Author's response to reviews

Title: Method for the location of primary wear scars from retrieved metal on metal hip replacements

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Version: 4 Date: 2 April 2015

Author's response to reviews: see over
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Version: 3 Date: 2 April 2015

Author's response to reviews: see over
Reviewer’s report

Title: The in vivo location of a primary wear scar in metal-on-metal hip replacements: a novel technique

Version: 3 Date: 15 December 2014
Reviewer: Julia Shelton

Reviewer’s report:

The paper addresses an important issue, namely that related to identifying the location of wear on metal on metal components. The paper is clearly written.

The methods that have been used are clear and indicate that the techniques proposed can be used if there is sufficient information provided, namely a CT scan and components that have sufficient rotational distinguishing features.

The figures appear to be genuine although I am not sure of the value of having both Figures 2 and 5. They both show the same data but Figure 5 is much more interesting as it relates the centre of the wear path to the anatomical position.

The discussion and conclusions are well balanced and adequately supported by the data as this is a relatively straightforward study with few limitations of the work.

The authors clearly reference appropriate sources.

I believe that the title claiming this to be a novel technique might be changed to ‘Method for the location of primary wear scars from retrieved metal on metal hip replacements’

The title has been changed to ‘Method for the location of primary wear scars from retrieved metal on metal hip replacements’

The abstract might be better to redescribe the novel technique as a method. The conclusions in the abstract are a little strong from the paper as presented.

The novel technique has been redescribed as a method. The conclusions in the abstract have been changed to reflect that this study has described a method from existing techniques instead of a novel technique.

Major Compulsory Revisions

This is a methodology paper and not one that sets out to address the fundamental mechanisms. The description that the method described is a novel technique may be a little extreme – the methods used are applying established techniques to produce a method for this important application.

The wording has been changed so that it does not claim to be a novel technique but instead, it is described a new method that has used existing techniques.
Table 1 describes many features about the retrievals that are not necessary for this paper – they are never referred to, nor are they used to explain the difference in wear patch location. If this table were to be reduced then it would make this paper a technical note rather than a paper which is probably appropriate. I believe that this paper should be changed to make it a technical note.

Some of the columns in Table 1 have been removed - namely “Implant side” and “Reason for failure”. This paper will be submitted as a technical advance, on consultation of the Senior Editor.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests
Reviewer's report

Title: The in vivo location of a primary wear scar in metal-on-metal hip replacements: a novel technique

Version: 3
Date: 22 February 2015
Reviewer: José Lamo-Espinosa

Reviewer's report:
An interesting and novel technique is described. The value of the technique could be to develop the knowledge of orthopedic surgeon about behavior of the prosthesis implants used in daily practice.

It is a short, clear and correct text. The aim is achieved.

Major Compulsory Revisions:
The short mean period of implant failure (4 years) may be explained because a selection bias. Could you explain more? Affects the bias to the size of the primary wear scar?

The discussion has been updated to explore the short mean period of implant failure with the addition of the following paragraph: “The mean period of implant failure is just under 4 years for our patient sample. This short length of time between implantation and failure may be explained by a selection bias, as we did not include patients whose implants had not failed, even though the implant may have had a substantial wear scar. Hence, an interesting aspect that has been unexplored in this study is whether there is a correlation between the period of implant insertion and the magnitude of the wear scar, This was one limitation of the study and in future, a method may be devised that allows us to visualise the in vivo primary wear scar pre-failure.”

Minor Essential Revisions:
It would be interesting to explain in discussion the clinical value of the information obtained with the technique and why it is different as other systems published until today. Although it is cited in the conclusion, I think it would be convenient in the discussion.

The conclusion is left unchanged but the following paragraph has been added to the Discussion in order to explain the clinical value of the information obtained with the technique and why it is different as other systems published until today: “The clinical value of the information obtained from this method will be of interest to surgeons who can suggest a more accurate patient-based prediction of implant longevity pre-revision surgery. Furthermore, it will be of use in the context of explaining wear behaviour of hip implants because the effect and importance of many variables are currently unknown. This is because of the limited investigations
gathered out with respect to the qualitative properties of hip wear, such as primary wear scar location.”

In 8 of the 13 cases the authors did not report the reason because the implant was removed. The importance of the manuscript lies in the technique presented. I think the authors could simplify the table, removing that column if the reasons can not be identified. Similarly, the table can be simplified by eliminating the column defined as side. It does not provide a relevant information.

Table 1 has been simplified by removing the columns labelled “Implant Side” and “Reason for Failure”.

It could be interesting to add references about the "edge loading theory" cited in the discussion. The remaining references are current and appropriate to the text.

The appropriate reference has been added i.e. [6,7].

In summary it is an interesting study but it leaves us expectantly for further studies that explain the clinical value of the technique.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests