Peer Review File

Reviewer A

Comment 1: This article proposes to review the evidence on preoperative planning in RSA. The plain radiographs, three-dimensional imaging techniques, the use of computer planning software, intraoperative navigation, and augmented reality are reviewed.

It is a complete review of the literature to bring what technique is more accurate and its value to improve the implant's position and result in better stability, durability, and clinical result. However, the paper cites the literature articles, and they are different in numbers or statistically and not comparable.

Reply 1: We appreciate your feedback. Regarding the final statement, it is important to clarify that this narrative review does not aim to conduct statistical comparisons or pooling of study results. Instead, its purpose is to provide a comprehensive summary and descriptive analysis of the current evidence on the topic. Consequently, it is expected to encounter studies with varying sample sizes or ones that may not be directly comparable. Recognizing the inherent heterogeneity across the included studies, we refrained from conducting meta-analyses or statistical comparisons of their results.

Modified text: *No changes in text.*

Comment 2: The title tells the readers that the article is a comparative study, but it is just a literature review.

Reply 2: We acknowledge the reviewer's perspective on this matter. The selection of the title was based on the suggestion provided by the guest editor of this series in the invitation letter. Taking the reviewer's comment into consideration, we propose an alternative title for this review article that avoids implying any comparisons between preoperative planning methods or suggesting a comparative study. Examples of such titles could be *"A Comprehensive Review of Preoperative Planning Strategies in Reverse Shoulder Arthroplasty: From Traditional Radiographs to Cutting-Edge Technologies"* or *"Advancements in Preoperative Planning for Reverse Shoulder Arthroplasty: From Radiographs to Augmented Reality."* However, we defer the final decision regarding the title to the guest editor.

Modified text: *No changes in text.*

Reviewer B

Comment 1: The manuscript is not blinded, it should be always blinded in order to avoid eventually conflict of interests

Reply 1: We appreciate the reviewer's observation. In our submission, the manuscript was not blinded as it was not specified in the author guidelines.

Modified text: *No changes in text.*

Comment 2: Line 27-29: The stality is also ensured by the conjoin Tendons and muscle (a.e. Delta) tension.

Reply 2: While we concur with the significance of deltoid muscle tension in ensuring stability for Reverse Shoulder Arthroplasty (RSA), it is important to clarify that this particular statement specifically addresses the relationship between **component positioning and the intrinsic**

stability of RSA. It does not pertain to the dynamic stability provided by the surrounding shoulder muscles.
Modified text: *No changes in text.*

Comment 3: Line 32. You mentioned complications of implant positioning and RSA configuration, please specify them.
Reply 3: Complications were specified and added to the text
Modified text: *Lines 48-50:* Other factors related with implant positioning and RSA configuration that may influence outcomes and complications, such as scapular notching, neurological injuries, or acromial fractures, are the amount of lateralization and distalization achieved postoperatively (18,19).

Comment 4: Line 33-34: I refer to the Paper of Boutsiadis et al. 2018 concerning the lateralization and distalization.
Reply 4: We do not understand what the reviewer is asking in this comment. I guess is about the previous query, but not sure.
Modified text: *No changes in text*

Comment 5: The Introduction is not clear enough, there is no correlation with the Study aim.
Reply 5: We respectfully differ from the reviewer's perspective. The introduction is adequately structured, beginning with an overview of the growing utilization of Reverse Shoulder Arthroplasty (RSA). It subsequently introduces the problem tackled in the review, emphasizing the significance of precise component positioning in RSA and the challenges surgeons face in achieving consistent implantation. Ultimately, the introduction transitions to the role of preoperative planning as a valuable tool in addressing this concern presenting the purpose of the review.
Modified text: *No changes in text*

Comment 6: The Study aim is also not specific in detail, please specify/change/complement it.
Reply 6: Although the purpose of the review is clearly stated at the end of the introduction, we will explicitly state this statement as the aim of the review to avoid further confusions.
Modified text: *Lines 62-65:* The aim of this review is to review and describe the current evidence on preoperative planning in RSA from plain radiographs, three-dimensional imaging techniques and the use of computer planning software, to the most recent technological advancements such as intraoperative navigation and augmented reality.

Comment 7: Line 298-299: Neck-shaft angle is referring to: Implant design or alpha angle? please specify it.
Reply 7: This statement is situated within a paragraph discussing humeral head osteotomy. Here, the "neck-shaft angle" specifically pertains to the angle formed between the long axis of the humerus and the normal of the osteotomy plane. It should be clarified that this angle is unrelated to implant design or the alpha angle.
Modified text: *Lines 317-318:* Neck-shaft angle (i.e. angle between the angle of the long axis of the humerus and the normal of the osteotomy plane), however, had significantly less deviation from the preoperative plan when conducted with navigation.

