

Surgical technique

Direct anterior approach on table



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Concept and description

The E.T.O.I.L.E System is designed to be utilized by the surgeon as an aid for total hip arthroplasty utilizing anterior approaches.

The E.T.O.I.L.E orthopedic table extension can be connected either to the orthopedic operating table via a suitable connector or with the E.T.O.I.L.E universal orthopedic tabletop. The entirety of medical devices comprising the E.T.O.I.L.E system aims to ensure proper exposition of the joint for direct anterior approach surgeries.

Rotational movements of the foot, traction, adduction, and hyperextension of the lower limb to be operated on can be facilitated with the E.T.O.I.L.E table extension.

NOTE

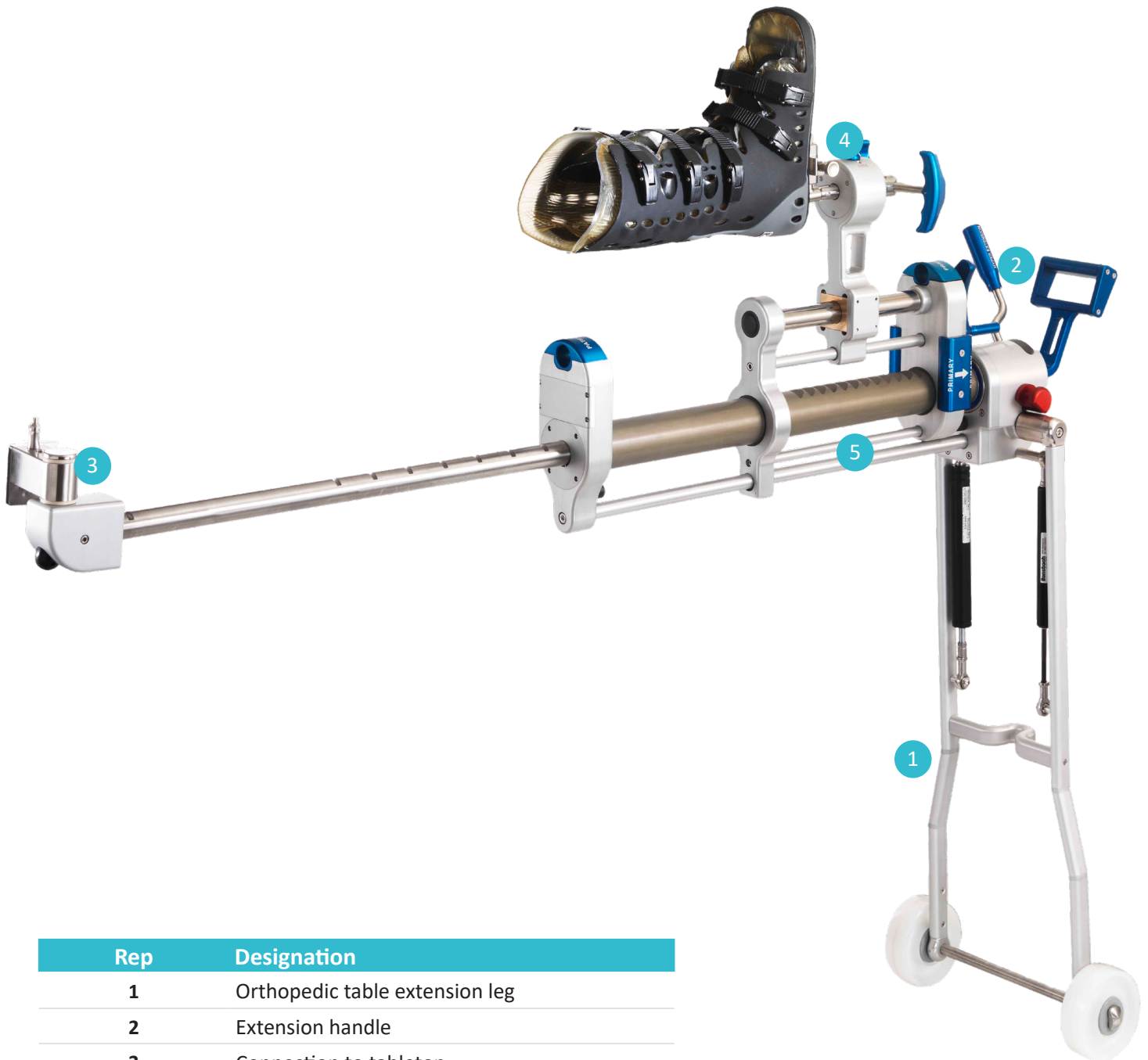
A user manual is provided with the E.T.O.I.L.E system, containing all necessary information regarding the installation, use, and maintenance of the medical devices comprising the E.T.O.I.L.E system. To ensure effective and safe utilization of this equipment, personnel must be familiar with all instructions.



