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Rheumatoid subacromial-subdeltoid bursitis with rice bodies: A case report

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ABSTRACT

Subacromial-subdeltoid bursitis of a shoulder with rice bodies is relatively uncommon. The understanding of the pathogenesis of rice body formation is yet approximate only but some clinical conditions like rheumatoid arthritis, tuberculous arthritis, seronegative inflammatory arthritis, juvenile rheumatoid arthritis and osteoarthritis are related to it. We describe a case of a 44 years old female with subacromial-subdeltoid bursitis of her right shoulder with numerous rice bodies' formation as a presenting feature of rheumatoid arthritis. She underwent subacromial and subdeltoid bursectomy with the removal of rice bodies and had immediate improvement of symptoms.

1. Introduction

Subacromial-subdeltoid bursitis with rice bodies in the shoulder is relatively uncommon. Chronic synovial inflammation related to rheumatoid arthritis, tuberculous arthritis, seronegative inflammatory arthritis, juvenile rheumatoid arthritis and osteoarthritis generates a non-specific response leading to rice body formation.[1] They look like grains of polished white rice and hence are called Rice Bodies.[1,2] Few studies have described Subacromial-subdeltoid bursitis of the shoulder with rice bodies as an initial clinical presentation of Rheumatoid Arthritis.[3–7] We also present a similar case of rheumatoid subacromial-subdeltoid bursitis with rice bodies.

2. Case history

A 44 years old lady came to orthopaedic outpatient with gradually increasing swelling over her right shoulder which she first noticed 9 months ago. The swelling was insidious in onset and asymptomatic until she presented to us with sudden onset pain and restriction of her right shoulder movements. She didn't give any history of trauma, fever, loss of appetite and weight loss but admitted occasional knees pain. Physical examination revealed swelling of approximately 6 × 5 cms in the subacromial region over right shoulder [Fig. 1]. The skin over the swelling was normal with no local signs of inflammation and the margins were ill-defined. The swelling was mildly tender, fluctuant, and loose bodies couldn't be palpated there. Initial shoulder Range of Motion (ROM) couldn't be assessed because of pain. However, it was restricted globally.

The mass was presumed to be some benign soft tissue condition and the patient was sent for ultrasound imaging of the right shoulder which showed fluid filled distended thick walled subacromial-subdeltoid bursa with a mild increase in wall vascularity and multiple non-shadowing echogenic nodular lesions within the bursa [Fig. 2]. Rotator cuff muscles and their tendons were normal. Plain X-rays of right shoulder showed soft tissue swelling without any calcification or bony abnormality. The patient was then referred for magnetic resonance imaging (MRI) which

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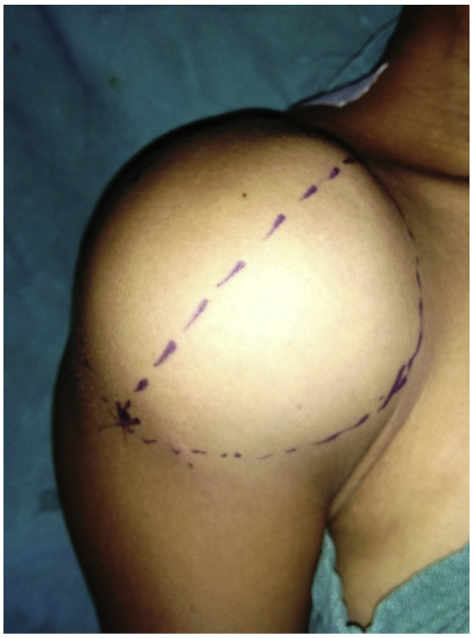

Fig. 1. Globular swelling at subacromial region over right shoulder.

