

Cluster headache following dental treatment: a case report

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Abstract: Cluster headache is a neurovascular disorder characterized by attacks of severe and strictly unilateral pain presenting in and around the orbit and temporal area. Attacks occur in series lasting for weeks or months separated by remission periods. An individual attack lasts 15-180 min with a frequency of once every other day to as often as 8 times per day. Ipsilateral radiation of the headache to orofacial regions, including the teeth, is not unusual. The area of involvement may obscure the diagnosis and lead to irreversible and unnecessary dental treatment. A case in which cluster attacks occurred immediately after a dental procedure is described. (*J Oral Sci* 53, 125-127, 2011)

Keywords: cluster headache; orofacial pain; sphenopalatine ganglion.

Introduction

According to "The International Classification of Headache Disorders; 2nd edition (ICHD-II)" published by the International Headache Society (IHS) (1), cluster headache has been classified, along with chronic paroxysmal hemicrania (CPH), as a variety of miscellaneous conditions and headache phenomena. Cluster headache is a periodic attack of severe pain localized primarily to the eye, temple, forehead, or cheek region, although ipsilateral radiation of the pain to orofacial regions during attacks is not unusual. This headache disorder can be provoked by physical stimulation, although

the pathophysiology is not known. This report describes a case of cluster headache that began simultaneously or immediately after dental procedures performed under anesthesia with intraoral injection of 2% lidocaine, which is the usual situation in general dental practice.

Case Report

A 48-year-old Asian male was seen as an emergency referral from a dentist. About four years previously, he had begun to experience significant attacks of headache, which usually began with a burning sensation in the right eye and nose. He denied the association of any nausea or vomiting with these attacks, but his right eyelid began to droop and the eye became reddened and lacrymose. The nose on the same side became stuffed and began to run soon after onset. These attacks typically lasted about 1 hour, and woke the patient, usually around 4-5 am. He had never suffered attacks on a daily basis, and initially the cluster episodes had occurred once every 2 years. He had consulted a variety of physicians and he undergone a number of examinations including CT scan. However, no abnormality had been found. The patient had suffered a relapse of the headache about 2 weeks prior to presentation, after 2 years without symptoms. Since the pain appeared to radiate to the maxillary teeth, he consulted a local dentist, who diagnosed mild periodontitis of the right upper molars. The attacks occurred immediately after undergoing scaling/polishing under local intraoral anesthesia with 2% lidocaine, and he was referred promptly to the Center for Orofacial Pain, Tokyo, Japan. Upon presentation, the patient complained of excruciating pain in the temple, orbit and jaw on the right side. Ipsilateral lacrimation, rhinorrhea, and eyelid edema were obvious, without any paresthesia. A trial of sphenopalatine anesthesia with topical application of 5% lidocaine reduced the intensity and area of the pain. A cotton-tipped applicator soaked in a local anesthetic solution was advanced along the superior border of the

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middle turbinate until the tip contacted the mucosa overlying the ganglion (Fig. 1). The applicator was removed after 20 min.

The intensity, duration, and frequency of the pain episodes, as well as the associated symptoms and the clinical findings, along with the lidocaine application trial, met the diagnostic criteria of the ICHD-II for cluster headache (Table 1). Accordingly, the patient was diagnosed as having cluster headache and prescribed eletriptan (20 mg, hs) by the referring neurologist. The headaches were completely resolved in 3 days.

Discussion

Cluster headache is a neurovascular disorders characterized by attacks of severe, strictly unilateral pain presenting in and around the orbit and temporalis area. Attacks occur in series lasting for weeks or months (i.e., cluster periods) separated by remission periods usually



Fig. 1 The patient with sphenopalatine anesthesia on the right side. Ipsilateral lacrimation, rhinorrhea and eyelid edema are seen.

lasting months or years. An individual attack lasts 15-180 min with a frequency of once every other day to as often as 8 times per day. The headache is associated with one or more of the following: conjunctival injection, lacrimation, nasal congestion, rhinorrhea, forehead and facial sweating, miosis, ptosis, and eyelid edema. Ipsilateral radiation of the pain to orofacial regions, including the teeth, is not unusual (2).

