TOTAL HIP REPLACEMENT
Doug Thompson, MD

PROCEDURE

- The purpose of the total hip replacement procedure is to replace diseased worn joint cartilage with metal and plastic to reduce or eliminate pain, decrease deformity, and improve function.
- An incision is made along the side or front of the hip, and a deeper incision is made longitudinally to expose the joint surfaces.
- The hip is dislocated, and the ball end of the thigh bone (ie femoral head) is cut near the base of the femoral neck, then reamed and shaped to accept a metal stem. The metal stem can be secured with cement or by press-fit and bone ingrowth. In most instances, I will use metal components with a porous coating to allow bone ingrowth, avoiding the potential problems with cement which can break down and create an abrasive which accelerates plastic wear and component loosening. However, bone quality and medical conditions can often require the stem to be cemented. The size of the metal stem is selected to provide the best pressfit inside the bony femoral canal and to maintain leg length and hip geometry as close as possible to normal. During this part of the procedure, bony spurs are also removed, and any excessive soft tissue is removed or released to allow optimum motion and eliminate deforming contractures or impingement.
- The cup socket of the hip is then reamed, and a metal cup is then secured into the hip socket.
- The choice of bearing material then determines the type of head and liner.
    - In most instances a plastic liner will be secured inside the cup, and a large polished metal ball will impacted on the femoral stem. The plastic liner provides a similar function as normal cartilage
    - In some instances, ie for metal-on-metal bearing surfaces, a polished metal liner will be secured inside the metal cup, and a large polished head impacted on the stem.
    - A newer type of bearing surface, ie bipolar, allows a polished metal liner to be secured inside the metal cup, and a bipolar head composed of a polished metal ball pressed inside a larger plastic ball.
- The plastic pieces will slowly wear, but with the latest technological advancements, should last 20 years or more.
- With optimum positioning and size of the components, the risk of dislocation is reduced through proper soft tissue tension. A manual test of stability throughout its range of motion is used to assess stability and avoidance of impingement. An xray is used during surgery to make sure the components are positioned correctly.
- Prior to implantation of the components, the hip is thoroughly irrigated with antibiotic solution.
- After implantation of the components, the deep soft tissues are closed, the skin closed with a watertight suture, and an impermeable dressing applied to prevent secondary infection until the wound is healed. A drain may or may not be used.

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POSTOPERATIVE CARE AND REHABILITATION

- Most people can expect to spend 3 days in the hospital, going home or to an inpatient rehabilitation facility on Thursday.
- During the acute hospital stay, you will participate in group physical therapy in the Joint Replacment gym on the orthopedic floor twice a day. Therapy will focus on on walking with a walker, exercises to maintain and improve the motion in your leg, and exercises to strengthen your leg muscles.
- It is important that you actively use your muscles to bend and straighten your knees while in bed to avoid stiffness. You will also be instructed to pump your ankles to exercise your calf muscles which also helps prevent blood clots in the legs.
- A medical doctor will provide management of your other medical problems while in the hospital.
- You will receive antibiotics, pain medications, laxatives, and blood thinners while in the hospital
- You will also continue with medications at home. We will give you prescriptions for these prior to your surgery date so that they are available once you get home.
- A case manager will visit with you in the hospital to arrange for your home equipment needs and facilitate your continued rehabilitation needs with either home health, outpatient physical therapy, or inpatient rehabilitation at one of the rehabilitation hospitals or a skilled nursing facilities. Some insurances allow inpatient rehabilitation at either St Michaels Rehab Hospital or HealthSouth Rehab Hospital, but many do not. If you require continued inpatient rehabilitation and your insurance does not approve a rehabilitation hospital setting, we will arrange for inpatient care at a skilled nursing facility. We will determine your preferences and family support situation for rehab during your preoperative visit.
- If you are transferred to an inpatient rehabilitation facility (ie either rehab hospital or skilled nursing facility) you will continue to receive physical therapy about 3 hours per day. You can generally expect to stay an additional 7-14 days in the inpatient rehabilitation facility before being discharged home.
- If you go home, we will arrange home health to visit you 5 times a week (or whatever your insurance allows) or outpatient physical therapy at a facility near your home.
- We want you to leave the dressing in place until seen in the office at your two week followup visit. A waterproof dressing will be used to allow you to take a shower, but you are to avoid baths during the time the dressing is in place.
- The first couple of weeks are a little rough, but you will be walking farther with less pain every day. By your two week postoperative appointment in the office, you can generally expect to be close to transitioning from a walker to a cane.
- By 6 weeks postop, you can generally expect to be doing well, walking without a cane and without pain.
- By 3 months postop, you will generally be back to normal.
- Most patients, depending on their job duties, can be back to work by 4-6 weeks after surgery. Some jobs may require a longer time off.

