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Reverse Total Shoulder Arthroplasty

Reverse total shoulder arthroplasty is a joint replacement surgery that can be performed for a variety of conditions where the rotator cuff tendons are badly damaged and beyond repair. These rotator cuff problems can occur in association with arthritis, shoulder instability, failure of a previous joint replacement or inability to raise the arm against gravity. Reverse shoulder replacement surgery changes the mechanics of the shoulder transferring more of the load to the deltoid muscle and less load to the rotator cuff muscles for function. The best clinical results for a reverse replacement are seen in patients who have some functioning rotator cuff tendons/muscles.

In the reverse total shoulder, the ball and socket are replaced, but they are reversed. The socket portion of your shoulder is replaced with a prosthetic metal ball and the ball portion of your shoulder is replaced with a plastic cup that is attached to the top of a metallic stem placed within the humerus, the upper arm bone.



Reverse Shoulder Arthroplasty X-ray, Pre-operative and Post-operative X-ray

Anatomy of the Shoulder

The shoulder is made up of two joints, the acromioclavicular joint and the glenohumeral joint. The acromioclavicular joint is where the acromion, part of the shoulder blade (scapula) and the collar bone (clavicle) meet. The glenohumeral joint is where the ball (humeral head) and the socket (the glenoid) meet. The rotator cuff connects the upper arm bone to the shoulder blade and is made up of the tendons of four muscles, the supraspinatus, infraspinatus, teres minor and the subscapularis. The deltoid muscle is the muscle that forms the rounded curve of the shoulder. Tendons attach muscle to bone. Muscles in turn move bones by pulling on the tendons. The deltoid and the rotator cuff are important for shoulder movement. The deltoid is a strong muscle that moves the arm away from the body and allows overhead motion. The rotator cuff contributes to this function, but especially keeps the ball tightly in the socket during shoulder motion. The reverse shoulder replacement is special because the parts are made differently so the deltoid can raise the arm without the rotator cuff.

Common Conditions that Require Reverse Total Shoulder Arthroplasty

Your surgeon may recommend reverse total shoulder replacement for the following reasons:

- A torn rotator cuff that cannot be repaired especially when associated with severe pain and/or the ability to raise the arm overhead
- Rotator cuff arthropathy (a specific pattern of arthritis seen in patients with long-standing rotator cuff tears)
- A previous shoulder replacement or other surgery that was not successful
- Chronic or long-standing shoulder instability (ball and socket joint is unstable)
- Some patients with chronic or long-standing arthritis associated with severe loss of shoulder range of motion
- Reconstruction following some tumor surgeries
- Failure of nonoperative treatments such as anti-inflammatories, cortisone injections, or physical therapy

Patients with a poorly functioning deltoid, an axillary nerve injury, active shoulder infection or severe loss of bone stock on the socket or ball are not candidates for a reverse shoulder replacement.

Expected Outcomes

Reverse shoulder arthroplasty has been performed in the United States since 2004. 93% of implants are functioning well and surviving at 10 year follow up. This surgery is reliable for pain relief in over 90% of patients. Most patients will also have an improvement in the ability to raise the arm overhead but this is somewhat dependent on the age of the patient, the strength of the deltoid muscle and the presence of some remaining rotator cuff tissue. It is realistic to expect to be able to raise the arm above shoulder level, to reach the top of the head and the opposite shoulder in most patients. Your ability to rotate the arm outward is dependent on the presence of some intact rotator cuff tendon as well. After a reverse shoulder replacement, most patients will lose some motion reaching behind the back. Most patients will be able to reach their belt line or back pocket only. For patients with shoulder dislocation problems, stability is restored in most. However, the risk of early dislocation following a reverse shoulder replacement is slightly greater than a standard replacement and can occur in up to 10% of patients.

