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Isolated Middle Glenohumeral Ligament Tear
- A Case Report -

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중관절와상완 인대의 단독파열
- 증례보고 -

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최창혁 · 권굉우 · 김신근 · 이상욱 · 장호선

일반적으로 견관절의 전방안정력은 하관절와상완인대에서 주역할을 하며, 불안정성으로 인한 병변은 관절순과 골관절와사이의 분리(Bankart lesion)로 나타난다고 한다. 중관절와상완인대는 특히 중등도의 외전위치에서 견관절의 전방안정성에 중요한 역할을 하는 정적 안정물로써, 다른 관절와상완인대의 동반손상없이 단독으로 파열된 례는 문헌고찰상 보고된 바가 없었다. 본 증례의 경우 특별한 외상력없이 내원 1년전부터 우측 견관절의 전방 불안정성과 동통성운동제한의 소견을 보였으며 상기 증상은 3개월 전부터 점차 악화되었다. 관절경 소견상 관절와순 부착부위에서 파열된 중관절와상완인대를 확인할 수 있었으며 동반된 관절와순의 부분파열 및 관절와관절면의 미란을 확인할 수 있었다. 파열된 중관절와상완인대와 비후된 활막을 변연절제 후 8개월 정도의 단계적 재활운동을 시행하였으며 동통과 관절운동의 회복소견을 볼 수 있었다.

본저자들은 관절경검사상 중관절와상완인대의 단독파열소견을 보인 39세의 여교사를 치료하였으며 그 결과를 문헌고찰과 함께 보고하는 바이다.

Key Words : Shoulder, Middle Gleno-Humeral Ligament, Tear

Middle gleno-humeral ligament is an important static anterior stabilizer especially in the middle range abduction position[1]. In general, most of the anterior destabilizing force is applied to the inferior gleno-humeral portion and pathologic lesion occurs between glenoid labrum and bony glenoid[10,11]. There were no previous descriptions of isolated middle gleno-humeral ligament stem tear without obvious trauma history. The purpose of this report is to describe a case of isolated middle gleno-humeral ligament tear and the result of a scheduled rehabilitation exercise program after arthroscopic shaving.

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CASE REPORT

A 39-year-old right handed teacher visited our outpatient clinic with complaint of pain and stiffness of her right shoulder for 3

months. She didn't experience any trauma. Her ordinary work was writing on a board with chalk for more than 10 years. The pain and stiffness developed insidiously and it did not respond to medication. Pain was accentuated after work. Painful stiffness limited her ability to wash her hair and back. On physical examination, the range of abduction(60 degrees at scapula plane), and external rotation(10 degrees at side and -20 degrees at 90 abduction) were significantly limited. The range of forward elevation(90 degrees) and internal rotation(L3) were also limited compared to contralateral side(full flexion and T7). Range of cross-body adduction was also limited with pain. On drawer stability testing, there was unremarkable difference on both sides of the shoulder. The plain radiograph revealed no abnormalities. The MRI suggested undulent appearance of anterior joint capsule and suspicious tear of the anterior glenoid labrum.

After administration of general anesthesia, the patient was placed in a lateral decubitus position. A stability test was performed which revealed Grade Ⅱ anterior laxity. On arthroscopic examination, there was no discernible changes at the biceps anchoring portion. But, we could find ligamentous stump at the mid-anterior portion of glenohumeral joint. Contrary to the MRI findings, the middle gleno-humeral ligament was torn at its glenoid origin with partially detached glenoid labrum(Fig. 1). Retro-grade re-examination of MRI revealed torn MGHL at axial image 4, and image 5(Fig. 2). The diameter of the stump measured about 5 mm. The capsule was slightly injected and synovial tissue around the torn ligament was hypertrophied. Articular cartilage of the glenoid surface showed about 25% of Grade Ⅲ(fissures, fragment) change in the antero-inferior

