J Shoulder Elbow Surg (2017) ■■, ■■–■■

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

ORIGINAL ARTICLE

Treatment of recurrent anterior shoulder instability with the Latarjet or Bristow procedure in older patients

Philipp Moroder, MD[a], Victoria Stefanitsch, MD[b], Alexander Auffarth, MD[b], Nicholas Matis, MD[b], Herbert Resch, MD[b], Fabian Plachel, MD[a,b,*]

[a]*Center for Musculoskeletal Surgery, Campus Virchow, Charité–Universitaetsmedizin, Berlin, Germany*
[b]*Department of Orthopedics and Traumatology, Paracelsus Medical University, Salzburg, Austria*

Background: The coracoid transfer procedure is commonly and successfully used to treat shoulder instability in young patients. However, there is concern that the outcome of this procedure might be inferior in older patients because of decreased bone graft quality and the potential concomitant presence of irreparable rotator cuff tears (RCTs).

Methods: All patients older than 40 years treated with a coracoid transfer procedure between 1998 and 2013 because of anterior shoulder instability were included. Surgical indication criteria were anterior glenoid bone defects and/or the presence of an irreparable yet functionally compensated RCT. Of 27 consecutive patients, 25 (93%) were followed up after an average of 9 years (2-15 years) clinically as well as by means of computed tomography scans. Mean age at surgery was 62 years (40-85 years).

Results: Nine patients (36%) were revised during the follow-up period. The average Western Ontario Shoulder Instability Index of the nonrevised patients was 556; Rowe score, 77; American Shoulder and Elbow Surgeons score, 75; Constant score, 65; and subjective shoulder value, 70%. The average preoperative instability arthropathy score of 0.7 increased to 2.0 ($P < .001$). An irreparable RCT showed no significant effect on the clinical outcome scores or revision rate but was associated with the development of cuff arthropathy ($R = 0.89$; $P = .01$). An increased grade of preoperative cuff arthropathy was associated with a higher revision rate ($R = 0.55$; $P = .04$).

Conclusion: The coracoid transfer procedure represents a joint-preserving treatment option for anterior shoulder instability in older patients with glenoid bone defects or concomitant irreparable yet functionally compensated RCTs. However, bone graft– and hardware-related complications as well as required revision operations are frequent.

Level of evidence: Level IV; Case Series; Treatment Study

Keywords: Anterior shoulder instability; glenoid bone defect; irreparable rotator cuff tear; coracoid transfer procedure; elderly population; complications

Investigation performed at the Department of Orthopedics and Traumatology, Paracelsus Medical University, Salzburg, Austria.
Ethikkommission Land Salzburg approved this study: 415-EP/73/637-2016 (31.03.2016).

*Reprint requests: Fabian Plachel, MD, Augustenburger Platz 1, D-13353 Berlin, Germany.
E-mail address: fabian.plachel@charite.de (F. Plachel).

1058-2746/$ - see front matter © 2017 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.
https://doi.org/10.1016/j.jse.2017.10.022

Recurrence of instability is a common complication after primary anterior shoulder dislocation. Although Rowe found a bimodal age distribution of primary shoulder dislocation with a peak in both the 20s and 60s, the incidence of recurrence steadily decreases with age.[20] Nonetheless, recurrence of instability can be observed in patients older than 40 years as well and can represent a treatment challenge because of decreasing tissue quality and increasing concomitant structural lesions.[17]

A frequently encountered risk factor for recurrent anterior shoulder instability is glenoid bone loss, which decreases the concavity compression–dependent shoulder stability ratio and therefore needs to be treated with bone grafting surgery if the defect size is extensive.[25] However, in patients older than 40 years, the quality of the bone graft transfer, mostly involving either the coracoid process or iliac crest, remains a concern because of age-dependent decrease in bone mineral density.[2]

Another concern in this group of patients is concomitant degenerative rotator cuff tears (RCTs), which can be observed in 54% of shoulder instability patients older than 40 years and 100% of patients older than 70 years.[24] This is largely due to age-related susceptibility to degenerative changes, resulting in a weakening of the musculotendinous unit. Whereas the cause-effect relationship between instability and cuff tears is often difficult to determine in hindsight, cuff tears are an important factor to consider in treating patients for anterior shoulder instability as the rotator cuff represents the main dynamic stabilizer of the shoulder joint.[10] Although acute traumatic RCTs after shoulder dislocation can usually be repaired directly, chronic traumatic or degenerative tears might become irreparable over time because of tendon retraction and muscle degeneration. Even if reverse shoulder arthroplasty is a valuable treatment option for recurrent anterior shoulder instability and irreparable RCT in older patients, joint-preserving techniques should be considered to treat instability in static centered and functionally compensated shoulder joints despite the presence of a concomitant irreparable RCT.

