acromioclavicular joint and coracoclavicular space during arm elevation and evaluate the influence of the body posture (standing or supine) on shoulder kinematics. A total of 25 shoulders of 15 patients (7 males and 8 females) were enrolled in this study. The shoulder motion during elevation was analyzed using previously repeated 3D/2D model-image registration methods. The fluoroscopic images were acquired in the standing and supine postures. Two-way repeated analysis of variance was performed to compare kinematic data between postures. With the arm in the side position, acromion in the standing posture was more depressed than that in the supine posture (-7.0 vs. -4.8 mm). As the humerus was elevated, the acromion showed medial, superior, and anterior translation in both postures. However, the coracoclavicular distance was the longest with the arm in the side position and became narrower during elevation. As the humerus was elevated, a coracoid process showed medial, superior, and posterior translation relative to the clavicle in both postures. These results suggest that coracoclavicular translation was not the same as acromioclavicular joint translation during elevation. In addition, the body posture aff5cted each kinematics. This knowledge would be useful for developing clinical insight.

8 ELASTICITY EVALUATION OF THE FIBER BUNDLE FORMING THE COMMA SIGN WITH ULTRASOUND MICROSCOPY

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Purpose: The comma sign is a well-known marker of the torn edge of the subscapularis tendon (SSC). The purpose of this study was to evaluate the elasticity of the supraspinatus tendon (SSP), the fiber bundle forming the comma sign (FBCS), and the SSC in intact and cuff-torn shoulders using ultrasound microscopy to examine the reason why the FBCS is maintained even in cuff-torn shoulders.

Methods: We used formalin-fixed cadavers. Of 6 intact shoulders of 6 cadavers (mean age, 74.5 years) and 5 cuff-torn shoulders of 3 cadavers (mean age, 88.0 years), serial histological sections, including the SSP, FBCS, and SSC, were created. One section with the most clearly visible FBCS and SSP/FBCS and FBCS/SSC connections were selected from each specimen and observed using ultrasound microscopy. In each selected section, new images of the SSP/FBCS and FBCS/SSC boundaries colored according to the sound speed of the reflected wave were created. In addition, the sound speeds of the substantially tendinous portion of the SSP/SSC and the central portion of the FBCS were recorded.

Results: In 6 intact shoulders, 3 SSP/FBCS borders and 3 FBCS/SSC borders were clear. However, all 5 cuff-torn shoulders demonstrated unclear SSP/FBCS and FBCS/SSC boundaries. The sound speed of the reflected wave was significantly slower in the FBCS than in the SSP or SSC in both the intact and cuff-torn shoulders.

Discussion: The FBCS was not considered as robust as the SSP or SSC. The gradual change of the elasticity in the SSP/FBCS and FBCS/SSP borders would lead to avoid stress concentration and rupture of the FBCS.

9 INTRAOPERATIVE AND POSTOPERATIVE COMPLICATIONS OF ANATOMICAL TOTAL AND REVERSE SHOULDER ARTHROPLASTIES: A MULTICENTER STUDY

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Purpose: Reverse shoulder arthroplasty (RSA) has relatively high risks of perioperative complications. We performed a multicenter study to clarify the complications of anatomical total shoulder arthroplasty (aTSA) and RSA.

Materials and Methods: Of the 474 patients enrolled in this study, 302 underwent RSA and 172 underwent aTSA. The mean age at operation was 75.6 years. The mean follow-up period was 22.3 months. Perioperative complications were identified, and the severity was classified into G0 (no), G1 (healed), G2 (residual dysfunction), G3 (operation), and G4 (death). These data were analyzed using χ^b test and logistic regression analyses, and the statistically significance was set at $p<.05$.

Results: The complication rates of aTSA and RSA were 10.3% and 17.9%, resepectively. The odds ratio for aTSA was 47% lower than that for RSA. G0, G1, G2, G3, and G4 complications were identified in 141, 3, 1, 0, and 0 patients during aTSA; in 126, 3, 6, 1, and 0 patients after aTSA; in 283, 0, 8, 8, and 0 patients during RSA; and in 260, 12, 11, 16, and 3 after RSA, respectively. RSA had a statistically significant higher risk of perioperative complications than aTSA intraoperatively ($p<.01$; odds ratio, 0.55), while it had a relatively higher risk than aTSA postoperatively, but there was no statistically significant difference ($p = 0.09$). The major complications of RSA during operation were humeral and glenoid fractures, and those after operation were scapular fractures, dislocations, glenoid component failures, neurological disorders, and perioperative death. We could not detect any related factors for the complications of RSA.

Conclusion: RSA has a high risk of complications without predicting factors, and careful patient evaluation, care, and operative procedures are essential.

10 OUTCOMES AFTER ROTATIONAL INFRASPINATUS MUSCLE TRANSFER FOR IRREPARABLE MASSIVE ROTATOR CUFF TEARS AND LONG-TERM FOLLOW-UP

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Background: We developed a surgical technique for rotational infraspinatus muscle transfer in cases with irreparable massive rotator cuff tears while avoiding strong tension at the repaired site to avoid causing paralysis of the suprascapular nerve. Our method involves detaching the infraspinatus muscle, including the portion where the infraspinatus and supraspinatus muscles are connected to the scapula. With this rotational transfer of the infraspinatus muscle, reconstructions of the damaged infraspinatus and supraspinatus muscles are possible by elongation of the supraspinatus muscle.