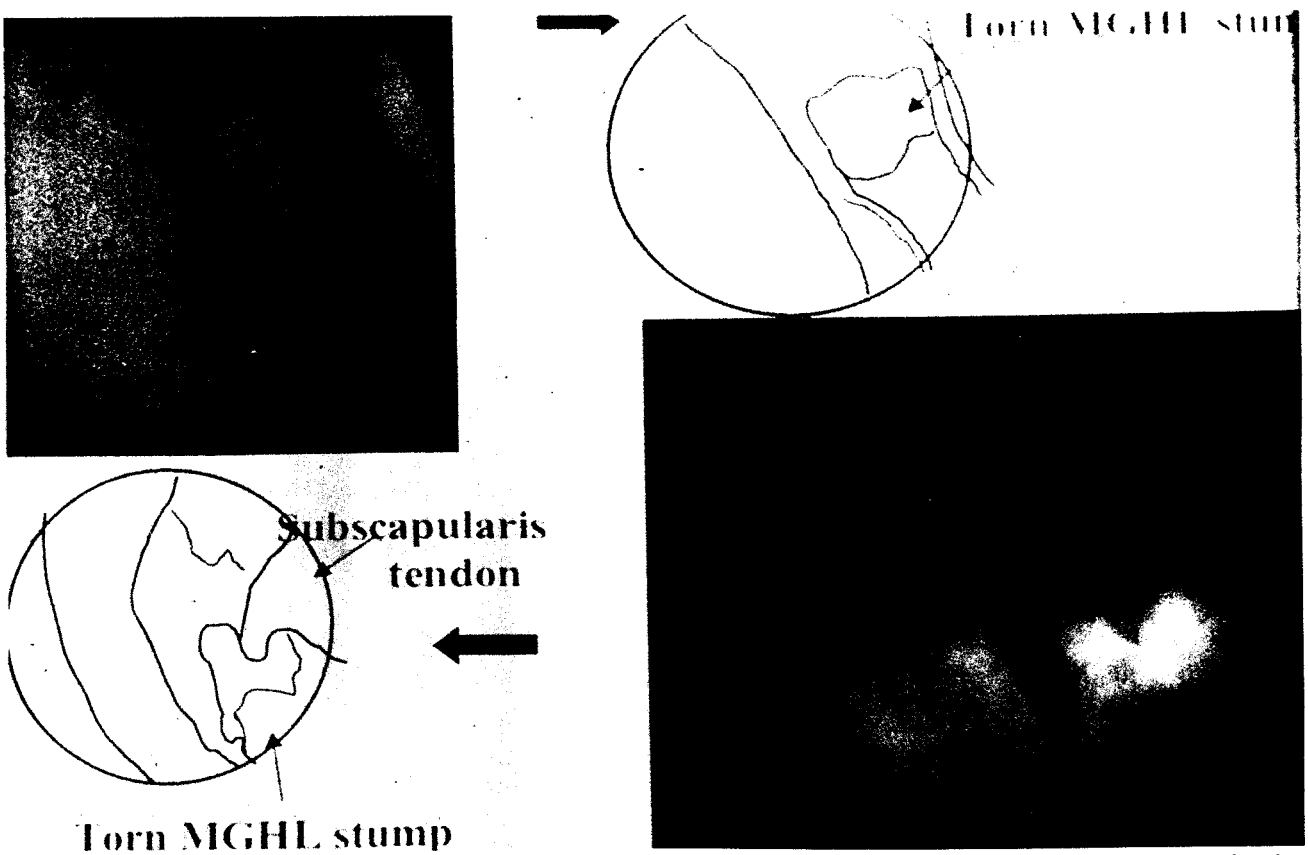

Fig. 1. On arthroscopic examination, intact biceps anchor and partially detached glenoid labrum were identified. Torn MGHL stump was found at the mid-anterior portion of glenohumeral joint.

portion(Fig. 3). Other structures appeared without abnormal changes. A 4㎜ full radius shaver was used to debride the hypertrophied synovium and stump end of torn MGHL. Pendulum motion exercise was begun the day after the operation with arm sling applica-

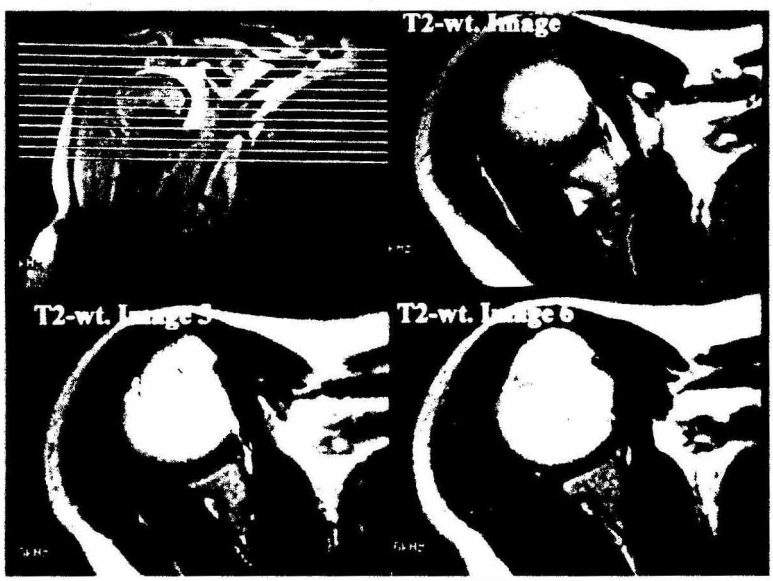

Fig. 2. T2-weighted axial image suggested suspicious tear of middle glenohumeral ligament at 2 to 3 O'clock position of the glenoid(Image 4, 5). There was no discernible changes under this level of the glenoid labrum(Image 6).

