Total Shoulder Replacement *Without* Cutting Muscles or Tendons

Anatomy and function of the shoulder

The shoulder is a ball-and-socket joint between the upper arm bone, which is called the humerus, and the shoulder blade, which is called the scapula. The ball is on the top of the upper arm bone and the socket is on the shoulder blade. However, the socket is not a full cup. It is a shallow depression similar to a golf tee. To prevent the ball from slipping over the edge of the shallow socket and dislocating with heavy lifting, the rotator cuff compresses the ball into the socket. When the ball is compressed into the socket, the shoulder joint is a stable rotational fulcrum for the powerful deltoid and pectoralis muscles. This stable rotational fulcrum allows the arm to lift heavy weights above shoulder and head level.

Shoulder arthritis

Shoulder osteoarthritis is a “wear and tear” disease in which the cartilage surfaces of the joint are worn away until the humerus bone is rubbing against the scapula bone. Arthritis creates swelling, pain, stiffness, weakness, and loss of shoulder function. Over time, arthritis tends to get worse. While anti-inflammatory pills and steroid injections can make the shoulder feel better, they do not fix the arthritis or prevent it from getting worse.

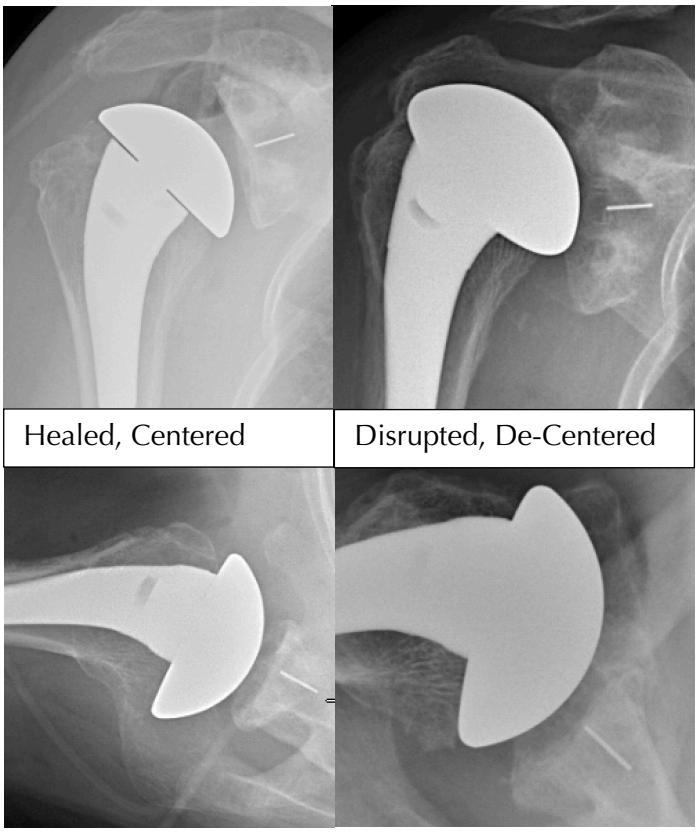
Total shoulder replacement

In total shoulder replacement, the ball is replaced with a highly polished metal alloy, and the socket is replaced with a very durable plastic. These parts are sized to match your bones. The plastic socket is glued to the shoulder blade with special bone cement. The metal ball is attached to the top part of the upper arm bone as it is coated with a special surface that the upper arm bone will grow in to. The artificial joint removes pain, stiffness, weakness, and inflammation from arthritis. Total shoulder replacement has risks such as infection, damage to the nerves or arteries, and many other potential problems. While shoulder replacements last a long time, they do not last forever. The shoulder replacement lasts longer when it is used more gently.

Peter Chalmers, MD | January, 2023

Subscapularis

Traditional shoulder replacement requires that the bone attachment of the front rotator cuff muscle, the "subscapularis", be cut to expose the joint and repaired at the end of surgery. As a result, patients who undergo this procedure cannot reach behind their back or push or pull more than 2-3 pounds of pressure for 3 months after surgery to allow for healing. Even when patients are very careful, accidents do occur and these can disrupt the repair. When the repair fails the shoulder does not function properly. The ball is also no longer centered in the socket, which can cause the socket to loosen. Even when the repair heals perfectly, cutting and repairing the tendon can cause the muscle to atrophy. The risk of repair failure is at least 5-10%.



Healed, Centered | Disrupted, De-Centered

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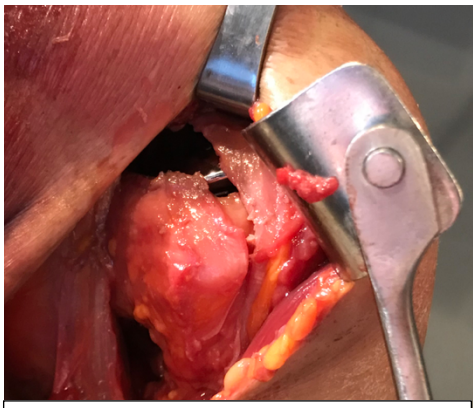
Dr. Chalmers believes that the shoulder functions best when the muscles or tendons are not cut. He has been working to develop a new method for performing total shoulder replacement without cutting any muscles or tendons. This new technique builds upon the work of other shoulder surgeons. Because there are no muscle or tendon repairs to heal, patients that undergo this procedure do not have any weight-lifting or motion restrictions after surgery. Patients also do not need to use a sling. Not all patients are candidates for the procedure. Patients with severe stiffness, severe arthritis that deforms the socket, and rotator cuff tears cannot undergo this procedure. In addition, because this procedure is new the long-term outcomes are not known. Patients who wish to have the most "tried-and-true" procedure should have a traditional shoulder replacement.



Shoulder Replaced, Tendons Intact

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