

Hip Access Using the CROSSTRA[°]C Hip Guide System



As described by:

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Introduction

The anatomy of the hip joint makes arthroscopic access to the hip challenging. Accessing the central compartment of the hip joint, between the acetabulum and the femoral head, involves distracting the hip and establishing two or three working portals.

When accessing the central compartment of the hip joint, the primary portals are the anterolateral portal and the anterior portal. If necessary, a posterolateral portal and other accessory portals can be used to improve access to the hip joint. Establishing the anterior portal typically has been a challenge because its direction is outside of the plane that can be navigated using the image intensifier. The anteroposterior fluoroscopy view can assist in navigating the anterolateral and posterolateral portals.

The evolution of Smith & Nephew's hip access instrumentation has led to the development of the new CROSSTRA[®] Hip Guide System. The system incorporates the arthroscope as part of the aiming device, which helps triangulate accurate trajectories into the hip joint. After the initial portal has been established, the CROSSTRA[®] Hip Guide System can help minimize the number of attempts made to establish additional working portals.

The Principles of Aiming Using the CROSSTRA[®] Hip Guide System

The CROSSTRA[®] Hip Guide System works in both the supine and lateral decubitus positions. It provides accurate needle trajectory positioning across a range of trajectories, aligning the needle in the middle of an arthroscope's field of vision. Position the arthroscope to view the location of the desired needle placement, and the hip system can deliver a reproducible trajectory and assist with first-time entry to that point.

The CROSSTRA[®] Hip Guide attaches to a 4.5 mm or 5.0 mm Smith & Nephew ARTHROGARDE[®] Hip Access Cannula. To ensure an accurate trajectory, a proprietary locking connection hub joins the hip access cannula and the hip guide. A sliding track allows the guide to align to any portal position within the hip guide's range of motion.

