Anthropometric and Radiologic Measurements of Coracoid Dimensions and Clinical Implications in an Indian Population

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Background: Recurrent shoulder dislocation and anterior instability are most commonly attributed to pathology of the capsulolabral complex with the presence of bony loss at the humeral and glenoid surfaces. Unassessed bone loss has been a cause of failure of primary soft tissue procedures or recurrence of symptoms, despite adequate address of soft tissue pathology.

Purpose: To study the anthropometric and radiologic dimensions of the coracoid in relation to glenoid bone loss, its adequacy in filling glenoid defects in an Indian population, and whether the choice of surgical technique (congruent arc vs classical) and graft positioning alters the surgical results. This study also intended to establish whether computed tomography measurements correlate with actual anthropometric measurements.

Study Design: Cross-sectional study; Level of evidence, 3.

Methods: A total of 64 participants with 108 healthy shoulders were included in this study. Additionally, 100 skeletally mature bone specimens of the scapula were measured to assess glenoid diameter as well as coracoid width and length in 2 perpendicular planes with a humeral subtraction 3-dimensional en face glenoid view.

Results: Specimen and participant measurements proved that the congruent arc technique was able to fill up to 50% more glenoid bone loss than the classical technique in an Indian population (mean ± SD, 13.45 ± 6.97 vs 7.96 ± 4.89 mm, respectively), with computed tomography being the best and most accurate modality to study it. The mean difference in the bone block length restoration of the glenoid bony arc was 5.41 ± 2.08 mm. Radii of curvature were congruent in populations of the Indian subcontinent.

Conclusion: The congruent arc technique can be performed in an Indian population but with caution and careful presurgical assessment of bone loss. However, adequate coracoid dimension to accommodate the implant for fixation without failure must be ensured, as anthropometry suggests the existence of a subset of the population in whom the graft may have compromised width for accommodating standard implants for fixation.

Keywords: congruent arc; Latarjet; anthropometric; Indian population; anterior shoulder instability

Recurrent shoulder dislocation and anterior instability have been most commonly attributed to pathology of the capsulolabral complex with the presence of a combination of bony loss at the humeral and glenoid surfaces. A variety of surgical techniques have been described in the literature, of which the choice of treatment depends on the pathology and the preference of the surgeon. Large-scale prospective trials have established the efficacy of (1) soft tissue procedures in cases of isolated soft tissue lesions and (2) supplementation with a soft tissue or bony procedure in cases of glenoid, humeral, or bipolar loss. Unassessed bone losses have been a cause of failure for a primary soft tissue procedure or a recurrence of symptoms, despite adequate address of the soft tissue pathology. The reported recurrence rates are up to 75% in cases of glenoid loss over 25% that are treated with a soft tissue procedure alone.[8]

According to Burkhart et al,[12] glenoid bone loss over 25% and/or an engaging Hill-Sachs lesion correlates with a recurrence of dislocation after arthroscopic soft tissue stabilization in approximately 67% of patients, as opposed to 4% in shoulders with limited bone loss.[16,31,36]

Glenoid insufficiency includes glenoid rim erosions and bony Bankart lesions. The incidence of bone loss at the

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TABLE 1
Descriptive Statistics of Complete Cohort[a]

	Range[b]	Minimum	Maximum	Mean ± SD
Glenoid diameter	14.45	19.25	33.70	25.1268 ± 4.8
Superior-inferior dimension	5.57	5.33	10.90	8.0074 ± 2.2
Medial-lateral dimension	7.07	9.86	16.93	13.4151 ± 3.1
Length	12.17	16.23	28.40	23.3209 ± 3.4

[a]Values are presented in millimeters. Valid N (listwise) = 208.
[b]Maximum – minimum.

glenoid in cases of chronic and recurrent anterior shoulder instability ranges from 5.4% to 32%. Hovelius et al[20] reported an incidence of about 8%.[4,24,25,34]

The Bristow-Latarjet procedure has been the most popular modality of treatment, utilizing the coracoid bone block for restoring the glenoid surface. The procedure has been proposed to work by 3 stabilizing mechanisms: (1) the buttress effect of the coracoid bone, (2) the sling effect of the conjoint tendon and subscabularis, and (3) reinforcement by capsular duplication with the released coracoacromial ligament. Postoperative assessment of the procedure's adequacy in filling up defects has recently been documented in the literature,[7,15,22,32] but the importance of preoperative anthropometric and radiologic correlation of coracoid measurements in the treatment of recurrent anterior dislocation of the shoulder has been scarcely studied in an Indian population. Preoperative decision making regarding the choice of procedure for glenoidplasty in terms of its adequacy remains paramount.

