



# Bilateral scapular fractures after reverse shoulder arthroplasties



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Scapular fractures are a well-recognized complication after reverse shoulder arthroplasty (RSA).<sup>2-6,8,10,11,13,15,16,19,27,28,30</sup> Varying theories as to the etiology of these fractures exist, and the natural history of the operative and nonoperative treatment of these fractures has not yet been fully elucidated. Although many authors have recognized and reported on this complication unilaterally, to our knowledge no one has reported on this complication occurring bilaterally and examined its functional consequence.

## Case report

A 63-year-old right-hand dominant woman with a history of failed rotator cuff repair on the right shoulder underwent an RSA with a Delta III prosthesis (DePuy, Warsaw, IN, USA) for the diagnosis of rotator cuff tear arthropathy. Her preoperative active range of motion (AROM) was 70° in forward elevation (FE), 65° in external rotation (ER), and to the fifth lumbar vertebra in internal rotation (IR). Preoperative outcome measures were as follows: American

Shoulder and Elbow Surgeons (ASES) score, 40; Constant score, 29; Shoulder Pain and Disability Index, 88; University of California–Los Angeles score, 12; Simple Shoulder Test score, 1; and 12-Item Short Form Health Survey, 30. Medications pertinent to the planned procedure were ibandronate, atenolol, and clopidogrel.

Details of the operation include wafer osteotomy of the subscapularis and repair, placement of the humeral stem in 10° of retroversion, and use of a DePuy Delta III prosthesis. **Figure 1** represents the radiographs taken at the first postoperative visit (2 weeks). At the 6-month visit, the patient's AROM was 140° in FE, 40° in ER, and to the second lumbar vertebra in IR.

At 10.5 months postoperatively, the patient returned with increasing pain and declining function without a traumatic event. Her AROM had decreased to FE of 40°, ER to 10°, and IR to the posterior superior iliac spine. Physical examination revealed significant tenderness along the acromial angle, and radiographs showed increased acromial tilt and a fracture at the base of the acromion. A computed tomography (CT) scan was ordered to further characterize the fracture (**Fig. 2**). At this time, the patient was treated conservatively and placed in an abduction sling.

At approximately 22 months postoperatively, she was diagnosed with rheumatoid arthritis and prescribed daily prednisone (5 mg orally 4 times a day). Her right shoulder had not regained motion; however, because of pain and difficulty in sleeping and other activities of daily living (ADLs), the patient wished to be evaluated for an RSA on her left side. She was extensively counseled about the

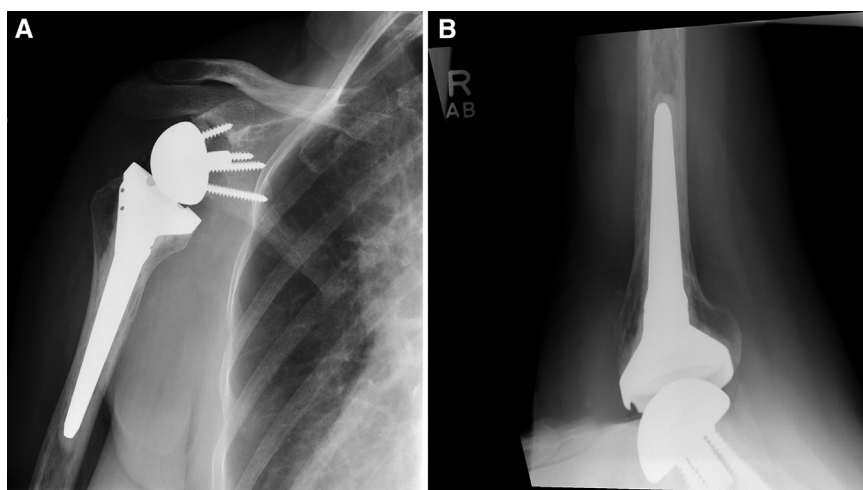
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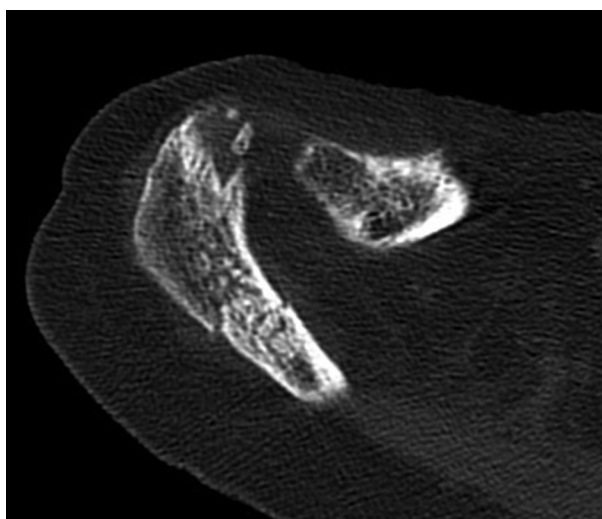
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**Figure 1** (A and B) The Grashey (true anteroposterior) and axillary lateral views of the right shoulder at the 2-week postoperative clinic visit. The prosthesis is a DePuy Delta III and is cemented.



**Figure 2** Axial cut of the CT scan at the level of the fracture.

concerns in patients with bilateral RSAs, especially given her minimally functional right side with the acromial base fracture. At approximately 27 months after the initial arthroplasty, the patient elected to undergo RSA on the left side. Medications pertinent to the planned procedure were ibandronate, atenolol, clopidogrel, and prednisone. The humerus was cut in 15° of retroversion, and an Equinox prosthesis (Exactech, Gainesville, FL, USA) was used. [Figure 3](#) represents the postoperative radiographs obtained 2 weeks after the procedure on the left.

The patient's preoperative AROM on the left was FE to 45° and ER to 30°; IR and outcome measures were not obtained. The patient did well in the perioperative period, with AROM of FE to 140° and ER to 45°. At approximately 3.5 years postoperatively on the left, the patient was getting up from a seated position when she felt a "pop" in her left shoulder that was followed by extreme

pain. Evaluation at that time revealed point tenderness along the left scapular spine and AROM values of 30° in FE, 45° in ER, and IR to the greater trochanter. Imaging revealed an obliquely oriented, minimally displaced fracture of the scapular spine. Given that the patient had relatively poor function on the right side after a similar fracture, the patient was once again presented her options with a strong recommendation for surgical fixation of the fracture. Once again, the patient declined surgery, and conservative treatment was undertaken. She was evaluated 6 months later with radiographs and a CT scan ([Fig. 4](#)) and again declined any intervention.

At the most recent follow-up (6 years on the right and 4 years on the left), the patient continued to have difficulty with overhead activities and pain. Her range of motion and outcome measures were obtained at that time and are summarized in [Table I](#). Radiographs at the most recent follow-up (6 years on the right, 4 years on the left) are represented in [Figure 5](#).

## Discussion

Stress fractures of the acromion are uncommon in the setting of a nonarthroplasty shoulder, but select case reports can be found throughout the literature.<sup>7,9,12,21-23,29</sup> However, the incidence of scapular fractures after RSA has been reported to be between 0.8% and 10.2%.<sup>3-6,8,10,11,13-16,19,26-28,30</sup>

Given the relatively low incidence of bilateral RSAs being performed, only a single case report exists in the literature that discusses bilateral atraumatic scapular spine fractures after RSA.<sup>17</sup> This report focused on the radiographic presentation and diagnosis of this type of lesion rather than quantifying the motion loss in FE or examining the decline in functional outcome measures after such fractures. However, the case report did mention that the "function was never regained in either shoulder, with the

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