

견관절에 발생한 활액막 연골종증의 관절경적 치료에서 소절개를 이용한 상완 이두건 건초 병변의 병행 치료

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Arthroscopic Treatment of Synovial Chondromatosis of the Shoulder Joint with Mini-open Procedure for the Lesions of Biceps Tendon Sheath

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Synovial chondromatosis is an uncommon condition, and the involvement of the shoulder joint is rare. A 15 year old female patient presented to author's institution for right shoulder pain. We checked the plain radiographs and MRI. And they showed that a diagnosis of synovial chondromatosis in the shoulder, and they also demonstrated that the disease involved the bicipital tendon sheath as well as glenohumeral joint. We removed all loose bodies with total synovectomy by arthroscopic procedure, and a mini-open procedure for the lesions of biceps tendon sheath.

Arthroscopic treatment affords excellent visualization of the shoulder joint with less morbidity. However, with current arthroscopic techniques, it is difficult to manage the synovial chondromatosis of biceps tendon in bicipital groove. The authors suggest that the complete elimination of synovial chondromatosis involving shoulder requires a mini-open procedure for the lesions of biceps tendon sheath in addition to the arthroscopic resection of the affected synovium and loose body removal in the glenohumeral joint.

KEY WORDS: Shoulder, Biceps tendon sheath, Synovial chondromatosis, Mini-open procedure

INTRODUCTION

Synovial chondromatosis is a rare monoarticular arthropathy of unknown etiology. Histologically, the osteocartilagenous loose bodies are formed in the synovial membranes of the joints, the tendon sheath, or bursa by metaplasia of synovial cells into chondrocytes^{4,10}. The most common site of synovial chon-

dromatosis is the knee joint of young and middle-aged adults, followed in frequency by the hip, elbow, wrist, ankle and shoulder^{12,13}. The symptoms are generally mild initially, but according to the degree of disease progression, pain, limited motion, intermittent locking and crepitus develop⁹. Bloom and Pattinson¹ reported only 10 cases involving the shoulder joint out of 191 cases of synovial chondromatosis in a meta-analysis of the literature. Early primary synovial chondromatosis can result in radiolucent loose bodies producing symptoms, so plain radiographs may be negative in the early stages of the disease, whereas magnetic resonance imaging can easily confirm the loose bodies in the early phase of the disease⁹. Although spontaneous remission has

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been reported, malignant transformation has also been reported⁸⁾. Therefore, the treatment of synovial chondromatosis of the shoulder involves complete removal of the loose bodies and affected synovium. Recently, due to the advantages provided by the arthroscopic management, various cases of arthroscopic surgery for the synovial chondromatosis of the shoulder have been reported^{2,6,9,11,15)}.

Here, the authors report a rare case of synovial chondromatosis of the shoulder with the involvement of the biceps tendon sheath in order to demonstrate the effectiveness of mini-open procedure for the biceps tendon sheath in addition to the arthroscopic technique for the glenohumeral lesion.

CASE REPORT

A 15 year-old, right-hand dominant girl presented with vague shoulder pain which had persisted for 8 months. The patient had no history of trauma or other underlying medical problems, and the shoulder pain and decreased range of motion had become aggravated over the past 2 months before visiting authors' clinic. Physical examination revealed palpable crepitus in the right shoulder joint, and the tenderness was noted over the long head of the biceps tendon. The patient had forward flexion to 150°, abduction to 180°, external rotation at arm in side to 50° and internal rotation at the back to T12, as compared with 170°, 180°, 90° and T6 on the left side, respectively. However, the strength was sym-

metric in both shoulders. Plain radiographs demonstrated the presence of multiple calcifications around the shoulder joint, mainly inferiorly (Fig. 1A, B).

A magnetic resonance image demonstrated multiple tiny loose bodies within the glenohumeral joint and subcoracoid bursa as well as in the bicipital groove (Fig. 2A, B). There was erosion at the posterior aspect of the humeral head with synovial enhancement and joint effusion.

was placed into the anterior portal with a switching stick, the loose bodies flowed out through the cannula, induced by the high pressure of the arthroscopic fluid. We removed some loose bodies which were adherent to the posterior humeral head (Fig. 3B), and large loose bodies that were not able to flow out through the cannula were crashed and retrieved with a motorized shaver. We further performed arthroscopic total synovectomy through additional anterosuperior and posterolateral portals. Repeated inspection did not reveal any loose bodies in the glenohumeral joint, and especially, in the proximal bicipital groove (Fig. 3C). Next, the 2 cm incision was extended from that of anterior portal, and the biceps tendon was identified. Pathologic tendon sheath and multiple loose bodies that were in the biceps tendon sheath were eliminated. The tendon appeared completely intact. Figure 4 depicts the multiple loose bodies that were retrieved from the glenohumeral joint and bicipital groove. The loose bodies and synovial tissue were histologically confirmed to be synovial chondromatosis (Fig. 5A, B).