In this study, we assessed the anthropometric and radiologic dimensions of the coracoid in relation to glenoid bone loss, its adequacy in filling up glenoid defects in an Indian population, and whether the choice of surgical technique (congruent arc vs classical) and graft positioning alters the results. The congruent arc technique of placement of coracoid graft involves rotation of the graft by 90°, which is in concordance with the radius of curvature of the glenoid and thus involves less decortication and more glenoid surface coverage. The study also intended to establish if computed tomography (CT) measurements actually correlate with actual anthropometric measurements.

METHODS

This cross-sectional study included 64 participants with 108 healthy shoulders. One hundred bone specimens of skeletally mature scapulae were also measured for glenoid diameter and coracoid width and length in 2 perpendicular planes. The calculations on scapula specimens were independently done by 2 authors (L.M.G. and M.T.) using handheld digital calipers. The specimens were obtained from the Department of Anatomy, Vardhman Mahavir Medical College and Safdarjung Hospital, and the Army College of Medical Sciences, New Delhi, India. Both institutes are government-approved teaching colleges with an attached tertiary-care hospital. The results are presented as means from dual studies that were performed independently.

TABLE 2
Descriptive Statistics of Measurements by Vernier Calipers and Computed Tomography[a]

	Range[b]	Minimum	Maximum	Mean ± SD
Vernier calipers[c]				
Glenoid diameter	14.45	19.25	33.70	24.66 ± 5.04
Superior-inferior dimension	4.89	5.33	10.22	7.96 ± 2.1
Medial-lateral dimension	6.97	9.86	16.83	13.45 ± 2.8
Length	12.17	16.23	28.40	22.89 ± 3.7
Computed tomography[d]				
Glenoid diameter	13.41	20.29	33.70	25.55 ± 3.9
Superior-inferior dimension	5.45	5.45	10.90	8.04 ± 1.8
Medial-lateral dimension	6.80	10.13	16.93	13.37 ± 2.3
Length	12.10	16.30	28.40	23.71 ± 3.0

[a]Values are presented in millimeters.
[b]Maximum – minimum.
[c]Valid n (listwise) = 100.
[d]Valid n (listwise) = 108.

Glenoid diameter and coracoid width and length in 2 perpendicular planes were determined by 2- and 3-dimensional CT reconstructions and digital substraction techniques. All parameters were measured in reference to the glenoid plane to ensure surgical and radiologic applicability.[1,9,14,27] The maximum length of the coracoid available for transfer was the bone segment between the tip of the coracoid and the anterior extent of the trapezoid (coracoclavicular) ligament.[29] The bony landmark was identified on the medial part of the root of the coracoid process as a rough impression for the attachment of the conoid ligament. From this bony prominence for ligament attachment, an obliquely forward- and lateral-ward elevated ridge was traced to the upper surface of the horizontal portion. The most medial part of the ridge was taken as a reference point.[19]

All patients included were skeletally mature, and written informed consent was taken. CT scan views (1.5-mm section and original magnification; Siemens Medical Solutions Inc) were coronal oblique, sagittal oblique, and axial. The CT scans were processed into humeral subtraction 3-dimensional en face glenoid (sagittal oblique) views to allow for rotational variation of the 3-dimensional image displayed on a 2-dimensional computer screen with Horos (v 1.1.7) for OS X.

