

Peer Review File

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Reviewer A:

This is a well written and extensive study of a surgical unit's experience with radiological reporting of mastoid opacification and subsequent clinical diagnosis of mastoiditis.

It is a somewhat obvious final conclusion of which all ENT surgeons would be well aware, but nonetheless presented in an extremely thorough and detailed way with convincing arguments.

One criticism would be the length of the paper with is very verbose and detailed and perhaps a little repetitive. There are several interesting paragraphs which are perhaps a little self-indulgent and not critical to the message of the paper, for example long explanations of the pathophysiology of mastoiditis in the discussion. Whilst it will be painful for the authors to trim such sections, it would read better and reduce the word count.

Reply: we agree that the paragraphs on pathophysiology of mastoiditis, middle ear pressure, and bony destruction and have removed them

Changes in text: We have removed Table 1, which was a summary of complications resulting from mastoiditis and removed Lines 406 (on pathophysiology of middle ear pressure and mastoid effusion) and Lines 419 (on pathophysiology of bony destruction in mastoiditis)

However, overall, I feel it is well presented and clearly rigorously and scientifically researched, for which I applaud the authors.

Some tiny minor points:

LINE 76-77 The sentence on line 76-77 does not read well. I would add the word "either" before "incipient" and the word "alternatively" before the word "coalescent".

Reply and changes in text: this suggested revision has been added on line 76-77 to improve readability

LINE 249 The sentence starts "Hundred". How many hundred?

Reply and changes in text: One hundred patients – this has been changed on line 249

The conclusion is appropriate and well made. Hopefully the message will filter through to radiologists and reduce the overuse of the term "mastoiditis" in their clinical reports and be replaced, as the authors suggest, with the term "mastoid opacification", the clinical significance of which can then be decided by the requesting physician.

Reviewer B:

The authors present a large retrospective series of images and the prevalence of radiographic vs clinical mastoid opacification. This is an important topic because ENT surgeons are frequently consulted about radiological findings which are often not in keeping with clinical findings. This is a well-known fact and does not need further elaboration. The aim of this study is to presumably increase awareness amongst non-ENT surgeons about this phenomenon.

Major issues:

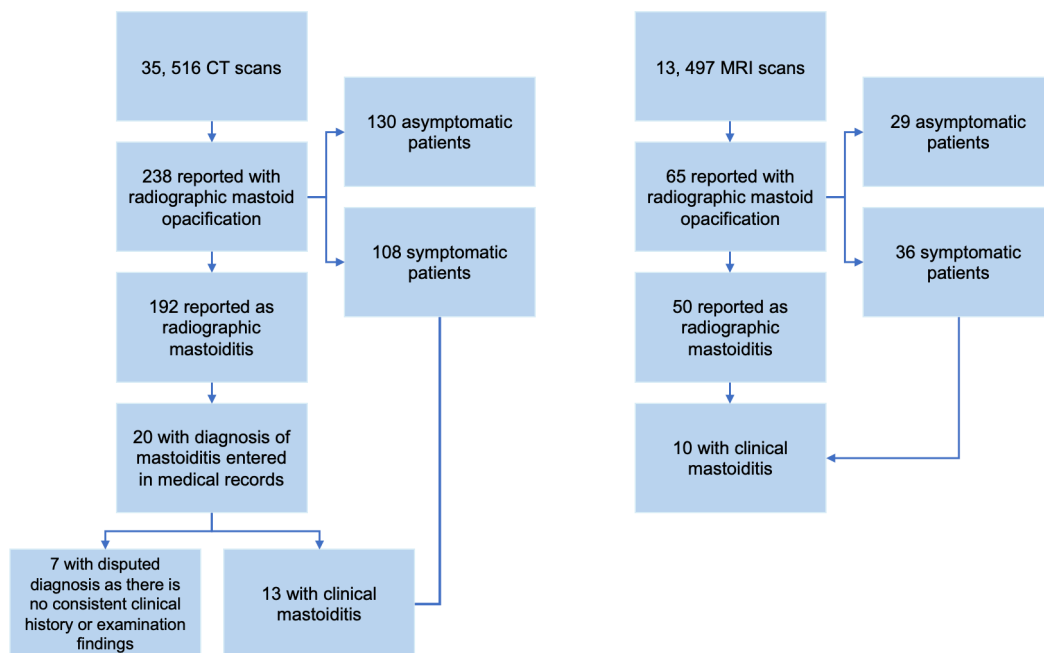
1. It is sometimes confusing during the text to follow the author's arguments and correlations between mastoiditis and the different aspects of this. It is recommended that the author specify very clearly the different types of mastoiditis and use this consistently throughout the text. For example, "clinical mastoiditis" and "radiological mastoiditis" should be specified to help the reader determine which type of mastoiditis is the author referring to. In addition, there authors have made a distinction between "medical record derived mastoiditis" and "retrospective reclassification of mastoiditis based upon medical record review". This should also be made clear. The flow chart in Figure 1 helps but this should be expanded to cover the above subtypes of "mastoiditis"

Reply: to reconcile this we have added definitions of radiographic mastoiditis and clinical mastoiditis in the methodology. We also stated that there were cases where mastoiditis was entered in the medical records by junior doctors without consistent clinical history or examination findings (7 cases in the CT cohort, 0 cases in the MRI cohort), and because the diagnosis was entered solely based on the imaging report and without ENT consultation, we dispute that these patients actually had mastoiditis.

