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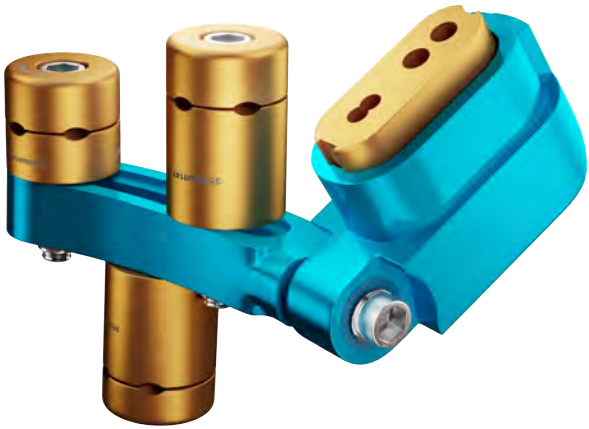
Dynamic and Anatomic Hip External Fixator



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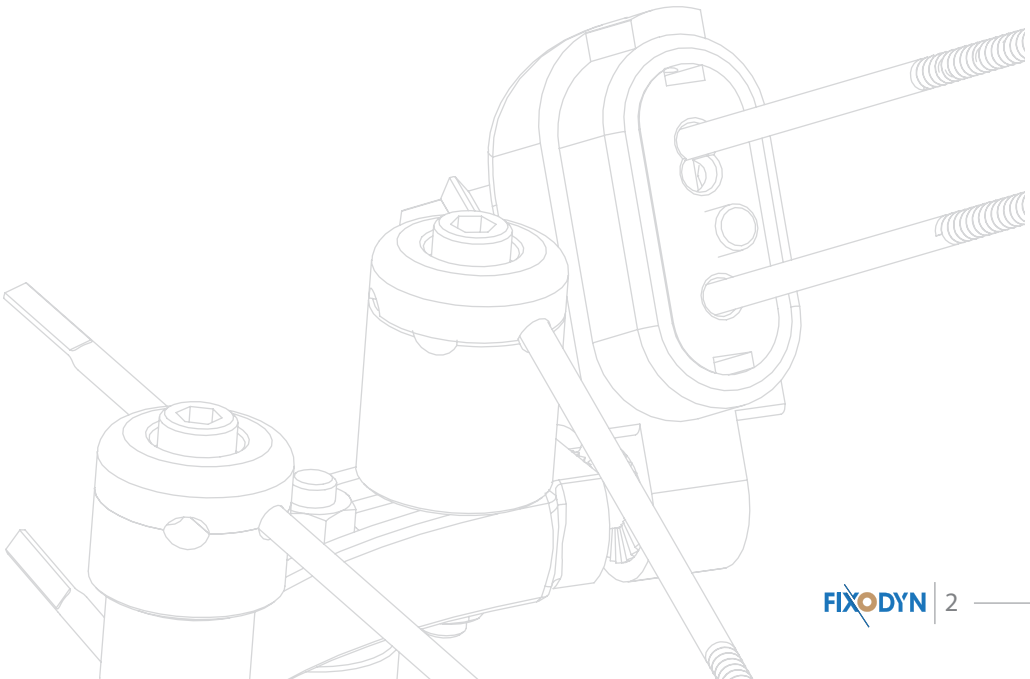

Information

Hip fractures, particularly intertrochanteric fractures, are prevalent among the elderly population.

Due to comorbidities such as diabetes, cardiovascular diseases, or hypertension, the perioperative mortality rate is significantly high.

Open reduction and internal fixation, considered the gold standard for treating such fractures, are associated with increased blood loss during surgery and heightened surgical risks. Reduced compliance among elderly patients with medical comorbidities makes fatal complications almost inevitable, leading many surgeons to hesitate in performing open surgeries.

To address this complex scenario, external fixation emerges as the optimal solution. In response, we have developed the Dynamic Hip External Fixator Dynamic Hip External Fixator.

The Dynamic Hip External Fixator can be inserted under sedation or local anesthesia. Its dynamic sliding component allows for external compression of the fracture, offering a promising approach to managing hip fractures in this challenging patient population.

Dynamic Hip External Fixator is designed for fixing intertrochanteric fractures. Unlike traditional methods that require open surgery, this external fixator utilizes a sliding mechanism to apply external compression force directly to the fracture site, enabling compression without open invasive procedures. In contrast, the Dynamic Hip Screw, the current standard internal fixation method, necessitates open surgery.

