

# Treatment of Chronic Shoulder Dislocation with Reverse Shoulder Arthroplasty and Glenoplasty: A Case Report

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## ABSTRACT

Glenohumeral dislocation is one of the most common joint dislocations, accounting for 45% of all cases. More than 90% are anterior dislocations. Chronic anterior shoulder dislocation is common in older patients; however, many cases are not diagnosed early, making treatment challenging. The objective of this article is to describe a glenoplasty technique using an autologous humeral head graft combined with reverse shoulder arthroplasty. We present the case of a 79-year-old woman with pain and functional impairment of the right shoulder of more than 3 years' duration. Her range of motion was 20° of forward flexion, 20° of extension, and 10° of abduction, with no external or internal rotation. Radiographs and computed tomography scans revealed bone loss in both the glenoid and the humeral head. Reverse shoulder arthroplasty was performed. Satisfactory outcomes were achieved in terms of range of motion, pain relief, and return to activities of daily living. **Conclusion:** This technique is useful in older patients with chronic dislocation and glenoid bone loss and provides satisfactory outcomes.

**Keywords:** Dislocation; arthroplasty; bone graft; glenoid, humeral head.

**Level of Evidence:** IV

## Resolución de la luxación inveterada de hombro con una técnica de artroplastia invertida y glenoplastia. Reporte de un caso

## RESUMEN

La luxación glenohumeral es una de las luxaciones articulares más frecuentes, representa el 45%. Más del 90% son luxaciones anteriores. La luxación anterior de hombro crónica es frecuente en pacientes mayores; sin embargo, muchas no se diagnostican de manera temprana y su tratamiento se convierte en un desafío. El objetivo de este artículo es comunicar una técnica de glenoplastia con injerto autólogo de la cabeza humeral y artroplastia invertida de hombro. Se presenta el caso de una paciente de 79 años que tenía dolor e impotencia funcional de hombro derecho de más de 3 años de evolución, y rangos de movilidad de 20° de flexión anterior, 20° de extensión, 10° de abducción, rotaciones externa e interna nulas. Las imágenes radiográficas y tomográficas revelaban pérdida de tejido óseo tanto en la glena como en la cabeza humeral. Se decidió realizar una artroplastia invertida de hombro. Se obtuvieron resultados satisfactorios en los rangos de movilidad, el alivio del dolor y el retorno a las actividades cotidianas. **Conclusiones:** Esta técnica es útil en pacientes mayores con luxación crónica y pérdida de tejido óseo en el componente glenoideo, y sus resultados son satisfactorios.

**Palabras clave:** Luxación; artroplastia; injerto óseo; glenoides; cabeza humeral.

**Nivel de Evidencia:** IV

## INTRODUCTION

Glenohumeral dislocation is one of the most common joint dislocations, accounting for 45% of all dislocations. More than 90% are anterior dislocations.<sup>1</sup> Chronic anterior shoulder dislocation is common in elderly patients; however, many cases are not diagnosed early.

In elderly patients, associated injuries such as rotator cuff tears, fractures, and even osteonecrosis of the humeral head are common. Failure to diagnose the condition may lead to loss of shoulder function, early osteoarthritis,

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**How to cite this article:** López A, Ruiz Rufino C, Martínez C, Bustos L, Fiminela H, Caram M. Treatment of Chronic Shoulder Dislocation with Reverse Shoulder Arthroplasty and Glenoplasty: A Case Report. *Rev Asoc Argent Ortop Traumatol* 2026;91(4):364-370. <https://doi.org/10.15417/issn.1852-7434.2026.91.4.1970>

humeral head necrosis, instability, and even nerve injury.<sup>2</sup> Surgical treatment is indicated in the presence of instability and aims to improve pain, neurological symptoms caused by nerve compression or injury, function, and quality of life.<sup>3,4</sup>

The objective of this article is to present a technique involving glenoplasty with an autologous humeral head graft and reverse shoulder arthroplasty in a case of chronic anterior shoulder dislocation with glenoid bone loss.