NOTE

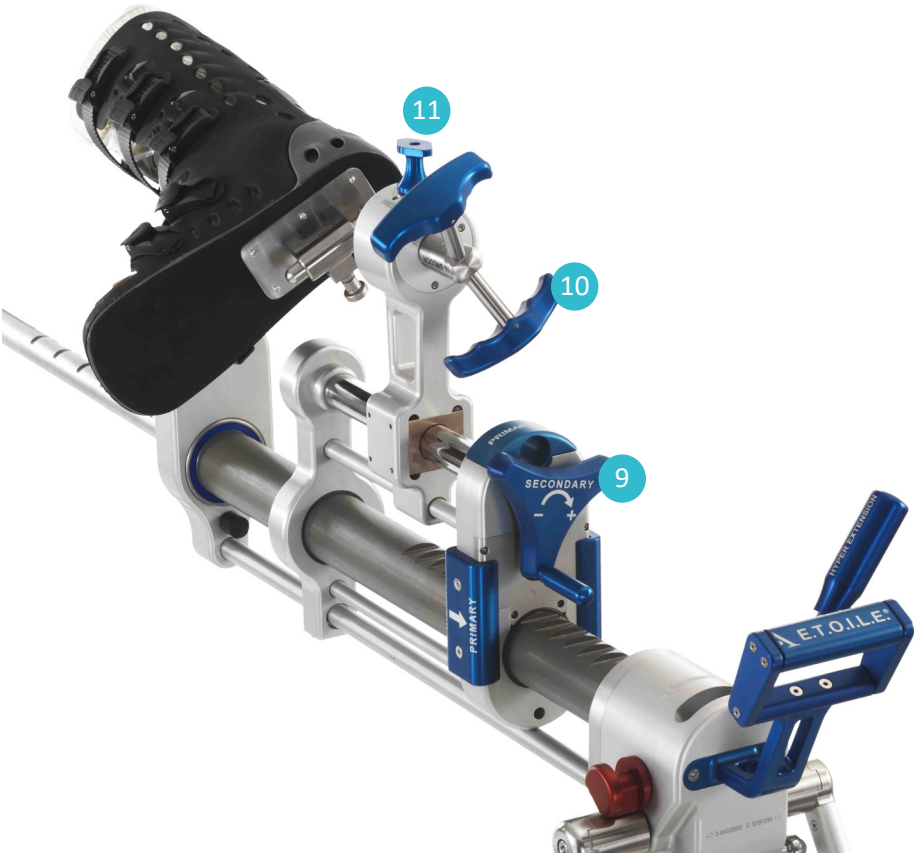
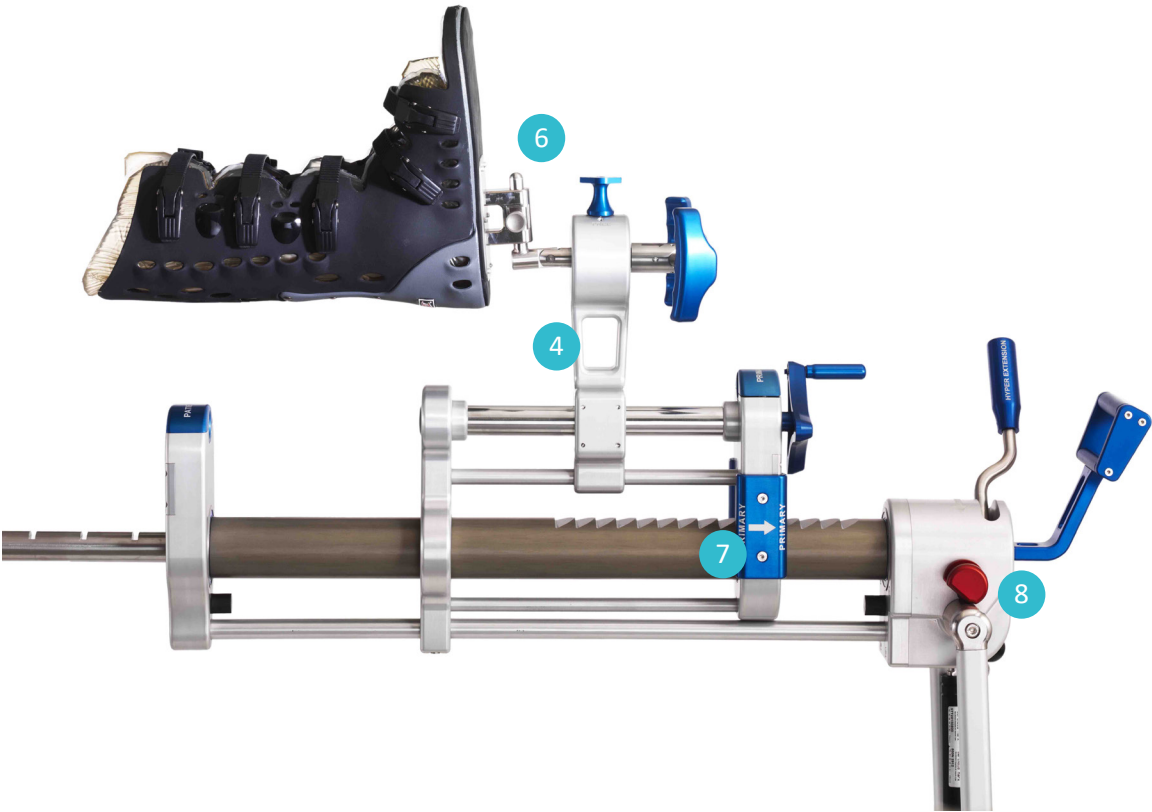
The E.T.O.I.L.E. logo present on the page refers to the user manual.

Concept and description



Rep	Designation
1	Orthopedic table extension leg
2	Extension handle
3	Connection to tabletop
4	Mast
5	Cart
6	Boot attachment
7	Primary traction
8	Safety button
9	Secondary traction handle
10	Rotation handle
11	Free button

Concept and description



1 Setup

The patient is positioned according to the department protocol in a supine position on the operating table.

- The patient's foot is placed in the boot, protected by a silicone pad, and subsequently, the boot is connected to the E.T.O.I.L.E. system (Figure 1).
- The pubic support is positioned to stabilize the pelvis.
- The posterior support wedge is placed under the upper part of the femur (Figure 2).



figure 1



figure 2

2

Operative planning

With the help of the radiological assessment and overlays, it is possible to: (Figures 3 and 4).

- Determine the joint center,
- Select the height positioning of the stem on the femur,
- Evaluate the size of the implant by seeking maximal metaphyseal filling,
- Identify the level of femoral cut.

Planning can be done using digital images. AMPLITUDE implants are registered in leading templating softwares and can be registered on request (Figure 5).

