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Dear Editor,



Please find enclosed the edited manuscript in Word format (file name: 8525-review.doc).

Title: Imaging of the Temporomandibular joint: An update

Author: Asim K Bag, ²Santhosh Gaddikeri, ¹Aparna Singhal, ¹Simms Hardin, ¹Benson D Tran, ¹Josue A Medina, ¹Joel K Curé

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The manuscript has been improved according to the suggestions of reviewers:

1 Format has been updated.

2 Revision has been made according to the suggestions of the reviewer

(a) Response to comments made by Reviewer 00742372

Comments: “The authors have focused on clinical details of the of various TMJ pathologies. They should rather focus on different appearances of various TMJ pathologies on imaging and how to differentiate one condition from other. The manuscript should be rewritten with focus on imaging.”

Response: *The article is rewritten with emphasis on imaging of the normal and diseased TMJ as suggested by the reviewers.*

(b) Response to comments made by Reviewer 00742031

Comments: This is a very detailed, descriptive and informative review, which can be used by many clinicians as a TMJ imaging guide. The intention and the content of the review are very pertinent, except for the length of the manuscript presented, which is extensively big. Authors could review the text to be more concise. The text is full of interesting and different images, illustrating many of the TMJ conditions discussed within the text, although some of them need some improvements. Herein are my doubts and suggestions.

Response: *Based on the reviewer’s comments, the article is rewritten with exclusion of many paragraphs not pertinent to the imaging of the TMJ. Most of the content is now concise and relevant to imaging. All of the reviewer’s suggestions are implemented in the revision.*

a. Additional comments:

i. Abstract:

1. Please describe the abbreviations before using them.

Response: *Noted and implemented.*

2. 1st sentence: “common pathologies” – your paper is very long and detailed, therefore you

have not discussed the most common pathologies but also some problems not so common. Thus, change for “some common and uncommon pathologies”.

Response: Noted and implemented.

3. At the last phrase, change the word “elaborated” to “discussed” and use the term “internal disarrangements”, in plural, because there are various possible disarrangements.

Response: Noted and implemented.

4. Also change “that is” for “that are”, and put a comma before the word “that”

Response: Noted and implemented.

Text:

1. Overall, before using the abbreviated terms, please present their complete form at their first appearance in text (MRI, CT, etc...). Please also check the entire grammar of the manuscript, because many errors can be observed.

Response: Noted and implemented. All the authors heavily review the revision and all possible grammatical changes have been taken care of.

2. Pag 3, Introduction, last but one line: put a comma before the word “specifically”.

Response: This sentence is rewritten.

3. Pag 4, 2nd and 3th paragraphs: you refer to “joint effusions”. Why looking for joint effusions are necessary? What does their presence means? You will only talk about them in detail in pag 23, but at this moment I believe that it is necessary some words to define this important feature, something like “They also do not give useful information concerning joint effusions, which are commonly associated with pain and disc displacements 59”.

Response: Noted and implemented. This section (Imaging techniques) now is described after the “normal anatomy” section as suggested by the reviewer.

4. Thinking about my previous question, maybe, changing the sequence of the text would be better. I think that showing the anatomy of the TMJ and its normal function would come first. Then, you should present the techniques of imaging of TMD, and lastly the features observed in the images regarding the problems. I believe that showing the structures first would help the reader in understanding why some images are, sometimes, essential.

Response: See above.

5. Pag 5 line 3: The phrase “MRI should be considered part of the standard evaluation of the TMJ” seems strange, because the primary evaluation of the TMJ should be essentially clinical, based on the history taking and on the evaluation of patient’s signs and symptoms. As you commented in this paragraph, the “overlap between internal derangement and other possible etiologies such as myofacial pain dysfunction” makes the clinical assessment of the muscles and TMJ by palpation and other diagnostic tests essential. Images, in my opinion, are not “part of the standard evaluation of the TMJ”, but they should be a complementary approach, requested in cases that they would be essential for a differential diagnosis. The image would help the clinician’s decision whether changing or

not the management of the condition, i.e. in specific situations, not in all situations. This needs to be better addressed in the text.

Response: This is addressed appropriately.

6. Pag 6, last paragraph: “The cranial compartment consists is located...”, the word “consists” is not fitting the text well.

Response: Noted and addressed appropriately.

7. Pag 7, line 3: “In most individual” may be “In the majority of individuals”?

Response: Noted and changed.

