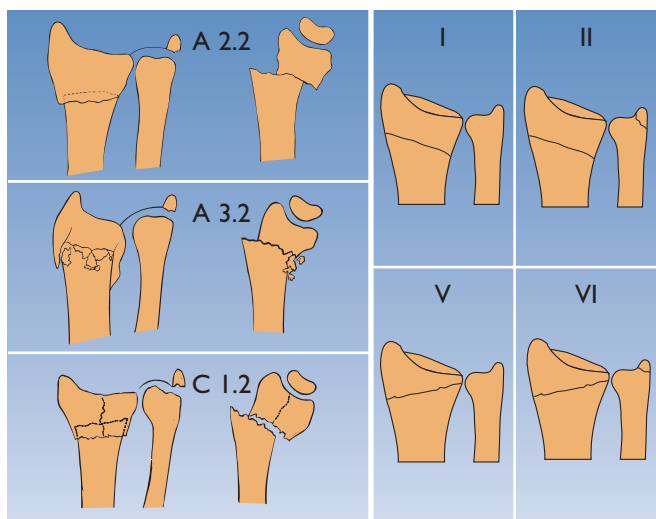


The Pennig Dynamic Wrist Fixator

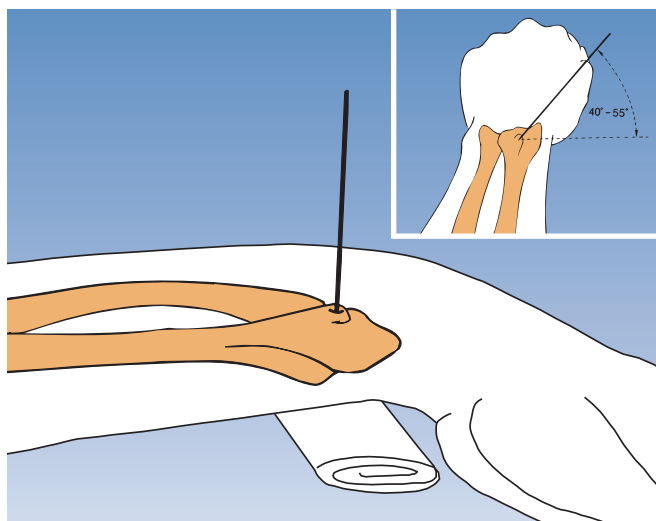
Part B: Extra-articular application with the radiolucent wrist clamp

By Prof. Dr. D. Pennig

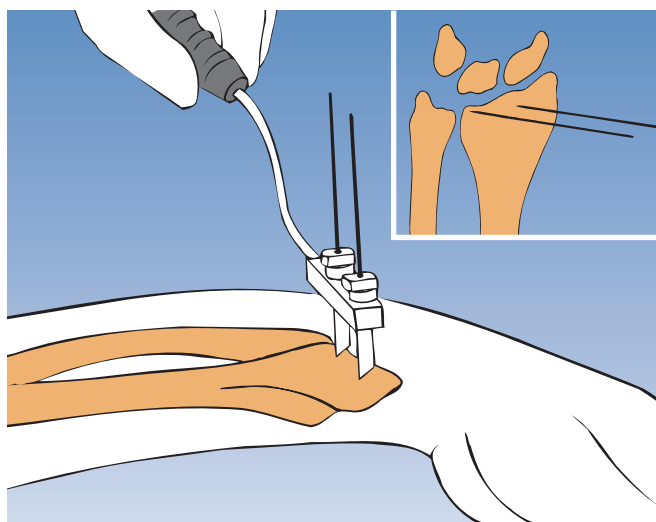


The fractures that can be treated with this technique include AO type A2 and A3 metaphyseal fractures, which correspond to Frykman I and II fractures, and V and VI fractures, with no intra-articular involvement and a distal fragment with a volar length of 10 mm.

Fractures with a non displaced intra-articular fracture line (C1. 2) may also be treated with this technique, provided that two screws can safely be inserted distally.



