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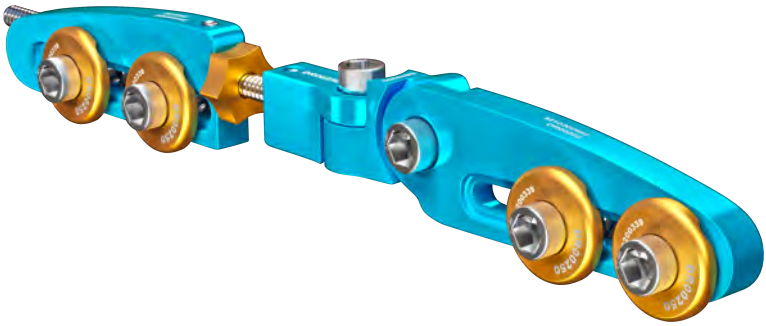
Dynamic and Anatomic Distal Radius External Fixator



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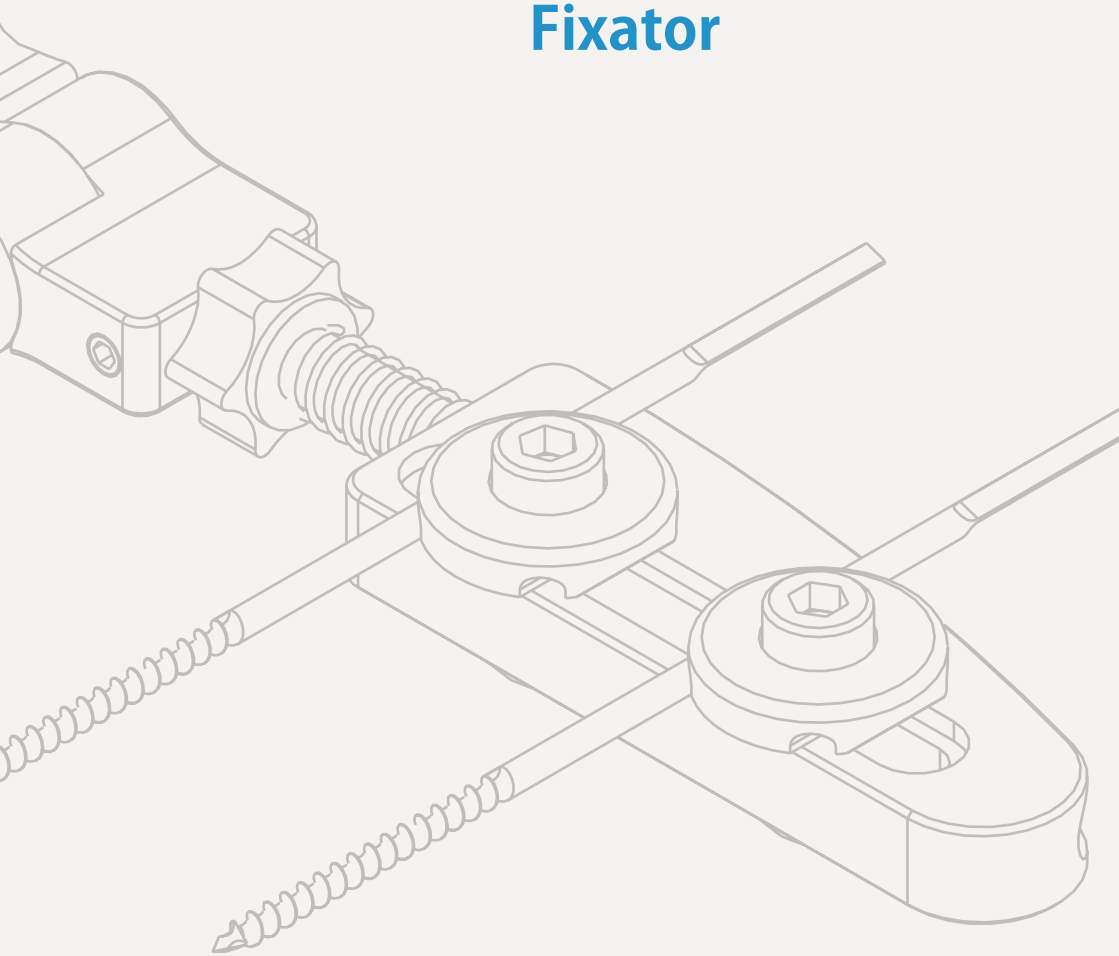

Information

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Distal radius fractures are the most prevalent fracture type in emergency settings.

External fixation is one of the optimal treatment modalities for managing distal radius fractures, particularly beneficial in cases involving articular or metaphyseal comminution.

