Journal of Cranio-Maxillo-Facial Surgery 43 (2015) 97–101

Contents lists available at ScienceDirect

Journal of Cranio-Maxillo-Facial Surgery

journal homepage: www.jcmfs.com

Treatment of a subtype of trigeminal neuralgia with descending palatine neurotomy in the pterygopalatine fossa via the greater palatine foramen–pterygopalatine canal approach

Junbing Guo [a, 1], Daiyin Huang [a, 1], Songling Chen [a, *], Shuangxi Zhu [a], Qiong Rong [b]

[a] Department of Oral and Maxillofacial Surgery, The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China
[b] Department of Prosthetic Dentistry, The First People's Hospital of Yunnan, Kunming, China

ARTICLE INFO

Article history:
Paper received 6 May 2014
Accepted 20 October 2014
Available online 24 October 2014

Keywords:
Descending palatine nerve
Greater palatine foramen
Pterygopalatine canal
Pterygopalatine fossa
Trigeminal neuralgia

ABSTRACT

Purpose: To discuss an effective surgical treatment of a subtype of trigeminal neuralgia with descending palatine neuralgia of the maxillary division.
Method: Nine patients, who suffered from trigeminal neuralgia with descending palatine neuralgia of the maxillary division, received neurotomy and avulsion of the descending palatine nerve in the pterygopalatine fossa via the greater palatine foramen–pterygopalatine canal approach. Seven of the patients had a recurrence of descending palatine neuralgia after they received treatment of maxillary neuralgia with neurotomy and avulsion of the infraorbital nerve; two patients were diagnosed with descending palatine neuralgia of the maxillary division in our department. Postoperative follow-up was conducted.
Results: Pain in the palate disappeared; all patients felt numb and paresthetic in the area innervated by the trigeminal nerve, with no pain. During the 3–36 months of follow-up, no recurrence occurred.
Conclusions: Descending palatine neurotomy in the pterygopalatine fossa via the greater palatine foramen–pterygopalatine canal approach is a simple, safe and effective way to treat a subtype of trigeminal neuralgia – descending palatine neuralgia.

1. Introduction

Trigeminal neuralgia is one of the most common neurological disorders of the oral and maxillofacial regions of middle-aged and elderly people (Cruccu et al., 2008). Patients suffer from physical and psychological pain. In 1990, Katusic reported that the morbidity rate of trigeminal neuralgia was 4–5/10 million in Minnesota, USA (Katusic et al., 1990). The descending palatine nerve is a branch of the maxillary division of trigeminal nerve, and descending palatine neuralgia with pain in the mucous membrane of the palatal side of the maxillary posterior-tooth area is a common type of trigeminal neuralgia. Among maxillary neuralgia cases, descending palatine neuralgia can occur at the same time as neuralgia of other branches of the maxillary nerve (for example, infraorbital neuralgia) or occur alone. It has been reported that maxillary neuralgia patients suffer from relapse of descending palatine neuralgia after they have received neurotomy and avulsion of the infraorbital nerve outside the infraorbital foramen, or maxillary neurotomy in the pterygopalatine fossa via some approaches (Jiang, 2003). The treatment of descending palatine neuralgia so as to improve the effects of treatment for maxillary neuralgia and reduce the recurrence rate was an unsolved clinical problem. According to the literature, there is no report of treating descending palatine neuralgia with surgery alone. In this study, treatment of descending palatine neuralgia of the maxillary division with neurotomy and avulsion of the descending palatine nerve in the pterygopalatine fossa via the greater palatine foramen–pterygopalatine canal approach was adopted in nine cases and satisfactory results were gained.

2. Materials and methods

2.1. Clinical data

From June 2008 to June 2013, treatment of descending palatine neuralgia of the maxillary division of the trigeminal nerve with

* Corresponding author. Tel.: +86 20 87332200.
E-mail addresses: 26084789@qq.com (J. Guo), daiyin250@sohu.com (D. Huang), chensongling@hotmail.com, hpyycsl@hotmail.com (S. Chen), surgergman@sohu.com (S. Zhu), 476357411@qq.com (Q. Rong).
[1] Junbing Guo and Daiyin Huang contributed equally to this work.

http://dx.doi.org/10.1016/j.jcms.2014.10.016
1010-5182/

neurotomy and avulsion of the descending palatine nerve in the pterygopalatine fossa via the greater palatine foramen–pterygopalatine canal approach was performed in our department for nine patients (four male and five female) aged between 42 and 76 with an average age of 56. The length of their disease courses ranged from 6 months to 15 years, with an average of 5 years. All the patients had taken carbamazepine with unsatisfactory or even no curative effect. Recurrence of descending palatine neuralgia happened in seven patients after they received treatment for maxillary neuralgia with neurotomy and avulsion of the infraorbital nerve; two patients were diagnosed with descending palatine neuralgia of the maxillary division in our department. All nine patients were re-diagnosed with descending palatine neuralgia of the maxillary division of the trigeminal nerve. After CT or MRI examination, secondary trigeminal neuralgia caused by intracranial tumors or multiple sclerosis was excluded. Data for all the patients is listed in Table 1.