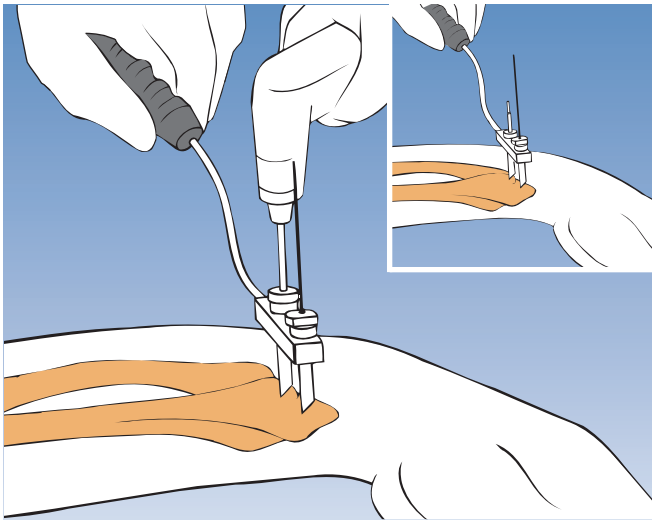
Make a 10-15 mm incision over Lister's tubercle, expose the bone and insert a 1.5 or 1.6 mm K-wire at about 45° to the frontal plane. Check its position radiographically.



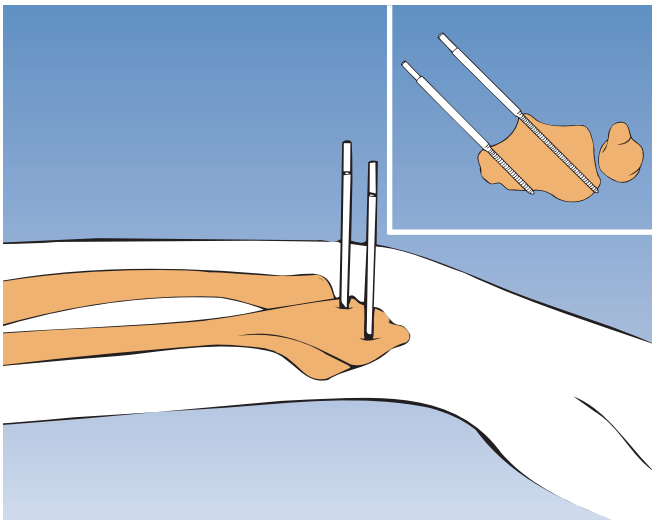
Slide a template with handle, with one screw guide and one pilot wire guide over the K-wire. Introduce the second screw guide with the second pilot wire guide inside it.

Insert a second 1.5 or 1.6 mm K-wire parallel to the first, through a 10-15 mm incision, after clearing the soft tissues down to the bone.

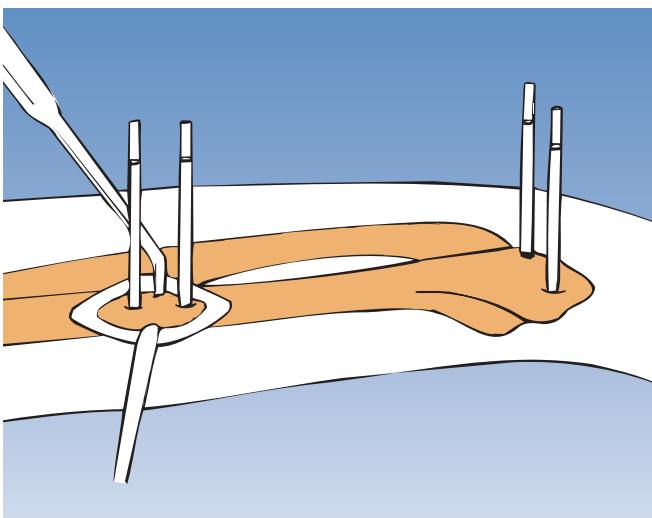
Remove the template and check the position of both K-wires radiographically in two planes.



Replace the template together with screw guides and pilot wire guides. Remove the K-wire in Lister's tubercle together with its pilot wire guide and insert a 2.7 mm drill guide. Drill with the 2.7 mm drill bit and insert a 80/35 mm screw.



