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SIGNIFICANT DIFFERENCES IN GLENOID BONE LOSS MEASUREMENT

ABSTRACT

Purpose: The purpose of this study is to determine the accuracy and difference between 3 common methods of measuring glenoid bone loss, and its application to previously published studies regarding bony stabilization procedures.

Methods: A list of patients with anterior bony glenoid defects was created by searching the electronic medical records. Three surgeons reviewed each patient's advanced imaging (CT, 3D CT, or MRI), and glenoid bone loss was measured using three different methods of measurement: 1) Linear Measurement Percentile (LMP), 2) Area Measurement Percentile (AMP), and 3) Circle-Line Method (CLM). The intraclass correlation coefficients (ICC) between reviewers and mathematical differences between measurement techniques were calculated.

Results: The images of one-hundred-twenty-five patients with anterior glenoid bone loss were measured. For all image sequences, the ICC was greatest with the AMP (0.738) and CT with 3D reconstruction (0.735). Of the entire sample, the average bone loss was LMP 21.3% (5.6%-43.5%), CLM 15.7% (1.6%-42.2%), and AMP 16.5% (2.3%-40.3%). On average, the difference between the LMP and AMP was 5.57%. When comparing the AMP and LMP, the greatest difference in measurement was 5.8%, and this occurred at an LMP of 19.1%, which is an AMP of 13.2%.

Conclusion: When measuring anterior glenoid bone loss, the CT with 3D reconstruction and AMP method have the greatest interobserver reliability. Furthermore, the greatest difference between LMP and AMP occurs at an LMP between 18.3% and 20.0% (AMP between 12.4% - 14.2%), and the difference is approximately 5%.