MRI as an Essential Diagnostic Approach for Trigeminal Neuralgia

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Abstract Trigeminal neuralgia is a well recognised disorder frequently reported to the dentist. The diagnosis of trigeminal neuralgia is primarily based on history and clinical criteria. The clinical findings do not differentiate idiopathic trigeminal neuralgia from symptomatic trigeminal neuralgia. We describe a case of clivopetrosal meningioma presenting as trigeminal neuralgia and discuss the importance of magnetic resonance imaging as an essential diagnostic approach when trigeminal neuralgia occurs concurrently with a brain tumour.

Keywords Trigeminal neuralgia · Clivopetrosal meningioma · MRI · Gamma knife surgery · Intracranial lesions

Introduction

Persistent orofacial pain without obvious proximate physical cause is one of the most challenging clinical issues confronted by the dentist. The spectrum and prevalence of orofacial neuropathic pains is such that every dentist will certainly encounter patients with neuropathic pain. Neuropathic pain may mimic dental pain, or other somatic pain, thus clinician might treat them with familiar but inappropriate methods. Patients with persistent pain often seek consultation from many clinicians and undergo multiple unnecessary procedures before correct diagnosis and

appropriate treatment. Therefore, the dentist must gain familiarity with the pathophysiology, presentation, diagnosis, and treatment of orofacial neuropathic pain [1].

Trigeminal neuralgia is one of the most frequently reported neuralgic pains. The diagnosis of trigeminal neuralgia is based primarily on a history of characteristic pain attacks that are consistent with specific, widely accepted research and clinical criteria. Its cause is unknown, although vascular compression of the trigeminal nerve roots is often suggested [2]. In a smaller group, the signs and symptoms of trigeminal neuralgia are secondary to those of another disease process that affects the trigeminal system, such as multiple sclerosis or a cerebellopontine-angle tumour. This is referred to as “symptomatic trigeminal neuralgia” [3].

Accurate diagnosis of trigeminal neuralgia is particularly important because a variety of specific treatments can greatly reduce or totally eliminate pain symptoms in most patients [4]. In this article we present a case of trigeminal neuralgia secondary to clivopetrosal meningioma.

Case Report

A 40 year old female patient was referred to us with left sided facial pain since 6 months. On detailed history, patient had visited a dentist for the same problem and was advised to undergo root canal treatment for the upper left first molar. Symptoms did not subside even after such treatment. Later she reported to neurology department, was diagnosed as having left sided trigeminal neuralgia and was put on tablet Tegretol 200 mg twice daily. Pain decreased after medication for some time.

Patient reported to us after 3 months with unresolved pain. On detailed examination, pain was sharp, lancinating along the maxillary division (V₂). Clinical diagnosis of

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Fig. 1 Petroclival meningioma compressing the left sided 5th nerve complex

Fig. 2 Tumour spreading onto the inferior tentorial surface/hiatus margin, the region of the Meckel's cave entry

trigeminal neuralgia was made and patient was advised to undergo magnetic resonance imaging (MRI) brain to rule out vascular compression over the trigeminal nuclei.

MRI brain revealed calcified small left sided petroclival meningioma, spreading onto the inferior tentorial surface/hiatus margin, the region of the Meckel's cave entry, compressing the left sided 5th nerve complex and the ipsilateral pons (Figs. 1, 2). Patient was informed about the tumour and consultation with the neurosurgeon was arranged, other cranial neuropathies were ruled out. The surgeon advised gamma knife surgery. Because of her economical constraints she underwent intensity modulated radiation therapy for the tumor and presently she is pain free.

Discussion

Trigeminal nerve neuropathy can involve any segment of the nerve from its central origins to its peripheral branches. Multiple sclerosis and infarct are the most common abnormalities of the brainstem that cause trigeminal neuralgia [3].

Jannetta et al. have described vascular compression by superior cerebellar artery to be the common etiology in trigeminal neuralgia cases [4]. Rarely is it attributed to an intracranial tumour (incidence <0.8 %), which is one of the factors that makes diagnosis of the disorder so difficult [5]. Most of the tumours that are known to lead to the development of trigeminal neuralgia (acoustic and trigeminal schwannomas, meningiomas, epidermoid cysts, lipomas and metastases) are generally located in the posterior fossa [5–8].

