

# **Evaluation of Preoperative Factors which Affect the Alpha Angle of the Screws after the Latarjet**

Heedong Lee<sup>1</sup>, Jae-Chul Yoo<sup>2</sup>

<sup>1</sup>Orthopedic Surgery, VHS medical center, <sup>2</sup>Orthopedic Surgery, Dept of Orthopaedics, Samsung Medical Center

**INTRODUCTION:** The Latarjet procedure has shown excellent results in treating anterior shoulder instability. The position of the bony fragment and the insertion angle of the screw (known as the alpha angle) are critical factors for a successful procedure. It is stipulated that a parallel angle to the glenoid articular surface should be accomplished to allow maximal compression of the graft and to reduce the risk of suprascapular nerve injury and the clinical failure rate. This study aimed to assess the preoperative factors that affect the better outcome of the alpha angle.

**METHODS:** This study was retrospective design with 61 patients who underwent the Latarjet procedure from October 2009 to November 2022. Postoperative CT scans were reviewed for the alpha angle and classified into two groups; an alpha angle greater than 25 degrees was classified as Group 1, and an angle lesser than 25 degrees was classified as Group 2. The preoperative CT scans were then evaluated. Images in axial and sagittal planes were simultaneously displayed in the same screen window. The corresponding axial view of the equator of the native glenoid was obtained, and the line joining the anterior and posterior glenoid edge was extended until it reached the margin of the anterior chest skin. Then the line perpendicular to this line was drawn until it reached the margin of the lateral deltoid skin. Finally, the line was drawn from the anterior edge of the glenoid to the deltopectoral interval. The following five parameters were measured. 1) The distance from the anterior edge of the glenoid to the skin of the chest, 2) the distance from the anterior edge of the glenoid to the lateral skin margin of the deltoid, 3) the distance from the anterior edge of the glenoid to the skin margin of the deltopectoral interval, 4) the angle between line (1) and (3), and 5) the version of the glenoid.

## **RESULTS:**

Sixty-one patients were involved in this study, with 27 patients in Group 1 and 34 in Group 2. The mean angle of each group was 36° and 12° respectively, and the BMI was significantly higher in group 1 ( $p = 0.002$ ). In addition, group 1 was significantly longer in the distance from the anterior edge of the glenoid to the anterior ( $p = 0.009$ ), lateral ( $p = 0.010$ ), and deltopectoral margins ( $p = 0.010$ ). The angle between lines (1) and (3) and the glenoid version was also significantly larger in Group 1 ( $p = 0.001$ ).

## **DISCUSSION AND CONCLUSION:**

The alpha angle is a key factor for the stability of coracoid bone graft in the Latarjet procedure. Surgeons may predict the possibility of the appropriate insertional angle of the screw by measuring the factors mentioned above. The clinical importance of this study lies in the observation that it is the first study to evaluate the preoperative factors that facilitate the proper position of the screw fixation in the Latarjet procedure.