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Outcome of single-tendon rotator cuff repair in patients aged older than 65 years

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Background: Rotator cuff repairs in patients aged older than 65 years are reported to have a high failure rate. Furthermore, asymptomatic cuff tearing is frequent in this age group, so the value of tendon repair has been questioned. Our aim was to review the results of cuff repair in these patients and to identify factors predicting outcome.
Methods: In this study, 58 patients aged older than 65 years with reparable supraspinatus tears underwent primary open (22 patients) or arthroscopic (36 patients) repair. The leading symptom was pain despite nonoperative treatment for at least 6 months. Tendon healing was assessed on ultrasonography.
Results: Forty-four shoulders could be reviewed at a mean follow-up of 57 months (range, 24-112 months). Tendon healing was complete in 31 shoulders (70%). The mean Constant score (CS) improved from 49 points (range, 5-74 points) preoperatively to 78 points (range, 23-100 points) at follow-up ($P < .05$). The respective values for the relative CS were 64% (range, 7%-97%) and 95% (range, 33%-100%) ($P < .05$). The mean CS was better for healed repairs (82 points [range, 57-100 points]) than for nonhealed repairs (61 points [range, 23-88 points]) ($P < .05$). In 41 of 44 cases (93%), patients were satisfied or very satisfied with the operation. Though not statistically significant, dominance, cortisone injection, smoking, and tendon retraction appeared to favor nonhealing.
Conclusions: Isolated supraspinatus tendon repairs in patients aged older than 65 years have a high healing potential and yield good clinical results with even better outcome if the repairs heal. Repair of symptomatic single-tendon rotator cuff tears in patients aged older than 65 years who do not respond to conservative treatment appears justified.
Level of evidence: Level IV, Case Series, Treatment Study.

Keywords: Rotator cuff repair; outcome; tendon healing; elderly

Rotator cuff disease is the most common pathology causing shoulder pain.[23] There is a significant association between increasing age and the presence of rotator cuff tears. In asymptomatic shoulders, the prevalence of full-thickness tears is approximately 20% for subjects aged between 60 and 70 years and 31% to 50% in individuals aged between 70 and

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80 years.[21,23] Spontaneous healing of clinically relevant tears has not been observed. Conversely, there is a significant risk for tear progression with associated development of pain and dysfunction.[26] If tears become symptomatic, both arthroscopic and open rotator cuff repairs yield a rate of good or excellent 10-year results of roughly 90%.[6,25] Although satisfactory pain relief is possible without rotator cuff tendon healing, functional outcome is better for healed repairs.[13] Structural repair failure has been shown to increase with initial tear size and with increasing age.[13,19,21] Indeed, age has been identified as a key predictor for structural and functional outcome,[13,22] and repairs of comparable tears in patients aged older than 65 years have a reported healing rate of only 43%.[21]

Because the rate of tendon healing of small tears is less than 50% in patients aged older than 65 years and because progression of structural joint degeneration has to be expected after nonhealed repairs,[16] the structural and clinical midterm to long-term outcome of repairs in patients aged older than 65 years is of substantial interest. There are only very few studies focusing on repairs of rotator cuff tears in patients aged older than 65 years, and this is specifically true for arthroscopic repairs. Therefore, the purposes of this study were to determine the value of rotator cuff tear repair in patients aged older than 65 years and to establish the results of open as well as arthroscopic repair.

Methods

Patients

Fifty-eight consecutive patients aged older than 65 years with full-thickness supraspinatus tears were operated on by the senior surgeon (C.G.) or under his direct supervision. During the same period, 42 patients underwent rotator cuff repair or debridement for massive ($\geq$2 tendons) rotator cuff tears without functional impairment. Finally, 81 reverse total shoulder arthroplasties were implanted for painful pseudoparesis with massive nonreparable cuff tear.

All patients gave their written consent for the procedure. To be included in this study, a tear had to be limited to the supraspinatus tendon with an association of no more than a partial subscapularis tear (no more than upper third) or infraspinatus tear (delamination of upper part). On the basis of imaging criteria, all rotator cuff tears were reparable with an acromiohumeral distance of greater than 7 mm on the anteroposterior radiographs and fatty infiltration of the supraspinatus muscle of less than stage III according to Goutallier on computed tomography scans[10] or magnetic resonance images.[5] Patients were excluded if they had had prior surgery, if the tears were larger than defined earlier, or if advanced osteoarthritis of the glenohumeral joint was present. All patients underwent unsuccessful conservative treatment for at least 6 months, which consisted of physiotherapy.

Preoperative assessment

All patients were preoperatively scored according to Constant and Murley.[4] We noted the side affected. Previous subacromial cortisone injections and smoking history were assessed.

Radiographic evaluation included standard radiographs and magnetic resonance arthrotomography. The acromiohumeral distance was measured on the true anteroposterior radiograph with the arm in neutral rotation. Tear size and tendon retraction were evaluated on magnetic resonance arthrotomography. Supraspinatus tendon retraction was evaluated on the coronal view at the level of the glenoid apex.[21] Tear extension with tendon delamination involving the superior part of the infraspinatus or subscapularis tendon (or both) was evaluated on the sagittal view.[21] All tear size measurements were verified intraoperatively.

Surgical technique

Patients treated early in the study were operated on with an open technique. A superolateral approach was used with detachment of the deltoid. A tenodesis of the long head of the biceps was performed. All patients had an anterolateral acromioplasty. The rotator cuff was repaired with a modified Mason-Allen suture technique. Both suture ends were passed in a transosseous manner and tied over a cortical bone–augmentation plate.[9]

In the second phase of the study, patients were operated on arthroscopically. A tenotomy of the long head of the biceps was performed in all cases. All patients had an anterolateral acromioplasty. The rotator cuff was repaired with nonabsorbable suture anchors. We used a single-row mattress suture technique and sliding Nicky knot in all arthroscopic repairs.

Postoperative rehabilitation

All patients underwent placement of an abduction brace at 45° for 6 weeks. Passive range-of-motion exercises were initiated on the first postoperative day under patient-controlled interscalene analgesia. Active range of motion with the elbow fully flexed was allowed after 6 weeks and with the elbow extended at 12 weeks. Strengthening exercises were not allowed for 3 months after surgery.

Postoperative assessment

All patients were evaluated by 2 independent examiners (A.D. and A.C.) who had not been involved in any of the surgical procedures. Evaluations were conducted as preoperatively including scoring according to Constant and Murley and with the Subjective Shoulder Value. Strength was measured in kilograms with a validated electronic dynamometer with the shoulder in neutral rotation and 90° of abduction in the scapular plane. Satisfaction was measured on an analog scale from 1 to 4.

Radiographic evaluation consisted of standardized anteroposterior, lateral, and axillary radiographs. Acromiohumeral distance was measured and degenerative changes were graded according to Hamada et al.[12] Cuff healing was assessed by ultrasonography. The ultrasound examination was performed by or under the supervision of a trained radiologist (M.Z.). Healing was defined as a watertight cuff with complete tendon healing. A watertight cuff with a thinned tendon was considered as a failure. The accuracy for ultrasound evaluation of the rotator cuff tear has previously been reported.[14] Seven patients underwent postoperative magnetic resonance arthrography imaging for suspicion of tendon nonhealing; they did not undergo additional ultrasonography.