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PAIN CONTROL

- Multiple modalities for pain control to allow comfort, early ambulation, and shorter hospital stay. By controlling the pain immediately after surgery, less pain medication is needed in the following days because the pain pathway sensitization is delayed.
- Local Injection. To help control pain, a local anesthetic will be injected into the soft tissues inside the hip.
- Anti-Inflammatories. Unless contraindicated, you will be given IV NSAIDs and IV Tylenol before leaving the operating room, and the IV NSAIDs will continue during your stay in the hospital. By inhibiting the inflammatory response to surgery, the pain can be significantly reduced.
- Oral Pain Medication. For further breakthrough pain, oral narcotics will also be used. Typically, only low does hydrocodone is needed, and will be given on a scheduled basis unless you become nauseous or tired or confused.
- PCA pump. A patient controlled anesthetic (PCA) pump will be available for severe episodes of breakthrough pain. When the patient pushes a button, a small dose of narcotic will be pumped intravenously for fast pain control. The dose and interval of medicine are controlled. With the above pain modalities in use, the PCA pump use is seldom needed.
- The oral and IV narcotics can cause constipation and nausea. Laxatives will be given to minimize the effects of the narcotics on the bowels, and anti-nausea medicine will be given at the end of surgery and as needed thereafter.

RISKS AND PREVENTION

- In general, you can expect 95-97% chance that your surgery will do well without complications. However, there is a possibility of a complication despite all of the precautions we take. We take precaution to minimize the risk of complications, as detailed below (these are the most common complications, but there may be others):
- Medical Complications
    - Your unique medical conditions are best known by your primary care physician and other medical subspecialists. Prior to surgery, we will obtain labs and send you to your primary care physician and other indicated subspecialists to evaluate your medical condition, determine the medical risks of surgery, and provide medical clearance for surgery. They will assess your risk of cardiopulmonary or other medical complications and develop a coordinated plan for your perioperative medical management to minimize those potential risks. They will help fine tune your medical condition in preparation for surgery.
    - If your have diabetes, renal disease, rheumatalogical problems, pulmonary problems, or cardiovascular problems, your risk of complications is increased.
    - It is important to keep your blood pressure under control during the perioperative period. If your blood pressure is too high, you can have a stroke in the perioperative period. You should take your blood pressure medications with just a sip of water on the morning of surgery.
    - For diabetics, blood sugar may be managed with a sliding scale insulin protocol.
    - If you take methotrexate or TNFa antagonists, you should generally stop them one cycle before surgery and not restart them until after the wound is healed at the first postoperative visit to facilitate bone and soft tissue healing.
    - Cardiac complications can occur despite preoperative evaluation and clearance, including myocardial infarction, congestive heart failure, arrythmia, and even death. A cardiologist evaluation and perioperative management will be used as indicated.
    - Constipation or Bowel Immobility can develop after surgery and will be treated with laxatives and other means as needed.
    - Urinary retention is common after surgery. You will have a foley catheter placed prior to surgery, and it will be discontinued typically on the first or second day after surgery. In some instances, it may have to stay in place longer.
- Anesthesia Complications
    - Aspiration Pneumonia. To prevent aspiration of your stomach contents, please do not eat or drink anything other than your blood pressure medicines and a sip of water after midnight before surgery.
    - Atelectasis. When you undergo general anesthesia, a machine will breath for you, inflating your lungs. When that inflation pressure is removed after surgery, a small amount of inflammation and fluid can collect in the small sacs in the lungs. It is important to drive that fluid away by breathing deeply every hour to avoid pneumonia and reduce postoperative fever. You will be given an incentive spirometer while in the hospital help with the deep breathing, and we will use oxygen and breathing treatments if needed.
    - Your anesthesiologist will do a thorough evaluation of your medical condition and plan for your anesthesia requirements during your preoperative registration visit

