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— Abstract —

**MRI of Acute Septic Arthritis of the Shoulder Joint;
Correlation with Arthroscopic Findings**

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Purpose: Urgent diagnosis and treatment of the septic arthritis is required. The purpose of this study is to review to correlate preoperative MRI findings with arthroscopic findings in septic arthritis of the glenohumeral joint.

Materials and Methods: Eleven patients with acute septic arthritis of the glenohumeral joint were treated with combination of arthroscopic lavage, debridement, and systemic antibiotics. The arthroscopic staging of infection was made based on the modified criteria of Gächter and five major findings of MRI were marked in each stage of septic shoulder.

Results: Bone and cartilage erosion was the end stage finding and two patients with all five positive findings had failed with arthroscopic treatment. Reactive bone marrow edema was evident in the greater tuberosity. Joint effusion, synovial thickening and soft tissue edema were rather non-specific finding and presented in all stages of septic shoulder.

Conclusion: Diffuse marrow edema with metaphyseal cyst formation in the preoperative MRI implied advanced stage of septic arthritis, which may fail with arthroscopic debridement.

Key Words: Shoulder, Septic arthritis, MRI, Arthroscopy

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가 , 9 (82%)
: 6 (55%)
(staphylococcus aureus) 가
(pseudomonas) 2
(18%) , 1 (9%)
(pneumococcus)
2

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Gächter

Table 1. The arthroscopic staging of infection by modified Gächter 's criteria¹³⁾

Stage	Arthroscopic finding
I	Opacity of fluid, redness of the synovial membrane, possible petechial bleeding, no radiological alterations
II	Severe inflammation, fibrinous deposition, pus, no radiological alterations
III	Thickening of the synovial membrane, compartment formation (" sponge-like " arthroscopic view), cartilage erosion, no radiological alterations
IV	Aggressive pannus with infiltration of the cartilage, undermining the cartilage, radiological signs of subchondral osteolysis, possible osseous erosions and cysts

(Table 1)¹³⁾.

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(Fig.

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1B).

II (n=2):

(Fig.

(Table 2).

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ure 2A).

(Fig. 2B).

4
2 , III 5 , IV 3
(Table 3).

III (n=5):
가 T1- T2-

4

(Fig. 3A).

I (n=1):

T2-
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(Fig. 1A).

(Fig. 3B).

3

IV (n=3):

Table 2. The five major typical findings of septic arthritis of the shoulder in MRI¹⁵⁾

(Figure 4A).

1. Increased joint effusion with synovial thickening
2. Soft tissue edema around the shoulder joint
3. Reactive bone marrow edema in the head
4. Cartilage erosion of the head or glenoid
5. Bony erosion with subchondral infiltration

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(Figure 4B).

Table 3. Correlation of MR Findings with Arthroscopic Staging.

	Stage I (n=1)	Stage II (n=2)	Stage III (n=5)	Stage IV (n=3)
A. Increased joint effusion & synovial thickening	1	1	5	3
B. Soft tissue edema around the joint	1	1	3	3
C. Reactive bone marrow edema in the head	*Nil	Nil	5	3
D. Cartilage erosion of the head or glenoid	Nil	Nil	3	3
E. Bony erosion with subchondral infiltration	Nil	Nil	Nil	3

(Arthroscopic staging was based on modified Gachter 's criteria¹³⁾

*Nil : none

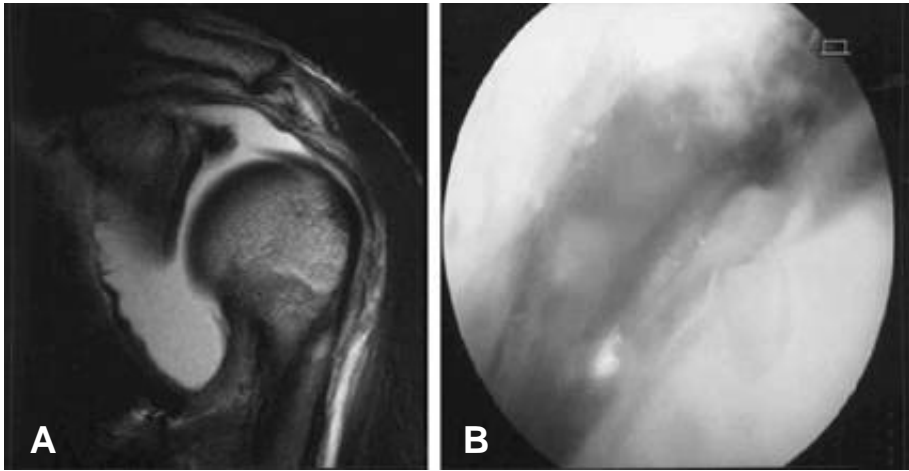


Fig. 1. A 23 years old man had infection of the glenohumeral joint after contrast injection. Coronal T2W MR image reveals increased joint fluid with high signal intensity in the deltoid. Cartilage and bone marrow signal are normal(A). Arthroscopy at this stage visualizes cloudy joint effusion with snow storm like appearance because of cell debris and necrotic tissue, which corresponds to stage I(B).