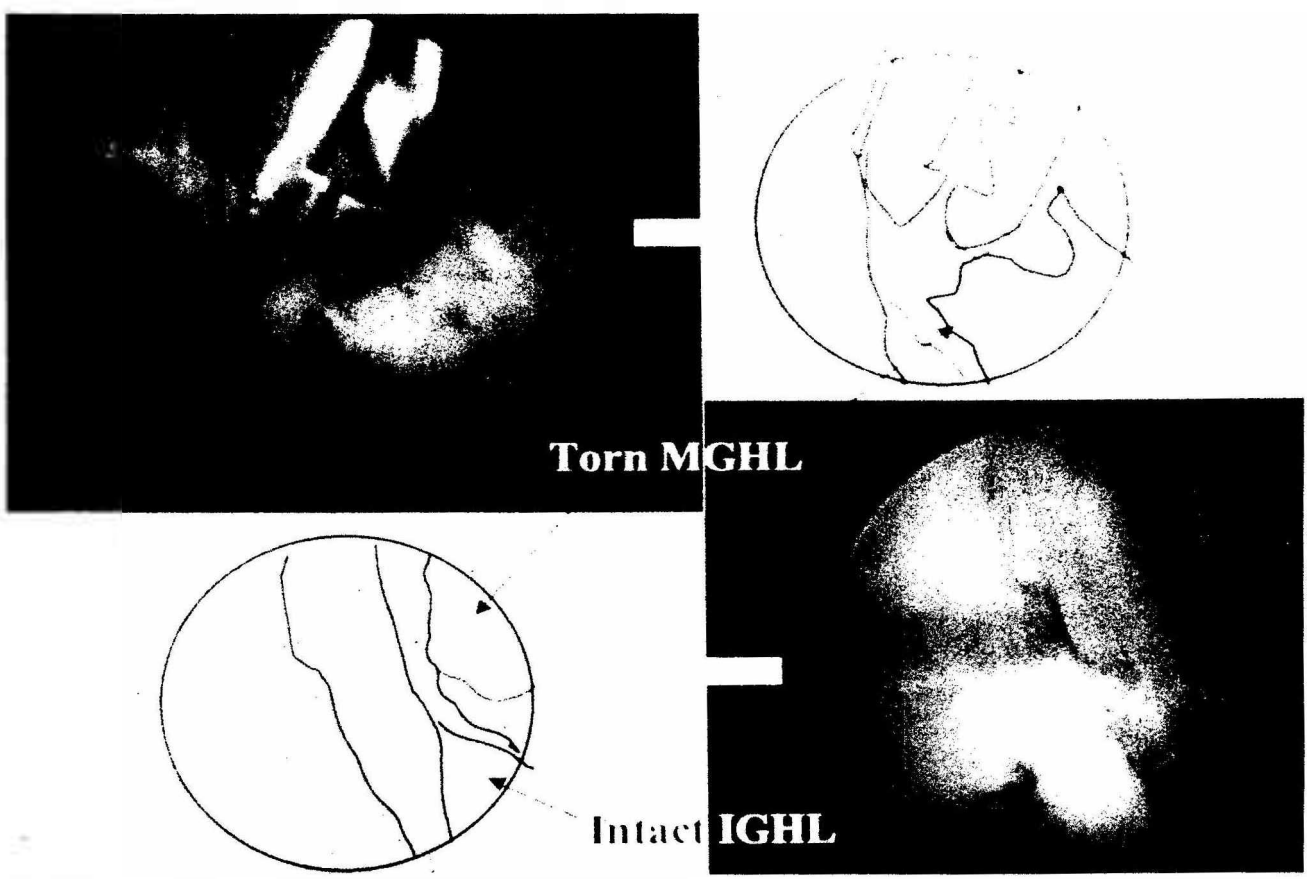

Fig. 3. Arthroscopic assisted debridment and shaving of contracted stump of MGHL. Torn substance portion measured about 5mm in diameter. Under the contracted MGHL stump, thickened sheet-like structure was considered as a superior band of IGHLC. Grade III articular damage was found at the corresponding antero-inferior portion of the glenoid(25%).

