1 AN ANATOMICAL STUDY OF ROTATOR CUFF INSERTIONS
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Most clinicians agree that tears involving more than 50% of the thickness influence the surgeon to perform a repair. The purpose of this study is to determine the thickness of supraspinatus insertion to the greater tuberosity in 43 cadaver shoulders. The mean distance of the supraspinatus insertion at the 10 mm lateral to the bicipital groove was 9.6 (SD, 1.6) mm; there was no significant difference between male and female or right and left. Articular side partial supraspinatus tear with more than 5 mm of exposed bone lateral to the articular cartilage edge is considered involving 50% of tendon substance.

2 MOTION ANALYSIS OF SCAPULOHUMERAL RHYTHM DURING INTERNAL AND EXTERNAL ROTATION WITH THE ARM IN ADDUCTION
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Objective: To determine the scapulohumeral rhythm during internal and external rotations of the arm in adduction.

Methods: Seven healthy male adults (mean age 27.3 yrs) were enrolled. The scapulohumeral and scapulothoracic motion was recorded using an electromagnetic tracking device, 3 Space-Win (Polhemus, USA). The volunteers were asked to move their arm, from the neutral rotation in adduction, rotated internally up to 60°, and externally up to 60°.

Results and Conclusion: With the arm at the side, the scapulohumeral rhythm during internal rotation was 6 to 1, and that of external rotation was 4 to 1.

3 THE POSTOPERATIVE RESULTS OF THE POSTERIOR CAPSULORRHAPHY FOR MULTIDIRECTIONAL INSTABILITY OF THE SHOULDER BETWEEN HUMERUS-BASED AND GLENOID-BASED T-CAPSULAR INCISIONS
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Posterior capsulorrhaphy for 24 multidirectional unstable shoulders produced equally satisfactory results, after either humerus-based or glenoïd-based T-capsular incision. However, 10 of 16 shoulders (63%) showed posterolateral defects of the humeral head after the former procedure, while none of 8 did after the latter procedure. The acromialhumeral interval was shorter and signals on MR images were weaker in those with the defect than those without. This may be caused by circulatory disorders of the humeral head due to tighter capsulorrhaphy and/or injury to the posterior circumflex artery. The true pathogenesis and the clinical significance of this humeral head defect remain unclear.

4 REFLEX SYMPATHETIC DYSTROPHY AFTER OPERATION WITH ROTATOR CUFF TEARS
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Purpose: An association between reflex sympathetic dystrophy (RSD) and rotator cuff tear has been documented. This study investigates the characteristics and clinical results of RSD with rotator cuff tear.

Materials and Methods: One hundred sixty-three consecutive shoulders who underwent rotator cuff repair were studied prospectively. RSD was identified in 22 shoulders.

Results and Conclusion: The time it took to develop symptoms was within 2 weeks and 2 weeks or subsequent ones after operation. Symptoms after surgery disappeared within 2 weeks and over 1 month. RSD with rotator cuff tear was divided into two categories.

5 THE BRISÉMENT PROCEDURE FOR SHOULDER STIFFNESS ASSOCIATED WITH ROTATOR CUFF TEARS
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The effectiveness of brisement procedures for preoperative shoulder stiffness associated with rotator cuff tears was evaluated. The outcome of 34 shoulders with the preoperative shoulder stiffness which received brisement procedures were compared with that of 32 shoulders which did not have the preoperative stiffness. They were assessed with the JOA score and the transition of range of motion. Postoperative shoulder functions improved significantly in both groups and there was no significant difference in the range of abduction in two groups. Thus we concluded that the brisement procedures were useful for preoperative shoulder stiffness associated with rotator cuff tears.

6 CLINICAL RESULTS OF “IN & OUT” SUTURE FOR INTRATENDINOUS TEARING OF THE ROTATOR CUFF
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Purpose: To evaluate clinical outcome of open cuff repair for the intratendinous tearing (IT) using “in & out” sutures to stick IT together after debridement.

Materials and Methods: Fifty-eight patients were divided into 3 groups after tendon-bone suture; group A (GA), those having no IT, group B (GB), those without repairing IT, and group C (GC), those with “in & out” technique for IT.

Results and Conclusion: The supraspinatus tendon was thinner in GB (4.5mm) than in GA (6.5mm) and GO (6.3mm). The high signal on MRI was more frequent in GB (66%) than in GA (30%) and GC (26%). This suture technique appears promising in repairing IT.

