



ELSEVIER

ORIGINAL ARTICLE

Cement-within-cement technique in revision reverse shoulder arthroplasty

Eric R. Wagner, MD, Matthew T. Houdek, MD, MS, Nicholas M. Hernandez, MD, Robert H. Cofield, MD, Joaquin Sánchez-Sotelo, MD, PhD, John W. Sperling, MD, MBA*

Department of Orthopaedic Surgery, Mayo Clinic, Rochester, MN, USA

Background: The purpose of this study was to determine the complications and results of cement-within-cement-humeral fixation in revision reverse shoulder arthroplasty.

Methods: In 38 shoulders, a cemented humeral component was revised to a cemented reverse humeral component using a cement-within-cement technique. The mean follow-up time was 3.7 (2.0-7.0) years. Clinical, radiologic, and hard outcomes were assessed using the Kaplan-Meier survival method, Fisher exact test, and Student *t*-test.

Results: The average operative time for the cement-within-cement technique was 153 minutes. There were 7 (18%) nondisplaced intraoperative fractures involving the greater tuberosity that occurred on implant removal; all healed at last follow-up. A second revision surgery was performed in 3 (8%) patients who underwent cement-in-cement humeral component revision for glenoid loosening (n = 1), periprosthetic instability associated with glenoid loosening (n = 1), and periprosthetic humerus fracture (n = 1). The overall implant revision-free survival at 2 and 5 years was 95% and 91%, respectively. Patients experienced significant pain relief, improvements in their shoulder range of motion, and high satisfaction. There was 1 “at-risk” humeral component (grade 4 or higher humeral lucency, moderate subsidence) that did not undergo revision surgery. There were 2 other humeral components with grade 3 humeral lucency, no subsidence.

Conclusions: Cement-within-cement fixation of the humeral component in revision reverse shoulder arthroplasty is associated with a reasonable operative time, good medium-term survival rates, and good pain relief and functional outcomes with low complications. This technique is an important consideration to preserve humeral bone stock and potentially humeral component and implant stability.

Level of evidence: Level IV; Case Series; Treatment Study

© 2017 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.

Keywords: Cemented; humeral; reverse; total; shoulder; arthroplasty; revision

Approval for this study was provided by the Mayo Clinic Institutional Review Board: 16-001368. Each author certifies that his or her institution approved the human protocol for this investigation and that all investigations were conducted in conformity with ethical principles of research.

*Reprint requests: John W. Sperling, MD, MBA, Department of Orthopaedic Surgery, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA.

E-mail address: sperling.john@mayo.edu (J.W. Sperling).

Revision shoulder arthroplasty is a difficult procedure with variable results.^{3,18-20} During the last decade, the advent of the reverse shoulder arthroplasty (RSA) has given surgeons an important option in revision arthroplasty because of its ability to provide adequate fixation on a compromised glenoid and to compensate for an insufficient rotator cuff. The semiconstrained design and medial center of rotation of this

prosthesis have enabled surgeons to overcome many of the complex challenges faced in the revision setting.

However, when revising a previously placed humeral component, surgeons are faced with the complex challenge of attempting to save bone stock while providing a stable foundation for the revision stem. In revising a failed cemented humeral component, complete removal of cement to obtain cementless fixation of the revision stem may be extremely difficult to achieve and can lead to severe intraoperative bone loss and fracture. Implantation of a new cemented revision component in a retained mantle of cement is commonly considered in revision hip surgery,^{7,8,11-13,15} but its performance in the shoulder is largely unknown. The purpose of this study was to determine the outcome of revision RSA using a cement-within-cement technique.

Methods

We identified our retrospective study sample through our prospectively collected institutional total joint registry.² This registry prospectively captures patient demographics, operative details, complications, reoperations, implant revisions, and clinical outcome scores of patients treated with total joint arthroplasty. Patients are asked to follow up with the surgeon twice during the year after operation, then again at postoperative years 2 and 5, and subsequently at 5-year intervals. The remainder of the information not captured through this registry was obtained through electronic medical record review.