The mean radii of curvature were recorded for each glenoid and each coracoid from 2 different rotational views to reduce intra- and interobserver variability on CT. This was essentially done to establish the precise role of a congruent arc Latarjet technique and its efficacy in an Indian population.[5,18]

RESULTS

The morphometric and CT scan findings (Tables 1 and 2, Figures 1-3) were assessed for the scapular specimens and

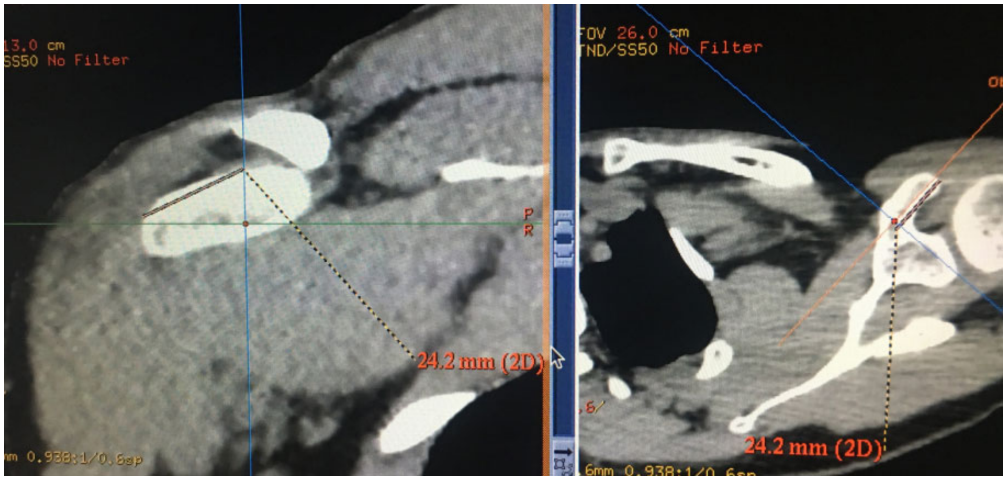

Figure 1. Computed tomography–guided measurement for the length of the coracoid.

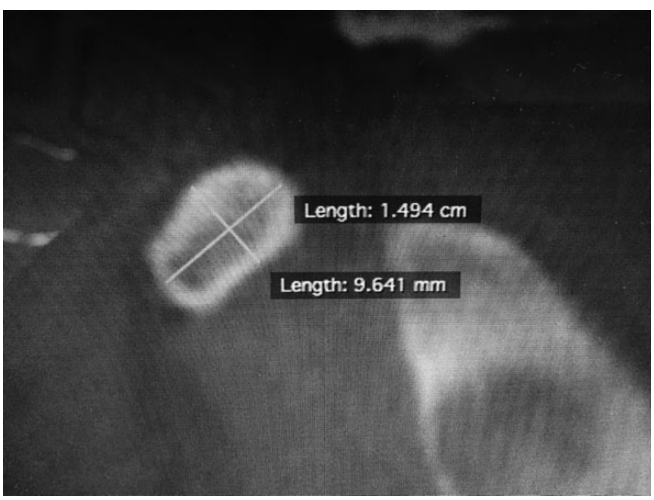

Figure 2. Computed tomography–guided measurements for the medial-lateral and superior-inferior dimensions of the coracoid.

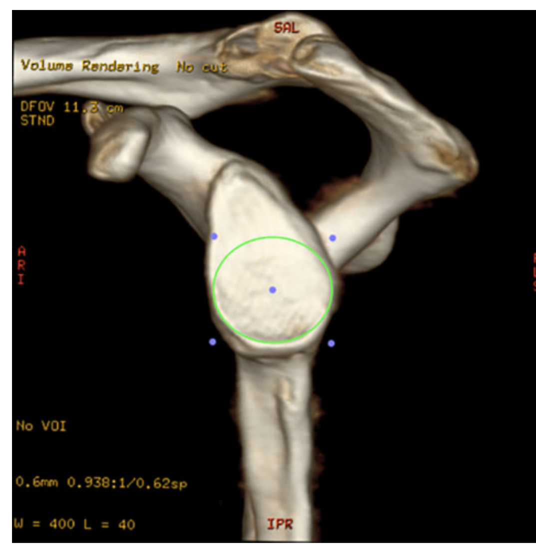

Figure 3. Measurement with a 3-dimensional humeral subtraction view with en face glenoid view as described by Sugaya et al.[34] The green circle quantifies the percentage of bone loss by modeling the inferior glenoid as a perfect circle.