Methods: We assessed 9 shoulders in 9 patients (6 men and 3 women, mean age: 71 years, range: 66–78 years) with rotator cuff tears with a maximum diameter >5 cm and 2 tendons involved in the tear who were followed up for a mean period of 11.4 years (range: 10.1–12.8 years). The Japan Orthopedic Association and University of California Los Angeles scores were evaluated.

Results: Eight patients showed no pain, and the remaining patient showed reduced pain at the last follow-up. Before operation, 2 years after operation, and at the last follow-up, the mean ranges of active flexion, abduction, and external rotation were 88, 90, and 32; 159, 169, and 31; and 160, 159, and 13, respectively; the JOA scores were 47.8, 90.4, and 85.8 points, respectively, and the UCLA score were 7.2, 33.7, and 32.8 points, respectively.

Conclusion: Rotational infraspinatus muscle transfer surgery is considered effective in repairing irreparable massive rotator cuff tears; this effectiveness lasts >10 years.

11 FACTORS AFF5CTING OUTCOMES OF CONSERVATIVE MANAGEMENT FOR PSEUDOPARALYSIS OF THE SHOULDER

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This study aimed to analyze factors aff5cting the outcome of conservative management of pseudoparalysis of the shoulder. This study included 27 patients with pseudoparalysis of the shoulder, including 18 women and 9 men, with a mean age of 80.1 years. The type of cuff tear was massive tear in all the patients. All patients were treated conservatively for a mean duration of 3.9 months. Satisfactory results were achieved in 19 patients. Eight patients with unsatisfactory results eventually required surgery. The factors that caused nonresponse to treatment in 8 patients were compared with the contributing factors to treatment response in 19 patients. The factors were as follows: patient characteristics, degree of osteoarthritis change, and associated tear of the subscapularis tendon. All data were statistically analyzed. The identified factors that had a significant difference between the 2 groups were as follows: degree of osteoarthritis change and associated tear of the subscapularis tendon. Tear of the subscapularis tendon and changes in osteoarthritis were suggested to be factors that aff5cted the outcomes of conservative management. In the patients with osteoarthritis, satisfactory pain relief was difficult to attain. In patients with tears of the subscapularis tendon, decreased centripetal force due to collapse of the force couple was considered the cause of the poor outcomes. Surgical treatment should be considered positively for patients with factors that cause poor outcomes of conservative management of pseudoparalysis of the shoulder.

12 PREVALENCE AND RELATED FACTORS OF LESIONS OF THE LONG HEAD OF THE BICEPS TENDON IN ELDERLY PATIENTSS

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Background: The epidemiology of lesions of the long head of the biceps tendon (LHBT) is unknown. Materials and

Methods: A medical checkup was conducted for elderly local residents. This study included 334 elderly (668 shoulders; 68 men and 266 women) with a mean age of 75.3 years. We examined the background factors and physical and ultrasonographic examination results of both shoulders. The subjects were divided into 2 groups according to the presence or absence of LHBT lesions. We determined the prevalence of LHBT lesions and conducted statistical analysis to compare any differences between the 2 groups.

Results: LHBT lesions were present in 15.7% shoulders (105/668 shoulders). The prevalence of lesions in each decade of life was 4.1% in the 60s, 14.6% in the 70s, and 25.0% in the 80s. Of the 105 shoulders with LHBT lesions, 38 (36.2%) shoulders had current pain. Of the patients with and without current pain, 23.3% and 13.3% had LHBT lesions, respectively. LHBT lesions significantly correlated with age, current pain, rotator cuff tears, pulley lesions, and fluid in the bicipital groove ($p<.01$).

Conclusions: Of the 668 shoulders, 15.7% had LHBT lesions, and the prevalence of LHBT lesions increased with age. Current pain was present in 36.2% LHBT lesions. The factors related to the development of LHBT lesions included age, current pain, rotator cuff tears, pulley lesions, and fluid in the bicipital groove.

13 TEN-YEAR OUTCOMES OF HEMIARTHROPLASTY AND ROTATOR CUFF RECONSTRUCTION IN PATIENTS AGED ≥70 YEARS WITH CUFF TEAR ARTHROPATHY

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Aim: This study aimed to evaluate the outcomes of small head hemiarthroplasty and rotator cuff reconstruction over >10 years in patients aged ≥70 years with cuff tear arthropathy.

Methods: Thirty-three shoulders with CTA in patients aged ≥70 years were treated with small head hemiarthroplasty with cuff reconstruction between January 2006 and April 2010. Twelve patients were available for >10 years of follow-up (mean, 10.2 years), including 2 men and 10 women with a mean age of 75 years (range, 71–82 years). For cuff reconstruction, latissimus dorsi and teres major muscle transfers were performed in 3 patients, partial transfer of the subscapralis tendon was performed in 2 patients, and a pectoralis major muscle transfer was performed in 1 patient.

Results: No secondary or revision surgeries were required. The mean JOA score was 76.1 points (range,55–94 points), and the mean pain score was 25 points (range, 10–30 points) at the final follow-up. The active forward elevation was 122.1° (range, 60°–165°), and the external rotation was 21.3° (range, 0°–40°). Although no implant loosening occurred, 9 (75%) patients had a glenoid wear, 3 (25%) patients had lucent lines, 7 (58%) patients had bone absorption, and 7 (58%) patients had upper translation of the humeral head.

Conclusions: Hemiarthroplasty with cuff reconstruction in patients aged ≥70 years with cuff tear arthropathy provided satisfactory outcomes at >10 years postoperatively. The results suggest that it is a useful and stable treatment even for elderly patients.