The coracoid process transfer in terms of the Latarjet or Bristow procedure is commonly and successfully used to treat shoulder instability in young patients.[14,23] However, there is concern that the outcome of the same procedure might be inferior in older patients because of decreased bone graft quality and the concomitant presence of irreparable RCTs.[2,24]

In this study, we report the clinical and radiologic outcome after the Latarjet or Bristow procedure for the treatment of recurrent anterior shoulder instability in patients older than 40 years after an average follow-up period of 9 years.

Methods

Study population

The inclusion criteria were recurrent anterior shoulder instability, treatment by means of a coracoid transfer procedure, age of 40 years and older at the time of surgery, and minimum follow-up of 2 years. Surgical indication criteria were anterior glenoid bone defects and/or the presence of an irreparable yet functionally compensated RCT. Between 1998 and 2013, there were 27 consecutive cases that fulfilled the inclusion criteria and were invited for clinical and radiologic follow-up examination. A total of 25 patients (93%) were available for final follow-up after an average of 9 years (range, 2-15 years). One patient died of an unrelated cause, and 1 patient could not be contacted because of a lack of current contact information.

There were 12 women (48%) and 13 men (52%) with a mean age at surgery of 62 years (range, 40-85 years). The dominant shoulder was affected in 14 patients (54%). The initial shoulder dislocation occurred at a mean age of 51 years (range, 16-85 years) and was caused by a simple fall on the shoulder in 11 patients (44%), by a minor trauma in 8 patients (32%), and by a sports injury in 6 patients (24%). The mean number of total shoulder dislocations before surgery was 15 (range, 2 to approximately 100).

In 16 patients (64%), an irreparable RCT (75% posterosuperior cuff tear involving the supraspinatus and infraspinatus; 25% superior cuff tear involving the supraspinatus) with tendon retraction to the level of the glenoid (stage 3 according to Patte[16]) and fatty degeneration of the muscle (stage ≥3 according to Goutallier et al[8]) was diagnosed preoperatively using magnetic resonance imaging. A substantial bony glenoid defect was detected in 16 patients (64%) either by preoperative computed tomography (CT) scans or by the bare spot method intraoperatively.[3] In 7 patients (28%), both an irreparable RCT and a substantial bony glenoid defect were present. Six patients (24%) had undergone 1 or multiple previous operations on the affected side, including anterior stabilization procedures (n = 6) and attempted rotator cuff repairs (n = 4) (Table I).

Surgical technique

All operations were performed with the patient placed in beach chair position. A standard deltopectoral approach was used. First, the coracoacromial ligament was released from its insertion at the coracoid process. After the pectoralis minor tendon was detached, the osteotomy of the coracoid process was performed. The subscapularis was split horizontally between the middle and the lower third of the muscle, and a horizontal capsulotomy was performed to expose the anterior glenoid rim. The glenoid labrum was removed, and the detached coracoid bone graft was placed flush with the articular surface of the glenoid. Depending on the size of the coracoid process, the bone graft was secured using 1 (Bristow,[13] n = 8) or 2 (Latarjet,[26] n = 17) cancellous screws. The capsule was then closed side to side, and a partial readaptation of the subscapularis was performed. Postoperatively, the shoulders were kept in a sling for 4 weeks with limited passive exercises. Subsequently, stepwise active motion with increased range of motion and strength was allowed.

Clinical follow-up

At follow-up evaluation, all patients completed a questionnaire about their satisfaction with the operation and any complications encountered or revision operations required since the index procedure. The clinical outcome was determined by the Constant score (CS) and the age- and gender-adjusted CS,[5,6] the Western Ontario Shoulder Instability Index (WOSI[11]), the ROWE score,[21] the American Shoulder and Elbow Surgeons shoulder assessment form (ASES[19]), the subjective shoulder value (SSV[7]), and a 10-point visual analog scale