Anterior Approach
Total Hip Replacement

Minimizing the Time from Replacement to Recovery
**Introduction—what is the anterior approach?**

The anterior approach for hip replacement is a surgical technique for hip replacement that is achieving recent interest in the United States. It has been used for greater than 60 years in Paris, France. During this time it has demonstrated numerous advantages for patients, such as a small incision, a reduced dislocation rate, shorter early rehabilitation, and improved accuracy of limb length and implant position. Until recently this procedure was rarely utilized by American surgeons.

Improving technology such as commercially available orthopedic tables, streamlined instrumentation, and improving surgeon training have all been factors in the growth of this technique worldwide.

**Advantages of the anterior approach arthroplasty**

There are numerous advantages to the Anterior Approach Total Hip Replacement. The anterior approach hip arthroplasty is a surgical approach from the front of the hip, as opposed to a lateral (side) approach. In the anterior approach, the hip is accessed using an existing interval between muscles. We take advantage of a naturally existing plane, which means—no muscles need to be cut or detached to access the hip. Standard implants and Resurfacing implants can all be placed through this interval.

Nearly all traditional approaches require the gluteal muscles to be cut or split; as these are some of the most powerful muscles in the body. Surgery that injures these muscles can prolong recovery. One of the advantages of the anterior approach is the accelerated recovery time because the gluteal muscles attaching the pelvis or femur are left undisturbed.

Another advantage is low dislocation rate. Dislocation is a common concern of patients and orthopedic surgeons using traditional techniques for hip replacement. Commonly reported rates for dislocation utilizing traditional techniques range from 2-4%. With anterior approach this risk is remarkably reduced to less than 0.5%. It is our opinion that by leaving the posterior capsule and muscles intact, we improve the natural function of the hip and reduce the chance of dislocation. Additional studies, including a large multicenter study have now been published showing that these results can be expected with other surgeons applying this technique. Data from this trial demonstrates similar findings in terms of short-term rehabilitation and dislocation rates.

An additional advantage of the anterior approach is the ability to use fluoroscopy (x-ray) intraoperatively to verify correct component position, leg length and offset. Nearly all surgeons performing hip replacement require post-operative radiographs to confirm appropriate positioning of implants. Using fluoroscopic guidance afforded by the anterior approach technique, we find that implants can be correctly implanted in a very accurate and reproducible fashion. Adjustments are done during surgery rather than afterward.

Many surgeons who perform traditional techniques may call their approach anterior or antero-lateral. In my opinion, only the anterior approach utilizing this interval (also known as the Smith-Peterson interval) can truly qualify as being called an anterior approach.
History of anterior approach hip replacement surgery

The first successful hip prosthesis design was implanted in the 1960’s in England. This initial design used a metal stem with a polyethylene acetabular component and both parts were cemented in place. Shortly thereafter, in Paris, France a group of orthopedic fracture surgeons were using the anterior approach to implant similar prosthesis designs. The technique had been performed successfully in Europe, however it took some improvement in equipment before it would gain acceptance abroad. A specialized table and instrumentation was developed allowing it to gain acceptance in North America over the last decade. The technique achieved world-wide interest in 2009 when Professional Golfer, Tom Watson, had a historic run at the title less than a year out from anterior approach hip replacement.

Physician Spotlight: Dr. Nicholas Mast

How did I get interested in Anterior Approach Total Hip Arthroplasty?

I began my training in Orthopedic Surgery in Salt Lake City, Utah under some very highly respected hip surgeons. Dr. Harold Dunn, Dr. Chris Peters, and Dr. Aaron Hofmann taught me the fundamentals of hip replacement surgery. I performed hundreds of hip replacement surgeries through these traditional approaches. In select cases, and cases of revision surgery I still favor these approaches.

It took seeing a few patients of a surgeon based out of Santa Monica, Dr. Joel Matta, before I began to open my eyes to other techniques of hip replacement. I had heard stories of his patients returning to golf or skiing in the time it took most of my patients to get rid of crutches! I was finally convinced when my father, also an orthopedic surgeon, had his hip replaced by Dr. Matta. His recovery was much faster than what I had experienced with standard hip replacement (despite the fact he was a difficult patient!). Shortly thereafter my bags were packed, and I was headed to Southern California to spend the year with Dr. Matta as his fellow.

