DIRECT ANTERIOR APPROACH

MINIMIZING RECOVERY.
MAXIMIZING RESULTS.

MATTHYS ORTHOPAEDIC CENTER
CENTER FOR MINIMAL INVASIVE JOINT SURGERY

2301 25TH STREET SOUTH
FARGO ND 58103

701-241-9300
(TOLL FREE) 866-887-9300

WWW.JOINTPAIN.MD
INTRODUCTION:

One of the major concerns among patients who will be having joint replacement is the length of recovery after surgery. Complete recovery after a traditional hip replacement can take up to twelve months. There has been a general trend in all of orthopaedics to try to decrease this recovery time and keep patients active. The clearest way to facilitate a speedy recovery is to create less trauma to the hip during surgery. This is the basis of minimally invasive surgery (MIS). Not all MIS techniques are the same.

MIS for hip replacement can be performed using many different techniques. The Direct Anterior Approach (DAA) technique is the most unique and is the least commonly used MIS approach. Dr. Matthys started using this approach in 2002 and has been involved in more than 2500 hip replacements using this approach. Dr. Matthys is considered one of the nations most experienced minimally invasive surgeons. He is a consultant for the orthopaedic industry to teach other surgeons the Anterior hip replacement technique. Nearly every patient who meets the criteria for a hip replacement is a candidate for this technique and is the preferred approach used by Dr. Matthys.

Though rarely used in the United States, the direct anterior approach for total hip replacement provides advantages for the patient. The major benefit of the DAA over other MIS techniques is that no muscles are violated, split or taken off the bone. Rehabilitation is generally easier and quicker. After surgery there are no restrictions in the position of the hip and there is no need for specialized seats or equipment. Dislocation risk is reduced because no muscles are cut from the bone. Leg length is more accurately controlled, and the incision is small. It can be used for almost all patients requiring primary hip replacement, including patients with arthritis in both of their hips. MIS is an exciting area in orthopaedics that has a promising future.

TRADITIONAL TOTAL HIP REPLACEMENT (THR):

For nearly a century, doctors have been putting various materials into diseased and painful hip joints to relieve pain. The first hip replacement was performed in 1894 using Ivory as the femoral head. Following this, multiple materials and changes in techniques have evolved. Sir John Charnley is considered the Father of Modern hip replacement. In the 1960’s he was the first to use a plastic liner on a metal ball, which has evolved into the gold standard in today’s joint replacements.

Most of the focus for the past 20 years has been on finding ways to fix the implants to the bone. The implants used today have a high success rate. New implants and techniques continue to evolve. The success rate at 10 years for current implants is nearly 90%. Today, hip replacement surgery is one of the most successful operations in all of medicine.
The current controversies in the field of hip replacement are the type of surfaces used to replace the ball and socket (metal, ceramic or plastic) and which is the best way to access the hip (anterior, posterior, anteriolateral or a combination 2-incision) and what the benefits are of using computer to assist in the surgery. There has also been a growing interest in surface replacement; an evolving technique that has some advantages and limitations (see Surface Replacement Handout).

**FACTS ABOUT TOTAL HIP REPLACEMENT:**

- Approximately 300,000 hip replacements are performed in the U.S. each year.
- 64 percent of hip replacement patients are women.
- 54 percent of hip replacement patients are between 40 and 64 years of age.
- 90 to 95 percent of hip replacements are successful for up to 10 years.
- Younger, more active patients are now receiving hip replacements and are demanding high-technology implants that will last longer and support their active lifestyles.

**REVIEW OF SURGICAL APPROACH TECHNIQUES:**

Sir John Charnley’s original description of THR involved cutting of normal healthy bone in order to access the hip. This is no longer used today for patients undergoing first time hip replacement. The hip joint is covered and surrounded by many muscles, nerves and blood vessels. The way a surgeon obtains access to the hip joint and navigates around these important structures is determined by the surgical approach. The 4 main techniques to gain access to the hip are:

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>LOCATION OF INCISION ON THE HIP</th>
<th>Approximate % of North American Surgeons using the Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>POSTERIOR</td>
<td>BACK</td>
<td>60%</td>
</tr>
<tr>
<td>ANTERIOLATERAL</td>
<td>SIDE</td>
<td>35%</td>
</tr>
<tr>
<td>DIRECT ANTERIOR</td>
<td>FRONT</td>
<td>&lt;2%</td>
</tr>
<tr>
<td>2 INCISION</td>
<td>FRONT AND SIDE</td>
<td>Data not available</td>
</tr>
</tbody>
</table>
The different types of approaches all have advantages and limitations. The only true muscle sparing approach is the direct anterior. The other 3 involve cutting or the splitting of muscle which can cause more pain after surgery and slow the recovery process. More importantly the detachment of muscle can cause weakness of the hip and/or put the artificial hip at risk for dislocation (ball and socket disengagement).

