

## Does the Change of Retroversion of the Glenoid Protect the Axillary Nerve During Arthroscopic Latarjet Procedure? An Anatomical Study

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### Summary:

A significant boost in scapular retroversion increases the distance between the axillary nerve and our fixation system in the arthroscopic Latarjet Surgery, improving the security of this procedure.

### Abstract:

#### INTRODUCTION

Latarjet Procedure has gained popularity in recent years, especially for the treatment of patients with anterior shoulder instability associated with glenoid bone loss defects, reporting small rates of fail and low rate of complications in clinical series in medium and long-term follow-up. Some authors have been described this procedure by arthroscopy, but requires the use of glenoid guide and medial portals to the coracoid process, which implies an increased risk of iatrogenic injury to the axillary nerve.

The purpose of this paper is to describe the distance between the axillary nerve and the orientation of the graft fixation system and to assess whether retroversion of the scapula influence in this distance.

#### METHODS

For this study 7 fresh- frozen shoulder specimens, in semi beach chair position were necessary (based on obtain a difference of 10 mm, with a statistical power of 98% and significance level of 0.05).

We used two K-wires 2.0 parallel to the articular glenoid surface in position 7' and 8' o'clock, 7 mm medial to the posterior glenoid (perpendicular to the major scapular axis). Two independent evaluators measured the distance between the tips of the K-wire in the horizontal plane and the axillary nerve for the superior an inferior (AKHS and AKHI) and the distance between the lower K-wire and axillary nerve in the vertical plane (AKV). The scapula was positionned in physiological anteversion, and with respectively 15° and 30° of more retroversion. The results will be compared by groups (scapular retroversion) using T-Student tests and multivariate analysis (ANOVA). For the interobserver correlation we used the Pearson Correlation Test.

#### RESULTS

The normal anteversion of the sample was  $34^\circ \pm 2,3$ . The AKHS distance was  $2.5 \pm 1.6$ mm in normal anteversion,  $6.3 \pm 1.2$  mm at  $-15^\circ$  and  $11.4 \pm 1.4$  mm at  $-30^\circ$ . The distance AKHI was  $-0.37 \pm 1.6$ mm;  $3.4 \pm 1.4$ mm;  $10.6 \pm 2.1$  mm in position neutral,  $-15$  and  $-30$  respectively. The AKV distance was  $0.12 \pm 0.2$  mm;  $4.9 \pm 1.6$ mm;  $9.9 \pm 1.7$ mm in position neutral,  $-15^\circ$  and  $-30^\circ$  respectively. This increase in the distances was statistically significant ( $P < 0.001$ ).

In 71% of the cases the K-wire was in contact or medial to the axillary nerve in normal anteversion position. When we positioned the scapula with 15° or 30° of more retroversion, any K- wire was in contact or medial to the axillary nerve (p-value  $< 0.0001$ ).

Regarding to interobserver variability, we obtained a very high correlation, using the Pearson correlation test ( $> 0.9$ ).

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### CONCLUSIONS

Scapular retroversion increases significantly the distance between the position of the coracoid graft and the axillary nerve during arthroscopic Latarjet procedure and therefore the risk of iatrogenic injury of the axillary nerve. A guide to mobilize in retroversion the scapula is an excellent tool to move away from the axillary nerve.

### KEY WORDS

Shoulder instability – Arthroscopic Latarjet – Axillary nerve Lesion – Scapular Retroversion