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## Secondary frozen shoulder following septic arthritis – An unusual complication of magnetic resonance arthrogram



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### ABSTRACT

**INTRODUCTION:** Magnetic resonance (MR) arthrogram is a commonly used investigation tool to detect various pathologies in the shoulder. The complications following this procedure is minor and rare. Septic arthritis is one of the rare complications which can develop after MR arthrogram. We report a case of secondary frozen shoulder after MR arthrogram induced septic arthritis.

**PRESENTATION OF CASE:** A young, fit and well female patient underwent MR arthrogram to detect any labral tears. Two days following the procedure, she developed signs and symptoms suggestive of septic arthritis of the shoulder. The patient underwent repeated arthroscopic debridement and washout. The organisms isolated was *Staphylococcus epidermidis*. She was treated with six weeks of intravenous antibiotics. The patient developed stiffness of the shoulder due to secondary frozen shoulder which was treated with arthroscopic capsular release with good functional outcomes at three months.

**DISCUSSION:** MR arthrogram is a rare cause of septic arthritis of the shoulder. The common method introducing the organisms is from the skin flora or contaminated arthrogram trays. The treatment is repeated arthroscopic washouts and six weeks of appropriate intravenous antibiotics. Residual pain, stiffness and chondrolysis are common sequelae of septic arthritis.

**CONCLUSION:** Septic arthritis is a recognised and rare complication of MR arthrogram. Early and prompt diagnosis with arthroscopic washout and debridement combined with intravenous antibiotics helps to eradicate the infection. Secondary frozen shoulder is a late complication of sepsis in the joint.

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### 1. Introduction

Magnetic resonance (MR) arthrography of the shoulder is frequently used investigation in the detection of labral-ligamentous complex abnormalities and of partial or full-thickness tears in the rotators cuff [1,2]. It is usually well tolerated procedure without any major complications [3]. Gleno-humeral joint sepsis is a relatively rare complication of intra-articular injections [4,5,6]. The incidence of infections following MR arthrogram is being reported as 0.003% [3]. Patients who develop shoulder joint sepsis generally have

associated comorbidities [7,8]. The commonest micro-organism isolated in cases of septic arthritis of the shoulder is *staphylococcus aureus* [7]. We report a rare case of a fit and young female who developed septic arthritis of the shoulder after undergoing MR arthrogram with gadolinium. In spite of all the necessary aseptic precautions taken during the procedure, patient still contracted *Staphylococcus epidermidis* septic arthritis of the shoulder. The patient also developed secondary frozen shoulder which was managed with arthroscopic capsular release. We perform on an average about 250 cases of MR arthrogram every year. To date only one case of septic arthritis has been reported in our institution following MR arthrogram.

### 2. Case report

A 35 year old female was admitted from accident and emergency department with complaints of pain, swelling and limitation of movements of right shoulder. She was right hand dominant and

☆This case report is rare and unique. MR arthrogram is a commonly done procedure in the radiology department. We recommend strict aseptic precautions should be observed while undertaking this invasive procedure. Secondary frozen shoulder is a late complication of septic arthritis.

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Fig. 1. Arthrogram of the shoulder being performed for the MRI scan.

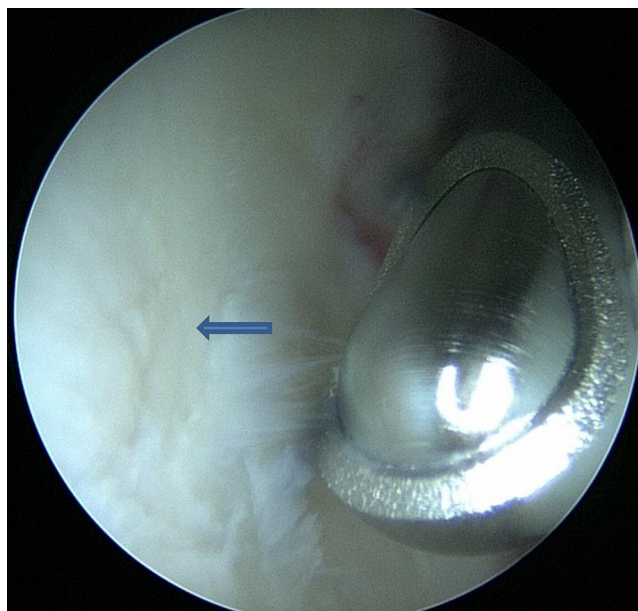


Fig. 2. Arthroscopic picture showing fibrillation of glenoid articular cartilage.