tion. After 2 weeks of ex-ercise, the range of motion was slightly decreased, especially external rotation(0 degree at side and -40 degrees at 90 abduction). Cross-body adduction was increased about 10 degrees with diminution of exertional pain. She could return to her usual desk work with some difficulty. After 2 weeks, a stretching exercise was added. Until 6 weeks the range of motion was not much improved even though pain gradually decreased after 3 weeks of exercise. After 12 weeks exercise, exertional and night pain were much improved. Ranges of motion were 90 degrees of abduction, 110 degrees of flexion, 30 degrees of external rotation at side(-10 degrees at 90 abduction), and T11 level of internal rotation. She could do all her daily work without difficulty other than back-washing and weight lifting above shoulder level. After 16 weeks exercise, there were 10 degrees increment of abduction, and external rotation on both sides. Shoulder pain was negligible and daily work was more easily performed. After 8 months of scheduled exercise program, she regained painless motion up to 135 degrees of scapula plane abduction, 125 degrees of neutral flexion, 40 degrees of external rotation at side(0 degree at 90 degree abduction), and T11 level of internal rotation with normal ratio of sapulothoracic and glenohumeral motion compared to contralateral side.

DISCUSSION

Historically, the glenohumeral ligaments were first described as thickenings in the capsule of the shoulder joint[2,3,7,8,12]. DePalma was one of the first investigators to point out the wide variability of the shoulder capsule based on dissection study[2]. Turkel and associates were the first to perform anatomic radiographic studies to clarify the orientation and position of shoulder ligaments during shoulder abduction. They confirmed MGHL as a primary stabilizer for anterior stability at 45 degrees abduction which also limits external rotation in mid-abduction position even though inferior glenohumeral ligament (IGHL) was the primary stabilizer for anterior instability in whole range of abduction[11].

DePalma and associates have observed that the middle glenohumeral ligament has the greatest variation in size of all the ligaments of the shoulder[2]. It is absent in approximately 8% to 30% of cases and is poorly defined in approximately 10% of cases[3,8].

When present, it usually originates from the superior glenoid just below the superior glenohumeral ligament(SGHL), slightly medial to the glenoid labrum[3,6,9,11]. Using arthroscopic inspection and gross and histological dissection, O'Brien and associates have defined inferior glenohumeral ligament complex(IGHLC) as a constant structure that has a three component nature[8]. Recently, Bigliani and associates studied this capsule region and they found that the anterior band was consistently present and represented the thickest area of this region(mean=2.8㎜)[1]. The shoulder is one of the most functional joints of the body and in spite of its highly variable anatomy it can function relatively uniformly. During sequential shoulder motion, there is coordinated function of static and dynamic stabilizers and overlapping action of each stabilizer. But, a more robust ligament would experience greater strain[9] or force, and would play a larger role in generating obligate translations[4] than would an underdeveloped structure. So, most of the primary anterior destabilizing forces are probably focused on the gleno-labral portion of the IGHL(classic Bankart lesion) under routine anterior destabilizing position.

Under some unique situation, stress might be transferred through a relatively weak stabilizer. Even though there was no abrupt traumatic force to rupture the ligamentous structure, repetitive stress may cause rupture eventually. Jobe and associates have defined MGHL avulsions, likewise, have been noted to occur leading to subluxation of the glenohumeral

joint without frank dislocation of the shoulder[5]. In our case, the injury mechanism was unclear because she did not suffer recognizable traumatic event nor strenuous activity at her work. As a school teacher, her usual work was board writing for more than 10 years. The only clue was the position of writing with midrange abduction. But it might not be a problem confined to the patient only. We could not exactly identify the cause of substance tear of the MGHL at its labral portion. It has been identified as a secondary restraint to both inferior and anterior instability and might act as a primary restraint in some situations. And some authors believe that it plays a greater protective role for anterior stability of the shoulder when its morphology is cord-like as was our case[12].

She suffered right shoulder pain for more than 3 months and gradually was unable to elevate her arm above 70 degrees of abduction. It was uncertain when the MGHL was torn, but in spite of the MGHL tear there were no abrupt changes of anterior stabilizing forces. Glenoid articular cartilage denuding and partial tear of stretched labrum were focused on the inferior portion and they implied instability at mid-range of abduction and inablility of further abduction. It revealed that the main stabilizing role of MGHL and IGHLC changed at this point in this patient. It might not be necessary to reattach the MGHL; instead, releasing adhesions and shaving the hypertrophied structures. The stabilizing role of MGHL might be replaced by balanced action of IGHLC and strengthening of dynamic stabilizer.

We tried to rehabilitate the shoulder function with a scheduled exercise program composed of gravity, stretching, and strengthening exercises. It took 8 months and she regained painless motion up to 135 degrees of scapula plane abduction, 125 degrees of neutral flexion, 40 degrees of external rotation at side(0 degree at 90 degree abduction), and T11 level of internal rotation with normal ratio of scapulothoracic and glenohumeral motion compared to contralateral side.

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