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by Orthopedic & Sports P.T. Assoc. OSPTA
and Valley Outpatient Rehabilitation VOR

Total Shoulder Replacement

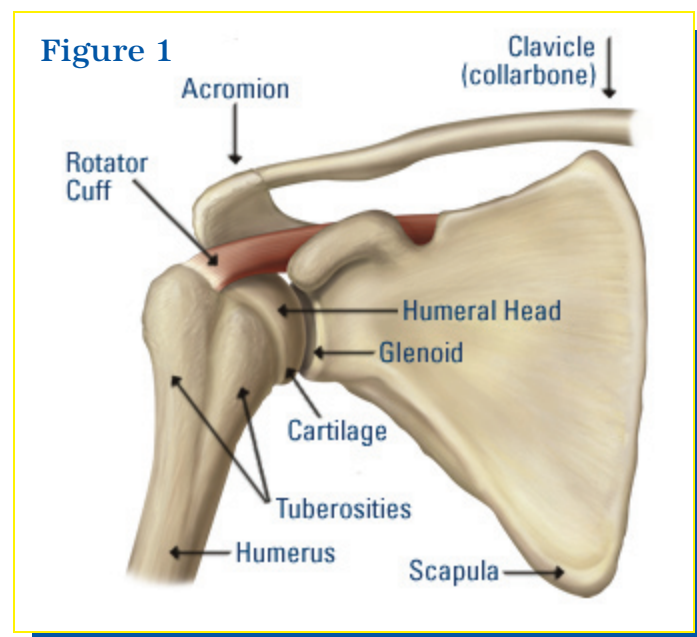
OVERVIEW

The total shoulder replacement (TSR) is the third most replaced joint, behind the hip and knee. Nearly 25,000 procedures were performed last year. Started in the 1950s, TSR has been performed regularly and in increasing numbers. Advancements in technology, materials, surgical hardware, and technique have resulted in more functional outcomes and low complication rates. This is especially true when performed by high-volume surgeons in high-volume hospitals. Osteoarthritis, severe fracture, rheumatoid arthritis, rotator cuff dysfunction, avascular necrosis, and a history of a previous failed shoulder surgery are all possible indications for this surgery. Regardless of pathology, most individuals have a common theme of prevailing complaints: pain, diminished function and limited motion. Therefore, the primary goals of TSR are to alleviate pain, restore function, and improve motion. Individuals in the early stages of some of these disease processes can be managed conservatively through the use of oral and injectable medications, modalities like heat and ice, and physical therapy. In the long run, these treatments may only be palliative; as the disease advances, surgical intervention may be the only option.

ANATOMY

The shoulder complex is one of the most elaborate joints in the body. It consists of one

main joint, known as the glenohumeral joint, and 3 smaller interdependent joints. It is the glenohumeral joint that is affected with a TSR. It is a multiaxial ball-and-socket style synovial joint providing a high degree of mobility in multiple directions (figure 1). The ball surface at the upper portion of the humerus is called the humeral head. It meets with a socket-shaped surface called the glenoid, which is part of the scapula. Due to the dynamic nature of the shoulder, additional soft tissue support is required. Four muscles collectively known as the rotator cuff are the primary stabilizers of this joint (figure 2). Additional stabilization comes from other muscles nearby (such as the deltoid, rhomboids and pectorals) as well as from ligaments and

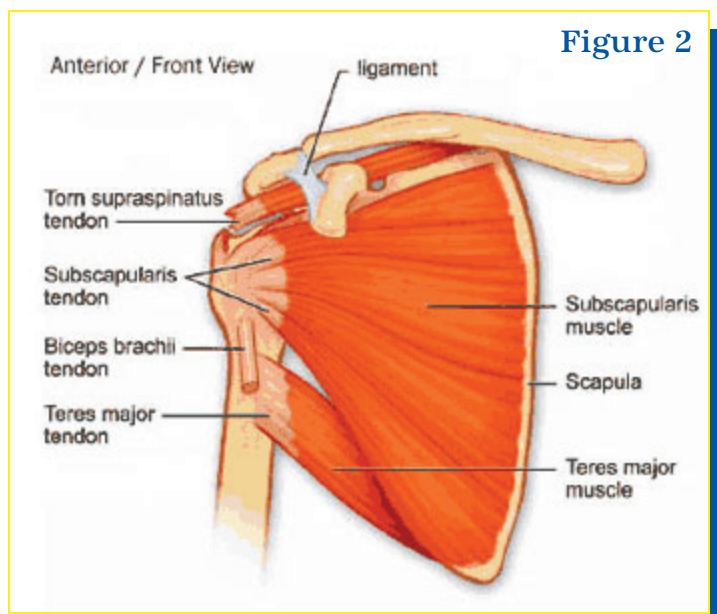


other connective tissue. Since the shoulder does not normally bear weight (like the hip or knee), joint destruction is either the result of a disease process, trauma, or repetitive soft tissue damage.

SURGICAL CONSIDERATIONS

There are generally three types of shoulder replacement procedures. The most common is a standard TSR (figures 3, 5). This procedure involves the removal of both the humeral head and the glenoid. Metal and other synthetic components that mimic the anatomy of the original bone are then implanted with screws and a glue-like cement substance. Most patients who have this procedure have an intact rotator cuff, but suffer from some type of degenerative joint disease, like arthritis. Two newer procedures, the reverse total shoulder replacement and the hemi-arthroplasty have been used in special cases with promising outcomes.

The reverse shoulder replacement, as the name suggests, reverses the ball portion and the socket portion of the joint during surgery (figure 4). It offers a treatment for conditions that previously had no solution, such as massive rotator cuff tears, rotator cuff arthropathy (tear plus arthritis), and as a salvage procedure for those who have had a previous shoulder surgery that has failed.