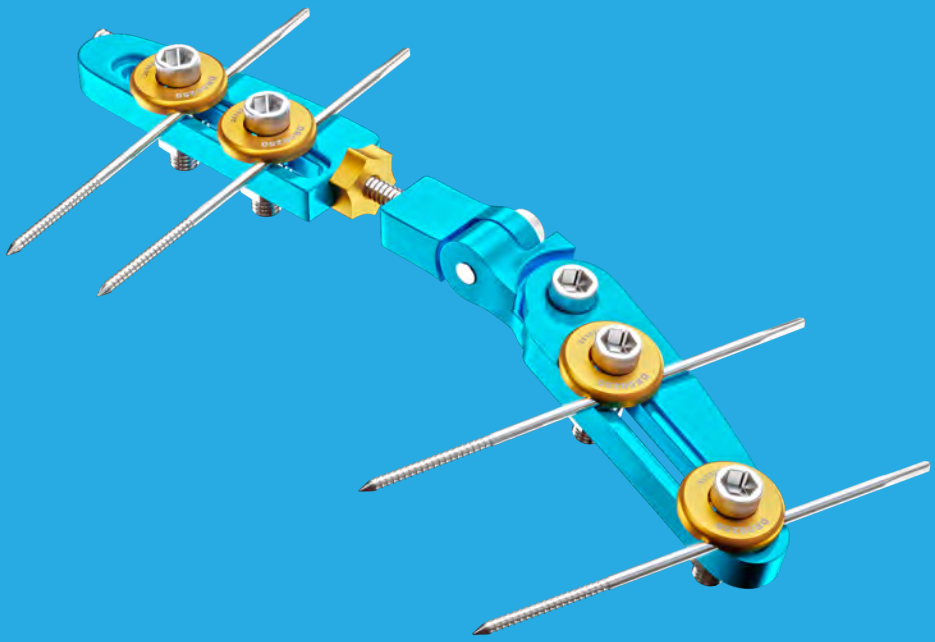
Ligamentotaxis is the primary mechanism for achieving closed reduction of distal radius fractures, with optimal reduction achieved when the traction axis is ulnarly and volarly deviated perpendicular to the distal radius articular surface.

Volar tilt and radial inclination are two critical radiological parameters of the distal radius articular surface. Dynamic Distal Radius External Fixators excel in their ability to adjust the traction force axis perpendicular to the articular surface.

The Dynamometer of the Distal Radius Dynamic External Fixator enables the surgeon to control the amount of distraction force applied and prevent over-distraction injuries.

The Dynamic Distal Radius External Fixator applies perpendicular distraction force to the distal radius articular surface, enhancing ligamentotaxis results. Featuring adjustable joints, it ensures optimal treatment efficacy.

Adjustment of the articular components of the external fixator is conducted in accordance with radiological parameters of the unaffected side.



A key feature of Dynamic Distal Radius External Fxators is its ability for "gradual distraction" facilitated by a distractor nut.

The Dynamic Distal Radius External Fixator offers the advantage of inserting Schanz pins at any desired distance or direction, owing to the independent clamp system located in the proximal and distal portion of the fixator.

Tips and tricks

Tips and tricks for application:

- It is mandatory to sterile the Dynamic Distal Radius External Fixator before surgery.
- Dynamic Distal Radius External Fixator is pre-fabricated for treatment of right sided fractures.
- Flipping of clamps make the fixator suitable for left sided fractures.
- Four 2.5*150 mm schanzes, perforator and insertion instrument set are necessary for surgery.
- Schanz insertion precautions like predrilling is necessary Fluoroscopy is necessary to verify the operation.
- It is better to calculate the exact values of volar tilt and radial inclination according to normal side radiographic parameters.