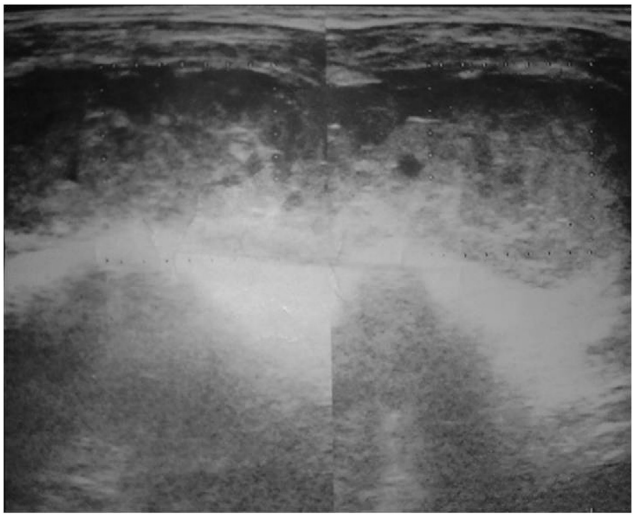

Fig. 2. USG showing fluid filled distended thick walled subacromial–subdeltoid bursa with multiple intrabursal non-shadowing echogenic nodular lesions.

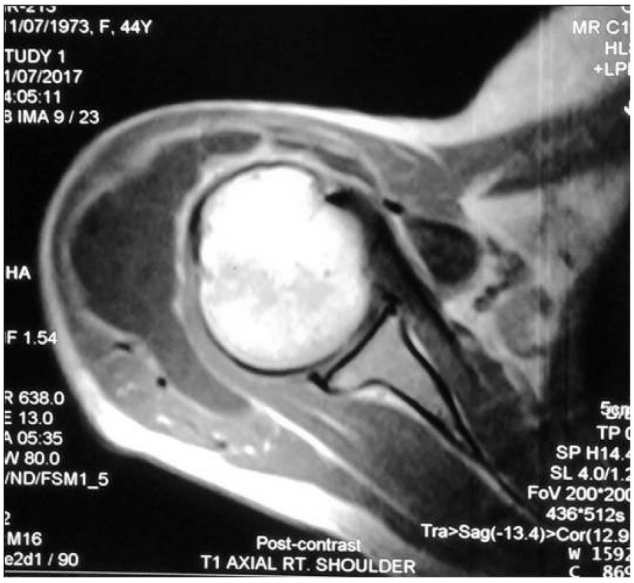

Fig. 4. Post contrast axial MRI image of right shoulder showing distended subacromial–subdeltoid bursa with thickened enhancing wall.

revealed distended right subacromial-subdeltoid bursa filled with fluid and multiple small well defined intrabursal loose bodies which showed hypointense signal intensity in all sequences [Fig. 3a and b]. Associated thickening of the bursal wall and its enhancement in post-contrast images was also noted [Fig. 4]. Glenohumeral joint was normal with no joint effusion. These imaging findings were consistent with right subacromial-subdeltoid bursitis with rice bodies.

Laboratory findings were normal except rising of erythrocyte sedimentation rate (62mm/h). However C-reactive protein (CRP) and rheumatoid factor (RF) were not done.

Excision Biopsy was done through the deltopectoral approach. After reflecting the deltoid muscle and opening up the protruded synovial membrane, numerous peas sized loose bodies extruded out [Fig. 5]. All loose bodies along with the whole bursal sheath were removed [Fig. 6a and b]. However, there wasn't any connection between synovial bursa and the joint.

