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# Glenoid Exposure During Shoulder Replacement

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Glenoid exposure for total shoulder replacement can be challenging and represents the most difficult part of the procedure. Exposure requires both humeral and glenoid-based releases. We prefer a lesser tuberosity osteotomy instead of a subscapularis takedown. The osteotomy offers significant advantages for glenoid visualization by decreasing the encroachment of anterior humeral bone. Specific glenoid-based releases are then performed in this sequential fashion: 1) the rotator interval including the coracohumeral and superior glenohumeral ligament is released, 2) the middle glenohumeral ligament is divided in an inferior direction, 3) the inferior glenohumeral ligament is then divided as the inferior extension of the above dissection, and 4) posterior glenoid retractors are placed and the axillary nerve is directly visualized. An inferior capsular release then is performed dependent on the necessity of further exposure.

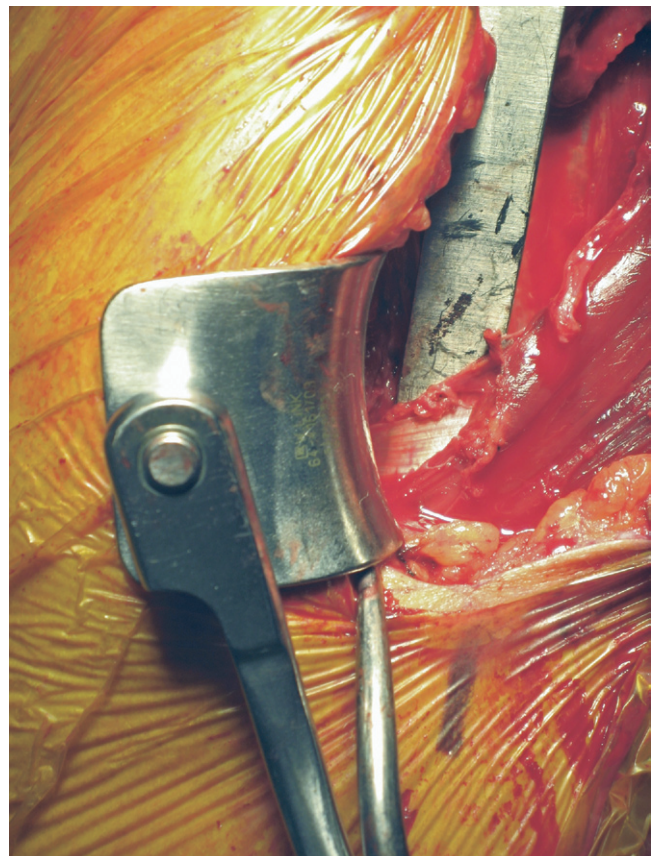
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The surgical approach to the glenoid requires an intimate understanding of the anatomy of the glenohumeral joint as well as the structures that prevent adequate visualization. The exposure of the glenoid is a combination of both humeral and glenoid exposures with the humeral exposure being essential for adequate glenoid visualization.

## Deltopectoral Approach

Exposure of the glenoid begins with an extensile deltopectoral approach. The incision begins just medial to the coracoid and continues to the area of the insertion of the deltoid. The skin is incised sharply and dissection is continued with the use of a sharp electrocautery device. Retraction is performed with sharp Gelpi retractors using a lifting motion to identify the dissection planes. Once the subcutaneous fat has been incised, the underlying pectoralis major and deltoid muscle can be appreciated. The medial border of the deltoid extends medial to the tip of the coracoid overlying the pectoralis major. The fatty triangle at the most proximal portion of the incision delineates the interval between the deltoid and pectoralis major. A straight Adson is used to define the interval and pierce the superficial fascia. Blunt dissection is utilized to mobilize the interval. The cephalic vein is retracted laterally to minimize bleeding from venous branches. The



**Figure 1** Release of the sternal head of the pectoralis major insertion to the humerus is very helpful for exposure of both the humerus and the glenoid. We recommend releasing approximately 3 to 4 cm of the upper portion of the pectoralis major insertion. (Color version of figure is available online.)

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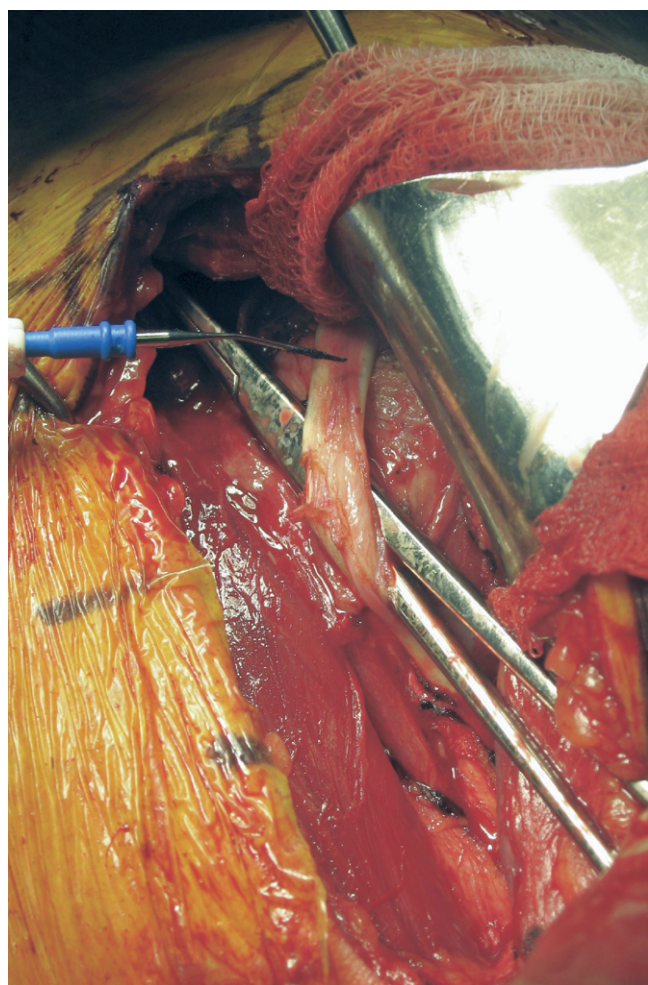
clavipectoral fascia is pierced with a straight Adson and the fascia is opened. The conjoint tendon is identified and can be retracted medially. The subdeltoid space is developed, extending from its insertion to underneath the acromion, allowing the placement of a deltoid retractor.

