J Shoulder Elbow Surg (2016) ■■, ■■–■■

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

ORIGINAL ARTICLE

Immediate and early complications of the open Latarjet procedure: a retrospective review of a large consecutive case series

Gary M. Gartsman, MD[a], Wame N. Waggenspack Jr., MD[b,*], Daniel P. O'Connor, PhD[c], Hussein A. Elkousy, MD[a], T. Bradley Edwards, MD[a]

[a]*Fondren Orthopedic Group, Houston, TX, USA*
[b]*Foundation for Orthopaedic, Athletic and Reconstructive Research, Houston, TX, USA*
[c]*Health and Human Performance, University of Houston, Houston, TX, USA*

Background: Immediate and early postoperative complications of the Latarjet procedure are not well documented in the literature. The purpose of this study was to report the procedure-related complications of our large consecutive case series of 3 surgeons at a single high-volume center.

Methods: We conducted a retrospective chart review of 416 Latarjet procedures performed on 400 patients (16 patients had bilateral procedures) who underwent surgery by the 3 senior authors from October 2002 to July 2015. Immediate and early complications included hardware problems, infection, and neurologic injury. In addition, the patient's age and history of prior instability surgery were noted and evaluated as risk factors for complication.

Results: The overall complication rate was 5.0% (21 complications in 19 procedures). Thirteen neurologic injuries (3.1%) occurred to the axillary (7), musculocutaneous (4), and suprascapular (2) nerves, including 2 patients with multiple nerves affected. All but 2 patients had complete resolution of symptoms at time of last follow-up. Six infections (1.4%) developed, including 3 superficial infections treated with oral antibiotics and 3 deep infections requiring irrigation and débridement with intravenous antibiotics. Two early hardware-related complications (0.05%) were also noted. Increased age was associated with a higher complication rate. History of prior surgery was not associated with increased complications in our series.

Conclusions: This study highlights the procedural complications of the Latarjet procedure. Neurologic injury was the most common complication in our series, with complete or near-complete recovery in 11 of 13 patients.

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

Keywords: Shoulder instability; anterior shoulder instability; recurrent shoulder instability; coracoid transfer; Latarjet procedure; immediate complications; short-term complications

The Latarjet procedure is a well-described treatment for recurrent anterior shoulder instability in patients with glenoid bone loss or after failed soft tissue stabilization procedures. Whereas longer term complications such as recurrent instability, osteoarthritis, and graft nonunion are better defined, there is little literature focused on complications associated

This study protocol (TOH166) was reviewed and deemed appropriate for "Exempt Approval" status by the Institutional Review Board of Texas Orthopedic Hospital as of January 21, 2016.

*Reprint requests: Wame N. Waggenspack Jr, MD, Foundation for Orthopaedic, Athletic and Reconstructive Research, 6400 Fannin St, Suite 1700, Houston, TX 77030, USA.

E-mail address: wwaggmd@gmail.com (W.N. Waggenspack Jr).

1058-2746/$ - see front matter © 2016 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.
http://dx.doi.org/10.1016/j.jse.2016.05.029

with the procedure itself.[1,2,11-13,15] Most reports are retrospective in nature, are composed of heterogeneous populations of patients (including other coracoid transfer or stability procedures), and mention intraoperative or immediate complications only briefly or not at all. Therefore, the true incidence is difficult to ascertain.

Several recent publications demonstrate the inconsistent reporting of procedural complications.[3,4,6,7,16] Griesser et al performed a systematic review of 1904 shoulders in 45 studies reporting the complications of coracoid transfer procedures, including arthroscopic, and found neurologic injury in 1.6% (31 of 1904), a 1.3% infection rate, and intraoperative fracture of the coracoid in 1.5% of patients.[6] Butt and Charalambous reviewed 30 studies including 1658 coracoid transfer procedures, reporting similar rates of neurologic injury (1.2%), infection (1.5%), and intraoperative coracoid fracture (1.1%).[3] However, as noted by the authors, infection and neurologic injury were not reported in 11 and 16 of the 30 studies included, respectively.

