



ATYPICAL MYCOBACTERIAL OSTEOMYELITIS OF THE OLECRANON IN AN ADULT: A RARE OCCURRENCE

Orthopaedics

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ABSTRACT

An eighteen year young adult presented with painless swelling over left elbow joint of 4 months duration in absence of constitutional symptoms. Range of motion at elbow joint was painful but preserved. Radiographic evaluation showed cortical erosion with lytic lesion in left olecranon. Magnetic resonance **Image showed altered signal intensity; hypo on T1 and hyper-intense on T2** in the left olecranon. Open biopsy showed epithelioid granuloma and Langhans giant cells. Polymerase chain reaction identified atypical mycobacterium DNA. **The patient received 6 months of chemotherapy. Lesion showed progressive resolution on serial radiograph with good function outcome.** It requires high index of suspicion and prompt evaluation for early diagnosis. To reach final diagnosis histopathological examination should be performed in addition to nucleic acid amplification/PCR. Institution of timely chemotherapy decreases the morbidity and preserves good joint function, avoids further complications.

KEYWORDS

Atypical Mycobacterium; Osteomyelitis; Olecranon.

Introduction

Atypical mycobacteriums are defined as Mycobacterium other than Mycobacterium tuberculosis and Mycobacterium leprae species. They are naturally present in water, soil, fish, non-pasteurized milk and as laboratory contaminants [1]. They cause localized opportunistic infection of soft tissue, lung or bone usually in immune-compromised individuals with potential to disseminate. However infection can occur in immune-competent individuals but rarely disseminates. Bone infection by atypical mycobacterium is rare occurrence but reported in both long and short bones both however more common in soft tissues [2] Clinical features of atypical Mycobacterium are similar to that of mycobacterium tuberculosis such as nonspecific symptoms, delayed progression, difficult to grow organism on culture and hence delay in diagnosis [3]. Early diagnosis and institution of treatment prevents the complication of getting destruction of bone and articular cartilage and joint deformities.

Case report

An eighteen year old female presented with pain and swelling in left elbow joint of four months duration. She had no constitutional symptoms such as fever, anorexia, weight loss. There was no history of any chronic illness. The significant findings found in the patient was swelling over posterior aspect of left elbow and tenderness over left olecranon with preserved range of motion at left elbow joint.

Complete blood count showed normal blood counts, ESR was 40mm/1st hour, CRP was 1.81mg/dl. Mantoux test showed induration of 2×4 mm after 72 hours and interpreted as negative test. Blood culture was negative for organism. Plane radiograph of left elbow (**fig.1**) showed osteolytic lesion in olecranon. **Magnetic Resonance Imaging study** of left elbow showed focal abscess in left olecranon process with perifocal marrow edema, minimal joint effusion and lytic lesion in olecranon (**fig.2**).

Curettage of lesion was done. Sample obtained was sent for microscopic, culture sensitivity, histopathological and nucleic acid amplification (PCR) tests. Acid fast staining of sample showed no organism. Culture was negative for aerobic and anaerobic bacteria. **Histopathological** examination showed chronic inflammatory cells with areas of necrosis, epithelioid cells and giant cells, suggesting infection from mycobacteria (**fig.3**). PCR study turned out to be

positive for DNA of Non-Tuberculous Mycobacterium and was negative for Mycobacterium tuberculosis. Chest X-ray was negative for primary tuberculous lesion.

On the basis of above investigations it was assumed to be atypical mycobacterial osteomyelitis of left olecranon. Patient was started on

Clarithromycin and Rifampicin. Patient was followed up in outpatient department with serial clinical examination, ESR, CRP and radiograph at 6 weeks intervals. After 6 months of chemotherapy ESR value was found to be in normal range, radiographs showed slow and steady improvement of lytic lesion of olecranon over 6 months (**Fig.4**) with preserved range of motion of left elbow joint (**Fig.5**).

Discussion

Most atypical mycobacterium are weakly pathogenic bacteria with low mortality on infection. They are widely distributed in nature and have no natural host reserves in contrast with mycobacteria tuberculosis. **Atypical mycobacterial osteomyelitis** is very rare infection in immunocompetent individuals, usually they are associated with patients with immunodeficiency and are very difficult to treat [4,5]. It can colonize immunocompetent hosts easily, but with only mild pathogenicity.

