

## Reply to reviewer's comments

1 Title. Does the title reflect the main subject/hypothesis of the manuscript? I would recommend it be specified as to what anatomical structure is receiving pulsed RF. Eg. "Effectiveness of pulsed radiofrequency of the medial cervical branches for cervical facet joint pain"

-> Thank you for your comment. We changed the title as follows.

**"Effectiveness of pulsed radiofrequency on the medial cervical branches for cervical facet joint pain"**

2 Abstract. Does the abstract summarize and reflect the work described in the manuscript? Yes

3 Key words. Do the key words reflect the focus of the manuscript? Yes

4 Background. Does the manuscript adequately describe the background, present status and significance of the study? Yes

5 Methods. Does the manuscript describe methods (e.g., experiments, data analysis, surveys, and clinical trials, etc.) in adequate detail? Line 136 – Thoracic or Cervical?

-> Thank you for your comment. We added the detail in the methods as follows, specifying the target site, as follows.

**"Once the needle tip was at the target site of the medial cervical branch, the needle was repositioned until the patient reported pain or a pressure sensation that was similar to the pain they usually experienced at less than 0.5 V to confirm the proximity to the medial cervical branch."**

6 Results. Are the research objectives achieved by the experiments used in this study? What are the contributions that the study has made for research progress in this field? The objective was to

determine the efficacy of pulsed RF in CFP. As per the authors there was a mean decrease in the NRS score by more than 50%, which was statistically significant.

-> Thank you for your comment. We described the meaning of the results of this study, and whether our objectives were achieved by the experiments used in this study as follows.

**These findings demonstrated that PRF stimulation was effective in alleviating CFP and more than half of the patients who received the treatment were satisfied with the results of this treatment.**

7 Discussion. Does the manuscript interpret the findings adequately and appropriately, highlighting the key points concisely, clearly and logically? Are the findings and their applicability/relevance to the literature stated in a clear and definite manner? Is the discussion accurate and does it discuss the paper's scientific significance and/or relevance to clinical practice sufficiently? Yes.

Further elaboration on the other available modalities for the treatment of cervical facet pain is required. Also, a comparison between the currently available modalities for treatment in the form of a chart or a table would complete the discussion. "approximately half of the patients reported successful pain relief ( $\geq 50\%$  pain reduction), and this effect lasted for at least 3 months.

-> Thank you for your comment. We elaborated on the other available modalities for the treatment of cervical facet pains as you recommended.

Medial branch nerves are very small nerve branches that carry pain signals from facet joints to the brain. There are various methods for treatment of CFP. Physical therapy, manipulation, mobilization, oral medication, and cognitive behavioral therapy may be applied but the pain-reducing effect is controversial<sup>[24]</sup>. Three types of interventions for the treatment of CFP include intraarticular facet injections, MBBs, and neurolysis of medial branch nerves by using radiofrequency<sup>[25]</sup>.

To avoid the side effects of local anesthetics and corticosteroids, PRF stimulation was suggested as an alternative treatment method for CFP. No previous study has directly compared the effect of PRF stimulation to the cervical medial branches with other treatment methods for non-traumatic facet pain. Therefore, this study aimed to investigate whether PRF stimulation was effective in management of chronic CFP.

Furthermore, about half of the patients showed satisfaction with the results following PRF stimulation" – Of the 50% patients that had successful pain relief, were the same 50% satisfied with the result? If so, kindly integrate the two into one sentence. The present writing style is misleading to the reader.

-> Thank you for your comment. We made corrections in the sentence as you recommended.

Furthermore, about half of the patients reported successful pain relief and showed satisfaction with the results following PRF stimulation.