Release of the superior 2 cm of the pectoralis major adds significantly to the exposure of the glenoid (Fig. 1). Additional pectoralis major can be released without significant morbidity if it is required to improve visualization.

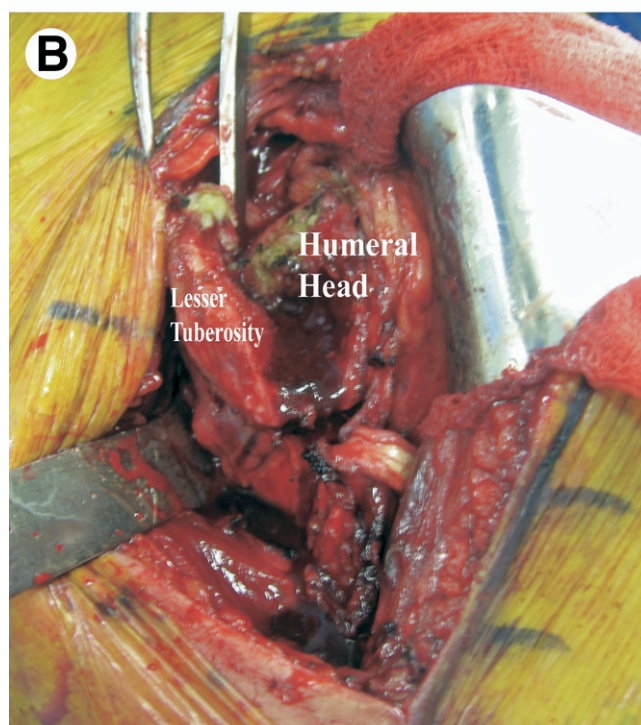
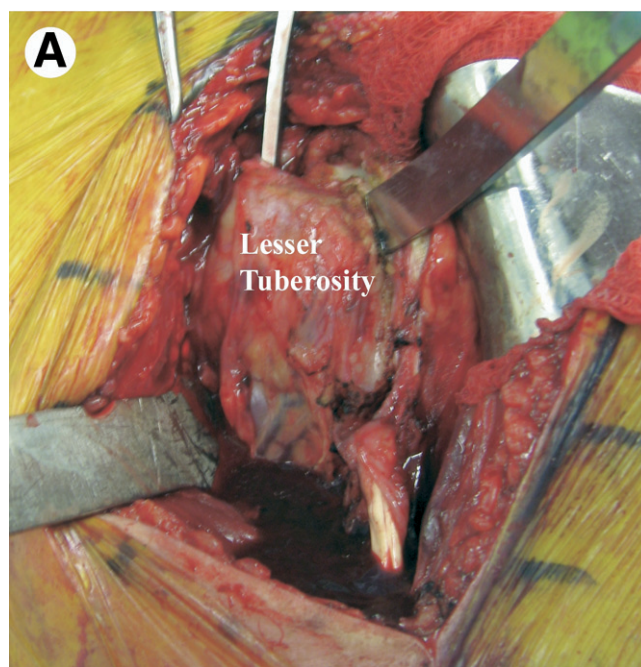
The coracoacromial ligament is then identified with the use of a lap pad sweeping off subcutaneous fat. The ligament is then sharply released with the use of electrocautery. This allows improved visualization of the rotator interval and the upper border of the subscapularis muscle.

## Humeral Exposure

The long head of the biceps is identified in the biceps groove and is tenotomized as proximally as possible (Fig. 2). The tendon is identified and the transverse humeral ligament is



**Figure 2** The bicipital groove is exposed by releasing the transverse humeral ligament all the way into the rotator interval. The biceps tendon is then delivered out of the groove and tenotomized. Tenotomy of the biceps greatly improves exposure to the humerus for capsular release. (Color version of figure is available online.)



**Figure 3** (A) A lesser tuberosity osteotomy is performed after biceps tenotomy. A curved osteotome is placed into the bicipital groove and approximately a 7- to 10-mm-thick sleeve of bone is osteotomized. (B) This figure depicts the lesser tuberosity after osteotomy. Removal of the 7-mm-thick bone along the anterior–medial edge of the humerus greatly improves the exposure to the glenoid and allows for secure fixation of the subscapularis after placement of the humeral and glenoid components. (Color version of figure is available online.)

released. Tenodesis of the biceps tendon is performed only in young patients in whom a cosmetic deficit or spasticity in the early postoperative period is a concern.

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