at the hospital, and review that once again on the day of surgery. They can explain the options, recommendations, procedures, and risks in more detail.

- Infection
    - Infection is a very serious problem that is taken seriously. The implants we place can get infected at the time of surgery or at any time after surgery from bloodborn bacteria from dental procedures, urinary tract infections, etc. If they get infected, it is often necessary to remove the components to treat the infection, and later reimplantation after the infection is cured. This is a disastrous condition which we want to avoid and take every precaution to try to prevent.
    - Your teeth and mouth can be a source of infection at the time of surgery and at any time thereafter. We will evaluate your dental health and refer you to your dentist for any concerning dental issues and clearance prior to surgery if needed. Any dental issues must be resolved prior to a joint replacement, and surgery may be canceled if not resolved to our satisfaction. At any time after your joint replacement, it is important to take antibiotics prior to and following any dental procedures. If your dentist cannot provide prophylactic antibiotics, ask our office and we will prescribe them for you.
    - Your nose can also be a source of bacteria that can cause infection. We will culture your nose and determine if difficult bacteria are present. We will also prescribe mupirocin antibiotic ointment which you will use 5 days prior to surgery to eradicate any nasal bacteria, particularly MSSA and MRSA.
    - Your skin can carry a multitude of bacteria, including difficult to treat MRSA strains. You will be instructed to take a whole body bath or shower with Hibiclens antibacterial soap for 5 days prior to surgery, including the morning of surgery You will also be prepped upon arrival at the hospital on the day of surgery with Hibiclens. You will also be prepped again in the operating room and a sealant iodine barrier used to wrap around the operative site.
    - Contamination during surgery can occur, but its risks are minimized by the use of clean “spacesuit” hoods, meticulous sterile technique, antibiotic irrigation, and IV antibiotics before, during, and after surgery for 24 hours.
    - Secondary infection from a draining wound after surgery can also occur. To minimize this risk, we use a watertight suture closure on the skin and apply an impermeable dressing while in the operating room. That dressing provides a barrier to secondary infection and will stay in place until removed in our office at your 2 week followup appointment. We may also prescribe an oral antibiotic at the time of your preop visit to be taken at home after surgery.
    - If you have an active urinary tract infection, it must be treated prior to surgery. We will collect a urine sample in our lab in preparation for surgery and treat accordingly.
    - Steroids delay wound healing. We prefer that oral steroids be stopped or reduced below 7.5mg/day to avoid wound complications.
    - Methotrexate and other rheumatological medications also delay healing and can lead to increased risk of secondary infection or immunosuppression of your own body’s defense mechanism. Your should stop methotrexate preferably 7 days before surgery, and not restart until 2 weeks after surgery. Other medications

such as TNFa antagonists and SERMS should also be stopped at least one cycle prior to surgery.

