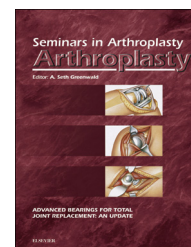


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A “Modern” posterior approach: “The Back Is Back”

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ABSTRACT

In recent years the direct anterior approach (DAA) to total hip arthroplasty has gained in popularity. This increased interest in the DAA took place at a time when surgeons using a traditional posterior approach were struggling with dislocation risks and slowed recovery due to now outdated, and largely abandoned, techniques combined with older style implants. However, at the same time that the DAA gained in popularity, the standard posterior approach was also being modified. It has been adapted to work with newer instrumentation and modern cementless implants which also offer an expanded array of sizing and dimensioning versatility. We present a contemporary, iliotibial band sparing, minimally invasive posterior approach that we believe achieves the same degree of soft tissue preservation, with similar early recovery benefits as compared to the DAA. This highly modified posterior approach offers a lower risk profile and the potential for stepwise adoption and a surgeon controlled learning curve.

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1. Introduction

1.1. A modern perspective on total hip arthroplasty

The total hip arthroplasty (THA) of today has become very different than when it was described by Sir John Charnley in the 1960s or when it underwent modifications in the 80s and 90s. THA is being performed with increasing frequency, and when compared to other surgical procedures, a high degree of reliability. Given the increasing reliability, both surgeons and patients alike expect every aspect of the procedure to be performed to perfection. With this in mind, the ideal procedure is one that is safe, reliable, reproducible and which minimizes blood loss, operative time, costs, and complications. In addition, the procedure should be as minimally invasive as possible, while still allowing for sufficient access to both the femur and the acetabulum. Additionally, the ability to extend the approach in cases when this needed is

ideal in the event of intraoperative complications. All of these goals should be achieved while minimizing postoperative pain and improving early functional outcomes. Although it is a high bar, these results appear achievable with today's operative techniques. We believe that any surgical approach to THA should take all these factors into account while appropriately weighing the risks of complications versus possible benefits.

1.2. A modern approach to total hip arthroplasty

Just as there are modern expectations, there are modern approaches for THA. For many years, the standard THA approach has been the traditional posterior approach initially described by Dr. Bernhard von Langenbeck in 1874 and modified by Dr. Emil Kocher and later by Dr. Austin Moore [1]. In recent years the direct anterior approach (DAA) has been resurrected. This technique of gaining access to the hip joint

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was originally described by orthopaedic surgeons such as Drs. Carl Hueter in 1881, Marius Smith-Peterson in 1939, and the Judet brothers in the 1900s. It was never originally conceived as a technique for placing intra-medullary femoral components, but has been adopted as a novel, tendon sparing approach for THA [1]. During the decade long popularization of the DAA, there has been a growing debate regarding which approach to THA leads to superior outcomes. This discussion has become more intensified with claims of dramatic improvements of outcomes and safe same-day hip arthroplasty in the lay press regarding the anterior approach [2,3]. There is a general perception that may in part be promoted by the device industry that the DAA is a superior minimally invasive THA procedure. This perception is further promoted in direct to consumer marketing via websites, print ads, billboards, and media featured patient testimonials. These types of promotional activities, however, typically do not mention published risks or clearly documented clinical advantages [4].

As the DAA and its complications are becoming better understood, the classic posterior approach initially described by Drs. Langenbeck, Kocher, and Moore has been abandoned by many surgeons in favor of a tendon sparing posterior approach that resembles the original posterior approach only in the fact that femoral preparation occurs posterior to the iliotibial band (ITB) and gluteus medius in a more intuitive and anatomically precise location directly in line with the femoral axis. This critical point is often overlooked when reviewing data on the DAA versus a “posterior” approach. Instead, the DAA is often compared to the traditional posterior approach or a “mini-posterior” or short incision version of the traditional approach. In these posterior approaches all the external rotators to the hip are released and the ITB is incised [5-7]. Just as the DAA has become a modified version of the anterior approach described by Drs. Hueter, Smith-Peterson, and the Judet brothers, the posterior approach has been modernized to be less invasive in many of its iterations.