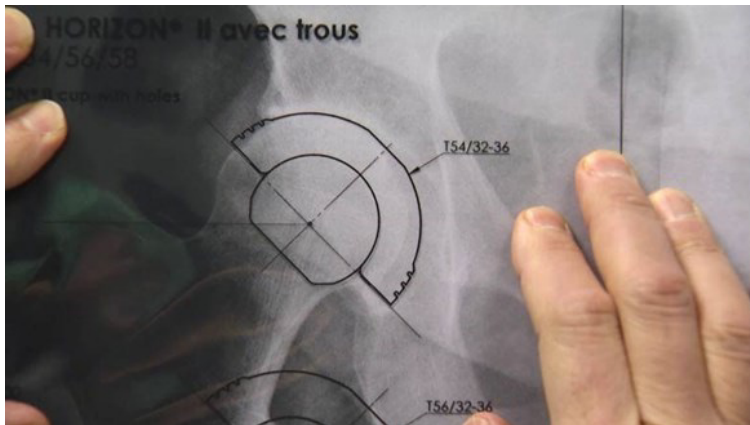


figure 3

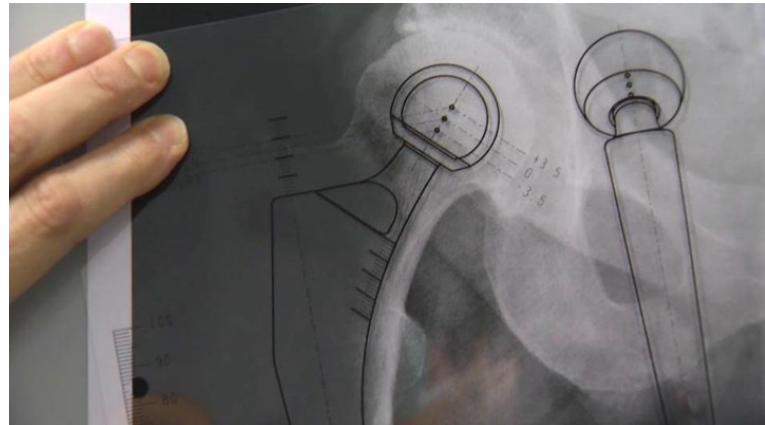


figure 4

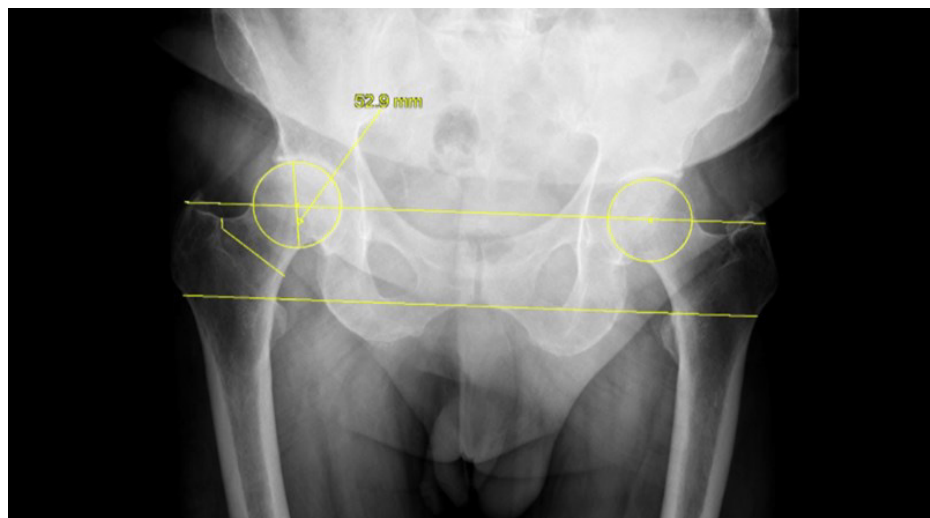


figure 5

IMPORTANT

The instruments mentioned on the following pages are intended to be used with Amplitude implants.

REMINDER

The planning, surgical approach, and operative technique are under the sole responsibility of the surgeon. For the preparation and implantation of the implants (acetabulum and stem), refer to the operative technique.

3 Incision marking

After positioning the surgical drapes, the following landmarks are identified: (Figure 6).

- Anterosuperior iliac spine = ASIS (Anterior Superior Iliac Spine),
- Anterior half of the iliac crest,
- Prominence of the greater trochanter (Greater Trochanter),
- Muscular body of the Tensor Fasciae Latae (Tensor Fasciae Latae),
- Head of the fibula.

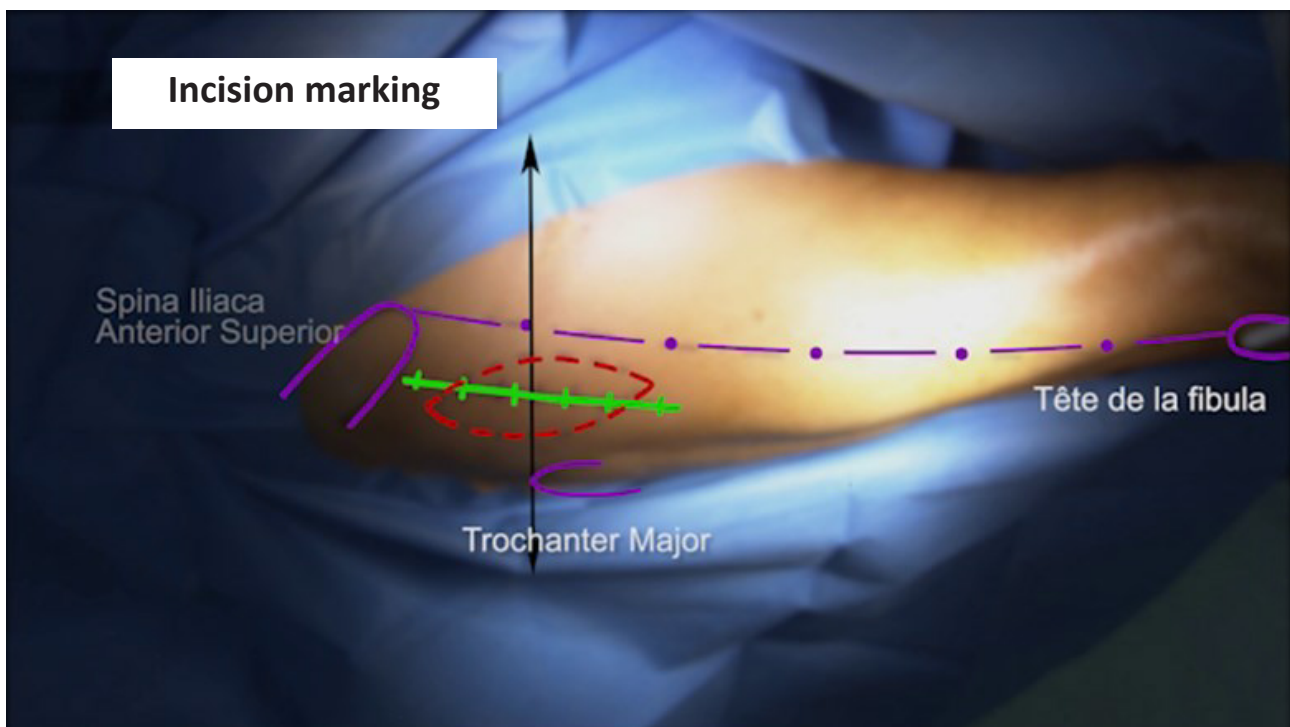


figure 6

4 Incision

The incision for the minimally invasive direct anterior approach is parallel to the line passing through the ASIS and the head of the fibula (green line in Figure 6). The reference point is the vertical line joining the tip of the greater trochanter.

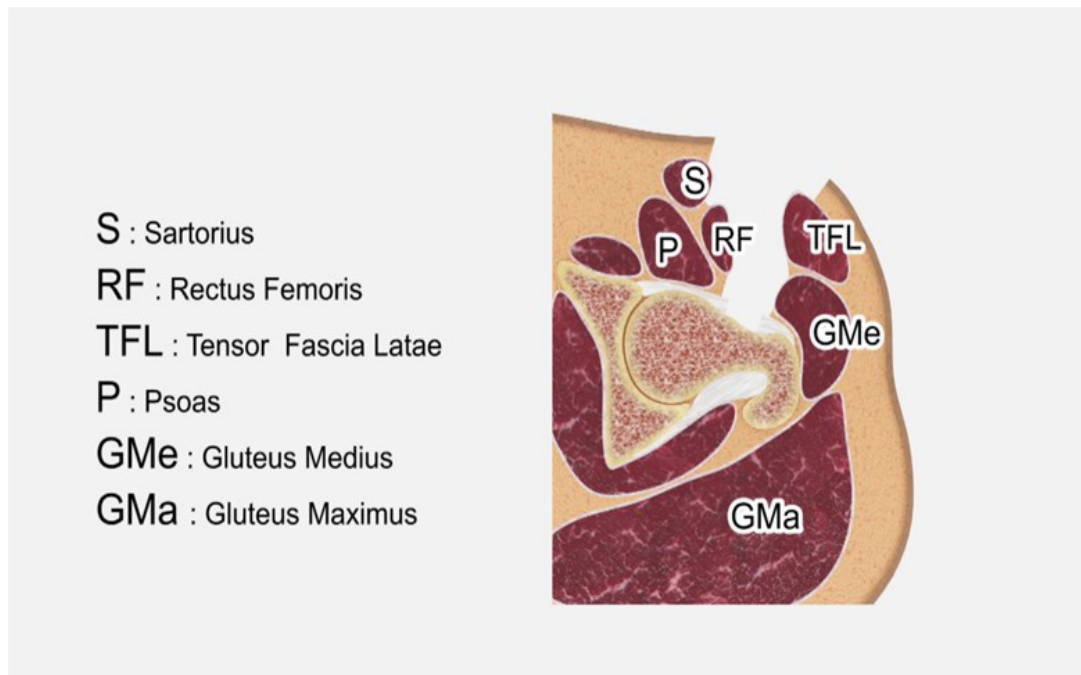


figure 7

NOTE

The dissection is performed without muscle injury, between the Tensor Fasciae Latae (TFL) muscle laterally and the Rectus Femoris (RF) muscle medially (Figure 7).