## CLINICAL CASE

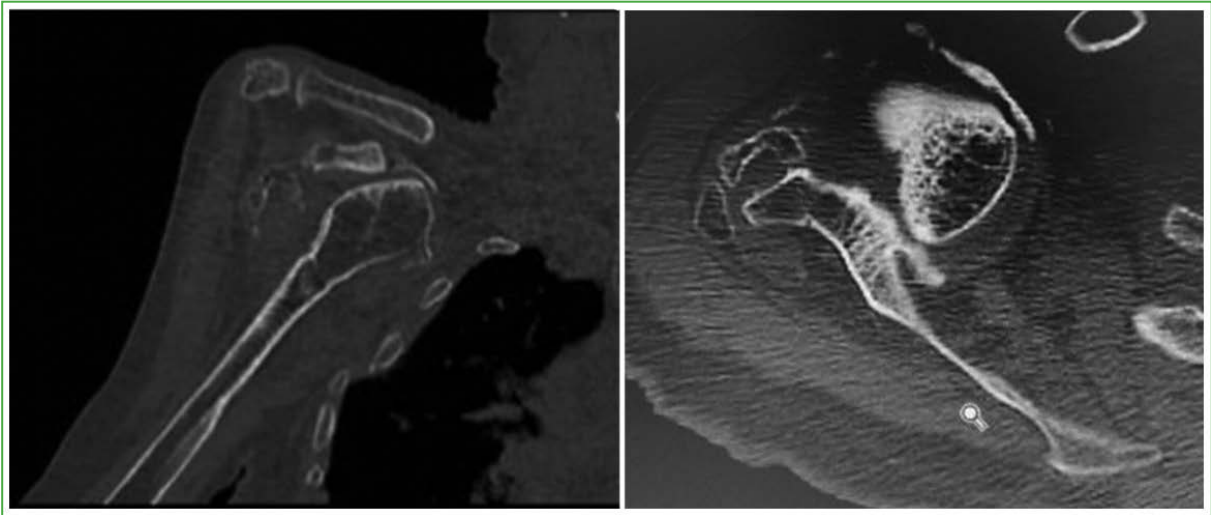
A 79-year-old woman presented with right shoulder pain and functional limitation associated with paresthesia in the right upper limb for more than 3 years. Her pain had worsened over the previous year, prompting her family to bring her for consultation.

Physical examination revealed deltoid atrophy. The muscle was clinically functional and active, with no evidence of axillary nerve injury, which could have occurred given the duration of the dislocation; therefore, the atrophy was considered secondary to disuse. Range of motion was 20° of forward flexion, 20° of extension, and 10° of abduction, with no external or internal rotation. Anteroposterior and lateral radiographs of the right shoulder showed loss of glenohumeral joint congruity with a humeral bone defect (Figure 1).



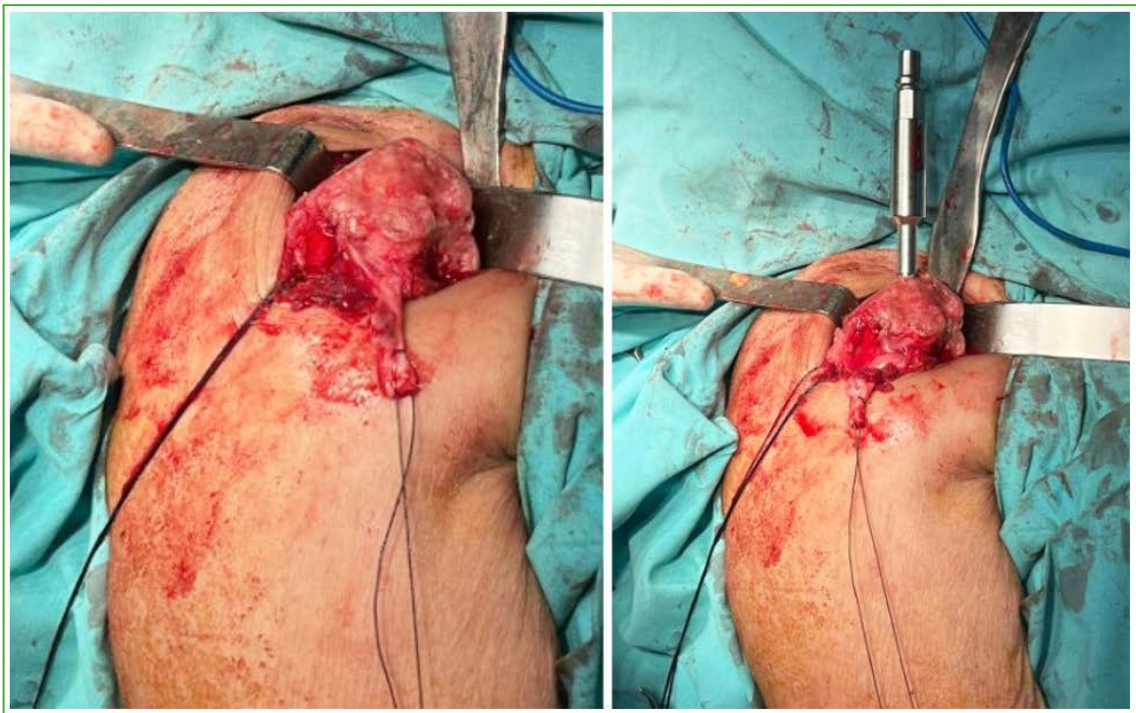
**Figure 1.** Anteroposterior and lateral radiographs of the right shoulder showing loss of glenohumeral joint congruity with a humeral bone defect.