On histopathologic examination, a section from bursal tissue showed chronic inflammation, haemorrhage and synovial proliferation whereas section from loose bodies showed fibrinoid

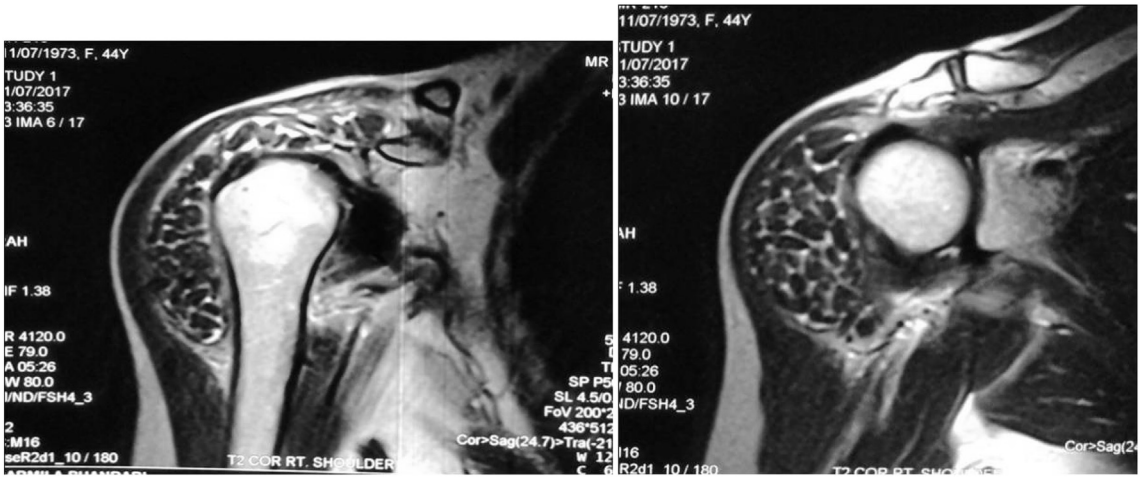

Fig. 3. a & 3b: Coronal T2-weighted MRI images of right shoulder showing distended subacromial–subdeltoid bursa filled with fluid and multiple small well defined hypointense intrabursal loose bodies.

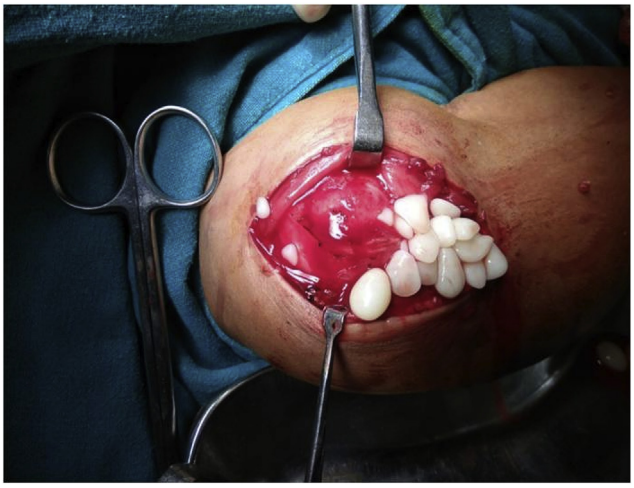

Fig. 5. Numerous pea sized loose bodies (Rice Bodies) extruding out.

necrosis and inflammatory infiltrate and no cartilaginous/chondrocyte proliferation was evident [Fig. 7]. The Zeil-Nelson stain was negative for acid-fast bacillus. Thus the findings were consistent with rheumatoid bursitis.

After the alarming biopsy report, investigations were carried out for Rheumatoid arthritis. Both RA Factor (29) and Anti-CCP (48 U/ml) were elevated with positive CRP and she had a score of 6 according to the 2010 American College of Rheumatology/European League Against Rheumatism Classification for rheumatoid arthritis.[8] Thus the diagnosis of rheumatoid arthritis was made and the patient was put on DMARDS and regular follow-up. Follow-up after 1 year revealed decreasing ESR (21mm/h), CRP (negative), RA Factor (15.5 IU/ml) and Anti-CCP (21.2 U/ml). Patient's shoulder ROM was painless with Abduction of 120°, forward Flexion of 135°, Extension of 30°, Internal Rotation of 30°, and External Rotation of 55°.

