

Total Elbow Replacement: Not for the Young and Active

Joint replacements are available now for the elbow. But it's a tricky joint made up of three separate bones and two distinct joints. And it is responsible for repetitive motion of the hand and arm as well as rotation of the forearm, and weight-bearing activities through the hand and wrist.

Because of the high activity demand on a replacement implant and its limited lifespan, total elbow replacement (TEA) isn't usually recommended for young patients. In fact, it is considered a salvage procedure -- in other words, only used as a last resort to save the joint.

Before considering a total elbow replacement (TEA) in anyone younger than 40 years of age, all other avenues of treatment should be explored. This usually consists of conservative (nonoperative) care as well as surgery. Conservative care starts with medications (antiinflammatories) or injections (e.g., steroid or hyaluronate injections). Physical Therapy to reduce pain, increase joint motion, and improve function should be tried. If three to six months of conservative care fail to bring the desired results, then surgery may be the next step.

Surgical procedures available to the surgeon (and patient, of course) include: 1) debridement (surgical cleaning) of the joint, 2) interpositional arthroplasty (remove part of the joint and fill in with tendon or other graft tissue), or 3) partial arthroplasty (only part of the joint is replaced). These approaches are used in the management of young adults who have developed degenerative arthritis following injury to the elbow.

How does the surgeon decide which procedure to use for each patient? Well, the key is to evaluate each and every patient individually. Do not try to apply a one-solution-fits-all kind of treatment or management approach. As with conservative care, the goals of surgical treatment are to reduce pain and improve elbow function.

Patients can be divided into two groups based on history and physical examination. The first group are individuals who have a painful, stiff elbow joint at the end-ranges of motion (full flexion and/or full extension). These patients seem to do best with the less invasive debridement procedure. Debridement can be done arthroscopically (minimally invasive approach) or with an open incision.

Patients with pain any time they move the elbow and who have X-ray or CT signs of advanced joint degeneration are better candidates for a more involved surgical procedure. With many choices for surgical approaches, the surgeon must carefully review all aspects of each case.

For example, are there any loose fragments inside the joint? What is the status of the joint surface (i.e., are there any holes or defects? do the joint surfaces match up)? Where is the joint stiffness coming from: the joint capsule? loose fragments inside the joint? damaged and now scarred ligaments? Has any nerve damage developed as a result of the original trauma or injury?

The surgeon must match the patient's lifestyle and activity level with treatment. Removing the head of the radial bone where it meets the elbow joint (a procedure called resection) eliminates one portion of the arthritic joint. This procedure also reduces the amount of force that is transferred into and through the joint. Activities (especially weight-bearing activities) must be limited. Long-term results using this method for younger patients are unknown.

Joint resurfacing, partial joint replacement, and interpositional arthroplasty are considered next. Each has their limitations and restrictions. For example, a partial joint replacement involves removing the radial head

and replacing it with a metal implant.

In some cases, the radial head can be resurfaced, saving more of the bone while restoring the ability of the joint surface to slide and glide during motion. Joint stability may be only partially restored and there is a chance the implant will sink down into the bone or come loose altogether. Long-term studies using these techniques for degenerative post-traumatic elbow arthritis in younger patients are not available either.

One other intermediate procedure that can be done before total elbow replacement is the interposition arthroplasty. The surgeon rebuilds the joint surface by removing the diseased bone and placing graft material in its place.

This approach is technically challenging for the surgeon but has three advantages for the patient. 1) It can be used for more active patients, 2) the person doesn't have to limit how much he or she uses the elbow or how much weight is put through the arm, and 3) if this procedure fails, it's not the end of the line. Patients can still have other surgical options such as the elbow replacement. To qualify for interpositional arthroplasty, the patient must have good bone density, no infection, and no elbow deformity or dislocation.

And finally, we come to the total elbow replacement (TEA) option. Remember, the most appropriate candidates for TEA are patients with painful elbow motion and X-ray evidence of joint destruction. Before using an elbow implant to replace the diseased, degenerated joint, the patient must agree to limit lifting to less than 10 pounds for a single item and less than two to five pounds for repetitive loads. Activities and weight-bearing restrictions will also be advised.

The patient who receives a TEA can expect a stable joint with near normal elbow motion. Complications and problems are fairly common though and the patient must be prepared for this possibility. The implants just haven't held up on long-term studies. Loosening requiring revision (a second surgery) happens more often than anyone would like. Patients often outlive their implants. The bushings wear out, the parts crack and break apart or come loose. Any of these events will require another surgical procedure.

In summary, young adults who suffer a serious injury to the elbow often develop post-traumatic elbow arthritis at an early age. Living with daily, constant pain and loss of motion that results in decreased function (sometimes to the point of disability) is no picnic. Treatment options range from pain relieving medications to surgery to replace the joint. But the bottom-line is that evidence so far suggests total elbow arthroplasty (TEA) is not the best way to go for these patients. All other avenues of treatment should be explored first before resorting to TEA as a salvage procedure.

Reference: Benjamin W. Sears, MD, et al. Posttraumatic Elbow Arthritis in the Young Adult: Evaluation and Management. In *Journal of the American Academy of Orthopaedic Surgeons*. November 2012. Vol. 20. No. 11. Pp. 704-714.