

Magnetic Resonance Imaging and Ultrasound Evaluation of Chronic Lateral Malleolar Bursitis: A Case Report

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ABSTRACT

Chronic lateral malleolar bursitis is an unusual cause of lateral ankle swelling that can mimic tendon, joint, or soft-tissue disorders. Present case report is of a 48-year-old male farmer with a 7-month history of painless, fluctuant swelling over the right lateral malleolus. High-frequency Ultrasonography (USG) of the right ankle revealed a focal, well-defined effusion/cystic lesion in the subcutaneous plane/lateral malleolar bursa, characterised by multiple mobile echogenic lenticular structures (rice bodies) with minimal internal vascularity. Magnetic Resonance Imaging (MRI) of the right ankle revealed T2 weighted (T2W) and Proton Density Fat Saturation (PDFS)- a focal hyperintense fluid collection (effusion)/cystic lesion in the subcutaneous plane/lateral malleolar bursa containing multiple T2W and PD FS hypointense rice bodies, with no involvement of the peroneus tendons, bone marrow, or adjacent neurovascular structures. Aspiration and histopathology revealed fibrinous rice bodies with chronic inflammatory cells with no evidence of granulomatous infection, confirming the diagnosis of chronic lateral malleolar bursitis. This case demonstrates the simultaneous use of USG and MRI to describe the superficial bursae in real time, assess the extent of involvement, and rule out deeper extension.

Keywords: Ankle, Neurovascular structures, Rice bodies, Surgical drainage

CASE REPORT

A 48-year-old male farmer came to the emergency room with swelling on the lateral aspect of his right ankle, which gradually increased in size over a period of seven months. The patient had no history of trauma. There were no associated systemic symptoms. Upon further questioning, the patient gave a history of prolonged squatting and sitting cross-legged while farming. These postures cause friction between the lateral aspect of the ankle and the ground. The patient recently had difficulty wearing shoes due to swelling, which prompted him to seek medical attention. There was no prior history of tuberculosis, rheumatoid arthritis, or other chronic inflammatory or infectious disorders. This history was obtained specifically because of the established correlation between rice body formation and tuberculous and rheumatoid bursitis.

In addition to having no known co-morbidities such as diabetes mellitus, hypertension, or immunosuppressive disorders, the patient had no major prior medical or surgical history.

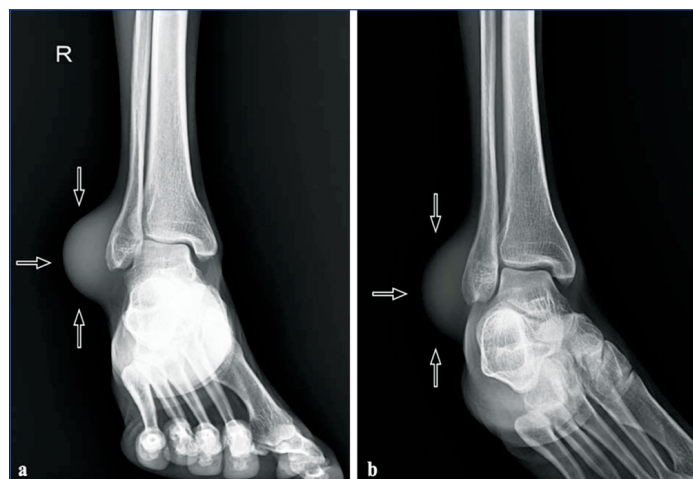
During the examination, a localised, fluctuant swelling above the lateral malleolus was noted. No break-up/hyperpigmentation/pulled-up appearance/puckering was seen [Table/Fig-1]. The patient did not report pain; however, examination revealed mild restriction of ankle range of motion on the affected side compared with the contralateral limb; formal goniometric measurements were not performed.

A radiograph of the right ankle showed a peri-articular/juxta-articular focal radio-opacity and soft-tissue swelling in the lateral malleolar region, measuring ~ 62×25×58 mm (anteroposterior x transverse x craniocaudal). The central area appeared homogeneous with no calcifications or fat content, while the margin appeared ill-defined medially and smooth laterally. Visualised bones (distal tibia, distal fibula, and talus) appeared normal. Visualised joints (distal tibio-fibular, tibio-talar, and talo-crural joints) appeared normal [Table/Fig-2a,b].

