

# Methods of biometric measuring of glenoid: Scan study of 200 glenoids.

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**Introduction:** An evaluation of the dimensions of the morphology of the glenoid may allow for a personalised prosthetic treatment. However, few wide-ranging studies exist concerned with scanned glenoid measurements. We are presenting an analysis of glenoid dimensions.

**Materials and methods:** 100 consecutive thoracic CAT scans carried out over 15 months including the two non-pathological glenoids were analysed by 3 surgeons. There were 54 women and 46 men with an average age of 64.8 years (20-92). Each glenoid was evaluated as a 2D reconstruction, with several cross-section views, using CARESTREAM software. We carried out our measurements only on healthy glenoids or those with little wear. The largest vertical axis, the largest horizontal axis, the surface of the glenoid and the tangent circle at the lower end of the glenoid were analysed. The depth and the bony stock of the glenoid were measured at 9 points of this circle, divided into four faces, corresponding to the attachment positions of a metaglene. An intra and inter-observation evaluation was carried out.

**Results:** The measurements (200 glenoids) found: Large vertical axis = 38.5mm (25-51), large horizontal axis = 27.9mm (20-56), surface of the tangent circle at the lower end of the glene diameter  $624.5\text{mm}^2$  (324-983). For each patient, the two glenoids were relatively symmetrical for the measurements taken. The analytical study allowed us to classify the glenoids by size into 3 groups: small (circle surface =  $420\text{mm}^2$ ), medium ( $525\text{mm}^2$ ) and large ( $685\text{mm}^2$ ). The glenoid dimensions correlated with the size of the patients. The most representative measurement of the glenoid size was the largest horizontal axis, which also corresponded with the diameter of the circle measured inside the glenoid. With regard to the depth of the glenoid, the risk of lesion to the suprascapular nerve in the upper-posterior face exists beyond 10.7mm. The measurement method is reliable and reproducible with an average difference of 2.7mm over all the measurements compared.

**Discussion:** These results are close to those already presented in literature. The large number of patients included in this cohort linked to the reliability and reproducibility of the measurements allow us to adapt this method for pre-operative planning of glenoid implant placements for prostheses. The principal limit remains the two-dimensional character of our study.