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Evaluating Glenoid Bone Loss Location Using Best Fit and Outer Circles: Are we pointing in the same direction?

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Introduction and Background

Clinicians commonly use a clock face model to describe glenoid lesions, but variations in the usage of best fit and outer circles are often observed. Determining the compatibility of these methods is crucial, as discrepancies may affect clinical practice and the interpretation of previous research outcomes.

Material and Method

This study included 231 patients with recurrent anterior shoulder instability. We assessed the location, orientation, and extent of glenoid defects based on o'clock measurements, employing templates of both the outer and best fit circles. We investigated discrepancies between two methods and explored factors that influenced these discrepancies.

Results

The orientation of the linear defect showed subtle but statistically significant differences between the circles (3:02 ± 0:21 for the outer circle and 3:03 ± 0:22 for the best fit circle, $p < 0.001$). The outer circle frequently overestimated the location of the defect's center, and the superior and inferior margins (all $p < 0.001$). Additionally, the anterior or posterior placement of the best fit circle's center relative to the glenoid axis was associated with all measurement discrepancies. While discrepancies in the measurements of the center, superior, and inferior margins correlated with glenoid defect size ($p < 0.001$ for all), the orientation of the defect line did not correlate with defect size ($p = 0.456$), indicating that the defect may expand while maintaining its original angle.

Conclusions

The defect locations of the outer circle and best fit circle differed statistically. Although the average difference was less than one hour, caution is needed when interpreting findings across studies or in surgical communication, as reference points or clockface systems may differ between them. Among these locations, the orientation of the defect line appears stable with respect to defect size in each circle, suggesting that the defect may serve as a reference for describing anchor or bone block placement during surgery.

Figure & Table 1.

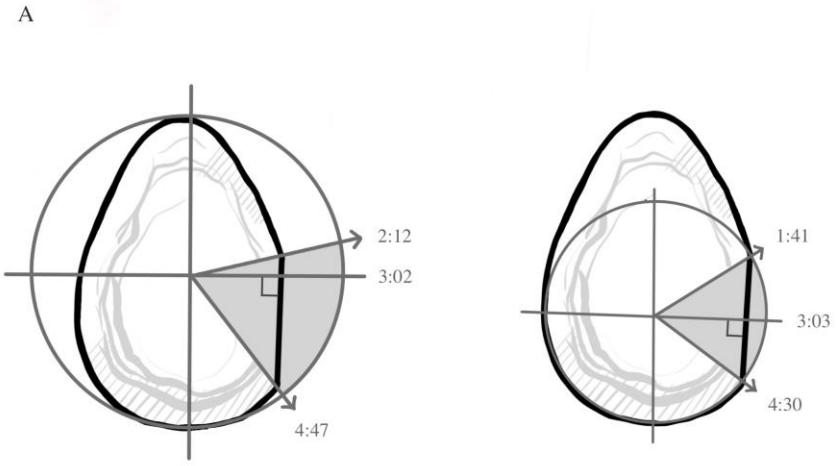

Figure & Table 2.