	CT scan of the thorax revealed lytic destruction of the inferior angle of scapula with few bony fragments. Lung parenchyma showed evidence of collapse and consolidation in the anterior segment of the left upper lobe with bronchiectasis; however, no communication was noted between the scapular lesion and lung parenchyma or the pleural cavity.
18	Balaji et al. ¹⁹	2013	17 Y/M	Left	Superomedial aspect of body of scapula	4 × 3 cm	Isolated	Biopsy and antitubercular treatment	
			17 Y/F	Right	Inferior angle of scapula	6.3 × 6.9 cm	Isolated	Incision and drainage of the abscess with debridement, sequestrectomy and antitubercular treatment	
19	Jagtap et al. ²⁰	2013	25 Y/M	Right	Inferior angle of scapula	5.9 × 8.4 × 6.9 cm	Isolated	Drainage and antitubercular treatment	MRI showed an erosive lesion involving the inferior angle of the scapula communicating with a large multiseptated abscess between the teres major and the latissimus dorsi with a few prominent right axillary lymph nodes.
20	Chandane et al. ²¹	2016	7 Y/M	Left	Body of scapula	NA	Isolated	Incision, drainage, and antitubercular treatment	MRI showed extensive erosions of right scapula with necrotic axillary lymph nodes on same sides.

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Table 1 continued

21	Sambharia et al. ²²	2016	14 Y/M	Right	Acromion process of scapula	1.8 × 0.9 cm	Isolated	Debridement, curettage, and antitubercular treatment	
22	Ghanshyam et al. ²³	2018	34–50Y 3 M/1F	Left	Blade-2 cases Inferior angle-1 case Spine and blade-1 case	NA	Isolated	Incision, drainage, and antitubercular treatment	Case series of 4 cases.
23	The current case	2024	22 Y/F	Right	Spine of scapula	7.5 × 1.1 × 7.0 cm	Isolated	Incision and drainage, curettage and antitubercular treatment	On MRI, a focal osteomyelitis of the medial part of the spine of the scapula with collection and multiple axillary lymph nodes involvement was noted.

CT: Computed tomography; FNAC: Fine needle aspiration cytology; MRI: Magnetic resonance imaging; NA: Not available

Anti-tubercular treatment was started empirically for 12 months according to the World Health Organization guidelines: 2 months of intensive therapy and 10 months of continuation phase. ESR and CRP values were progressively decreased on serial follow-up. Side effects of anti-tubercular drugs were periodically assessed using liver and kidney function and serum uric acid tests. Shoulder immobilizer was applied for 4 weeks, after which physiotherapy was started to gain functional range of movements and prevent stiffness of the shoulder joint.

The pain and swelling resolved after three months of the anti-tubercular treatment. After 1 year, complete resolution of the lesion, both clinically and radiographically, was achieved, without any complications. Radiological recovery was in the form of sclerosis around the lytic area. Clinically, the pain and swelling were resolved. At 1.5-year follow-up, the patient remained asymptomatic, had no recurrence, and showed normal shoulder range of motion.

3. Discussion

Skeletal tuberculosis usually occurs after a primary infection of the lungs or lymph nodes by hematogenous spread and less commonly by lymphatic spread. Incidence of involvement of the scapula is very rare, accounting for less than 1% of the skeletal tuberculosis cases.¹ Isolated involvement of scapula in tubercular infection is very rare and only few reports are available in the literature. (Table 1) Diagnosis of skeletal tuberculosis is difficult due to its common nonspecific presentation. It often presents with longstanding pain and swelling without any constitutional symptoms because of which its diagnosis and treatment are delayed. Sometimes, it may also present with discharging sinus. Generally, it occurs in young adults. Constitutional symptoms, such as fever and malaise, can also be present in few cases. Clinically, reduced shoulder mobility may mimic frozen shoulder. ESR and CRP levels are usually elevated. Radiographs mostly show a lytic lesion with sclerosis and periostitis.¹¹ The differential diagnosis of a lytic lesion in a radiograph can be pyogenic infection, tumor-like bone cyst, sarcoidosis, and eosinophilic granuloma.^{2,16} Tubercular infection usually has a lytic lesion with marginal sclerosis, which can be easily confused with benign tumors. In children, the lesion may be confused with cystic neoplasm.¹² Hence, biopsy of the lesion and further culture and histopathology are very important for early diagnosis. MRI and computed tomography (CT) are required for determining the extent of the disease. Biopsy of the lesion—the Gold standard test—showed caseous necrosis and granuloma. Bone scintigraphy using Technetium-99m-methylene diphosphonate helps in early detection and localization if the entire skeleton is not scanned for detection of multiple foci.¹⁵

