

## Case 14777

### Rice Bodies associated with Rheumatoid Arthritis

Thomas De Clercq<sup>1</sup>, Aliaksandr Anisau<sup>2</sup>, Filip Vanhoenacker<sup>234</sup>

<sup>1</sup> University Hospitals Leuven, Herestraat 49, 3000 Leuven, Belgium

<sup>2</sup> Department of Radiology, AZ Sint-Maarten, Duffel-Mechelen, Belgium

<sup>3</sup> University Hospital Antwerp, Department of Radiology, University Hospital Antwerp; Wilrijkstraat, 10 2650 Antwerp, Belgium

<sup>4</sup> University of Ghent, Faculty of Medicine and Health Sciences, De Pintelaan 185, 9000 Ghent  
;Email:filip.vanhoenacker@telenet.be  
University Hospital Antwerp

**Section:** Musculoskeletal System

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**Patient:** 57 year(s), female

## Clinical History

A 57-year-old female with a history of longstanding seronegative, ANF-positive rheumatoid arthritis presents to the department of orthopedic surgery with shoulder pain.

## Imaging Findings

Plain radiography of the right shoulder revealed degenerative changes at the acromioclavicular joint and sclerotic delineated erosions at the humeral head [Fig. 1]. Conventional Arthrography of the right shoulder showed irregular delineation of the joint capsule with multiple intra-articular filling defects and a partial articular infraspinatus tear [Fig. 2]. Subsequent MR Arthrography confirmed erosions at the anatomical neck, the partial articular tear of the infraspinatus tendon and the intra-articular foci of intermediate signal on both pulse sequences, in keeping with rice bodies [Fig. 3]. Plain radiographies of the hands and feet performed at a previous date showed sequelae of longstanding rheumatoid arthritis [Fig. 4].

## Discussion

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The term rice body was originally coined in 1895 due to its resemblance to polished grains of rice [1]. Rice bodies are considered a non-specific response to synovial inflammation, most commonly found in rheumatoid arthritis (RA) [2]. Other causes of rice body formation are tuberculous arthritis, septic arthritis and spondyloarthropathy [3, 4].

Its pathogenesis is not fully understood. Most authors believe that rice bodies result from micro-infarcts in hypertrophic synovium, leading to detachment of synovial free fragments into the joint cavity. Histologically rice bodies consist of acidophilic amorphous core surrounded by fibrin and collagen [3, 4]. They appear to be unrelated to disease activity, severity or duration [1, 2, 5, 6]. Plain radiography (CR) is usually nonspecific and adds little in the diagnosis. Although CR may show marginal erosions as a consequence of longstanding underlying joint disease in RA, direct visualization of rice bodies - however - is impossible. Conventional arthrography may reveal multiple intra-articular filling defects. Ultrasound shows multiple hyperechoic, intra-articular loose bodies, associated with signs of arthritis including hypervascular synovial inflammation, bursitis and erosions [4]. The imaging modality of choice is MRI or MR arthrography. On MRI, rice bodies appear as multiple intra-articular foci iso- or hypointense to skeletal muscle on T1-weighted images (WI) and hypointense on T2-WI [2-5].

The differential diagnosis on imaging includes synovial chondromatosis, pigmented villonodular synovitis (PVNS) and lipoma arborescens. Synovial chondromatosis may be primary or secondary due to underlying joint disease. The signal intensity of the intra-articular loose bodies is variable according to the stage of the disease. Loose bodies may contain hyaline cartilage in the initial stage, that may later calcify or ossify. PVNS is characterized by hypointense synovial structures on both pulse sequences and shows blooming artifacts on gradient echo imaging, due to the presence of hemosiderin. In joints with a tight capsule bone erosions are often associated. Lipoma arborescens consist of a subsynovial lipomatous soft tissue proliferation which is isointense to fat on T1- and T2-WI [7].

Removal of rice bodies may correlate with clinical improvement in affected joints [1, 2]. Some authors recommend aspiration or arthroscopic lavage or surgical synovectomy as potential treatment options [1, 3, 4].

In conclusion, rice bodies are a relatively uncommon imaging finding in patients with longstanding articular disease. Meticulous analysis of the imaging findings, knowledge of underlying joint disease, such as RA, and correlation with previous imaging allows a correct diagnosis.

## Final Diagnosis

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Rice body formation in rheumatoid arthritis.

## Differential Diagnosis List

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- Synovial chondromatosis., • Pigmented villonodular synovitis., • Lipoma arborescens.