the study participants, respectively. The findings represented randomly distributed data. The mean length, thickness, and width of the coracoid process and the maximum glenoid diameter measured were in concordance with the measurements of the scapular specimens done with digital handheld calipers of scapular specimens (Figures 4-8), with no statistically significant difference between the 2 measurements. The mean differences between the 2 independent observers with regard to superior-inferior, medial-lateral, and length differences of the coracoid were 0.81 mm, 0.33 mm, and 1.21 mm, respectively.

The mean radii of the curvature of the glenoid and coracoid process in the specimens were uniformly concordant in all cases and proved the congruent arc method of graft placement to be better. The mean ± SD maximum harvestable graft width was 13.45 ± 6.97 mm in the case of a congruent arc Latarjet procedure and 7.96 ± 4.89 mm if the same graft was used by the classical approach. The mean difference in the bone block length restoration of the glenoid bony arc was 5.41 ± 2.08 mm. The concept of congruent arc restoration held true in the population of the Indian subcontinent. Although specimens may represent adequacy, the actual procedure may require decortication of the graft, which may lead to an inadequate graft width for screw placement.

The subjective variation in coracoid and glenoid measurements was proportionate to the stature of the participant in the cases of no glenoid loss. The maximum loss of glenoid that could be hypothetically covered in expert hands would be about 32% of the glenoid surface by the classical technique and 54% by the congruent arc technique. The

Figure 4. Measurement of coracoid width in the medial-lateral plane by handheld calipers.

Figure 5. Measurement of coracoid width in the superior-inferior plane by handheld calipers.

minimum superior-inferior length recorded was 5.33 mm, and the range of the medial-lateral length (ie, maximum – minimum) was 7.07 mm in a total of 208 specimens (Table 1). This shows significantly lower values as compared with the literature on a non-Indian population.[11,23,28,31]

DISCUSSION

Recurrent anterior instability of the shoulder has been addressed with various techniques according to indication, surgical expertise, and surgeon preference. The era has seen tremendous change, from open to arthroscopic repairs. The literature has extensive documentation on indication, technique, long-term results, and complications of each in standard populations, with pre- and postoperative assessment and cadaveric as well as biomechanical studies.

Figure 6. Marking of coracoid length.

Figure 7. Length measurement with handheld calipers.

Of the various methods to treat anterior shoulder instability, this study assessed the efficacy of the Latarjet procedure in an Indian population in correlation to the anthropometric measurements in live participants and bone specimens. We secondarily compared the effectiveness of classical versus congruent arc Latarjet procedures in an Indian population with regard to maximum harvestable graft dimensions, graft position, and the efficacy of both procedures in filling up glenoid bone defects.

Higher chances of recurrence owing to underappreciation of bone loss at the glenoid and humeral sides have been documented. The choice of patients and the type of graft to be used can be determined only after proper preoperative planning. Various authors have studied racial differences in anthropometric measurements of the coracoid and glenoid and have established the importance of preoperative assessment.[30] Paladini et al[31] reported the clinical implications of coracoid measurements in filling up glenoid defects with postoperative CT scan and 3-dimensional reconstruction techniques.[1]

Figure 8. Glenoid diameter measurement with handheld calipers.

The cases with glenoid loss reaching up to 30% in patients with recurrent anterior instability are few, but preoperative assessment and decision making remain important to prevent failures. Initially, as the classical approach was defined for the Latarjet procedure, it became a popular procedure among the French, who also used it for primary Bankart lesions.[3]

Following this, Boons et al[10] provided the concept of the congruent arc Latarjet, whereby the inferior glenoid surface was prepared and the coracoid graft placed in such a manner after 90° of rotation that the inferior raw surface was in contact with the glenoid surface for union. This became more popular because the curvatures of the radii of the glenoid and inferior coracoid surfaces were found to be in approximation; thus, the method was better as compared with the classical method and required less decortication to be in concordance with the glenoid diameter.

