

Comments on “Low-Cost Alternative External Rotation Shoulder Brace and Review of Treatment in Acute Shoulder Dislocations”

DOI: 10.5811/westjem.2015.3.25815

Lacy K, Cooke C, Cooke P, et al. Low-cost alternative external rotation shoulder brace and review of treatment in acute shoulder dislocations. *West J Emerg Med.* 2015;16(1):114-120.

To the Editor:

We read the paper of Lacy et al. (2015) with interest.¹ The authors present a narrative review of the use of external rotation bracing in acute shoulder dislocations. One of the weaknesses of a narrative review is that it is more likely to be subject to reporting bias. In their review the authors focus on published studies that demonstrated successful outcomes. The first two originate from Itoi et al. whose 2003 randomized controlled trial popularized the concept of external rotation bracing in this patient group.^{2,3} However, their good results have not been replicated in three subsequent randomized controlled trials.⁴⁻⁶ The third study cited concluded that external rotation bracing was advantageous.⁷ However, the major confounding factor in that study was that the internal rotation group had a younger mean age. As this is a well-established risk factor for re-dislocation the results of this study should be interpreted with caution.^{8,9} Furthermore, a recent systematic review and meta-analysis also concluded that ER bracing is not advantageous.^{10,11} We feel that the narrative review in this publication does not provide a balanced overview of the clinical studies available and we question the value of external rotation in the management of these patients.

Lacy et al. also describe the production of a low-cost external rotation brace that is more cost effective than those commercially available. The image of the sling provided demonstrates that this device produces only a small degree of external rotation. A recent systematic review demonstrated that reduction of the labrum is only achieved in 35% of cases when the arm is positioned in over 30 degrees of external rotation.¹² However, the clinical studies previously discussed^{3-5,7} only achieved 10 to 20 degrees of rotation, and the illustration of the described technique in this paper suggests even less was achieved with this alternative brace. As a result, its effectiveness in achieving labral reduction and shoulder stability cannot be extrapolated from previous studies where a higher degree of rotation was obtained. An additional factor not addressed is the acceptability of the splint to patients. External rotation bracing is extremely inconvenient and poorly tolerated. Its prescription is associated with poor compliance, which may limit effectiveness.³⁻⁵

In closing we commend the authors on their innovative thinking and consider their design to be a cost-effective

alternative to commercially available external rotation braces for posterior dislocations. However, the lack of any clear advantage to external rotation bracing for anterior shoulder dislocations in previous systematic reviews and meta-analysis should limit the subjection of patients to this poorly tolerated brace. The cheaper, more readily available internal rotation sling remains the standard treatment for these patients.

Robert W. Jordan, MBChB, MRCS

University Hospitals Coventry and Warwickshire, Coventry, United Kingdom

Adnan Saithna, MBChB, MSc, DipSEM, FRCS (T&O)

Southport and Ormskirk Hospitals NHS Trust

Address for Correspondence: Robert W. Jordan, MBChB, MRCS, University Hospitals Coventry & Warwickshire, Clifford Bridge Road, Coventry, CV2 2DX, UK. Email: Robert.jordan@doctors.org.uk.

Conflicts of Interest: By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

Copyright: © 2015 Jordan et al. This is an open access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 4.0) License. See: <http://creativecommons.org/licenses/by/4.0/>

REFERENCES

1. Lacy K, Cooke C, Cooke P, et al. Low-cost alternative external rotation shoulder brace and review of treatment in acute shoulder dislocations. *West J Emerg Med.* 2015;16(1):114-120.
2. Itoi E, Hatakeyama Y, Kido T, et al. A new method of immobilization after traumatic anterior dislocation of the shoulder: A preliminary study. *J Shoulder Elbow Surg.* 2003;12(5):413-415.
3. Itoi E, Hatakeyama Y, Sato T, et al. Immobilization in external rotation after shoulder dislocation reduces the risk of recurrence – a randomized controlled trial. *J Bone Joint Surg Am.* 2007;89:2124-2131.
4. Finestone A, Milgrom C, Radeva-Petrova DR, et al. Bracing in external rotation for traumatic anterior dislocation of the shoulder. *J Bone Joint Surg Br.* 2009;91:918-921.
5. Liavaag S, Brox JI, Pripp AH, et al. Immobilization in external rotation after primary shoulder dislocation did not reduce the risk of recurrence. A randomized controlled trial. *J Bone Joint Surg Am.* 2011;93:897-904.
6. Whelan DB, Litchfield R, Wambolt E, et al. External rotation immobilization for primary shoulder dislocation: a randomised controlled trial. *Clin Orthop Relat Res.* 2014;472:2380-2386.