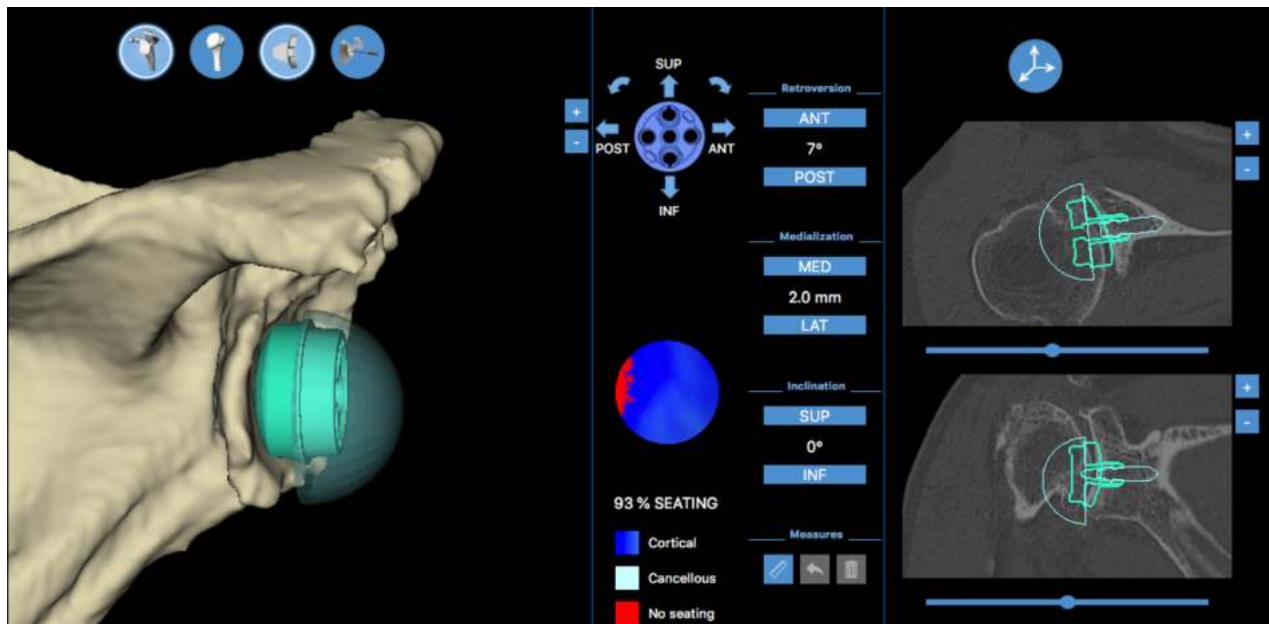
Most patients can be very active following a reverse shoulder replacement. Golf, tennis, swimming and light yard work and gardening are allowed. It is important to know that the ability to do these things depends on many different factors, and varies greatly between patients. It is generally recommended that patients do not routinely lift more than 60 lbs with the operative arm following this surgery. Failure to observe this restriction can result in pain and/or early loosening of the artificial joint. In addition, a reverse shoulder replacement slightly lengthens the arm (approximately ½ inch). This is not noticeable by most patients. However, the contour of the shoulder often appears slightly different as the deltoid muscle may appear thinner or more hollow in some.

Preoperative Planning

Before your surgery, it will be required to have preoperative testing. In some cases blood work, EKG (heart tracing), or a chest x-ray may be needed. A chest x-ray is only done if you have a lung condition or a history of cigarette smoking. If any of these tests are needed, they will be scheduled for you and will be done during pre-testing when you meet with the anesthesia staff. If further testing is needed it will be arranged by the pretesting staff. If it has been some time since you have seen your primary care physician and you have a lot of medical problems, it would be best that you see your medical doctor before your pre-test date. The pre-test center will also provide you with a special soap and instructions that should be used before the surgery.

Your surgeon may also recommend advanced imaging studies such as an MRI or CT scan of the shoulder to assess the rotator cuff tendons and bone stock of the glenoid (socket) to determine if you are a candidate for a reverse shoulder replacement and to help with surgical planning.

We also use the CT scan to virtually template the shoulder replacement. This generates a patient specific guide to help implant the shoulder replacement in the optimal position. In turn we hope this increases implant longevity, improves shoulder function, and decreases complications.



Virtual Templing of a Reverse Total Shoulder Replacement

Your Surgery and Hospital Stay

You will arrive at the hospital approximately two hours before your scheduled surgery time. Procedures are performed on a “to follow” basis. Occasionally, a procedure scheduled ahead of yours may take longer than expected, so there may be some delay before your surgery. Regardless, it is important that you arrive on time. Sometimes an earlier procedure will cancel and we run ahead of schedule. You should not have anything to eat or drink after midnight the night before surgery. You may be advised to take some of your medications with a sip of water only. The anesthesia staff will discuss this with you at the time of your pre-testing. Upon arrival to the hospital you will go through a check-in process. At the appropriate time you will be brought into a pre-operative holding area. At this point the nurse will see you, review your records, and an IV will be started. A member of the anesthesia team will meet with you to discuss any anesthesia concerns and anesthetic options. Your surgery will be performed under general anesthesia (you will go to sleep.) In addition, the anesthesiologist may recommend a regional block if they think that you are a good candidate. This involves an injection of local anesthetic (numbing medicine) or placement of a catheter near the nerves at the base of the neck. These blocks are generally recommended to help control your pain following surgery. The anesthesiologist will discuss the risks of the block and the decision to perform this is a mutual decision between the patient and the anesthesiologist.