Given the noncylindrical anatomic shape of the coracoid, the classical technique (vs congruent arc technique) warrants shaving a larger portion of coracoid bone to match the glenoid diameter, further predisposing to the compromised ability of the coracoid to fill up glenoid defects and thus increasing risk of graft failure, fracture, and osteolysis. As such, the congruent arc technique has been proven to be a more biologically and anatomically sound reconstruction of the glenoid as compared with the classical technique. Scott et al[33] studied the efficacy of the congruent arc Latarjet over the classical technique and found that the former had superior results to the latter, as the radii of the curvature of the glenoid and coracoid inferior surfaces were closely related.[3,5] Our study had similar outcomes, proving the congruent arc technique to be a better alternative to the classical technique in view of the coverage of glenoid loss, although there were a few limitations.[2,12]

The graft dimensions in an Indian population were in proportion to the glenoid dimensions in our study. The study highlights the fact that minimal graft thickness (if used per the congruent arc technique) might not be able to safely accommodate two 4-mm screws in the anterior-posterior plane, because of the compromised bone thickness and anatomic makeup of a subset of the Indian population. We wish to state that modification of fixation methods in the form of screws with lesser core diameters or alternate methods, such as a suture disc, should be kept as an alternative to standard instrumentation in case of athletes with shorter stature and higher demands. This will help in better screw placement and fixation and, eventually, in a lesser chance of failure. Graft positioning too far medially may lead to an elevated risk of redislocation. However, malpositioning too far laterally may lead to early-onset osteoarthritis.[21]

Alternate ways to procure a graft should be counseled for, and the surgeon should be ready in both cases, as a standard 3.75-mm drill bit may lead to intraoperative graft failure. The maximum safe zone for insertion of screws was defined as being about 10° to the glenoid articular surface by Lädermann et al[28] to protect the suprascapular nerve. This is a narrow window and may be compromised in cases of a small anterior-posterior length available for graft fixation. The margin of error in these cases is negligible and may lead to a procedure failure in cases of smaller coracoids. The use of a graft holder that has a buttress effect while drilling should be considered essential for graft preparation with smaller-diameter bits and screws for fixation in an Indian population.[26,31,32,35]

Based on the present study, it is not possible to comment on the minimum graft dimensions for performing a successful Latarjet procedure, because studies have used alternative fixation methods (as described in detail[6,13,17]).

As far as a conventional fixation method is concerned, offsets are available in sizes ranging from 4 mm to 8 mm depending on the graft. The minimum available offset size is 4 mm, where the graft has 2 mm of bone stock on both sides of the screw width. However, the safe limit of bone stock necessary for preventing graft failure has not been clearly documented. More studies are needed to assess this area. If we consider 2 mm to be the safe limit on both sides individually, 8 mm of graft width is critical for a successful procedure with conventional screws for fixation of graft.

CONCLUSION

We conclude from the results that the maximum harvestable graft was able to cover up to 1.5-times larger defects with the congruent arc Latarjet technique in an Indian population. The mean thickness of the coracoid graft was such that placement of two 4-mm cannulated screws was possible with the congruent arc technique, but the mean margin remaining on both sides was only about 2 mm, which suggests a need for very precise implant placement.

The population under study also included participants who had a harvestable graft thickness smaller than the mean value, which was inappropriate for screw placement per the congruent arc fashion, as the coracoid is not a perfect cylinder in shape. Considering decortication during the actual procedure might leave the surgeon in a further compromised situation in these cases. The bone margin on both sides of the screws in the anterior-posterior plane may be just marginal because of the smaller anatomic dimensions of the coracoid in an Indian population, and the chances of intraoperative graft failure during fixation and later osteolysis may increase for patients where the coracoid superior-inferior girth remains small, which may warrant the use of a classical technique over the congruent arc technique.

Thus, the need for a CT scan in these cases is imperative to assess the adequacy of the graft preoperatively to prevent intraoperative complication and postoperative failure. We also conclude that CT-based measurements are the best modality to assess the bone loss and are completely in concordance with anthropometric measurements.

