Minimally Invasive Anterior Approach
Surgical technique

Corin
Responsible Innovation
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Introduction

The Minimally Invasive Anterior Approach (MIAA™) is Corin’s direct anterior approach. This surgical technique covers MIAA™ with the use of a specifically designed table (With-Table technique) or with a standard operating room or fracture table and "figure of four" (Without-Table technique).

These techniques can be used for any of Corin’s hip stems. For specific information on the templating or use of the individual systems please refer to the individual surgical techniques.
A1. Patient positioning/draping
Patient is supine for this procedure. When sliding the patient down the table it is important to make sure the patient is level as the anatomical landmarks are critical for positioning the cup. When the patient has been positioned, check the patient visually to make sure they are level. Then palpate the Anterior Superior Iliac Spine (ASIS) to further ensure they are level. Place some traction on the legs to take out any slack before draping.

When draping the operative site ensure the surgical field includes the ASIS, a portion of the iliac crest down to the mid-thigh and the greater trochanter.

A2. Skin incision
The incision is determined using the ASIS as a reference. The starting point for the incision is 2cm distal and 4-6cm lateral to the ASIS. An oblique incision towards the fibular head is made slightly lateral to the intermuscular space between the Tensor Fascia Lata (TFL) on the lateral side and sartorius on the medial side. The incision is approximately 2cm more than the estimated cup outer diameter. The facia overlying the TFL (identified by the pink hue) is then incised in line with the skin incision.

Note: Internally rotate the foot to make the TFL more prominent to palpate. The muscle fibres of the TFL should be in line with the fascial incision, if not you may be in the sartorius or gluteus medius muscle.

A3. Muscular dissection
The intermuscular interval can easily be developed by finger pressure in a medial direction until the capsule can be palpated. This preparation should be completed without force to prevent injury to the lateral circumflex femoral artery. Blunt disect medius/minimus off the capsule. Place a bent Holmanns over the lateral capsule, between the capsule (over the lateral aspect of the femoral neck) and the gluteus minimus and medius.

Develop the interval between rectus, sartorius medially and TFL with blunt finger dissection. Place in a large Gelpi retractor.
A4. Muscle dissection

Soft tissue on stretch will free up the lateral circumflex vessels. Tie off the lateral circumflex artery.

Note: Following identification of the artery, it should be tied off or electrocautery should be utilised to minimise blood loss.

Once the vessels are tied off, clean up the fat pad in a triangle from vastus lateralis inferiorly, rectus medially and TFL laterally.
A5. Capsule incision
Incision in the capsule is made as shown above.

Now place two retractors inside the joint.
There are now three important releases to carry out as detailed below:

1. Release the capsule off the medial calcar towards the lesser trochanter; this can be a vascular area and arterial bleeding is common.
2. Place a retractor between the labrum and the capsule and release the capsule along the Smith-Petersen interval off the ilium.
3. Release the capsule off the piriformis recess to carefully expose the lateral neck for visualisation in determining your neck cut.

Note: For surgeons used to conventional THR, the neck cut is more conservative for MiniHip™.
A6. Femoral exposure

Remove the superior and lateral capsule protecting medius and minimus.

Rotate the femur externally by up to 120 degrees.

Note: Optimal external rotation depends on anteverision of the femoral neck and is patient specific. Additional releases may be necessary to obtain optimal external rotation

Partially hyperextend the leg.

Note: Adduction facilitates the final release

Rotate the femur and place a Ranawat retractor medially and a Muller retractor behind the femur.

Lower the operating limb and place a retractor behind the greater trochanter. Release the posterior capsule if necessary and move the femur slowly to give better exposure.

Place a bone hook into the femoral neck and pull upwards to release the femur. Once the femur is fully mobilised, increase the extension and adduction to place the femur in the final position for impacting.

Note: Adducting the table prior to complete extension assists in exposing the 1 o’clock – 11 o’clock position to complete the femoral release.
Without-table MIAA™ technique

B1. Patient positioning and preparation

Position the patient supine on a fluoroscopy capable table.