## Figures

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**Figure 1** Fig. 1 Anteroposterior plain radiography of the right shoulder





Plain radiography of the shoulder shows degenerative changes at the acromioclavicular joint with osteophyte formation (arrow ). Note the presence of partially sclerotic delineated radiolucent lesions superolateral aspect of the humeral head (arrowheads).

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Area of Interest: Musculoskeletal joint;  
 Imaging Technique: Conventional radiography;  
 Procedure: History;  
 Special Focus: Arthritides;

**Figure 2 Fig. 2 Shoulder arthrogram**



The anteroposterior view shows irregular delineation of the joint capsule (white arrowheads).

Area of Interest: Musculoskeletal joint;  
Imaging Technique: Conventional radiography;  
Procedure: Arthrography;  
Special Focus: Arthritides;

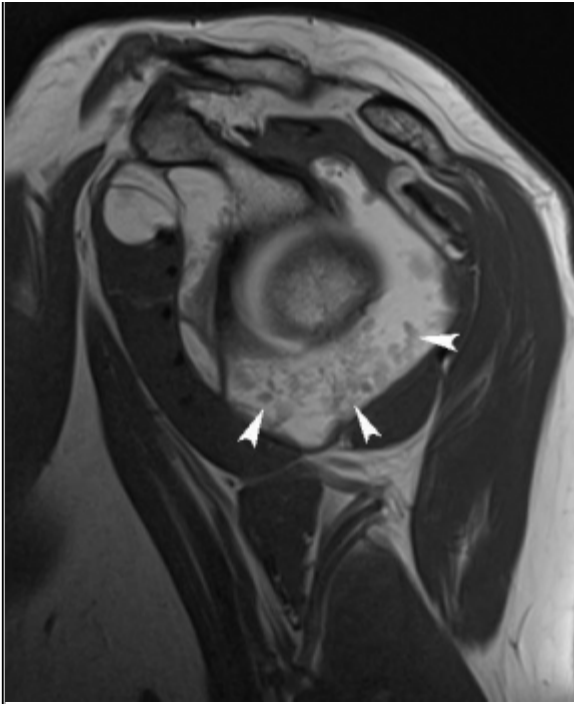


The scapular Y-view shows multiple intra-articular filling defects (black arrowheads). Note also contrast leakage at the articular side of the infraspinatus in keeping with a partial tendon tear (long arrow).

Area of Interest: Musculoskeletal joint;  
Imaging Technique: Conventional radiography;  
Procedure: Arthrography;  
Special Focus: Arthritides;

**Figure 3 Fig. 3 Magnetic resonance of the right shoulder**





Oblique sagittal T1-WI slice shows multiple intra-articular hypointense foci in keeping with rice bodies (arrowheads).

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Area of Interest: Musculoskeletal joint;  
 Imaging Technique: MR;  
 Procedure: Arthrography;  
 Special Focus: Arthritides;

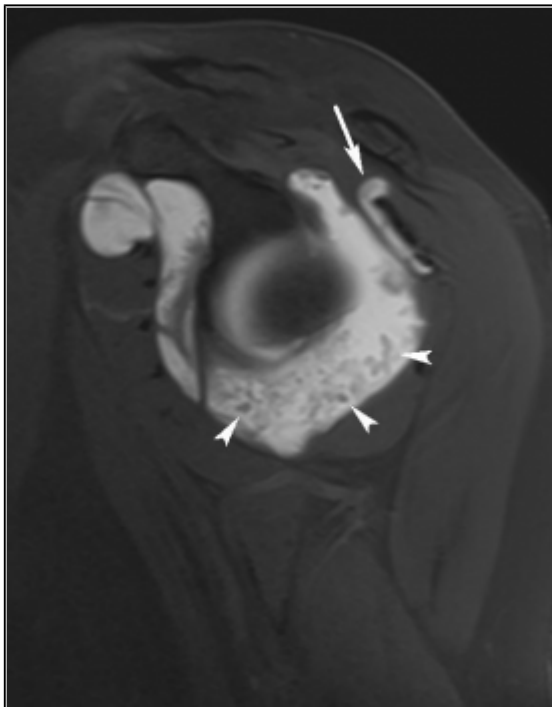


Oblique sagittal T1-WI more laterally shows huge erosions at the superolateral aspect of the humeral head (arrows).