Patient demographics

From January 1, 2005, through December 31, 2012, there were 38 revision RSAs performed for patients who required revision of a cemented humeral component from their index primary arthroplasty to a cemented reverse component (cement-in-cement technique) with >2 years of follow-up. Of note, we attempted to compare with a control group of patients who were converted from a cemented to an uncemented humeral component, but this was not possible given the diversity of these patients; most had to be converted to either a proximal humerus replacement (n = 3) or allograft prosthetic composite (n = 3), required a strut allograft (n = 2), or were associated with periprosthetic fractures (n = 3). Excluding these cases and all with <2 years of follow-up, there were only 2 cases that were converted from cemented primaries to uncemented revision humeral stems and 4 components that underwent complete cement removal and repeated cement application. Of the 2 cases that were converted to an uncemented revision humeral stem, 1 required revision for glenoid loosening; 2 of the 4 that underwent complete cement removal had an intraoperative fracture, whereas the other 2 required postoperative reoperations, including a glenosphere dissociation and revision for repeated instability.

The 38 patients who underwent the cement-within-cement technique (Fig. 1) were observed for an average of 3.7 years (range, 2-7) or until revision surgery. The demographics are summarized in Table I. The primary indications for revision surgery in the cemented group included 21 cases with instability or subluxation, 16 for glenoid disease (wear or component loosening), and 1 for humeral component loosening within the cement mantle. Of those revised for

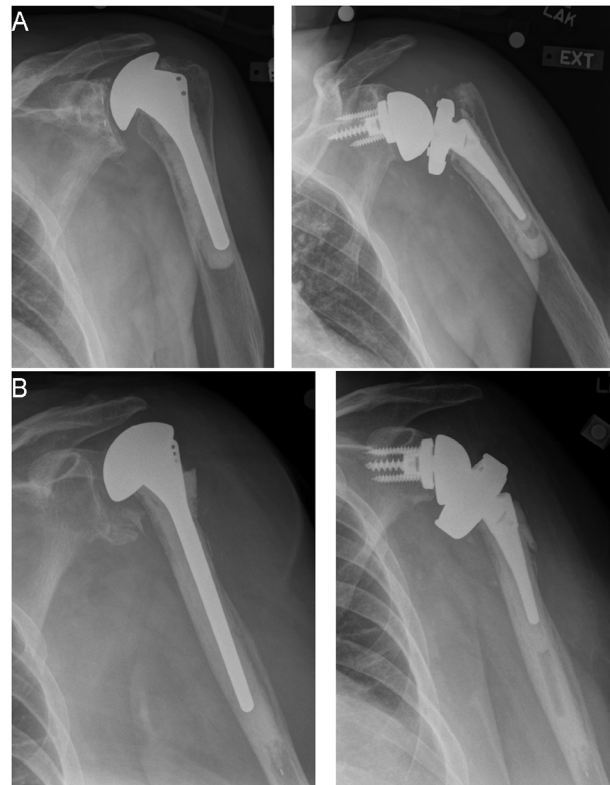


Figure 1 (A and B) Revision of previously cemented humeral components to reverse prosthesis using the cement-within-cement technique. The patients' humeral components remained stable at their last follow-up (5.2 years in A, 4.3 years in B).

Table I Demographics

Variables	No. (%) or mean (range)
No.	38
Age (years)	70 (55-89)
Female	24 (63%)
Body mass index, mean	30.0
Smokers	3 (8%)
Diabetes mellitus	7 (18%)
Humeral retroversion	24° (10°-30°)
Operative time (minutes), mean	153
Prior total shoulder (anatomic or reverse)	25 (66%)

instability, 7 had prior anatomic arthroplasties with rotator cuff tears leading to anterior (n = 2) or posterosuperior (n = 5) instability, 5 had instability associated with a reverse arthroplasty, and 9 had failed hemiarthroplasties associated with rotator cuff tears and superior escape. All patients undergoing revision surgery for glenoid or humeral loosening had a preoperative workup to rule out infection, including erythrocyte sedimentation rate and C-reactive protein level, and when determined appropriate by the treating surgeon, an aspiration. Of note, 3 of the 17 cases revised for loosening had

Download English Version:

<https://daneshyari.com/en/article/5710116>

Download Persian Version:

<https://daneshyari.com/article/5710116>

[Daneshyari.com](https://daneshyari.com)