16th February 2015

Dear Editor,

Please find enclosed the edited manuscript in Word format (file name: WJOrugby5.docx).

Title: Surgical interventions for anterior shoulder instability in rugby players: a systematic review

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Name of Journal: *World Journal of Orthopaedics*

ESPS Manuscript NO: 16369

We thank you and the reviewers for their thoughtful comments on the our systematic review, The manuscript has been revised according to the reviewer's comment. Below this letter is a comprehensive point-by-point description of the steps taken to update and revise this paper according to those recommendations.

The formatting recommendations made by you; including a conflicts of interest statement, an audio file for the core tip, referencing studies in the tables and providing a modifiable PRISMA flow chart has also been done.

Thank you again for reviewing our manuscript and we look forward to a final decision regarding publication in your journal.

Yours sincerely

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Reviewer 1

Comment 1

This paper is a systematic review of surgical interventions for shoulder instability in rugby players. Unfortunately, there are only six low quality studies to assess this topic and as the authors pointed out quantitative analysis was not possible, and therefore it is difficult to address this specific clinical/research question.

Response 1

We agree with the reviewer's comments that this area of musculoskeletal injury in elite sports is lacking in quantity and quality of research to inform orthopaedic surgeons interested in this field. We hope that our systematic review does provide some insight regarding preferred surgical practices by specialists in this field, and the outcomes of these treatments. Importantly, the limitations of the evidence base highlighted by this paper should underline the need for future biomechanical and clinical studies in this area of orthopaedic and sports medicine.

Comment 2

The authors should try to make the clinical question more specific (e.g evaluate only surgical treatment of anterior shoulder instability in order to avoid confusion) and include in their review only papers with anterior shoulder instability.

Response 2

The revised systematic review now focuses only on anterior instability in elite rugby players. As such the title, methods, results and conclusions now reflect this adjustment and there is no reference to posterior instability or inclusion of posterior instability studies within the quantitative synthesis of data.

Comment 3

I suggest that the authors should report clearly, in the Results section, IN TOTAL, demographic data of the study population (age, sex, mean age at surgery e.t.c) the total rate of recurrence, mean time to return to rugby, e.t.c. This will help the reader to have a clear idea of the total study population

Response 3

We thank the reviewer for this comment and agree that introducing this information will give the reader a clear idea of the total population. The Results now read:

"A total of 368 shoulders in 365 elite rugby union and rugby league players were included. Overall, the mean age at surgery was 23.2 years, with a range from 16 to 35 years ***(Table 3).*** *The*

mean duration of follow up was 72 months, with a range of 17 months to 237 months ***(Table 4).*** *Return to competitive play was reported in 230 out of 269 patients (85.5%) at a mean time of 13 months, with a range of 2 to 24 months. Recurrence of instability occurred in 32 of the 368 cases (8.7%).*"

Comment 4

INTRODUCTION Page 5, lines 83-88. These are general and very well known anatomic info and it is not necessary to report them here. In this way you can save some space and provide the necessary background for shoulder instability in athletes.

Response 4

This has now been addressed. The section on anatomy has been removed between line 83-88 and the introduction focuses on incidence and treatment of instability, as well as instability in collision sports.

Comment 5

METHODS Page 7 –inclusion exclusion criteria. I think you should report that only studies that described surgical intervention and not "treatment intervention" were included.

Response 5

This has been addressed. The inclusion criteria now reads:

"Studies that described a surgical treatment intervention for elite rugby players with anterior shoulder instability were included."

Comment 6

To my opinion, as I pointed out in my general comments you should be more specific and include only anterior instability cases to draw useful conclusions.

Response 6

This systematic review now focuses and reports only on anterior instability as per the reviewer's suggestions.

Comment 7

Please define the required time of follow-up. Page 7, lines 146-147. "year of publication" is double. Please delete one.

Response 7

This has now been addressed and reads:

"Only studies with a minimum follow up of 12 months were included."

The double year of publication has been deleted.

Comment 8

RESULTS I think you should organize your results in a more clear way. For example you do not report what is the mean Rowe score (in the running text), or the total rate of recurrence in chronic and acute cases, differences between arthroscopic and open techniques, or differences between soft tissue and Latarjet reconstructions. By analysing each of the studies separately, the reader is difficult to have the overall impression of the problem.

