

## SOP – Humeral Intracondylar Fissure

### Transcondylar screw drill guide

Please read these notes carefully and contact us immediately if you require any further information or have any concerns regarding the printed models or guides supplied.



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### Pre-operative

- Depending on surgeon specification a bone model and one or several drill guides will be supplied.
  - Humeral condyle - translucent yellow plastic – for pre-op / intra-op practice of drill guide fit – this can be autoclaved (see guidelines below).
  - Drill guide or guides – biocompatible and autoclavable translucent orange plastic. Recommend autoclave protocols are below, however all standard protocols are acceptable.
    - 138°C for 3 minutes
    - 134°C for 6 minutes
    - 121°C for 15 minutes
- The 3D bone model, and especially the drill guide(s), are UV light sensitive and should be stored away from direct sunlight (e.g. in a draw or box). Extended exposure to UV light may reduce the strength of the guides.

### Intra-operative

- **A surgical approach to the medial humeral epicondyle is made.**
  - A skin incision is made directly over the epicondyle and extends 2-3cm proximally and 1-2cm distally.
  - The incision is continued directly through several fascial layers until the epicondyle is reached.
  - The proximal slope of the epicondyle, and the adjacent regions of cortex corresponding to the guide footprint area easily exposed (mobile, fatty tissue is present in these locations)
  - Distally, and extending cranially around the epicondyle, is the origin of the flexor carpi radialis muscle. Unless specifically specific at the planning stage elevation of this is necessary for appropriate guide fit. The recommended protocol is as follows -
    - The distal portion of one, or two, locking loop sutures can be placed with the muscle in-situ. Each suture end is left long to allow mobilisation of the muscle, and for subsequent reattachment.
    - It can be helpful to run a small elevator beneath the muscle to define the most caudal level of attachment to the epicondyle.
    - The muscle is elevated from the epicondyle with a scalpel blade, immediately adjacent to the cortex. For optimal guide fit the origin of the flexor carpi radialis muscle is elevated from the epicondyle.
- **Ensure soft tissue elevation to the extent required for the drill guide footprint.**
  - Ensure all soft tissues adherent to the epicondyle are removed (scrape with a 15 blade).
  - Distally this tissue can be is tenacious and if left will adversely affect guide fit and screw trajectory (usually distally).
- **Identify the position of drill guide fit.**
  - This is usually very obvious due to the highly contoured shape of the epicondyle.
  - If sequential drill guides are to be used these will be labelled with the requisite drill bit size.
- **Drill the first pilot hole.**
  - Carefully align the drill bit with the channel in the guide such that off-axis pressure (which could move the guide) is avoided. The transparent, cylindrical nature of the channel facilitates alignment.
  - The guide is stabilised by the non-dominant hand.
  - Drill the pilot hole; an appropriate exit point in the palpable depression just distal and cranial to the lateral epicondyle can be checked.
- **Overdrill the pilot hole.**
  - With the sequential guide system the above steps are repeated with each larger guide.
  - With a single guide the pilot hole is manually over-drilled aiming for the above landmark.
- **Bur a space for the screw head**
  - Ideally use a high speed bur to flatten a small portion of the distal downslope of the epicondyle immediately adjacent to the screw hole such that the head of the screw contacts a flat, rather than steeply angled, bone surface. This usually slightly recesses the screw head beneath the tip of the epicondyle.

- Place the screw.
- Reattach FCR.
  - Ideally one or several 1.1mm holes are drilled in the epicondyle adjacent to the screw head and are used as anchor points for the locking loop suture.
  - Alternatively the suture can be tied to screw immediately below the head prior to this being fully tightened.
- Wound closure.
  - Fascial closure should be meticulous to avoid any dead space given the predisposition to seroma formation. The ulna nerve is caudal to this approach but care should be taken to avoid entrapment with a suture.

#### Post-operative

- We actively encourage feedback regarding any aspect of the guide system – please let us know your thoughts.