**The Direct Anterior Approach - A Muscle Sparing Philosophy**

The DAA approach is an alternative to the more traditional posterior or lateral approach. The basic premise for the DAA is to work around the muscles and tendons and not detach them. The muscles in the front (anterior) of the hip go from top to bottom. It is therefore easy to separate them and work between them. The muscles in the back of the hip run side-to-side (transversely) and need to be cut through or detached to access the hip joint.

Keeping the muscles intact spares the healing process that would need to take place and also helps prevent the dislocation.

**Muscles Overlying the Front of the Hip**

**History of Anterior Approaches to the Hip**

Smith and Petersen were two orthopedic surgeons in the early 1900s that described this approach for pelvic reconstruction and therefore, their names are applied to it. The classic full Smith-Petersen approach is used for pelvic reconstruction by many pelvic reconstruction surgeons. For use with the total hip replacement, a shorter version of their technique is used. In 1932, a German surgeon named Heuter first used the anterior approach for performing a hip replacement. In other areas of Europe, the replacements are commonly performed through an anterior approach with the use of a specialized surgical table called the Judet table. In America, the DAA has been slow to become popular due to the established excellent outcomes using the traditional approaches.

It is important to understand that hip replacement has been proven successful over the past 40 years and changes that are being made need long term follow-up to prove that a newer technique is better than a previous standard of care. Direct Anterior Approach has been proven to be successful. Some of the potential advantages of the DAA are:
• Faster rehabilitation.
• Possible shorter hospital stay
• Earlier return to work.
• Less pain medications required.
• There are no hip precautions to follow, which means the patient can cross his/her legs and bend at the waist without fear of dislocating the hip.
• There is no requirement for using a hip abduction pillow while at home
• The dislocation rate is the lowest of all surgical approaches used.
• Unlike other minimally invasive procedures, the patient’s weight and size does not factor in whether he/she is a candidate for this approach.

OVERVIEW OF SURGERY FOR THE REPLACEMENT OF THE HIP

1. A three to four inch incision is made over the front of the hip.
2. The hip is exposed by following a natural plane between muscles and without detachment of muscle or tendons from the bone.
3. The neck of the femur is cut and the arthritic head is removed (see drawing)
4. Acetabular preparation: The arthritic acetabulum (the socket) undergoes a procedure called “reaming”. A rounded shape reamer rotates on the end of a shaft. Reamers of gradually increasing size accurately shape the bone of the acetabulum to accept the acetabular component.

5. An acetabular component slightly larger in diameter than the reamed acetabular cavity is inserted. The liner (metal, plastic or ceramic) is then locked in place.
6. The femur is then prepared. The femur is a hollow “canal” that is progressively enlarged using a broach. This is done by hand until the correct size is achieved. Every canal is a different size and therefore different sized implants are used.
7. The femoral stem is then placed down the femoral canal.
8. The stem is in place and different sized necks are used to make the two legs equal in length.

9. Most stems are press-fit and do not require a cementing process.

10. The table repositions the leg to its normal position and the trial head is “reduced” into the acetabulum. Active x-ray control is now used for sizing. Side by side television monitors compare the x-ray image of the patient’s opposite hip to the operated hip. This comparison gives immediate information regarding equality of leg length.

SUMMARY

Minimally Invasive Surgery of the hip continues to evolve. Patients are experiencing a more pain free recovery without any hip precautions or restrictions when the Direct Anterior Approach is used. The benefits can provide for a greater quality of life and allowing patients to get back their active life style. Recovery does vary from patient to patient and is mostly dependent on how bad the hip was prior to the operation.

MIS THR is still a major operation and carries with it some risk. Because some reports have indicated a higher complication rate with other MIS techniques, be sure the surgeon you choose is well experienced and reputable.