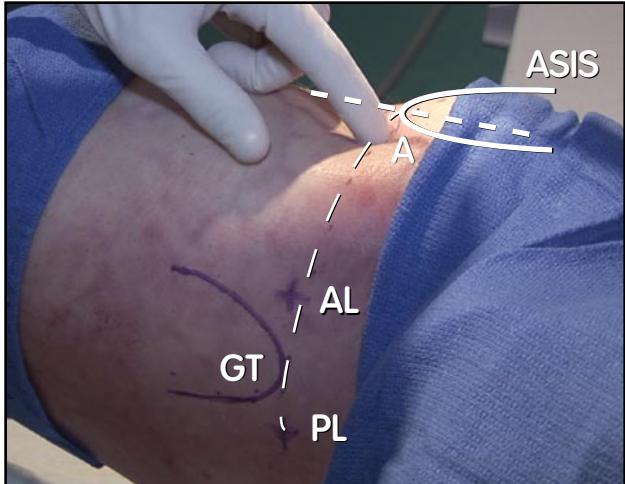


Figure 1



Figure 2

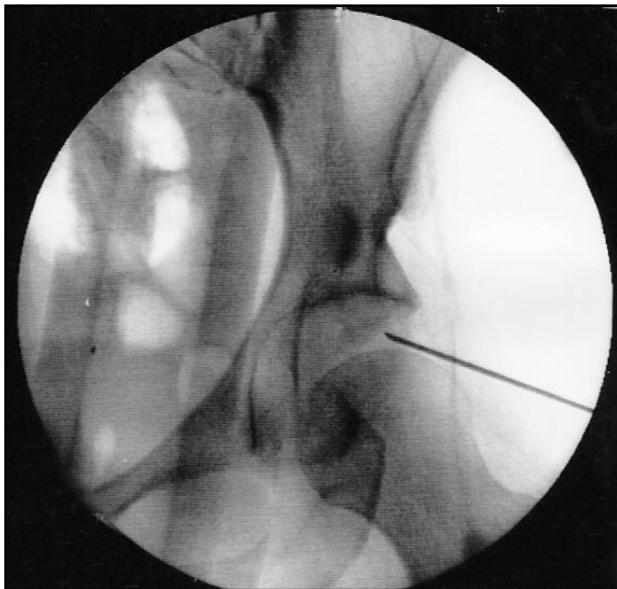


Figure 3

Accessing the Central Compartment Using the CROSSTRAC[°] Hip Guide System

After the patient has been positioned and prepared for hip arthroscopy, apply traction. Identify and mark landmarks to map out the anterior (A) portal, anterolateral (AL) portal and, if required, the posterolateral (PL) portal (Figure 1). The greater trochanter (GT) and anterior superior iliac spine line (ASIS) are also indicated in Figure 1.

Note: Images in this technique guide show the left hip in the supine position using a 70° arthroscope.

Note: To prevent injury to the femoral neurovascular bundle, do not establish any portal medial to a line drawn caudally from the ASIS.

Establishing the Anterolateral Portal

Align the trajectory into the hip joint using fluoroscopy and an arthroscopy needle which has been placed on the skin surface. This will indicate the direction to follow into the hip joint from the anterolateral portal (Figures 2 and 3).

Following the trajectory demonstrated by the fluoroscopy image with the needle on the skin, insert an arthroscopy needle into the anterolateral portal until it penetrates the hip capsule (Figure 4). Use fluoroscopy to verify access to the hip joint. Slowly advance the needle tip through the tough capsule tissue, with the needle tip's bevel suitably rotated in order to avoid injury to the acetabular labrum and femoral head.

Note: To avoid injury to the articulating joint surfaces, do not hit the acetabulum with the needle after penetrating the hip capsule.

When the needle is properly positioned in the hip capsule, remove the arthroscopy needle stylet, and insert a Nitinol guide wire (Figure 5).

The acetabulum can be palpated with the blunt tip of the guide wire to confirm intra-articular position. Remove the guide wire from the needle and distend the hip joint with 30–40 cc of saline solution to increase separation between the femoral head and the acetabulum. Reinsert the guide wire in the needle after hip distention. Remove the needle, leaving the guide wire in place.

Make an incision at the point where the guide wire enters the skin prior to introducing the ARTHROGARDE® Hip Access Cannula – Cannulated Obturator assembly (Figure 6).