Our clinical trial has confirmed its effectiveness, leading to its availability in the market. By providing an alternatives to traditional treatments, Dynamic Hip External Fixator minimizes mortality and morbidity associated with surgeries. They also alleviate surgical load for orthopedic surgeons, particularly in regions with high incidences of intertrochanteric fractures.

Advantages

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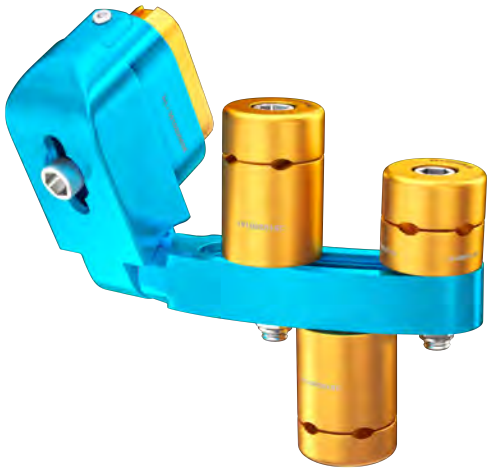
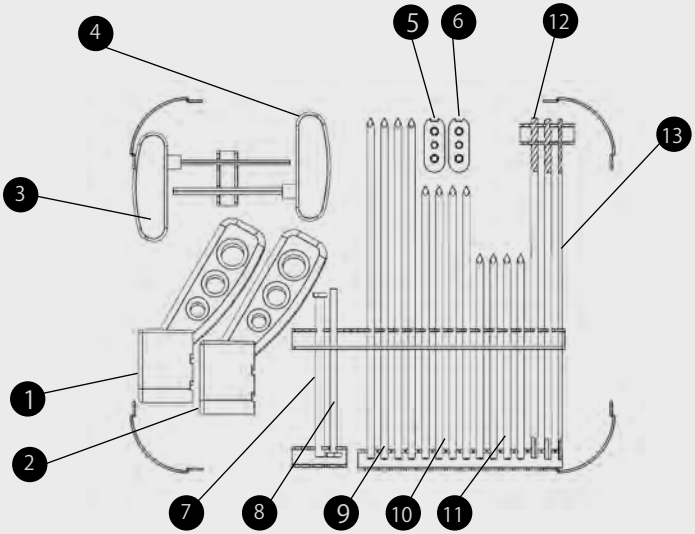
- A sliding mechanism to apply external compression force directly to the fracture site
- Closed noninvasive procedure
- Minimizes mortality rate and morbidity
- Schanz insertion away from hygiene area
- Stable 3D femoral fixation



Tips and tricks

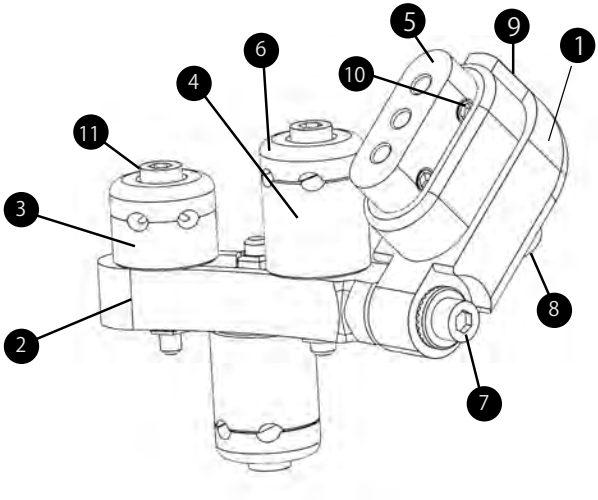
Tips and tricks for application:

- It is mandatory to sterilize the Dynamic Hip External Fixator before surgery.
- The Dynamic Hip External Fixator is prefabricated for the treatment of right-sided fractures. Flipping the half-ring makes it suitable for left-sided fractures.
- Two 250*5 mm Schanz screws, three 150*5 mm Schanz screws, a 3.2mm drill bit, perforator, and insertion instrument set are necessary for surgery.
- Schanz insertion precautions such as pre-drilling are necessary.
- The central Schanz hole is used in cases with a short femoral neck diameter.
- The patient will be operated on the fracture table, similar to the conventional method of fracture fixation with Dynamic Hip Screw.
- Fluoroscopy is necessary to verify the operation.
- Traction on the operated leg should be released to achieve compression during the fastening of the sliding head.