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Area of Interest: Musculoskeletal bone;  
 Imaging Technique: MR;

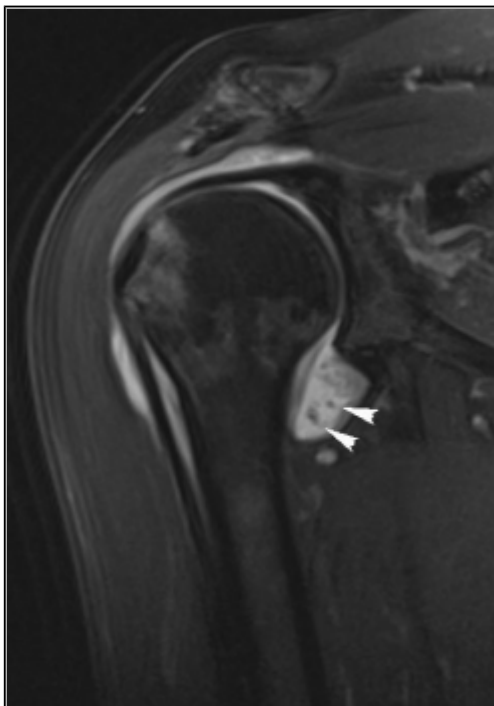
Procedure: Arthrography;  
Special Focus: Arthritides;



Oblique sagittal T1-WI with fat suppression shows multiple intra-articular hypointense foci (arrowheads).

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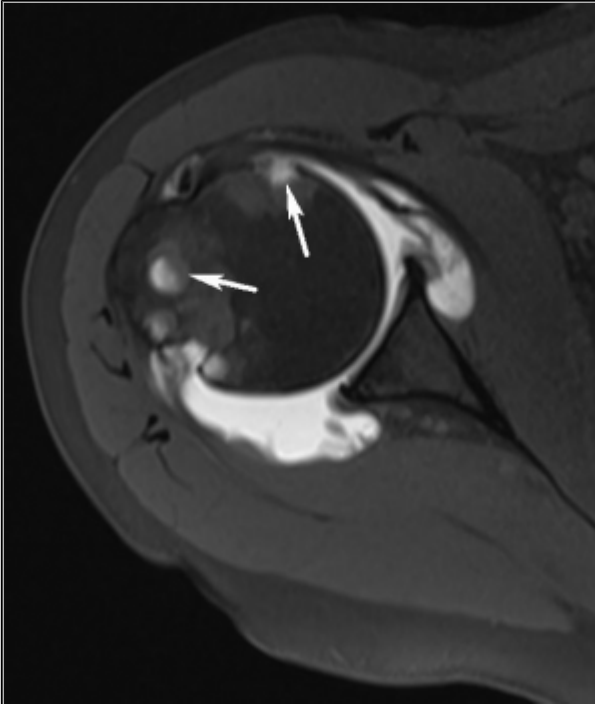
Area of Interest: Musculoskeletal joint;  
Imaging Technique: MR;  
Procedure: Arthrography;  
Special Focus: Arthritides;



Coronal T2-WI with fat suppression shows intra-articular hypointense foci in keeping with rice bodies (arrowheads).

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Area of Interest: Musculoskeletal joint;  
Imaging Technique: MR;  
Procedure: Arthrography;  
Special Focus: Arthritides;



Axial T1-WI with fat suppression shows the multiple erosions at the anterior and posterior side of the humeral head (arrows).

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Area of Interest: Musculoskeletal bone;  
Imaging Technique: MR;  
Procedure: Arthrography;  
Special Focus: Arthritides;

**Figure 4 Fig. 4 Plain radiography of hands and feet**





Anteroposterior view of the feet shows multiple sclerotic delineated erosions and cartilage loss at the metatarsophalangeal joints and fusion of the second proximal interphalangeal joint of the left foot due to previous surgery .

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Area of Interest: Musculoskeletal joint;  
 Imaging Technique: Conventional radiography;  
 Procedure: History;  
 Special Focus: Arthritides;



Anteroposterior view of the hands shows sequelae of long standing rheumatoid arthritis with cartilage loss and joint destruction, particularly at the left metacarpophalangeal joint II and the right metacarpophalangeal joint I and multiple interphalangeal locations.

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Area of Interest: Musculoskeletal joint;



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## Citation

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Thomas De Clercq<sup>1</sup>, Aliaksandr Anisau<sup>2</sup>, Filip Vanhoenacker<sup>234</sup>

<sup>1</sup> University Hospitals Leuven, Herestraat 49, 3000 Leuven, Belgium

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<sup>4</sup> University of Ghent, Faculty of Medicine and Health Sciences, De Pintelaan 185, 9000 Ghent ;Email:filip.vanhoenacker@telenet.be (2017, Jul. 24)

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