



## Original article

# Safety zone for posterosuperior shoulder access: study on cadavers<sup>☆</sup>



Miguel Pereira Costa, Sandro Baraldi Moreira, Gustavo Costalonga Drumond\*,  
Fernanda de Marchi Bosi Porto, Fabiano Rebouças Ribeiro,  
Antonio Carlos Tenor Junior

Hospital do Servidor Público Estadual de São Paulo, São Paulo, SP, Brazil

## ARTICLE INFO

## Article history:

Received 21 May 2014

Accepted 30 June 2014

Available online 8 June 2016

## Keywords:

Shoulder/anatomy and histology

Shoulder/innervation

Acromioclavicular joint/surgery

Operative surgical procedures

## ABSTRACT

**Objective:** The posterosuperior shoulder access used in surgical treatment for acromioclavicular dislocation was constructed through dissection of 20 shoulders from 10 recently chilled adult cadavers, and the distances from this route to the nearby neurovascular structures were analyzed.

**Methods:** A Kirschner wire was introduced into the top of the base of the coracoid process through the posterosuperior shoulder access, in the area of the origin of the conoid and trapezoid ligaments, thus reproducing the path for inserting two anchors for anatomical reconstruction of the coracoclavicular ligaments. The smallest distance from the insertion point of the Kirschner wire to the suprascapular nerve and artery/vein was measured.

**Results:** The mean distance from the suprascapular nerve to the origin of the coracoclavicular ligaments at the top of the base of the coracoid process was 18.10 mm (range: 13.77–22.80) in the right shoulder and 18.19 mm (range: 12.59–23.75) in the left shoulder. The mean distance from the suprascapular artery/vein to the origin of the coracoclavicular ligaments was 13.10 mm (range: 9.28–15.44) in the right shoulder and 14.11 mm (range: 8.83–18.89) in the left shoulder. Comparison between the contralateral sides did not show any statistical difference.

**Conclusion:** The posterosuperior shoulder access route for anatomical reconstruction of the coracoclavicular ligaments in treating acromioclavicular dislocation should be performed respecting the minimum limit of 8.83 mm medially.

© 2016 Sociedade Brasileira de Ortopedia e Traumatologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

<sup>☆</sup> Study conducted at the Hospital do Servidor Público Estadual de São Paulo, Serviço de Ortopedia e Traumatologia, Grupo de Ombro e Cotovelo, São Paulo, SP, Brazil.

\* Corresponding author.

E-mails: [gustavodrumond@gmail.com](mailto:gustavodrumond@gmail.com), [marateko@hotmail.com](mailto:marateko@hotmail.com) (G.C. Drumond).

<http://dx.doi.org/10.1016/j.rboe.2016.06.001>

2255-4971/© 2016 Sociedade Brasileira de Ortopedia e Traumatologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Zona de segurança no acesso posterossuperior do ombro: estudo em cadáver

R E S U M O

### Palavras-chave:

Ombro/anatomia e histologia  
Ombro/inervação  
Articulação  
acromioclavicular/cirurgia  
Procedimentos cirúrgicos  
operatórios

**Objetivo:** Os autores fizeram o acesso posterossuperior do ombro usado no tratamento cirúrgico da luxação acromioclavicular, a partir da dissecação de 20 ombros de 10 cadáveres adultos recém-resfriados, e analisaram as distâncias da via às estruturas neurovasculares próximas.

**Métodos:** Introduziu-se um fio de Kirschner no topo da base do processo coracoide pelo acesso posterossuperior do ombro, na área de origem dos ligamentos conoide e trapezoide, para reproduzir o trajeto da inserção de duas âncoras para reconstrução anatômica dos ligamentos coracoclaviculares. Mediu-se a menor distância do ponto de inserção do fio de Kirschner ao nervo e à artéria/veia supraescapular.