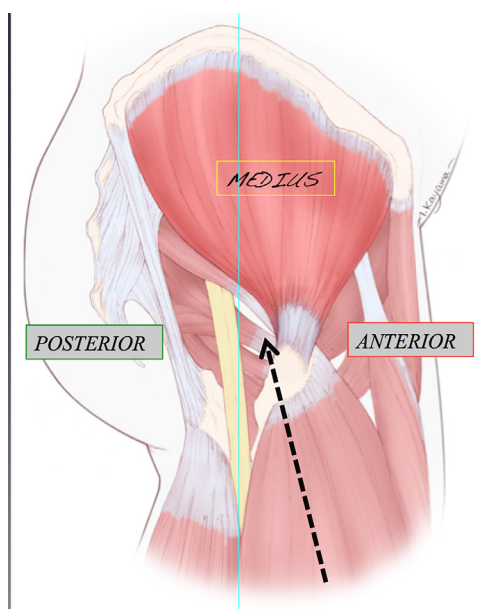


Figure 1 – The location of the posterior approach compared to the anterior approach relative to the gluteus medius.

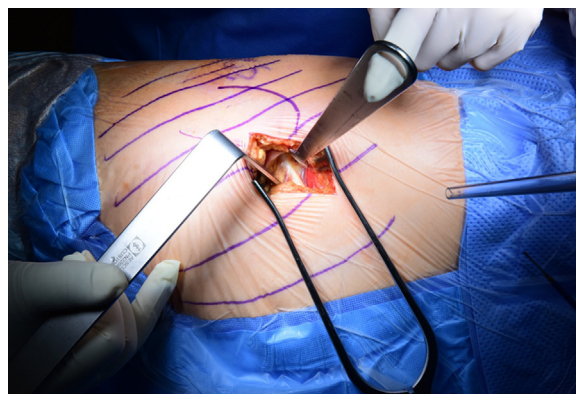


Figure 2 – Exposure of the piriformis and short external rotators seen through a gluteal window. Note that the incision is proximal to and does not extend into the iliotibial band.

2. A Modern Posterior Approach

2.1. Soft tissue approach

As opposed to the classic posterior approach, we have pursued a minimally invasive transgluteal, ITB sparing highly modified posterior approach (Fig. 1). The incision involves the proximal part of the classic posterior approach without extension distally into the ITB. The incision begins at the posterior corner of the greater trochanter, and is carried proximally in line with the fibers of the gluteus maximus. Care is taken to avoid any violation of the ITB. The gluteus maximus muscle is teased apart in line with its fibers, and the piriformis and conjoined tendon are identified beneath this as they insert into the greater trochanter (Fig. 2). In this “modern” posterior approach, only these tendons are released at their insertion, and they are repaired at the conclusion of the case along with the preserved superoposterior capsule. The ITB, quadratus femoris, obturator externus, and gluteus maximus are preserved. In the senior author’s favored version, a percutaneous portal is used for reaming the acetabulum, impacting the acetabular cup and drilling for and inserting acetabular screws. The unique value of the portal is that it keeps the soft tissue dissection minimal while retaining adequate angular access to the acetabulum [8-10]. Others have suggested that a modified set of retractors with offset instrumentation and angled reamers can also be used while working through the same soft tissue window [9,11].

2.2. Femoral preparation

Once the piriformis and conjoined tendons are released, a capsulotomy is performed beginning at the base of the greater trochanter and continued along the axis of the neck. An initial segmental neck cut is then made. A central, mid-neck, napkin ring segment is removed. The remaining head segment can then be removed and traditional surgical dislocation is avoided. Some authors have suggested that this may preserve the integrity of the surrounding soft tissue and

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