Advantages

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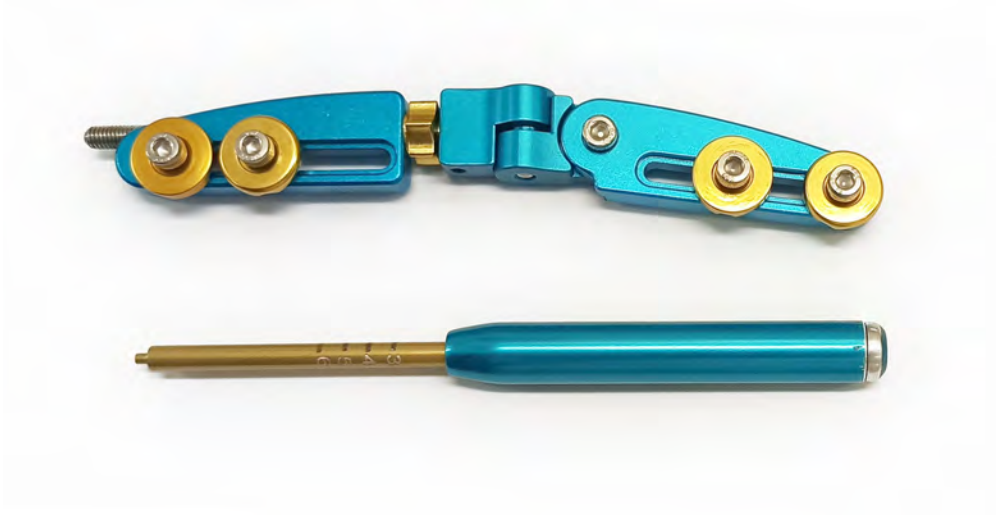
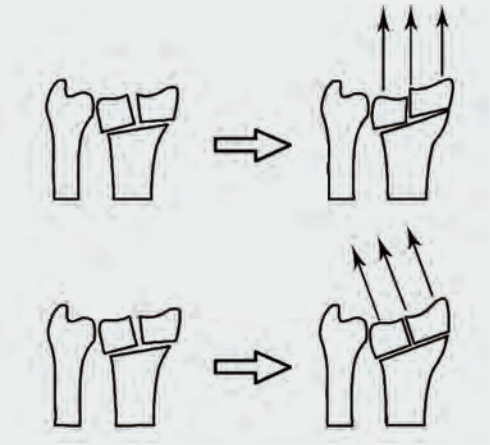
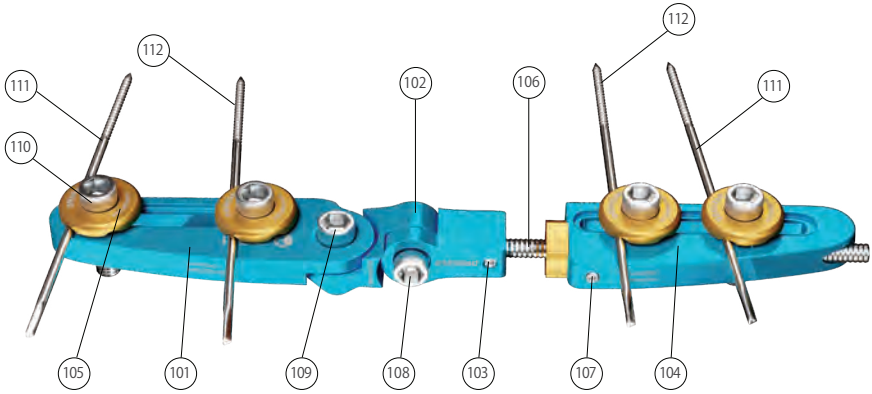
- Low profile; less than 100 gr weight
- Accurate traction perpendicular to the articular surface
- Distractor nut facilitates gradual distraction
- Adjustable clamps allow for applying of traction force perpendicular to the articular surface
- Dynamometer enabling the surgeon to control the amount of force applied and prevent over-distraction injuries



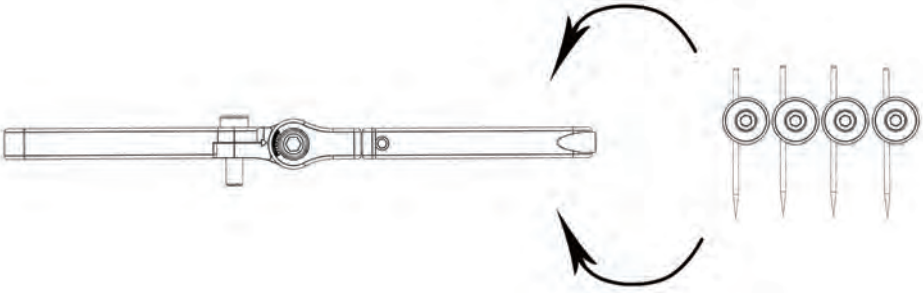


The function of Dynamic Distal Radius External Fixator is primarily based on distraction and ligamentotaxis. To achieve acceptable bone reduction, traction must be exerted perpendicular to the articular surface rather than parallel to the radius shaft. We have designed Dynamic Distal Radius External Fixator that maximizes efficiency with minimal traction. Using the dynamic external fixators, we can exert the traction force perpendicular to articular surface with adjusting two joints of the external fixator according to the palmar tilt and radial inclination. When force is directed perpendicular to the distal radius joint surface, reduction of fragments occurs more properly.



External fixator components

101: Radius fixing plate
102: Proximal connecting part
103: Distal connecting part
104: Metacarpal fixing plate
105: Schanz clamp
106: Distraction rod
107: Distraction nut
108: Distraction rod screw
109: Palmar tilt hinge screw
110: Radial inclination hinge screw
111: Schanz clamp screw
112: Schanz pin

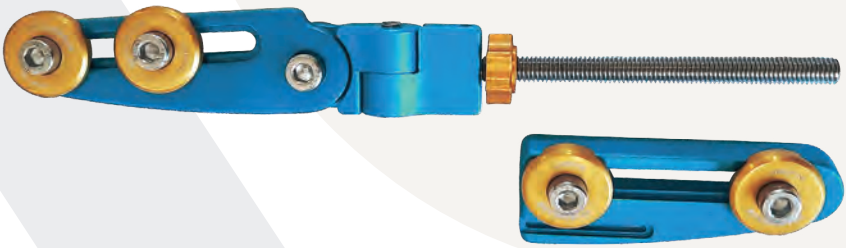


This product is assembled for the right sided distal radius fractures. To be used for the left sided fractures, the user should reposition the clamps on the other side.

