ANTERIOR TOTAL HIP ARTHROPLASTY

And Other Approaches

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Total Hip Arthroplasty (THA) Background

- THA, also know as Total Hip Replacement
- Regarded as the most valued development in orthopedics
- Primary causes of hip joint deterioration are trauma and disease, such as arthritis
  - Cartilage becomes worn
  - Underlying bone develops spurs and various irregularities
    - Produces pain and loss of motion
- Ability to relieve pain and restore function
  - Return to daily living, walking, and a life with no/minimal pain
Stages of THA

Healthy Hip Anatomy

Various Signs of Arthritis

Total Hip Implant
Procedural Similarities

- Once the hip joint has been exposed, procedures to dislocate and replace the femoral head are similar.
- The femur is prepared for implantation following nearly the same methodology.
- The acetabulum is then reshaped and prepared for insertion of the prosthetic cup implant.
- The prostheses are put in place and the joint is put back together and tested for fit and range of motion.
- When the surgeon is satisfied, muscles are reattached and incisions sutured close.
Most Common Total Hip Arthroplasty Approaches (THA)

- Posterior (from the back of the hip)
- Lateral (from the side of the hip)
- Anterolateral (half way between the lateral and anterior)
- Anterior (from the front of the hip)

Constant improvement in procedures and instruments allow more classifications of posterior lateral, including mini incisions (approx. 4 – 6 in depending on Pt.)
Early Total Hip Arthroplasty Procedures

- Late 1940’s – France: Dr. Judet performs 1st femoral head replacement due to fracture
- 1960’s – England: Sir Charnley performed low friction arthroplasty for the treatment of hip arthritis
  - Beginning of modern type of hip replacement
  - Detached a muscle and part of bone (trochanteric osteotomy) through direct lateral approach
  - Reattachment of muscle and bone using wire
  - Because of trochanteric osteotomy, recovery included several weeks of strict bedrest before beginning to walk again
  - Modified in the US to become the “posterior” approach
Location of Trochanter

Diagram showing the location of the Trochanter on the pelvis, detailing the ilium, iliac crest, anterior superior iliac spine, acetabulum, femoral head, femoral neck, greater trochanter, lesser trochanter, pubis, ischial tuberosity, and ischium.
Posterior Approach

- 70% of orthopedic surgeons use this approach
- Incision
- Muscles that are split or detached:
  - Iliotibial Band
  - Gluteus Maximus
    - Sometimes gluteus maximus is also released from femur
  - Piriformis
  - Superior and Inferior Gemellus
  - Quadratus femoris
  - Posterior Hip Capsule (part of the ischiofemoral ligament) is cut or split open
Posterior Muscles

- Internal Pudendal Nerve
- Superior Gluteal Nerve
- Gluteus Maximus
- Gluteus Minimus
- Gluteus Medius
- Piriformis
- Superior Gamellus
- Inferior Gluteal Nerve
- Obturator Internus
- Inferior Gamellus
- Ischial Tuberosity
- Quadratus Femoris
- Sciatic Nerve
- Adductor Minimus
- Biceps Femoris
- Semitendinosus
- Adductor Magnus
- Gracilis
Pro’s

- Proven track record of success
- Low complication rate
- Potentially minimally invasion

Con’s

- Ischiofemoral ligament can be unstable
- Early dislocation is higher than other methods
  - Overall of risk of dislocation is currently down to 1%-2%
- 3 Posterior Precautions
- Other Considerations
  - Longer heal time than others
  - Elevated commode needed
  - Specialized equipment for donning socks & shoes
  - Caution while sitting
Direct Lateral Approach

- Incision is made 5 cm proximal and distal to the greater trochanter
- Tensor fascia latae (TFL) is retracted to expose gluteus maximus
- Gluteus maximus is divided along aponeurosis to expose greater trochanter
  - Care to protect sciatic nerve
- Gluteus medius and vastus lateralis are incised logitudinally over the greater trochanter
  - Anterior portions are separated from insertion sites exposing gluteus minimus tendon, which is detached from insertion
- Capsule is now exposed and ready to be opened for replacement
Anterolateral Approach

- Surgical approach – between tensor fascia latae (TFL) and gluteus medius
- Incision moves posterior and distally, then curves to follow the femur distally
- Retract TFL anteriorly, gluteus medius posteriorly to expose joint capsule
- Joint capsule is cut to expose femoral head
- Dislocate with external rotation
Anterolateral Approach

TOP - Skin incision
SIDE – retracting the gluteus medius posteriorly and the tensor fascia latae anteriorly.
Anterior Approach

- Not as popular as Posterior Approach, but is gaining popularity among surgeons
- Incision
  - Caution not to damage the lateral femoral cutaneous nerve near the anterior iliac spine
- Gluteus medius and tensor facia latae are detached from their origin at the ilium
- Muscles are not cut, but are retracted with special instruments, to expose the joint capsule
- Joint capsule is then opened to view the joint
Anterior Approach

**Pro’s**
- Less tissue trauma
  - Muscles & tendons are not cut
- Usually shorter hospital stay
- Quicker and less painful rehabilitation
- No hip precautions
- Immediate stability in the hip
- Decreased limp as seen in lateral approach

**Con’s**
- Some patients are not good candidates
  - Previous hip surgery
  - Certain hip bone deformities
  - Excessively muscular or obese
  - Significant osteoporosis
    - Procedure involves putting torque on the femur, risking fracture
- Special operating table and retractors needed
"Allows the surgeon to place the patient in the optimal position to perform the surgery. Although the procedure can be done without the special surgery table, the surgeon can expect that the table will serve as another “assistant” in the operating room, facilitating reliable and reproducible results."
http://www.uyoemd.com/anterior-hip
Interesting Facts

- To date, no clinical study demonstrates superiority of one approach over another.
- Short term benefits vs. possible side effects must be evaluated for each patient’s circumstances.
- According to projections by the American Academy of Physical Medicine and Rehabilitation, “the number of surgeries will increase by 60 percent in the next 30 years as the baby boom population ages.”
- Every year in the United States alone, more than 285,000 hip replacements are performed, and the number is expected to double to about 573,000 by the year 2030, according to the March 6, 2008 issue of Time.
- Long term success is demonstrated by 90% of THA patients remain functioning after 20 years, 70% after 30 years.
Summary

• Reasons for THA
  • Increased pain
  • Decreased weight-bearing status
  • Decreased function and mobility
References

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