

## SUPERIOR APPROACH FOR HIP IMPLANT SURGERY

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There are three guiding principles of surgery: 1) careful control of bleeding, 2) protection from infection, and 3) gentleness of handling tissue. The purpose of any surgical exposure is to ensure not only the best and safest surgical result but also the best recovery. It was with this purpose in mind that I spent many hours with John M. Clark, MD, PhD (1948-2015) reviewing CT scans of the hip and pelvis, as well as performing surgery to find the ideal pathway to the hip.

There are three approaches used commonly for hip implant surgery – anterior, lateral, and posterior. Dr. Clark, a gifted surgeon, also held a PhD in anatomy. As a result of our research, we discovered a fourth approach for hip implant surgery now known as the **superior** approach. Initially, we used this approach for procedures involving only the femur, such as partial hip replacements for fractures and femoral-only hip resurfacings. By extending the incision distally, we found we could also access the acetabulum easily. It is now possible to use this superior approach for essentially all hip implant procedures.

After presenting this approach at meetings and conferences for a number of years, it was formally named and published as the “**superior**” approach in 2004. Its main advantage is a more gentle approach. After placing the patient in a side-lying position (a common sleeping position) (Fig. 1), an incision is made in direct line with the femur in an area where there is little muscle (Fig. 2).

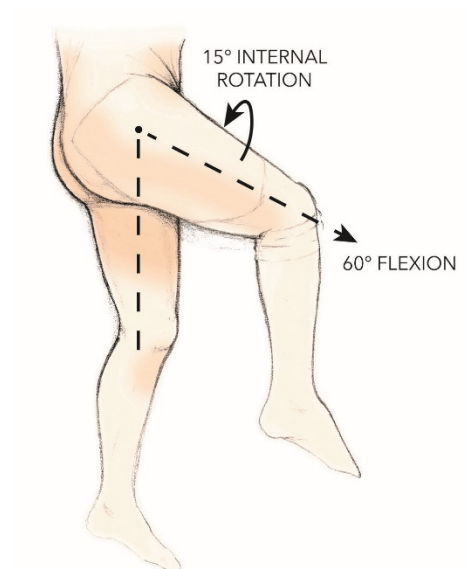


Figure 1

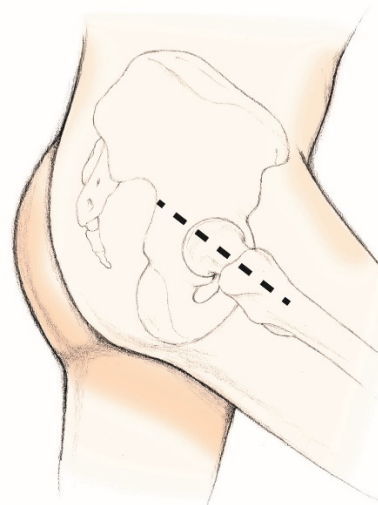


Figure 2

The top of the hip capsule (Fig. 3) is opened and the only deep structure I need to release (cut) is the piriformis tendon, which I repair during closure of the incision.

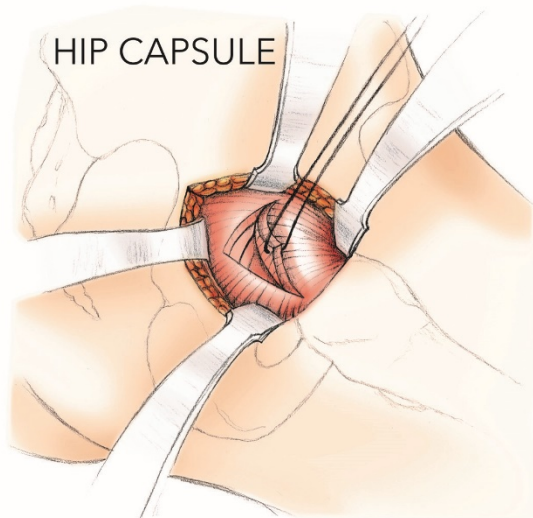


Figure 3

The incision is made long enough to place both components of a hip implant. The femur is prepared from the top down while the acetabulum is prepared from the bottom up. Although the implant components could be placed using two small incisions, we found overall better healing when only one incision was made.