Response 8

We have amended the results section so that they reflect the reviewer's recommendations. Unfortunately a meaningful mean Rowe score for the studies was not possible because only 3 studies used a Rowe score of which only 2 provided a quantitative value for the score rather than a qualitative categorisation (e.g. good/excellent). For sub-group comparison not all studies provided sufficient sub-group detail to provide a complete comparison, however based on the reviewer's recommendation we have provided a summary of recurrence rates where possible. A new section in the results section now reads:

"A complete sub-group comparison of all pathology and treatment related recurrence rates was not possible because of lack of specific descriptions within some of the studies. However, where reported recurrent instability after surgery occurred in only 1 out of 41 (2.4%) reported cases of acute instability and 16 out of 231 (6.9%) cases of chronic or recurrent shoulder instability. Furthermore, recurrence of instability after arthroscopic surgery was reported in only 2 out of 39 (5.1%) cases compared to reported recurrences in 14 out of 84 (16.7%) cases after an open surgical technique was performed. Recurrence after soft tissue surgical techniques were adopted occurred in 7 out of 133 (5.2%) cases and recurrence after a Latarjet procedure was performed occurred in 14 out of 77 (18.2%) cases. It was observed that where open procedures were performed instead of arthroscopic procedures, or a Latarjet procedure in preference of soft tissue stabilization, the patients groups were more likely to have osseous defects"

Comment 9

Please define if acute anterior instability is the same with first time dislocation.

Response 9

The methods section now contains the sentence:

"Patients with acute instability were defined as those who received treatment after a first episode of dislocation."

Comment 10

Please report the mean Coleman score and how many studies were good, fair, and poor according to this.

Response 10

The quality assessment section of the results now reads:

"A comparison of each CMS domain scores between the two raters using a Pearson's correlation was 0.966, indicative of strong inter-rater reliability. The mean CMS score for the 5 studies included in this systematic review was 47.4 (range 35 – 58) ***(Table 4).*** *None of the studies had 'excellent' (85 – 100) or 'good' (70 – 84) CMS scores. Two studies had a 'fair' CMS score (55 – 69) and 3 had a 'poor' CMS score (< 55). "*

Comment 11

Page 9, lines 193-195: This is the only study with posterior instability cases which is different form anterior instability and you should remove this study.

Response 11

This has now been done. Thank you.

Comment 12

DISCUSSION You should compare your findings and compare your results with similar studies (in other sports contact and non-contact sports) to see if there are any differences.

Response 12

The discussion now reports comparison of recurrence rates for arthroscopic and open capsular repair in our study with other contact and collision sports.

Unfortunately there is a lack of existing literature that reports recurrence rates after Latarjet procedures in athletes so this was not included.

Relevant sections include:

"These results compare favorably to a cited recurrence rate of 11% in the general population [28] and 14.3% in young athletes [29] treated with arthroscopic stabilization repairs for acute anterior instability. Interestingly, Larraine et al found that that amongst the 121 patients who underwent arthroscopic stabilization for recurrent instability the results were slightly poorer as 10 (8.3%) players sustained a subsequent dislocation. Higher rates of dislocation are reported after arthroscopic surgery for patients with recurrent instability in other collision sports. Mazzoca et al reported on a case series of 13 collision athletes (American football) who underwent arthroscopic stabilization for recurrent anterior shoulder instability and 2 (15%) experienced a recurrent dislocation [11]."

AND

"With the exception of a single mini open procedure performed for a HAGL by Larrain et al., only

Bonnevialle et al. performed open capsular repair on their patients with anterior instability [22]. Their study reported that 19.4% of rugby players had a subsequent dislocation. This is more than twice the recurrence rate Larrain et al. presented in their cohort of rugby players treated with arthroscopic capsular repair and considerably higher than the results of an American study that reported a recurrence rate of 3% for open capsular repair in American football players with recurrent anterior instability."

Comment 13

Please report in the Abstract data like, mean Coleman score, rate of recurrence, time to return to rugby e.t.c

Response 13

The abstract now contains the following:

"The mean Coleman Methodological Score for the 5 studies was 47.4 (poor). Owing to heterogeneity amongst the studies, quantitative synthesis was not possible, however a detailed qualitative synthesis is reported. The overall recurrence rate of instability after surgery was 8.7, and the mean return to competitive play, where reported, was 13 months."

Comment 14:

Title should be modified to "surgical intervention for anterior shoulder instability."

Response 14

This has now been corrected.

Reviewer 2

This manuscript is a well organized and written. Although information is not quite new it well summarizes important data for a very specific patient population. This may attract readers' attention. It also gives very good information about the methodology that can inspire many researchers. This Reviewer has no specific comments.

Response to Reviewer 2

We thank the reviewer of their thoughtful comments.

With regards to the Editor-in-chief review, the following comments were made with reference to the authorship of this study :

'Author: the changes you made in the results section were not reflected in the abstract:" A total of 368 shoulders in 365 elite rugby union and rugby league players were included". This discrepancy is not acceptable. The authors need to carefully read and edit the manuscript before its submission.'

As this was the only comment made that related to the authorship, we felt it important to escalate to the editor in chief and science editor that our results are not a discrepancy and our manuscript is in fact correct. Neyton et al operated on 37 shoulders in 34 players (3 players had bilateral surgery). We have shown this in Table 2. The manuscript was carefully read and edited prior to resubmission.