5 Muscular plane

After ensuring hemostasis control, the aponeurosis of the Tensor Fasciae Latae muscle is opened. Dissection is performed inside the sheath to avoid the femoral cutaneous nerve.

Exposure:

- A Beckmann retractor is positioned deeply to laterally retract the Tensor Fasciae Latae muscle.
- Access to the anterior circumflex vessels pedicle is obtained. Hemostasis is then carefully performed (Figure 8).

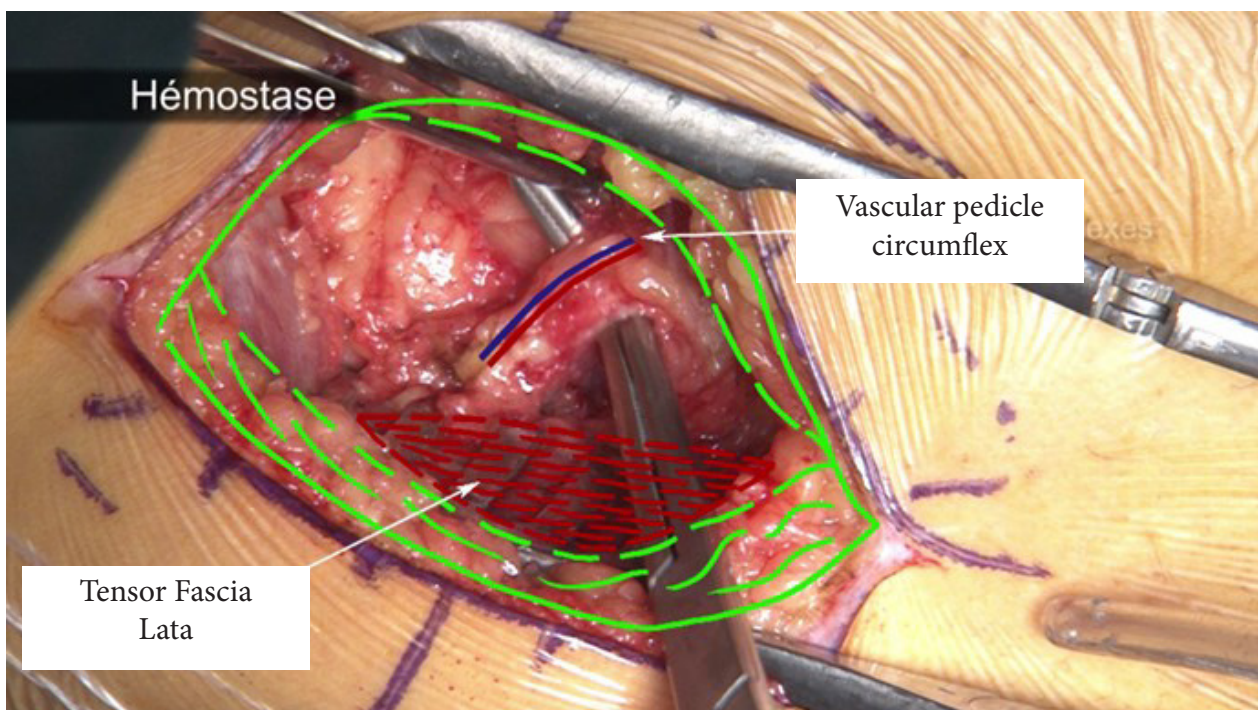


figure 8

6 Capsulotomy

After repositioning the Beckmann retractor, the pre-capsular fat is excised to expose the anterior joint capsule.

The anterior capsulotomy is performed in a triangular shape (black line in Figure 9):

- The distal part corresponds to the anterior intertrochanteric line (insertion of the vastus muscles: Vastus Lateralis and Vastus Intermedius).
- The proximal part follows the Ilio-psoas muscle to the acetabulum.

Exposure:

The capsule is grasped with traction sutures, and a Hohman retractor is positioned on the medial edge of the femoral neck (Figure 10).