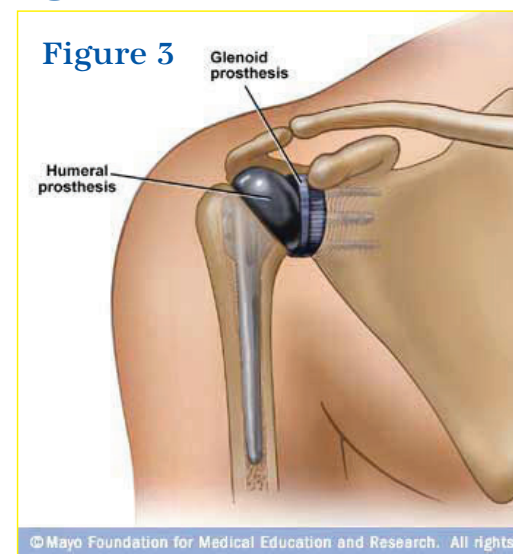


The hemi-arthroplasty is a partial replacement, whereby only the humeral head is removed and replaced. The anatomical socket remains but is resurfaced to form a more congruent interface with the humeral implant. This procedure is used in populations who are young, or have a physically demanding lifestyle, situations where the glenoid is unable to be replaced with an implant, and in incidents of severe fracture of the humeral head. In the case of severe fracture, it is often times more successful to replace rather than repair the humeral head due to the fragile nature of the blood supply and subsequent risk of bone death if the blood supply does not return or is inadequate.

Generally speaking, a typical TSR surgery lasts approximately 2 hours. The patient usually has a 4-6 inch incision along the front of the shoulder just above the armpit and most likely will be wearing a sling for 4-6 weeks. Physical therapy is started with an emphasis on range of motion, then progressing to strengthening. Most patients can return to deskwork in 4-6 weeks and heavy-duty work in approximately 4 months. Although complication rates are low, they can include loosening of the implant, instability, muscle dysfunction, and tears of the rotator cuff. Implant life expectancy is usually greater than that of a total hip or total knee, varying from 10 to 20 years.

REHABILITATION

In the weeks leading up to surgery, pain-free strengthening exercises performed below shoulder-height can be of some benefit. A pre-operative strengthening program can help to mitigate



some of the weakness and atrophy that will develop after surgery. Almost immediately after surgery some form of rehabilitation is initiated. Usually while in the hospital the patient will be taught specific exercise either by a member of the surgical team or by a physical therapist. After discharge, rehabilitation will continue under the direction of a physical therapist usually in conjunction with the surgeon's protocol. With guidance, the patient can do most of the rehabilitation at home.

The initial phase focuses on surgical pain control, passive range of motion and a home exercise program. It is important that the patient strictly adhere to the surgeon and physical therapist's instructions. Active arm use or improper stretching in certain directions can have a significant adverse effect on outcome, particularly in the first few weeks after surgery.

Once the sling has been discontinued, gentle active-assisted range of motion usually can begin. This includes the passive motion from the initial phase as well as motion that will be partially powered by the involved extremity, with progression to full motion powered solely by the extremity. The patient is largely pain free at this stage.

At approximately 8-12 weeks, gentle strengthening can begin. This consists

of very simple, light resistance exercise. The shoulder and arm will be very weak. Some patients may experience mild muscle soreness, which is normal. When it is appropriate, the patient is progressed to a more advanced strengthening

Figure 4



program. Sedentary individuals usually do not require physical therapy beyond 12 weeks. Individuals who develop complications and those with physically demanding occupations or lifestyles will require a longer rehabilitation period, one that focuses on strengthening, work conditioning, or task-specific training.

In general, the expected total recovery time for strength and function should be 9-12 months. These timetables are approximate and will vary depending on the nature and complexity of the surgery and the surgeon's post-op protocol. Reasonable patient expectations should include the alleviation of pain and improved strength; full range of motion should not be expected.

CONCLUSION

Total Shoulder replacement can help alleviate pain, improve range of motion and help regain function. Indications for a TSR are osteoarthritis, severe fracture, rheumatoid arthritis, rotator cuff dysfunction, avascular necrosis, and a history of a previous failed shoulder surgery. There are three types of TSR: standard TSR, reverse TSR and hemiarthroplasty. Please consult your orthopedic surgeon if you feel you may be a candidate for a total shoulder replacement. For your rehabilitation needs, remember that Orthopedic & Sports Physical Therapy Associates, Inc (OSPTA) have convenient locations and day and evening hours to assist you in maximizing your rehabilitation.

Figure 5





OSPTA, Inc.
107 Professional Plaza
North Charleroi, PA 15022

NEWS *briefs*

OSPTA would like to thank Mr. Shawn Heltman, PT for his contribution to the newsletter.

OSPTA would like to welcome Ms. Krista Lizinger, DPT to the OSPTA team and congratulate her for successfully passing her state boards.

OSPTA would like to remind everyone that home health visits can be performed through

Available services are:

- Physical Therapy
- Occupational Therapy
- Speech Therapy
- Nursing
- Home Health Aides
- Social Services



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Carnegie	412-279-7700
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Clairton/ Jefferson	
Medical	412-466-8811
Connellsville	724-626-3320
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Farmington	724-329-4723
North Huntingdon	724-864-4410
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Mt. Lebanon	412-276-6637
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The Hand Center
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 Country Club Road 724-258-6211
 Residence at Hilltop 724-292-1229
Rostraver 724-379-7130
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