8. Pag 7, line 7: “...separates the articular surface form the nonarticular surface...”, may be “from the”.

Response: Noted and changed.

9. Pag 7, last sentence: I believe it is better to use periods to separate the lyrics “a.k.a.”.

Response: Noted and changed.

10. Pag 8, 9, 10 and 11: in my opinion, the parts “articular capsule”, “ligaments”, “Jaw-closing muscles/Adductors” and “Jaw-opening muscles/Abductors” are unnecessary, because, although they comprise a review on the anatomy, this is not the aim of the review and they are not necessary to the understanding of the images. I would suggest you to keep only the section “muscles” because it contains some information regarding their contribution to mandibular movements, and in my opinion this is sufficient.

Response: Noted and addressed.

11. Pag 11, line 15: “the thinnest portion of the meniscus” may be between dashes or between commas (?).

Response: This sentence is rewritten addressing the concern.

12. Pag 11, line 18: “The meniscus is...”: I think it is better to refer to “the disk” not to “meniscus”, to keep a pattern in text.

Response: Noted and addressed.

13. Pag. 12, line 17: “band of the meniscus”, the same.

Response: Noted and addressed.

14. Pag 13, 2nd paragraph: see comments on Figure 2.

Response: Noted and addressed.

15. Pag 13, 3th paragraph, line 2: “thecondylar” should be “the condylar”.

Response: Noted and addressed.

16. Pag 14, 3rd and 4th lines from the end: Does “EAC” mean external auditory canal? Please describe in the text before using the abbreviation.

Response: Noted and addressed.

17. Pag 15, 1st paragraph: “There can also be several variations.... other developmental abnormalities”: in my opinion, this whole paragraph is a complement of the description given at the 1st line of pag 14, therefore it can be allocated just after it. Therefore, as you are presenting some abnormalities and some diseases as consequence of their presence, I believe that the title of the section is not adequate as “normal anatomic variations” because I understand as “normal variations” only those which are not able to cause a problem.

Response: Noted and addressed.

17. Pags. 17, 18 and 19: the congenital syndromes presented are extremely rare conditions. It was only possible to show 1 image from them. Why don't you cite them, keeping the 1st and 2nd paragraphs of pag. 17, and discuss general features, and finally illustrate with the case presented in figure 8? There are too much details, I think they are not necessary.

Response: We agreed with the reviewer. The section of congenital anomalies is deleted.

18. Pag 20, 2nd paragraph: ADR and ADR wouldn't be better described as “anterior (disk) displacement with (no) reduction”?

Response: Noted and changed.

19. Pag 20, last line: “...with timw” may be “with time”.

Response: Noted and changed.

20. Pag 21, 1st line: “de Leeuw et al”, insert a period after the “et al.”.

Response: Noted and changed.

21. Pag 21, 1st paragraph, 2nd line: “Unenhanced MRI is the imaging modality of choice for the detection of a cause for ID.” I would change the terms “...for the detection of a cause...” to “of choice for investigating the possible causes of ID, based on the presented image features”.

Response: Noted and changed.

22. From the 8th paragraph of pag 30 through the end, the information presented in text is not referenced. Please add references for these parts.

Response: Many references are added to address this concern.

23. Pag 26, last line: “polyarticlur”: polyarticular?

Response: Noted and changed.

24. Regarding the topic “TMJ arthritis”, from pags 26 to 31: this topic is very detailed, and in my opinion it could be more concise.

Response: Noted and addressed.

25. Pag 33, last paragraph, 2nd and 3rd lines: “osteo osteoma”: osteoid osteoma?; “nonossifying”: non-ossifying?; put an “and” between “non-ossifying fibroma” and “aneurismal bone cyst”.

Response: Noted and changed.

Figures and legends:

Overall: When citing Figures in the text, put them before the paragraph period, not after.

1. There are two images in Figure 1 (A and B), and I suggest you to put them side-by-side. The description is good but I found it difficult to see the lyrics in the image. I also suggest you to locate in the image what is anterior (A) and what is posterior (P), to help readers to understand the image.

Response: Noted and changed.

2. Again, there are two images (A and B) in figure 2. I suggest you to put them side-by-side. Please also check the legend of figure 2: the “bow-tie” fashion is clearly observed in figure 2A, but not on figure 2B. In my opinion, the quality of Figure 2B is not sufficiently good.

