Screw and Wire Technique for Condylar Fracture Reduction

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Abstract In case of displaced condylar fractures, ideal reduction during open reduction and internal fixation poses a challenge to the surgeon. This article describes a simple technique to aid reduction with the use of a screw and wire during open treatment.

Keywords Condylar fracture · ORIF · Maxillofacial trauma

Open reduction and internal fixation of condylar fractures have become a more accepted treatment modality in the recent past. The greater the displacement and angulation, proportionate is the difficulty in precise reduction. The intimate relationship of this region with the facial nerve and branches of the external carotid artery makes proper reduction challenging. Various techniques have been described to aid reduction like use of a towel clip to apply traction at the angle and use of a hook at the sigmoid notch, and in this article we describe a novel technique to assist reduction using a screw and a wire.

Indication Medial override condylar fractures benefit the best from this technique; however, it can be used in cases of difficult Lateral override condylar fractures also.

Instruments 2*6 mm screw, 26-gauge stainless steel wire, 16-gauge needle.

The Technique After visualizing the fracture through the approach of your choice either preauricular or retro-mandibular, the 2*6 screw is used as a reduction screw in the distal segment at least a centimeter inferior to the probable space to be occupied by the plates [1]. Keep two threads of the screw above the surface. Insert the sixteen-gauge needle just inferior to the ipsilateral angle of the mandible distal to the palpable facial artery, staying lateral to the mandible to enter the surgical field and hold it in position. Now insert the 26-gauge wire into the needle till it exits its tip, loop it around the screw, and reinsert it into the needle till it exits from the hub (Fig. 1). Once both ends of the wire are secured with a wire twister, tighten the reduction screw to barely accommodate the wire loop. Release the wire twister and carefully remove the needle, ensuring that the wire is not displaced (Fig. 2). Now use the wire twister to twist the wire to snugly and firmly tug on the screw. This screw–wire system held with a wire twister is then used to deliver traction to the distal segment of the fracture, enabling better visualization of the proximal segment of the condyle facilitating proper reduction in the fracture (Fig. 3).

Once the fracture is reduced into anatomic position, maxillomandibular fixation shall be achieved to ascertain adequate ramal height and occlusion post-reduction. Miniplates can be used to fix the fracture segments, and in our practice we use two miniplates to fix the condylar fractures.

Advantages of this technique:

- There is a bony anchorage by the reduction screw making its use more predictable than the sponge holder over skin.
- Ease of locating the fractured segment due to traction of the proximal segment, so less manipulation of the

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Fig. 1 26-Gauge wire entering and exiting from the hub of 16-gauge needle. *Demonstrated using an STL model*

Fig. 2 After removal of the needle, wire is ready to deliver traction. *Demonstrated using an STL model*

Fig. 3 Screw and wire for traction distal to right sub-condylar fracture as seen through retromandibular approach

fractured segment and hence less intrascapular trauma caused due to excessive manipulation of the condylar segment.

- Negligible scar from the needle port.
- It is easy to perform and when used prudently may help reduce operative time.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent A written informed consent was obtained from all individual participants included in the study.

Reference

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