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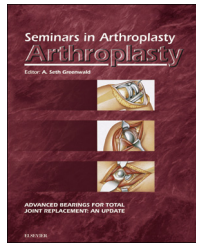

Glenoid revision is best treated with glenoid implants: Affirms

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ABSTRACT

Radiographic lucency adjacent to the glenoid component is a common finding after a total shoulder arthroplasty. In fact, the majority of patients with this entity are asymptomatic and require no management. However, when there is documented progression of lucent lines, leading to clinically symptomatic loosening, revision total shoulder arthroplasty is warranted. Treatment options for revision surgery are guided by the amount of glenoid bone loss and include either reimplanation or removal. When feasible, reimplantation of the glenoid yields superior clinical results. Reimplantation strategies include reimplantation without bone grafting, one-stage reimplantation with bone grafting, two-stage reimplantation with bone grafting, and reimplantation with the use of glenoid augments. If bone loss precludes, the clinician may consider implant removal with either biologic resurfacing or hemiarthroplasty.

1. Introduction

Total shoulder arthroplasty is an extremely successful procedure with excellent pain relief, patient satisfaction, and long-term outcomes. In 1997, Torchia et al. [1] showed the survivorship of the original Neer prosthesis to be 93% at 10 years and 87% at 15 years. Since that time, other studies have also affirmed this longevity, and in 2005, Deshmukh et al. [2] demonstrated survival rates at 10 and 20 years being 93% and 85%, respectively. Furthermore, in a large meta-analysis, Radnay et al. [3] showed that the patients who underwent total shoulder arthroplasty for the treatment of primary glenohumeral osteoarthritis were significantly more satisfied with their results than were the patients who were treated with a humeral head replacement. However, in spite of the high success rate, complications related to total shoulder arthroplasty do exist, at times necessitating a revision operation. While there may at times be a clearly delineated reason for primary implant failure, the pathology is often multifactorial and difficult to identify. The cause of failure may be elucidated based on the symptoms the patients are experiencing, demonstrating the need for a thorough history and physical examination [4]. If the main complaint is loss of motion, there may be bony block malunion or an issue with prosthetic size or position. If the patient is experiencing episodes of instability, the components may have been placed in incorrect version or there may be progressive glenoid wear. Furthermore, patient weakness may represent a rotator cuff tear, deltoid atrophy, neurologic injury, or tuberosity resorption. Lastly, if the main complaint is pain, it may be related to any of the above causes in addition to an underlying infection or component loosening.

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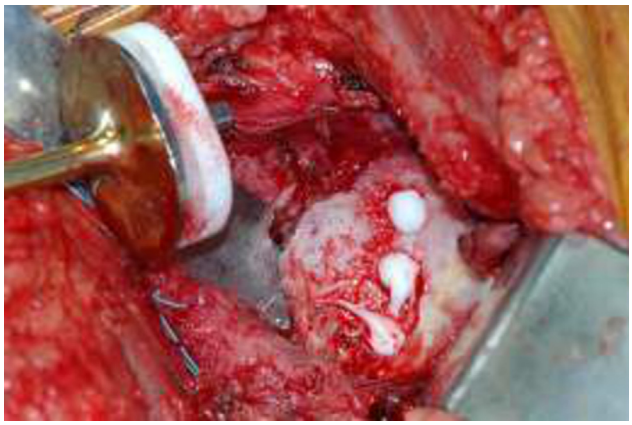

Figure 1 – An intraoperative photograph demonstrating the use of a pegged glenoid component with a modern instrumented cement pressurization technique. (Color illustration of figure appears online.)

While any of the aforementioned causes may necessitate a revision procedure, the most common reason for a failed primary total shoulder arthroplasty is symptomatic glenoid loosening. The clinician is often faced with a challenging situation when evaluating a patient with radiographic lucency surrounding the glenoid prosthesis, as this may often be found in asymptomatic patients as well. Raiss et al. [5] published their results on cemented total shoulder replacements and noted that none of the humeral components but 36% of the glenoid components were radiographically loose at 10-year follow-up. Additional studies have shown the rate of radiographic lucent lines about the cemented glenoid component as occurring anywhere between 20% and 90% [6,7]. In a separate study, Barwood et al. [8] showed that the incidence of radiolucent lines may be related to the surgical and cementation technique. The authors demonstrated that the use of a pegged glenoid component with a modern glenoid reaming system and an instrumented cement pressurization technique will achieve a low prevalence of radiolucent lines in patients undergoing a total shoulder arthroplasty for primary glenohumeral osteoarthritis (Fig. 1). While pegged and keeled glenoid designs each have their specific benefits, the amount of bone removed is less with pegged glenoids and are therefore more favorable in the event that a revision surgery is necessary.