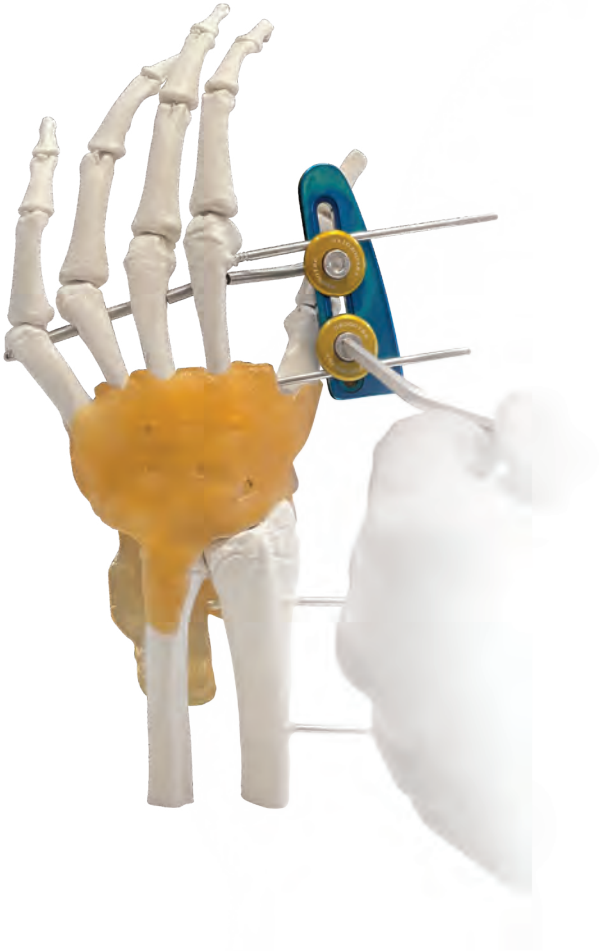
Dynamic and Anatomic Distal Radius External Fixator Insertion Procedure:

- Set up the operating room, ensuring patient placement in the supine position and accurate positioning of the C-arm for imaging.
- Perform preparation and draping.
- Insert the first distal 2.5 mm Schanz pin at the base of the 2nd and 3rd metacarpals.
- Insert the next pin distally and parallel to the first pin, but only in the 2nd metacarpal.
- Insert the first proximal pin 2 centimeters proximal to the fracture line, perpendicular to the radial alignment, from the radial to ulnar side.
- Insert the final Schanz pin parallel to the previous pin, with a distance of 3 to 5 centimeters from it.

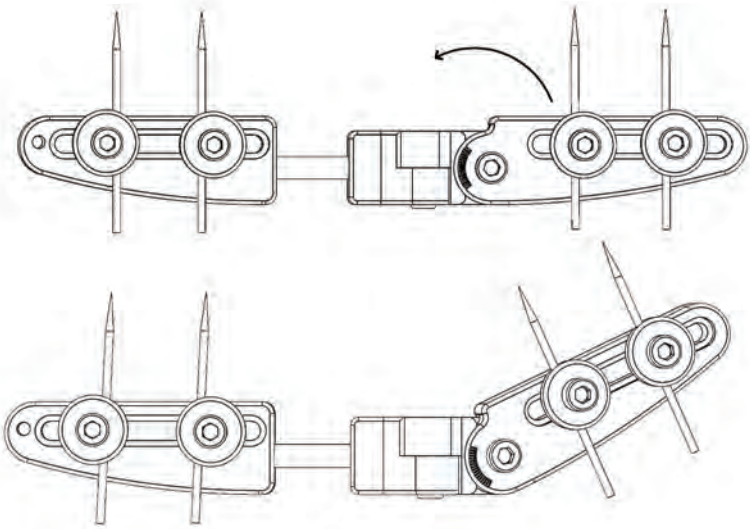
After loosening the distractor rod screw with the appropriate screwdriver, detach the metacarpal plate from the bone.



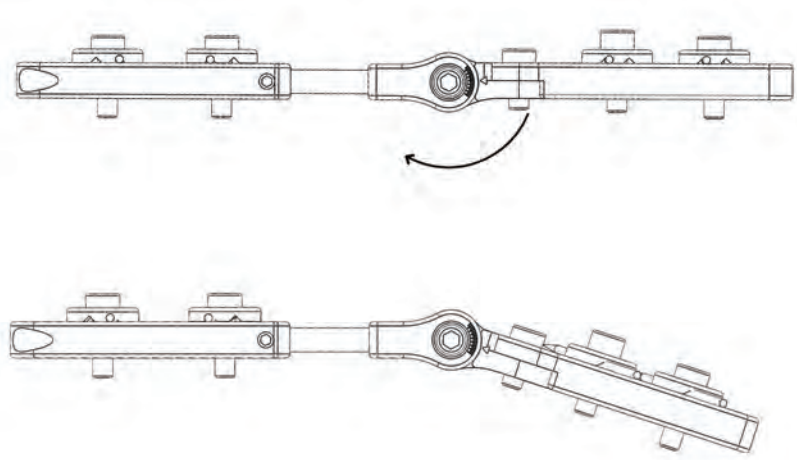
Secure the Schanz pins to the clamp system of the metacarpal plate, positioning them three centimeters away from the skin.



