



## Commentary

## Physical examination tests technical accuracy of sacral lateral branch RFN

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At lower cervical and lower lumbar segmental levels the medial branches of the dorsal rami typically do not become cutaneous. Consequently, numbness has not been a feature of concern following medial branch blocks or radiofrequency medial coagulation at these levels.

It is, therefore, understandable, to some degree, that testing for numbness has, in the past, not been part of the practice of sacral lateral branch blocks or sacral lateral branch radiofrequency coagulation. Indeed, none of the pioneering studies of these procedures paid attention to numbness. Yet, this is a curious omission, for it is well-established that the sacral lateral branches become the medial clunial nerves that innervate the skin over the buttock.

Moreover, numbness in the practice of spinal radiofrequency coagulation is not without precedent. The third occipital nerve becomes cutaneous, and numbness in the distribution of this nerve has served as a confirmatory test that third occipital nerve blocks [1] or third occipital nerve radiofrequency coagulation [2] has been technically adequate. Absence of numbness indicates that the target nerve has not been captured, and serves as a quality assurance check.

In this regard, the study of Vorobeychik et al. [3] fills an intellectual and professional vacuum in the practice of procedures that target sacral lateral branches. This contribution is long overdue, and is more significant than simply tidying up a corner of research.

In various ways, to various extents, practitioners and investigators alike have been concerned about the technical adequacy of techniques used to block sacral lateral branches or to coagulate them. As targets, these nerves are elusive. They cannot be captured using a single target point. Studies have shown that blocks at multiple sites and at multiple depths are required to fully anesthetize the sacral lateral branches [4–6]. Meanwhile, investigators have competed in promoting and comparing various techniques by which to capture the sacral lateral branches with radiofrequency coagulation [7–32].

The results of Vorobeychik et al. [3] resurrect a classical practice: examining the patient. Instead of arguing on theoretical grounds that their procedure is better than others at securing the lateral branches, physicians have at their disposal a test that can be applied immediately, in each and every patient.

Finding numbness is not a guarantee that a block or a coagulation will relieve the pain for which the patient was treated, but it is an indication that no technical failure has occurred, just as it is for third occipital nerve

blocks or third occipital radiofrequency coagulation. If numbness does not occur, the lateral branches cannot have been properly captured. By applying this quality assurance test, physicians can tell if they have made a mistake in their execution of the procedure, instead of blaming the patient or the procedure for lack of a positive response.

Accordingly, testing for numbness should become a critical element of the operational criteria both for sacral lateral branch blocks and for sacral lateral branch radiofrequency coagulation. If numbness does not occur, the physician should revisit their execution of the procedure.

The results of Vorobeychik et al. [3] show that immediate relief of pain occurs significantly more often when patients incur numbness. Curious is the small proportion of patients who obtain relief without going numb; but it is pointless arguing about happened in these patients without additional data. A placebo-controlled trial would be required to determine if these constituted placebo responses.

What needs still to be determined is how long the analgesic effect of sacral lateral branch radiofrequency coagulation endures, and if any patients consider the associated numbness to be adverse. In the meantime this need underpins a second, addition to the operational criteria.

Patients undergoing sacral lateral branch radiofrequency coagulation should be informed that numbness in the buttock will be the price that they must pay in order to be relieved of their sacroiliac pain. A corollary flows from this association. Being completely numbed may be too high a price to pay for inadequate, partial relief of pain.

## References

- [1] Lord S, Barnsley L, Wallis B, et al. Third occipital nerve headache: a prevalence study. *J Neurol Neurosurg Psychiatry* 1994;57:1187–90.
- [2] Govind J, King W, Bailey B, et al. Radiofrequency neurotomy for the treatment of third occipital headache. *J Neurol Neurosurg Psychiatr* 2003;74:88–93.
- [3] Vorobeychik Y, Shah B, Gordin V, et al. Assessment of technical adequacy of sacral lateral branches cooled radiofrequency neurotomy. *Intervent Pain Med* 2022.
- [4] Dreyfuss P, Snyder BD, Park K, et al. The ability of single site, single depth sacral lateral branch blocks to anesthetize the sacroiliac joint complex. *Pain Med* 2008;9: 844–50.
- [5] Dreyfuss P, Henning T, Malladi N, et al. The ability of multi-site, multi-depth sacral lateral branch blocks to anesthetize the sacroiliac joint complex. *Pain Med* 2009;10: 679–88.
- [6] Stout A, Dreyfuss P, Swain N, et al. Proposed optimal fluoroscopic targets for cooled radiofrequency neurotomy of the sacral lateral branches to improve clinical outcomes: an anatomical study. *Pain Med* 2018;19:1916–23.