In spite of the relatively high radiographic incidence of loosening, clinical manifestation is less often encountered, as patients may be entirely asymptomatic. Figure 2A and B demonstrates a 72-year-old female who underwent a right total shoulder arthroplasty 19 years ago and a left total shoulder arthroplasty 15 years ago. Despite having radiographic evidence of glenoid loosening on the right side but not on the left side, she has no complaints with respect to either side and is extremely satisfied with her result. When evaluating a symptomatic patient with lucency on radiographs, the clinician must decipher whether the root of pain is related to loosening or if there is a separate concomitant process triggering the symptoms. A thorough evaluation must include a complete radiographic shoulder series to assess component position, such as laboratory values, namely inflammatory markers, to assess for an indolent infection. Further workup can subsequently be tailored to the specific situation. CT scans can be useful to assess the version of the glenoid component as well as bone loss around the component and polyethylene wear. Furthermore, MRI scans can be useful to assess the integrity of the rotator cuff, while an EMG may be utilized if a neurologic injury or deltoid atrophy is suspected.

Given the relatively high prevalence of radiographic lucent lines in asymptomatic patients with total shoulder arthroplasty, it is only after all of the other possible causes for a painful shoulder have been ruled out that the clinician should proceed with a revision surgery for isolated glenoid loosening. Various treatment options for revision surgery exist and are guided by the amount of bone loss. Antuna et al. [9] intra-operatively categorized glenoid bone loss on

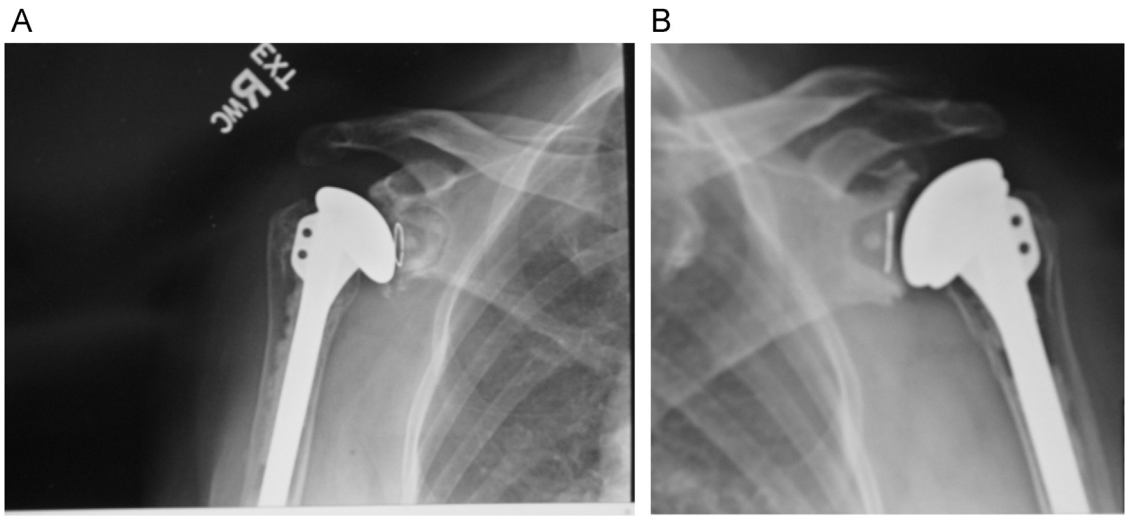

Figure 2 – (A and B) A 72-year-old female who underwent a right TSA 19 years ago and a left TSA 15 years ago. Despite having radiolucent lines around the glenoid component on the right side but not on the left side, the patient is completely asymptomatic and is satisfied with her result.