7. Taskoparan H, Tunay S, Kilincoglu V, et al. Immobilization of the shoulder in external rotation for prevention of recurrence in acute anterior dislocation. *Acta Orthop Traumatol Turc.* 2010;44(4):278-284.
8. Hovelius L, Augustini B, Fredin H, et al. Primary anterior dislocation of the shoulder in young patients. A ten year prospective study. *J Bone Joint Surg Am.* 1996;78:1677-1684.
9. Kralinger F, Gloser W, Wischatta R, et al. Predicting recurrence after primary anterior shoulder dislocation. *Am J Sports Med.* 2002;20:41-48.
10. Paterson WH, Throckmorton TW, Koester M, et al. Position and duration of immobilization after primary anterior shoulder dislocation: a systematic review and meta-analysis of the literature. *J Bone Joint Surg Am.* 2010;92(18):2924-2933.
11. Vavken P, Sadoghi P, Quidde J, et al. Immobilization in internal or external rotation does not change recurrence rates after traumatic anterior shoulder dislocation. *J Shoulder Elbow Surg.* 2013;23:1-7.
12. Jordan RW, Saithna A, Old J, et al. Does external rotation bracing for anterior shoulder dislocation actually result in reduction of the labrum? a systematic review. *Am J Sports Med.* 2014.

DOI: 10.5811/westjem.2015.4.26247

In Reply:

We would like to thank the editors of the *Western Journal of Emergency Medicine* for the opportunity to reply to the letter to the editor by Jordan et al. regarding our paper “Low-Cost Alternative External Rotation Shoulder Brace and Review of Treatment in Acute Shoulder Dislocations.”¹

Jordan et al. comment in their letter to the editor,² “We feel that the narrative review in this publication does not provide a balanced overview of the clinical studies available and we question the value of external rotation in the management of these patients. They further state that, the paper is “likely to be subject to reporting bias.” Jordan et al.² quote articles that question the value of external rotation bracing over internal rotation bracing for acute anterior dislocations.³⁻⁷ Each one of these publications³⁻⁷ is also referenced in our review¹ and are the reason we clearly state in our article that “Posterior dislocations are immobilized in external rotation or a ‘gunslinger’ position of neutral rotation, abduction, and slight flexion.⁸ The position of immobilization for anterior shoulder dislocations is somewhat controversial,” and we repeat that “larger randomized controlled trials, as well as meta-analyses comparing external and internal rotation immobilization for acute traumatic anterior shoulder dislocation, have not shown a statistically significant difference in regards to recurrence of dislocation.”³⁻⁷

Jordan et al.² further state that “a recent systematic review and meta-analysis also concluded that external rotation bracing for anterior shoulder dislocations is not

advantageous.”^{6,7} Unfortunately they misquote Patterson et al.,⁶ which states in its conclusion, “Bracing in external rotation may provide a clinically important benefit over traditional sling immobilization, but the difference in recurrence rates did not achieve significance with the numbers available.”

Also in a commentary written by Bruce S. Miller on this article⁸ in the same journal, Miller questions the discrepant findings in this emerging body of evidence for external rotation bracing in anterior shoulder dislocations and feels it certainly warrants further investigation but does not discount the work of Itoi et al.³ as does our current letter to the editor.

Jordan et al.² state, “The image of the sling provided demonstrates that this device produces only a small degree of external rotation,” and also state that “the clinical studies previously discussed^{3-5,10,11} only achieved 10 to 20 degrees of rotation and the illustration of the described technique in this paper suggests even less was achieved with this alternative brace.” Allow us to provide you with some better images (Figure) and mention that the degree of external rotation brace is adjustable depending on the amount of padding used in the bump. The placement of more padding anteriorly in the bump will create a greater degree of external rotation. The padding within the bump can also be compressed posteriorly to create a wedge shape, which aids in achieving additional external rotation.

Jordan et al. further comment that an additional factor not addressed is the acceptability of the splint to patients. “External rotation bracing is extremely inconvenient and poorly tolerated. Its prescription is associated with poor compliance which may limit its effectiveness.”^{3,4,11} Unfortunately the above statement is

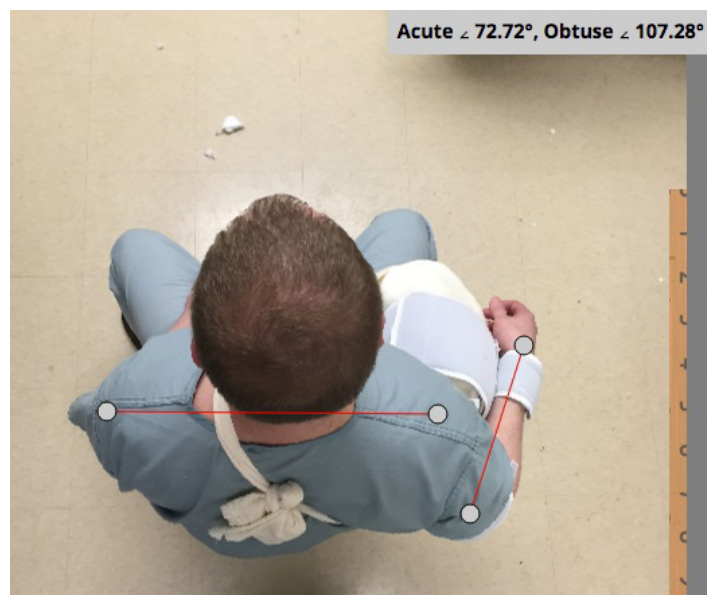


Figure. An overhead picture of the low-cost alternative external rotation shoulder brace demonstrating 18 degrees of external shoulder rotation. With additional padding in the bump anteriorly, greater external rotation can be achieved.

