

CORTICAL SUTURE-BUTTON FIXATION FOR GLENOID BONE LOSS: A SYSTEMATIC LITERATURE REVIEW

Poster #26

Michael Banffy, MD¹; Matthew Sedgwick, PhD²

1 Cedars Sinai Kerlan-Jobe Institute, Los Angeles, CA, USA

2 Smith & Nephew, Hull, United Kingdom

Disclosure of Interests

Michael Banffy, MD

Consultancy (teaching and research): Smith & Nephew, Arthrex, Stryker and Vericel

Matthew Sedgwick, PhD

Employment: Smith & Nephew

Background

Screws have traditionally been the device of choice for bone fixation for treatment of shoulder anterior instability.¹

The use of screws is often associated with complications, including ²

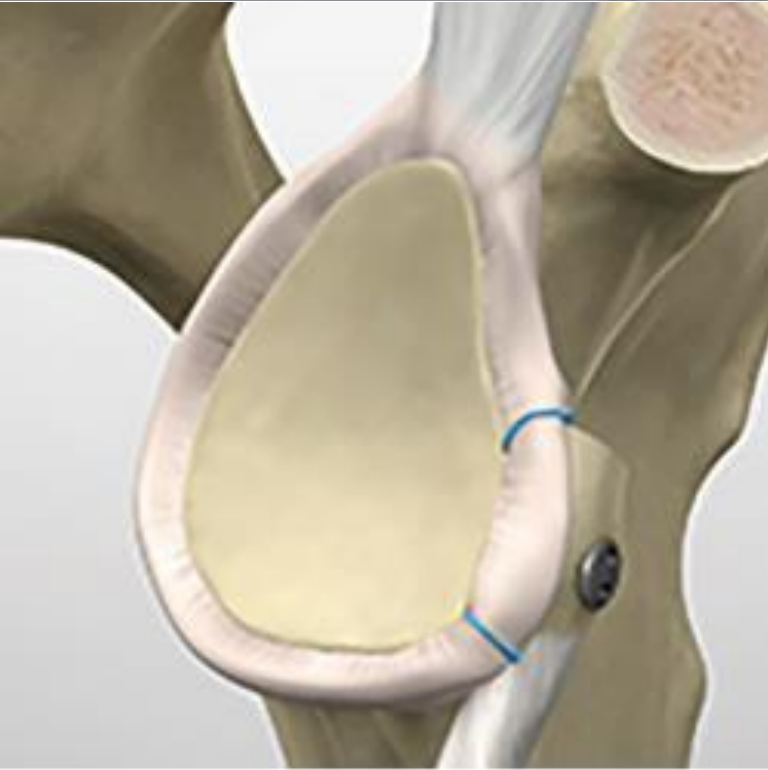
- Hardware failures: screw pullout or loosening, bending or breakage, and
- Nerve complications at the shoulder

Background

Suture button fixation of a bone graft in patients with anterior instability associated with glenoid bone loss has been proposed as an alternative to screw fixation.^{3,4}



Objective



To review the safety and effectiveness of a commercially available suture-button fixation device (Double Endobutton; Smith & Nephew) in the treatment of anterior instability associated with glenoid bone loss

Study Design and Methods

A systematic literature review of Embase and PubMed:

- Search terms: ((glenoid AND bone AND loss) OR (anterior AND shoulder AND instability)) AND (eden-hybinette OR Latarjet OR Bristow OR "bone block")
- Filters: English language; 1 Jan 2010 – 20 July 2021 (date of search)
- Meta-analyses were used to compare the outcomes between techniques

Inclusion criteria

Population

- Anterior shoulder instability associated with bone loss
- $N \geq 5$ patients

Intervention

- Surgery involving bone transfer or grafting using Double Endobutton (Smith & Nephew)
- Surgeries happening solely in or since 2010

Comparator

- Not required

Outcome

- Recurrence rate
- Re-operation rate
- Patient- or observer-reported outcomes
- Return to sport
- Bone healing and complications

