

BILATERAL REVERSE SHOULDER PROSTHESIS LONG-TERM FOLLOW-UP: A CASE REPORT

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ABSTRACT

Purpose: Reverse shoulder prosthesis is a method used after massive rotator cuff tears. It is a surgical method used to improve shoulder functions and to cope with pain. Long-term results of physiotherapy programs applied after surgery are insufficient. The aim of this study is to investigate the long-term results of reverse shoulder prosthesis applied to both shoulders.

Methods: A 66-year-old female patient with a rotator cuff tear on both shoulders was included in the study. After surgery, 40 sessions of physiotherapy were applied to the left shoulder and 45 sessions of physiotherapy to the right shoulder, and the right shoulder was followed for 6 years and the left shoulder for 8 years. VAS for pain, goniometer for active range of motion, and constant shoulder score questionnaire for functionality were used in the evaluations.

Results: Significant differences were found in the preoperative and postoperative evaluation in terms of pain, activities of daily living and active range of motion of the patient. While the preoperative Constant scores were 32 for the left shoulder and 34 for the right shoulder, the postoperative Constant scores were calculated as 84 for both shoulders.

Keywords: rehabilitation, reverse prosthesis, shoulder exercises

INTRODUCTION

Reverse shoulder prosthesis (RSP) has been used in the surgical treatment of shoulder problems, and this method used in many diseases is a surgical method used in massive rotator cuff tear arthropathy. It has been reported as a salvage surgery in patients with irreparable rotator cuff tears with limited range of motion and pain (1). It was first designed by Paul Grammont in 1980 in France (2). Biomechanically, the RSP shifts the center of rotation of the shoulder medially and inferiorly so that the moment arm of the deltoid muscle is extended. As a result, RSP can generally increase the anterior flexion and abduction of the arm, despite a non-functional rotating cuff. Multiple studies have reported an improvement in

pain and function in patients after RSP for rotator cuff tear arthropathy (3–5).

In this study, we investigated the late functional results of a patient with a diagnosis of rotator cuff tear arthropathy who underwent reverse shoulder prosthesis on both shoulders.

REPORT OF THE CASE

She was followed up in a physical therapy clinic in a private hospital in Konya. A 66-year-old female patient underwent RSP surgery in the left shoulder area in January-2013 and in the right shoulder area in June-2015.

Both surgeries were performed by the same orthopedist and physiotherapy and rehabilitation program by the same physiotherapist.

Rotator cuff tear arthropathy was evaluated as stage 5 in our patient according to the classification described by Hamada et al (6).

Before surgery, flexion, internal and external rotation of the shoulder joint, passive and active range of motion (ROM) were measured with a universal goniometer. Constant and Visual Analogue Scale (VAS) scores were evaluated preoperatively and postoperatively at regular intervals. A superolateral incision was used in the patient who was operated on by the same surgeon.

Phase I; postoperative/joint protection; phase II, active ROM/early boost; phase III, moderate strengthening; and Phase IV home program (7).

Phase I (first five weeks); To protect the operated joint, active movement was initiated in the elbow, wrist and wrist joints while the shoulder joint was in the shoulder strap. Passive joint motion in the shoulder was not allowed for the first 4-5 days due to tissue healing. Immobilization was performed for the first 4-6 weeks and cold-pack application was performed every 2 hours for 15 minutes. Isometric exercises for the deltoid and scapular muscles and passive range of motion exercises were started as of the 7th day. The patient was asked to do isometric exercises for 10 repetitions every hour. In order to

Table 1. Values of The Patient Before and After Treatment

LEFT SHOULDER	Flexion	Internal Rotation	External Rotation	Constant Score	VAS Score
Preoperative Evaluation	30°	10°	15°	32	9
6. month	110°	10°	20°	80	0
1. year	170°	60°	60°	80	0
3. year	170°	70°	80°	84	0
5. year	170°	80°	80°	84	0
7. year	170°	80°	80°	84	0
8. year	170°	80°	80°	84	0
RIGHT SHOULDER					
Preoperative Evaluation	50°	20°	30°	34	9
6. month	130°	40°	50°	80	0
1. year	170°	80°	80°	80	0
3. year	170°	80°	80°	84	0
5. year	170°	80°	80°	84	0
6. year	170°	80°	80°	84	0

Postoperative rehabilitation program

Patient Molieri et al. a rehabilitation protocol consisting of 4 phases was applied according to the protocol.

protect the shoulder joint, internal rotation movement was started in the shoulder joint after the 6th week. Active-assisted exercises for the shoulder joint were patient was started from the 5th week to ensure deltoid functionality. The patient was asked to do 10 repetitions of active-assist shoulder exercises in 2

sets from the 5th week. Home exercises were in the form of repetitions of exercises done in the clinic.

Phase II (6-12 weeks) shoulder joint active exercises were patient started. The patient was advised to avoid internal rotation movements while in hyperadduction and shoulder adduction. In addition, she was told that she should avoid hyperextension movements during the entire treatment period. The patient was asked to do 10 repetitions of shoulder exercises in 2 sets at home.

Phase III (12-16 weeks) Light resistance exercises were added to the treatment program.

Phase IV (16 weeks and later) was continued as a home program.

A total of 40 sessions of rehabilitation program was applied for the left side and 45 sessions for the right side.