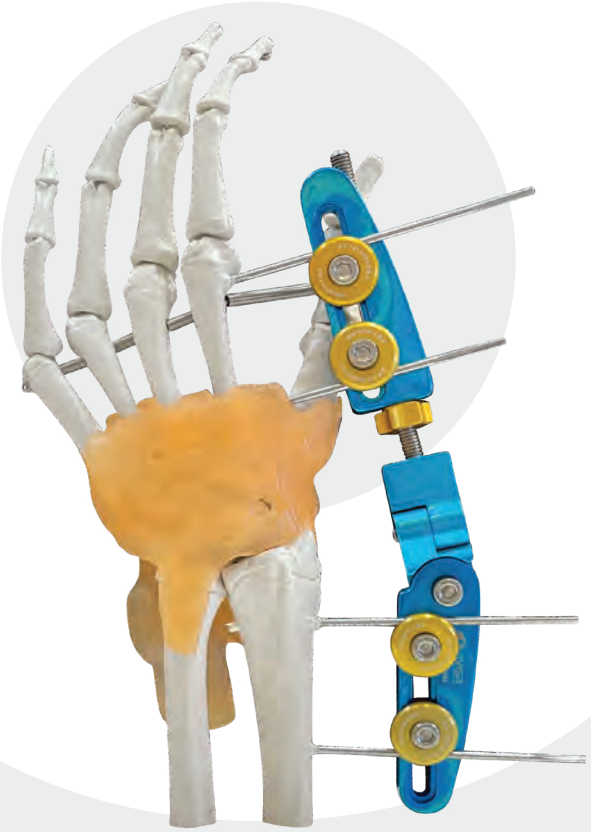
The Dynamic Distal Radius External Fixator comprises two joints. The proximal joint moves along the coronal plane and aids in reducing radial inclination.
The distal joint moves along the sagittal plane and assists in reducing palmar tilt.



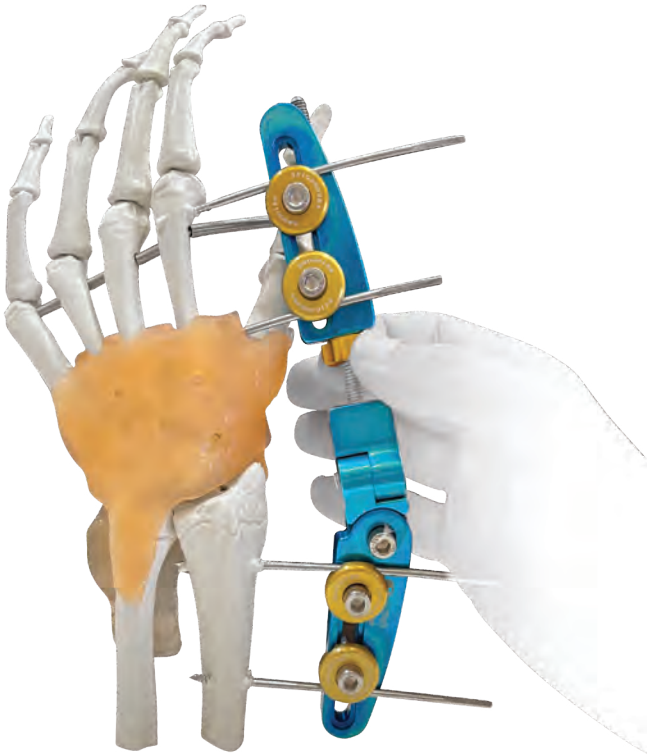
Adjust the proximal and distal joints according to the radial inclination and palmar tilt of the unaffected (normal) side, respectively, and then tighten them using the appropriate screwdriver.

