KEY PROCEDURES

OPEN REDUCTION AND INTERNAL FIXATION OF A MIDDLE-THIRD CLAVICLE FRACTURE WITH A SUPERIOR PLATE

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Published outcomes of the procedure can be found at: *J Bone Joint Surg Am.* 2003 May;85(5):790-7, *J Bone Joint Surg Am.* 2013 Sep 4;95(17):1576-84, and *J Orthop Trauma.* 2005 Aug;19(7):504-7

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Abstract

Open reduction and internal fixation has become a reliable technique to treat complex middle-third clavicle fractures (AO/OTA B-15). Nonoperative treatment of these fractures may result in higher rates of symptomatic malunion, nonunion, dissatisfaction with cosmetic appearance, and even dysfunction and muscular weakness. Risk factors such as substantial displacement or comminution, far lateral fractures, fractures in the elderly, open fractures, or those occurring in polytrauma scenarios are appropriate indications for surgery.

The aim of the procedure is to reconstitute the initial curvature and length of the clavicle, restore a normal connection from the arm to the axial skeleton, and provide stable fixation of the proximal and distal fragments, to allow an immediate full range of motion during rehabilitation.

The procedure includes the following steps.

- Step 1: Place the patient in a beach-chair, semi-sitting position.
- Step 2: Make a transverse skin incision along the anteroinferior aspect of the clavicle.
- Step 3: Expose the fracture site, identify and prepare the fragments unless they are comminuted, and preserve soft-tissue attachments to the extent possible.
- Step 4: Reduce the fragments by direct or indirect manipulation, and maintain the reduction with clamps, Kirschner wires, or mini-fragment plates. Consider bridging comminuted zones to allow secondary fracture-healing.
- Step 5: Apply a contoured plate to the superior or anterior surface of the clavicle, and obtain at least 6 cortices of fixation on each side with strategic nonlocking and locking screws. The working length of the plate is more important than the number of screws or cortices.

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- Step 6: Obtain a single intraoperative anteroposterior radiograph of the clavicle.
- Step 7: Separately close the wound in layers (deltotrapezial fascia, platysma, and skin). Apply sterile dressings and a sling.

The patient is discharged home on the same day if the injury is isolated, and a full range of motion of the affected shoulder is allowed immediately. The patient is expected to regain full function and strength of the arm once healing occurs.

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