To the editor and the reviewers,

We have read your comments about our article titled '**Radiological Evaluation of Patellofemoral Instability and Possible Causes of Assessment Errors**' (Manuscript NO.: 62650, Review).

First of all, we would like to thank you for your careful and guiding evaluation. There are not many publications in the literature examining the parameters used in radiology in PI evaluation and compiling the possible causes of error, so we think that this article will be of particular interest to radiologists and orthopedists.

We have uploaded the corrected final version (clear version) of the manuscript to the system.

Below you will find your comments and our responses to them, point by point:

Reviewer #1:

General Comments: Overall, this is some interesting paper that has value. It provides further interesting data in a very evolving topic. The strengths of the review are the in-depth analysis of each of the radiological measurements and the possible causes of assessment errors. I consider that some revisions are needed. Manuscript is not friendly for reviewers since line numbers are missing.

Title: appropriate

Abstract: The abstract is of appropriate length and summarizes the study well.

Keywords: appropriate

Introduction: appropriate

Comment 1:

"Anatomy": I believe that basic descriptions of anatomy are not necessary. There is a discrepancy between this and the rest of the review, where there is a very thorough and more advanced analysis of radiographic landmarks.

Answer 1:

The anatomy section has been significantly shortened. It was left in a few sentences only as an introduction to the subject.

Comment 2:

"Soft tissues": Last paragraph: "The lateral retinaculum acts as a secondary stabilizer against the lateral translation of the patella.": Should read medial translation.

Answer 2:

Sorry, you are right, correction made.

Comment 3:

"The imaging algorithm of PI": "The bones and soft tissues that make up the patellofemoral joint can be evaluated with radiography, CT, and MRI.": This sentence is repeated several times.

Answer 3:

Similar statement has been removed.

Comment 4:

“Patellar height evaluation”: This section is extremely long and with excessive information, which makes it difficult to keep the reader's attention. I would consider summarizing and being more compact.

Answer 4:

The significant shortening have been made in this section.

Comment 5:

“Trochlear dysplasia”: Q angle is related to the alignment of structures and not to trochlear dysplasia. Consider moving Q angle description to “other parameters” section. “Other parameters used in the evaluation of patients with PI”: consider analyzing Coronal Alignment, Femoral anteversion and Tibial torsion in this section.

Answer 5:

A new section called 'Evaluation of coronal alignment, femoral anteversion and tibial torsion' has been opened. The part about Q angle has been transferred here.

Summary: appropriate

References: appropriate and updated, almost 20 references from the last 5 years

Figures: sufficient and appropriately illustrative of the paper contents

Table: very useful

Reviewer #2:

I would like to congratulate the authors for conducting this comprehensive review. In order to improve the quality of this review, I have some recommendations:

Comment 1:

In the anatomy section, the authors stated: According to the morphology of these facets and the localization of the median ridge, Wiberg has defined four types. What are those types?

Answer 1:

Wiberg's original definition and later described by Baumgartl type 4 patella were considered when referring to the patella shape. However, there was some confusion during the writing process. Upon your warning, Wiberg's original description was left as:

According to the length of its facets and the localization of the median prominence, Wiberg defined the normal patella morphology as three types.

Comment 2:

There are some problems with the citations and references; some of them are not accurate. The whole references and citations need to be checked. For example, Reference 4 evaluates patella morphology and not a comparative study.

Answer 2:

All references have been rechecked.

Comment 3:

Please put the reference immediately after et al. For example, Yue et al., Nizic et al., and Gracitelli et al. found that IS has etc.[42,49,51] should be Yue et al. (N), Nizic et al. (N), and Gracitelli et al. (N) ad so on.

Answer 3:

References have been designed as you said.

Comment 4:

In the references list, the authors used (REFERANSLAR) instead of References! The whole manuscript needs to be rechecked for proper English language and grammar.

Answer 4:

Spelling error corrected.

After making those corrections and revisions, I think this manuscript will interesting for readers.

Reviewer #3:

In this literature review, Ormeci et al discuss the techniques used to evaluate patellofemoral instability. Overall, the authors have presented the content in a logical manner and have included the appropriate figures to illustrate the review well. There are some points within the text that requires clarification, and there are some minor concerns relating to the consistency and accuracy of references and content that should be addressed.

Comment 1:

The text would be significantly improved by a section discussing causes of PI, and how radiological assessment are catered for different causes.

Answer 1:

Upon your suggestion, an addition was made to the introduction part about PI reasons and references:

'Many factors can cause instability of the patellofemoral joint. Problems in the bony structure of the patella and trochlea (e.g. patella alta, increased distance of the tibial tubercle-trochlear groove (TT-TG), rotational limb malalignment, trochlear dysplasia), deficiency in static soft-tissue constraints (e.g. medial capsular restrictions, medial patellofemoral ligament (MPFL)) or insufficiency of dynamic constraints (eg, vastus medialis obliquus (VMO)) can lead to PI.'

[Colvin AC, West RV. Patellar instability. J Bone Joint Surg Am 2008;90(12):2751–62.]

[Bollier M, Fulkerson JP. The role of trochlear dysplasia in patellofemoral instability. J Am Acad Orthop Surg. 2011 Jan;19(1):8-16. doi: 10.5435/00124635-201101000-00002. PMID: 21205763.]