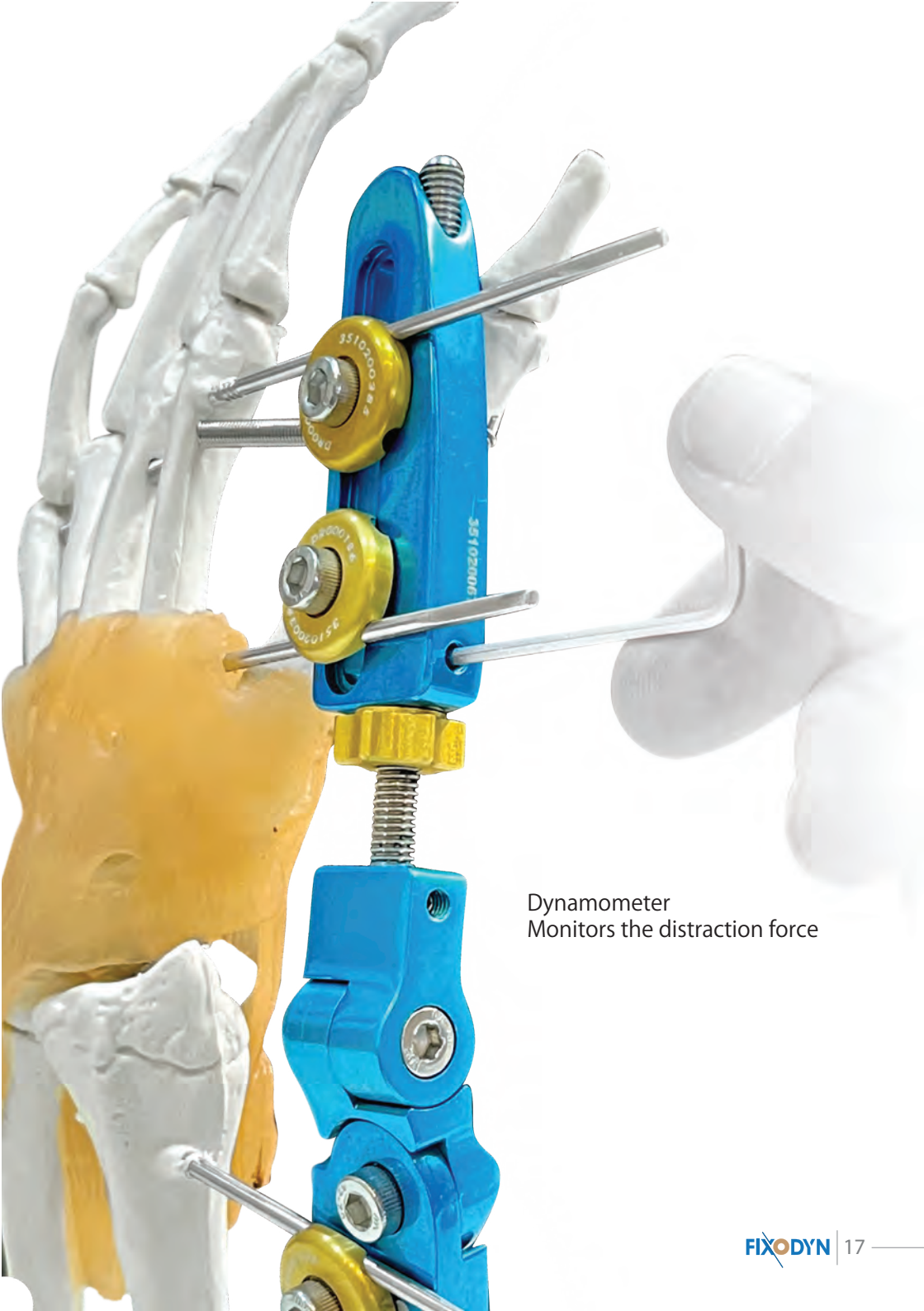


The default values for palmar tilt and radial inclination are 11 and 23 degrees, respectively. You can also utilize radiographs of the intact side for reference. Once the angles have been adjusted and the corresponding screws tightened, insert the distractor rod into the metacarpal plate, and secure the radius clamps to the two proximal Schanz pins.



By turning the distractor rod nut clockwise, you can achieve the desired tension between the proximal and distal Schanz pins.



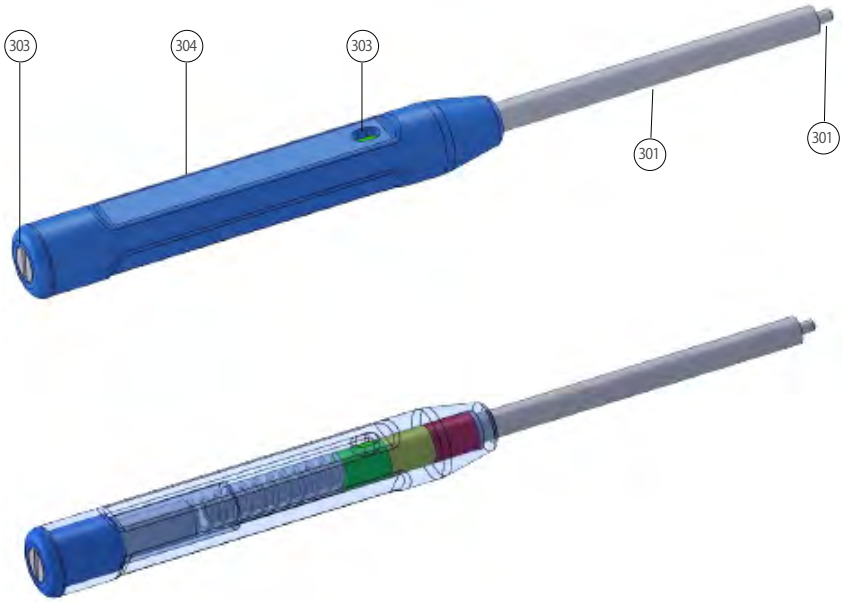


Dynamometer
Monitors the distraction force

- Over-distraction may result in increased tension over tendons, particularly extensor tendons, leading to stiffness and diminished fingers' range of motion.
- The Dynamometer for the Distal Radius Dynamic External Fixator enables us to control the amount of force applied and prevent over-distraction injuries.
- The surgeon confirms the appropriate amount of distraction force applied after the surgery, as well as during each patient's follow-up visit