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- [7] Ferrante FM, King LF, Roche EA, et al. Radiofrequency sacroiliac joint denervation for sacroiliac syndrome. *Reg Anesth Pain Med* 2001;26:137–42.
- [8] Cohen SP, Abdi S. Lateral branch blocks as a treatment for sacroiliac joint pain: a pilot study. *Reg Anesth Pain Med* 2003;28:113–9.
- [9] Yin W, Willard F, Carreiro J, et al. Sensory stimulation-guided sacroiliac joint radiofrequency neurotomy: technique based on neuroanatomy of the dorsal sacral plexus. *Spine* 2003;28:2419–25.
- [10] Vallejo R, Benyamin RM, Kramer J, et al. Pulsed radiofrequency denervation for the treatment of sacroiliac joint syndrome. *Pain Med* 2006;7:429–34.
- [11] Burnham RS, Yasui Y. An alternate method of radiofrequency neurotomy of the sacroiliac joint. a pilot study of the effect of pain, function, and satisfaction. *Reg Anesth Pain Med* 2007;32:12–9.
- [12] Cohen SP, Hurley RW, Buckenmaier CC, et al. Randomized placebo controlled study evaluating lateral branch radiofrequency denervation for sacroiliac joint pain. *Anesthesiology* 2008;109:279–88.
- [13] Kapural L, Nageeb F, Kapural M, et al. Cooled radiofrequency system for the treatment of chronic pain from sacroiliitis: the first case-series. *Pain Pract* 2008;8:348–54.
- [14] Cohen SP, Strassels SA, Kurihara C, et al. Outcome predictors for sacroiliac joint (lateral branch) radiofrequency denervation. *Reg Anesth Pain Med* 2009;34:206–14.
- [15] Karaman H, Kavak GO, Tufek A, et al. Cooled radiofrequency application for treatment of sacroiliac joint pain. *Acta Neurochir* 2011;153:1461–8.
- [16] Patel N, Gross A, Brown L, et al. A randomized, placebo-controlled study to assess the efficacy of lateral branch neurotomy for chronic sacroiliac joint pain. *Pain Med* 2012;13:383–98.
- [17] Cheng JG, Pope JE, Dalton JE, et al. Comparative outcomes of cooled versus traditional radiofrequency ablation of the lateral branches for sacroiliac joint pain. *Clin J Pain* 2013;29:132–7.
- [18] Ho KY, Hadi MA, Pasutharnchat K, et al. Cooled radiofrequency denervation for treatment of sacroiliac joint pain: two-year results from 20 cases. *J Pain Res* 2013;6:505–11.
- [19] Stelzer W, Aiglesberger M, Stelzer D, Stelzer V. Use of cooled radiofrequency lateral branch neurotomy for the treatment of sacroiliac joint-mediated low back pain: a large case series. *Pain Med* 2013;14:29–35.
- [20] Schmidt PC, Pino CA, Vorenkamp KE. Sacroiliac joint radiofrequency ablation with a multilesion probe: a case series of 60 patients. *Anesth Analg* 2014;119:460–2.
- [21] Anjana Reddy VS, Sharma C, Chang KY, Mehta V. Simplicity' radiofrequency neurotomy of sacroiliac joint: a real life 1-year follow-up UK data. *Br J Pain* 2016;10:90–9.
- [22] Rejaei D, Singh N, Sheth S, et al. A novel approach to the treatment of sacroiliac joint complex pain: bipolar radiofrequency ablation applied in a palisade pattern. *Reg Anesth Pain Med* 2016;41:416–7.
- [23] Biswas BK, Dey S, Biswas S, et al. Water-cooled radiofrequency neuroablation for sacroiliac joint dysfunctional pain. *Anaesthesiol Clin Pharmacol* 2016;32:525–7.
- [24] van Tilburg CW, Schuurmans FA, Stronks DL, et al. Randomized sham-controlled double-blind multicenter clinical trial to ascertain the effect of percutaneous radiofrequency treatment for sacroiliac joint pain: three-month results. *Clin J Pain* 2016;32:921–6.
- [25] Tinnirello A, Barbieri S, Todeschini M, et al. Conventional (Simplicity III) and cooled (SInergy) radiofrequency for sacroiliac joint denervation: one-year retrospective study comparing two devices. *Pain Med* 2017;18:1731–44.
- [26] McCormick ZL, Choi H, Reddy R, et al. Randomized prospective trial of cooled versus traditional radiofrequency ablation of the medial branch nerves for the treatment of lumbar facet joint pain. *Reg Anesth Pain Med* 2019;44:389–97.
- [27] Bayerl SH, Finger T, Heiden P, et al. Radiofrequency denervation for treatment of sacroiliac joint pain-comparison of two different ablation techniques. *Neurosurg Rev* 2020;43:101–7.
- [28] Kleinmann B, Wolter T, Weyerbrock A. Cooled radiofrequency for the treatment of sacroiliac joint pain - impact on pain and psychometrics: a retrospective cohort study. *Scand J Pain* 2020;20:737–45.
- [29] Shih CL, Shen PC, Lu CC, et al. A comparison of efficacy among different radiofrequency ablation techniques for the treatment of lumbar facet joint and sacroiliac joint pain: a systematic review and meta-analysis. *Clin Neurol Neurosurg* 2020;195(Aug):105854.
- [30] Speldewinde GC. Successful thermal neurotomy of the painful sacroiliac ligament/joint complex-a comparison of two techniques. *Pain Med* 2020;21:561–9.
- [31] Yang AJ, Wagner G, Burnham T, et al. Radiofrequency ablation for chronic posterior sacroiliac joint complex pain: a comprehensive review. *Pain Med* 2021;22(Suppl 1):S9–13.
- [32] Burnham TR, Smith A, McCormick ZL, et al. Evaluation of an ultrasound-assisted longitudinal axis lateral crest approach to radiofrequency ablation of the sacroiliac joint. *Am J Phys Med Rehabil* 2022;101:26–31.