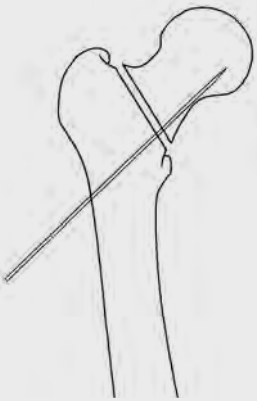
Insertion set components:

1- 20 mm distance jig
2- 16 mm distance jig
3- Small screw driver
4- Large screw driver
5- Sliding core (20 mm)
6- Sliding core (16 mm)
7- Thick sleeve
8- Thin sleeve
9- Schanz 250*50
10- Schanz 200*50
11- Schanz 150*50
12- Drill bit 3.2
13- Pin



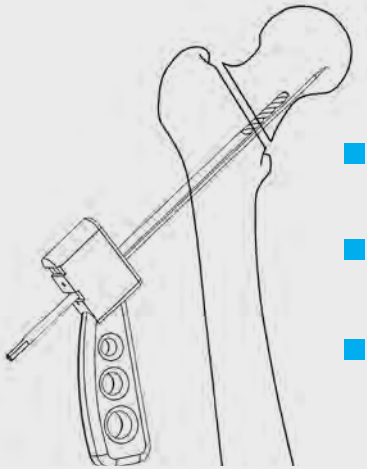
Dynamic Hip External Fixator components:

1- Head
2- Semi-lunar part
3- Short rod
4- Long rod
5- Sliding core
6- Pulley
7- Semi-lunar part-head connecting screw
8- Compression screw
9- Above the head screw
10- Nutting screw
11- Rod screw

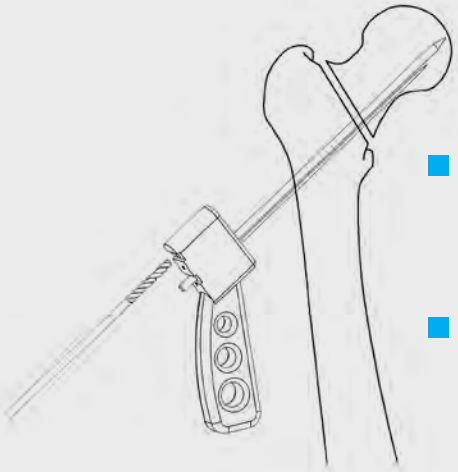


Dynamic Hip External Fixator Insertion Procedure

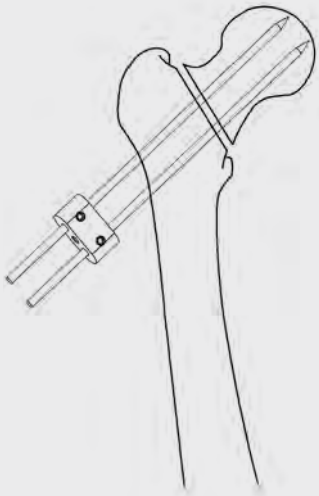
- Ensure proper setup of the operating room, including patient transfer to the fracture table, positioning of the C-arm for precise imaging during surgery, and execution of closed reduction maneuvers.
- Prepare and drape the surgical site meticulously.
- Perform percutaneous insertion of a single 20mm Steinmann pin just superior to the inferior calcar region. Angle the pin between 120-150 degrees under fluoroscopic guidance. Aim for optimal placement at the center of the femoral neck, as observed in the lateral view of fluoroscopy.



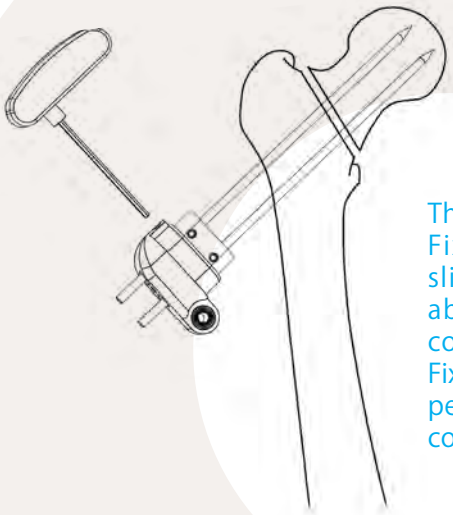
- Insert the pin through the designated hole in the inferior section of the jig.
- Prior to insertion, pre-drill through the inferior Schanz hole using a 3.2mm drill bit.
- Insert a 250*5mm Schanz pin, ensuring it extends up to 5mm from the articular surface of the femoral head.