You can anticipate that your surgery will last approximately 2 hours, although this varies depending on the complexity of your surgery. If you have family members with you they will wait for you in the waiting room. Your doctor will speak with them after your surgical procedure to let them know that you are finished. During your surgery, family members should plan on remaining in or near the waiting area in order to be accessible at the completion of the procedure. Belongings will be stored in a locker in the pre-operative area. Please leave valuables at home or with family.

When you wake from surgery you will be located in the post-operative recovery room. Unfortunately family members cannot be present with you at this time as there are many other patients and many nurses in this area. Once you have been stabilized and are comfortable, approximately 1-3 hours after surgery, you will be transferred to the nursing division and you will be able to see your family.

Most patients go home the same day of surgery. If you have medical problems that require closer monitoring, we sometimes encourage patients to spend 1 night in the hospital. If you are planning to go to an extended care or rehab facility you will likely need to stay 3 nights due to insurance reasons. If you are planning to go to one of these facilities you may want to research facilities in your area prior to surgery. The social work staff will assist with placement once you are in the hospital. Unfortunately we cannot obtain insurance authorization in advance since many of these facilities require a physical therapy evaluation in the hospital prior to acceptance.

You will have a dressing on your shoulder and your arm will be immobilized in a sling. You may also have a drain in place to collect fluid and blood from the surgery. This will be monitored closely during your hospital stay. It will be removed the morning you are discharged. Other equipment you can expect to have while hospitalized includes: an IV until you are eating, drinking and voiding normally, a cold therapy unit in the place of ice bags, compression and sequential stockings on your legs to prevent blood clots, possibly oxygen tubing according to your needs, and possibly a catheter if you are not able to urinate normally.

As previously noted, you may be given a regional block. This block usually wears off sometime in the night. Your nurse will be offering you pain medication every 4 hours. We recommend that you begin taking the medication when it is offered so that you will have medication in your system when the block wears off. In addition to the routine pain medication you can ask for additional pain medication in IV or pill form if needed. Please ask for additional pain medication when you first begin feeling uncomfortable. You will also have medication for nausea if needed.

Lab work or "blood work" will be done during your stay. By looking at these results decisions are made regarding your care. In order for the lab results to be ready for your doctor in the morning the staff will collect samples from you. This is normally done between 12am and 2am. We apologize for any inconvenience this may cause you.

Depending on your needs you may need a blood transfusion after your surgery. It is requested that you not donate blood for yourself prior to surgery. If a friend or family donated blood prior to your surgery, you will receive that blood. Otherwise you will receive blood from the blood bank. Your doctor or nurse can answer questions you may have about this.

Occupational therapy will see you after your surgery to evaluate your needs. If they feel it necessary a referral will also be made to physical therapy. You will begin doing range of motion for exercises the morning after your surgery. The therapist will instruct you on these exercises. It is recommended to have a family member attend the therapy session.

Risks and Complications

The list below includes some of the common possible side effects from this surgery. Fortunately, complications are very rare in your doctor's practice. Please note that this list includes some, but not all, of the possible side effects or complications. Complications may include complications from anesthesia, infection, nerve injury, blood vessel injury, bleeding, shoulder stiffness, failure to improve your symptoms as much as you had hoped, a stress fracture of the acromion bone where the deltoid originates, a blood clot in your arms or legs which may very rarely travel to your lungs, complex regional pain syndrome and dislocation. This type of joint replacement is more susceptible to dislocation because of the way the cup is perched beneath the ball. Fortunately, this is usually an easily solvable problem. Any time prosthetic components (man made parts) are put into a joint, there is always a very small chance that one or more of the parts may have a problem that requires another surgery in the future.

Postoperative Care

1. Sling instructions. After surgery your shoulder will be placed in a sling. The sling should be worn as directed by your doctor. The sling is used to limit motion of your shoulder. It is very important to wear your sling as directed by your doctor after surgery. You may remove your arm from the sling to bend and straighten your elbow and to move your fingers several times a day. You may remove the sling to bathe, dress, and perform elbow range of motion several times a day.
2. Diet. We recommend that you eat a light diet the evening of surgery and the next day but you may resume eating a regular diet as soon as you tolerate it. Increasing fluids and dietary fiber (fruits, vegetables, and whole grains) in the weeks after surgery will assist with any constipation issues you may have from the pain medication.
3. Pain control. When you are discharged from the hospital you will be given a prescription for pain medicine. You may take this medicine as prescribed. You will be discharged with your cold pack machine. This machine has a sleeve which is attached to an ice cooler. You place ice and some water in the cooler and plug this in to a regular outlet. This circulates cold water through the shoulder sleeve providing relief of pain and swelling after surgery. You should keep ice on the shoulder frequently for the first 48-72 hours after surgery. We urge icing 2-3 times per day for the first week especially before sleep. We do recommend that you put a t-shirt or a thin towel between you and the sleeve so that it doesn't injure your skin.