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7 THE FRACUTRES OF THE ANTERIOR GLENOID RIM ASSOCIATED WITH JOINT INSTABILITY: TREATMENT OF FRESH LESIONS AND OLD LESIONS
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The 12 cases of the fractures of the anterior glenoid rim associated with joint instability were treated surgically. The fresh lesions were 9 and the old lesions were 3. In fresh cases, the open reduction and internal fixation of the anterior glenoid rim were performed. Eight of 9 cases were restored the stability, complicated with the necrosis of the humeral head in one case. In the two old cases, the glenoid rim was reconstructed with the bone graft from the posterior acromion. In another old case, total shoulder arthroplasty was performed. All the old cases were restored the stability.

8 GROWTH FACTOR EXPRESSION IN RABBIT SUPRASPINATUS TENDON USING A FINITE ELEMENT MODEL
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Purpose: To clarify the expression of growth factors during the healing process of the simulated rotator cuff tear.

Subjects and Methods: 27 Japanese White rabbits with a defect on the supraspinatus tendon were harvested on 1, 3, 5, 7, 9, 11, 14, 21, 28 days postoperatively (n = 3). The defect was assessed by immunohistochemical staining with each of the antibodies (bFGF, IGF-1, PDGF, TGF-β, VEGF).

Results: In the order of TGF-β, IGF-1, PDGF, bFGF, peaks of the expression were observed.

Conclusion: During the supraspinatus tendon healing, 4 types of growth factors (bFGF, IGF-1, PDGF, TGF-β) were expressed on specific time point.

9 DEVELOPMENT OF THE GLENOHUMERAL LIGAMENTS: VARIATIONS BETWEEN THE RIGHT AND LEFT SHOULDER
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Purpose: To observe the glenohumeral ligament (GHL) development between the right and the left shoulders.

Methods: In 54 pair shoulders of 27 embalmed cadaver, the size of the GHL was assessed by the width and thickness.

Results: In 11 cadavers the development of the GHL was completely the same on both sides of the shoulder whereas the difference in the development of only one ligament was observed in 5 cadavers, two ligaments in 7 cadavers, all 3 ligament in 4 cadavers.

Conclusion: Discrepancy of the GHL development between the right and left shoulders was observed 60% of the embalmed paired shoulders.

10 ANALYSIS OF STRESS DISTRIBUTION IN THE TEAR SUPRASPINATUS TENDON USING A FINITE ELEMENT METHOD
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To study the stress distribution of tear SSP with a finite element model, we created a 2-dimensional finite element model by MARC software, (MARC, MSC Software Corp) such as the rectangular SSP model with a transverse tear at the SSP attachment site. The SSP tendon was pulled proximally with the force of 10 N. A high tensile stress area was observed on both ends of the tear, and the edge of the tear was curved to the proximal end. In the tear SSP tendon, the high stress area was distributed in the remnant tendon closer to the tear site.

11 IMMobilIZATION IN EXTERNAL ROTATION FOR INITIAL ANTERIOR DISLOCATION OF THE GLENOHUMERAL JOINT
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Twelve shoulders with initial anterior dislocation were evaluated the coaptation effect of the subscapularis muscle when the shoulder was immobilized external rotation, and the practical use of the immobilizer to keep the shoulder in external rotation position. MRI were made, with the arm held at the side and positioned first in the maximum internal rotation and then in 15° external rotation. The coaptation effect was observed in 10/12 shoulders (83.3%). All of the patients answered the discomfort was within the bounds of their tolerance and were able to put on the immobilizers for 3 weeks.

12 CROSS-SECTIONAL AREA OF THE TENDON AND MUSCLE OF THE SHOULDERS WITH CUFF TEARS: A CADAVERIC STUDY
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Purpose: To clarify the morphological changes of the biceps in rotator cuff tear (RCT) shoulders.

Method: The cross-sectional area (CSA) of the tendon of the long head of the biceps (LHB) was measured at 9 different levels. The physiological CSA of the muscle was calculated for both heads of biceps.

Results: The CSA of the LHB tendon at the entrance of the groove was significantly greater in RCT than in normal. The physiological CSA did not show any significant differences between the normal and RCT shoulders.

Conclusion: Hypertrophy of the LHB tendon was a localized morphological change.