REFERENCES

1. Arciero RA, Spang JT. Complications in arthroscopic anterior shoulder stabilization: pearls and pitfalls. *Instr Course Lect*. 2008;57:113-124.
2. Armitage MS, Elkinson I, Giles JW, Athwal GS. An anatomic computed tomographic assessment of the coracoid process with special reference to the congruent-arc Latarjet procedure. *Arthroscopy*. 2011;27:1485-1489.
3. Bessière C, Trojani C, Carles M, Mehta SS, Boileau P. The open Latarjet procedure is more reliable in terms of shoulder stability than arthroscopic Bankart repair. *Clin Orthop Relat Res*. 2014;472(8):2345-2351.
4. Bigliani LU, Newton PM, Steinmann SP, Connor PM, McIlveen SJ. Glenoid rim lesions associated with recurrent anterior dislocation of the shoulder. *Am J Sports Med*. 1998;26:41-45.
5. Bishop JY, Jones GL, Rerko MA, Donaldson C; MOON Shoulder Group. 3-D CT is the most reliable imaging modality when quantifying glenoid bone loss. *Clin Orthop Relat Res*. 2012;471(4):1251-1256.
6. Boileau P, Gendre P, d'Ollonne T, Gastaud O, Gonzalez J, Seeto B. Suture button fixation is an alternative to screw fixation for Latarjet procedure. *J Shoulder Elbow Surg*. 2017;26(10):e331.
7. Boileau P, Mercier N, Roussanne Y, Thélu C, Old J. Arthroscopic Bankart-Bristow-Latarjet procedure: the development and early results of a safe and reproducible technique. *Arthroscopy*. 2010;26(11):1434-1450.
8. Boileau P, Villalba M, Hery JY, Balg F, Ahrens P, Neyton L. Risk factors for recurrence of shoulder instability after arthroscopic Bankart repair. *J Bone Joint Surg Am*. 2006;88:1755-1763.
9. Boone JL, Arciero RA. Management of failed instability surgery: how to get it right next time. *Orthop Clin North Am*. 2010;41:367-379.
10. Boons HW, Giles JW, Elkinson I, Johnson JA, Athwal GS. Classic versus congruent coracoid positioning during the Latarjet procedure: an in vitro biomechanical comparison. *Arthroscopy*. 2013;29(2):309-316.
11. Boselli K. Coracoid thickness and glenoid width: anatomic considerations for the Latarjet procedure. *JBJS Orthopaedic Highlights: Shoulder and Elbow*. 2012;2(11):e9.
12. Burkhart SS, De Beer JF, Johannes RH, et al. Results of modified Latarjet reconstruction in patients with antero-inferior instability and significant bone loss. *Arthroscopy*. 2007;23:1033-1041.
13. Chaudhary D, Goyal A, Joshi D, Jain V, Mohindra M, Mehta N. Clinical and radiological outcome after mini-open Latarjet technique with fixation of coracoid with Arthrex wedge mini-plate. *J Clin Orthop Trauma*. 2016;7(1):23.
14. Chuang TY, Adams CR, Burkhart SS. Use of preoperative three dimensional computed tomography to quantify glenoid bone loss in shoulder instability. *Arthroscopy*. 2008;24:376-382.
15. da Silva L, da Costa Lima Á, Kautsky R, Santos P, do Val Sella G, Checchia S. Evaluation of the results and complications of the Latarjet procedure for recurrent anterior dislocation of the shoulder. *Rev Bras Ortop*. 2015;50(6):652-659.
16. Di Giacomo G, Itoi E, Burkhart SS. Evolving concept of bipolar bone loss and the Hill-Sachs lesion: from engaging/non-engaging lesion to on-track/off-track lesion. *Arthroscopy*. 2014;30(1):90-98.
17. Giacomo G, de Gasperis N, De Vita A, et al. Coracoid bone graft osteolysis after Latarjet procedure: a comparison study between two screws standard technique vs mini-plate fixation. *Int J Shoulder Surg*. 2013;7(1):1.
18. Gooding BWT, Cresswell TR, Sloan R, du Toit DF, de Beer J. Glenoid and coracoid morphology are ideally matched for the congruent-arc Latarjet. *Shoulder and Elbow*. 2010;3(1):17-21.