3. Discussion

Rice bodies were first described by Riese.[2] It was found to be associated with tuberculous arthritis and it looked like grains of polished white rice. However, the pathogenesis of its formation is poorly understood. In an immunohistochemical study by Berg,[9] rice bodies were demonstrated to have an acidophilic, amorphous core surrounded by fibrin and collagen. There was also the presence of microvasculature and a protein composition similar to the synovial membrane within some rice bodies which suggested that they were derived from infracted synovium.[9,10] Later, Albrecht et al. postulated that rice bodies are the end product of synovial inflammation, proliferation, and subsequent secondary degeneration leading to synovial sloughing, which subsequently becomes encased by fibrin derived from synovial fluid.[11] Studies have also shown rice bodies to be associated with osteoarthritis[12–14] and chronic inflammation.[15]

In rheumatoid arthritis, the prevalence of rice bodies varies greatly and in a series by Propert[16] the microscopic rice bodies were found to be as high as 72%. However, few studies have shown improvement of symptoms following removal of rice bodies.[5,16]

The differential diagnoses include synovial osteochondomatosis, tuberculous bursitis and pigmented villonodular synovitis (PVNS). In Synovial osteochondromatosis, the subintimal fibroblasts in synovial joints are affected. Multiple loose bodies are formed subsequently which get detached from the synovial membrane and start floating inside the joint. It's a benign metaplastic proliferative disorder of the synovium that rarely affects the shoulder joint.[17]

On T2-weighted sequences of MRI, the rice bodies are seen as well-defined nodules of low signal whereas the loose bodies of synovial osteochondromatosis appear as high signal nodules.[1,3] Foci of signal voids are often seen in PVNS which reflects hemosiderosis and these are absent in rice bodies.[3] If the rice bodies are mineralized, then only they are visible on plain radiographs.[3,7] In our case, multiple small well defined intrabursal loose bodies were seen which showed hypointense signal intensity in all sequences of MRI. However, no foci of signal voids were seen. They were not visible on plain radiographs as well.

In the case of tuberculosis, the rice bodies present with granulomatous inflammation, Langhans giant cells and localized caseous necrosis.[18,19] Ziehl–Neelsen positivity is also seen as other tuberculous lesions.[19] In our case, the Zeil-Nelson stain was negative for acid-fast bacillus and the lesion did not present with characteristic tuberculous histology. Furthermore, the patient had no history of tuberculosis symptoms or exposure as well.

In conclusion, Subacromial-subdeltoid bursitis with multiple rice bodies' formation is relatively uncommon. We describe a rare

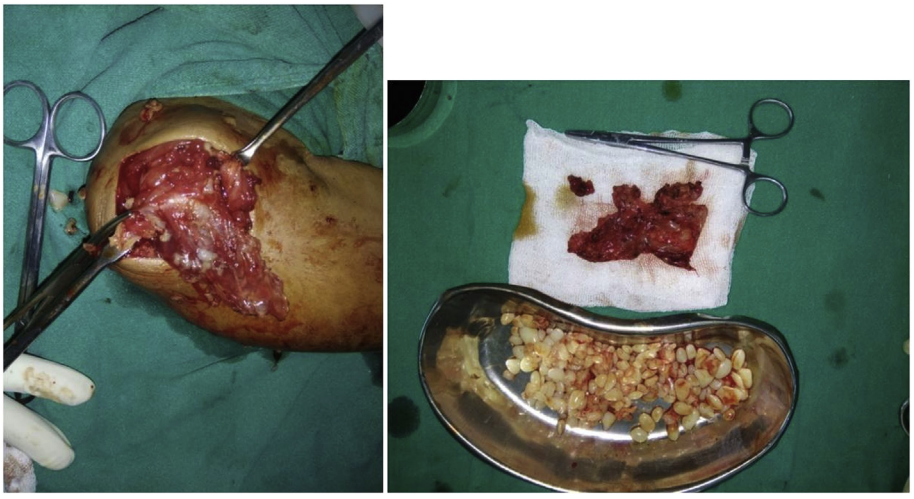

Fig. 6. a & 6b: Inflamed Subrachnoid-subdeltoid bursa removed completely with all loose bodies.