Computed tomography confirmed anterior loss of glenohumeral joint congruity, with anatomic changes in the glenoid, a significant anterior glenoid bone defect of 30%, classified as type D according to the modified Walch classification, and 50% erosion of the humeral head (Figure 2).



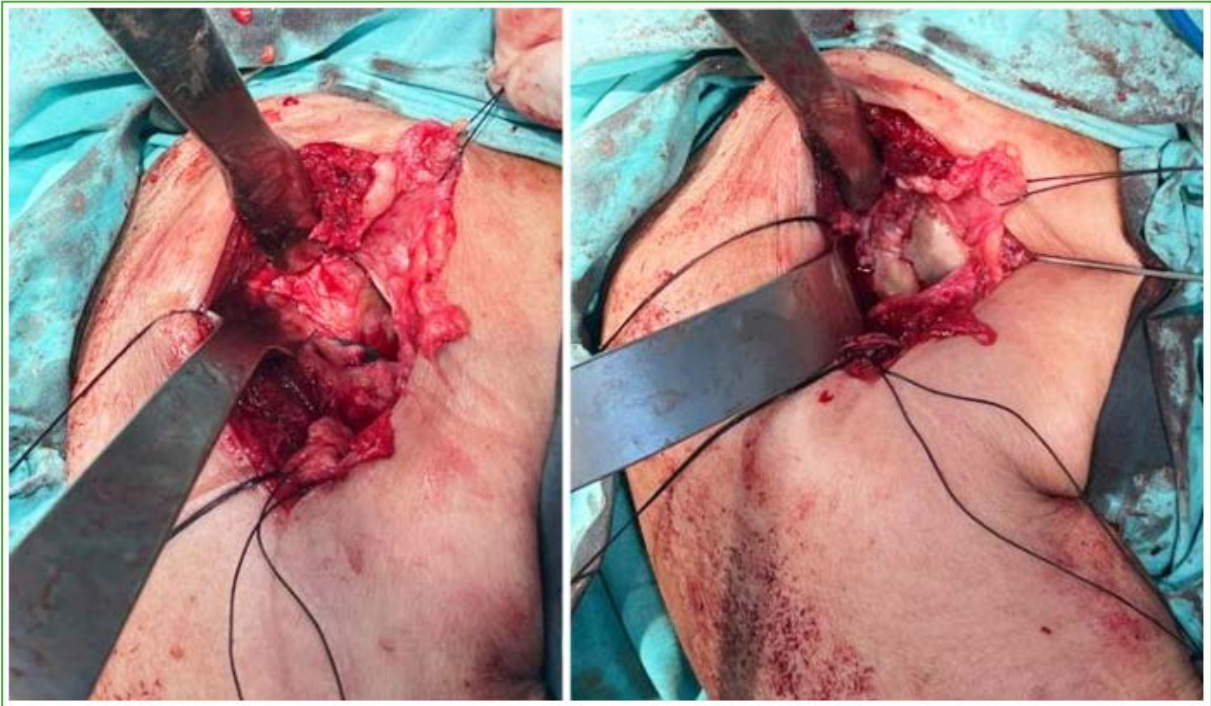
**Figure 2.** Representative CT images showing the dislocated humeral head impacted anteriorly and an axial view demonstrating anatomic changes in the glenoid with an anterior bone defect >30%.

