Evaluating Post-Operative Outcomes of "On-track," "Near-track," and "Off-track" Shoulders via Pre-Operative Imaging of Latarjet Patients in the MOON Shoulder Instability Cohort

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INTRODUCTION: Bony injury of the glenoid and the humeral head are important predictors of outcomes for anterior shoulder instability. Latarjet has become a common treatment approach for significant bone loss of the anterior glenoid, combined bone loss, or recurrent dislocations after soft tissue procedures. The concept of the glenoid track (GT) and its relation to a Hills-Sachs lesion (HSL) has been validated regarding outcomes for soft tissue stabilization procedures, but there remains a gap in the literature exploring the effect of glenoid track and Latarjet outcomes. The purpose of this study was to analyze the impact of glenoid track on outcomes of Latarjet patients.

MATERIAL & METHODS: Latarjet surgery patients within the MOON shoulder instability cohort, all treated between December 2012 and August 2023, were analyzed. Pre-operative magnetic resonance imaging and computed tomography scans were used to measure percentage glenoid bone loss, glenoid track width (GT) and Hills-Sachs interval (HSI) with subsequent calculation and classification into "on-track" (HSI<GT) or "off-track" (HSI>GT). "On-track" shoulders were further stratified into "central-track" (HSI/GT<75%) or "peripheral-track" (HSI/GT>75%). Distance-to-dislocation (DTD) was calculated for on-track shoulders and used to determine whether the shoulder is "near-track" (DTD<8mm). Stratified groups were analyzed in relation to respective surgical failure defined as any recurrent subluxation, dislocation, or re-operation for residual shoulder instability.

RESULTS: 159 subjects had suitable pre-op imaging and 124 completed post-operative outcome surveys. For all Latarjet patients the average percentage of glenoid bone loss was 18.8% with an average GT and HSI of 19.0mm and 19.3mm, respectively. 95 patients were identified as having off-track lesions whereas 64 were classified as on-track. Average glenoid bone loss was 15.1% for the on-track cohort and 21.8% for the off-track cohort. Of the on-track lesions, 30 were central track and 34 were peripheral track. Based upon distance to dislocation calculations, 45 shoulders were classified as near track. Overall, 2.5% of LTJ patients reported dislocation, 22% had reported subluxation, and 0.63% had repeat surgery. 79.7% of "on-track" and 72.6% of "off-track" subjects reported no negative outcomes within 2 years post-operation. Recurrent dislocation, subluxation, and re-operation rates were 3.2% vs 1.6%, 24.2% vs 18.8%, and 1.6% vs 0% for the off-track and on-track cohorts respectively. In addition, 8 of the 13 failures (7 subluxations and 1 dislocation) in the on-track cohort were in shoulders with near-track bone loss, representing a 15.6% and 2.2% recurrent subluxation and dislocation rate in the near-track cohort. There was a 7.1% increased likelihood of negative outcomes in the off-track group, for a risk ratio of 1.35 and odds ratio of 1.48 ($\chi 2 = 1.03$; $p = 0.31$).

DISCUSSION: This study found no significant differences in negative outcomes for patients with either "on-track" or "off-track" shoulders undergoing the Latarjet procedure affirming this as a suitable option for patients in either category. Reported recurrence of dislocation, subluxation or repeat surgery were noted to be over 20% in the on-track cohort and nearly 30% in the off-track cohort. These results indicate that while the off-track group shows a higher risk and higher odds of negative outcomes compared to the on-track group, the difference is not statistically significant based on the chi-square analysis. It is also notable that 61.5% failures in the on-track cohort were in shoulders with "near-track" lesions. Future research should continue to investigate causes of suboptimal outcomes in the Latarjet patient population.