4. Wound care. If you were discharged with a clear dressing covering your incision you should leave it in place until your scheduled follow up visit with your surgeon. This type of dressing can get wet, you may shower when you get home. If you were discharged with a white gauze dressing you may remove your dressing 5 days after surgery. After the dressing is removed you may then shower. You may not get in a hot tub or pool and immerse the incision underwater for six weeks but you may get in the shower and let the water run over them. Pat the incisions dry afterwards. There is no need to place any ointment over the incisions, it is better to keep them dry. Sometimes significant bruising is seen in the front of the shoulder or along the biceps muscle. This is normal and is related to mild internal bleeding after surgery. If you notice drainage from the incision, swelling or increased pain 5 days after surgery please call the office. Redness around the incision is very common and should not be a concern unless it is associated with drainage 5 days after surgery, redness spreading away from the incision or fevers.
5. Sleep. It is often very difficult to sleep in the week or two following shoulder surgery. The surgery itself may interfere with your sleep-wake cycle. In addition, many patients have increased shoulder pain lying flat on their back. We recommend that you try sleeping in a recliner or in a reclined position in bed. This is often much more comfortable. You may place a pillow behind your elbow in order to move your arm away from your body slightly. This often helps with the pain. You should wear your sling when you sleep.
6. Driving. Operating a motor vehicle may be difficult due to you inability to use your operative arm. If you should have an accident or get pulled over while wearing a sling, the authorities may consider that driving while impaired. The decision to drive is based on your comfort level with driving essentially one-handed. If you need to drive you should wait at least until you have seen your doctor at the first postoperative visit. Once you are out of your sling you may drive once you feel safe operating a vehicle. No one should operate a motor vehicle while taking narcotic medications. Please avoid car driving until you are off narcotics.
7. Physical therapy. The decision to prescribe physical therapy and when to start these activities is made on a case by case basis. This will be discussed with you on your first postoperative visit. It is rare that your surgeon will prescribe therapy before your first postoperative visit. You may be instructed by your surgeon/occupational therapist to begin gentle range of motion exercises on the day of surgery. These will be self-directed exercises that you start on your own.

Medications to Avoid Before and After Surgery

Medications that increase the chances that you will bleed excessively after surgery include:

1. Aspirin, enteric-coated, baby, and plain aspirin or any other product containing aspirin. In some cases, we may recommend stopping your aspirin 1 week before surgery. In others cases, low-dose aspirin may be continued based on your medical condition. Please discuss with your surgeon
2. Coumadin – discuss this with the prescriber as to the best time to stop this medication before surgery
3. Celebrex- stop 1 week prior to surgery
4. Ibuprofen (Advil, Motrin) - stop 1 week prior to surgery
5. Naprosyn (Aleve) - stop 1 week prior to surgery
6. Plavix – discuss this with the prescriber as to the best time to stop this medication before surgery
7. Some over-the-counter herbs can also effect bleeding. These include chondroitin, dan shen, feverfew, garlic tablets, ginger tablets, ginkgo, ginseng, and quilinggao and fish oil

After shoulder surgery, you should avoid all anti-inflammatory medications including ibuprofen (Advil, Motrin) and Naprosyn (Aleve) and any other prescription anti-inflammatories, unless your surgeon prescribes them. Do not resume these medications until your doctor says that it is okay. You may take Tylenol unless otherwise instructed not to do so. (Dr. Martusiewicz often uses anti-inflammatory medications after surgery. You will be given a prescription at the time of discharge if you should be taking this type of medication.)

Follow Up Appointment

A follow up appointment is usually scheduled at the time that surgery is scheduled. Patients are seen in the office 10-14 days after surgery for suture removal. If you have not been scheduled for a follow up, please call the office to set up an appointment. We will then schedule your second follow up appointment for approximately 3 to 4 weeks thereafter.

Emergencies

Signs of an emergent situation include increasing redness, swelling, and significant drainage from the incision site, a fever greater than 101.5, inability to tolerate food and fluids after surgery. In rare cases, temporary breathing difficulties can occur in patients who have had a regional block or a pain catheter. If you find that you have any of these situations, it is advisable that you call our office or the hospital. If the office is closed please call the respective Beaumont Orthopaedic Unit so that emergent care can be initiated for you.

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