The patient was placed in the beach-chair position under general anesthesia. Through a deltopectoral approach, an osteotomy of the humeral head was performed. The glenoid was then prepared for placement of an autologous graft obtained from a portion of the humeral head. The graft was shaped to fit the defect and fixed with cannulated screws. A glenoid component (size 36), a glenosphere (size 36), and a 10-mm-diameter uncemented humeral stem with a porous metaphyseal surface for osseointegration were implanted. In this case, bone cement was used to provide rotational stability at the distal end of the stem, which lacks a porous surface. The tuberosities were repaired with high-strength sutures (Figures 3-5).

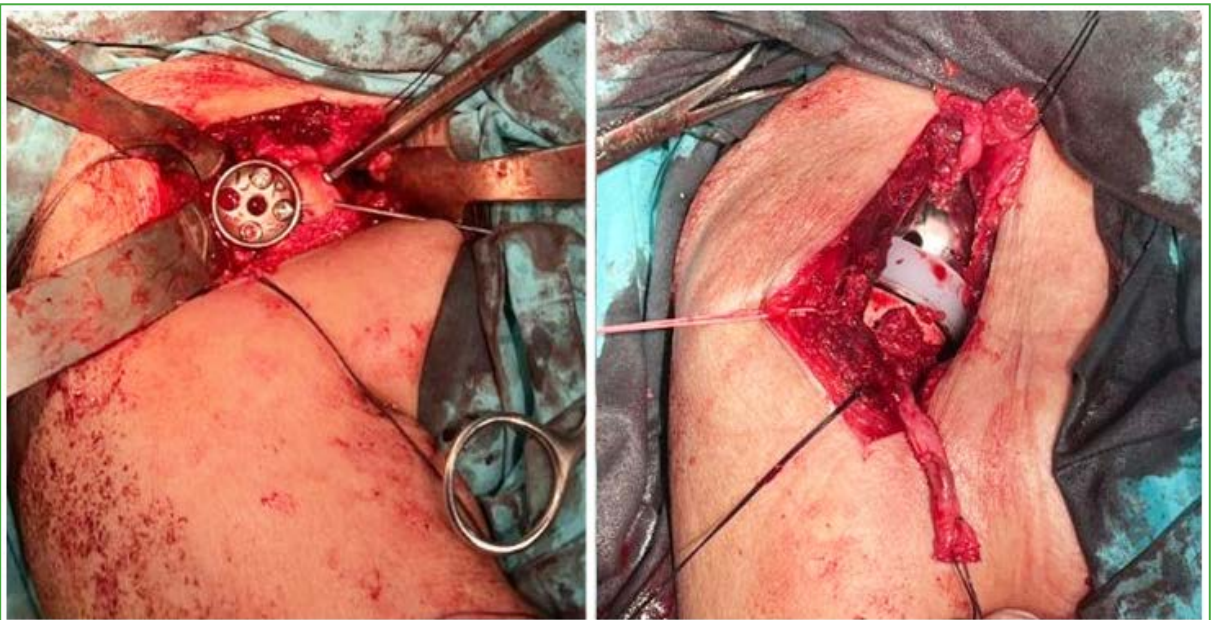


**Figure 3.** Exposure of the humeral head and insertion of the guide for humeral osteotomy. The humeral head defect is visible.





**Figure 4.** Exposure of the glenoid region. The initial glenoid defect is shown, followed by the reconstructed glenoid after placement of the autologous humeral head graft.



**Figure 5.** Placement of the glenoid component on the reconstructed glenoid. The prosthesis is shown in place and reduced.

Postoperatively, the patient wore a sling for one month and was followed weekly. During the first week, pendulum exercises without resistance were prescribed. Beginning in the third week, assisted active and passive range-of-motion exercises were initiated under the supervision of a physical therapist. Finally, progressive muscle-strengthening exercises were initiated at the sixth week, with assessment of range of motion.

At 18 months, range of motion was 80° of forward flexion, 40° of abduction, 20° of external rotation, and 20° of internal rotation.

Follow-up radiographs showed adequate osseointegration of the prosthesis and congruity of its components (Figure 6).