Figure 4

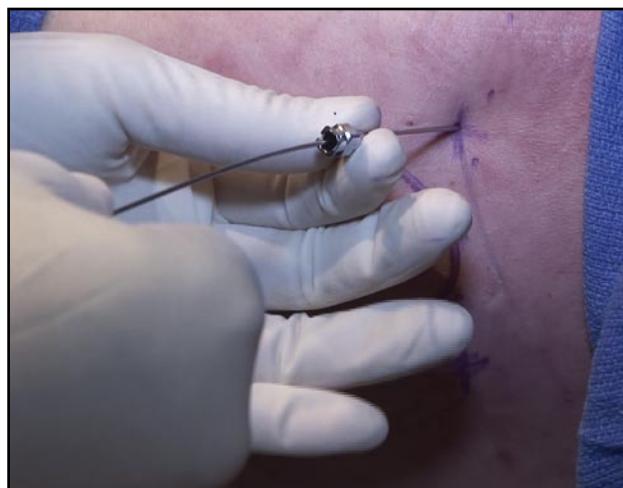


Figure 5

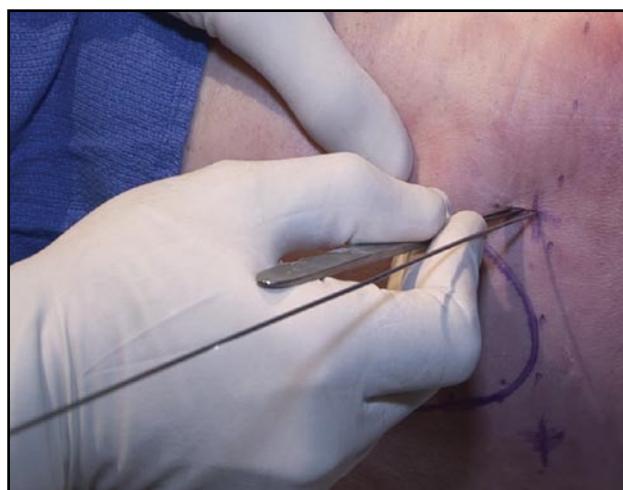


Figure 6

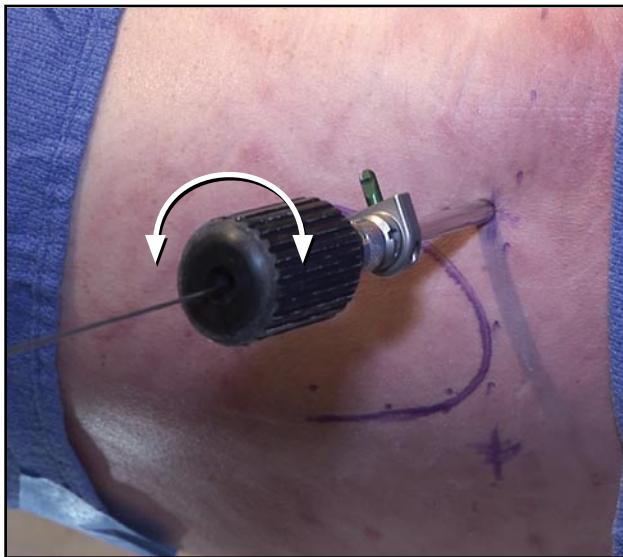


Figure 7

Introduce a 4.5 mm or 5.0 mm hip access cannula with cannulated obturator over the guide wire. Advance the cannula slowly through the capsule and into the joint using a rotatory motion to avoid uncontrolled penetration of the hip capsule (Figure 7).

While inserting the cannula and obturator, pull back slightly on the guide wire to prevent inadvertently advancing the guide wire, causing kinking and bending of the guide wire.

Connect the scope to a hip irrigation extender. Attach the scope to the implanted cannula (Figure 8). Perform a visual inspection of the hip joint, flushing as needed to achieve a clear view of the femoral head, joint capsule, and acetabular labrum (Figure 9).



Figure 8

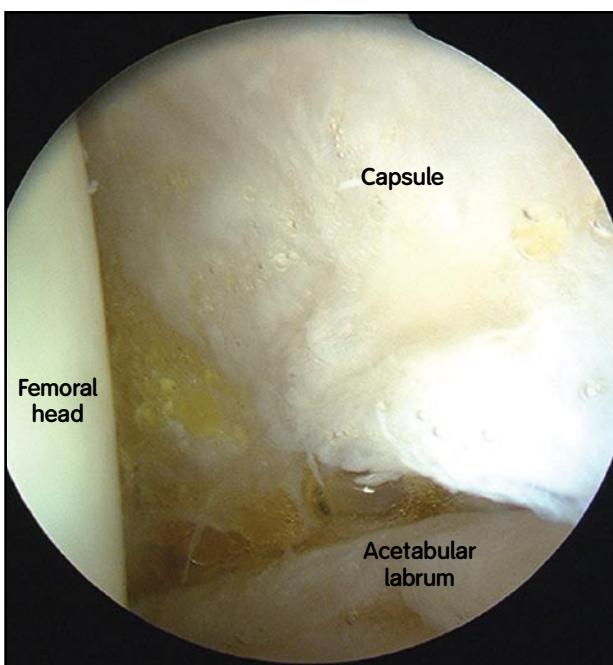


Figure 9

Establishing the Anterior Portal Using the CROSSTRA[®] Hip Guide

1. Attach the CROSSTRA[®] Hip Guide to the implanted ARTHROGARDE[®] Hip Access Cannula (Figure 10).
 - a. Align the hip guide prongs with the associated holes on the connection hub on a 4.5 mm or 5.0 mm hip access cannula (Figure 11).
 - b. Push hip guide prongs into the cannula holes until they lock into place. Feeling the prongs lock verifies proper attachment (Figure 12).



