Reviewer's report

Title: Micro-morphologic changes around biophysically-stimulated titanium implants in ovariectomized rats

Version: 1 Date: 11 January 2007

Reviewer: Britt Wildemann

Reviewer's report:

General

The project aims in the investigation of the effect of a pulsed electromagnetic field (PEMF) or low-magnitude high-frequency mechanical vibration (MV) on the implant integration. Metallic implants were implanted in the proximal tibial metaphyses of ovariectomized rats and the implant integration was analyzed by CT after two weeks.

The study addresses an important aspect in orthopaedic surgery and a new stimulation method for implant integration will be beneficial for the patient.

After reading the submitted manuscript, however, I have following concerns.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. OVX model
   It is not clear why ovarioectomized rats were used in this study. Implant integration can also be investigated in animals without an impaired bone metabolism. And if a model for osteoporosis should be used, it is necessary to demonstrate the effect of ovarioectomy in all animals and not randomly in 5 animals. In addition, the effect on bone density should also be shown; otherwise the model is not reliable.

2. Stimulation
   MV: for the effect of the mechanical vibration it is necessary, that the operated leg is in contact with the stimulation plate. Was it possible to guaranty a ground contact for the entire stimulation period?

   Control-group:
   The animals from the treatment groups were placed in special devices that might influence the normal behaviour/motion. Was this considered in the control group?

3. CT
   It would be very helpful if the authors could provide example CT images of the three VOIs and also examples of e.g. VOI 1 for the three different treatment groups.

4. Data
   The tables 1-4 should present the ANOVA analysis of the different parameter. The tables, however, present only descriptive statistics without giving any value for the significance. This must be overworked and the presentation needs improvement.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

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

Quality of written English: Needs some language corrections before being published

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