13 NIGHT PAIN IN SHOULDERS WITH ROTATOR CUFF TEARS: CHANGES IN PREOPERATIVE AND POSTOPERATIVE SUBACROMIAL BURSAL PRESSURE
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We reported that the subacromial pressure was significantly increased in the shoulders with night pain. The aim of this study was to compare the preoperative and postoperative pressure. The pressure of six shoulders (five male, one female, average age 58 years) with rotator cuff tears was preoperatively and postoperatively measured. In all shoulders, night pain disappeared postoperatively. Pressure was measured in the standing position, the supine position and the lateral decubitus position. Postoperative pressure was significantly decreased compared to preoperative pressure. We believed that this increase in pressure on the subacromial bursa may be the cause of night pain.
14  PATCHING PROCEDURE USING THE BICIPITAL LONG TENDON (NOBUHARA’S PROCEDURE) FOR THE TREATMENT OF ROTATOR CUFF TEARS THAT EXTEND INTO THE SUBSCAPULAR TENDON
Yukihiko Hata, MD, Narumichi Murakami, MD, Hirokazu Kobayashi, MD, Hiroshi Seki, MD, Hiroyuki Kato, MD, Dept of Rehabilitation Med, Shinshu University School of Medicine, Dept of Orthop Surg, Aizawa Hospital, Dept of Orthop Surg, Shinshu University School of Medicine, Matsumoto, Japan
The rotator cuff that extends into the subscapular tendon was repaired by the patching procedure using LHB (Nobuhara’s procedure). The purpose of this study was to describe the operative technique and short-term outcome. 21 shoulders that underwent surgery for rotator cuff tears except the massive tear were included in this study. The internal rotation power of all the patients was significantly weak, and four patients were positive for Gerber’s lift-off test. After surgery, all the patients had a powerful shoulder with a negative lift-off test. The JOA score one year postoperatively improved significantly (p < 0.01).

15  TREATMENT OF PYOGENIC ARTHRITIS OF THE SHOULDER
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Five men and two women in a good health with mean age of 66.5 year except an infant suffered from pyogenic arthritis. Debridements were performed except one case. The organisms were Candida, Mycobacterium tuberculosis, Pneumocococcus and Staphylococcus (including MRSA). The mean interval until operation was 9.3 days. Three cases with early treatment were healed primarily, but two cases with delayed treatment needed another operation. The infant with MRSA humerus osteomyelitis was performed debridement of humerus and got good healing with no recurrence. We need care for patients without immune suppression. Early diagnosis and surgical treatments are necessary.

16  MRI EVALUATION OF SUPRASPINATUS INSERTION
F. Ushijima, MD, J. Ide, MD, PhD, S. Maeda, MD, K. Takagi, MD, PhD, Dept of Orthop Surg, Kumamoto Univ Sch of Med, Kumamoto, Japan
Most clinicians agree that tears involving more than 50% of the thickness influence the surgeon to perform a repair. However, there is no report demonstrating thickness of supraspinatus insertion in Japanese. The purpose of this study is to determine the thickness in MRI. The mean distance of 32 subjects at the 10 mm lateral to the bicipital groove was 9.5 mm; there was no significant difference between male and female or right and left. Articular side partial supraspinatus tear with more than 5 mm of exposed bone lateral to the articular cartilage edge is considered involving 50% of tendon substance.

17  THE EFFECT OF SHOULDER STRETCHING ON ELEMENTARY SCHOOL BASEBALL PLAYERS
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Medical check was performed twice at one-year interval (2001 and 2002) on 33 little leaguers (range of age, 10 to 12 yrs), and measurements of the range of shoulder internal rotation were made with the shoulder at 90° abduction (2nd IR). The mean loss of 2nd IR of the throwing shoulder is 18.9° ± 12.5° on 2001 and 11.5° ± 6.9° on 2002, and the difference was significant. There were 18% of the players performing proper shoulder stretching on 2001, 70% on 2002 respectively. This study showed the effect of shoulder stretching on elementary school baseball players.

18  ARTHROSCOPIC TREATMENT OF ROTATOR CUFF INJURIES IN THROWING ATHLETES
J. Ide, MD, S. Maeda, MD, K. Takagi, MD, Dept of Orthopaedic Surgery, Kumamoto Univ Sch of Med, Kumamoto, Japan
Between 1998 and 2001, 46 throwing athletes (6 women, 40 men, mean age; 27) with rotator cuff injuries were treated arthroscopically. 34 patients were baseball players. We performed debridement of torn cuff (articular partial tear; n = 38), repair of torn cuff (n = 8), subacromial decompression (n = 6), debridement of torn labrum (n = 12), repair of SLAP (n = 23). Partial cuff tears involving 5 mm (50%) or greater of tendon insertion were repaired. 19 patients (39%) returned at pre-injury level, 23 (50%) returned at lower level, 5 (11%) could not return. Internal impingement was a major mechanical cause of rotator cuff injuries in throwing athletes.