

CASE REPORT

Ultrasound Appearance of Rice Bodies-A Rare Musculoskeletal Infection

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ABSTRACT

Introduction: Atypical mycobacterial tenosynovitis and bursitis are rare diseases. To our knowledge, rice-body formation in atypical mycobacterial tenosynovitis and bursitis has not been previously reported.

Case report: We reviewed the imaging findings of three cases of atypical mycobacterial tenosynovitis and bursitis, highlighting the varying appearances of rice bodies on Sonography.

Conclusion: Rice body formation is a rare finding in case of atypical mycobacterial tenosynovitis and thus can be a useful radiographic diagnostic feature in diagnosis of such cases.

Keywords: Sonography, Rice bodies, Tuberculosis

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INTRODUCTION

Atypical mycobacterial tenosynovitis and bursitis are rare diseases.¹⁻³ Tuberculosis (TB) is an endemic in many developed countries. However, extra pulmonary tuberculosis involvement of the musculoskeletal system is uncommon, accounting for only 10% of tuberculosis (TB) cases. Because of low clinical suspicion, their diagnosis is usually delayed. This results in increased morbidity. Involvement of the hand and wrist can present as an isolated feature, and hence can be helpful in diagnosis of a case of Atypical mycobacterial tuberculosis. However this being a rare presentation, the diagnosis is usually missed. Increased awareness of the disease with increased suspicion for a case and familiarity with the

imaging features can give a leading approach to diagnose a suspected case. Thereafter the diagnosis can be confirmed with identification of different Mycobacterium species by using polymerase chain reaction (PCR) for rapid detection of the causative agent and timely management of the disease. Sonography is an excellent, non invasive, cost effective and dynamic imaging technique for evaluation of musculoskeletal system. Newer high resolution transducers, allow optimal visualization of soft tissue of wrist and hand. When combined with plain radiography, ultra sonography and MRI can be diagnostic in many diseases of superficial musculoskeletal tissues.

Previous case reports of atypical mycobacterial tenosynovitis and bursitis have focused mainly on the clinical and microbiologic aspects of these entities. However, rice-body formation in atypical mycobacterial tenosynovitis and bursitis has not been previously reported. We reviewed the imaging findings of three cases of atypical mycobacterial tenosynovitis and bursitis, highlighting the varying appearances of rice bodies on Sonography.

CASE REPORT

A 50 year old female presented with gradually increasing swelling over the left wrist (fig-1) for 2 year and pain, tingling sensation and numbness of left hand for last six months. Patient had involvement. Patient had history of contact with the tuberculosis. X-ray chest was normal. X-ray of wrist & hand revealed soft tissue swelling at anterior aspect of wrist joint, (fig-2) no bony abnormality was seen. Sonography revealed evidence of synovial thickening, effusion and multiple tiny oval shaped echogenic bodies embedded over tendons & bursa (fig-3). Finding were characteristic of tenosynovitis with rice body formation (fig-4). Post surgical, pathological



Figure-1: Photograph of patient shows swelling over the anterior aspect of wrist joint



Figure-2: X-RAY AP and lateral view of wrist shows soft tissue swelling and no associated bony injury

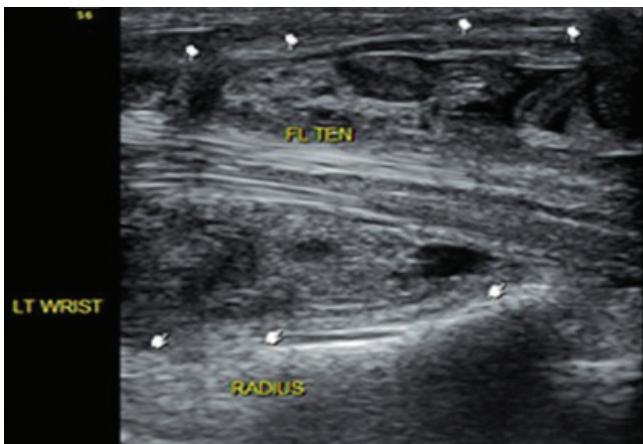


Figure-3: sonography of anterior aspect of wrist joint showing synovium thickening, with effusion and multiple rice body formation along the flexor tendons



Figure-4: Intraoperative images show white, pearl like, tiny rice bodies around the flexor tendons.

and microbiological finding reveals the diagnosis of tubercular tenosynovitis with rice body formation. Inflammatory conditions associated with rice bodies are also seen in rheumatoid arthritis, seronegative inflammatory arthritis, typical & atypical micro bacterial infections.

