

CASE REPORT

A Case Report: Reverse Shoulder Joint Replacement - Neer's Four Part Fractures of Head & Neck of Humerus with Glenohumeral Arthritis

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ABSTRACT

A reverse shoulder replacement is a surgical procedure in which prosthetic shoulder components are used to replace injured shoulder. It is used to treat serious shoulder conditions including shoulder fractures, arthritis, and rotator cuff injuries. Even if the rotator cuff muscles are not working properly, the benefits of the new joint allow for better shoulder movement. The deltoid muscles, which cover the front, back, and sides of the shoulder, can help in arm mobility without the need for the rotator cuff. This article describes a case of a 70-year-old woman who developed glenohumeral arthritis in addition to a Neer's four-part fracture of the humerus' head and neck.

KEYWORDS

• Cuff arthritis • Reverse shoulder replacement • Conventional shoulder replacements

INTRODUCTION

The shoulder joint consists of the humerus (upper arm bone) and the scapula (shoulder blade). The shallow socket of the scapula accommodates the rounded end of the humerus,

referred to as the ball or humeral head, enabling a wide range of motion. Cartilage, tendons, and ligaments surrounding the joint provide support and facilitate movement. The primary difference between reverse total shoulder arthroplasty (RTSA) and a traditional shoulder

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replacement is that in RTSA, the ball is placed on the socket side of the joint and the socket on the humeral side, which allows for the deltoid muscle to assist in shoulder movement in the absence of a functional rotator cuff¹.

During conventional shoulder replacement, the new plastic socket is attached to the shoulder blade, and the metal ball is affixed to the humerus. This more traditional approach mimics the natural shoulder anatomy, and is usually indicated for patients with intact rotator cuff function. However, reverse total shoulder replacement is especially beneficial for patients with rotator cuff deficiencies, as it allows the deltoid muscle to compensate for the rotator cuff and improve shoulder function².

CASE REPORT

A 70-year-old woman presented to our hospital after sustaining a fall, resulting in significant pain, swelling, and limited shoulder mobility. Radiographs revealed glenohumeral arthritis and four-part humeral neck fractures. The patient was otherwise healthy with no history of hypertension or diabetes. Given the severity of her condition, reverse shoulder arthroplasty (RTSA) was chosen as the surgical treatment³.

The deltopectoral approach was utilized for better access to the lower glenoid and to improve visualization during the procedure. The arm was adducted and rotated, with the elbow pushed forward and upward to dislocate the humeral head, allowing for the resection of the anatomical neck and removal of osteophytes. An extramedullary guide was used to resect the humeral neck at a 30-degree retroversion angle, ensuring proper alignment of the humeral components⁴.

After preparing the humeral canal with reamers and broaches, the cemented humeral stem was inserted. The glenoid surface was then prepared with a reamer along a guidewire to ensure proper seating of the base plate. The glenoid component was positioned with a 10-degree anterior tilt to reduce the chance of failure and was fixed with screws targeting dense bone areas⁵.

Following surgery, the arm was immobilized for two weeks, and external rotation was limited for the first four weeks. Early rehabilitation included pendulum exercises for the shoulder and elbow. At three months postoperatively, the patient had no pain and demonstrated a

satisfactory range of motion⁶.



Figure 1: Pre-operative X-ray



Figure 2: Post operative X-ray



Figure 3: Clinical photograph immediately after surgery

DISCUSSION

Reverse total shoulder arthroplasty (RTSA)

has gained popularity globally, especially in the treatment of rotator cuff arthropathy and other traumatic and degenerative shoulder conditions. The prosthetic components of RTSA differ from those in anatomical total shoulder arthroplasty, with the glenoid component serving as a ball and the humerus as the socket. RTSA is indicated for cases such as pseudo-paralysis from irreparable rotator cuff tears, acute humeral fractures, post-traumatic arthritis, and revision surgery after failed anatomical total shoulder replacement⁷.

Indications:

- Rotator cuff arthropathy, caused by large rotator cuff tears leading to humeral migration and glenohumeral arthritis⁸.
- Pseudo-shoulder paralysis due to irreparable rotator cuff tears.
- Acute fractures of the proximal humerus that are displaced.
- Post-traumatic arthritis of the glenohumeral joint.
- Chronic shoulder dislocations.
- Revision after failed total shoulder arthroplasty or hemiarthroplasty.
- Inflammatory joint conditions, such as rheumatoid arthritis⁹.

Contraindications:

- Axillary nerve palsy.
- Insufficient deltoid muscle function.
- Active infections.
- Significant deficiency of glenoid bone stock.
- Skeletal immaturity.
- Neuromuscular disorders increasing prosthesis dislocation risk¹⁰.

CONCLUSION

Reverse shoulder arthroplasty is an increasingly preferred treatment for various shoulder pathologies, especially in patients with rotator cuff dysfunction. The primary benefit of RTSA is that it shifts the rotational axis of the shoulder, enabling the deltoid to perform most of the work that the rotator cuff normally would. Proper patient selection, understanding biomechanics, and post-operative rehabilitation are key factors in achieving successful outcomes with

RTSA¹². Routine follow-up and monitoring are essential for identifying complications and ensuring optimal recovery.

Conflict of Interest: Nil

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