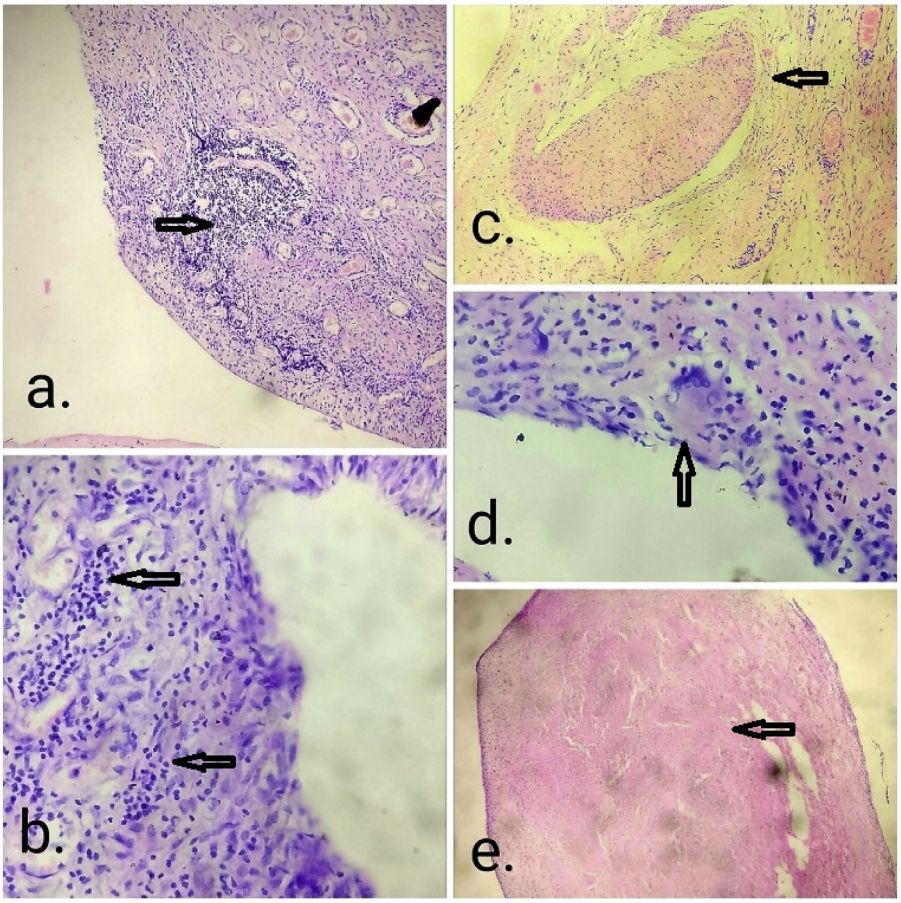

Fig. 7. Histopathological sections showing **a.** presence of lymphoid follicle in synovial tissue, **b.** chronic inflammatory cell infiltrate, infiltrating synovial tissue, **c.** neuronal hyperplasia, **d.** synovial giant cell and **e.** central dense homogenous acellular area in section from rice body.

case of a patient with symptomatic isolated subacromial-subdeltoid bursitis with numerous rice bodies' formation as a presenting feature of rheumatoid arthritis. Improvement in symptoms was seen following subacromial-subdeltoid bursectomy and rice bodies' removal.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jcot.2018.09.014.