RESULTS

The mean follow-up period of the patient was 9 years for the left shoulder and 7 years for the right shoulder. While the preoperative Constant scores of our patient were 32 in the left shoulder and 34 in the right shoulder, the postoperative Constant score was 84 for the left shoulder at the 9th year and 84 for the right shoulder at the 7th year. The patient's shoulder range of motion values are given in Table 1. Shoulder movements of the patient after 9 years are given in Figure 1A-E.

While the pain intensity of the patient was 9 in the preoperative period according to VAS, it was recorded as 0 according to VAS in the postoperative period.

DISCUSSION

It was found that the rehabilitation program applied after reverse shoulder prosthesis improved the patient's pain, normal range of motion and daily living activities.

In their systematic examination review, Garrett et al. reported that there was no difference in postoperative complication rates or results in patients with or without subscapularis repair, but a full-functional subscapularis muscle could increase the shoulder internal rotation range of motion (7). In our study, as the subscapularis muscles were intact in both shoulders, the internal rotation range of motion was found to be increased.

Boudreau et al. recommended the use of sling-shoulder strap 3-4 weeks after surgery, early deltoid and scapular isometric exercises, and a gradual passive range of motion in the first 6 weeks of recovery (8). The patient used shoulder strap and was given early isometric exercises and passive range of motion exercises for at least 4 weeks.

Ernstbrunner et al. evaluated patients under the age of 60 who underwent RSP. RSP in patients younger than 60 years leads to substantial subjective and functional improvement without clinical deterioration beyond 10 years (9). Our patient was under 60 years of age at the time of her operation and her results were quite good.

Information on the long-term results of RSP applications is insufficient. The longest mean follow-up period reported in the literature is 108 months (9). In our patient, the follow-up period was 108 months for the left shoulder and 90 months for the right shoulder.

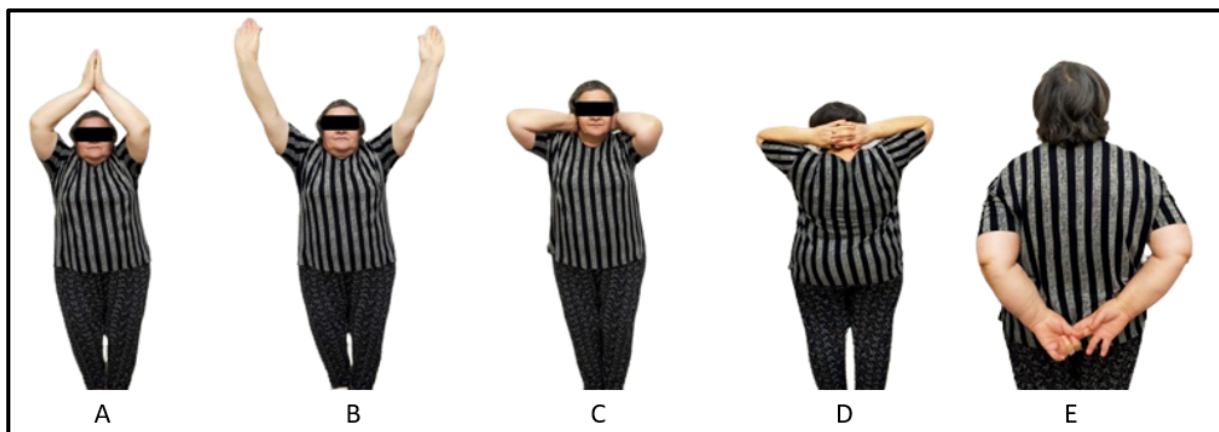


Figure 1 A-E: Patient's 6th Year Left Shoulder Movements, 8th Year Right shoulder movements
A: Shoulder abduction, B: Shoulder flexion, C: Shoulder external rotation -Anterior View D: Shoulder external rotation- Posterior view E: Shoulder internal rotation

Guery et al. reported that there was some decrease in function in an average of 80 months of follow-up after RSP application and stated that it should not be done to people under the age of 70 (1). Favard et al. also reported that revision may be needed after RSP applications, especially in young patients. They suggested that functional deficiencies and radiographic changes worsen over time (1,10). For these reasons, they suggested that care should be taken when recommending RSP in young patients. In our patient, although our follow-up period in the left shoulder was 108 months, no decrease in function was detected and our patient had his first operation at the age of 66. It was considered that our patient had difficulty in practicing daily life activities and RSP was applied to this patient because she had arthropathy of rotator cuff tear in both shoulders. Although the long-term results of Favard et al. are unknown, they suggested that pain and function improved after RSP in patients with rotator cuff tear arthropathy (10). Pain and function improvement were also observed in our patient.

Although there is no common protocol when looking at rehabilitation protocols, Boudreau et al. divided the rehabilitation program into 4 phases (8). Our rehabilitation program was similar to these phases. A recent systematic review by Garrett et al. showed that the only consensus is that physiotherapy plays an important role in optimizing patient outcomes and that high-quality prospective research is needed (7). In our study, we believe that the rehabilitation was performed by the same physiotherapist, the long session duration, and the patient's regular follow-up visits prevented us from encountering any negativity in the long-term results of our patient.

In a systematic review by Ernstbrunner et al., they reported that there was no regression in functional results in 5 to 20 years of follow-up in patients who underwent reverse shoulder prosthesis (11).

CONCLUSION

It has been observed that appropriate rehabilitation program and regular follow-up have positive effects on long term results in patients who underwent reverse shoulder prosthesis.

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