- The surgeon has the option to choose between sliding cores of 17mm or 20mm based on the femoral neck diameter.
- A specially designed jig assists the surgeon in predrilling and inserting the subsequent Schanz pin with precision.

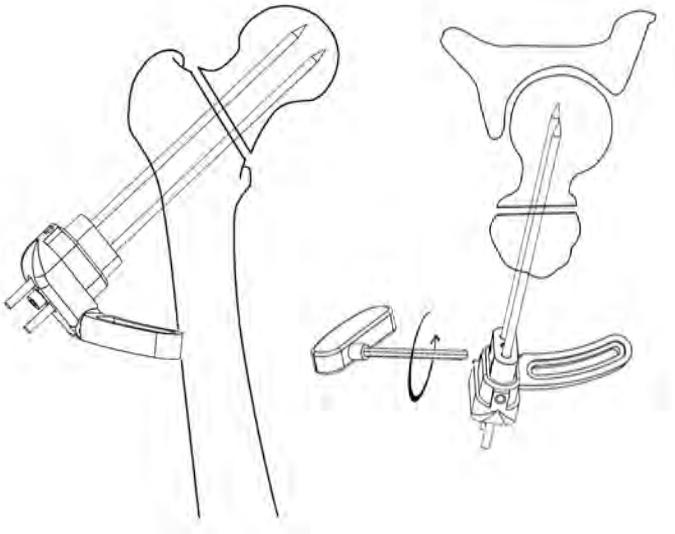


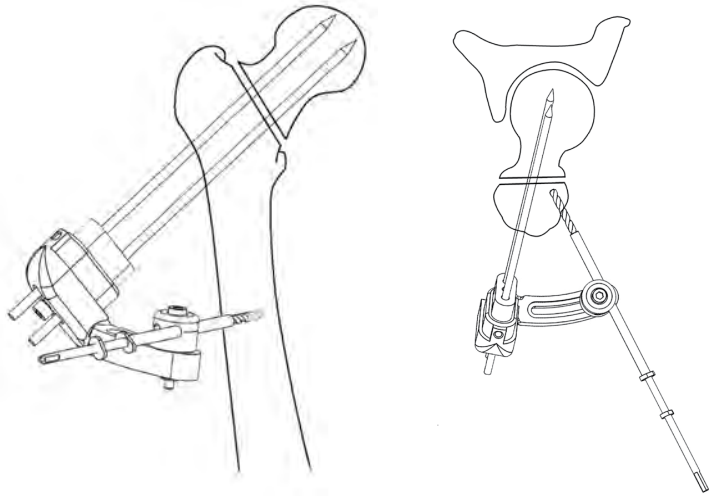
Utilize nutting screws to securely tighten the sliding core over Schanz pins, positioning them approximately 5-7 centimeters from the skin surface.



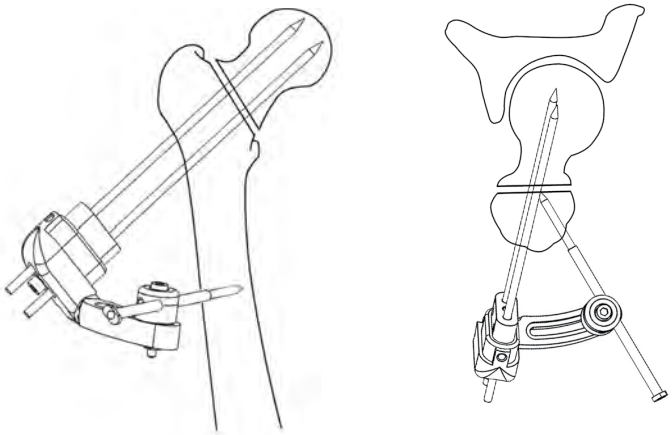
The head of the Dynamic Hip External Fixator will be positioned over the sliding core. A fixing screw, located above the head, secures the sliding core within the Dynamic Hip External Fixator head, allowing for the maximum permitted distance to facilitate optimal compression at the fracture line.

The orientation of the semi-lunar part will be adjusted to securely fix with the DHEF head posteriorly.