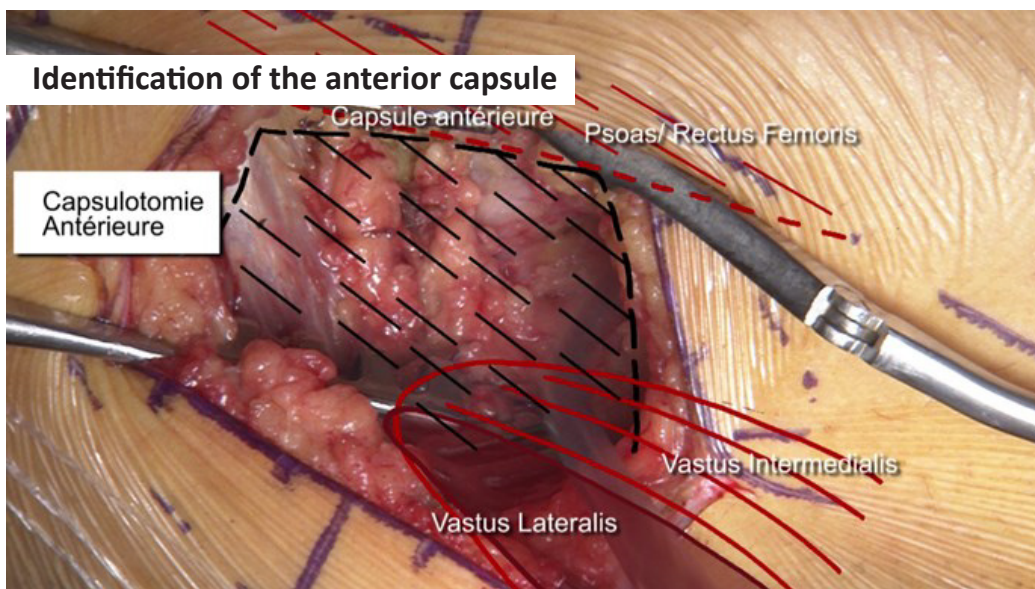


figure 9

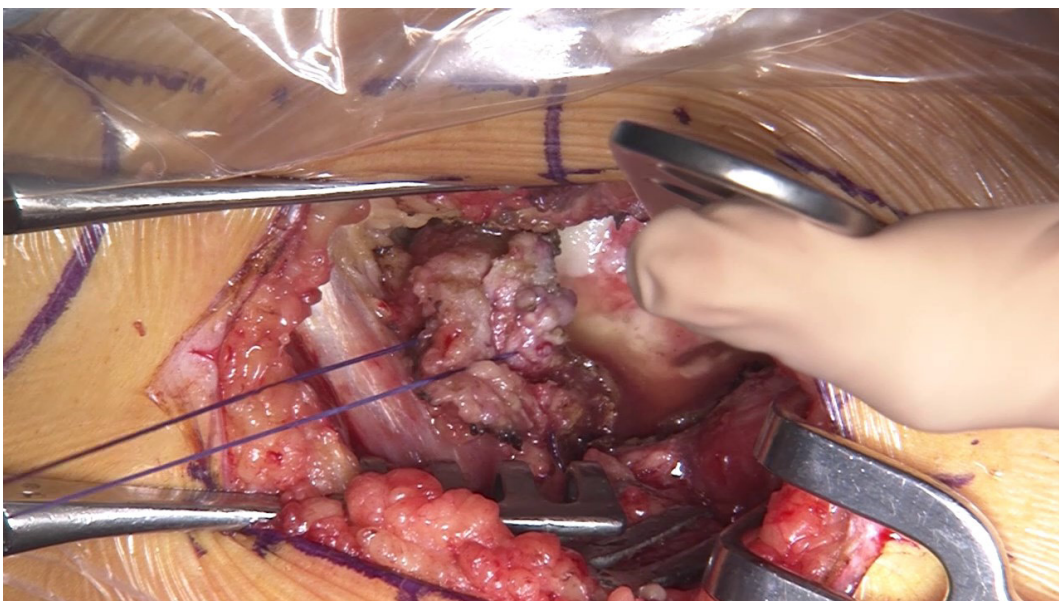


figure 10

7 Exposure and Femoral Neck Sectioning

We identify the landmarks for femoral cut (Figure 11):

The intertrochanteric line,

- The superior border of the neck taking into account the planning elements.
- The femoral neck section is performed using the oscillating saw according to the operative plan.

A slight traction is applied to the lower limb (primary or secondary traction) and the foot is externally rotated at 45°.

- The head extraction is performed using the bone hook.

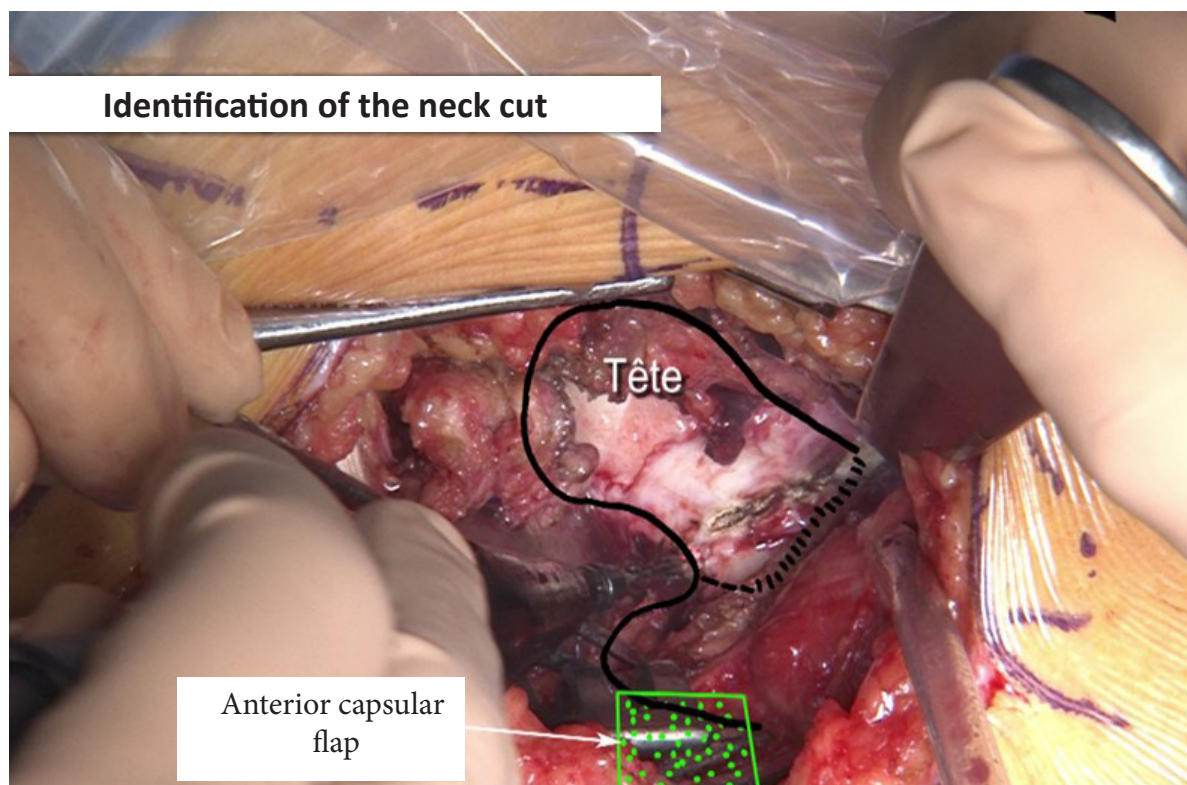


figure 11

NOTE

Special attention is paid to the complete section of the Merckel spur.

8

Acetabular Preparation

The Charnley frame is positioned on the anteromedial capsule on one side (large valve) and on the identified anterior capsular flap on the other side (small valve). Exposure can be enhanced by 2 Hohman retractors (Figure 12).

Cleaning of the acetabulum is performed.

Exposure of the acetabulum allows identification of (Figure 13):

- The acetabular roof,
- The back wall,
- The transverse acetabular ligament (Ligamentum transversum acetabuli),
- The posterior wall.

Each acetabular reamer is introduced using the Kocher clamp, and the offset I.M.A reamer holder is adjusted in situ.

Acetabular trials are performed until a satisfactory press fit is achieved using the trial acetabular cup holder.