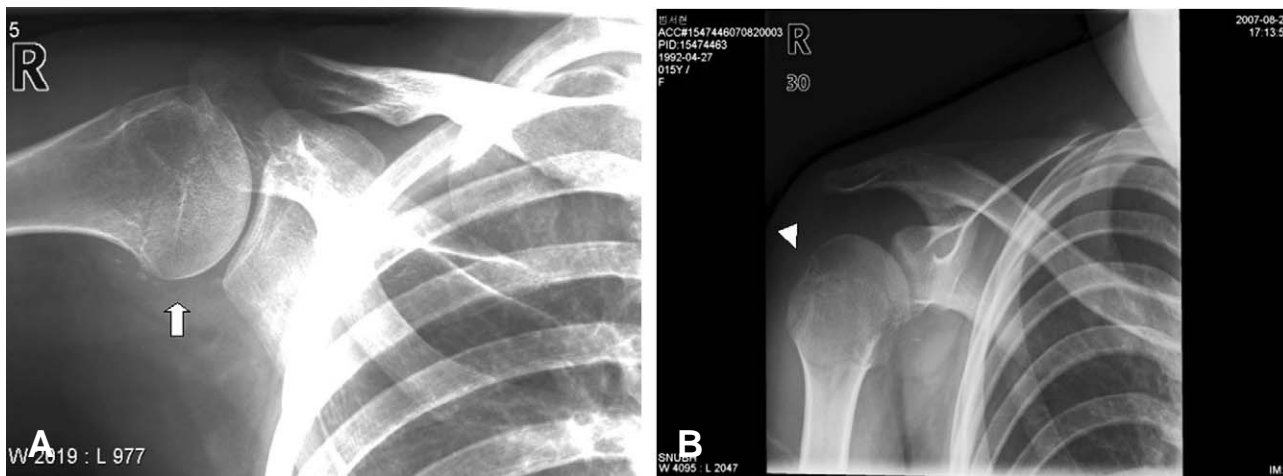


Fig. 1. (A) Anteroposterior radiograph of the right shoulder demonstrates the presence of multiple calcifications in the shoulder joint, mainly inferiorly (arrow). (B) Apical view shows erosion at posterolateral aspect of the right humeral head (arrow head).