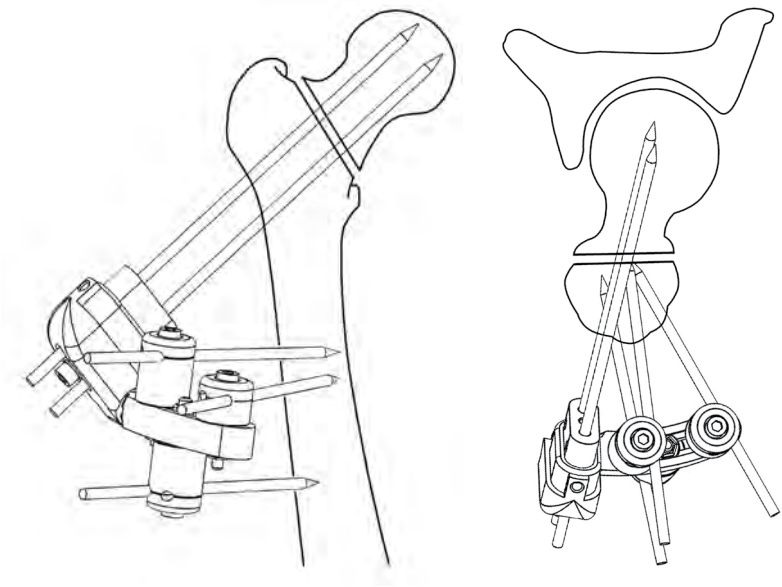




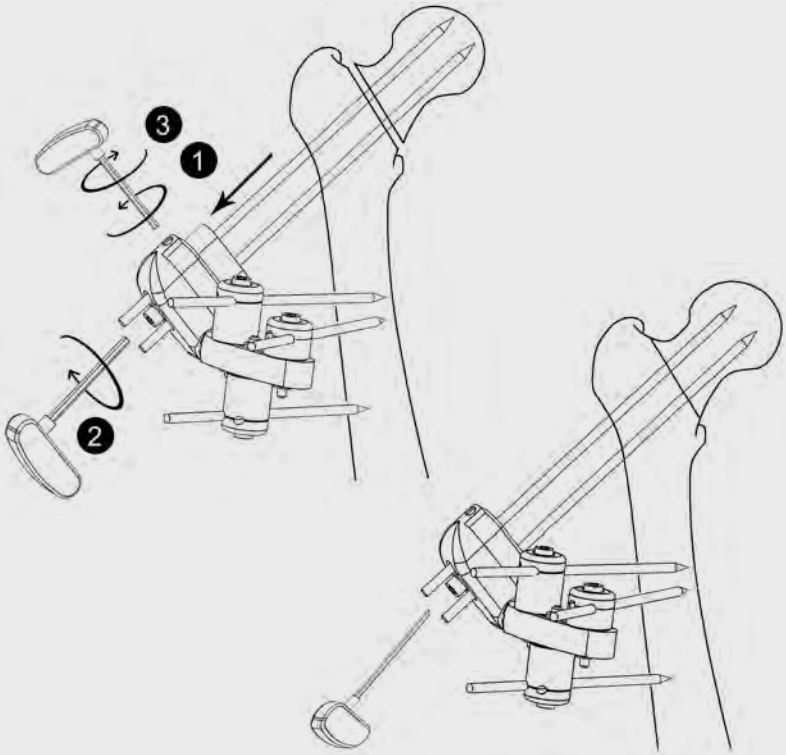
Next, proceed to drill through both cortexes using a 3.2mm drill bit.



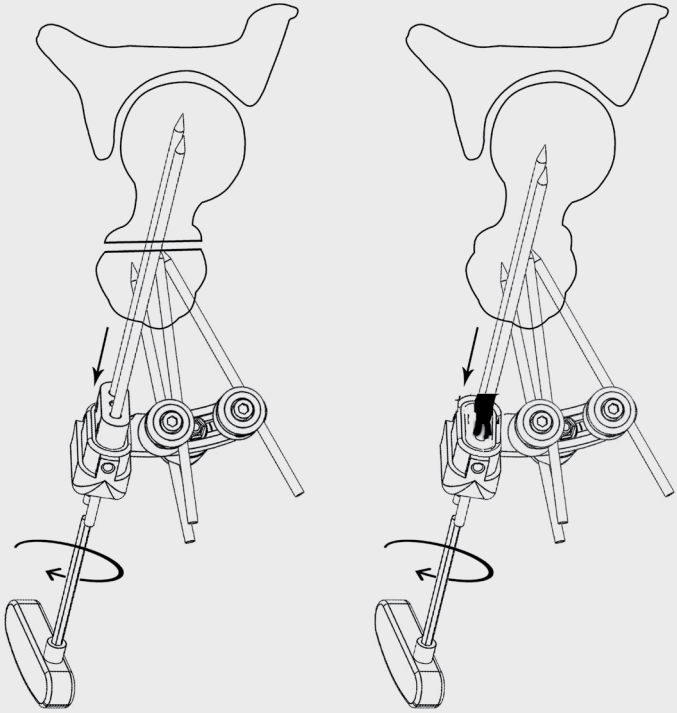
Once the thinner sleeve and drill bit are removed, the 5*150 Schanz can be securely placed.