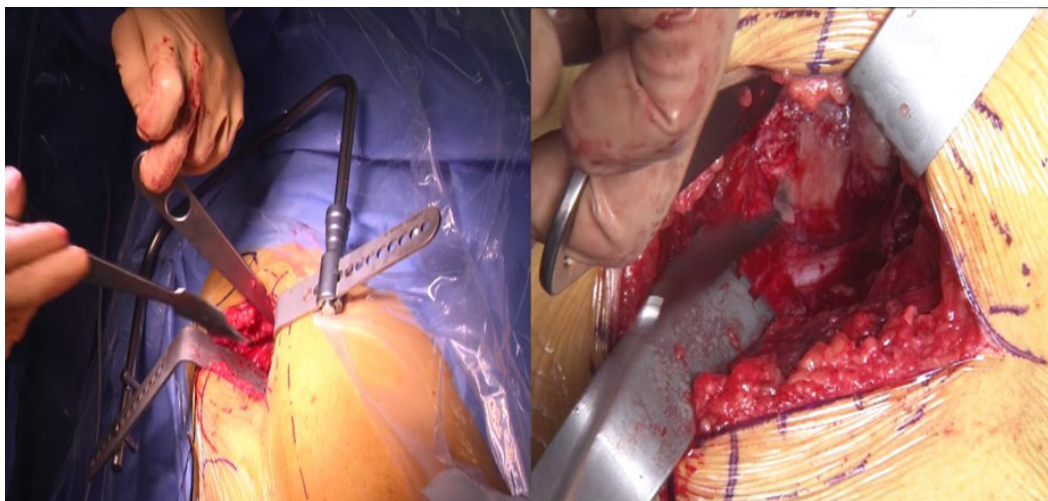


figure 12

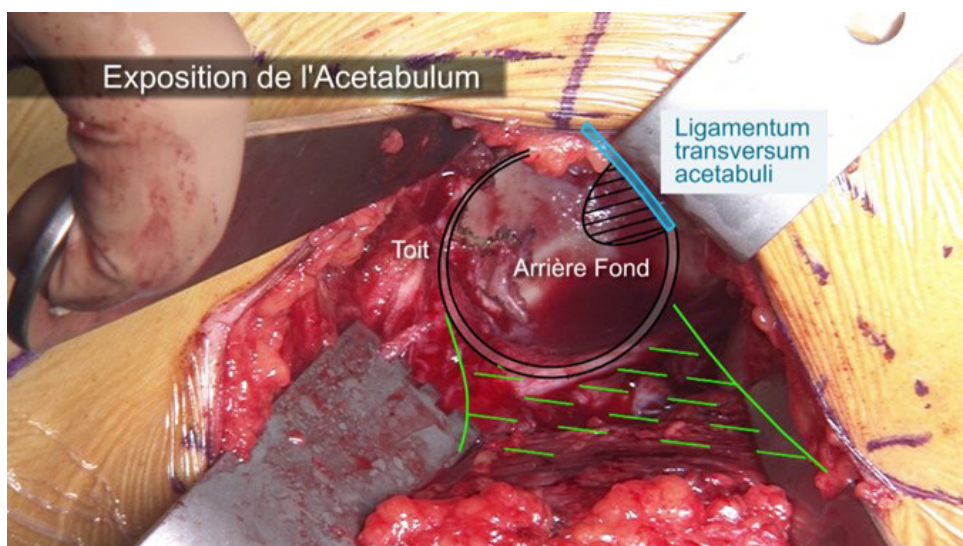


figure 13

9

Placement of the final cup

The final acetabular cup is positioned on the offset I.M.A. cup holder.

Positioning of the final acetabular cup:

- External landmark: The cup holder is used as an external landmark. It allows adjustment of anteversion and inclination in the sagittal and frontal planes (Figures 14 and 15).
- Internal landmark: The positioning of the implant is verified in relation to the anterior and posterior bony margins.

After impaction of the final acetabular cup, the acetabular liner is impacted.

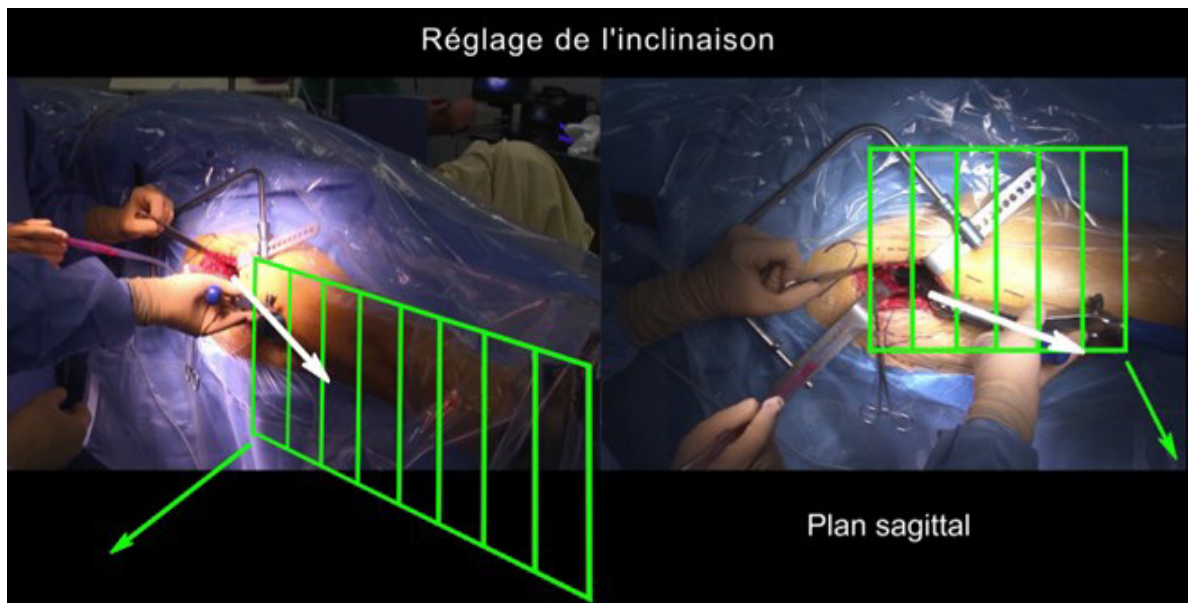


figure 14 (The orientation of the green grid represents the sagittal plane)

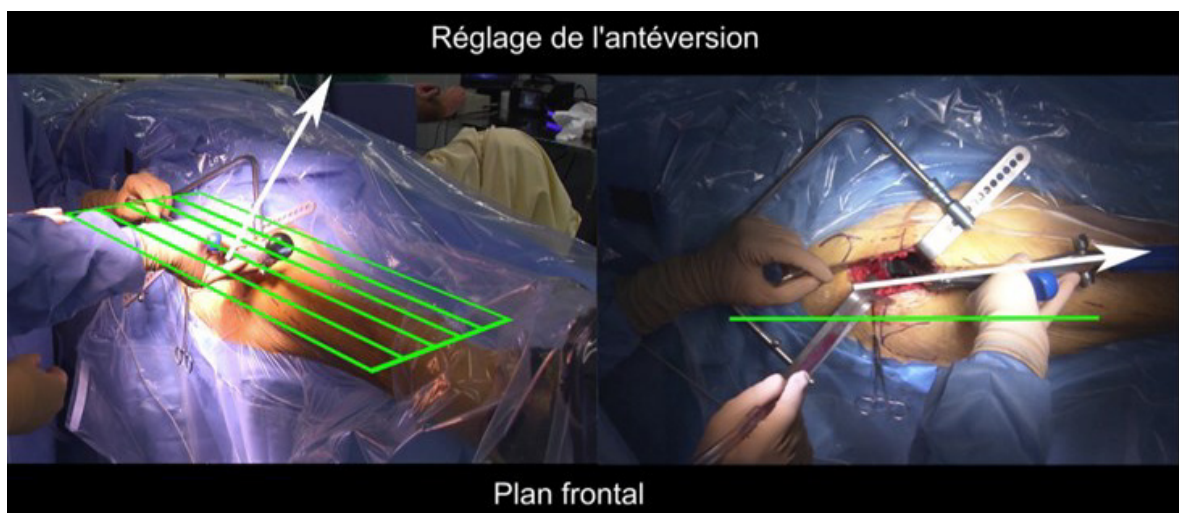


figure 15 (The orientation of the green grid represents the frontal plane)

NOTE

Fluoroscopy can be used as an aid in learning the technique to control the positioning of the implant.