Other

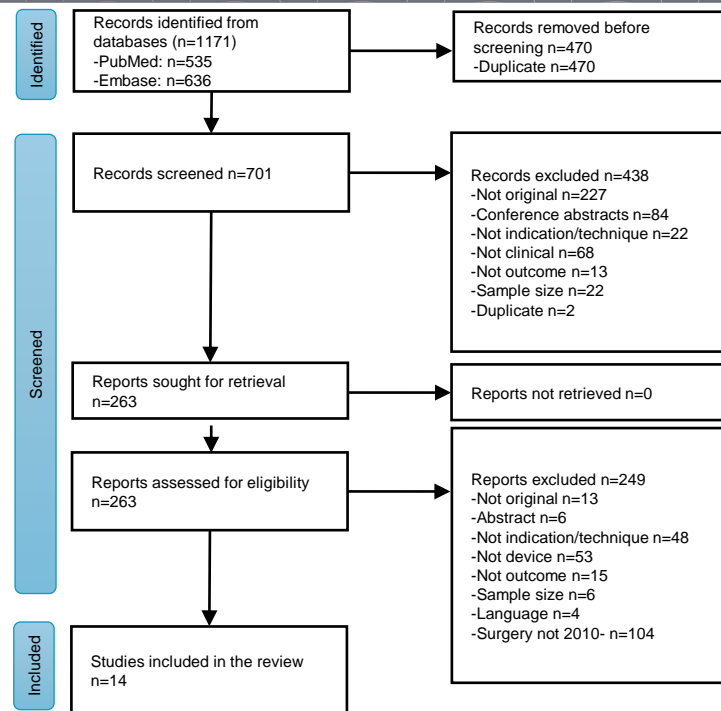
- Primary empirical clinical study
- Full-text publication
- English language
- Publication 2010 -

Results: Study Selection

14 articles covering 752 patients included (Figure) ³⁻¹⁶

10 independent cohorts covering 454 patients

Among articles with likely patient overlap, only the article with most patients was included in an analysis



Study selection flow chart

Results: Patient Characteristics

Patient demographics:

Majority of patients were male aged 20 to 30 years

Surgical procedure:

Most common: Arthroscopic Latarjet

Other: Open Latarjet, arthroscopic Bristow, open or arthroscopic Eden-Hybinette using autograft, and Eden-Hybinette using allograft

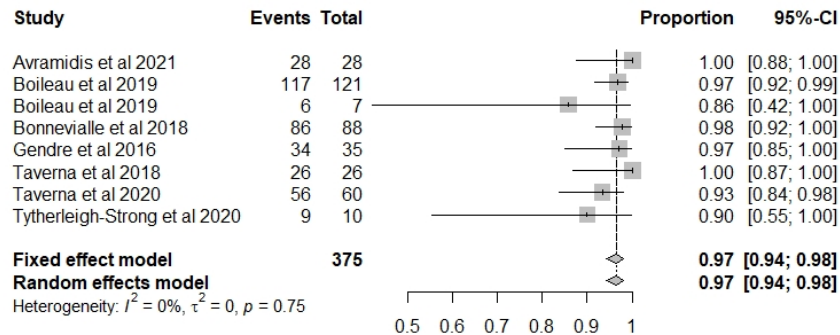
Results: Recurrence

No subsequent subluxation or dislocation

97% (95% CI, 94 – 98)

8 articles

375 patients



Rate of recurrence, defined as the occurrence of anterior subluxation or dislocation postoperatively, after repair of anterior shoulder instability associated with bone loss