- Position the Anterior Superior Iliac Spine (ASIS) at the level of the break in the table. This will permit appropriate motion of the femur as the table is extended.
- The table needs to be able to extend at the hip and the hip must be positioned to permit fluoroscopy views of both hips and the obturator foramen.
- Check leg lengths in the supine position and correlate with hip radiographs for later reference.

Prepare both legs and drape each leg free to permit crossing the operative leg underneath the non-operative side. The iliac crest should be included in the operative field to permit extensile exposure if necessary. The non-operative leg should be prepped from the toes to the groin, and then draped to permit full movement of the leg. The ipsilateral side is prepped from the midline above the ASIS to mid-thigh.

B2. Skin incision

The incision is determined using the ASIS and the tip of the greater trochanter as reference points. The starting point for the incision is approximately 2cm distal and 4-6cm lateral to the ASIS. An oblique incision is made slightly lateral to the intermuscular space between the Tensor Fascia Lata (TFL) on the lateral side and sartorius on the medial side. The incision is approximately 2cm more than the estimated cup outer diameter. The fascia overlying the tensor fascia lata (identified by the pink hue) is then incised in line with the muscle fibres.
B3. Muscular dissection
The intermuscular interval can easily be developed by finger preparation in a medial direction until the capsule can be palpated. The muscle must be completely released from the fascia. This preparation should be completed without force to prevent injury to the lateral circumflex femoral artery. Following identification of the artery it should be tied off or utilise electrocautery to minimise blood loss. Use a cob elevator to dissect the fibres of rectus from the underlying anterior hip capsule.

B4. Exposure through capsule
To prepare for exposing the anterior capsule, place three retractors as follows:
1. Superior to the lateral capsule or against the ilium to retract the abductors.
2. Inferior to the femoral neck (large sharp Hohmann)
3. Under the rectus tendon – on top of the anterior acetabular rim in the upper cranial quarter directed to the opposite shoulder. This will avoid injury to the femoral nerve and vessels.

Carry out an anterior-superior capsulectomy. This allows excellent visualisation and femoral mobilisation. Mobilise or excise the capsule from the piriform fossa.
Place the first two retractors inside the capsule for protection when the osteotomy is performed.
B5. Femoral exposure

Place the operative leg in a gentle 'figure of four' position under the opposite leg and knee (as shown above). Adduction and 90 degrees of external rotation are necessary.

Bluntly dissect under the TFL and locate the greater trochanter. Follow the dissecting figure round the anterior and lateral trochanter to ensure no entrapment of posterior soft tissues. Abduct and externally rotate the leg slightly and elevate the femur with a hook to assess the need for posterior soft tissue releasing. The piriformis fossa must be fully exposed. Remove all the capsule.

Lower the end of the table and adduct the hip to aid with femoral exposure.

Note: overly forceful positioning of the leg can result in fracture of the greater trochanter. Some posterior releases are needed in most patients to achieve adequate exposure.

Place two retractors as follows;

1. Under the tip of the greater trochanter (not in the resection of the neck) progressively lift the femur until the osteotomy plane can be reached through the skin incision (double-pronged retractor).

2. On the femur medial to the osteotomy plane (cobra retractor).
MiniHip™ operative summary

a. Intra-operative templating
b. Neck starter awl
c. Curved starter awl
d. Femoral canal preparation
e. Fin templating
f. Finishing broaching
g. Trial reduction
h. Implantation
TriFit TS™ operative summary

a. Femoral neck osteotomy
b. Femoral canal preparation
c. Intra-medullary (IM) reamer
d. Sequential rasping
e. Calcar preparation
f. Trial reduction
g. Stem implantation
h. Femoral head impaction
MetaFix™ operative summary

a. Femoral neck osteotomy  
b. Femoral canal preparation  
c. Femoral punch  
d. Tapered IM reamer  
e. Compaction broaching  
f. Calcar preparation  
g. Trial reduction  
h. Stem implantation  
i. Bone grafting  
j. Femoral head impaction