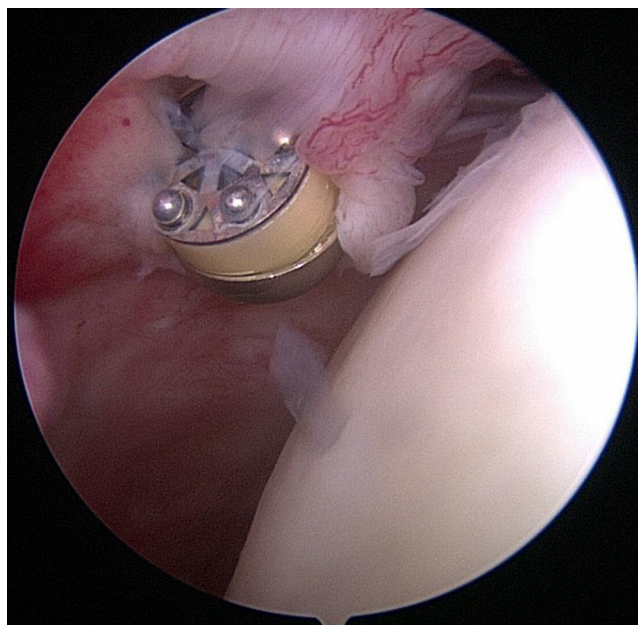


Fig. 3. Arthroscopic release of scar tissue in the rotator cuff interval.

works as an accountant. There was no significant past medical history. She also complained of feeling hot and unwell. Two days prior to these symptoms she underwent a MRI arthrogram with gadolinium contrast of the right shoulder (Fig. 1).

The patient was seen in the shoulder clinic about four months back with complaints of pain in the right shoulder. On examination of the shoulder at that time revealed full range of movements with positive signs of impingement. She had signs of hypermobility syndrome with Beighton score of 7. She had an ultrasound scan of the shoulder which was normal with no evidence of any rotator cuff pathology. The MRI arthrogram was requested to find the cause of impingement.

On examination at the time of admission she had a temperature of 39.6°. Tenderness in the anterior and lateral aspect of right shoulder. All the movements of the shoulder were grossly restricted due to pain. The blood test showed WBC of 3.2, CRP of 76 and ESR was 46. The X-ray examination of the right shoulder was unremarkable. An aspiration of the shoulder was carried out under aseptic conditions which revealed thick pus. This was sent for Gram stain and culture and sensitive tests. The Gram stain showed Gram positive cocci with plenty of neutrophils and no crystals. The patient underwent arthroscopic washout same day. The culture and sensitive reports was positive for *S. epidermidis* sensitive to flucloxacillin. The patient was commenced on intravenous flucloxacillin.

On the third post-operative day, patients symptoms became worse. The blood tests showed CRP of 126 with WBC 3.9 and ESR of 40. The patient had a repeat arthroscopic washout which revealed articular cartilage fibrillation in the glenoid cartilage (Fig. 2), with pus in the inferior capsule. The antibiotics was continued for six weeks. She had a repeat ultrasound scan at 6 weeks which revealed no fluid collection and the aspirate showed no growth of organisms. The sequential blood test for inflammatory markers was also normal (Table 1).

The patient was followed up after 3 months. She complained of pain and limitation of movements. On examination she had 90° of flexion and abduction and no external rotation. She underwent arthroscopic capsular release of the shoulder. The arthroscopy revealed inflamed biceps tendon and scar tissue in the rotator cuff interval. The scar tissue was excised and medial gleno-humeral ligament released (Fig 3). Intensive shoulder physiotherapy was started same day of surgery and continued for six weeks. The check-up at 3 months revealed good functional range of movements.

3. Discussion

MR arthrogram is a relatively safe procedure with very few complications including infections [3]. This case report shows a rare cause for septic arthritis of the shoulder. Septic arthritis can

Table 1  
Sequential inflammatory blood markers of the patient.

TIME	CRP(mg/L)	WBC(10 <sup>9</sup> /L)	ESR(mm/h)
Admission	76	3.2	46
3rd Post operative day	126	3.9	40
6th Post operative day	45	5.9	32
9th Post operative day	8.6	6.0	29
12th Post operative day	4.6	7.5	27
30th Post operative day	<2	4.6	9
42nd Post operative day	<2	6.0	7

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