References

1. Subramaniam R, Tan JWL, Chau CYP, Lee KT. Subacromial bursitis with giant rice bodies as initial presentation of rheumatoid arthritis. *J Clin Rheumatol Pract Rep Rheum Musculoskelet Dis*. 2012 Oct;18(7), 352–5.
2. Riese H. Die reiskorperchen in tuberculos erkrankten Synovalsacken. *Detsch Z Chir*. 1895;42:1–99.
3. Griffith JF, Peh WCG, Evans NS, Smallman LA, Wong RWS, Thomas AMC. Multiple rice body formation in chronic subacromial/subdeltoid bursitis: MR appearances. *Clin Radiol*. 1996;51(7):511–514.
4. Kataria RK, Chaiamnuay S, Jacobson LD, Brent LH. Subacromial bursitis with rice bodies as the presenting manifestation of rheumatoid arthritis. *J Rheumatol*. 2003;30(6):1354–1355.
5. Steinfeld R, Rock MG, Younge DA, Cofield RH. Massive subacromial bursitis with rice bodies. Report of three cases, one of which was bilateral. *Clin Orthop*. 1994;301:185–190.
6. Thevenon A, Cocheteux P, Duquesnoy B, Mestdagh H, Lecomte-Houcke M, Delcambre B. Subacromial bursitis with rice bodies as a presenting feature of seronegative rheumatoid arthritis. *Arthritis Rheum Off J Am Coll Rheumatol*. 1987;30(6):715–716.
7. Chen A, Wong L-Y, Sheu C-Y, Chen B-F. Distinguishing multiple rice body formation in chronic subacromial-subdeltoid bursitis from synovial chondromatosis. *Skeletal Radiol*. 2002;31(2):119–121.
8. Aletaha D, Neogi T, Silman AJ, et al. Rheumatoid arthritis classification criteria: an American College of Rheumatology/European League against Rheumatism collaborative initiative. *Arthritis Rheum*. 2010;62(9):2569–2581, 2010.
9. Berg ED, Wainwright R, Barton B, Puchtler H, Mcdonald T. On the nature of rheumatoid rice bodies. *Arthritis Rheum Off J Am Coll Rheumatol*. 1977;20(7):1343–1349.
10. Cheung HS, Ryan LM, Kozin F, Mccarty DJ. Synovial origins of rice bodies in joint fluid. *Arthritis Rheum Off J Am Coll Rheumatol*. 1980;23(1):72–76.
11. Albrecht M, Marinetti GV, Jacox RF, Vaughan JH. A biochemical and electron microscopy study of rice bodies from rheumatoid patients. *Arthritis Rheum Off J Am Coll Rheumatol*. 1965;8(6):1053–1063.
12. Bucki B, Lansaman J, Janson X, et al. Osteoarthritis with rice bodies rich in calcium microcrystals. 4 cases with ultrastructural study. *Rev Rhum Ed Francaise*. 1993;61(6):415–420, 1994.
13. Li-Yu J, Clayburne GM, Sieck MS, et al. Calcium apatite crystals in synovial fluid rice bodies. *Ann Rheum Dis*. 2002;61(5):387–390.
14. Gibilisco PA, Schumacher Jr HR, Hollander JL, Soper KA. Synovial fluid crystals in osteoarthritis. *Arthritis Rheum*. 1985;28(5):511–515.
15. Sugano I, Nagao T, Tajima Y, et al. Variation among giant rice bodies: report of four cases and their clinicopathological features. *Skeletal Radiol*. 2000;29(9):525–529.
16. Popert AJ, Scott DL, Wainwright AC, Walton KW, Williamson N, Chapman JH. Frequency of occurrence, mode of development, and significance of rice bodies in rheumatoid joints. *Ann Rheum Dis*. 1982;41(2):109.
17. Kumar A, Aggarwal A, Sahni VK. Primary synovial osteochondromatosis of a subdeltoid bursa. *Indian J Orthop*. 2010;44(1):104.
18. Suso S, Peidro L, Ramon R. Tuberculous synovitis with “rice bodies” presenting as carpal tunnel syndrome. *J Hand Surg*. 1988;13(4):574–576.
19. Pimm LH, Waugh W. Tuberculous tenosynovitis. *J Bone Joint Surg Br*. 1957;39(1):91–101.