**Resultados:** A média da distância do nervo supraescapular até a origem dos ligamentos coracoclaviculares no topo da base do processo coracoide foi de 18,10 mm (13,77 a 22,80) no ombro direito e 18,19 mm (12,59 a 23,75) no ombro esquerdo. A média da distância da artéria/veia supraescapular até a origem dos ligamentos coracoclaviculares foi de 13,10 mm (09,28 a 15,44) no ombro direito e 14,11 mm (08,83 a 18,89) no ombro esquerdo. Não houve diferença estatística comparativa entre os lados contralaterais.

**Conclusão:** A via de acesso posterossuperior do ombro para reconstrução anatômica dos ligamentos coracoclaviculares no tratamento das luxações acromioclaviculares deve ser feita com respeito ao limite de 08,83 mm medialmente.

© 2016 Sociedade Brasileira de Ortopedia e Traumatologia. Publicado por Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

Acromioclavicular dislocation is a common injury in orthopedic practice.<sup>1</sup> The most common mechanism of injury is falling on the adducted shoulder, with force being applied directly to the acromion.<sup>2</sup> This injury occurs more frequently among young individuals and is associated with impact sports and high speed vehicles accidents.<sup>3,4</sup> Rockwood, *apud* Lemos<sup>2</sup> and Mouhsine et al.,<sup>5</sup> classified acromioclavicular dislocations in six types: types I and II, considered as mild, with non-operative treatment; types IV, V, and VI, severe, with surgical treatment<sup>6</sup>; and type III, moderate, which has controversial treatment, dependent on factors such as age, sports activity, and deformity.

There are over 75 described techniques for the surgical treatment of acromioclavicular dislocations, but none is considered to be the gold standard.<sup>7</sup> The techniques include the following: acromioclavicular joint fixation with wire or plate<sup>8,9</sup>; coracoacromial ligament transfer<sup>10</sup>; coracoacromial interval fixation with screw; use of anchors at the top of the base of the coracoid process or subcoracoid suture loop<sup>11,12</sup>; and tendon reconstruction with autograft from the coracoclavicular and acromioclavicular ligaments.<sup>13</sup> The modifications of the techniques that secure the clavicle to the coracoid process range from the use of screws (or subcoracoid loops) to the use of anchors and materials such as the Endobutton™ (flip-button™). These techniques can be done through open, minimally invasive,<sup>14</sup> or arthroscopic surgery.<sup>15,16</sup> The advantage in the use of anchors is its placement closer to the anatomical insertion site of the coracoclavicular ligaments.<sup>17</sup>

The posterossuperior shoulder approach for the treatment of acromioclavicular dislocations was presented during the 34th Brazilian Congress of Orthopedics and Traumatology (2002) and received the Professor Orlando Pinto de Souza Award for Creativity. Developed by the Shoulder and Elbow Group of our department, this approach aims to facilitate the access to the top of the base of the coracoid process; more anatomically reduce the acromioclavicular joint; and preserve the anterior portion of the deltoid muscle, allowing for a better functional recovery of the shoulder.

This study aimed to reproduce the posterossuperior shoulder access for the surgical treatment of acromioclavicular dislocations in cadavers and to evaluate the risk of neurovascular injury.

## Methods

The study dissected 20 shoulders in 10 recently-chilled adult cadavers (three women and seven men), mean age of 61 years (43–79), with no congenital abnormalities, signs of trauma, or previous surgery on the shoulder. Data on height, gender, and age were collected. The same group of researchers was responsible for all dissections. A pilot study (using two shoulders from two cadavers) was made in advance before the start of data collection, for better understanding and assessment of the local anatomy.

The procedures were performed with the cadaver in the supine position and a pad under the ipsilateral scapula. A surgical pen marker was used for marking of bone protrusions of the distal clavicle, the coracoid process of the acromioclavicular joint, the acromion, and the scapular spine,

Download English Version:

<https://daneshyari.com/en/article/2707822>

Download Persian Version:

<https://daneshyari.com/article/2707822>

[Daneshyari.com](https://daneshyari.com)