Comment 8: Line 319: I think in the glenoid component positioning is also a certain learn curve from the surgeon, this do not have to be underestimated
Reply 8: We fully concur with the significance of surgeon experience in achieving precise glenoid component positioning through traditional methods. However, in the context of this paragraph's conclusion on the utilization of technologies such as PSI, navigation, and navigated AR, it should be noted that the learning curve for surgeons in adopting these technologies is relatively short, and its direct correlation with the final implant position has not been definitively established.
Modified text: *No changes in text*

Comment 9: Line 323-329: there is contradictory statement between the lines. please check it.
Reply 9: We apologize for any confusion caused. We would appreciate it if the reviewer could provide further clarification regarding the specific aspect of the statement that is perceived as contradictory. This would enable us to address the concern more effectively by either engaging in a constructive argument or making appropriate modifications based on the feedback received.
Modified text: *No changes in text*

Comment 10: Line 329- 333: I think there is also a question of implant design, patient goals, injury and/or bony defects.
Reply 10: Certainly. It is worth noting that the establishment of optimal planning parameters, considering the factors mentioned above, remains an area of uncertainty. As a result, there exists variability among surgeons in terms of glenoid baseplate positioning during 3D planning.
Modified text: *No changes in text*

Reviewer C
Comment 1: Good work, but it needs to get deep in the topic, especially in some paragraphs, to be considered fair for publication.
Reply 1: Thank you for your feedback. We appreciate your acknowledgment of the overall quality of the work, and we will make the necessary revisions to ensure a more comprehensive and informative discussion.
Modified text: *No changes in text*

Comment 2: Line 28 What do you mean with "" intrinsic stability of a RSA implant depends essentially on humeral version"?
Reply 2: This statement is founded on a biomechanical study that examined the resistance to anterior dislocation of RSA implants, considering different positions of the glenoid and humeral components. Intrinsic stability, in this context, pertains to the stability of the implants independent of soft tissues or other patient-related factors. Some lines were modified and added to better clarify this.
Modified text: *Lines 38-45:* The relationship between component positioning and stability of the RSA has been also demonstrated. In a biomechanical study, Favre et al examined the resistance to anterior dislocation of RSA implants with varying degrees of version of the humerus and glenoid components (12). The findings of this study indicated that the version of the humeral component version is the crucial factor for intrinsic stability (i.e., stability of the implants regardless of soft tissues or other patient-related factors). However, it should be noted that the

version of the glenoid component might also play a role, particularly when retroversion exceeds 10 degrees.

Comment 3: Line 184- 198: several studies have measured the differences between software. It would be better to show these measurements trying to find out an applicative point of view to help the reader in his surgical practice. This paragraph is correct but should go deep inside the topic.
Reply 3: The points raised by the reviewer have already been addressed in the manuscript. Specifically, Table 2 highlights the observed variations among different software programs, and lines 191 to 204 provide detailed explanations regarding the potential reasons behind these differences.
Modified text: *No changes in text*

Comment 4: Line 245: you must cite all systems, even blueprint has a PSI tech. Smart space is not a true PSI system, it uses Optical control so it's more like computer assisted technique.
Reply 4: The content requested by the reviewer is already present in the manuscript. In Table 1, we have provided citations for all the systems, and under the "Main features" column of this table, it is clearly specified which systems possess PSI technology, including Blueprint. This line is specifically referring to the systems that offer PSI guides for the humerus osteotomy and that is the reason why only the Medacta and Lima systems are cited. We acknowledge that Smart Space is not a PSI system, and our intention was not to portray it as such. Rather, the mention of Smart Space in that line referred to the fact that the manufacturer, Lima prosthesis, offers single-use PSI systems for the humeral osteotomy. We hope this clarifies any confusion.
Modified text: *No changes in text*

Comment 5: Line 270 try to compare also PSI and GPS
Reply 5: No direct comparative studies between these two methods were found, and as we did not conduct meta-analytical techniques to pool the studies, a direct comparison cannot be made. However, in Table 3, we have presented the differences found in different studies between these technologies and the implanted components, enabling the reader to draw some comparisons between them.
Modified text: *No changes in text*

Comment 6: Line 274 spinogleoid correct typo
Reply 6: Thank you. Typo has been corrected.
Modified text: *Lines 292-293:* Kwak et al demonstrated that when using PSI there was a significant decrease in the proportion of screws involving the spinoglenoid notch (56).

Comment 7: Table 3: You can cite :
Giorgini A. Computer-assisted surgery in Reverse shoulder arthroplasty: Early experience
Reply 7: Thank you for the suggestion; however, we believe the suggested paper cannot be included in Table 3. The reason is that it did not involve a comparison of preoperative planning with postoperative CT scans, making it impossible to determine the deviation between the planned glenoid position and the actual postoperative outcome, which was a consistent criterion in all the studies included in Table 3.
Modified text: *No changes in text*