DISCUSSION

Atypical mycobacteria have colonial characteristics different from those of *Mycobacterium tuberculosis*.⁴ As the name implies, atypical mycobacteria are less common than typical mycobacteria. Musculoskeletal involvement occurs in 5–10% of patients with atypical mycobacterial infection⁴, which is commonly precipitated by trauma, such as surgery or penetrating injury. The hand and wrist are the most frequent sites of atypical mycobacterial

infection. Occurrence in these sites is postulated to be related to both the relative abundance of synovium in the region and the increased risk for pathogen inoculation through minor penetrating injuries.⁴ At presentation, concurrent atypical mycobacterial infection in pulmonary sites or in separate sites in the bursa or tendon sheath is rare, especially in immunocompetent patients. However, in immunocompromised patients, especially in patients with AIDS, disseminated atypical mycobacterial infection with multiple organ involvement is frequently found.^{2,5} Although it is rare, atypical mycobacterial infection is an important disease to recognize, given the increasing incidence of the disease because of the spread of the AIDS epidemic and an increased virulence of the mycobacteria.⁴ Typically, diagnosis of atypical mycobacterial tenosynovitis is delayed; the length of time between the onset of symptoms and diagnosis may be as long as 1 year.^{4,6} Physical signs of acute infection are usually not present. Blood tests are generally not helpful, although the erythrocyte sedimentation rate and C-reactive protein level may be elevated in some patients. Imaging studies play an important role in establishing the diagnosis of tenosynovitis and in providing clues to the possible presence of mycobacterial infection. Potentially harmful steroid therapy can thus be avoided.⁷ The clinical and imaging appearances of tuberculous tenosynovitis vary, depending on duration of the disease, host resistance, and organism virulence.^{8,9} To our knowledge rice-body formation in atypical mycobacterial tenosynovitis and bursitis has not previously been reported. The rice bodies are composed of fibrin and are identical to those present in mycobacterial tuberculous tenosynovitis. Both sonography and MR imaging can reveal the presence of rice bodies. However, if the rice bodies are small, Sonography may fail to delineate the individual rice bodies and instead may give an impression of a soft-tissue mass, debris, blood, or viscous fluid inside the bursa. Further evaluation on MR imaging is recommended for patients believed to have tenosynovitis whose sonographic findings show low-level internal echoes or an apparent soft-tissue mass in the tendon sheath.

Inflammatory conditions often associated with rice-body formation are rheumatoid arthritis; seronegative inflammatory arthritis; and tuberculous joints, tenosynovitis, and bursitis.¹⁰ Histologic examinations for all patients revealed a multinucleated giant cells granulomatous infection, with associated fibrinous rice bodies. Frequently, tissues infected by mycobacteria (typical or atypical) that are examined

with Ziehl-Neelsen stain do not result in positive findings. Tissue culture is the most important means of identifying the offending pathogen, although it may take months to obtain a positive result.² Treatment is usually started empirically on the basis of the clinical, radiologic, and histologic findings. Patients usually respond to synovectomy and antimycobacterial treatment. In conclusion, rice bodies may be found in atypical mycobacterial tenosynovitis. Both sonography and MR imaging can depict rice bodies, but MR imaging is especially useful if the rice bodies are small.

CONCLUSION

In conclusion, this case highlights the following: (i) rice bodies may be found in atypical mycobacterial tenosynovitis; (ii) in evaluating tenosynovitis of the wrist with nodules, one must investigate also atypical Mycobacterium, particularly if suggested by endemic geography and occupation of patient; (iii) contrast-enhanced MR imaging is useful in depicting the extension of the synovitis; (iv) T1- or T2-weighted MR images are not helpful in distinguishing between the exact cause of nodules; and (v) PCR is a sensitive and specific method in identification of different mycobacterium species, allowing early diagnosis of the infection and treatment with surgery and antibiotics.

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