Figure 10

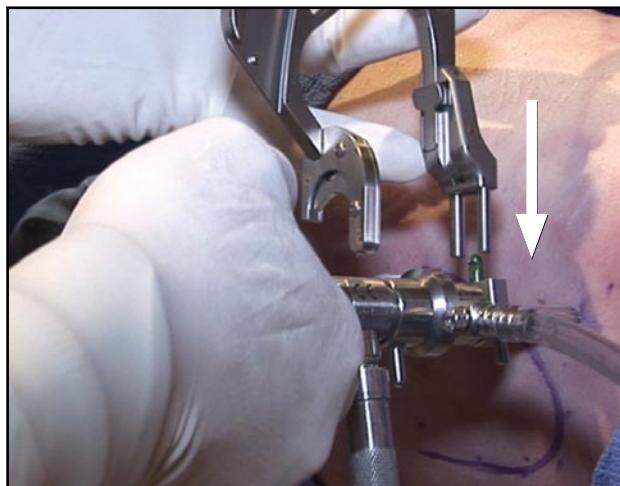


Figure 11



Figure 12

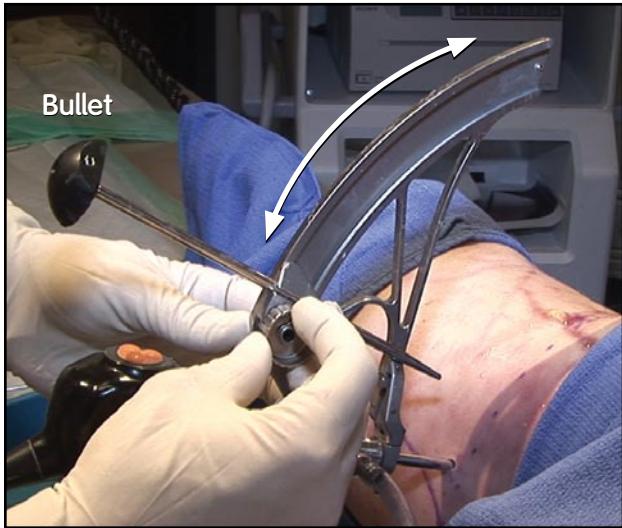


Figure 13

2. Adjust the hip guide to the desired portal position.
 - a. Following the skin landmarks, make a skin incision at the preferred entry point for the anterior portal.
 - b. Insert the bullet into the hip guide and align the bullet to the skin incision by sliding the bullet along the guide's arc (Figure 13).
 - c. Firmly lock the bullet position by turning the locking knob clockwise (Figure 14). This ensures that the bullet alignment will be maintained when establishing trajectories into the hip joint.



Figure 14

- d. Position the arthroscope's distal tip so that:
 - i. It is pulled as far proximal as possible while still within the joint to give the widest field of view (Figure 15).
 - ii. The center of view of the joint space shows the point where the new portal is desired (Figure 18).
- e. Insert the bullet into the incision and advance the bullet until the black knob is flush against the stainless steel guide (Figures 16 and 17).

3. Locate the anterior triangle arthroscopically: the superior margin is the capsule; the inferior margin is the femoral head; the base is the lateral limit of the field of view (Figure 18).

The anterior hip capsule, inside the anterior triangle, should be in the center of the field of view. This should be the entry point of the needle.



