

Distance to Dislocation and Hill-Sachs to Glenoid Track Width Ratio Predict the Risk of Recurrent Instability after Arthroscopic Bankart Repair

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INTRODUCTION: The predictive value of the “on-track/off-track” concept has been recently called into question. Peripheral on-track lesion has been claimed to have higher risk of recurrent dislocation. Two new thresholds have been proposed: the “Hill–Sachs interval to glenoid track width ratio” (H/G ratio) and the “distance to dislocation” (DTD). The aim of the present study was to quantify the rate of recurrent anterior shoulder dislocation in relation to the H/G ratio and the DTD in patients with “on-track” lesions who had undergone primary arthroscopic labral repair.

METHODS: A retrospective study was conducted. Patients with recurrent anterior gleno-humeral instability who underwent arthroscopic Bankart repair with a minimum of 12 months follow up were included. A preoperative computed tomography (CT) scan was performed in all patients. Only patients with on-track bipolar defects were included. Subsequently, three-dimensional computer-based reconstruction of the Hill-Sachs and glenoid bone defect were performed using a dedicated software in order to obtain the H/G ratio and the DTD. H/G ratio was calculated following the formula: Hill Sachs interval/glenoid track width; while DTD was calculated as follows: Glenoid track width – Hill Sachs interval. Included patients were then divided into two groups according to H/G ratio ($<$ or \geq 0.7), DTD (\leq or $>$ 0.8 mm) and recurrence (Y/N). The primary outcome was recurrent instability after surgery. Secondary outcomes were: Western Ontario Shoulder Instability Index (WOSI), American shoulder and elbow score (ASES), Tampa Scale of kinesiophobia (TSK-13), and Tegner Activity Scale. The correlation between H/G ratio and DTD was also evaluated. Comparison between groups was performed by use of chi-square test for categorical variables and unpaired t-test for discrete variables. Quantitative correlation between H/G ratio and DTD was evaluated through Pearson’s correlation coefficient. Significance was set at $p < 0.5$.

RESULTS: The study included 80 patients, (68 males and 12 females). Median age (\pm IQR) of patients was 25 ± 15 years. Median follow up (\pm IQR) was 66.5 ± 59.8 months. Forty-eight patients showed H/G ratio $<$ 0.7, while 32 showed H/G ratio \geq 0.7. Recurrence was as high as 21.9% in case of H/G ratio \geq 0.7 ($p = 0.038$). Patients with high H/G ratio also showed worse WOSI scores after surgery ($p = 0.024$). Comparison between groups did not show any other significant difference. Thirty-seven patients showed DTD $>$ 0.8 mm, while 43 showed DTD \leq 0.8 mm. Recurrence was as high as 20.9% in case of DTD \leq 0.8 mm ($p = 0.014$). Comparison between groups did not show any other significant difference. Overall, recurrence rate was 12.5% (ten patients). Higher H/G ratio ($p = 0.034$), smaller DTD ($p = 0.027$), worse ASES ($p = 0.035$), and worse Tegner ($p = 0.013$) scores were found among patients who experienced recurrent instability after surgery. Agreement between H/G ratio and DTD was 86% ($p < 0.0001$). Pearson’s correlation was 0.98.

DISCUSSION AND CONCLUSION:

The study showed that both H/G ratio \geq 0.7 and DTD \leq 8 mm are predictive of recurrent instability after arthroscopic Bankart repair. There is a strong correlation between the two parameters. Surgeons should be aware that not all on-track lesions are equal and additional procedures should be taken into consideration for peripheral on-track lesions.