Response: Noted and changed.

3. In figure 5, put arrows showing the condyles' reabsorption.

Response: Noted and changed.

4. In figure 8, I've missed some narrow and asterisks to show the main observed features.

Response: Noted and addressed.

5. In figure 10, I believe that if you show similar images as those presented in Figure 9 for ADR, but presenting a ADNR case in both opening and closing positions, would be more illustrative of the condition.

Response: Noted and changed.

6. In the legend of figure 16, on 2nd line, it would be “joint cavities” instead of “join cavities”.

Response: Noted and changed.

7. Figure 21 is not cited in the text. Moreover, I suggest you to put an arrow to show the synovial condromatosis.

Response: Noted and arrow added.

(c) Response to comments made by Reviewer 00503683

- a. 1- Too broad...concentrate to TMJ pathologies centered in the manuscript images...the rest is beyond the scope of this work (biomechanics and morphophysiology).

Response: We agree with the reviewer's comment. We have deleted a large portion of the manuscript as suggested by the reviewer. The section of the congenital diseases is completely removed. Biomechanics section is retained as we think understanding of the biomechanics of the joint movements is one of the key concepts to understand the imaging appearances of the TMJ internal derangements for which the joint is most commonly imaged. We also think that morphophysiology of the muscles related to the TMJ is an important concept required for correct image interpretation. We have deleted morphophysiology of the articular capsule and ligaments associated with the TMJ as suggested by the reviewer.

- b. 2- Try to organize presentation according to some TMJ disorders classification...i.e, functional, structural, inflammatory, developmental, tumoral...etc.

Response: Noted and implemented.

- c. 3- Avoid muscular anatomy explanation and stomatognathic open-close jaw dynamics with physiologic details...too light and mistakable.

Response: Muscles related to TMJ are routinely seen on MR images. Additionally, MRI of the TMJ is inherently anatomic and functional. Imaging sequences are repeated both in open-mouth and closed-mouth position to document the functionality of the joint. We think it is essential to have a discussion on the muscles controlling movements of the TMJ as well as dynamics of the TMJ movements for better understanding of the MRI of normal and abnormal TMJ.

- d. 4- Fix the Arthrography paragraph as this: Arthrography is another imaging modality rarely used today because MRI can be used to evaluate the TMJ without being invasive, exposing the patient to a possibility of allergic reaction from the contrast, possibility of infection, or using radiation that can be used to evaluate the TMJ. Before MRI imaging was available, this was the first way to perform a dynamic study of the TMJ. This imaging modality required one to inject radiopaque contrast into the TMJ with fluoroscopic guidance. Once the contrast was in the joint, adhesions, disk dysfunction, as well as disk perforation would be looked based on how contrast flows in the joint.

Response: Noted and implemented.

- e. 5- TMJ and ear structures are more than the Huschke external ear channel, i.e., Huggier channel (iter chorda anterior), with two more TMJ unnamed ligaments mistaken as fatty tissue...showed in some MRI sagittal deep images (i.e., orange arrowhead of figure 2...and figure 16) but there is nothing related to conceptually middle ear-TMJ common structures. Try this: Ramirez LM. "Up to Date on Tinnitus", In: Somatic tinnitus and Stomatognathic links. ISBN: 978-953-307-655-3. InTech - Open Access Publisher.

Response: This article is already too long and addition of the anatomy sharing TMJ and middle ear cavity is outside the scope of this article. We do appreciate reviewer's concern and recommendation.

- f. 6- Images' technical matters as proton density weighted characterization (signal intensity and contrast) are present in the text but each sagittal image (additional to the orientation) must detail the level in each slice taken (lateral, middle or internal).

Response: Noted and implemented.

- g. 7- Text and references corrections must be edited.

Response: References are corrected according to the journal format. The authors have heavily reviewed the text. Many areas are rewritten for to deliver the content more precisely and more appropriate way.

3 References and typesetting were corrected

Thank you again for publishing our manuscript in the *World Journal of Radiology*.

Sincerely yours,

Asim Kumar Bag

Asim K. Bag, | Assistant Professor
Section of Neuroradiology | The Department of Radiology
School of Medicine | The University of Alabama at Birmingham
JT N432 | 619 19th Street South | Birmingham, AL 35249-6830
O: 205.934.9952 | F: 205.975-9262 | abag@uabmc.edu