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Sphenopalatine ganglion radiofrequency neurolysis for refractory painful Frey's syndrome after parotidectomy: a neuromodulatory approach

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Introduction

Frey's syndrome is a well-documented sequela of parotid gland surgery, primarily characterized by gustatory sweating and flushing due to aberrant regeneration of postganglionic parasympathetic fibers. Although localized autonomic dysfunction is common, the development of refractory, lancinating craniofacial pain mimicking trigeminal neuralgia is an exceedingly rare and debilitating manifestation. Conventional management, including gabapentinoids, carbamazepine, and local botulinum toxin injections, frequently fails to provide sustained relief for both the neuropathic pain and the autonomic distress.

Case presentation

A male patient, status post-parotidectomy, presented with an intractable, atypical presentation of Frey's syndrome. The clinical picture was dominated by recurrent episodes of severe, paroxysmal pain in the submandibular and pre-auricular regions (Visual Analogue Scale [VAS] 9/10), described as stabbing and burning. Paroxysms were exclusively triggered by gustatory stimuli, notably acidic and salty foods; the mere anticipation or thought of citric food was sufficient to evoke maximum-intensity pain. Concurrently, the patient exhibited localized pre-auricular gustatory hyperhidrosis. Ingestion of neutral liquids and alcoholic beverages failed to trigger the pain, underlining a highly selective gustatory reflex loop. Following failure of comprehensive pharmacological therapy and botulinum toxin type A injections, the patient underwent percutaneous radiofrequency neurolysis of the sphenopalatine ganglion (SPG) utilizing electrothermal energy to disrupt pain conduction and autonomic pathways. The intervention yielded immediate pain resolution (VAS 0/10) alongside a substantial reduction in gustatory sweating. At the 12-month follow-up, the clinical benefit remained sustained, significantly restoring the patient's quality of life without neurological deficits.

Discussion

This case highlights a unique pathophysiological overlap where parasympathetic hyperactivity directly drives a severe craniofacial neuropathic pain state, likely amplified by central and peripheral sensitization mechanisms. The SPG plays a pivotal role as a major parasympathetic center in trigeminal-autonomic mechanisms. While SPG radiofrequency neurolysis is traditionally reserved for primary trigeminal autonomic cephalgias, its application here demonstrates a targeted disruption of the aberrant reflex arc connecting salivary gustatory afferents to nociceptive facial pathways. By modulating the SPG, the intervention potentially blunted both the efferent secretomotor response and the retrograde nociceptive transmission, achieving clinical control where conventional therapies failed.

Conclusion

Sphenopalatine ganglion radiofrequency neurolysis represents an effective and targeted neuromodulatory intervention for patients suffering from refractory, pain-predominant Frey's syndrome, successfully modulating both the autonomic and neuropathic arms of the disease.

Keywords:
Sphenopalatine ganglion
Pain
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