These factors are also discussed in the later 'Radiological evaluation of the patellofemoral joint' and 'Assessments and Measurements' sections, as to how the measurements were made and possible errors.

Comment 2:

Abstract: Sentence on line two beginning with 'In radiological evaluation,….' Needs to be modified. I believe the authors meant to write 'In order to identify the presence of patellofemoral instability…, ' Re the sentence commencing on line four, where authors state In this study, we mainly examine….. and use other assessment methods that allow the patellofemoral joint to be evaluated qualitatively and quantitatively.' This needs to modified as it is inappropriate for a literature review given that the authors did not 'use' the assessment methods.

Answer 2:

The relevant expression has been changed to 'In order to identify the presence of patellofemoral instability' upon your suggestion.

Your other suggestion has also been changed to:

'In this study, we mainly examine four main instability factors (trochlear dysplasia, patella alta, tibial tuberosity-trochlear groove (TT-TG) distance and patellar tilt). We also briefly review some of the other assessment methods used in the quantitative and qualitative assessment of the patellofemoral joint such as the patellar size and shape, lateral trochlear inclination, trochlear depth, trochlear angle, and sulcus angle used in cases of patellofemoral instability. In addition to all these, we reviewed the evaluation of coronal alignment, femoral anteversion and tibial torsion.

Comment 3:

Introduction: Under subsection 'Bones' in the sentence commencing 'According to the morphology of these facets and the localisation of the median ridge, wiberg has defined four types.'. It is unclear what the authors are referring to. Four types of

what? Furthermore, Wiberg, cited as reference number 3 described three types of patella in luxation with the femoral condyles. Type IV Wiberg was described by Baumgartl (reference below) twenty years after Wiberg's original article. Baumgartl F. Anatomische und klinische Bedeutung des Femoropatellargelenkes. Zentralbl Chir. 1966;91:505.

Answer 3:

You are right, there is an error here. Wiberg's original definition and later described by Baumgartl type 4 patella were considered when referring to the patella shape. However, there was some confusion during the writing process. Upon your warning, Wiberg's original description was left.

Wiberg makes the typing in his original article as follows:

'On the basis of its form the patella could be classified into three normal types. In the first, the ridge separating the medial and lateral facets was situated approximately in the middle of the patella, so that the facets were about equal in size. In the second, the ridge was shifted slightly medial, so that the lateral facet occupied a larger proportion of the articular surface of the patella, while in the third, the medial patellar facet with very small.'

We corrected the expression in our article and changed it to be more understandable as follows:

'According to the length of its facets and the localization of the median prominence, Wiberg defined the normal patella morphology as three types.'

Comment 4:

Citation number 4 is inappropriate, as there is simply no comparative description of the thickness of patella cartilage relatively to other parts of the body, this is a study that evaluated patella morphology instead. I advise that all references and citations are checked for accuracy.

Answer 4:

This statement is in the source number 13 in our article, we apologize for the inaccuracy in the bibliography. The reference number has been corrected. Below is the source number 13 from which the information was obtained:

'Hungerford DS, Barry M. Biomechanics of the patellofemoral joint. Clinical Orthopaedics and Related Research. 1979 Oct(144):9-15. PMID: 535256'

However, at the request of other reviewers, the anatomy section was shortened. This information was removed as it did not directly affect the article.

It has also been reviewed in other references and citations.

Comment 5:

Under subsection 'soft tissues', the first and second sentences do not follow. It should state somewhere that the four muscles form the quads and that the quad tendon is part of the extensor mechanism. I advise checking sentences throughout to ensure that the content flows logically. Likewise, in same paragraph, it is stated that extensor mechanism disorders can be observed in nervous system pathologies. I believe the authors mean to state instead that some nerve disorders can affect the innervation of the extensor mechanism**.**

Answer 5:

This section has been shortened and edited.

The part about 'Nerve disorders' has been omitted from the article in order to ensure the integrity of the topic and to make shortening.

Comment 6:

Description and definition of TT-TG distance should be moved to an earlier section. Sentence commencing 'the deepest points of the TG and TT are taken as bases.' Should be changed to deepest point of the TG and most prominent part of the TT'. There should be a in the text to discuss the common causes of instability. These, and how they affect PF stability, and how they should be assessed should then be discussed in a separately heading of the review Under assessments and measurements,

Answer 6:

Upon your suggestion, adjustments were made regarding the TT-TG distance. The definition of TT-TG was previously made under the subtitle 'The imaging algorithm of PI' under the heading 'Radiological evaluation of the patellofemoral joint':

'The TT-TG measurement is essentially the distance between the deepest points of the TG and the most prominent part of the TT in the horizontal plane.'

Later, this issue was discussed in detail in the relevant section.

Comment 7:

the section titled: ‘Trochlear Dysplasia’ does not belong as it is not a form of assessment nor a form of measurement.

Answer 7:

Title changed to '*Evaluation of trochlear dysplasia*' and edited in other titles to fit.

Under the heading Assessments and Measurements, first, major instability factors were evaluated, then some minor displacements were made to explain other factors (for example, 'Evaluation of patella size and shape' was transferred after them).

Re-reviewer

Comment:

Thank you for addressing the comments thoroughly, I recommend publication without need for further changes.

Answer:

Thanks for your comments.

With these changes, we think that the writing is more fluent. Thank you very much for your efforts.

Sincerely,