Reviewer's report

Title: Hip preserving surgery with concentrated autologous bone marrow aspirate transplantation for the treatment of asymptomatic osteonecrosis of the femoral head: retrospective review of clinical and radiological outcomes at 6 years postoperatively

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Reviewer: Lynne Jones

Reviewer's report:
This manuscript describes the authors' experiences with the use of concentrated autologous bone marrow aspirate transplantation for the treatment of asymptomatic osteonecrosis of the femoral head. They reported on the results of 31 hips in 31 patients with a mean follow-up of 5.8 years (range, 2 to 11.5 years). Their findings indicate that they have a 70% survival rate up to 5 years decreasing to approximately 50% at 6.7 years. These results are in agreement with others such as Hernigou and Gangji et al. As one would expect, the collapse rates are higher in the more extensive osteonecrotic lesions. The primary concern with this study is that there were no controls. While this would have possibly reduced the numbers that received CABMAT, this is a serious limitation of this study. This is especially true as they compared their survival analysis to only one other study and this other study did not perform a core in the same manner as the authors of this manuscript. The authors selected a reference that had particularly poor results for core decompression. Another concern is the use of the mean collapse rate. Delaying the need for a total joint procedure is considered a successful outcome by many surgeons. As indicated by the authors' own results, the rate of survival is influenced by the length of follow-up. For example, while a 50% survival rate may be good for findings at 10 years, it would be particularly poor at 1 or 2 years.

abstract, line 32 Please state the range of when the surgeries were performed for these specific patients.

abstract line 51 What does this mean? Did you only have follow-up on 26 patients?
They state that their patients are 'idiopathic' but later state that the patients had either corticosteroid or alcohol associations. This would not be considered idiopathic by the medical community. Some have references this as secondary osteonecrosis to distinguish this group from patients with ON from direct causes (trauma, sickle cell, for example).

Please provide a reference for the sentence on incidence.

Please add 'in most patients' to the end of the sentence describing conservative treatment.

The sentence on core decompression is very biased. I suggest adding 'longterm' outcome is unsatisfactory in a majority of patients.

For rotational osteotomy, again it may have a good result - not all patients have a good result.

This should be 'corticosteroid' to distinguish the type of steroid that was given. Please correct throughout the manuscript.

What is the mean & range of follow up for each of the types of ON. This is particularly important when trying to interpret the findings of the survival curves.

Please see comment above about idiopathic patients.

What were the reasons that the remaining 15 patients received corticosteroids?

Please state that this is the Student's t test. Was this for matched pairs?

Please provide information on the Survival Analysis. Also, what statistical package was used?
It should be clearly mentioned what the scales are: what is best and what is worst. Also, what is the maximum number of points for each subscore.

The first sentence of this paragraph is Materials and methods and should be deleted.

This paragraph needs to be expanded so that you understand that this comment is an overview. You need to state what new findings were found in this study. The paragraphs that follow are comments on the different categories of lesions. This needs to be stated in this first introductory paragraph.

Furthermore, like other surgical interventions for osteonecrosis, CABMAT was not 100% successful. Therefore, you should modify your sentence to say that it showed the potential to alter the natural course of the disease for some patients.

Figure 3 shows your results versus the natural history. Please clearly indicate that the collapse rate for Koo's study in this comparison was specifically to his control 'natural history' group. Furthermore, it would be of particular interest to show the different survival rates for each of the Types of osteonecrosis.

This collapse rate was for what time periods?

Please be clear that the Min study was for untreated femoral heads.

Are their results for over the same time periods as your study? A comparison to the results of the multiple drill hole core decompression technique - a procedure closer to what the authors have done - should be included in the discussion.


pg 11 line 29 The transition to mechanism should be distinguished by a subtitle.

pg 11 line 45 This sentence needs to be revised. The mechanism is the introduction of new stem/progenitor cells to an area with deficient or dead stem/progenitor cells (i.e. the necrotic lesion).

pg 12 line 41 You would need to state that it is less-invasive than what. It is more invasive than a core decompression as you are obtaining cells from the iliac crest. Also you are stating that it is less expensive but you have not mentioned this in the discussion and it was not the topic of this study.

Figure 2 Please label the y axis. Please explain in the legend that a higher score is better. We also need to know what the maximum points are for each subscore.
Figures 3 and 5 Please state what the error bars are in the legend. Standard deviation? Standard Error? 95% Confidence Limits?
Figure 5 There are no error bars for the last time period.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.
No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.
Yes
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?

If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**

Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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