Reviewer's report

Title: Characterization of bone repair in rat femur after treatment with calcium phosphate cement and autogenous bone graft

Version: 1 Date: 4 February 2010

Reviewer: Vivek Shetty

Reviewer's report:

The authors evaluate the use of a new alpha-TCP cement in non-critical sized rat femur defects at 3, 7, 14, 21, and 60 days and compare the healing to no graft and autogenous bone graft controls. It is a potentially interesting study, but many important concepts are not addressed.

The introduction does not state the current problems with available bone grafting materials, and why this study is important or how it fills gaps in our knowledge. What advantages does their alpha-TCP variant offer in terms of properties that other currently used materials do not? Also, the purpose or objective of the study is not clear.

In materials and methods section, it is not stated how many animals are included in the study, or how many animals per treatment group or time point were used. It is also very unclear why this defect location was chosen, or why the authors are using a non-critical sized defect model.

Results should include another type of quantitative analysis, like microCT or histomorphometry. Again, the fact that the animal number is not mentioned is a significant omission. Also, the comparisons should be at the same time point for each graft material- simply put, the comparisons with alpha-TCP vs. control vs. autograft should be presented at the same time point. It would also be interesting to compare beta-TCP with alpha-TCP to determine the differences and if there are any advantages of the new alpha-TCP.

The discussion section should compare these results to other osteoconductive materials. Again, explain why this defect was chosen in this location as well as the choice defect size. What about the age of the rats? Why was this age chosen? Are the authors concerned about eventual healing, early healing, completion of healing as in the total volume of the defect regenerated? This is not clear and is not compared to the current literature.

References are adequate, should be greater in number when these comparisons
and increased background material is included in the introduction and discussion sections. Figures are ok, but Figure 5b and 7a are out of focus.

Declaration of competing interests:

'I declare that I have no competing interests'
Uploaded on behalf of V. Shetty by G Smith EdOffice