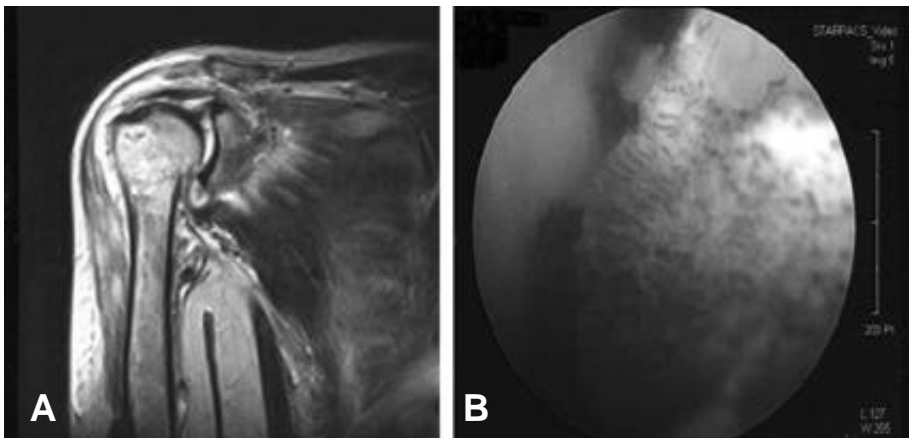


Fig. 2. A 56 years old man had local injection at private clinic. Coronal and axial MR demonstrates findings similar to stage I. There is soft tissue swelling beyond the glenohumeral joint involving the deltoid. Capsular fibrosis is not evident in the MR images(A). Severe inflammation and fibrinous deposition in the anterior capsule is visualized(B).

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MRI

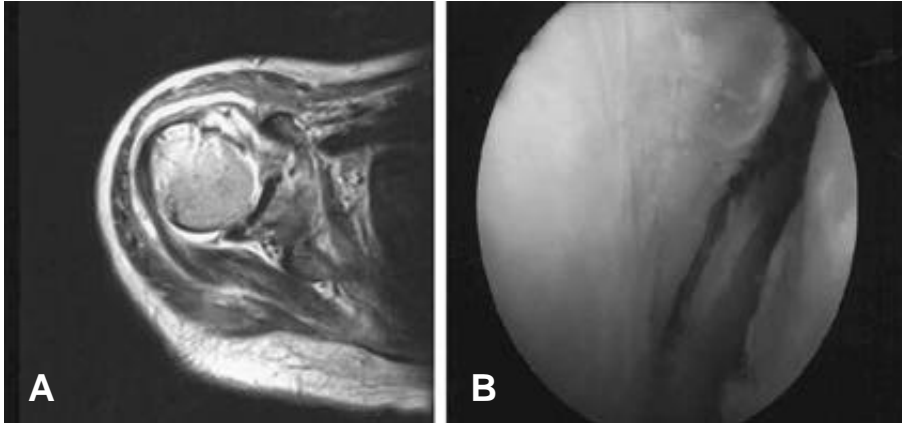


Fig. 3. A 43 years old patient with a septic shoulder. An axial T2-weighted image demonstrates fluid outpouching. The anterior capsule is irregular and thick with irregular margin(A). Yellow cheese like fibrotic tissue over the synovium at anteroinferior quadrant of the joint(B).

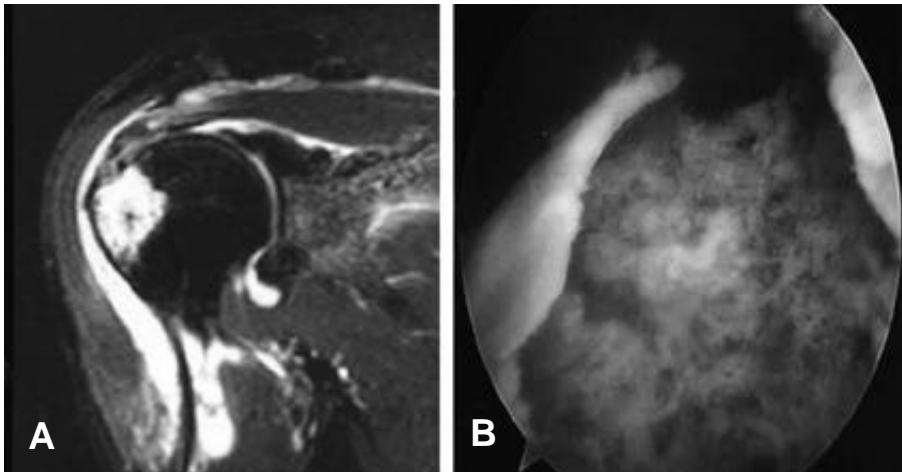


Fig. 4. A 55 years old patient with septic shoulder after local injection. Reactive bone marrow edema in the great tuberosity demonstrates increased signal intensity at T2-weighted image. The size of marrow edema varies but localizes within the superolateral quarter of the head(A). Arthroscopic view on the superolateral aspect: articular cartilage detachment from the periphery of the head and subchondral bone is exposed(B).

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