The ASES (*American Shoulder and Elbow Surgeons*) score was 70, which we considered indicative of an adequate return to functional activities.



**Figure 6.** Follow-up anteroposterior and lateral radiographs of the right shoulder. The components are congruent, and the screws securing the graft show no evidence of loosening.

## DISCUSSION

The exact timeframe for defining a shoulder dislocation as chronic is not clearly established in the literature. Some authors define it as a dislocation persisting for >3 weeks.<sup>5</sup> Diagnosis is often delayed in elderly patients with low functional demands because of factors such as an incomplete physical examination and inadequate radiographic assessment.

The diagnosis is confirmed by radiographs. Computed tomography may be obtained for more accurate assessment and treatment planning. Based on CT findings, our case was classified as type D according to the modified Walch classification, defined as any degree of glenoid anteversion or anterior subluxation of the humeral head <40%.

This definition is based on the modified Walch classification, which describes glenoid morphology in primary glenohumeral osteoarthritis.<sup>6</sup> The modified Walch classification adds types B3 and D and redefines types A2 and C.

Type A: centered humeral head, concentric wear, and no humeral head subluxation. A1: minor central erosion. A2: substantial central erosion, with the humeral head protruding into the glenoid cavity.

Type B: posteriorly subluxated humeral head and a biconcave glenoid with asymmetric wear. B1: posterior joint-space narrowing, subchondral sclerosis, and osteophytes. B2: biconcave glenoid with posterior rim erosion and glenoid retroversion. B3: monoconcave glenoid with posterior wear and retroversion  $>15^\circ$  or posterior humeral head subluxation  $>70\%$ , or both.

Type C1: dysplastic glenoid with retroversion  $>25^\circ$ , regardless of erosion.

Type C2: biconcave glenoid with posterior bone loss and posterior translation of the humeral head.

Type D: glenoid anteversion or anterior subluxation of the humeral head  $<40\%$ .<sup>1</sup>

Bone defects of the humeral head and glenoid, together with soft-tissue contractures, make these injuries challenging to treat.

Reverse shoulder arthroplasty became widely used for the treatment of rotator cuff arthropathy, and its indications have expanded to include patients with extensive soft-tissue involvement and poor bone quality.<sup>7</sup>

Accordingly, reverse shoulder arthroplasty is indicated in patients with chronic glenohumeral dislocations, particularly elderly patients, those with humeral head defects involving  $>40\%$  of the articular surface, significant glenoid bone loss, irreparable rotator cuff tears, nerve compression or injury, and dislocations of more than 6 months' duration.<sup>8</sup>

Statz et al. compared 3 hemiarthroplasties, 7 total shoulder arthroplasties, and 9 reverse shoulder arthroplasties performed in 21 patients (7 with glenoid defects reconstructed using a humeral head autograft), with a 2-year follow-up. The authors reported that reverse shoulder arthroplasty was superior in terms of stability and reoperation rates.<sup>9</sup>

Frías et al. reported the follow-up of six patients with chronic anterior shoulder dislocation treated with reverse shoulder arthroplasty. One patient had anterior glenoid bone loss that was also treated with an autologous humeral head graft. The authors concluded that reverse shoulder arthroplasty for this chronic condition, even in the presence of correctable bone defects, provides good functional outcomes.<sup>10</sup>

Our patient had no complications during follow-up. However, in one of the series with longer follow-up, Matsoukis et al. compared reverse shoulder arthroplasty in patients with primary osteoarthritis and those with chronic dislocation. They reported better outcomes and fewer complications in patients with primary osteoarthritis, although patients with chronic dislocation also achieved good outcomes in terms of function and quality of life. Complications associated with reverse shoulder arthroplasty included postoperative instability and glenoid component failure.<sup>11</sup>

## CONCLUSIONS

Chronic glenohumeral dislocations are underdiagnosed injuries that generally occur in elderly patients. Because diagnosis is often delayed, treatment selection can be challenging. In the presence of soft-tissue injuries and associated bone defects, reverse shoulder arthroplasty is considered a good treatment option because glenoid bone defects can be reconstructed with autologous grafts, providing good stability and satisfactory functional outcomes.

We consider this technique a good treatment option for patients with the conditions described.

Conflicts of interest: The authors declare no conflicts of interest.

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