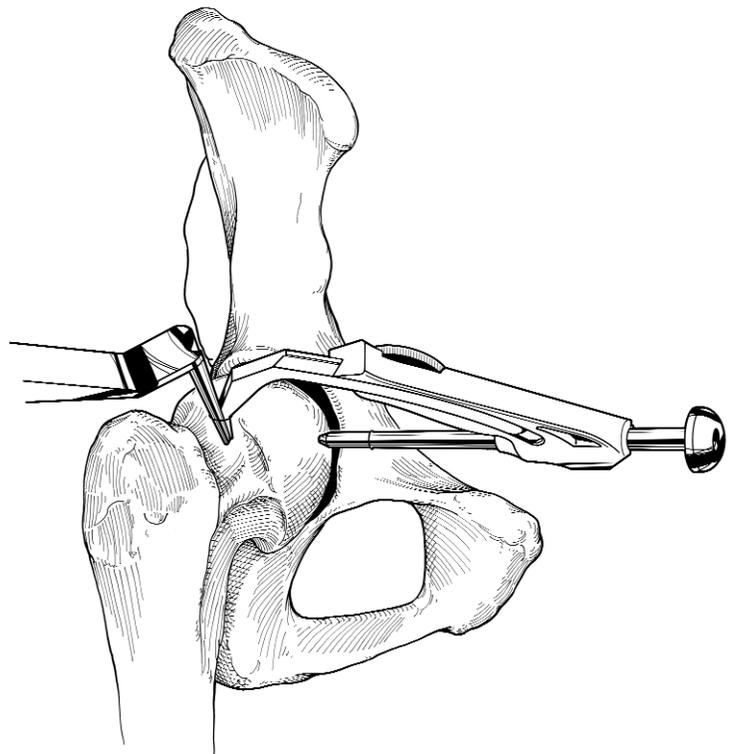


Hip arthroscopy using the Smith & Nephew Hip Access System

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While hip arthroscopy has become a standard surgical procedure, one of the biggest challenges of this technique continues to be the ability to gain access to the hip joint.

For example, the use of an anterior portal is well-justified to gain access to structures located medially and anteriorly inside the hip joint; yet the ability to quickly and accurately place the anterior portal has relied on the use of fluoroscopy and the surgeon's learning curve. Repeated attempts to create this portal can cause iatrogenic damage to the femoral head articular cartilage and increase overall traction time.

The Smith & Nephew Hip Access System is designed to provide a simple and reproducible hip arthroscopy technique for the surgeon and operating room personnel. The five instruments in the Hip Access System facilitate rapid and safe portal creation, exchange, and instrument passage. The system also includes a guide for accurate placement of the anterior and other auxiliary portals. In most cases, the guide will allow the surgeon to create the anterior portal without fluoroscopy. It will also reduce the number of attempts required to gain access, thereby reducing the risk of iatrogenic damage to the femoral head articular cartilage, risk of injury to the femoral lateral cutaneous nerve, and overall traction time.

The instruments in the Hip Access System are used with standard length 4.0 mm arthroscopes and their respective cannulae. At least two 17-gauge arthroscopic needles and two Nitinol guide wires are also required.

- The Smith & Nephew Cannulated Switching Stick advances over the Nitinol guide wires to provide access into the hip capsule.
- The Smith & Nephew Portal Enlarger advances over the cannulated switching stick and enlarges the diameter of the arthroscopic portal. The switching stick and portal enlarger may also be advanced simultaneously, depending on the tightness of the joint.
- The T-Handle is designed to advance the cannulated switching stick and the portal enlarger into the hip joint. The T-Handle provides a firm grip to push the instruments into the joint, as well as the rotational torque needed to facilitate access.
- The Smith & Nephew Pistol Grip Slotted Cannula slides over the portal enlarger and allows straight or curved working instruments to be passed into the joint.
- The Hip Director Guide is an aiming guide that provides an intra-articular reference to pinpoint the entrance of the needle to the anterior portal. The Hip Director Guide has three key components: an intra-articular aimer with a reference point at its tip, a handle with an integrated sliding arch that directs a needle towards the aimer, and a cannulated bullet attached to the sliding arch for passage of a needle. Once the aimer is in place, the sliding arch provides a 25° range of adjustment (from 40° to 65°) to the bullet in reference to the aimer, allowing adaptation to the anatomic configuration of individual patients (Figure 1).