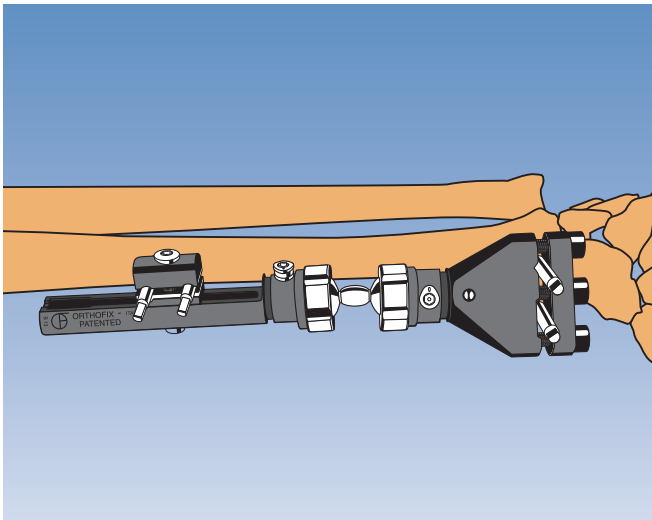
Remove the second K-wire together with its pilot wire guide, insert a 2.7 mm drill guide and drill for the second screw. Use a 70/20 mm screw. Remove the template.



Holding the fracture in preliminary reduction, place the fixator temporarily over the distal screws. Ensure that the clamp for the proximal screws is in the centre of the proximal module. Mark the positions for the proximal screws on the skin.

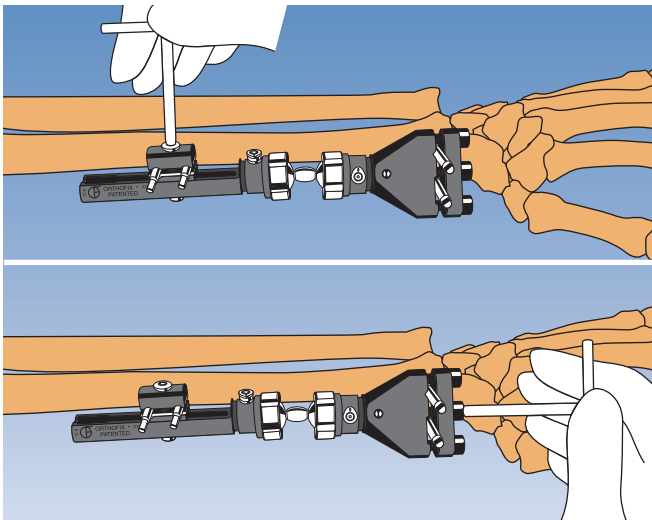
Make a 25 mm incision, dissecting carefully down to the bone to avoid damage to the superficial branch of the radial nerve.

Insert two 70/20 mm screws in a plane at 45° from the frontal plane, after drilling holes in the centre of the bone with the 2.7 mm drill bit, using the template.



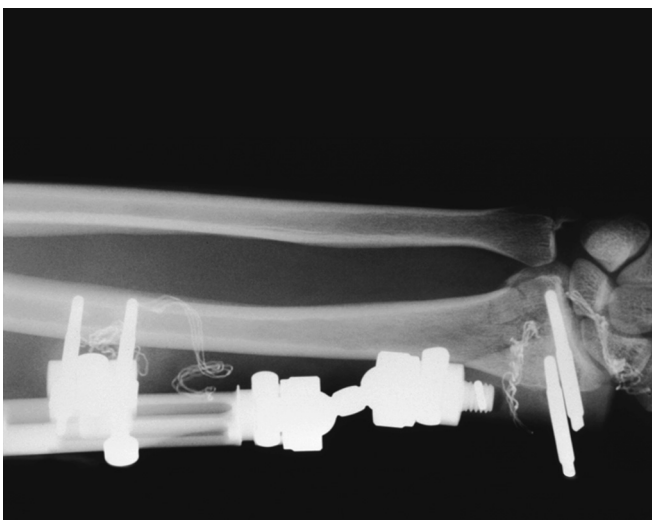
Mount the fixator with the sliding module proximally and the Extra-articular Radiolucent Wrist Clamp distally with the screw in the Lister's tubercle housed in the fixed screw seat.

Note: Ensure that both ball-joint security collars are fully tightened.