As Dr. Matta’s fellow I spent time assisting and performing well over 150 anterior approach total hip arthroplasties. I spent time reviewing his series of over 1800 patients having had this surgery. In that year, I was exposed to the breadth of complications that can occur with this approach and was taught the techniques to deal with these difficulties. I am forever indebted to him for his thoughtful instruction and encouragement.

In my own practice, I started performing the technique in 2007. I have been very happy with anterior approach hip replacement as a technique. Our complication rate with the technique has been very favorable, and the implementation of newer protocols and technologies has facilitated shorter hospital stays. I am excited to continue to apply this technique to increasingly complex problems of the hip, including revision (re-do) replacement, and bilateral cases.
**Hip anatomy**

A normal hip is a ball and socket type joint. The femoral head (the ball) and the acetabulum (socket) are covered by hyaline cartilage that has a very low friction surface, allowing for free and painless motion. (Figure 1)

In a hip with osteoarthritis, degeneration and loss of the cartilage surface result in bone on bone contact between the acetabulum and the femoral head. (Figure 2) The symptoms of arthritis are pain, loss of hip motion and impairment of activities. Total hip replacement is the definitive treatment of hip arthritis.

**The surgery**

The orthopedic table has been the major development that has facilitated the anterior approach total hip arthroplasty in North America. The anterior approach utilizes a specialized table that allows for precise positioning of the patient and the limbs during surgery. (Figure 3) Without the table, the exposure is compromised and it is difficult to use x-ray as an adjunct to control of implant position. I feel it is akin to using a workbench when tuning skis. One can get a much more precise tune if the ski is solidly affixed to a bench, as opposed to being propped up against a wall or chair.

There are a few tables currently manufactured specifically for this procedure. The Hana and ProFX are examples of this table. These tables have several unique capabilities. Spars support the legs and allow for manipulation of the operated leg during surgery. The table is radiolucent allowing x-ray to be used during placement of components. Compression boots can be placed on the legs to prevent intra-operative blood clot formation.
The approach

A 10cm (4 inch) skin incision is made on the front of the hip. The plane between the muscles is identified and the muscles of the front of the thigh are moved out of the way to allow access to the front of the hip (figure 4 and 5). The muscles and tendons are not detached from the bone. The femoral neck is cut and the arthritic femoral head and neck are removed (figure 6).

The arthritic acetabulum is prepared by reaming, a procedure that shapes the bone to accept the acetabular prosthesis (figure 7 and 8). The prosthesis is placed under X-ray for proper positioning. On occasion, one or more screws may be placed to improve initial stability. After two months or so, the growth of the bones onto the acetabular prosthesis provides long-term stability. After insertion of the titanium acetabular shell, a ceramic, polyethylene, or metal liner is inserted (figure 9).

The table position is changed to allow femoral access through the small incision. The correct size femoral canal broach is inserted and a “trial” femoral head is placed (figure 10 and 11). The table repositions the leg to its normal position and x-rays are used to compare both hips (figure 12 and 13). This gives immediate information regarding leg length equality and femoral offset (the distance of the femur from the pelvis). Adjustments are made to accurately reproduce the patient’s native anatomy. The appropriate final implant is selected and implanted into place. The prosthetic hip is relocated. The wound is washed with antibiotic solution and closed.
Recovery and follow up care

The hospital stay after the anterior approach hip arthroplasty is usually 1-2 days. The patient is up and walking immediately after surgery. The patient is encouraged to put full weight on the hip. Physical and occupational therapy will take place in the hospital but will not usually be required after one goes home. There are no positioning restrictions. The patient may use a standard toilet and may cross his/her legs. A wound sealant (Dermabond) is used to protect the incision, so no dressing is used. There are no sutures to remove. The only specific restriction is that one is to avoid swimming or soaking the wound until 2 weeks postoperatively. Physical therapy is not usually needed immediately, but may be ordered post operatively if there is any evidence of weakness or stiffness on exam. Patients may return to activities such as golf and pilates, when their pain permits. Driving is permitted when the patient has stopped taking narcotic pain medication.

Possible complications

As with all endeavors in life, there are risks and benefits to everything we do. When the surgery is indicated, the benefits are clearly evident. While rare, there are problems that can arise with this procedure. The major risks associated with the procedure include but are not limited to, bleeding, infection, nerve or blood vessel injury, fracture, dislocation, component malposition or malfunction. Any of these problems can necessitate further surgery to correct.

FIGURE 12

An example of radiographs of a 55-year-old male with osteoarthritis of the left hip.

