

Endoscopic Trigeminal Nucleus Caudalis Dorsal Root Entry Zone (NC DREZ) Lesioning for Atypical Facial Pain

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Introduction

While many chronic pain conditions are challenging to treat, atypical facial pain including conditions such as anesthesia dolorosa and trigeminal deafferentation are among the most difficult. Patients experience numbness in facial areas that also have constant severe, burning pain. The condition results from traumatic or surgical deafferentation injuries of the first-order trigeminal nerve. Anesthesia dolorosa occurs in up to 4% of patients who have undergone prior trigeminal procedures. Deafferentation releases second-order neurons along the trigeminal pain pathway to generate spontaneous pain signals, without a nociceptive stimulus. Medications used for neuropathic pain are first-line but often ineffective.



Methods

Trigeminal tractotomy/nucleotomy and open nucleus caudalis dorsal root entry zone (DREZ) lesioning are two ablative procedures that have been performed over the last several decades targeting the descending trigeminal tractus and the spinal trigeminal nucleus. Here we present technical details of a novel operative technique performed in five patients, using a percutaneous, endoscopic technique with neuromonitoring that allows direct visualization of the brainstem and physiologic confirmation of stimulation and ablation. We believe direct endoscopic visualization of the surrounding anatomy, including vertebral artery, PICA, Accessory nerve rootlets, C1, C2 roots and pial vessels, affords greater accuracy and safety.



Results

Four of the five patients had immediate, significant relief of their facial pain postoperatively. Upper and lower extremity strength and sensation remained intact. One patient did suffer from transient spinocerebellar ataxia that resolved by the following week. At three-month follow-up, four of the patients had significant pain relief compared to their pre -operative pain scores.



Conclusions

Endoscopic nucleus caudalis dorsal root entry zone (NC DREZ) lesioning is a safe, effective and minimally invasive approach for reducing neural hyper-excitability in second order neurons in patients with intractable atypical facial pain. Longer-term studies and followup are needed for these challenging types of craniofacial pain.

Learning Objectives

The objective of this manuscript is to describe the operative technique of endoscopic based NC DREZ lesioning and associated illustrative cases in which the procedure is effective.

References

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