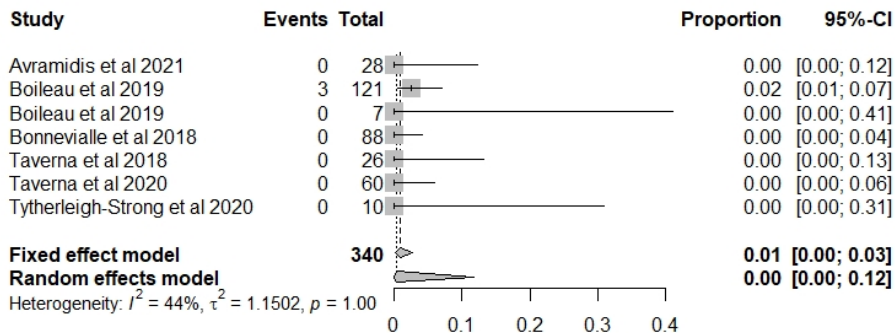
Results: Reoperation

Reoperation

0.9% (95% CI, 0.3 – 2.7)

7 articles

340 patients



Rate of reoperation after repair of anterior shoulder instability associated with bone loss

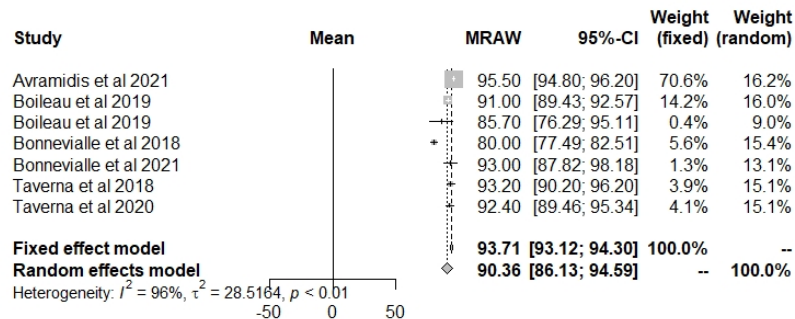
Results: Patient-Reported Outcome Measures

Walch-Duplay score

90.4 (95% CI, 86.1 – 94.6)

Mean follow-up time: 25.1 months

7 articles, 347 patients

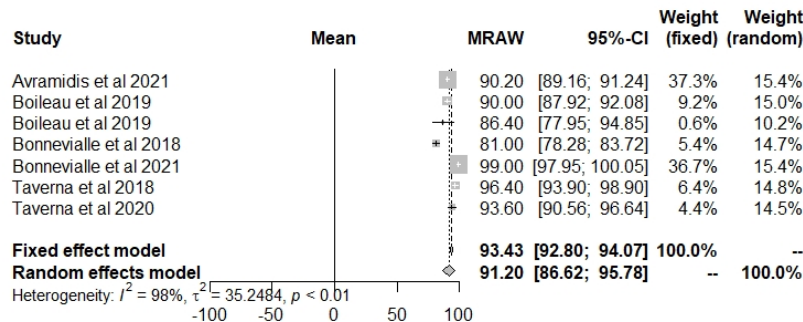


Rowe score

91.2 (95% CI, 86.6 – 95.8)

Mean follow-up time: 24.5 months

7 articles, 347 patients



Postoperative Walch-Duplay (top) and Rowe (bottom) scores

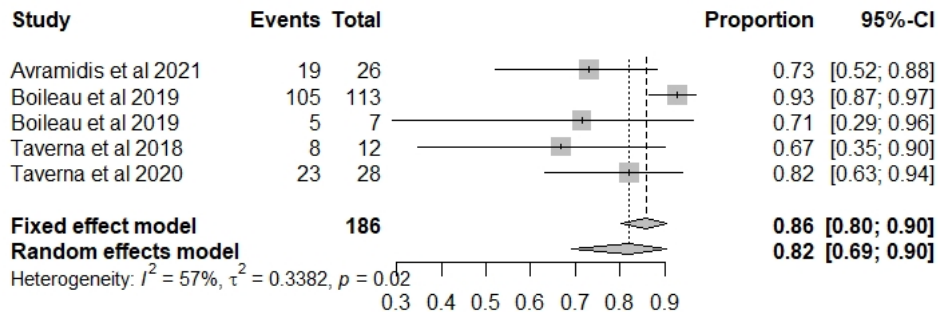
Results: Return to Sport

Return to pre-injury level of sport

82.1% (95% CI, 69.2 – 90.4)