10 Femoral Exposure

The circulating nurse releases the traction of the E.T.O.I.L.E. system.

- Posterior capsular tension is assessed using a Lambotte hook to allow femoral ascent.

The lower limb is positioned in external rotation to align the anterior surface of the patella in the vertical plane (Figure 16).

- Femoral ascent is continuously monitored with the Lambotte hook.

The circulating nurse positions the lower limb in extension and adduction.

- The upper end is exposed using two Hohman retractors (Figure 17).



figure 16

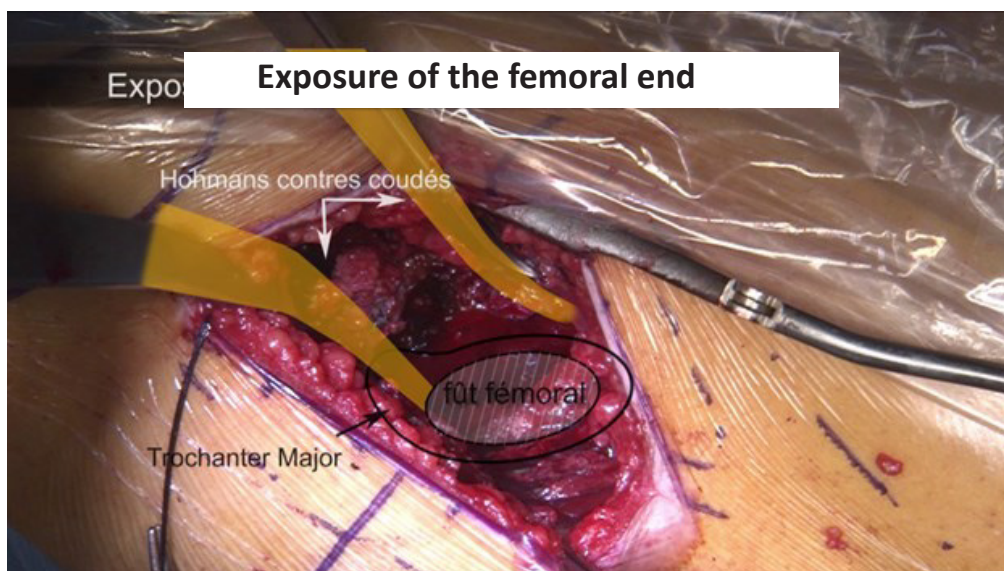


figure 17

NOTE

The capsule, as needed, can be released. The release is performed obliquely between the lower part of the acetabulum and the Merckel spur.

11 Femoral Preparation



Femoral preparation begins with the curette to open the medullary canal.

The curved femoral canal reamer is used without the use of a mallet (Figure 18).

The landmarks are:

- The plane of the anterior surface of the patella,
- The natural anteversion of the femur relative to the anterior cortex.

The size of the rasps is increased until the desired and planned size is reached.



figure 18

NOTE

To facilitate femoral preparation, dual offset broach handles or a DAA broach handle oriented at 45° compared to the broach can be used.

NOTE

During femoral preparation, it is important to avoid excessive anteversion. A stabilizing bar can be used with the rasp handle to help maintain proper alignment.

12 Placement of the final Stem

- The final femoral stem is inserted using an impactor, ensuring control of anteversion (Figure 19).
- The final femoral head is then positioned.

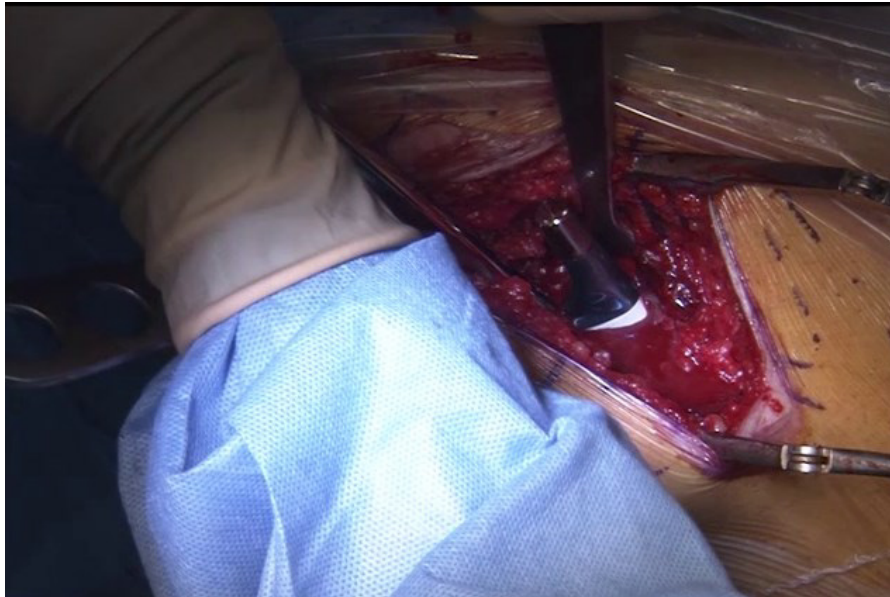


figure 19

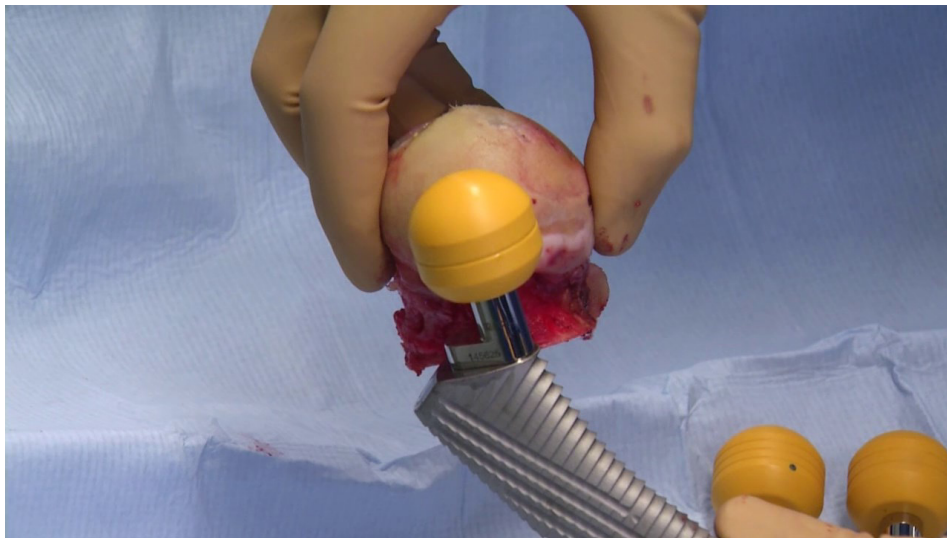


figure 20

NOTE

A final check of the planning validates the length of the femoral head-neck by superimposing the various trial necks on the femoral head (Figure 20).

