Surgically Treat Complex Shoulder Fractures

Best Way to Surgically Treat Complex Shoulder Fractures

When it comes to complex fractures of the humerus (upper arm) in older adults, surgeons really have their work cut out for them. There are so many things to keep in mind. A complex fracture usually means the bone is broken into three or four parts. Putting the pieces back together in a way that promotes recovery and return to full function can be a real challenge.

The age of the person matters because people over age 70 often have low bone mass and slow healing. The way in which the bone has fractured, the anatomy of the underlying structures, and risk of ischemia (loss of blood supply to the bone) are additional variables to consider. The chances of developing osteonecrosis (death of the bone) increase with each one of these factors.

A very well-known surgeon (Dr. Charles Neer) introduced the idea of replacing the shoulder instead of trying to repair it. That was back in 1970. Since then, surgeons have tried full joint replacement and hemiarthroplasty (replacing only one side of the joint). These methods have proven to work but not always smoothly. Ischemia and osteonecrosis are still major concerns. Pain relief and improvement in function and recovery aren't always guaranteed.

So, experts have gone back to the drawing board to rethink surgical treatment for these complex proximal humeral fractures. Proximal means the break occurred at the top of the shoulder where the round head and of the femur are located. They asked themselves if the results could be improved with better surgical technique.

They have tried developing implants specifically designed for the type of fracture involved. They have studied the anatomy of the joint very carefully trying to mimic it in every way with reconstructive surgery. Achieving optimal anatomical structures involves the structure, shape, angle, length, and orientation of bone, muscle, tendons, ligaments, even fat deposits.

To give you one example of why this is all important -- getting the proper height of the implant in the joint requires restoring the exact shape (contour) of the humerus where some of the muscles attach. Using the other shoulder as a template helps the surgeon reproduce "normal" as much as possible on the operative (fractured) side.

That brings us to the latest efforts in this area. This article reports on the use of reverse shoulder arthroplasty for three- and four-part proximal humeral fractures. The broken pieces are removed and replaced with a prosthesis (artificial joint). In the "normal" shoulder replacement, the socket side of the implant is a shallow plastic piece and the humeral component is a metal stem attached to a metal ball. In the reverse shoulder replacement, the ball and the socket are reversed.

Naturally, when a new technique is tried, the results must be recorded and reported. Studies done so far have been limited with small numbers of patients and short-term results. But so far the results have been more predictable with improved healing. There is better motion afterwards compared with other types of shoulder replacement.

There is a problem with dislocation of the implant in as many as 30 per cent of the patients. That particular complication occurs when the surgeon removes a bump on the bone called a tuberosity. In the beginning, it seemed easier to cut the tuberosity off rather than try and repair it. Now they know this piece is very important and should be restored whenever possible.

The authors conclude that reverse shoulder arthroplasty is a reasonable surgical treatment for severe upper arm fractures. It's not the best treatment for everyone. In fact, its uses are still fairly limited to older adults (70 or older) who don't have a normal, intact rotator cuff and who likely won't be able to complete a shoulder rehab program after surgery.

More research is needed in this area. The "best" treatment for complex proximal humeral fractures remains an individual decision for each patient based on multiple factors. The use of reverse shoulder replacements requires highly technical skills on the part of the surgeon. There's little room for error. But the results are reliable and effective in terms of restoring natural motion and function in this group of patients.

Reference: Jonathan Chad Levy. Reverse Shoulder Replacement Compared with Hemiarthroplasty for Proximal Humeral Fractures. In Current Orthopaedic Practice. Vol. 21. No. 5. Pp. 443-447.