

# Editorial Commentary: Is Arthroscopic Bone Grafting Nearly Equivalent to Open Bone Grafting for Glenoid Bone Defects in Recurrent Anterior Shoulder Instability?



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**Abstract:** Arthroscopic techniques are an emerging technology to deal with glenoid bone defects in patients with anterior shoulder instability, and improvements are being made to safely minimize the risk of injury to the anterior neurovascular structures including the axillary nerve. Arthroscopic glenoid reconstruction is a technically demanding procedure, but it does have promising short-term outcomes. I truly like the concept of anterior (and also posterior) bone grafting for defects of the glenoid, including the arthroscopic Latarjet. A free bone graft (iliac crest, distal tibia) is part of a logical surgical learning curve progression to treat bone defects from an arthroscopic standpoint. Before performing an arthroscopic Latarjet, I might suggest looking at performing free bone block fixation arthroscopically. But, for now, I still enjoy the success of an open bone grafting procedure and will continue to use open as my primary bone grafting (Latarjet, distal tibia, iliac crest), so as to optimize the position of the graft for successful long-term outcomes. We look forward to seeing more of the authors' work and a longer term follow-up of these patients to clearly delineate the development of osteoarthritis, recurrent instability, and long-term stability of the bone graft and shoulder joint function.

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The authors of the study entitled "Arthroscopic Versus Open Iliac Crest Bone Grafting in Recurrent Anterior Shoulder Instability With Glenoid Bone Loss: A Computed Tomography-based Quantitative Assessment," Ernstbrunner, Plachel, Heuberer, Pauzenberger, Moroder, Resch, and Anderl,<sup>1</sup> should be congratulated on their study reviewing 40 consecutive patients with recurrent anterior shoulder instability at 2 independent orthopaedic departments. The patients had, on average, a 17% to 18% glenoid bone loss and all underwent iliac bone autografting to the glenoid. The 40 consecutive patients underwent either open or arthroscopic iliac bone autografting and were assessed with computed

tomography (CT) scan. The inclusion criterion was patients with recurrent post-traumatic anterior instability with bone loss over 10%. The authors should also be commended on their technique, in both open and arthroscopic settings, specifically regarding the preparation of the bone graft. The graft is attached to a custom-made graft impactor and introduced until the impactor reaches the glenoid rim and then pins are used to fix the graft anteriorly. CT scans were obtained within 2 days after all surgeries, thus minimizing any potential of bias in terms of CT scan timing. The authors then reviewed the overall position of the graft and compared the open procedure group with the arthroscopic group.

The comparison of the overall position of the graft between the arthroscopic and open groups demonstrated that the open technique had a better impaction angle. There was less of an angle relative to the glenoid plane of  $26.9^\circ \pm 9.9^\circ$  in the open technique versus  $34.8^\circ \pm 7.8^\circ$  in the arthroscopic technique. This was a statistically significant difference, but it is of unclear clinical relevance given the lack of long-term outcomes data recorded on these patients. However, an  $8^\circ$

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impaction angle difference may have potential consequences that we still do not yet know given the relatively short-term follow-up period (imaging within 2 days of surgery). In addition, there was a statistically significant difference in the medial offset of 1.2 mm with the open group having less medial offset than the arthroscopic group. This certainly calls into question the clinical relevance of just 1.2 mm difference in medial offset, although various groups have looked at Latarjet coracoid bone graft positioning and found varying rates<sup>2-4</sup> of side-to-side offset difference and interpreted said offsets to have varying levels of clinical significance.<sup>2-9</sup> A consensus has been reached around bone graft lateralization being a risk factor for predisposition to earlier development of osteoarthritis of the shoulder,<sup>2-9</sup> yet more studies are required to further elucidate the precise thresholds for when graft malpositioning will result in long-term joint regeneration. Mediolateral step formation was not statistically significant and long-term outcomes are lacking as previously discussed, but the authors should be commended for evaluating all these patients with CT scan within 48 hours of surgery so we could have a good baseline. It would be optimal to see how these patients do in the long term.

Glenoid bone defects remain a significant challenge in the realm of instability as defined by Burkhart and De Beer,<sup>10</sup> Bigliani et al.,<sup>11</sup> Hovelius et al.,<sup>12</sup> and Provencher et al.,<sup>13,14</sup> that bone defects of the shoulder are a leading cause of failure after instability repair. Arthroscopic techniques are an emerging technology to deal with bone defects, and improvements are being made to safely solve the arthroscopic approach to avoid injury to the anterior neurovascular structures including the axillary nerve. The arthroscopic glenoid reconstruction is a technically demanding procedure,<sup>15</sup> but it does have promising short-term outcomes.<sup>16</sup>

There are some limitations to this study in that we do not have long-term outcomes on the patients and it would be ideal to see if the authors could follow these patients as part of a larger group prospectively long term to see how the arthroscopic approach does versus the open technique for similar bone deficiencies. The authors should be praised for their contribution as they had similar bone deficiencies in each group, thus minimizing confounders. Another limitation was related to who received arthroscopic versus open stabilization in this consecutive group. There could be a potential bias because this was not a randomized trial, but potentially a convenience type of sample that allowed for a retrospective nearly-matched analysis; however, iliac crest done arthroscopically may have self-selected for those with less body mass for example, making for some level of inherent bias.

How might this change my clinical care of the patient? I truly like the concept of anterior (and also

posterior) bone grafting for defects of the glenoid, including the arthroscopic Latarjet. A free bone graft (iliac crest, distal tibia) is part of a logical surgical learning curve progression to treat bone defects from an arthroscopic standpoint. I have used a distal tibia allograft in many situations, including failed Latarjet procedures, and also consider it for primary surgery if the patient has more than 20% to 25% bone loss and is missing not only bone, but a significant amount of cartilage as well that contributes to the concavity compression of the glenohumeral joint. In the current study, the mean bone loss was under 20%, but certainly on these larger defects (>20%), I would not hesitate to use a fresh distal tibia allograft.<sup>17</sup> Before performing an arthroscopic Latarjet, I might suggest looking at performing free bone block fixation arthroscopically. But, for now, I still enjoy the success of an open bone grafting procedure and will continue to use open as my primary bone grafting (Latarjet, distal tibia, iliac crest), so as to optimize the position of the graft for successful long-term outcomes.

We look forward to seeing more of the authors' work and a longer term follow-up of these patients to clearly delineate the development of osteoarthritis, recurrent instability, and long-term stability of the bone graft and shoulder joint function.

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