The USG of the right ankle (transverse and longitudinal scans) showed a focal cystic lesion/fluid effusion in the subcutaneous plane/lateral malleolar bursa of size ~ 65×23×55 mm (anteroposterior

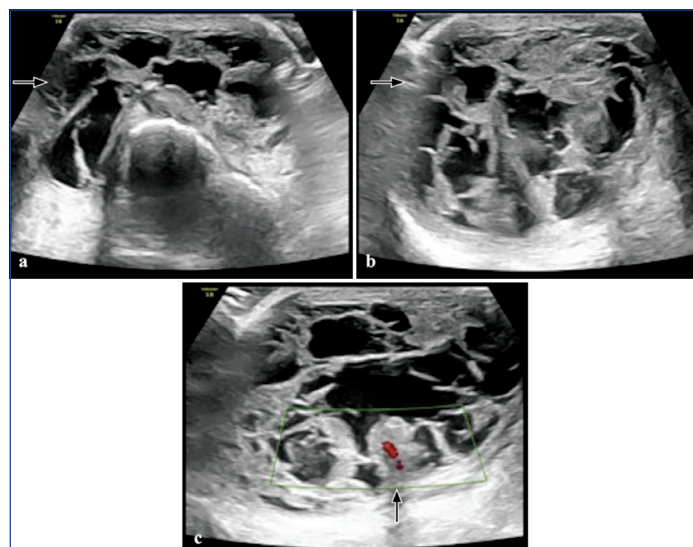


[Table/Fig-1]: Gross images of right ankle shows a localised, fluctuant swelling above/along the lateral malleolus no break-up/hyperpigmentation/pulled-up appearance/puckering (short thin black arrows).



[Table/Fig-2]: Radiograph of the right ankle: a) Anteroposterior; and b) Mortise views shows a peri-articular/juxta-articular focal radio-opacity and soft-tissue swelling in the lateral malleolar region (short thin black arrows).

x transverse x craniocaudal), volume ~ 45-50 cc, central multiple mobile, echogenic, lenticular-shaped structures with no posterior acoustic shadowing (likely rice bodies), and minimal increased colour flow (vascularity) on colour doppler and peripheral smooth to macro-lobulated margins [Table/Fig-3a-c].



[Table/Fig-3]: Ultrasonography (USG) of the right ankle: a) Longitudinal; b) Transverse scans; and c) Colour Doppler shows a focal cystic lesion/fluid effusion in the subcutaneous plane/lateral malleolar bursa with central multiple mobile, echogenic, lenticular-shaped structures with no posterior acoustic shadowing (likely rice bodies) and minimal increased colour flow (vascularity) on colour Doppler, and peripheral smooth to macro-lobulated margins (short thin black arrows).

The MRI of the right ankle showed T2W, PDFS- hyperintense cystic lesion/fluid effusion in the subcutaneous plane of lateral malleolar bursa of size ~ 65×25×60 mm (anteroposterior x transverse x craniocaudal), volume ~ 45-50 cc, with central multiple hypointense foci/structures (likely rice bodies), and peripheral smooth to macro-lobulated margins [Table/Fig-4a-c]. Based on clinical and imaging findings, chronic lateral malleolar bursitis was considered.

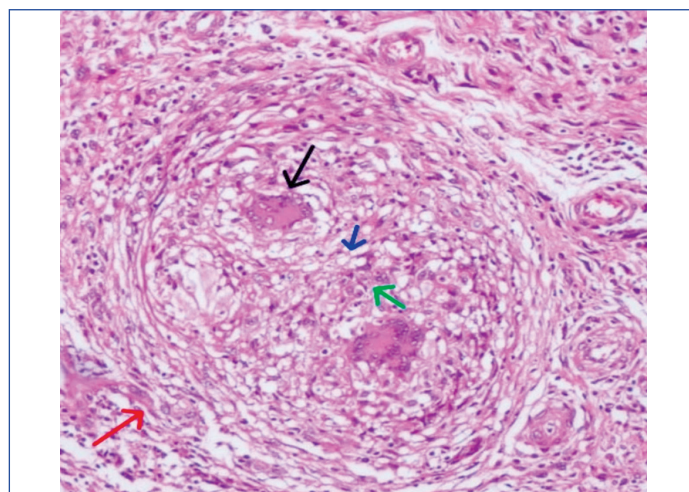
The patient underwent incision and drainage of the bursal fluid, while taking steps to avoid infection. A small cut was made over the lateral malleolus, and the fluid was drained. There were many small, whitish rice bodies in the bursal cavity. The sample was sent for examination under a microscope. The wound was closed in layers after the cavity was thoroughly cleaned. They were careful not to injure the nearby tendons and neurovascular structures. On the second postoperative day, the patient was discharged, since the postprocedural period was uneventful. At follow-up after two and four weeks, there were no signs of infection or recurrence, and the site had healed properly. The patient was told to perform ankle range-of-motion and strengthening exercises to regain

mobility and prevent stiffness. He was told to gradually return to normal activities. Medical management was not preferred due to the large size of the lesion, the presence of multiple rice bodies, and progressive swelling, which caused functional limitation (difficulty in wearing footwear). Therefore, surgical drainage was performed to achieve definitive symptomatic relief and to obtain material for histopathological evaluation.