13 Reduction

Reduction technique:

- The circulating nurse performs several actions under the surgeon's control:
- Remove adduction.
- Gradually reduce hyperextension by lifting the leg.
- Reduce external rotation (by gently performing internal rotation maneuver associated with a maneuver by the surgeon using the head pusher on the prosthetic head).



figure 21

NOTE

Stability trials can be performed by detaching the boot from the E.T.O.I.L.E. system (Figure 21).

14 Closure

- The joint capsule can be closed (Figure 22).
- If drainage is chosen, the suction drain is placed in front of the capsule.
- The aponeurosis of the Tensor Fascia Lata muscle is closed, avoiding nerve endings.
- Skin closure is performed according to usual practice.

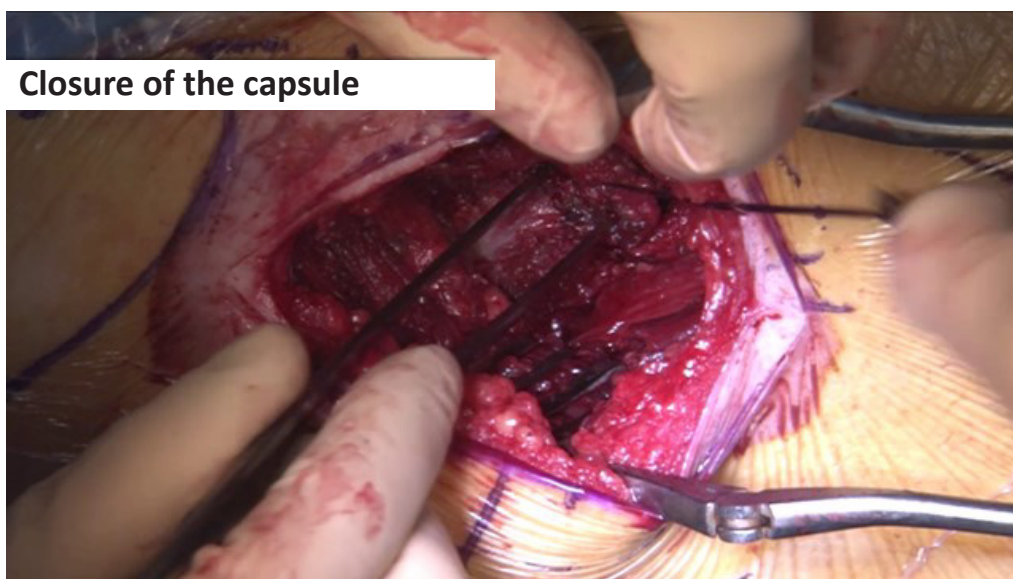
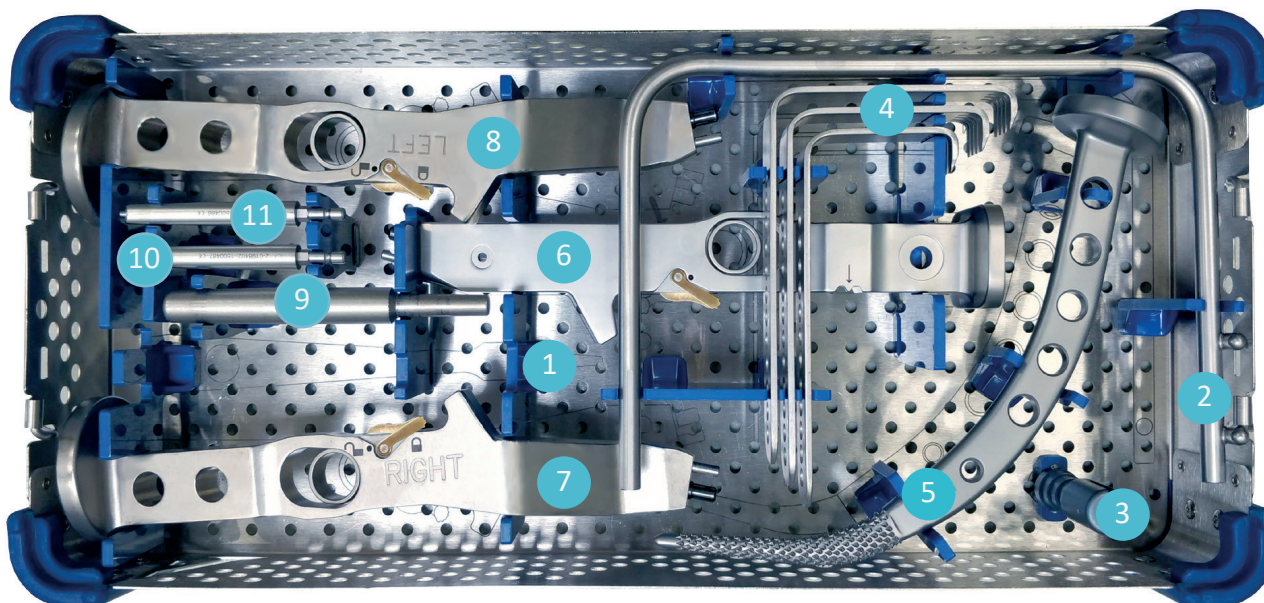


figure 22

Instrumentation

Anterior surgical approaches



Rep	Designation	Reference	Qty
1	Dual curvature Hohmann retractor	2-0199200	1
2	Charnley retractor frame	2-0199100	1
3	Valve fixation ring	2-0120700	1
4	Valve lengths 60, 80 and 100 for Charnley retractor frame	2-0122906 to 2-0122910	1 each
5	Femoral preparation starter broach	2-0199300	1
6	Straight broach handle for Hueter approach - Navigated	2-0123000	1
7	Offset Broach Handle for HUETER approach - Right	2-0123700	1
8	Offset Broach Handle for HUETER approach - Left	2-0123800	1
9	Holding rod 10/15	2-0126100	1
10	Impactor tip - Monobloc stem - Anterior Approach	2-0198401	1
11	Impactor tip - Modular stem - Anterior Approach	2-0198402	1



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