

Short communication

Pulsed radiofrequency modulation for lingual neuralgia

S.U. Rehman^a, M.Z. Khan^a, R. Hussain^b, A. Jamshed^{c,*}

^a Department of Anesthesiology and Pain Medicine, Shaukat Khanum Memorial Cancer Hospital & Research Centre, Johar Town, Lahore, Pakistan

^b Department of Surgical Oncology, Shaukat Khanum Memorial Cancer Hospital & Research Centre, Johar Town, Lahore, Pakistan

^c Department of Radiation Oncology, Shaukat Khanum Memorial Cancer Hospital & Research Centre, Johar Town, Lahore, Pakistan

Accepted 1 June 2011

Available online 7 July 2011

Abstract

Pulsed radiofrequency modulation (PRM) is a minimally invasive procedure that has been used successfully to treat neuropathic pain. Its use to treat lingual neuralgia has not to our knowledge been described previously, and we report a case.

© 2011 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

Keywords: Lingual neuralgia; Pulsed radiofrequency modulation; Lingual nerve block

Introduction

Lingual neuralgia is an uncommon form of neuropathic pain that usually occurs after injury to the lingual nerve or as a part of the mandibular (V3) component of trigeminal neuralgia.^{1,2} Results of treatment with pharmacological, surgical, and neural interventions are variable, and complications and relapses are common.² Pulsed radiofrequency modulation (PRM) is a minimally invasive technique that has been used with success to treat neuropathic pain.³ However, to our knowledge PRM has not been described for the treatment of lingual neuralgia. Our rationale for using it was to prevent the general sensory and gustatory complications that accompany other invasive and destructive procedures including conventional mode radiofrequency.

Case report

A 50-year-old woman with hepatocellular carcinoma was referred to the pain clinic with a 3-year history of a painful tongue. The pain was localised to the right side of the anterior tongue with a visual analogue score (VAS) of 9/10. She had 30–40 episodes every day, each episode lasting from a few seconds to a minute. The pain was associated with trigger points on the tongue, and attacks were frequent when these trigger points were touched by food; this caused difficulties in swallowing and speech. Medical management had failed, and we treated her with PRM of the right lingual nerve. A 22 G blunt radiofrequency needle with a 4 mm active tip was inserted into the oral mucosa just medial to the medial ridge of the mandibular ramus 1 cm above the occlusal surface of the third mandibular molar.

She was stimulated with 0.1–0.3 mV at 50 Hz to produce paraesthesiae in the distribution of the lingual nerve, and was given 4 cycles of PRM of 2 Hz with 20 ms pulses at 42 °C for 2 min. During the procedure she was repeatedly asked if there was any exacerbation or decrease in the intensity of pain and paraesthesiae. After the procedure she was given a pain diary to keep a record. Her pain VAS fell from 9/10 to 3/10 during the first week after the procedure, and the number of attacks fell to 5–10 a day. There were no

* Corresponding author. Tel.: +92 42 5945100; fax: +92 42 35945207.

E-mail addresses: saad_rehman@yahoo.com (S.U. Rehman), zafarkhan@skm.org.pk (M.Z. Khan), razah@skm.org.pk (R. Hussain), jamshedarif@hotmail.com (A. Jamshed).

associated paraesthesiae or abnormalities of taste. The PRM was repeated after two weeks without additional benefit. She was prescribed gabapentin and oxcarbazepine after the second procedure for control of her residual pain. At one month she had fewer attacks of reduced severity and her quality of life had improved.

Discussion

Treatment options for neuropathic pain include drugs to reduce the intensity of the pain, surgical interventions to remove compression or mechanical pressure on the involved nerve, and excision of the nerve.^{4,5} The type of treatment selected for each patient depends on the nature of the pain, its severity, the age of the patient, coexisting conditions, expected response, complications, and relapses. Drugs used to treat neuropathic pain include carbamazepine, gabapentin, tricyclic antidepressants, tramadol hydrochloride, baclofen, and lamotrigine. While pharmacotherapy can reduce the intensity of the pain the effect is transient, and when adverse effects of drugs and their impact on the quality of life are taken into account the benefits are uncertain.^{6,7}

Interventional procedures are usually used when pharmacotherapy has failed, and have been limited to peripheral nerve blocks of the mandibular nerve with cryotherapy, alcohol, and glycerol.^{5,8} Central procedures have included microvascular decompression, gamma knife stereotactic radiofrequency surgery, and percutaneous radiofrequency rhizotomy.^{6,9} All these induce damage to the nerve and carry the inherent risk that patients will develop paraesthesiae, dysaesthesiae, and anaesthesia of the site.

Radiofrequency involves placing an insulated needle with an active tip in the vicinity of a nerve or ganglion. A grounded electrode is passed through the cannula and the

radiofrequency current is emitted from the tip of the needle. The exact mechanism of action of pulsed radiofrequency in the relief of pain is not known. It has been postulated that it may act by modulating the perception of pain rather than by neural destruction,³ so pulsed radiofrequency can prevent the “dysaesthetic” complications associated with resection of a nerve. This makes it an effective intervention for the management of neuropathic pain.¹⁰

References

1. Tekeli KM, Agrawal T, Worrall SF. Unusual case of post-traumatic lingual paraesthesia. *Br J Oral Maxillofac Surg* 2008;**46**:157–8.
2. Nurmikko TJ, Eldridge PR. Trigeminal neuralgia – pathophysiology, diagnosis and current treatment. *Br J Anaesth* 2001;**87**:117–32.
3. Cahana A, Van Zundert J, Macrea L, Van Kleef M, Sluiter M. Pulsed radiofrequency: current clinical and biological literature available. *Pain Med* 2006;**7**:411–23.
4. McLeod NM, Tekeli KM, Cheriyan J. Trigeminal neuralgia: assessment and management by oral and maxillofacial surgeons in the United Kingdom. *Br J Oral Maxillofac Surg* 2009;**47**:42–5.
5. Dworkin RH, Backonja M, Rowbotham MC, Allen RR, Argoff CR, Bennett GJ, et al. Advances in neuropathic pain: diagnosis, mechanisms and treatment recommendations. *Arch Neurol* 2003;**60**:1524–34.
6. Robinson PP, Loescher AR, Yates JM, Smith KG. Current management of damage to the inferior alveolar and lingual nerves as a result of removal of third molars. *Br J Oral Maxillofac Surg* 2004;**42**:285–92.
7. Fields HL. Treatment of trigeminal neuralgia. *N Engl J Med* 1996;**334**:1125–6.
8. Han KR, Kim C. Brief report: the long-term outcome of mandibular nerve block with alcohol for the treatment of trigeminal neuralgia. *Anesth Analg* 2010;**111**:550–3.
9. Fardy MJ, Zakrzewska JM, Patton DW. Peripheral surgical techniques for the management of trigeminal neuralgia – alcohol and glycerol injections. *Acta Neurochir* 1994;**129**:181–4.
10. Gallagher RM. Pulsed radiofrequency treatment: what is the evidence of its effectiveness and should it be used in clinical practice? *Pain Med* 2006;**7**:408–10.