Petroclival meningiomas are in general, rare, benign, deep located tumours of the skull base [9–11]. Petroclival meningioma refer to meningioma that originate in the upper two-thirds of the clivus, at the petroclival junction, near the sphenoparietal synchondrosis, disposed partly supratentorial and partly infratentorial; arise medial to the trigeminal nerve, displace often the brain stem and the basilar artery to the opposite side. Disposed medial to cranial nerves V, VII, VIII, IX, X, XI petroclival meningioma frequently extend to the cavernous sinus, middle cranial fossa, down to the magnum foramen; compress the brainstem, may infiltrate or involve the skull base bone, the dura mater [12].

The typical presentation of the petroclival meningioma is that the symptoms are insidious in onset, slow growing, can become large before they become apparent clinically. Headache is the most frequent complaint with or without cranial neuropathies. Fifth, (even trigeminal neuralgia associated with contra lateral posterior fossa tumours), eighth cranial nerves and facial nerve being the most frequently involved. Rarely the lower cranial nerves, III, IV and VI are involved in nearly one-third cases. More cranial nerves may be involved due to mass effect on the

cerebellum with cerebellar signs, which occur in nearly 70 % of cases. Brain stem compression expressed by long tract signs like spastic paresis is reported in 15–57 % of patients and somatosensory deficits reported in 15–20 % of patients [11, 12], or increased intracranial pressure, either from the tumor mass or obstructive hydrocephalus [9].

Conclusion

There are many cases of trigeminal neuralgias initially mistaken for dental pain or tooth related pain and referred to the oral and maxillofacial surgeon. Many of the oral and maxillofacial surgeons have good knowledge about trigeminal neuralgia and treat them by conservative treatment. It is of severe importance that MRI scan has to be taken before starting any sort of treatment to rule out the intracranial lesions including the petroclival meningiomas.

References

1. Sirois DA (2001) Orofacial neuralgias and neuropathic pain. In: Silverman S, Truelove E, Eversole R (eds) *Essentials of oral medicine*. BC Decker Inc, Hamilton
2. Love S, Coakham HB (2001) Trigeminal neuralgia: pathology and pathogenesis. *Brain* 124(Pt 12):2347–2360
3. Klieb HB, Freeman BV (2008) Trigeminal neuralgia caused by intracranial epidermoid tumour: report of a case. *J Can Dent Assoc* 74(1):63–65
4. Scrivani SJ, Mathews ES, Maciewicz RJ (2005) Trigeminal neuralgia. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 100(5):527–538
5. Cirak B, Kiyamaz N, Arslanoglu A (2004) Trigeminal neuralgia caused by intracranial epidermoid tumor: report of a case and review of the different therapeutic modalities. *Pain* 7(1):129–132
6. Iwasaki K, Kondo A, Otsuka S, Hasegawa K, Ohbayashi T (1992) Painful tic convulsif caused by a brain tumor: case report and review of the literature. *Neurosurgery* 30(6):916–919
7. Al-mefty O, Smith RR (1991) Clival and petroclival meningiomas. In: Al-mefty O (ed) *Meningiomas*. Raven Press, New York, pp 517–537
8. Mayberg MR, Symon L (1986) Meningiomas of the clivus and apical petrous bone. Report of 35 cases. *J Neurosurg* 65(2):160–167
9. Ramina R, Fernandes BY, Neto MC (2008) Petroclival meningiomas: diagnosis, treatment and results. In: Ramina R, Aguiar P, Tatagiba M (eds) *Samii's essentials in neurosurgery*, vol 13. Springer-Verlag, Berlin, pp 121–134
10. Samii M, Ammirati M (1991) Petroclival meningiomas. In: Schmidek HH (ed) *Meningiomas and their surgical management*. WB Saunders, Philadelphia, pp 396–403
11. Sekar LN, Jannetta PJ (1987) Petroclival and medial tentorial meningiomas. In: Sekhar LN, Schramm VS Jr (eds) *Tumors of the cranial base: diagnosis and treatment*. Futura, Mount Kisco, pp 623–640
12. Iacob G, Cracium M (2011) Silvia Tene, microsurgical removal of posterior and petroclival meningiomas: a report of 8 cases. *Romanian Neurosurg* 18:2. http://www.roneurosurgery.eu/atdoc/IacobG_MicrosurgicalRemoval_f.pdf