Hip Access System

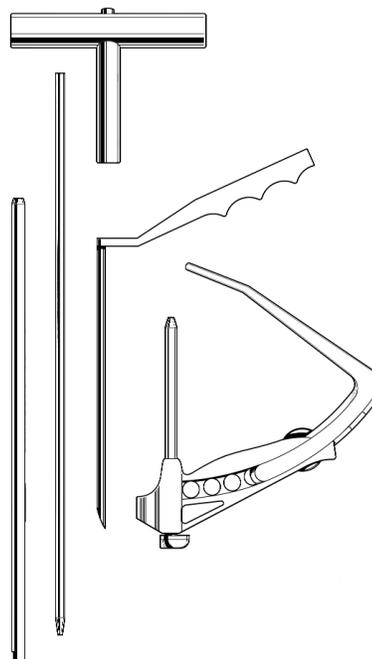


Figure 1

Patient Preparation and Positioning

Position the patient laterally or supine on a fracture table. Affix a traction device to the operative leg at the foot. Position an image intensifier to provide an anteroposterior image of the operative hip. Prepare and drape the surgical area in the standard fashion, then apply traction.

Palpate the greater trochanter and the Anterior Superior Iliac Spine (ASIS) under the skin and mark them with a skin marker.

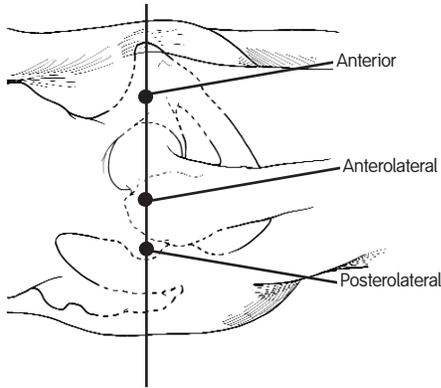


Figure 2

Portal Location

Three standard portals are utilized for hip arthroscopy: Anterolateral (AL), Posterolateral (PL), and Anterior (Figure 2).

The site of the anterior portal coincides with the intersection of a sagittal line drawn distally from the anterior superior iliac spine and a transverse line across the superior margin of the greater trochanter. The direction of this portal courses approximately 45° cephalad and 30° toward the midline. The AL and PL portals are positioned directly over the superior aspect of the trochanter at its anterior and posterior borders.

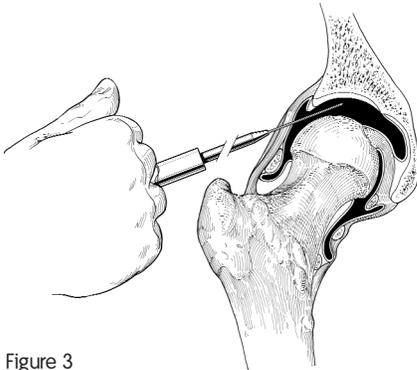


Figure 3

Anterolateral Portal Establishment

Establish the AL portal first. It is located at the superior-anterior corner of the greater trochanter. Introduce an arthroscopic needle into the skin at the AL portal site and guide it into the distracted hip joint using fluoroscopy. Remove the stylus from the needle and place a Nitinol guide wire through the needle and into the joint. Remove the arthroscopic needle.

Mount the cannulated switching stick in the T-Handle by aligning the guidelines and pass the assembly into the joint using the Nitinol guide wire (Figure 3).

Once the tip of the cannulated switching stick is inside the joint, remove the Nitinol guide wire and the T-Handle. Insert a standard arthroscopic cannula into the joint over the cannulated switching stick (Figure 4). Remove the switching stick and place the arthroscope inside the joint.

Posterolateral Portal Establishment

Establish the Posterolateral portal (PL) second. It is located at the superior-posterior corner of the greater trochanter. The sciatic nerve lies 2 to 3 centimeters posterior to this portal. External rotation of the hip should be avoided at this point because it moves the greater trochanter closer to the sciatic nerve. Introduce the arthroscopic needle at the PL site and direct it into the hip joint using direct visualization or fluoroscopy.

The arthroscopic needle in the PL portal can be used to detect fluid outflow, confirming entrance into the joint. Use the arthroscope in the AL portal to confirm proper placement by directly viewing the site of the needle. Once the needle location is confirmed, pass a Nitinol guide wire through the needle.

Using direct visualization, establish the PL portal by passing the cannulated switching stick mounted on the T-Handle over the guide wire. Remove the guide wire and transfer the T-Handle from the switching stick to the portal enlarger. Using the T-Handle, introduce the portal enlarger into the joint over the cannulated switching stick.

Note: The cannulated switching stick and portal enlarger may be advanced simultaneously depending on the tightness of the joint.

