

# Quality of life after shoulder arthroplasty—total shoulder arthroplasty versus hemiarthroplasty

**Original article** Lo IKY *et al.* (2005) Quality-of-life outcome following hemiarthroplasty or total shoulder arthroplasty in patients with osteoarthritis. A prospective, randomized trial. *J Bone Joint Surg Am* 87: 2178–2185

## SYNOPSIS

**KEYWORDS** osteoarthritis, shoulder, surgery

### BACKGROUND

Total shoulder arthroplasty (TSA) and hemiarthroplasty are two of the many treatment modalities available for osteoarthritis of the shoulder. There is ongoing debate regarding which of the two procedures is the best surgical option.

### OBJECTIVE

The object of this study was to compare the benefits in long-term quality of life in patients with shoulder osteoarthritis who had undergone TSA with the same outcomes of patients who had undergone hemiarthroplasty.

### DESIGN AND INTERVENTION

This was a prospective, randomized, double-blind, single-center trial. Patients diagnosed with primary osteoarthritis of the shoulder, who had not responded to  $\geq 6$  months of nonsurgical treatment, were randomly allocated to receive treatment with either hemiarthroplasty or TSA. Patients with a condition that could substantially contribute to shoulder dysfunction, as well as patients with inflammatory arthritis, rotator-cuff tear  $> 1$  cm, and any major illness that could substantially affect quality of life, were excluded from this study. Preoperative radiographs, as well as a CT scan of the affected shoulder, were taken at baseline. After surgery, patients were instructed in range-of-motion exercises, and strengthening exercises were begun after 8 weeks. Pain, quality of life, shoulder function, and global health were assessed postoperatively at

6 weeks and at 3, 6, 12, 18, and 24 months. Analysis was by intention to treat.

### OUTCOME MEASURES

The primary outcome measure of this study was patient score on the Western Ontario Osteoarthritis of the Shoulder index, measured on a scale of 0 to 100.

### RESULTS

A total of 42 patients were included in this study. Participating patients were randomly allocated to receive treatment with either TSA or hemiarthroplasty, thus receiving either a Neer series-II modular total-shoulder prosthesis or a hemiprosthesis implant. There were no significant demographic differences between treatment groups at baseline. There was one postoperative death, attributed to a thromboembolism. Two patients crossed over to the TSA group from the hemiarthroplasty group, one 12 months postoperatively and the other 18 months postoperatively. After 2 years, significant improvement in disease-specific quality of life was observed in both treatment groups ( $P=0.000$ ). There was no significant difference in quality of life between the TSA and hemiarthroplasty groups, as measured by the Western Ontario Osteoarthritis of the Shoulder index ( $90.6 \pm 13.2$  and  $81.5 \pm 24.1$  points, respectively;  $P=0.18$ ). Analyses comparing pain, shoulder function, and global health also showed no significant differences between groups. Four of the hemiarthroplasties performed were considered failures.

### CONCLUSION

The authors conclude that although there are trends to indicate superior outcomes in patients receiving TSA, both surgical procedures improve disease and quality of life in patients with shoulder osteoarthritis.

## COMMENTARY

Robert G Marx

This study by Lo and colleagues is a well-performed, randomized, clinical trial comparing TSA with hemiarthroplasty for patients with severe osteoarthritis of the shoulder. When performing a TSA, the glenoid is resurfaced with a polyethylene (completely plastic) component that is cemented into place. In both procedures, the humeral head is replaced with a prosthetic implant that is inserted into the humeral canal, with or without the use of cement. The advantage of hemiarthroplasty for patients with glenohumeral osteoarthritis is that the operation is less technically demanding, since the most difficult part of the full operation, the glenoid resurfacing, is not done. Operative time is also decreased, which might lessen the risks that are associated with surgery. By avoiding glenoid resurfacing, complications associated with the implant on the glenoid side are also eliminated. Concerns regarding hemiarthroplasty include pain related to the nonresurfaced arthritic glenoid, glenoid erosion from the metal implant on the bone, and possible further surgery to address these problems.

In this methodologically sound trial, the authors found differences between the two treatment groups, with better function and decreased pain observed in the TSA group. The differences are clearly clinically significant, with visual analog pain scores in the TSA group that are less than half of those in the hemiarthroplasty group, and the American Shoulder and Elbow Surgeons (ASES) evaluation form and the University of California, Los Angeles (UCLA) shoulder evaluation test scores that are approximately 10% higher in the TSA group. Because of the small number of patients in each group, however, the differences are not statistically significant. The authors address this lack of power in their discussion: their sample size estimates before the

study were based on the McGill pain score estimates, but the scores obtained in the study had a wider variance leading to a lack of power.

In summary, the authors found differences between the two groups, with the TSA patients having better function and less pain; however, they had too few patients to identify a statistically significant difference. Similar findings were found in a randomized trial by Gartsman, who randomly allocated 47 patients to either TSA or hemiarthroplasty.<sup>1</sup> Gartsman and colleagues actually did find statistically significant differences for the pain score, but not for the UCLA score. A systematic review and meta-analysis that included four randomized trials was recently published by Bryant *et al.*<sup>2</sup> By pooling the individual patient data from these four trials (a total of 112 patients) statistically significant improvements in the UCLA score, pain score, and forward elevation were found in patients who underwent TSA.

In view of these data, this author continues to perform TSA on patients with severe, disabling osteoarthritis of the shoulder who have not responded to nonsurgical treatment. Although there are advantages and disadvantages to both procedures, ultimately patient function and pain are of the greatest importance in choosing between the two methods.

## References

- 1 Gartsman GM *et al.* (2000) Shoulder arthroplasty with or without resurfacing of the glenoid in patients who have osteoarthritis. *J Bone Joint Surg Am* **82**: 26–34
- 2 Bryant D *et al.* (2005) A comparison of pain, strength, range of motion, and functional outcomes after hemiarthroplasty and total shoulder arthroplasty in patients with osteoarthritis of the shoulder. A systematic review and meta-analysis. *J Bone Joint Surg Am* **87**: 1947–1956

RG Marx is an Associate Professor of Orthopedic Surgery and Public Health at the Weill Medical College of Cornell University and the Director of the Foster Center for Clinical Outcome Research at the Hospital for Special Surgery, New York, NY, USA.

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## Competing interests

The author declared he has no competing interests.

## Correspondence

Hospital for Special Surgery  
Orthopedic Surgery and  
Sports Medicine  
535 East 70th Street  
New York  
NY 10021  
USA  
marxr@hss.edu

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## PRACTICE POINT

Total shoulder arthroplasty should be recommended for patients with severe osteoarthritis of the shoulder