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Surgical Approaches to the Region of the Shoulder Joint

Anthony F. DePalma MD CORR 1961;20:163–184

In 1961, DePalma [4] outlined the major surgical approaches to the shoulder girdle, describing in depth the local anatomy and providing a perioperative outline for surgeons

operating in this region of the body. To date, the deltopectoral approach is the most commonly used in the treatment of the vast majority of fractures of the proximal humerus. The exposure

allows application of plate and screw fixation for select fracture patterns, as well as for reconstruction of more complex fractures requiring arthroplasty. Surgeons can treat certain

Fig. 18 Access to the anterior, superior, and posterior regions of the shoulder is by extension of the horizontal limb to the incision described previously. The horizontal limb is extended around the acromion process to the lateral half of the spine of the scapula; it proceeds medially along the anterior and the inferior surfaces of the outer third of the clavicle and joins the vertical limb. (Reprinted with permission and © Lippincott Williams & Wilkins, from DePalma AF. Surgical approaches to the region of the shoulder joint. *Clin Orthop Relat Res.* 1961;20:163–184.)

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proximal humerus fractures requiring more posterior exposure with extension of the standard deltopectoral approach (Fig. 18).

Levy and colleagues [11] described a more versatile approach that utilized a single anterior skin incision and a more posterior split in the deltoid combined with the traditional deltopectoral interval. This allows for preservation of the deltoid origin while concomitantly allowing for access to multiple regions of the shoulder. Furthermore, there were modifications to the original Judet approach [9] to the posterior scapula for scapular fractures [8, 12], allowing for less muscle stripping from the underlying scapula without compromising visualization of the major fracture lines. Clinical experience with these modifications demonstrated their utility for the majority of scapular body, neck, and intraarticular glenoid rim fractures [8].

Earlier anatomic dissection studies concerning the vascular supply to the humeral head suggested the predominance of the anterior circumflex humeral artery [6]; however, a more recent volumetric analysis using gadolinium uptake on MRI found the posterior circumflex artery is the dominant supply to the proximal humerus [7]. These authors therefore advocated the use of an extended anterolateral approach to the proximal humerus, exploiting the raphe between

the anterior and middle heads of the deltoid [5]. Concern over further insult to the vascular supply of the proximal humerus following fracture spurred the use of minimally invasive techniques coupled with locked plating [13] and the reemergence of percutaneous pinning techniques with select fracture patterns [10].

As with all surgical approaches to the proximal humerus, surgeons must carefully identify and protect the axillary nerve as it courses anteriorly at a variable distance from the anterolateral acromion [2]. A recent cadaveric study [3] demonstrated that the position of the nerve changes with an abducted positioning of the shoulder. Advances in anesthetic options have also been presented in the orthopaedic literature, beyond the use of general anesthetics. Interscalene regional anesthesia are reportedly effective for both open and arthroscopic shoulder procedures, with a low complication rate [1]. The approaches to the shoulder DePalma outlined [4] have, in general, withstood the test of time. Subsequent modifications to these focused on minimizing soft tissue dissection and neurovascular injury, while maintaining the ability to adequately expose fractures and provide stable fixation.

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