5 articles

186 patients



Rate of return to sport after repair of anterior shoulder instability associated with bone loss

Results: Bone Healing and Migration

Bone healing/Union

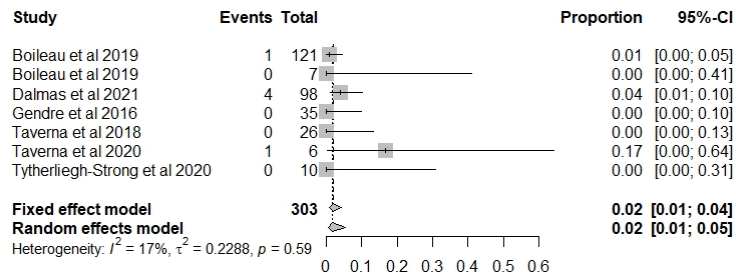
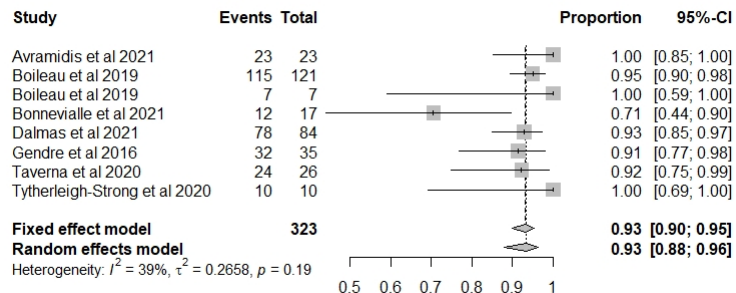
93.2% (95% CI, 89.9 – 95.5)

8 articles, 323 patients

Migration

2.0% (95% CI, 0.9 – 4.3)

7 articles, 303 patients



Rate of bone healing (top) and graft migration (bottom) after repair of anterior shoulder instability associated with bone loss

Results: Complications

No neurovascular complications at the shoulder or hardware complications were reported in any of the studies.

Conclusions

Clinical evidence demonstrates that the use of Double Endobutton is associated with excellent safety, success, and postoperative improvement in patient-reported outcome measures.

Suture-button fixation demonstrates favorable clinical outcomes without the known risk of hardware and nerve complications associated with screw fixation.^{17,18}

High-quality comparative studies are needed to determine fixation device superiority.