Figure 15



Figure 16



Figure 17

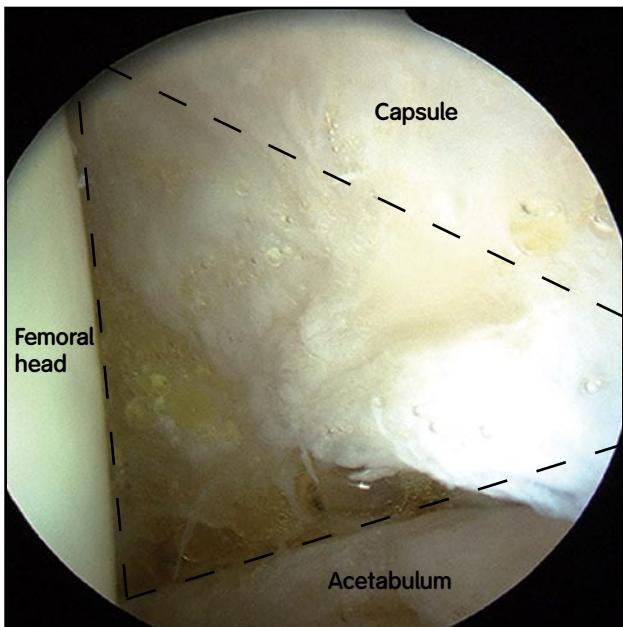


Figure 18

4. Insert the XL (extra-long) arthroscopy needle into the cannulated bullet (Figure 19).
 - a. Rotate the needle's stylet to align with the beveled needle tip, thus easing tissue penetration.
 - b. Rotate the needle so that the bevel is facing the femoral head, thus minimizing the potential for tissue damage.
 - c. Slowly advance the needle through the capsule until the "tenting" of the capsule is visible through the arthroscope (Figure 20). If repositioning is desired, the needle and bullet can be retracted slightly, the guide shifted, then the needle and bullet advanced once again.