#### Comparison to Other Approaches (Fig. 4)

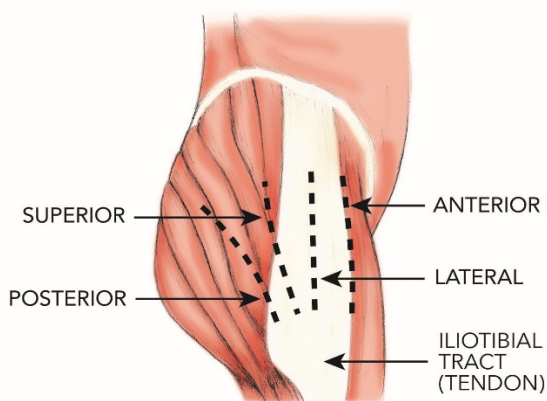


Figure 4

The **anterior** approach results in a very stable hip and is an excellent approach. I have used this more than any other approach during my career performing total hip replacements. In the past we used very small femoral heads (22 - 32 mm) for hip replacement procedures and the anterior approach for these cases helped prevent postoperative dislocations. Now we rarely use an implant with a femoral head size smaller than 36 mm and some designs allow for natural size femoral heads (44 - 50 mm). However, there is more blood loss with the anterior approach and the incision is cosmetically less acceptable. There can also be numbness on the front and side of the thigh following the anterior approach, because the lateral femoral cutaneous nerve is in the path of that approach. Most surgeons use a Hana<sup>®</sup> table for these procedures and put the leg in strong traction to assist pulling the hip out of joint. A gentler surgical approach would eliminate the need for a traction table.

The **posterior** approach allows for excellent exposure during surgery but requires postoperative restrictions on the patient in the weeks following surgery to allow for adequate soft-tissue healing. The posterior approach has been the most popular, because it requires no special equipment during surgery and the incision is less visible, making it more cosmetically appealing. However, the posterior approach does occasionally permit postoperative dislocation.

The **lateral** approach results in a stable hip and there are no issues with thigh numbness. A traction table is not necessary and the surgeon can sit during surgery. There is usually a temporary limp following surgery and this approach is not popular in the United States because of this concern.

Originally, the superior approach was called the "burglar" approach (suggesting the surgeon found his way into your hip unnoticed). The **superior** approach requires careful and complete knowledge to find the subtle and delicate muscular seam (Fig. 4). It took Dr. Clark and me years to work out the nuances and clues necessary to find this path consistently, despite the variation in patients' muscular anatomy.

Now, with care, I can always find this gentler, less traumatic route. The superior approach now is the Northwest Passage into the hip.

A Mayo Clinic study published in 2016 introduced a new concept for surgical approaches using tissue sensors. They documented that surgical trauma must also include stretch and traction as well as direct the direct trauma of surgical incision. A small incision with traction and stretch was found more traumatic than careful extensile exposure

No postoperative restrictions are needed for the superior approach and blood loss is minimal, eliminating the need for transfusion. In addition, postoperative dislocations are very rare. The **superior** approach is not for the occasional hip surgeon, as it requires precision and extensive experience. A trained assistant and special retractors are also needed for the procedure. However, manipulating the hip during surgery is gentle and precise, and eliminates the need for a traction table.

We look at the healing of the superior approach using MRI scans and found the fine seem healed well (Fig. 5).

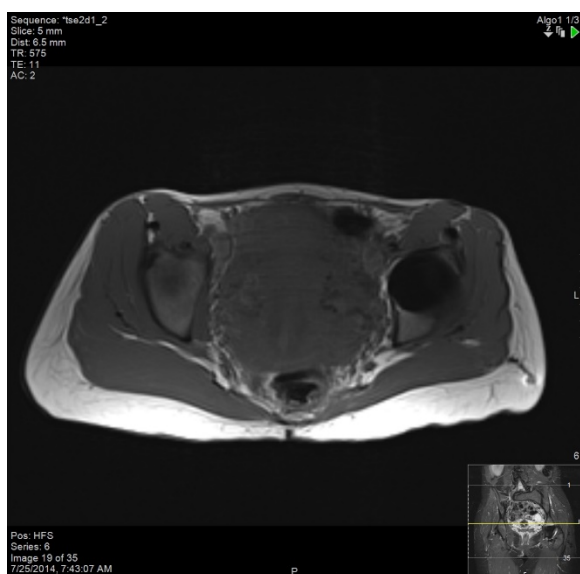


Fig 5

By comparison to the anterior approach the superior approach had a faster Time Up and Go

(TUG) test, less blood loss and no incidence of lateral femoral cutaneous nerve injury.

All of these approaches are reasonable options and none results in any significant muscle damage. All approaches today allow for early return in function and hip implant surgery is moving from the hospital to the ambulatory setting.

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