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Original article

Rotator cuff arthropathy: what functional results can be expected from reverse arthroplasty?☆

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ABSTRACT

Objective: To evaluate the functional results from reverse arthroplasty and its complications and relationships with types of injury.
Methods: Twenty-seven shoulders (26 women and one man) were treated. The patients were assessed using the UCLA functional scale. The implant used was the Delta Xtend Depuy® model. The injuries were classified using the Seebauer method for the degree of arthroplasty and the Nerot method for notching.
Result: The mean age was 77.4 years (range: 67–89) and the follow-up was 25.8 months (range: 6–51). The preoperative UCLA score was 10.1 (range: 6–15) and the postoperative UCLA score was 29.8 (range: 22–35), which was a statistically significant improvement ($p < 0.001$). According to the Seebauer classification, five patients were 1B, 19 were 2A and three were 2B. Fifteen cases presented complications (55.5%) and notching was the commonest of these, occurring in 14 patients (nine with grade 1 and five with grade 2), but this did not cause instability in any of them. Only one patient (3.7%) had a major complication, consisting of dislocation in the immediate postoperative period. Two patients (7.4%) said that they would undergo the procedure again. One patient (3.7%) underwent a revision procedure.
Conclusion: Reverse arthroplasty was shown to be an excellent option for treating patients with rotator cuff arthropathy, with a low rate of major complications. Notching was a frequent complication, but in the majority of the cases, it did not present clinical repercussions.

Artropatia de manguito: o que esperar do resultado funcional da artroplastia reversa?

Palavras-chave:
Bainha rotadora

RESUMO

Objetivo: Avaliar o resultado funcional da artroplastia reversa, suas complicações e relações com os tipos de lesões.

☆ Work performed by the Shoulder and Elbow Group, Orthopedics and Traumatology, Hospital Universitário Cajuru, Curitiba, PR, Brazil.

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Artroplastia
Ombro
Avaliação de resultados

Métodos: Foram tratados 27 ombros, de 26 mulheres e um homem. Os pacientes foram avaliados pela escala funcional de UCLA. O modelo de implantes usado foi o Delta Xtend Depuy®. As lesões foram classificadas segundo Seebauer para o grau de artropatia e Nerot para o *notching*.
Resultado: A idade média foi de 77,4 (67-89), o seguimento foi de 25,8 meses (6-51), o UCLA pré era de 10,1 (6-15) e o UCLA pós foi de 29,8 (22-35), com uma melhoria estatisticamente significativa ($p < 0{,}001$). Pela classificação de Seebauer, cinco eram 1 B, 19 eram 2 A e três eram 2 B. Tivemos 15 complicações (55,5%), o *notching* foi o mais comum e ocorreu em 14 pacientes, nove deles grau I e cinco grau II, mas nenhum deles gerou instabilidade. Apenas uma paciente (3,7%) teve complicação maior, com luxação no pós-operatório imediato. Dois pacientes (7,4%) alegaram que não repetiriam o procedimento. Uma paciente (3,7%) foi submetida a revisão.
Conclusão: A artroplastia reversa mostrou-se uma excelente opção para o tratamento de pacientes com artropatia do manguito rotador com baixo índice de complicações maiores. O *notching* é uma complicação frequente, mas que na maioria dos casos não apresenta repercussão clínica

Introduction

The first cases of glenohumeral arthrosis resulting from rotator cuff injuries were described by Adams and Smith, in 1850, *apud* Feeley et al.,[1] but it was Neer et al.,[2] in 1983, who used the term "arthropathy of the rotator cuff" for the first time to describe a combination of massive rotator cuff injury together with upward migration and femoralization of the femoral head and erosion of the acromion with possible acetabularization.

Regarding etiology, Garancis et al.[3] proposed the name "Milwaukee shoulder" for this pathological condition and suggested that it might be caused through accumulation of hydroxyapatite crystals inside the joint, which would then be phagocytized by synovial cells, thereby releasing proteolytic enzymes and leading to joint destruction. Neer et al.[2] put forward the hypothesis that mechanical and nutritional alterations would interact in the etiology of the disease. Mechanically, the presence of massive injury to the rotator cuff would cause an imbalance in the pairs of forces and would result in upward migration of the head and erosion of the acromion. The uncovering of the head would lead to unsealing of the joint with loss of negative pressure and extravasation of the synovial fluid to the soft tissues. The quality of the remaining fluid would diminish and this would lead to degeneration of the joint cartilage and osteopenia through disuse.[2]

This disease affects women more often, and particularly between the sixth and seventh decades of life. The dominant limb is more commonly affected and bilaterality occurs in 10–25% of the cases. The natural evolution leads to progressive chronic pain and limitation of activities. In physical evaluations, supraspinatus tests are positive. The subscapularis can be evaluated through the Gerber or liftoff test, and patients may present pseudoparalysis and test positively for the Hornblower sign. Nighttime pain and loss of range of motion are common, especially with regard to elevation and external rotation. Recurrent anterior edema (geyser sign or fluid sign) resulting from increased fluid pressure on the subacromial bursa may also be observed.[1,4]

The forms of treatment range from conservative treatment,[5,6] which is always indicated initially, to arthroscopic debridement,[7–9] hemiarthroplasty,[10–12] reverse arthroplasty[13–15] and salvage procedures such as arthrodesis[16,17] and resection arthroplasty.[18] Currently, anatomical total arthroplasty is proscribed for treating this pathological condition because of the low success rate, high rate of loosening, high attrition and instability generated through the phenomenon known as rocking horse.[19]

Recently, the popularity of reverse arthroplasty has increased. The concept of the current models is based on the principles of Grammont, with medialization and inferiorization of the center of rotation, which boosts the action of the deltoid.[13,20]

The objective of the present study was to evaluate the functional result from reverse arthroplasty for treating arthropathy of the rotator cuff, the complications from this procedure and relationships with types of injury.

Materials and methods

Between January 2010 and November 2013, the Shoulder and Elbow Group of the Department of Orthopedics and Traumatology of our institution conducted a retrospective epidemiological study that involved reviewing the medical files.

This study was approved by the Ethics Committee of the institution at which it was conducted.

The inclusion criteria were: (1) arthroplasty of the rotator cuff already established; (2) imaging examinations that demonstrated massive tearing of the rotator cuff; and (3) trophic deltoid presenting strength grade 5.

The exclusion criteria were: (1) permanent injury to the axillary nerve; (2) arthrosis of other etiologies; and (3) previous fractures of the glenohumeral joint.