Multifocal involvement is seen in children whereas osteoarticular involvement is usually solitary in adults.

Tubercular involvement of the scapula has been reported in pediatric patients.^{12,13} Bone scanning might, therefore, be important in children and adult who have multifocal osteoarticular tuberculosis.² Identification of acid-fast bacilli on Ziehl–Neelsen staining and giant-cells with granuloma formation on histological examination with tubercular bacilli culture are the investigations of choice in diagnosing skeletal tuberculosis. Bone pain that does not respond to analgesics may be due to infection or neoplasm. If plain radiographs are normal, more sensitive investigations, such as MRI and CT, are required to detect and localize the lesions. Morris et al. reported confirmation of musculoskeletal tuberculosis solely based on the identification of epithelioid granuloma and caseous necrosis or tubercular bacilli in fine needle aspirates or on tissue culture studies.^{24–26} Masood reported that fine needle aspiration cytology (FNAC) is a good alternative to open biopsy as it showed granulomatous reaction in 73%, bacteria in 64%, and positive culture in 83% of cases.²⁷ The presence of a sinus from which pyogenic organisms are cultured may lead to diagnosis of chronic osteomyelitis; however, if the sinus persists after administering suitable antibiotics, tuberculous osteomyelitis must be considered.

Tuberculosis is managed by anti-tubercular drugs. The sequestrum of tuberculous osteomyelitis is believed to be absorbed under adequate and effective anti-tubercular therapy. Surgical intervention is only required in cases where there is a large sequestrum, large abscess, or no improvement even after 3–4 weeks of anti-tubercular therapy or difficulty in making diagnosis. Surgical procedure including sequestrectomy, debridement, and biopsy may decrease the infection load, confirm the diagnosis, ascertain sensitivity to antibiotics, and help in early recovery.^{2,28} Isolated scapular tuberculosis is usually managed by anti-tuberculosis treatment.

In the present case, the patient had a trauma. The scapula, being superficial on the dorsal aspect, can easily be pierced by any sharp item or sustain abrasion and contusion. The swelling was aspirated, but it recurred after 3 months. The patient was managed by incision and drainage with curettage and antitubercular treatment for 1 year. The diagnosis and antibiotic sensitivity to drugs was confirmed using biopsy. This case highlights the occurrence of tuberculosis in an uncommon region, with no constitutional symptoms, and in an immunocompetent patient.

Identification of scapular involvement in all individuals with shoulder discomfort requires a high degree of suspicion. To prevent misdiagnosis, a thorough clinical and radiographic examination is required because periarthritis or a frozen shoulder are typically used to treat shoulder issues. Muscle wasting is a characteristic sign of tubercular involvement. MRI is a useful noninvasive tool for diagnosis, but diagnosis is established by needle aspiration or open

biopsy.

4. Conclusion

Isolated scapular tuberculosis is a very rare entity. Lack of awareness, absence of constitutional symptoms, nonspecific radiological findings, and antecedent history of trauma may lead to its misdiagnosis. Early diagnosis using radiological investigations and histopathology can help successfully manage scapular tuberculosis with antitubercular treatment alone, with excellent prognosis without any further complications. Chances of failure of anti-tubercular treatment are very rare and, hence, only a few cases need to be surgically managed.

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None.


6. Conflict of Interest


None.


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