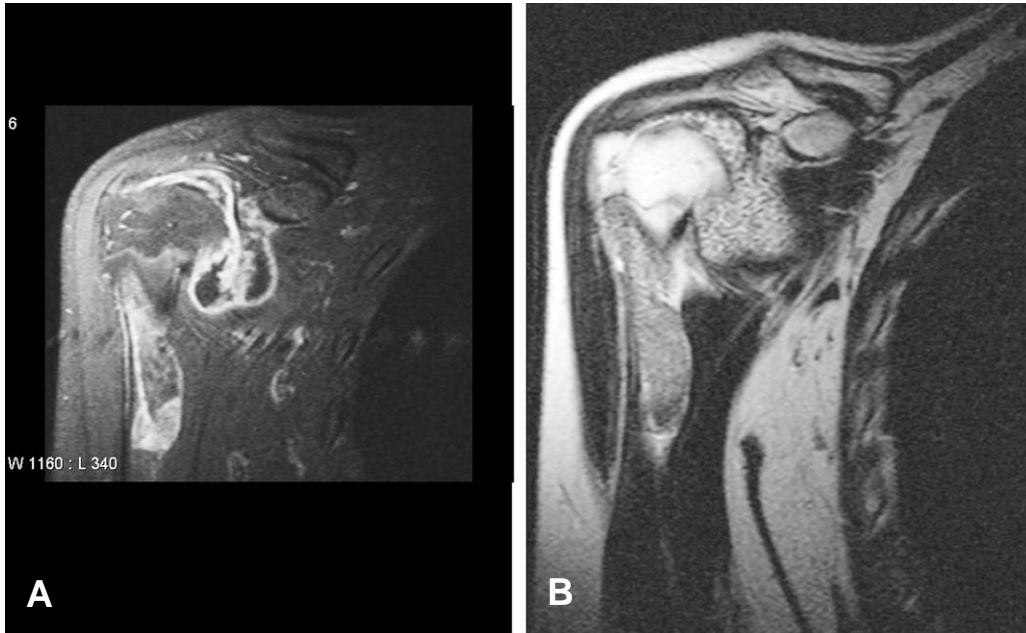


Fig. 2. (A) Gadolinium-enhanced, fat-suppressed T1-weighted MR oblique coronal image and (B) T2-weighted oblique coronal image depict multiple tiny loose bodies within the glenohumeral joint, subcoracoid bursa and bicipital groove with synovial proliferation and enhancement.

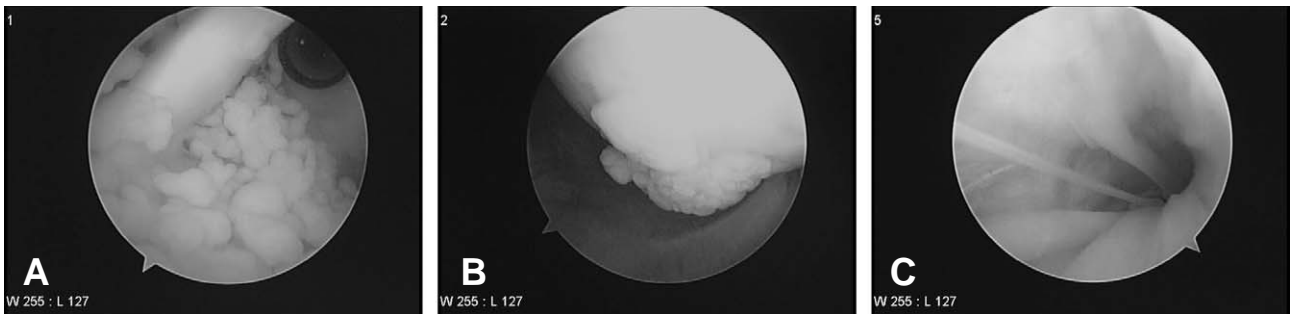


Fig. 3. (A) The standard posterior arthroscopic view illustrates many loose bodies around the biceps tendon. (B) Some loose bodies are adherent to the posterior humeral head. (C) There are no intra-articular loose bodies in the bicipital groove, and tendon looks normal.



Fig. 4. Multiple loose bodies extracted from glenohumeral joint and bicipital groove are shown.

Postoperatively, the patient was encouraged to start gentle passive and active-assisted exercise immediately. At 6 months after the operation, the patient did not have any pain and had a symmetric range of motion of the shoulders.

DISCUSSION

Primary synovial chondromatosis of the shoulder is a rare disease, and the exact etiology is unknown. Traditionally, the disease has been thought to be a metaplastic condition, which was recently related to a set of structural chromosomal abnormality and clonal karyotypic abnormalities of chromosome six³⁰.

