

## LETTERS TO THE EDITOR

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### Pulsed Radiofrequency

To the editor:

We would like to thank Professor Bogduk for his excellent review on pulsed radiofrequency (PRF) [1]. We intend to add some comments, and to correct a few errors. Hopefully this will contribute to a better understanding of the procedure.

PRF was not precipitated by the article by Slappendel et al [2]. We share the author's criticism of this article. We also feel uncomfortable with a disproportionate incidence of the C4 level in the patient material, which is unusual. The article was published when the development of PRF was already well on its way, and it has not played any role in the further evolution of the method. PRF was developed in 1995 and the first PRF procedure took place on February 1, 1996.

Further, we think that no justice is done to the article by Cosman and Cosman [3]. In this article it is stated that there is a small area of tissue destruction, either by heat spikes or by the lethal level of the electric fields close to the tip, but that it is uncertain if this explains the clinical effect of PRF. That is something different than proposing that this is the latest theory. The article then continues proposing alternative, non-thermal mechanisms. These are lower electric field phenomena, ultimately leading to conditioning stimulation and long-term depression. This is a more attractive and also more likely theory. It would explain the effects of PRF in procedures where the electric field around the target structure must be low (1,000–3,000 V/m), such as in PRF of the dorsal root ganglion (DRG) and in the intradiscal procedure [4].

We would also like to comment on the conclusion that radiofrequency (RF) causes a lesion, whereas PRF does not. A reputable dictionary tells us that the word "lesion" means "a localized pathological change in a bodily organ or tissue." Clearly then, in commonly used language, PRF causes a lesion. The author gives another personalized meaning to the word, but this is confusing. We suggest that he might add an adjective instead to make his point clear.

We have no intention to be fussy, but we mention a few minor errors to prevent long-term

copying out of this important article. The recommended frequency of PRF during the pulse is 500,000 Hz, not 50,000 Hz, the name of one author of reference 35 has been misspelled (it is Cosman ER), and the history of RF did not start with trigeminal neuralgia (Kirschner used direct current).

This having been said, we find confirmation in this article that the consensus that has been worded in 2002 [5] still holds. In our opinion, PRF is only worth pursuing if it can expand our possibilities to serve the interest of the patient. We therefore have to discriminate between two types of procedures. The first category is formed by those procedures where continuous RF has provided us with a satisfactory method, such as the thermocoagulation of the medial branch. In this category, the potential contribution of PRF would probably be modest at best, even in the hypothetical case that a randomized controlled trial (RCT) would show that PRF is equally effective as thermal RF.

The second category is formed by procedures where continuous RF has little or nothing to offer. This category includes PRF treatment for peripheral neuropathies and for painful trigger points, and PRF-DRG in patients with neuropathy. It also contains procedures that have the distinct advantage for the patient that an operation can be avoided, such as the intradiscal PRF procedure for discogenic pain and PRF-DRG for patients with an acute herniated disc [6].

As for scientific proof, more information has become available since the article was written. Two RCTs have now been carried out, both showing significant efficacy of PRF. The first RCT on cervical PRF-DRG has now been published [7]. The second RCT [8] is on the same procedure for posttraumatic brachialgia, and it is presently being written up for publication. That is not such a bad score, considering the fact that the first RCT on medial branch RF was published 20 years after Shealy's first publication.

The articles by Teixeira need, of course, confirmation, but here too there is additional information. It is now 18 months since the article on intradiscal PRF was written, resulting in a follow-

up of 21–43 months. None of these patients has had a recurrence of pain. The same is true for the patients who were on the surgeon's waiting list for radicular pain caused by a herniated disc. The 11/13 patients who were successfully treated with PRF now lead a normal and pain-free life, 3–4 years after the procedure. Only one of these patients needed a successful repeat procedure after 1 year. We find it hard to believe that there has been an epidemic of long-term placebo of such dimensions in Portugal.

We find the end conclusions of the article too categorical, and we miss a nuance that would do justice to these different groups of procedures. The title of the article is "Pulsed Radiofrequency," not "Pulsed Radiofrequency for the medial branch." We favor a consensus that continuous RF is at this point the method of choice for the medial branch, whereas PRF is a legitimate and now proven method for procedures in the second category.

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