Repeat the procedure for the remaining rods.

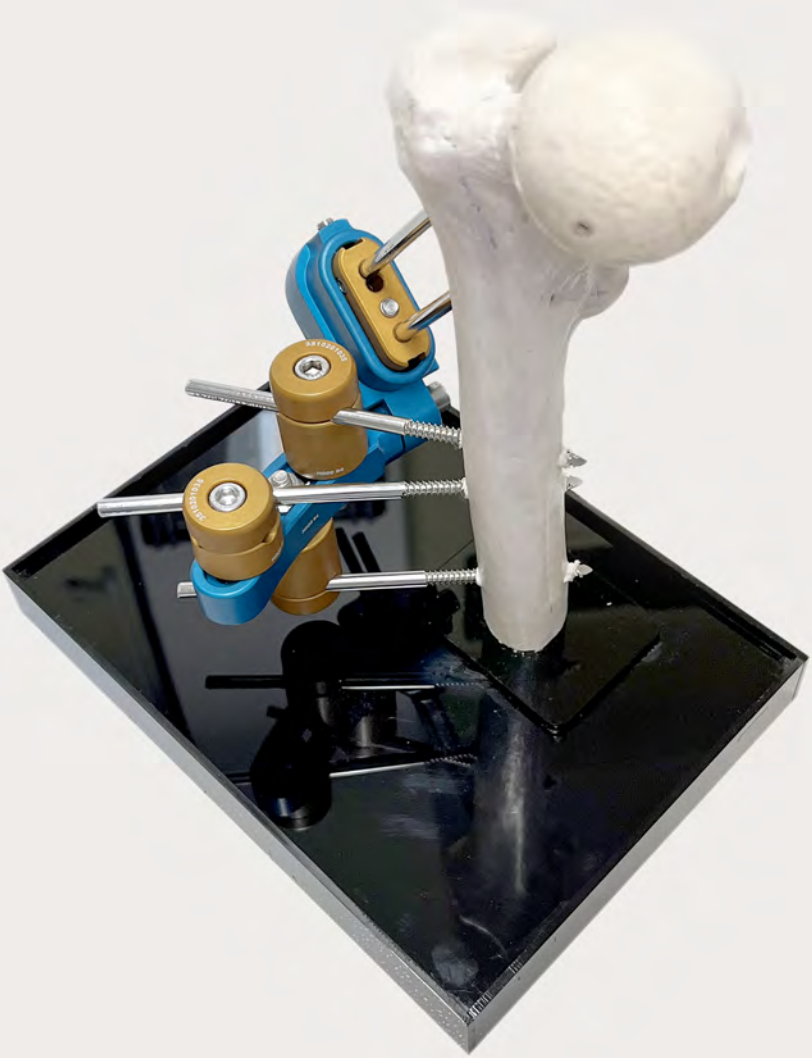


To compress the fracture line, release traction from the leg. Subsequently, tightening the compression screw will draw the sliding core into the Dynamic Hip External Fixator head, effectively compressing the femoral neck against the trochanteric metaphyseal bone.



Tightening the nut screw will secure the position of the sliding core within the head. Compressive dressing will then be applied around the pins. Finally, the patient will be transferred to the recovery room.

Gait training with a walker starts the day after surgery. The protocol for partial weight bearing involves toe-touch weight bearing with a walker until radiographic and clinical union is achieved. Compressive dressing should be changed daily. The nut screw can be released two weeks after surgery to allow for more dynamic compression in patients who are able to walk. For non-ambulatory patients, we achieve compression by tightening the compression screw at this time.
The estimated time to achieve radiologic union is approximately 2.5 months in ambulatory patients and 3.5 months in non-ambulatory patients.
The external fixator will be removed after union.



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