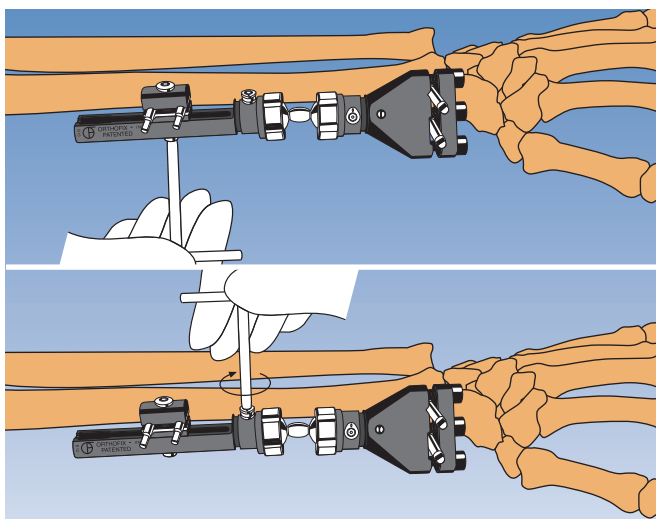


Tighten all clamp cover screws.

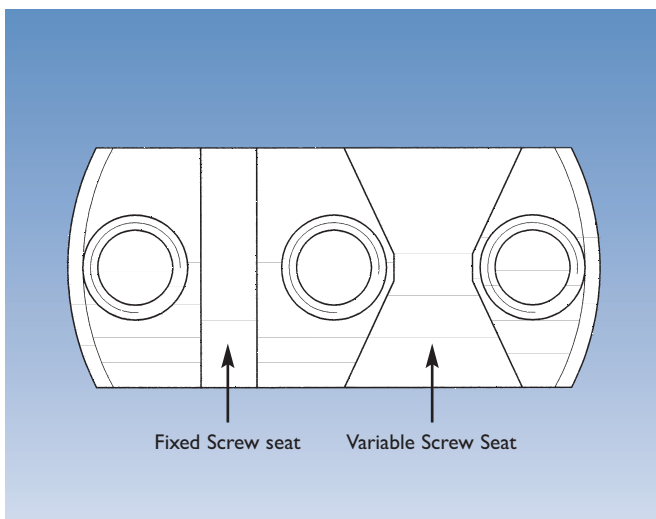
Note: To tighten the clamp cover of the Radiolucent Clamp, tighten the central locking screw first to avoid tilting the cover. Then tighten each screw until the Allen wrench slips in the hexagon in the screw head. The locking screws of this clamp should be replaced after every use. To loosen these screws, insert the end of a 3 mm Allen key into one of the holes in the edge of the screw head, and turn the screw anti-clockwise.



Reduce the fracture. The extra-articular radiolucent wrist clamp allows for visualisation of the fracture site.



Tighten the clamp anchoring screw and complete locking of the double ball-joints by turning the cams clockwise until very tight (dot moves between 90° and 170°).



The extra-articular radiolucent wrist clamp allows for convergent placement of the second distal screw. Convergent placement may be used if the radial epiphysis is very small, but the surgeon should be aware that this type of screw placement may lead to impingement of the soft tissues and reduced bone purchase. This procedure is therefore recommended only for surgeons with substantial experience in wrist surgery.

Note: When convergent screw placement is to be used, insert the screw in Lister's tubercle in the usual manner at 45° to the frontal plane. Apply the clamp over the screw and insert a wire guide through the second screw seat down to the bone. Insert a K-wire through a 10-15 mm incision and confirm its position in two planes; remove the clamp and place the template with a pilot wire guide and single screw guide over the wire. Holding the handle of the template steady, remove the wire, drill the wire track as above through a drill guide, and insert a 70/20 mm screw. After insertion of this screw, remove the template and apply the clamp. The proximal screws are then inserted as above.

The Orthofix Quality System has been certified to be in compliance with the requirements of:

- Medical Devices Directive 93/42/EEC, Annex II - (Full Quality System) as amended in 2007/47/EC
- International Standards ISO 13485 / ISO 9001 for external fixator devices, implants for osteosynthesis and related instruments.



See "Orthofix External Fixation System" instruction leaflet (PQ EXF) prior to use.

Manufactured by: ORTHOFIX Srl
Via Delle Nazioni 9
37012 Bussolengo (Verona)
Italy

Telephone +39 045 6719000
Fax +39 045 6719380



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