FIGURE 13

Post-operative radiographs following anterior approach hip replacement demonstrating that leg lengths and offset have been matched.
Total Joint Center

Should you decide that the anterior approach total hip arthroplasty is the surgical option for you, this office will work with you to schedule your surgery in a timely manner. We will contact your insurance company for authorization for the surgery. You will receive instructions on preadmission testing required by the hospital and anesthesiologist. You will generally return for a preoperative visit approximately 2 weeks before surgery to review any final questions and discuss the results of preoperative testing. Following surgery, and discharge home, you will schedule a follow-up appointment to be seen in the office at two (2) and six (6) weeks after surgery. Six (6) week and annual follow ups require x-rays prior to your appointment. Annual or Biannual appointments are generally required for the life of the prosthesis. Should you have any questions or concerns, feel free to call the office at (415) 353-6380.

Saint Francis Memorial Hospital’s Total Joint Center is dedicated to providing the best possible care for arthritis, connective tissue disorders, and joint diseases. Our program is made up of specialty trained surgeons, nurses, therapists and caregivers who are dedicated to state of the art care in the treatment of problems of the foot, ankle, knee, hip, and shoulder. We hope that you choose Saint Francis Memorial Hospital for all of your orthopedic needs.

References:


Staff

All of our office and hospital staff are excited to bring the anterior approach total hip replacement to the San Francisco Bay Area. A few definitions of the personnel involved in your care is presented to help you familiarize yourself with the workings of our office.

Total Joint Center at Saint Francis Memorial Hospital

**FELLOW:** an orthopedic surgeon wishing to pursue advanced training in a technique or area of interest. The fellow is under direct supervision of the treating physician (Dr. Mast), and may assist in examinations, in-hospital care, surgery, and research.

**PHYSICIAN ASSISTANT (PA):** Conducts patient and family contact prior to surgery, assists in in-hospital care, surgery and is readily available to answer questions about medications, rehabilitation, or concerns around the time of surgery.

**OFFICE MANAGER:** Office administration, may answer questions about Total Joint Center Billing and Administrative issues.

**SURGERY SCHEDULER/AUTHORIZATIONS:** Facilitates the authorization and scheduling of surgeries.

**MEDICAL ASSISTANT:** Facilitates the physician in scheduling of radiographs and procedures. Assists in the completion of forms and disability paperwork.

**FINANCIAL COUNSELOR:** Can provide financial arrangements and information regarding cost of hospital stay and insurance coverage. (415) 353-6140

Other Physicians

**HOSPITALISTS:** Internal Medicine specialists who perform complete medical evaluations around the time of surgery. They participate in in-hospital management of medications, fluids, antibiotics, pain management, and blood thinners.

**ANESTHESIOLOGISTS:** perform all anesthesia procedures

Hospital Personnel:

**HOSPITAL STAFF NURSE:** attends to the patient’s daily needs and dispenses medication while in hospital.

**PHYSICAL THERAPIST:** works with the patient to regain joint motion and muscle strength and to ambulate with or without assistive devices. (crutches, walker, cane, wheelchair)
Saint Francis Memorial Hospital, a Dignity Health Member, is an accredited, not-for-profit community hospital that has been providing exceptional healthcare in San Francisco for over 100 years. Located atop Nob Hill near downtown San Francisco, Saint Francis is home to the Bothin Burn Center, the largest in Northern California, the Center for Sports Medicine, the Spine Institute of San Francisco and the Total Joint Center. With its close proximity to downtown San Francisco, Saint Francis also specializes in Occupational Health and Emergency Medicine.

For more information, call (415) 353-6000 or visit www.saintfrancismemorial.org.
Centers of Excellence
- Bothin Burn Center
- Center for Sports Medicine
- Comprehensive Pain Management Center
- Emergency Services
- Occupational Medicine
- Spine Care Institute of San Francisco
- Total Joint Center

HealthGrades Clinical Achievements
- Five-Star Recipient – Stroke Survival (2012)
- Five-Star Recipient – Back and Neck Surgery (Spinal Fusion) (2012)
- Five-Star Recipient – Heart Failure Survival (2012)
- Stroke Care Excellence Award (2010 and 2012)

Parking and Location
GARAGE:
1199 Bush Street
(between Leavenworth & Hyde, off of Hyde and between Bush and Sutter)

HOURS:
7:00 AM - 7:00 PM Weekdays

VALET PARKING:
900 Hyde Street, front of hospital
7:00 AM - 5:00 PM Monday–Friday