2.2. Surgical procedure

After successful general anesthesia, a longitudinal incision was performed at the palatal mucosa 2 mm from the alveolar ridge, from maxillary canine to maxillary tuberosity; a 2 cm transverse incision was made from the mucosa of the palatal side of maxillary canine to the middle of the palate and then the incision, deep to the palate bone surface, turned to be longitudinal following the midline to the level of the two maxillary second molars (Fig. 1). The mucoperiosteal flap was elevated with a curved staphylorrhaphy elevator (Fig. 2). Adequate exposure was given to the greater palatine foramen; part of the palatal bone plate was removed around the greater palatine foramen, revealing a 2 cm × 2 cm bone window; then the nerve tracts were freed (Fig. 3). Afterwards, along the palatine neurovascular bundle, we separated the soft tissues in the nasal cavity above the jawbone at the inner side of the pterygopalatine canal inner wall, and traced upward along the descending palatine nerve into the pterygopalatine canal (Fig. 4). The inside soft tissues of the perpendicular plate of palate bone were separated, exposing the inside wall of pterygopalatine canal;

Table 1
Patient data for the nine patients with maxillary neuralgia.

Patient	Age	Sex	Type of pain	Painful area	Surgical intervention before III
1	55	M	Left maxillary neuralgia	A + B + C	I
2	60	F	Left maxillary neuralgia	A + B + C	I
3	62	M	Right maxillary neuralgia	A + C	I
4	50	F	Left maxillary neuralgia	A + D	II
5	42	F	Right maxillary neuralgia	A + D	II
6	45	M	Left maxillary neuralgia	A + D	II
7	76	M	Right maxillary neuralgia	A + C	I
8	53	M	Right descending palatine neuralgia	B	NO
9	61	F	Left descending palatine neuralgia	B	NO

Painful area: A, infraorbital region; B, hard and soft palate; C, maxillary tuberosity region; D: unclear.
Surgical interventions: I, pterygopalatine fossa segment neurectomy of maxillary nerve through maxillary sinus route; II, Neurotomy and avulsion of infraorbital nerve; III, descending palatine neurotomy in pterygopalatine fossa via greater palatine foramen–pterygopalatine canal approach.

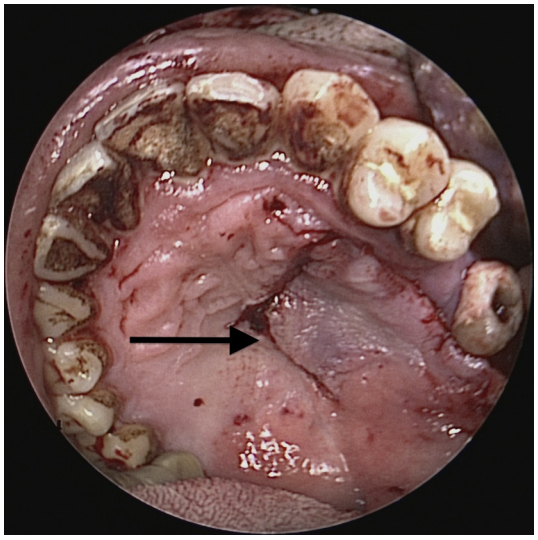

Fig. 1. Operative incision.

then the thin inside wall of the pterygopalatine canal was opened with an osteotome or periosteum elevator, gradually revealing the whole descending palatine nerve in the pterygopalatine canal (Fig. 5). Along the pterygopalatine canal, we then traced the descending palatine nerve upward and backward to the posterior wall of the maxillary sinus and removed part of the bone of the posterior wall (Fig. 6). After that, we continued to free the descending palatine nerve to the pterygopalatine fossa where blunt dissection along the descending palatine nerve was performed. Afterward, the descending palatine nerve was completely removed from the pterygopalatine canal (Fig. 7). The descending palatine nerve was cut under the sphenopalatine ganglion, 10 mm away from the foramen rotundum in the pterygopalatine fossa (Fig. 8) and cauterization with electrocoagulation was employed to cauterize the neural stump. Then we took out the whole nerve, and removed each branch of the descending palatine nerve from the soft tissues at the palate. Hydrogen peroxide and normal saline were employed to clean the operative site, and the mucosae of the outer wall and the posterior wall of the maxillary sinus were then

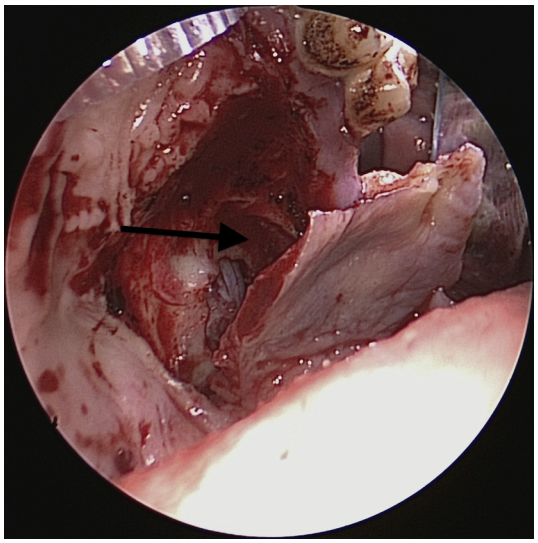

Fig. 2. Revelation of palate bone surface after elevating a mucoperiosteal flap in the palate.