In contrast, Shah et al published the short-term complications of their consecutive series of 48 Latarjet procedures, reporting a 10% (5 of 48) rate of neurologic injury involving the axillary, musculocutaneous, and radial nerves, with 4% (2 of 48) resulting in persistent deficit at time of final follow-up.[16] Delaney et al, in their study using neuromonitoring to detect which steps of the Latarjet procedure place the nerves at highest risk of injury, found a "clinically detectable nerve deficit" postoperatively in 7 of 34 patients (20.6%), although all deficits resolved completely before 6 months.[4] With a significantly higher incidence of nerve injury, the results of these studies more closely correspond to the rate of neurologic injury for open shoulder stabilization procedures previously reported.[8]

The purpose of our study was to report the immediate and early complications of the Latarjet procedure in a large consecutive series of patients performed by 3 surgeons at a single high-volume institution. We also sought to evaluate whether the patient's age or history of a prior stabilization procedure was associated with an increased complication risk in our population.

Materials and methods

We reviewed the medical records of all open Latarjet procedures performed by the 3 senior surgeons at our institution from October 2002 to July 2015. Two of the surgeons (G.M.G. and T.B.E.) are shoulder fellowship trained; the other surgeon (H.A.E.) is sports fellowship trained. Hospital records, operative notes, and all clinic notes including radiographic evaluations were reviewed. Immediate and early postoperative complications including hardware problems, infection, and neurologic injury were recorded. We identified 418 procedures in 402 patients eligible for inclusion in the study. Two patients did not follow up after surgery and were excluded. All other patients had a minimum follow-up of 2 weeks and were included in the analysis. Average follow-up was 7.8 months. Indications for the Latarjet procedure included recurrent anterior instability after prior stabilization procedures and anterior glenoid bone loss by Bernageau-view radiographs or computed tomography. We will use the Latarjet as a primary surgical treatment for anterior instability, especially in contact athletes.

Surgical technique

The Latarjet surgical technique used by the 3 senior authors has been previously described, with minor variations that are subsequently described.[5] Surgery is performed under general anesthesia with the patient in the beach chair position with a folded sheet under the scapula to make the coracoid readily palpable. We use an assistant to stabilize and to position the arm during the procedure. An examination under anesthesia is performed to confirm the preoperative diagnosis. Arthroscopic evaluation of the glenohumeral joint and subacromial space before open Latarjet procedure was performed at the discretion of the treating surgeon.

A 5-cm incision is made starting at the coracoid tip and extending inferiorly. The deltopectoral interval is developed and retracted with right-angle retractors, taking the cephalic vein laterally and ligating any crossing vessels to prevent postoperative hematoma.

With the arm abducted and externally rotated, the superior border of the coracoid is cleared of soft tissue, and the coracoacromial (CA) ligament is then identified and transected 1 cm lateral to the origin. With the arm returned to an adducted and internally rotated position, the pectoralis minor insertion is released from the medial coracoid. A periosteal elevator is then placed medially to expose the "knee," and the coracoid osteotomy is performed with a 90° microsagittal saw using the elevator to protect the neurovascular structures medially. Grasping forceps are used to control the coracoid while the coracohumeral ligament is released laterally to complete the graft harvest.

The deep surface of the coracoid is sharply cleared of soft tissue and decorticated while the CA ligament is protected. Two parallel holes are then drilled perpendicular to the long axis (posterior to anterior) and centered with respect to the coracoid width. One of the surgeons (T.B.E.) uses 4.5-mm malleolar screws and drills the holes freehand; the other 2 surgeons (H.A.E. and G.M.G.) use 3.75-mm cannulated cortical screws with a parallel drill guide.

Glenoid exposure is accomplished using a subscapularis split technique with the arm in an adducted and externally rotated position. Typically, we divide the muscle at the junction of the middle and inferior thirds, although in hyperlax patients, this split may be placed more superior in the muscle to maximize the sling effect of the conjoined tendon. A 1-cm vertical capsulotomy is performed at the glenohumeral articulation, and a smooth Trillat humeral head retractor is placed into the joint. Superior retraction is accomplished using a large Steinmann pin driven into the surgical neck of the scapula, and an inferior retractor placed under the scapular neck completes the glenoid exposure.

After removal of the anteroinferior capsulolabral soft tissue and creation of a bleeding bone bed, the coracoid is placed flush with the articular surface of the glenoid and secured with screws. A heavy nonabsorbable suture is used to repair the CA ligament to the joint capsule. The subscapularis split is not repaired. The wound is closed in layers. We do not routinely use a drain.

Statistical analysis

Fisher exact test was used to compare patients with and without prior surgery for frequency of infection, neurologic injury, and any complication. Analysis of variance was used to compare the average ages