19. Gray H, Carter H, Pick T, Howden R. *Anatomy*. London, England: Bounty; 2012.
20. Hovelius L, Eriksson K, Fredin H, et al. Recurrences after initial dislocation of the shoulder: results of a prospective study of treatment. *J Bone Joint Surg Am*. 1983;65:343-349.
21. Hovelius L, Sandström B, Olofsson A, Svensson O, Rahme H. The effect of capsular repair, bone block healing, and position on the results of the Bristow-Latarjet procedure (study III): long-term follow-up in 319 shoulders. *J Shoulder Elbow Surg*. 2012;21(5):647-660.
22. Ikemoto R, Murachovisky J, Nascimento L, et al. Results from Latarjet surgery for treating traumatic anterior shoulder instability associated with bone erosion in the glenoid cavity, after minimum follow-up of one year. *Rev Bra Ortop*. 2011;46(5):553-560.
23. Ilva J, Damas C, Sá M, Torres J. Morphological analysis of the scapula and its implications in Bristow-Latarjet procedure. *Acta Ortop Bras*. 2017;25(1):34-37.
24. Itoi E, Lee S-B, Amrami KK, Wenger DE, An K-N. Quantitative assessment of classic anteroinferior bony Bankart lesions by radiography and computed tomography. *Am J Sports Med*. 2003;31:112-118.
25. Itoi E, Lee SB, Berglund LJ, Berge LL, An KN. The effect of a glenoid defect on anteroinferior stability of the shoulder after Bankart repair: a cadaveric study. *J Bone Joint Surg Am*. 2000;82:35-46.
26. Klatte TO, Hartel MJ, Weiser L, et al. Accuracy of Latarjet graft and screw position after using novel drill guide. *Eur J Trauma Emerg Surg*. 2017;43(5):645-649.
27. Kwon YW, Powell KA, Yum JK, Brems JJ, Iannotti JP. Use of three-dimensional computed tomography for the analysis of the glenoid anatomy. *J Shoulder Elbow Surg*. 2005;14:85-90.
28. Lädermann A, Denard PJ, Burkhart SS. Injury of the suprascapular nerve during Latarjet procedure: an anatomic study. *Arthroscopy*. 2012;28(3):316-321.
29. Lian J, Dong L, Zhao Y, Sun J, Zhang W, Gao C. Anatomical study of the coracoid process in Mongolian male cadavers using the Latarjet procedure. *J Orthop Surg Res*. 2016;11(1):126.
30. Manal F, Cheah PS, Ahmad U, et al. Anatomic variation in morphometry of human coracoid process among Asian population. *Biomed Res Int*. 2017;2017:6307019.
31. Meyer DC, Moor BK, Gerber C, Ek ET. Accurate coracoid graft placement through use of a drill guide for the Latarjet procedure. *J Shoulder Elbow Surg*. 2013; 22(5):701-708.
32. Paladini P, Singla R, Merolla G, Porcellini G. Latarjet procedure: is the coracoid enough to restore the glenoid surface? *Int Orthop*. 2016;40(8):1675-1681.
33. Scott RM, Katthagen JC, Mikula JD, et al. Anatomic and biomechanical comparison of the classic and congruent-arc techniques of the Latarjet procedure. *Am J Sports Med*. 2017;45(6):1252-1260.
34. Sugaya H, Moriishi J, Dohi M, Kon Y, Tsuchiya A. Glenoid rim morphology in recurrent anterior gleno-humeral instability. *J Bone Joint Surg Am*. 2003;85:878-884.
35. Taverna E, Guarrella V, Cartolari R, et al. Arthroscopically-assisted Latarjet: an easy and reproducible technique for improving the accuracy of graft and screw placement [published online May 15, 2017]. *Shoulder and Elbow*. doi:10.1177/1758573217706701
36. Taverna E, Ufenast H, Broffoni L, Garavaglia G. Arthroscopically assisted Latarjet procedure: a new surgical approach for accurate coracoid graft placement and compression. *Int J Shoulder Surg*. 2013;7(3):120-123.