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Original article

Evaluation of the results from surgical treatment of fractures of the lateral extremity of the clavicle, using the double ligature technique☆

Alberto Naoki Miyazaki, Luciana Andrade da Silva, Guilhermel do Val Sella, Sergio Luiz Checchia, Sílvia Helena Cavadinha Cândido dos Santos, Vitor Schneider Chadud*

Faculdade de Ciências Médicas da Santa Casa de São Paulo (FCMSCSP), São Paulo, SP, Brazil

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ABSTRACT

Objective: To evaluate the incidence of consolidation in surgical treatment of fractures of the lateral extremity of the clavicle using the double subcoracoid ligature technique, with nonabsorbable No. 5 thread.

Methods: Between May 1993 and June 2013, the Shoulder and Elbow Group of our service surgically treated 116 patients (116 shoulders) with fractures of the lateral extremity of the clavicle. Among these, we were able to reassess 65 cases. The surgical technique used consisted of double subcoracoid ligature with two nonabsorbable threads. In two patients classified as type III, we had to combine this technique with use of an interfragmentary screw for fixation of the intra-articular portion of the acromioclavicular joint.

Results: We achieved fracture consolidation in 90%. Fourteen cases (21%) evolved with major complications: four cases of pseudarthrosis, five of adhesive capsulitis, two of delayed consolidation and three of loss of reduction. Two cases (3%) evolved with minor complications of skin granuloma.

Conclusion: The double ligature technique for fractures of the lateral extremity of the clavicle promotes the stabilization needed for consolidation to take place, without the need for synthesis using metal components. It avoids reoperation for the synthesis material to be removed. Moreover, it is a low-cost procedure with good reproducibility and preservation of the acromioclavicular joint.

☆ Work developed in the Shoulder and Elbow Group, Department of Orthopedics and Traumatology, Faculdade de Ciências Médicas da Santa Casa de São Paulo (FCMSCSP), Pavilhão Fernandinho Simonsen, São Paulo, SP, Brazil.

* *Corresponding author.*
E-mail: lucalu01@me.com (L.A. da Silva).

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Avaliação dos resultados do tratamento cirúrgico das fraturas da extremidade lateral da clavícula pela técnica do amarrilho duplo

Palavras-chave:
Fraturas ósseas
Clavícula
Articulação acromioclavicular

RESUMO

Objetivo: Avaliar a incidência de consolidação do tratamento cirúrgico nas fraturas da extremidade lateral da clavícula pela técnica do duplo amarrilho subcoracóideo com o uso de fio inabsorvível número 5.

Métodos: Entre maio de 1993 e junho de 2013, o Grupo de Ombro e Cotovelo do nosso serviço tratou cirurgicamente 116 pacientes (116 ombros) com fratura da extremidade lateral da clavícula. Desses, conseguimos reavaliar 65. A técnica cirúrgica usada foi o amarrilho duplo subcoracóideo com dois fios inabsorvíveis. Em dois pacientes classificados como tipo III tivemos de associar um parafuso interfragmentário para fixação da porção intra-articular da AC.

Resultados: Tivemos 90% de consolidação da fratura; 14 casos (21%) evoluíram com complicações maiores: quatro pseudoartroses, cinco capsulites adesivas, dois retardos de consolidação e três perdas de redução; e dois casos (3%) evoluíram com complicação menor: granuloma de pele.

Conclusão: A técnica do amarrilho duplo para as fraturas da extremidade lateral da clavícula promove a estabilização necessária para que haja consolidação sem necessidade de síntese metálica; evita reoperações para retirada do material de síntese; além de ser um procedimento de baixo custo, com boa reprodutibilidade e preservação da articulação acromioclavicular.

Introduction

Allman divided fractures of the clavicle into three groups based on anatomy and injury mechanisms.[1] Fractures located in the middle third (group I) are the most frequent type, account for around 80% of the cases and especially among young adults. Fractures located at the lateral extremity of the clavicle (group II) account for around 15–25%, while only around 5% occur in the proximal third (group III).[2–4] Fractures of the lateral extremity of the clavicle are classified based on whether the coracoclavicular ligaments are intact and on the impairment of the acromioclavicular joint. This classification was first described by Neer and was subsequently complemented by Craig.[5,6]

According to Edwards et al.[7] and Anderson,[8] surgical treatment is indicated in situations of displaced fractures of the lateral extremity of the clavicle because of the high risk of non-consolidation, which may affect around 30% of these patients. This morbidity is attributed partly to the shearing forces between the fragments, which contributes toward non-consolidation of the fracture.[9]

There is no standardized method for surgical treatment of fractures of the lateral extremity f the clavicle.[10] Several techniques have been described in the literature, consisting of using a screw,[11] fixation with metal wires,[12,13] fixation with a hook plate,[14] fixation with a specific locking Plate[15] or use of cerclage.[10,16] According to Neer,[16] the cerclage technique with double binding between the clavicle and the coracoid process indirectly promotes reduction and stabilization of the fracture, with minimal periosteal injury. Once consolidation has been achieved, the acromioclavicular ligaments (especially the upper one) are sufficient for maintaining the suspensor mechanism of the shoulder.[11,16,17]

The present study had the aim of evaluating the incidence of consolidation following surgical treatment by means of the subcoracoid double-binding technique, using nonabsorbable No. 5 thread, in cases of fractures of the lateral extremity of the clavicle.

Sample and methods

Between May 1993 and June 2013, 116 patients (116 shoulders) with fractures of the lateral extremity of the clavicle were treated surgically by the shoulder and elbow group of our service. Among these patients, 93 underwent the double-binding technique. We were able to reassess 65 of these patients from their medical files and radiographic images (Table 1).

The inclusion criterion was that all the patients needed to have presented fractures of the lateral extremity of the clavicle and needed to have undergone surgical treatment by means of the double-binding technique, with postoperative follow-up for a minimum of six months.

Patients presenting the following were excluded: fractures of the middle or proximal thirds of the clavicle; fractures in diseased bones; previous injuries or factures of the shoulder or the ipsilateral upper limb; associated neurovascular injuries; or follow-up shorter than what was established.

The patients were followed up as outpatients for a mean period of 11.64 months (range: 6–180). The mean length of time between the dates of the trauma and the surgery was 7.6 days, with a range from one to 21 days (Table 1).