referenced by three randomized controlled trials that report the following compliance with bracing:

3) The external rotation brace was used in 27 patients, all but one of whom complied fully with the treatment. An internal rotation brace was used in 24 patients, all of whom complied with the treatment regime.³

4) The compliance rate with the immobilization was 47.4% (45 of 95) in the internal rotation group and 67.7% (63 of 93) in the external rotation group.⁴

11) The compliance rate was 39 (53%) of 74 in the internal rotation group and 61 (72%) of 85 in the external rotation group (p=0.013).¹¹

Our patients also seem to tolerate this soft padded brace pretty well.

In conclusion, we would like to reiterate that our low-cost brace is a good option for patients who would benefit from external rotation bracing of the shoulder or humerus. It can be adjusted to get up to 20 degrees of external rotation, and like other external rotation braces the compliance of use is very similar to internal rotation bracing. It is beneficial in posterior dislocations, certain humerus fractures, and for post-op care, and although the literature is controversial it may be an option for acute anterior shoulder dislocations. So we feel that our review is balanced not biased, represents the opinion of recent publications and feel that the letter to the editor misrepresents the literature as we have stated.

Kyle Lacy, MD, MS

*Detroit Medical Center, Department of Orthopaedic Surgery,
Detroit, Michigan*

Chris Cooke, MD

*Detroit Medical Center, Department of Orthopaedic Surgery,
Detroit, Michigan*

Pat Cooke, BA

*Detroit Medical Center, Department of Orthopaedic Surgery,
Detroit, Michigan*

Justin Schupach, BS

*Wayne State University, Detroit Medical Center, Detroit,
Michigan*

Jon Carlson, MD

*Detroit Medical Center, Department of Orthopaedic Surgery,
Detroit, Michigan*

Rahul Vaidya, MD

*Detroit Medical Center, Department of Orthopaedic Surgery,
Detroit, Michigan*

Address for Correspondence: Kyle Lacy, MD, MS, Orthopaedic Surgery Offices, UHC-4G, Detroit Receiving Hospital, 4201 Antoine St, Detroit, MI 48067. Email: kylelacymd@gmail.com.

Conflicts of Interest: By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

Copyright: © 2015 Lacy et al. This is an open access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 4.0) License. See: <http://creativecommons.org/licenses/by/4.0/>

REFERENCES

1. Lacy K, Cooke C, Cooke P, et al. Low-cost alternative external rotation shoulder brace and review of treatment in acute shoulder dislocations. *West J Emerg Med.* 2015;16(1):114-120.
2. Jordan RW, Saithna A. Comments on "Low-cost alternative external rotation shoulder brace and review of treatment in acute shoulder dislocations". *West J Emerg Med.* 2015;16(3).
3. Finestone A, Milgrom C, Radeva-Petrova DR, et al. Bracing in external rotation for traumatic anterior dislocation of the shoulder. *J Bone Joint Surg Br.* 2009;91:918-921.
4. Liavaag S, Brox JI, Pripp AH, et al. Immobilization in external rotation after primary shoulder dislocation did not reduce the risk of recurrence. A randomized controlled trial. *J Bone Joint Surg Am.* 2011;93:897-904.
5. Whelan DB, Litchfield R, Wambolt E, et al. External rotation immobilization for primary shoulder dislocation: a randomised controlled trial. *Clin Orthop Relat Res.* 2014;472:2380-2386.
6. Paterson WH, Throckmorton TW, Koester M, et al. Position and duration of immobilization after primary anterior shoulder dislocation: a systematic review and meta-analysis of the literature. *J Bone Joint Surg Am.* 2010;92(18):2924-2933.
7. Vavken P, Sadoghi P, Quidde J, et al. Immobilization in internal or external rotation does not change recurrence rates after traumatic anterior shoulder dislocation. *J Shoulder Elbow Surg.* 2013;23:1-7.
8. Robinson CM. The epidemiology, risk of recurrence, and functional outcome after an acute traumatic posterior dislocation of the shoulder. *J Bone Joint Surg Am.* 2011;93(17):1605-1613
9. Miller BS. Commentary on an article by Sigurd Liavaag, MD, et al.: "Immobilization in external rotation after primary shoulder dislocation did not reduce the risk of recurrence. A randomized controlled trial". *J Bone Joint Surg Am.* 2011;93(10):e56 .
10. Itoi E, Hatakeyama Y, Sato T, et al. Immobilization in external rotation after shoulder dislocation reduces the risk of recurrence - a randomized controlled trial. *J Bone Joint Surg Am.* 2007;89:2124-2131.
11. Taskoparan H, Tunay S, Kilincoglu V, et al. Immobilization of the shoulder in external rotation for prevention of recurrence in acute anterior dislocation. *Acta Orthop Traumatol Turc.* 2010;44(4):278-284.