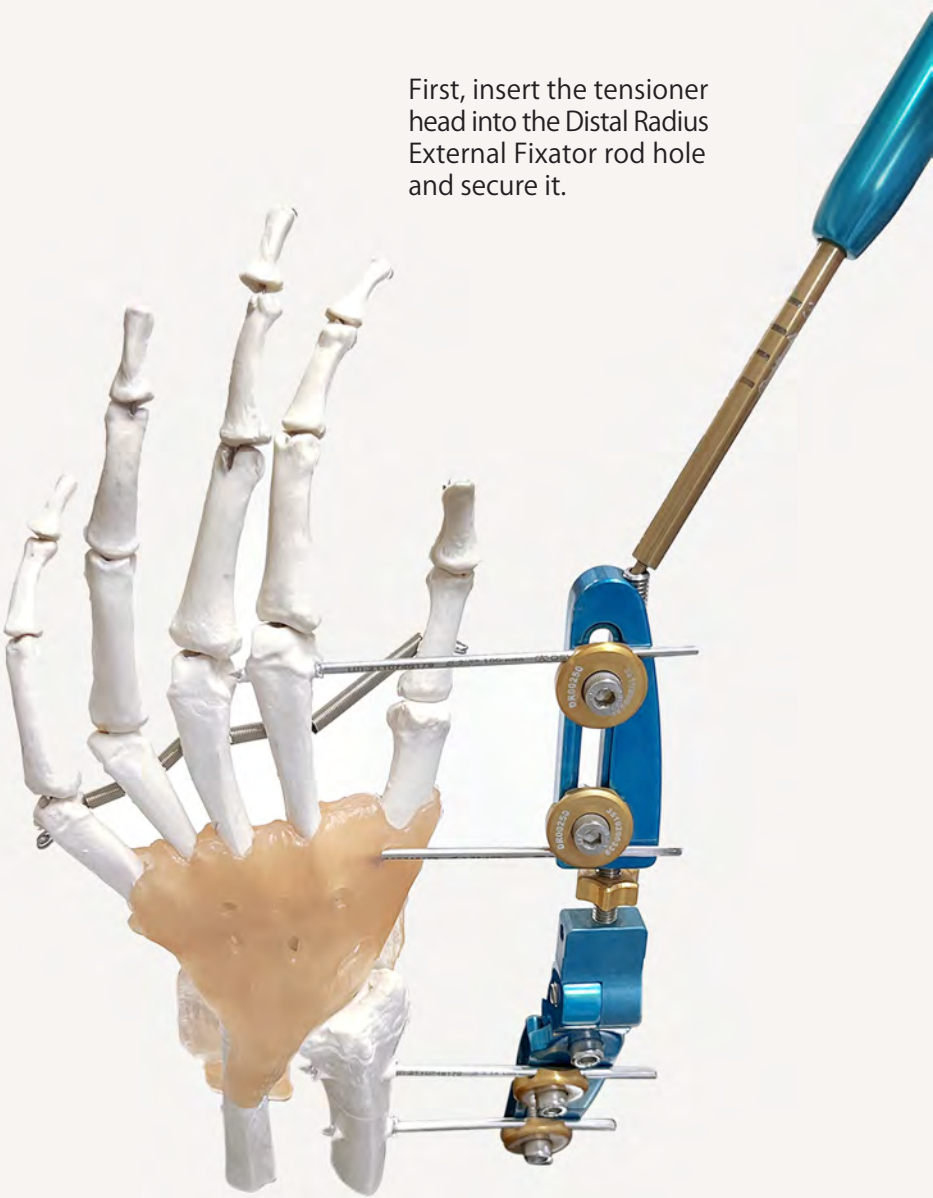
We have two types of tensioners: 1. Quantitatively scaled, which displays the exact force measurement, and 2. Color-scaled, with green, yellow, and red colors indicating increasing force levels, respectively. This type should be set to the yellow color, and if the force increases to the red color, it indicates over-distraction and a reduction in force is necessary.