8 Illustrations and tables. Are the figures, diagrams and tables sufficient, good quality and appropriately illustrative of the paper contents? Do figures require labeling with arrows, asterisks etc., better legends? Yes

9 Biostatistics. Does the manuscript meet the requirements of biostatistics? Yes

10 Units. Does the manuscript meet the requirements of use of SI units? Yes

11 References. Does the manuscript cite appropriately the latest, important and authoritative references in the introduction and discussion sections? Does the author self-cite, omit, incorrectly cite and/or over-cite references? The journal requires references to be cited as follows (for example): Kirpalani D, Mitra R. Cervical facet joint dysfunction: a review. Arch Phys Med Rehabil 2008 Apr;89(4):770-4. PMID: 18374011. doi: 10.1016/j.apmr.2007.11.028. List all authors, deleting the period (.) between the abbreviated name of the journal and the year of publication, after of the volume and number of the journal, write down the pages. In addition to the DOI, add the PMID.

-> Thank you for your comment. We made the changes in the references as you recommended.

12 Quality of manuscript organization and presentation. Is the manuscript well, concisely and coherently organized and presented? Is the style, language and grammar accurate and appropriate? Minor grammatical corrections required. One of present/past tense needs to be standardized throughout the manuscript. Manuscript is well ordered.

-> Thank you for your comment. We made grammatical corrections as you recommended. This manuscript was edited for language and grammar accuracy.

13 Research methods and reporting. Authors should have prepared their manuscripts according to manuscript type and the appropriate categories, as follows: (1) CARE Checklist (2013) - Case report; (2) CONSORT 2010 Statement - Clinical Trials study, Prospective study, Randomized Controlled trial, Randomized Clinical trial; (3) PRISMA 2009 Checklist - Evidence-Based Medicine, Systematic review, Meta-Analysis; (4) STROBE Statement - Case Control study, Observational study, Retrospective Cohort study; and (5) The ARRIVE Guidelines - Basic study. Did the author prepare the manuscript according to the appropriate research methods and reporting? Incompletely used CARE checklist.

-> Thank you for your comment. We added the STROBE statement as you recommended.

14 Ethics statements. For all manuscripts involving human studies and/or animal experiments, author(s) must submit the related formal ethics documents that were reviewed and approved by their local ethical review committee. Did the manuscript meet the requirements of ethics? The study is retrospective. The authors mention approval by the institutional review board. First, what are the original findings of this manuscript? What are the new hypotheses that this study proposed? What are the new phenomena that were found through experiments in this study? What are the hypotheses that were confirmed through experiments in this study? The authors recommend the use of pulsed radiofrequency, an established treatment modality for various pain conditions and syndromes, for the management of cervical facet pain. The effectiveness of this procedure has been shown in this study of 21 patients. Second, what are the quality and importance of this manuscript? What are the new findings of this study? What are the new concepts that this study proposes? What are the new methods that this study proposed? Do the conclusions appropriately summarize the data that this study provided? What are the unique insights that this study presented? What are the key problems in this field that this study has solved? The study proposes the use of pulsed RF for the management of cervical facet pain. Albeit the concept of using pulsed RF for facet pain is not new, there are few studies in literature on the subject. Third, what are the limitations of the study and its findings? What are the future directions of the topic described in this manuscript? What are the questions/issues that remain to be solved? What are the questions that this study prompts for the authors to do next? How might this publication impact basic science and/or clinical practice? The authors mention the limitations. In addition, clarification on the same/ different specialists performing the surgery would shed light on operator bias in the results. Authors' view on possible reasons for non-improvement in 5 patients should be added.

-> Thank you for your comment. In Korea, spinal interventions are performed by physiatrists, anesthesiologist, and neurologists. We added the followings in the discussion to clarify the existence of operative bias and the possible reasons for non-improvement in 5 patients as you

recommended.

In our study, PRF simulation was performed by a single physician with approximately 20 years of spinal intervention experience. Therefore, the risk of operator bias is seems to be low. Five patients in our study showed no improvement in CFP after PRF stimulation. This may be due to different underlying mechanisms involved in the development of chronic pain, which may be varied and complex <sup>[32]</sup>. Individualized treatment plans are required for appropriate management of CFP.