

Editorial Commentary: Preoperative 3-Dimensional Imaging for Shoulder Instability Is Vital for Determination of Off-Track Lesions and May Indicate Bankart Repair Plus Remplissage



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Abstract: The on- and off-track concept is gaining momentum for surgeons who treat patients with anterior shoulder instability. Preoperative imaging is critical for improving our outcomes. Determination of an off-track lesion prior to surgery using 3-dimensional computed tomography allows for improvement in outcomes by indicating remplissage. Intraoperative determination with the patient under anesthesia is not as good or as accurate. However, although Bankart repair plus remplissage shows good outcomes, bony procedures such as Latarjet, distal tibia allograft, and iliac crest or other bone graft procedures are preferred for large defects. Still, perhaps it is time to truly look at posterior adjuncts to anterior instability such as remplissage in patients who have off-track lesions, even with notable bipolar bone loss.

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Lee, Kim, Kim, Yoon, Cho, and Chun¹ from the Republic of Korea should be congratulated for their work entitled “Does an ‘Off-Track’ Hill-Sachs Lesion That Is Misclassified as ‘Non-Engaging’ Affect Outcomes From Bankart Repair Alone Compared With Bankart Repair Combined With Remplissage?” They retrospectively reviewed a large cohort of patients who underwent arthroscopic Bankart repair and who were classified as having either non-engaging or engaging

Hill-Sachs lesions arthroscopically. Patients with a diagnosis of non-engaging lesions underwent arthroscopic Bankart repair (group A), whereas patients with a diagnosis of engaging lesions underwent Bankart repair with remplissage (group B). Thus, intraoperative decision making was used to add remplissage, which has previously been considered a standard procedure.²

The on- and off-track concept is gaining momentum for surgeons who treat patients with anterior shoulder instability, although it can be challenging to truly determine on- and off-track lesions because there is now even a “near-track” lesion classification.³ However, this is where preoperative workup and imaging have been critical for improving our outcomes. The study by Lee et al.¹ shows us the same. Because 3-dimensional (3D) computed tomography (CT) has been validated as a tool to determine on- and off-track lesions,⁴ Lee et al. went on to review whether or not these lesions were truly on track or off track, retrospectively, using 3D CT. Overall, they concluded that there was no significant difference in the groups with and without remplissage, although the group that underwent remplissage had a mean of 21% bone loss and the group with non-engaging lesions that did not undergo remplissage had only 14% bone loss. When the recurrent group was broken down further, 60% of patients (9 of 15) in the

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off-track group (with lesser bone loss) had recurrence whereas patients who had greater bone loss and underwent remplissage had only a 7.4% recurrence rate (2 of 27). Such findings suggest that remplissage yielded significant and improved outcomes in terms of stability even in the group with larger bone defects with engagement. So, preoperative imaging is important—and determination of an off-track lesion prior to surgery will allow for improvement in outcomes with remplissage.

The utility of these findings shows that although intraoperative determination of an engaging or non-engaging lesion with the patient under anesthesia has historically been important,^{5,6} intraoperative assessment for Hill-Sachs engagement is not as good as 3D imaging to predict on- and off-track lesions. A notable limitation of the study by Lee et al.¹ is its retrospective nature; however, all measures were independently verified through the existing preoperative CT scans. The mere confirmation of an on- or off-track lesion has also been validated through examination under anesthesia.⁶ However, this may not always be the case because one may wonder whether the “engagement” is not being fully demonstrated for a variety of reasons, such as not pushing the shoulder hard enough, not having enough muscle relaxation provided by the anesthesiologist, and not having the arm in the correct position to allow it to engage. However, what we do know—and what the study of Lee et al. shows even further—is that there is significant benefit to measuring lesions preoperatively for the purposes of surgical decision making.

The patients in the study by Lee et al.¹ were monitored for almost 4 years on average, which is a robust follow-up time and speaks to the overall stability of the surgical constructs performed by the authors. Although longer-term follow-up would be desirable, the level of follow-up after 4 years certainly speaks to the durability of the repair in this challenging group of patients with bone loss as well as engaging lesions.

Although range of motion (ROM) has also been a persistent concern with the remplissage procedure, Lee et al.¹ showed overall minimal ROM differences. Although the differences in the ROM findings were statistically significant, we are not sure whether the differences were clinically meaningful, except external rotation with the arm at the side and abducted external rotation, which both showed a difference of approximately 8°. Thus, the results of Lee et al. are very consistent with those of prior published studies.⁷⁻⁹

Although the mean glenoid bone defect was significantly different between groups A and B (13.7% and 20.7%, respectively), off-track lesions were identified in 8.1% of group A patients (15 of 186). Of these 15 patients, 60% (9 of 15) had recurrent instability. The recurrence rate, therefore, was much higher in patients with off-track lesions than those with on-track lesions

in group A. In the group with greater bone loss, all patients had off-track lesions and were treated with remplissage. Overall, the patients had a very enviable recurrence rate. Healing after remplissage is also a concern, and although it has been reported that as little as 60% or 70% of the infraspinatus tendon truly heals into the humeral head,¹⁰ the vast majority of patients achieved 75% to 99% healing and there were even some with healing in the 50% to 74% range, which is again consistent with prior literature that shows incomplete healing after remplissage, although this is likely durable enough to provide an overall effective treatment.

So, should we be performing remplissage with higher levels of bone loss and off-track lesions? Certainly, Lee et al.¹ would agree that this would be the case. However, the jury is still out, and many authors would argue that bony procedures such as Latarjet, distal tibia allograft, and iliac crest graft or other bone graft procedures would be preferred for large defects.¹¹⁻¹³ Although Lee et al. do present some enviable results and very solid return-to-sport rates, perhaps it is time to truly look at the posterior adjuncts to anterior instability such as remplissage in patients who have off-track lesions and notable bipolar bone loss.¹⁴ Regardless, we now know how to better classify lesions preoperatively to determine what is best for the patient.

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