In immunocompetent individuals, very few cases of atypical mycobacterium osteomyelitis are reported in literature [6,7,8]. In our patient, there was no evidence of immunodeficiency, history of trauma or exposure to animals.

Osteomyelitis with Atypical mycobacterium is rare in literature as very few cases are reported. Significance of our study is to report the musculoskeletal infection caused by atypical mycobacterium in an immunocompetent individual without any risk factor.

Osteomyelitis caused by atypical mycobacterium presents similar to that caused by mycobacterium tuberculosis with chronic nature of non specific clinico-radiological signs and symptoms such as pain, soft tissue swelling and joint deformity.

Due to nonspecific clinico-radiological and histological findings; diagnosis of this disease is therefore established solely by isolation of the organism from culture samples of biopsy material [9, 10,11].

However it is difficult to distinguish osteomyelitis caused by **atypical mycobacterium** from infection due to mycobacterium tuberculosis. Microscopy of **atypical mycobacterium** rarely distinguishes the infection from tuberculous mycobacteria. When AFB smear tests for tuberculosis are positive in high-prevalence TB areas, tuberculosis **nucleic acid amplification tests/PCR** should be used for diagnosis. Nucleic acid amplification test is useful since it requires a small number of bacteria and provides results in a short time. It also has the advantage of early detection and is used widely due to high sensitivity and specificity [12].

In the present case report it was not possible to identify the precise organism on culture. Diagnosis was made on, Polymerase chain reaction, positive for atypical mycobacterial DNA, typical findings of histopathology and negative Mantoux test.

Delayed diagnosis due to negative results of the AFB smear, Mycobacterium tuberculosis nucleic acid amplification tests and overlooking the possibility of atypical mycobacterial infection are thought to be reasons for treatment failure.

Therapy for atypical mycobacterial infections remains difficult and the wide range of atypical mycobacterial species means that there are currently no effective single anti-NTM antibiotics. Therapy includes surgical debridement, abscess drainage and long-term chemotherapy, with surgery playing a more important role in some cases. Surgical debridement and drainage of abscesses are crucial for local atypical mycobacterial osteomyelitis, because the mycobacterial burden in the bone marrow is high and the dead bone might provide a storage site for mycobacteria [13].

The extent of the disease and immune status of the patient affect treatment of atypical mycobacterium. The use of intravenous antibiotics such as cefoxitin, imipenem, amikacin and oral antibiotics such as clarithromycin or new a macrolide is widely accepted

NO treatment guidelines exist and no guidelines or gold standards for the optimal duration of anti-mycobacterial chemotherapy have yet been developed, and there are no clinical trials in support. The antibiotics should still be chosen carefully and monitored closely to avoid adverse drug events, such as loss of vision, rash, and hepatic or renal toxicity [14,15].

Long-term follow-up of atypical mycobacterial osteomyelitis patients is important for patient recovery. In addition to the use of oral antibiotics, blood tests such as complete blood count, ESR, serial radiograph and liver and kidney function test should be used to monitor the progression of the disease [16]. A significant improvement in bone imaging results could suggest the effectiveness of therapy [16].



Fig1. Initial a) AP and b) Lateral views radiograph of left elbow showing osteolytic lesion in olecranon



Fig 2. Magnetic resonance imaging left elbow showing lesion in olecranon.

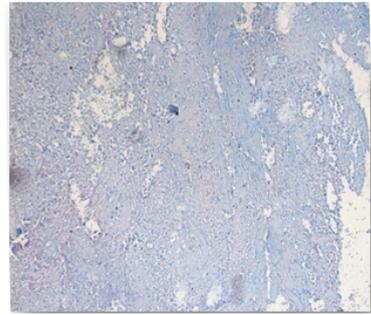


Fig.3a. showing Negative AFB stain on biopsy sample

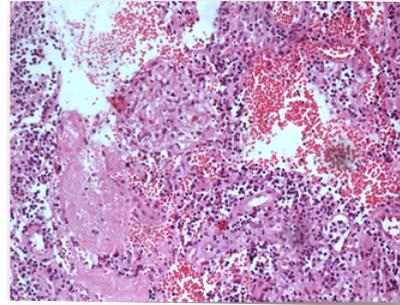


Fig.3b. showing Epithelioid cells.....????