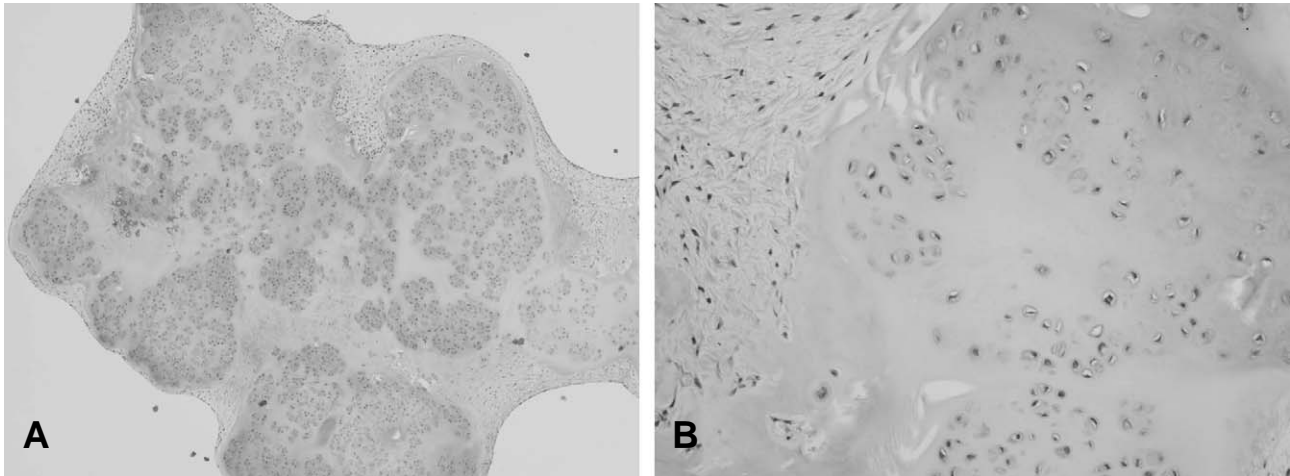


Fig. 5. (A) The photograph demonstrates the cross-section of synovial chondroma. It shows the circumscriptive and multinodular growth pattern (H&E, original magnification $\times 1$). (B) It demonstrates the synovial chondroma consisting of mature hyaline cartilage (H&E, original magnification $\times 10$)

Synovial chondromatosis should be differentiated from other diseases giving rise to loose bodies, such as degenerative joint disease, osteochondral fracture, osteochondritis dissecans, tuberculous arthritis, neurotrophic arthritis and other metabolic diseases⁷. Although the malignancy arising from synovial chondromatosis is extremely rare, it should be kept in mind that malignant transformation has been reported^{8,14}.

Milgram¹² described thirty cases of synovial chondromatosis, classifying them into three distinct stages: (1) active intra-synovial disease without loose bodies; (2) transitional lesions with both active intra-synovial proliferation and free loose bodies; and (3) multiple osteochondral loose bodies without active intra-synovial disease. Traditionally, open synovectomy has been carried out for the synovectomy and loose bodies removal. However, it requires considerable dissection and a longer postoperative course of rehabilitation, and ultimately results in a limited range of motion. In contrast to the open arthrotomy, arthroscopy affords the excellent visualization of the joint without significant morbidity of the joint². Recent reports also suggested that arthroscopic treatment for synovial chondromatosis of the shoulder joint results in decreased postoperative pain and a shorter period of rehabilitation^{2,9}.

Nevertheless, the current arthroscopic techniques cannot remove all of the free loose bodies within the bicipital groove^{4,11}. The authors undertook a mini-

open surgery to remove all of the loose bodies and the affected synovium in the biceps tendon sheath. Small¹⁶ suggested that synovial chondromatosis may also be found in biceps tendon sheaths secondary to local extension of the shoulder joint. In a retrospective article by Lunn¹³, the loose bodies were both present in the bicipital groove and shoulder joint among 9 of 18 patients with synovial chondromatosis of the shoulder joint. The authors found many loose bodies in the bicipital groove after arthroscopic decompression surgery in the glenohumeral joint, even though there were no loose bodies in the proximal bicipital groove confirmed by arthroscopy.

Although the recent arthroscopic surgery of synovial chondromatosis of the shoulder joint provides adequate decompression, low morbidity and early functional recovery, the authors believe that the addition of mini-open procedure for the biceps tendon sheath is necessary for the complete synovectomy in case that the biceps tendon sheath is also suspected to be involved by MRI.

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초 록

활액막 연골종증은 흔하지 않은 질환으로 견관절에 발생하는 경우는 드물다. 15세 여자 환자가 견관절 통증을 호소하여, 단순 방사선 검사 및 MRI 검사로 활액막 연골종증으로 진단하였고, 병변이 견관절뿐만 아니라 상완 이두건 건초 내로 침범 되었다. 저자들은 견관절 병변은 관절경 시술로, 그리고 상완 이두건 건초 내 병변에 대해서는 소절개를 통한 유리체 제거 및 활액막 전 절제술을 시행하였다.

비록 견관절경 시술이 적은 합병증 및 우수한 수술 시야를 제공하지만, 관절경 시술로는 이두 구내의 활액막과 건초 병변에 대한 완벽한 치료는 매우 어렵다. 이에 저자들은 이두 구까지 침범된 견관절에 발생한 활액막 연골종증의 완벽한 치료를 위해, 관절경적 활액막 전 절제술 및 유리체 제거술과 더불어 상완 이두건 건초의 소절개를 통한 병소의 완전 제거가 필요하여 문헌고찰과 함께 보고하고자 한다.

색인 단어: 견관절, 상완 이두건 건초, 활액막 연골종증, 소절개술