References

1. Mizuno N, Denard PJ, Raiss P, Melis B, Walch G. Long-term results of the Latarjet procedure for anterior instability of the shoulder. *J Shoulder Elbow Surg.* 2014;23(11):1691-1699. doi:10.1016/j.jse.2014.02.015
2. Griesser MJ, Harris JD, McCoy BW, et al. Complications and re-operations after Bristow-Latarjet shoulder stabilization: a systematic review. *J Shoulder Elbow Surg.* 2013;22(2):286-292. doi:10.1016/j.jse.2012.09.009
3. Boileau P, Gendre P, Baba M, et al. A guided surgical approach and novel fixation method for arthroscopic Latarjet. *J Shoulder Elbow Surg.* 2016;25(1):78-89. doi:10.1016/j.jse.2015.06.001
4. Boileau P, Saliken D, Gendre P, et al. Arthroscopic Latarjet: Suture-Button Fixation Is a Safe and Reliable Alternative to Screw Fixation. *Arthroscopy.* 2019;35(4):1050-1061. doi:10.1016/j.arthro.2018.11.012
5. Avramidis G, Kokkineli S, Trellopoulos A, et al. Excellent Clinical and Radiological Midterm Outcomes for the Management of Recurrent Anterior Shoulder Instability by All-Arthroscopic Modified Eden-Hybinette Procedure Using Iliac Crest Autograft and Double-Pair Button Fixation System: 3-Year Clinical Case Series With No Loss to Follow-Up. *Arthroscopy.* 2021;37(3):795-803. doi:10.1016/j.arthro.2020.10.036
6. Bonneville N, Girard M, Dalmas Y, Martinel V, Faruch M, Mansat P. Short-Term Bone Fusion With Arthroscopic Double-Button Latarjet Versus Open-Screw Latarjet. *Am J Sports Med.* 2021;49(6):1596-1603. doi:10.1177/03635465211001095
7. Bonneville N, Thélou CE, Bouju Y, et al. Arthroscopic Latarjet procedure with double-button fixation: short-term complications and learning curve analysis. *J Shoulder Elbow Surg.* 2018;27(6):e189-e195. doi:10.1016/j.jse.2017.12.007
8. Boileau P, Duysens C, Saliken D, Lemmex DB, Bonneville N. All-arthroscopic, guided Eden-Hybinette procedure using suture-button fixation for revision of failed Latarjet. *J Shoulder Elbow Surg.* 2019;28(11):e377-e388. doi:10.1016/j.jse.2019.03.022
9. Neyton L, Barth J, Nourissat G, et al. Arthroscopic Latarjet Techniques: Graft and Fixation Positioning Assessed With 2-Dimensional Computed Tomography Is Not Equivalent With Standard Open Technique. *Arthroscopy.* 2018;34(7):2032-2040. doi:10.1016/j.arthro.2018.01.054
10. Weick JW, Kalia V, Pacheco E, Jacobson JA, Freehill MT. Osseous Healing With Nonrigid Suture Fixation in the Arthroscopic Latarjet Procedure. *Orthop J Sports Med.* 2020;8(11):2325967120964489. Published 2020 Nov 17. doi:10.1177/2325967120964489
11. Metais P, Clavert P, Barth J, et al. Preliminary clinical outcomes of Latarjet-Patte coracoid transfer by arthroscopy vs. open surgery: Prospective multicentre study of 390 cases [published correction appears in *Orthop Traumatol Surg Res.* 2017 May;103(3):475]. *Orthop Traumatol Surg Res.* 2016;102(8S):S271-S276. doi:10.1016/j.otsr.2016.08.003
12. Dalmas Y, Thélou CE, Laumonerie P, Girard M, Faruch M, Bonneville N. Arthroscopic double-button Latarjet: two-thirds of bone block healed at 90 days. *Knee Surg Sports Traumatol Arthrosc.* 2021;29(1):136-142. doi:10.1007/s00167-019-05830-7
13. Gendre P, Thélou CE, d'Ollonne T, Trojani C, Gonzalez JF, Boileau P. Coracoid bone block fixation with cortical buttons: An alternative to screw fixation?. *Orthop Traumatol Surg Res.* 2016;102(8):983-987. doi:10.1016/j.otsr.2016.06.016
14. Taverna E, Garavaglia G, Perfetti C, Ufenast H, Sconfienza LM, Guarrella V. An arthroscopic bone block procedure is effective in restoring stability, allowing return to sports in cases of glenohumeral instability with glenoid bone deficiency. *Knee Surg Sports Traumatol Arthrosc.* 2018;26(12):3780-3787. doi:10.1007/s00167-018-4921-7
15. Taverna E, Longo UG, Guarrella V, et al. A new mini-open technique of arthroscopically assisted Latarjet. *BMC Musculoskelet Disord.* 2020;21(1):285. Published 2020 May 7. doi:10.1186/s12891-020-03307-0
16. Tytherleigh-Strong G, Aresti N, Begum R. Revision guided suture-button bone block stabilization of the shoulder in the presence of significant retained glenoid metalwork. *JSES Int.* 2020;4(4):803-813. Published 2020 Jul 11. doi:10.1016/j.jseint.2020.06.006
17. Zuckerman JD, Matsen FA 3rd. Complications about the glenohumeral joint related to the use of screws and staples. *J Bone Joint Surg Am.* 1984;66(2):175-180.
18. Delaney RA, Freehill MT, Janfaza DR, Vlassakov KV, Higgins LD, Warner JJ. 2014 Neer Award Paper: neuromonitoring the Latarjet procedure. *J Shoulder Elbow Surg.* 2014;23(10):1473-1480. doi:10.1016/j.jse.2014.04.003