We amended the flowchart as per the reviewer's suggestions to show this more clearly.

Changes in text: We define IMO, or incidental mastoid opacification, as RMO in the asymptomatic patient without otologic indication for the scan. We define RMO, or radiographic mastoid opacification, as mastoid opacification demonstrated on imaging. We define clinical mastoiditis as mastoiditis diagnosed in patients with

documented evidence of consistent clinical history and/or examination findings, where the diagnosis is not made solely based on the imaging report.



2. The authors have pointed out that 39 out of 238 patients on CT scans had bony erosion (table 5). Could the authors clarify how this number is consistent with what has been presented in the text in subsection 3.3?

Reply: 39 patients out of 238 in the CT group had bony erosion as stated in the table and in the text in subsection 3.2 “Analysis of CT and MRI cohort.” Of these 39 patients, 13 were diagnosed with mastoiditis, whilst alternative diagnoses were made in the other

The strong association between clinical diagnosis of mastoiditis and the presence of bony erosion is shown on the chi-squared test – this is because all patients with mastoiditis diagnosed by the ENT team had evidence of bony erosion on the scan. It was also a predictor for mastoiditis on multivariable regression analysis.

3. Subsection 4.4, second paragraph is confusing to read and needs to be rewritten. It is not entirely clear what point do the authors intend to make

Reply: We have clarified the first part of the paragraph and removed the section on how radiologist’s may choose to use different terminology or choose to report mastoid opacification in different ways, as this is not related to the study aim and can introduce confusion.

Changes in text: In their meta-analysis of studies on mastoid opacification, Mughal et al., showed that studies where the authors reviewed the scans reported a higher

prevalence compared to those that utilised the radiologist's report. Hence, it is possible that our data underestimates the true prevalence of radiographic mastoid opacification. Regardless, the data adequately addresses the study aim which is to address whether radiologist reporting of mastoiditis correlates with clinical mastoiditis or other otologic disease.

Minor issues:

1.Line 102 – suggest “radiographically on CT”

Reply and changes in text: the above suggestion has been included

2.Line 114 – suggest “Describing opacification of the mastoid cavity as mastoiditis can be hyperbolic and alarming for the non-otolaryngologist”

Reply and changes in text: the above suggestion has been included

3.Line 160 – suggest define IMO first in the text

Reply and Changes in text: We define IMO, or incidental mastoid opacification, as RMO in the asymptomatic patient without otologic indication for the scan. We define RMO, or radiographic mastoid opacification, as mastoid opacification demonstrated on imaging. We define clinical mastoiditis as mastoiditis diagnosed in patients with documented evidence of consistent clinical history and/or examination findings, where the diagnosis is not made solely based on the imaging report.

4.Line 169 – suggest “...an ENT review.”

Reply and changes in text: the above suggestion has been included

5.Line 177 – suggest “...data was expressed...”

Reply and changes in text: the above suggestion has been included

6.Line 200 – suggest “Of these, fifty...”

Reply and changes in text: the above suggestion has been included

7.Line 223 – who disputed the diagnosis and when?

Reply and changes in text: the diagnosis is disputed by the authors after retrospective chart review.

The diagnoses were made by junior doctors in the emergency department based on the imaging report without consistent clinical history or examination findings that suggested mastoiditis. Given the patients were discharged without ENT review or input, we do not believe the patients had clinical mastoiditis.

8.Line 233 – What does this sentence mean? Please clarify

Reply: The sentence on Line 185 is saying that patients who had mastoid opacification on imaging but did not have otologic signs or symptoms rarely had a diagnosis of acute otology pathology. Similarly, the preceding sentence (Line 183-185) means that patients with otologic signs and symptoms were much more likely to have clinical mastoiditis compared to asymptomatic patients on chi-squared test.

Changes in text: we have changed the sentence from “IMO...” to “mastoid opacification in asymptomatic patients rarely correlated with acute otologic disease.”

9.Line 249 – How many “hundred”?

Reply and changes in text: One hundred

10.Line 338 – suggest “...no cases...”

Reply and changes in text: the above suggestion has been included

11.Line 466 – suggest “In addition, MRI...”

Reply and changes in text: the above suggestion has been included

12.Line 387 – please reference

Reply and changes in text: added reference

13.Line 491 – please clarify “more”

Reply and changes in text (Line 491-496): the sentence has been changed to : In their meta-analysis of studies on mastoid opacification, Mughal et al., showed that studies where the authors reviewed the scans reported a higher prevalence compared to those that only read the radiologist’s report.”

14.Line 527 – suggest “Mastoid opacification can be found...”

Reply and changes in text: the above suggestion has been included

15.Line 529 – suggest “which in our experience is over-reported...”

Reply and changes in text: the above suggestion has been included

16.Line 529 – suggest “correlation” instead of “relation”

Reply and changes in text: the above suggestion has been included

17.Line 531 – suggest “...suggesting that the latter...”

Reply and changes in text: “...weak **correlation** between clinical and radiologic mastoiditis was seen in symptomatic patients on MRI, suggesting **that** it is useful as a second-line modality