- Blood Clots (DVT) and Pulmonary Embolism
    - With reduced mobility after a joint replacement, you are at risk of developing a blood clot in your legs. If blood clots form in the deep veins of the legs (DVT), they can dislodge and travel to the lungs where they can cause a serious and possibly deadly condition called a pulmonary embolism. Therefore, it is very important to try to prevent a blood clot from forming.
    - If you have had a DVT before, you are at increased risk of having one develop again, and we may recommend a filter be placed in your main vein to catch any clots before they reach your lungs.
    - The best way to prevent a blood clot is to have you walk as quickly as possible after surgery, using the normal muscular pumping motion of your body to increase the flow in the veins. We will have physical therapy begin to work with you on the day of surgery if possible, and definitely on the first day after surgery to get you walking as quickly as possible.
    - You will be instructed to also perform active motion exercises hourly while in bed, including toe curls, ankle pumps, and bending and straightening the knee. These motions simulate walking motion of the muscles, but without the weight.
    - We will also implement passive means to help with blood clot prevention, including plexipulses or sequential compression devices, TED hose, and blood thinners.
    - Plexipulses/SCDs are attached to the feet/calves, and a pneumatic pump inflates them to create a pressure gradient and flow in the veins of your legs, preventing blood stagnation. You will have these on while in bed during your hospital stay.
    - TED hose are compression stockings which help compress the legs and minimize the amount of blood that can pool in the veins of the legs. We will apply TED hose or a compression dressing during surgery, and you will wear them for 6 weeks after surgery.
    - Unless contraindicated, we will use blood thinners starting the day after surgery and continue for 10 days, until you become increasingly mobile. If you already take coumadin prior to surgery, we will resume your coumadin after surgery. For others, we will give Lovenox injections or an oral medicine called Xarelto. We will give these medications to you while in the hospital, and give you a prescription for an additional week for home use during your preop visit. After completion of 10 days of blood thinner, we will have you take 81mg of aspirin each day for an additional month.
- Bleeding/Blood Loss
    - You will lose blood during and after surgery which may require a blood transfusion based on your clinical symptoms.
    - We may place a drain during surgery to collect blood and prevent a hematoma from forming. The drain, if used, will typically be discontinued on the first or second day after surgery.
    - During surgery, we will lower your blood pressure (ie hypotensive anesthesia) to a minimize bleeding.

  - We use electrocautery during surgery to coagulate small vessels to minimize blood loss.
  - During surgery we also use a local injection that contains epinephrine to constrict small vessels and minimize blood loss.
  - Unless contraindicated, you will be given a dose at the start of surgery and at the end of surgery of a medicine which will help reduce bleeding.
  - We will have you discontinue aspirin, Plavix or like drugs, coumadin, NSAIDS, and any other medication that can thin your blood 5-7 days prior to surgery. These will be resumed 10 days after surgery, or sooner based on your medical condition.
  - We will check your blood level prior to surgery to see if you are anemic. If you are, we may start you on a medication called Procrit to improve your anemia prior to surgery.
  - Although not typically needed, an optional predonation of blood by the patient a few weeks prior to surgery allows their own blood to be given back after surgery. During the period between predonation and surgery, the patients body can generally build back up the normal blood volume, allowing the predonated blood to replace the blood lost during and after surgery.
- Dislocation
  - Recent technological advancements have allowed much bigger heads to be used, which significantly reduces dislocation risk.
  - With optimum positioning and size of the components, the risk of dislocation is reduced through proper soft tissue tension. A manual test of stability throughout its range of motion is used to assess stability and avoidance of impingement. An xray is used during surgery to make sure the components are positioned correctly.
- Heterotopic Ossification
  - Some patients form excessive bone around the hip, which can lead to stiffness and pain.
- Nerve Injury
  - Although nerves are typically never lacerated, they may occasionally be stretched during surgery due to stiffness or correction of deformities. In most instances, a nerve injury is temporary and may require bracing until the nerve recovers.
- Fracture
  - Patients with weak bone (osteoporosis) are at increased risk of fracture during the perioperative period. If a fracture occurs, it will be treated appropriately and may require additional procedures at the time of surgery or later.
- Vascular Injury
  - Very low risk, but has been reported in the literature.
- Loosening or Mechanical Failure
  - The implant can fail to have complete bone ingrowth into its porous coating, particularly in patients who take certain medications, have adverse medical conditions, have metal allergies, or have reduced bone formation from any cause.
  - Although rare with modern technological components, implants can fail.

- Continued Pain
    - Although the purpose of the procedure is to reduce or eliminate pain, in some rare cases, chronic pain of unknown etiology can continue.