Histopathological Examination (HPE) of the cystic lesion/effusion reveals rice bodies consisting of dense eosinophilic fibrin, foamy macrophages with vacuolated cytoplasm, multinucleated giant cells exhibiting clustered nuclei, and synovial lining hyperplasia along the bursal wall, thereby confirming chronic inflammatory bursitis with rice body formation. No granulomas or acid-fast bacilli were found [Table/Fig-5]. Chronic lateral malleolar bursitis was diagnosed based on HPE findings.



[Table/Fig-4]: Magnetic Resonance Imaging (MRI) of the right ankle: a) T2-weighted (T2W); (b,c) Proton-density (PD) Fat-saturation (FS) shows T2W axial - a focal hyperintense cystic lesion/fluid effusion in the subcutaneous plane/lateral malleolar bursa with central multiple hypointense foci/structures (likely rice bodies), and peripheral smooth to macro-lobulated margins (PD-FS coronal - hyperintense) (short thin black arrows). Visualised bones (distal tibia, distal fibula, and talus) appear normal. Visualised joints (distal tibio-fibular, tibio-talar, and talo-crural joints) appear normal. Visualised flexor and extensor muscles and tendons appear normal. Visualised neurovascular structures appear normal.



[Table/Fig-5]: Histopathological Examination (HPE) of cystic lesion/effusion shows rice bodies composed of dense eosinophilic fibrin (black arrow), foamy macrophages with vacuolated cytoplasm (blue arrow), multinucleated giant cells showing clustered nuclei (green arrow), and synovial lining hyperplasia along the bursal wall (red arrow), confirming chronic inflammatory bursitis with rice body formation. No granulomas or acid-fast bacilli were identified.

DISCUSSION

A bursa is a cyst with a synovial lining that is usually found above a bony prominence to reduce friction with tendons or tissues under the skin [1]. Bursitis is a common condition that can occur anywhere in the body. There are two types of bursa: adventitious and anatomical. Aberrant shear strain is the cause of the adventitious bursa, which is frequently found in subcutaneous tissue [2] around the lateral malleolus. Bursitis, inflammation of a bursa, can result from injury, repetitive stress, infection, or a systemic inflammatory disease. The lateral malleolar bursa, which is located above the lateral malleolus, is an adventitious bursa that can become inflamed due to long-term friction [3]. Lateral malleolar bursitis happens on the dorsolateral part of the foot, over the lateral malleolus. The condition has been observed in miners who sit with their legs crossed in tunnels with low ceilings [4] or in figure skaters, and is attributed to abnormal contact pressure and shear stresses on their malleoli from their boots [5].

Recent literature further supports the varied aetiopathogenesis and clinical spectrum of lateral malleolar/pre-malleolar bursitis. Naito M et al., described a case of recalcitrant lateral premalleolar bursitis associated with chronic ankle instability, wherein a communicating tract between the bursa and ankle joint via the extensor digitorum longus tendon sheath acted as a “check-valve” mechanism, leading to persistent swelling and recurrence. Surgical resection along with ligament repair was required for definitive management [6].

Similarly, Kim J et al., in a retrospective study of 19 patients with synovial fistula associated with lateral ankle instability, demonstrated that abnormal communication between the joint and periarticular soft tissues plays a crucial role in persistent or recurrent swelling. Imaging modalities, including MRI, were essential in identifying the fistulous tract, associated ligamentous injury, and extent of disease [7]. In contrast, the present case did not demonstrate any communication with the joint or associated ligamentous instability on MRI, suggesting a non-communicating adventitious bursa likely secondary to chronic external friction.

The differential diagnoses evaluated included ganglion cyst, peroneal tenosynovitis, soft-tissue neoplasm, and infective bursitis, including

tuberculous bursitis. A ganglion cyst was considered; however, the presence of multiple internal, mobile, echogenic rice bodies and minimal vascularity on USG was atypical. The MRI did not show any tendon sheath fluid, tendon thickening, or involvement of the peroneal tendons, so peroneal tenosynovitis was ruled out. A soft-tissue neoplasm was considered unlikely, as the lesion was solely cystic, devoid of solid components or aggressive traits. Infective bursitis, especially of tuberculous origin, was excluded due to the lack of systemic symptoms, a negative clinical history, and the absence of granulomas or acid-fast bacilli in histopathological analysis.

CONCLUSION(S)

Chronic lateral malleolar bursitis is an uncommon but significant cause of swelling on the lateral aspect of ankle. Imaging methods, specifically, USG and MRI are highly significant in accurate diagnosis since they aid in characterisation of the lesion which guides appropriate management for the patient.

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