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The posterior two-portal approach for reconstruction of scapula fractures: Results of 39 patients

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ABSTRACT

The purpose of this study was to describe the so-called posterior two-portal approach to the scapula in detail and to investigate the clinical outcome of patients with displaced glenoid and scapular neck fractures who were surgically treated using this approach. From February 1992 to August 2008, 39 patients (30 men and nine women; mean age: 53 years) with scapular fractures underwent surgical fixation at our institution. Thirty-three patients had glenoid fractures and six had unstable scapular neck fractures. All patients were treated via the two-portal approach. The reduction was evaluated radiographically, and the clinical results were analysed using the Constant score. The mean follow-up period was 78 months (range: 6–168). In 24 of the 33 glenoid fractures, the reduction was anatomical. The mean Constant score was 82.3 (range: 35–100) points. In one case, an early postoperative wound infection was cured by local revision, and one patient developed posttraumatic osteoarthritis of the acromioclavicular joint after 2 years. Only one patient developed specific glenohumeral degeneration after non-anatomical reduction. The posterior two-portal approach allows for a good visualisation of the posterior scapular neck and the glenoid area, facilitating the reduction and safe internal fixation of dislocated scapular neck and glenoid fractures.

Scapula fractures account for approximately 1% of all fractures and approximately 3–5% of all injuries of the shoulder girdle.[1,9,12] Ten to forty percent of these fractures affect the area of the joint or the scapular neck, and of these fractures, only 10% are displaced to the extent that they are considered for operative intervention.[1,2,14,17,18,21,22]

Scapula fractures usually result from a direct, blunt and violent impact and frequently affect the body of the scapula. This violent impact, which is usually transmitted indirectly via the upper extremity onto the scapula, must be of high velocity and requires high energy.[9] Depending on the direction of the violent impact and the position of the upper arm at the time of the accident, fractures of the glenoid fossa may occur.

Ideberg's classification[12] of these fractures is most commonly used (Fig. 1). Apart from these joint fractures, Euler et al.[9] differentiated between process, body and neck fractures.

In addition to the rare displaced process fractures, a surgery is indicated in joint fractures with a step or fracture gap that is >2–5 mm and in tilted neck fractures of >20–30° of angulation.[1,3,4,11,13,14,16,22]

When there is a combination of a scapular neck fracture and a clavicular fracture consistent with a floating shoulder,[8,16,24] the fixation of one of the two fractures is necessary to stabilise the shoulder girdle. In these cases, the listed criteria for scapula fixation will influence the decision as to which one of the bones should be treated surgically.

Except for displaced avulsion fractures of the anterior glenoid rim secondary to anterior shoulder luxation, the posterior approach to the scapula is the preferred option for surgical stabilisation of displaced glenoid and scapular neck fractures.[4,5,13,19,20,25]

The aims of the presented study are to describe in detail the so-called posterior two-portal approach[12] to the scapula and to determine the functional results that can be achieved using this special approach.

We report on the clinical outcomes of 39 surgically treated patients with glenoid and scapular neck fractures that were stabilised by using the so-called posterior two-portal approach.[4]

Patients and surgical technique

Between February 1992 and August 2008, 39 patients (30 male and nine female) underwent the stabilisation of displaced glenoid

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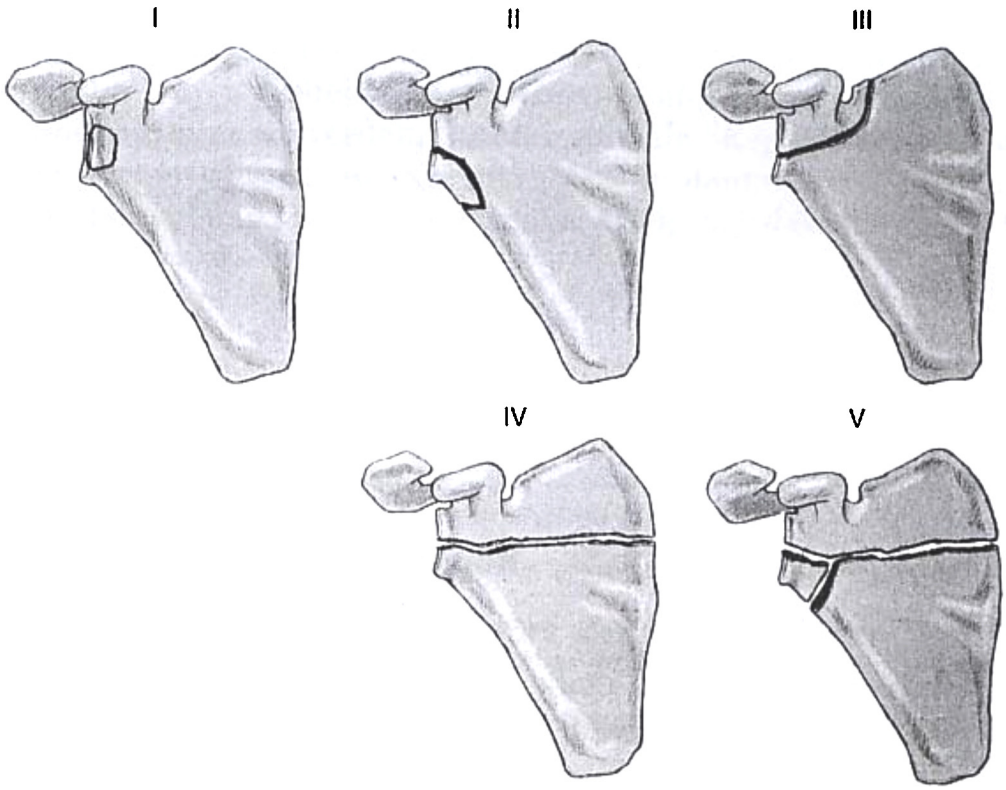