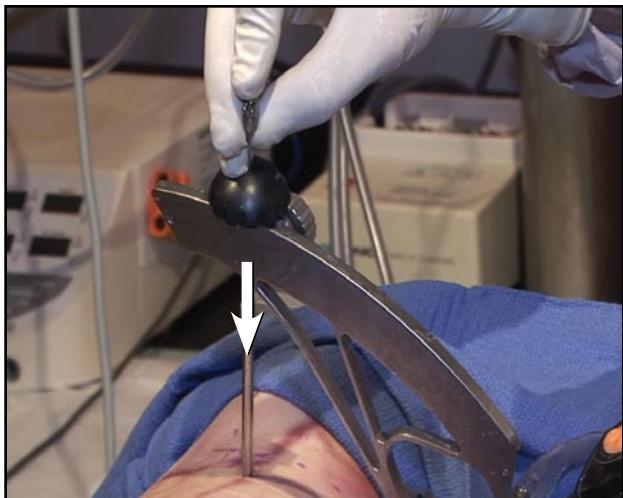


Figure 19

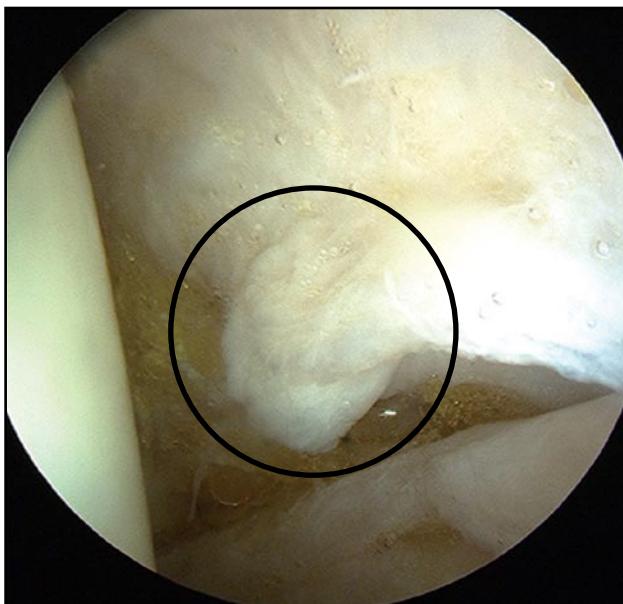


Figure 20

- d. Once the needle is positioned as desired, push the needle through the capsule into the central compartment (Figure 21).
 - e. Once into the compartment, remove the stylet from the needle.
 - f. Insert a Nitinol guide wire.
5. Remove the needle and cannulated bullet, leaving the implanted guide wire in place.
- a. When removing the needle and cannulated bullet, hold the guide wire at the skin incision as the bullet and needle are removed to ensure that the guide wire remains in the portal (Figure 22).
 - b. Remove the hip guide from the implanted guide wire utilizing the slot on the side of the guide.
 - c. Detach the guide from the hip access cannula by depressing the unlock lever (Figure 23).
 - d. Remove the hip guide from the cannula connection hub (Figure 23).



Figure 21



Figure 22

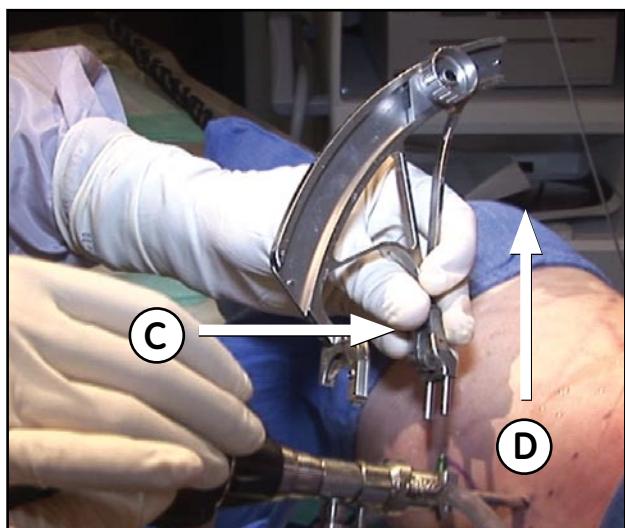


Figure 23

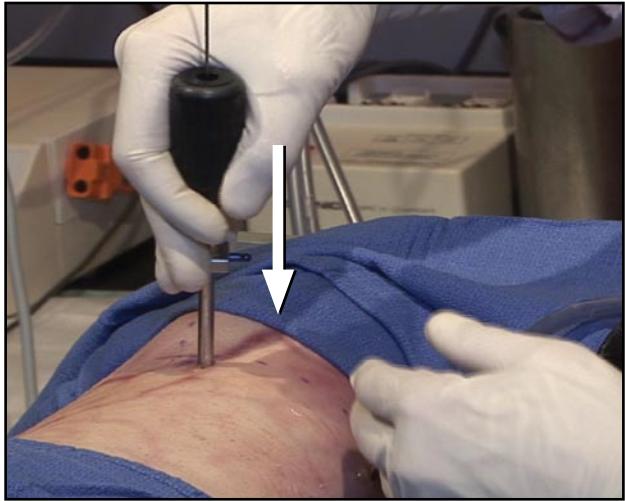


Figure 24

6. Insert the hip access cannula.

- Advance the hip access cannula and cannulated obturator over the guide wire (Figure 24).

Note: Take care not to advance the guide wire while advancing the cannula and cannulated obturator.

- Remove the guide wire and cannulated obturator, leaving the hip access cannula in place (Figures 25 and 26). Note the rounded edges of the cannula, which help protect against tissue damage (Figure 25).

Alternatively, advance a cannulated switching stick and dilator over the guide wire. Introduce a slotted cannula over the guide wire, switching stick, and dilator assembly. Remove assembly, leaving the slotted cannula in position for instrument introduction.

- Repeat steps as necessary to establish additional accessory portals.



Figure 25



Figure 26

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Additional Instruction

Prior to performing this technique, consult the Instructions for Use documentation provided with individual components, including indications, contraindications, warnings, cautions, and instructions.

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Endoscopy Division

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