301: Inserting head
302: Tension rod
303: Color Scale
304: Handle
305: Screw for adjustment

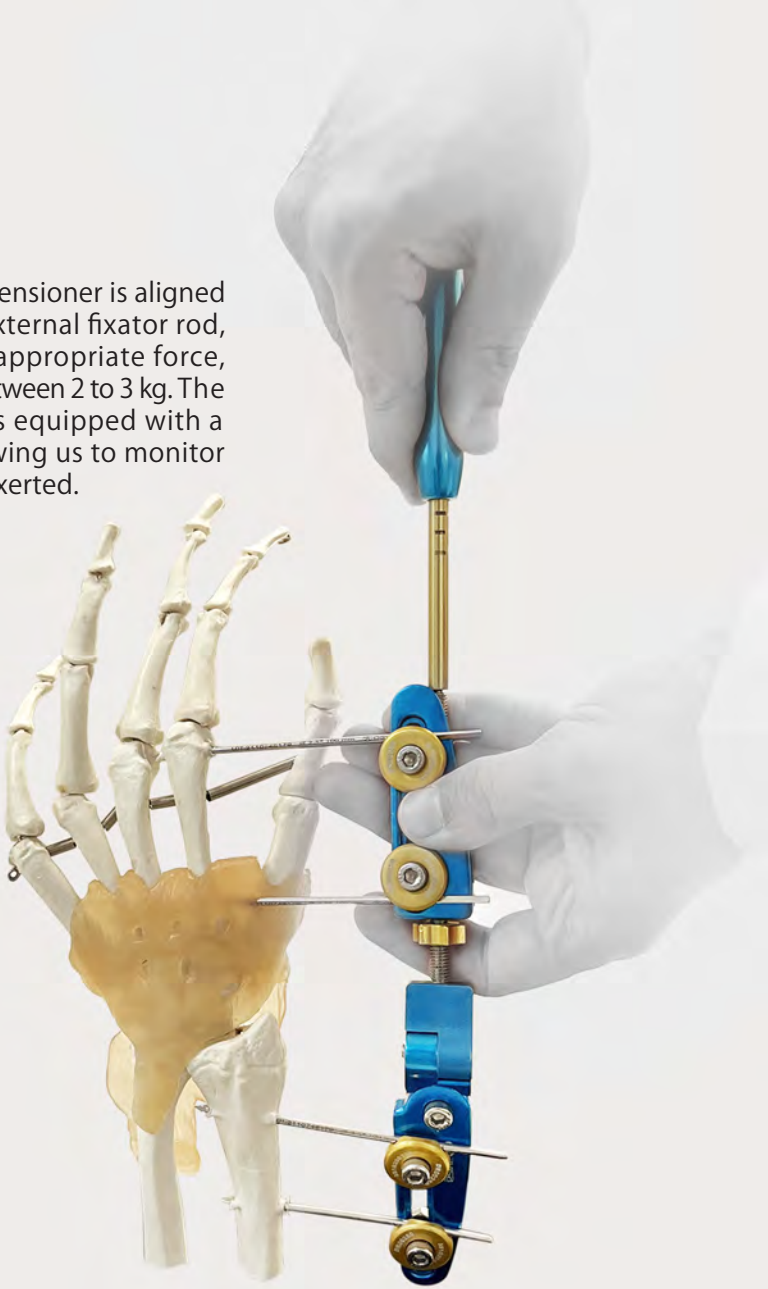


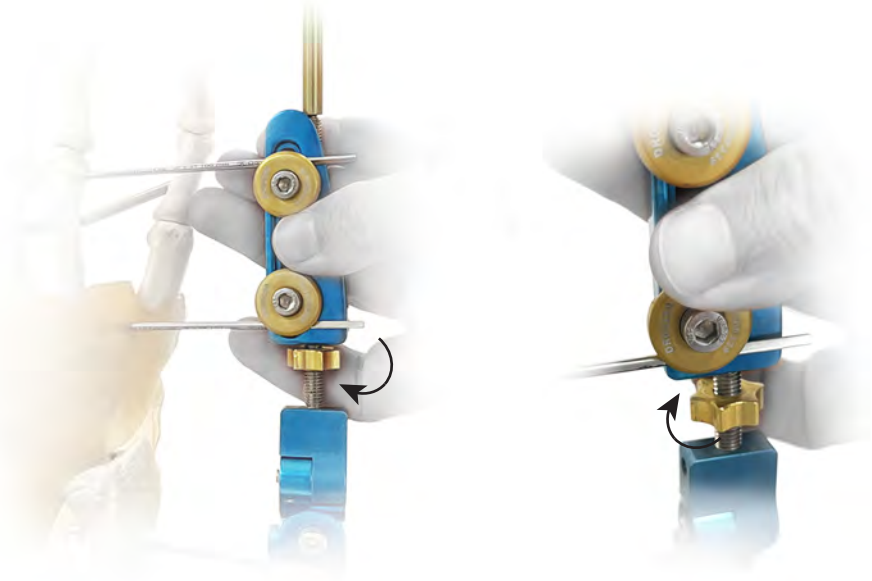
201: Inserting head
202: Tension rod
203: Numeric Scale
204: Handle
205: Screw for adjustment

First, insert the tensioner head into the Distal Radius External Fixator rod hole and secure it.



While the tensioner is aligned with the external fixator rod, apply the appropriate force, typically between 2 to 3 kg. The tensioneris equipped with a scale, allowing us to monitor the force exerted.





Once you have reached and maintained the desired distraction force, we turn the nut clockwise, using our index finger to touch the proximal border of the metacarpal plate.
Finally, you can double-check and confirm the proper amount of force applied by gently moving the tensioner and turning the nut.

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