KEY PROCEDURES

OPEN REDUCTION AND INTERNAL FIXATION WITH A LOCKING PLATE VIA DELTOPECTORAL APPROACH FOR THE TREATMENT OF THREE AND FOUR-PART AND PROXIMAL HUMERAL FRACTURES

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Published outcomes of this procedure can be found at: *JAMA*. 2015;313(10):1037-47, *J Orthop Trauma*. 2011;25(1):11-7, and *Injury*. 2011 Apr; 42(4):408-13, *J Shoulder Elbow Surg*. 2010 Jan;19(4):489-94.

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Abstract

Open reduction and internal fixation (ORIF) via the deltopectoral approach is the gold standard for operatively treated proximal humeral fractures when joint preservation is desired. Indications include an unacceptable deformity, need for stability and early mobilization, and osteoporotic bone. (1) A 12 to 14-cm incision is made in the deltopectoral groove. The fracture is reduced. (2) Pins and tension sutures are placed for provisional fixation. (3) The locking plate is placed with unicortical screws in the metaphysis of the proximal part of the humerus and bicortical screws in the shaft. (4) The rotator cuff tendon is sutured into the open suture holes of the plate. (5) The surgical wound is then closed in a layered fashion. Hertel et al. reported that calcar length <8 mm, disruption of the medial hinge, and complex fracture patterns are more predictive of future osteonecrosis. In a series of 34 patients managed with ORIF, Neviaser et al. showed that the length of the posteromedial hinge was not predictive of osteonecrosis. Additionally, with use of tetracycline labeling, Crosby et al. demonstrated that perfusion to the humeral head is maintained in more complex 3 and 4-part fractures following anatomic reduction. Although they are useful for surgical planning, the criteria proposed by Hertel et al. cannot accurately predict osteonecrosis. The most important predictor of ischemia is the length of the dorsomedial metaphyseal extension and the integrity of the medial hinge. Including medial support in the fixation greatly decreases the incidence of screw cutout and migration into the articular surface and increases functional outcomes. Proper and complete reduction is of the utmost importance because varus malreduction contributes to the loss of fixation and to technical complications, such as improper plate positioning, improper screw length, and screw cutout, that influence outcomes.

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