

# Surgical Options for Atypical Facial Pain Syndromes



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## KEYWORDS

• Atypical facial pain • Nucleus caudalis • DREZ • Motor cortex stimulation

## KEY POINTS

- Atypical facial pain is often recalcitrant to pharmacotherapy; appropriate patient selection can make surgery a viable and appropriate option for treatment.
- Nucleus caudalis dorsal root entry zone lesioning is an effective and safe means of treating atypical facial pain.
- Motor cortex stimulation is an alternative intervention to consider for patients who do not respond to nucleus caudalis dorsal root entry zone lesioning.

## INTRODUCTION

Facial pain syndromes encompass a body of diagnoses that can fit a very defined and classic presentation to one that is murkier and not localizable by physical examination or radiographic imaging. Beyond typical trigeminal neuralgia, atypical subtypes are often difficult to treat and refractory to common interventions. Herein, the *atypical subtype* is used as a catchall phrase to define trigeminal pain, not defined by trigeminal neuralgia type I or II by the Burchiel classification (Table 1).<sup>1</sup> The current spectrum of treatment of these syndromes includes pharmaceutical therapy, percutaneous procedures (chemical, thermal, irradiative, mechanical destruction), as well as open surgery, which includes microvascular decompression (MVD) and less often peripheral nerve stimulation, motor cortex stimulation, neurectomy, tractotomy, and nucleus caudalis dorsal root entry zone (NC DREZ)

lesioning, though there is currently no mutual understanding of terminology, diagnosis, or treatment of facial pain<sup>2</sup> (Table 2). Several treatment algorithms have been developed for the treatment of facial pain with these various modalities.<sup>3-6</sup> Alksne and colleagues<sup>6</sup> used preoperative risk assessment and the presence of a vascular loop on MRI imaging for the treatment of trigeminal neuralgia with MVD versus Gamma Knife radiosurgery. In the single-institution experience by Munawar and colleagues<sup>3</sup> atypical subtypes as well as less-often-used treatment modalities are incorporated in a more comprehensive treatment algorithm. Specifically, treatment with tractotomy is considered only in cases of cancer facial pain. Neurectomy and motor cortex stimulation are used in cases of trigeminal neuropathic pain and deafferentation-type injuries. Of note, NC DREZ lesioning is considered less often and thought to be a more morbid and invasive procedure. Since

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Disclosure Statement: S.P. Lad has consulted for and received grant support from Medtronic, Boston Scientific, and St. Jude Medical. None of the above contributed to the writing of the article, payment, or decision to submit for publication. He serves as Director of the Duke Neuro-Outcomes Center, which has received research funding from NIH KM1 CA 156687, Medtronic Inc, and St. Jude Medical. The remaining author reports no conflicts of interest.

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Neurosurg Clin N Am 27 (2016) 365–370

<http://dx.doi.org/10.1016/j.nec.2016.02.010>

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**Table 1**  
Burchiel classification scheme for facial pain

	Pain Category	History
Typical	Trigeminal neuralgia (type 1)	<50% episodic, typical trigeminal pain
	Trigeminal neuralgia (type 2)	>50% constant, typical trigeminal pain
Atypical	Trigeminal neuropathic pain	Unintentional injury secondary to dental/sinus injury, craniofacial trauma
	Trigeminal deafferentation pain (anesthesia dolorosa)	Intentional deafferentation secondary to destructive procedure
	Symptomatic trigeminal neuralgia	Multiple sclerosis, mass lesion (posterior fossa lesion)
	Postherpetic neuralgia	Herpes zoster (trigeminal distribution)
	Atypical facial pain	Somatoform pain disorder

Adapted from Burchiel KJ. A new classification for facial pain. *Neurosurgery* 2003;53(5):1166; with permission.

1982, NC DREZ lesioning at Duke has been refined to become safer and less invasive.<sup>7-9</sup> Furthermore, patient outcomes in the Nashold experience were reassuring with 96% pain relief postoperatively and 67% even still at 1 year. Patients were treated for postherpetic neuralgia, deafferentation pain (anesthesia dolorosa, post-tic dysesthesia, stroke, multiple sclerosis, gasserian tumor, Gamma Knife radiation injury), facial

trauma/surgery, atypical facial pain, and migraine/cluster headache with success. More recently, Chivukula and colleagues<sup>10</sup> reported 75% improvement in quality of life and greater than 50% pain reduction at the 8-year follow-up (16 patients). Therefore, the authors emphasize NC DREZ for the treatment of these atypical subtypes, a procedure the authors think is underused and, in their cohort, proven to be very effective.

**Table 2**  
Summary of current procedures for treatment of facial pain

	Procedure	Details	Notes
First order neurons	Microvascular decompression	Retrosigmoid craniectomy and vascular decompression of offending vessel from trigeminal nerve root	Nondestructive, complications include cerebrospinal fluid leak and vascular injury though routine procedure, widely accepted
	Destructive lesioning	Percutaneous needle insertion; chemical (glycerol), thermal (radiofrequency), or mechanical (balloon) destruction of trigeminal nerve	Destructive, does not require general anesthesia, can be selective for pain distribution, may result in numbness or dysesthesia, immediate pain relief
	Stereotactic radiosurgery	Stereotactic radiation of trigeminal nerve root	Destructive, noninvasive, may take several months for symptom relief
	Peripheral nerve stimulation	Peripheral trigeminal nerve electric stimulation	Nondestructive, trial period before permanent placement, adjustable settings for optimization
Second order neurons	NC DREZ lesioning	Radiofrequency ablation of nucleus caudalis from a posterior midline approach	Destructive, invasive, risk of transient ipsilateral limb ataxia
Third order neurons	Motor cortex stimulation	Epidural stimulation of motor cortex through burr hole	Nondestructive, invasive requiring craniotomy, adjustable settings for optimization

Adapted from Slavin KV, Nersesyan H, Colpan ME, et al. Current algorithm for the surgical treatment of facial pain. *Head Face Med* 2007;3:30.

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