Remove the T-Handle and cannulated switching stick from the portal enlarger.

With the portal enlarger in place, pass the pistol grip cannula into the joint (Figure 5). Remove the portal enlarger. The pistol grip cannula is used for instrument passage.

The AL portal is now the viewing portal and the PL portal is now the working portal.

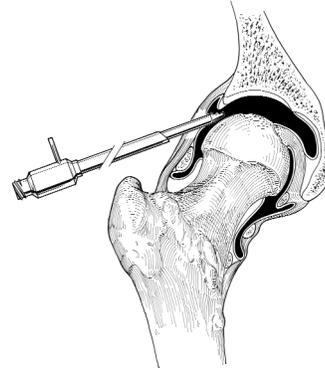


Figure 4

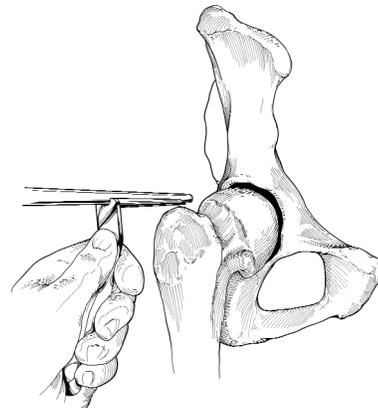


Figure 5

Shifting the PL and AL Portals

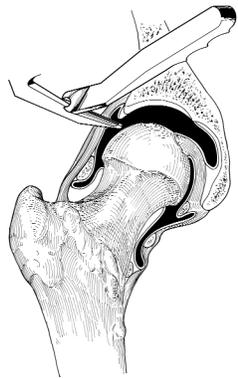


Figure 6

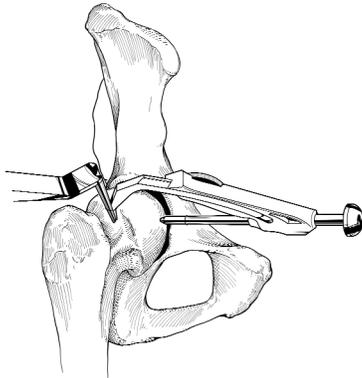


Figure 7

To shift portals – viewing portal to PL and working portal to AL – follow these steps:

1. Use the pistol grip cannula to pass the cannulated switching stick into the joint at the PL.
2. Remove the pistol grip cannula and pass it over the arthroscopic cannula at the AL portal and into the joint.
3. Use the arthroscope to confirm the position of the pistol grip cannula and then remove the arthroscope from the AL portal.
4. Remove the arthroscopic cannula from the AL portal and place it in the PL portal over the cannulated switching stick. The pistol grip cannula remains at the AL portal.
5. Remove the cannulated switching stick and insert the arthroscope into the arthroscopic cannula at the PL portal.

The PL portal is now the viewing portal and the AL portal is now the working portal (use the same technique to shift the portals back if necessary).

Establishing the Anterior Portal

To place the Smith & Nephew Hip Director Aimer into the joint, the viewing portal must be the PL. Pass the Hip Director Aimer into the joint using the pistol grip cannula at the AL portal and direct it towards the anterior hip capsule. Insure the tip of the aimer is under the anterior labrum to avoid perforation (Figure 6). Externally, calibrate the sliding arch so that the bullet does not pass medially beyond the ASIS (the femoral nerve, vein, and artery lie beyond this line). Make a mark on the skin at the point where the bullet will enter; this will be the anterior portal site. Make a small incision on the skin, followed by blunt deep dissection; pass the bullet fully into the incision. The bullet directs the needle into the joint, safely creating an anterior portal (Figure 7).

Note: Particular care must be taken to avoid the labrum in patients with hip dysplasia who have a thick or inverted labrum.

References

- 1) Glick JM, Sampson TG, Gordon RB, Bher JT, Schmidt E: Hip arthroscopy by the lateral approach. *Arthroscopy* 1987; 3:4-12.
- 2) Byrd JWT, Pappas JN, Pedley MJ: Hip arthroscopy: an anatomic study of portal placement and relationship to the extraarticular structures. *Arthroscopy* 1995; 11:418-423.
- 3) Ilizaliturri Jr.VM, Valero FS, Chaidez PA, Aguilera JM. An aiming guide for anterior portal placement in hip arthroscopy. *Arthroscopy* 2003; 19: E-77.

Additional Instruction

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

Courtesy of Smith & Nephew, Inc.,
Endoscopy Division

Caution: U.S. Federal law restricts this device to sale by or on the order of a physician.