Fig. 1. Ideberg's classification of glenoid fractures.[3]

and scapular neck fractures using the posterior two-portal approach. The average patient age was 53 years (range: 35–69).

Twelve patients exhibited additional associated injuries, mostly of the thorax and the upper extremities. Seven patients were polytraumatised. One patient was diagnosed with an incomplete lesion of the brachial plexus caused by direct force.

Of the 33 glenoid fractures, which were classified (Fig. 1) according to Ideberg,[3] there were 18 type II, five type III, three type IV and seven type V fractures. In addition, six unstable scapular neck fractures were associated with a floating shoulder injury and with a scapular neck angulation >20°.

The preoperative radiological diagnostics included radiographic films of the affected shoulder in anteroposterior (a.p.) and lateral views (*Y*-view), tangential view of the scapula and computer tomography (CT; Fig. 2). All displacements with intra-articular steps or gaps exceeding 2 mm or a glenoid-polar angle >30° were considered indications for surgery.

The surgical stabilisation was conducted on an average of 6 days (4–14 days) after trauma.

Surgical technique

In all cases, the standardised two-portal approach to the scapula described by Braun et al.[4] was used.

With the patient in the lateral decubitus position, the affected arm is placed on an arm rest. The skin incision courses along the scapular spine from lateral to medial, turning caudally towards the inferior angle. Directly above the deltoid muscular unit, the fasciocutaneous skin flap is developed laterally. The deltoid muscle is separated from the scapular spine approximately 3 cm medial to the acromion and is also retracted laterally. The two portals to the glenoid are achieved by dissections of cranial from the infraspinatus muscle and caudal between the infraspinatus and teres minor muscles. The infraspinatus muscle is separated from the glenoid and the scapular neck over a length of 5–6 cm and

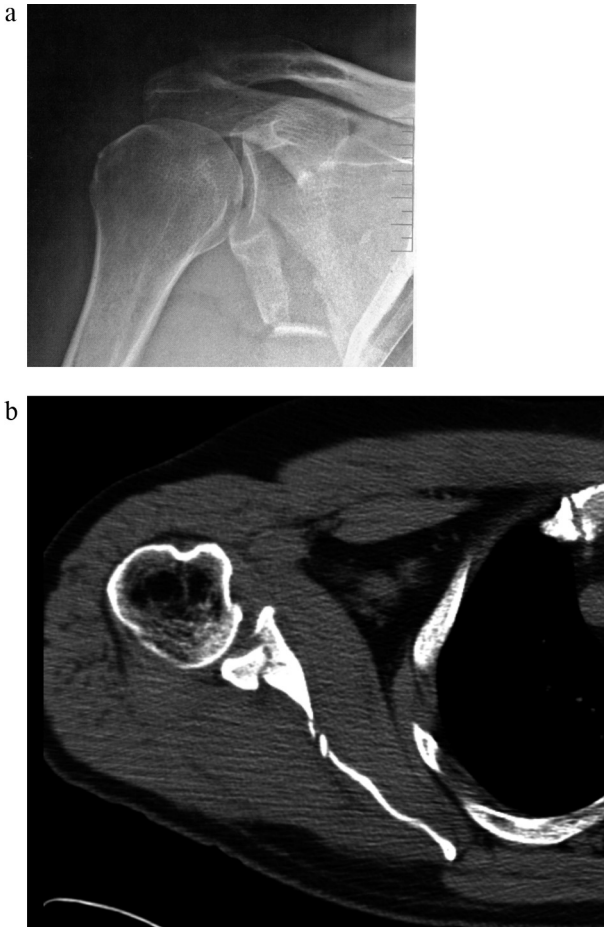

Fig. 2. a.p. X-ray of the right shoulder (a) and CT-scan (b) of a 34-year-old female after a fall onto her extended right arm: type II glenoid fracture according to Ideberg.