Fig4. At 9 months post chemotherapy AP and Lateral views radiograph of left elbow showing resolving osteolytic lesion in olecranon



a)



b)

Fig 5. Clinical photographs showing full range of motion: a) extension and b) flexion, at elbow at final follow up

Reference

1. Tortoli, E. (2003) Impact of Genotypic Studies on Mycobacterial Taxonomy: The New Mycobacteria of the 1990s. *Clinical Microbiology Reviews*, 16, 319-354.
2. Nakamura, T., Yamamura, Y., Tsuruta, T., Tomoda, K., Sakaguchi, M. and Tsukano, M. (2001) Mycobacterium kansasii Arthritis of the Foot in a Patient with Systemic Lupus Erythematosus. *Internal Medicine*, 40, 1045-1049.
3. Weigl, J.A. and Haas, W.H. (2000) Postoperative Mycobacterium avium Osteomyelitis Confirmed by Polymerase Chain Reaction. *European Journal of Pediatrics*, 159, 64-69.
4. Hayek S, Issakov J, Ezra E, Wientroub S, Yaniv M. Atypical mycobacterial

- granulomatous epiphyseal osteomyelitis in an immunocompetent child. *J Pediatr Orthop B* 2003;12(2 (March)):151–4.
5. Frosch M, Roth J, Ullrich K, Harms E. Successful treatment of *Mycobacterium avium* osteomyelitis and arthritis in an immunocompromised child. *Scan J Infect Dis* 2000;32(3):328–9.
 6. Redaelli de Zinis LO, Tironi A, Nassif N, Ghizzardi D. Temporal bone infection caused by atypical *Mycobacterium*: case report and review of the literature. *Ontol Neurotol* 2003;24(6):843–9.
 7. Lazzarini L, Mader JT, Calhoun JH. Osteomyelitis in long bones. *J Bone Joint Surg (Am)* 2004; 86:2305–18.
 8. McNaghten AD, Adams MR, Dworkin MS. Case 23-2000: osteomyelitis in HIV-infected patients. *N Engl J Med*. 2001;344:66–7.
 9. Raszka WV, Trinh TT, Zawadzky PM, Multifocal M. Intercellulare osteomyelitis in an immunocompetent child. *Clin Pediatr*. 1994;33:611–6.
 10. King BF. Disseminated *mycobacterium avium* complex in an immunocompetent previously healthy woman. *J Am Board Fam Pract*. 1994;7:145–8.
 11. De Vuyst, D., Vanhoenacker, F., Gielen, J., Bernaerts, A. and De Schepper, A.M. (2003) Imaging Features of Musculoskeletal Tuberculosis. *European Radiology*, 13, 1809–1819.
 12. Koh, W.J., Kwon, O.J. and Lee, K.S. (2005) Diagnosis and Treatment of Nontuberculous Mycobacterial Pulmonary Diseases: A Korean Perspective. *Journal of Korean Medical Science*, 20, 913–925.
 13. Centers for Disease Control and Prevention. Biopsy-confirmed hypersensitivity pneumonitis in automobile production workers exposed to metalworking fluids—Michigan, 1994–1995. *MMWR Morb Mortal Wkly Rep* 1996;45:606–610.
 14. Novick RJ, Moreno-Cabral CE, Stinson EB, Oyer PE, Starnes VA, Hunt SA, Shumway NE. Nontuberculous mycobacterial infections in heart transplant recipients: a seventeen-year experience. *J Heart Transplant* 1990; 9:357–363.
 15. Zakowski P, Fligel S, Berlin OGW, Johnson BL Jr. Disseminated *Mycobacterium avium*-intra-cellulare infection in homosexual men dying of acquired immunodeficiency. *JAMA* 1982;248:2980–2982.
 16. Greene JB, Sidhu GS, Lewin S, Levine JF, Masur H, Simberkoff MS, Nicholas P, Good RC, Zolla-Pazner SB, et al. *Mycobacterium avium* intra-cellulare a cause of disseminated life-threatening infection in homosexuals and drug abusers. *Ann Intern Med* 1982;97:539–546.