Reviewer’s report

Title: Histological evaluation of the efficiency of low-level laser therapy on bone regeneration in extraction sockets grafted with allograft material covered with resorbable collagen dressing

Version: 1 Date: 2 February 2015

Reviewer: Siddharth Shanbhag

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Major Compulsory Revisions

Methods:

1. What was the most common reason for tooth extraction? Especially since the inclusion criteria required all 5 socket walls to be intact. Also, include this point in the discussion since the results of the study only relate to 'ideal' sockets and not necessarily in sockets with 1 or more missing/damaged walls, which is very often the case.

2. Describe the device or method. How was the LLLT delivered?

3. Were there any 'drop-outs' i.e. did some patients who were initially included, have to be excluded following the extraction?

4. How was the randomisation performed?

5. It is very important to know how the biopsy times were determined. Authors state “If a site could be biopsied without compromising the long term success of the dental implant, the biopsy was carried out…” How was it determined whether a biopsy could or could not be performed i.e. how was 'healing' within the sockets assessed? (e.g. radiographically?)

6. Why was quantitative histomorphometry (e.g. % bone area, % new bone formation, % residual graft) not performed? Can 'significant' differences be appreciated based on qualitative histology and can it adequately provide the basis for making clinical recommendations?

7. Were histological observations performed in duplicate? Were the observers blinded to the treatment groups? Was it assessed using computerised methods?

Results:

8. Please provide an initial sentence regarding the general overall outcome i.e. did all 30 patients complete the study?, were there any complications? etc.

9. Were there any significant differences in terms of vascularity of the regenerated bone between the groups? Was there any expected effect of LLLT
on angiogenesis?

10. “No evidence of malignancy was observed.” Is there a risk of inducing malignancy with LLLT?

Discussion:

11. Patients were randomised after extraction and grafting. Could this potentially have led to some bias?

12. Would it have been useful to include another control group of patients who received only LLLT with no socket grafting? Is there any evidence that LLLT enhances 'de novo' bone healing?

13. Please provide a reference for “The presence of high amounts of collagen fibres in the test group may represent an early effect of the LLLT on bone repair.” Also, could this be correlated to some in vitro or preclinical in vivo evidence for an increase in LLLT-induced collagen formation by gene or protein expression?

14. It would be of scientific value to discuss the effects of LLLT on various stages of osteogenesis based on the current findings and existing literature. For example, the authors have stated that LLLT may increase osteoblast proliferation and differentiation, while the current findings suggest that it may also improve ECM production, but the effects of LLLT on mineralization (of ECM) may be questionable.

15. Please do not refer to other studies using “his”, “he”, etc.

16. Please include a note on the study limitations and scope for inferring the results to clinical practice. One concern might be that patients need to visit the clinic for 21 days after surgery for LLLT to be delivered adding to time and cost which must be weighed against the proposed benefit of reduction in overall treatment time.

17. Please discuss the findings in light of the current evidence for management of extraction sockets especially 'in-tact' (5-wall) sockets. Systematic reviews are available on the topic.

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.

Declaration of competing interests:

I declare that I have no competing interests.