The patient had reported the periodicity of his cluster attacks, which started at the same time each night, and the cluster period started at the same time each year. This feature of circadian and seasonal periodicity suggested cluster headache. In the literature, between 50% and 75% of attacks occur during sleep, often awakening the patient (2,3).

In the present case, sphenopalatine anesthesia was tried primarily for differential diagnosis. The sphenopalatine ganglion is located in the pterygopalatine fossa, posterior to the middle turbinate of the nose (Fig. 1). This is a parasympathetic ganglion with fibers from the greater superficial petrosal nerve, a branch of the facial nerve (cranial nerve VII). It is, however, functionally associated with the maxillary division of the trigeminal nerve (V2), since it is suspended by the pterygopalatine nerves within the fossa (4). Therefore, sphenopalatine anesthesia offers an opportunity to anesthetize autonomic and somatic nerves at the same time. This procedure is not uncomfortable but may tickle. Clinical experience has shown that sphenopalatine ganglion blockade can be useful for aborting acute attacks of migraine or cluster headache (5).

The pain of cerebral blood vessels is conveyed by the first division of the trigeminal nerve. Furthermore, the parasympathetic and sympathetic nerves also innervate these vessels. The parasympathetic innervation of the intracranial vessels arises from neurons located in the superior salivatory nucleus (SSN). The SSN contains the

Table 1 International Headache Society criteria for cluster headache (ICHD-II, 2004)

A. At least five attacks fulfilling criteria B through D
B. Severe or very severe unilateral orbital, supraorbital, and/or temporal pain lasting 15 to 180 minutes if untreated
C. Headache is accompanied by at least one of the following: <ol style="list-style-type: none"> 1. Ipsilateral conjunctival injection and/or lacrimation 2. Ipsilateral nasal congestion and/or rhinorrhea 3. Ipsilateral eyelid edema 4. Ipsilateral forehead and facial sweating 5. Ipsilateral miosis and/or ptosis 6. A sense of restlessness or agitation
D. Attacks have a frequency from one every other day to eight daily
E. Not attributed to another disorder

preganglionic parasympathetic neurons that travel with cranial nerve VII and synapse in the sphenopalatine ganglion. Postganglionic vasomotor efferents travel via the ethmoidal nerve to innervate the cerebral blood vessels. Then secretomotor efferents innervate both the lacrimal and nasal mucosal glands. These trigeminovascular and cranial-parasympathetic pathways provide the anatomic basis for the symptoms of cluster headache and other trigeminal autonomic cephalgias (6).

Because of its simplicity, sphenopalatine anesthesia lends itself to use at the chairside, especially in emergency cases encountered in dental practice. The patient's pulse rate, blood pressure, and respiratory rate must be monitored for untoward effects secondary to blockade.

In dental practice, patients with cluster headache may often have dental or midfacial complaints as the primary presentation. According to the dermatome on the face, pain from the mandibular molars is typically referred to the maxillary molars. It is therefore not surprising that orbital pain may refer to maxillary or mandibular areas, and so to the teeth in those areas (7). In this particular case, the pain appeared to radiate to the maxillary tooth on the ipsilateral side.

The next question is why the cluster attacks occurred following dental procedures. Although one report has considered the possible correlation between previous head trauma and the incidence of current headache attack (8), cluster headache is regarded as a primary headache disorder. Dentists often become so focused on dental aspects that they lose perspective and fail to consider medical consequences. For improved management of orofacial pain, any differential diagnosis has to include both dental and medical aspects together. The same could be said of the medical community in general.

It is not uncommon for patients with cluster headache to consult a dentist, and to be initially misdiagnosed and receive unnecessary treatment (9). Orofacial pain specialists should be familiar with this headache disorder, since

patients occasionally seek treatment in dental practice.

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