

Point of Care

The Point of Care section of JCDA answers everyday clinical questions by providing practical information that aims to be useful at the point of patient care. The responses reflect the opinions of the contributors and do not purport to set forth standards of care or clinical practice guidelines. Readers are encouraged to do more reading on the topics covered. If you would like to submit or answer a question, contact editor-in-chief Dr. John O'Keefe at jokeefe@cda-adc.ca.

Question 1

Dental laboratory technicians warn dentists against the inadvertent creation of a “J” margin when preparing teeth for aluminum oxide and zirconium oxide all-ceramic coping systems. What are they referring to, and how can it be prevented?

All-ceramic restorations that are built over aluminum oxide or zirconium oxide copings (substructures) require a definitive 360° chamfer margin. It must be deep enough to accommodate both the thickness of the coping and the layering porcelains that will be fired over it. No matter what system is used, manufacturing technique will not make up for any serious deficiencies in the design of the preparation, especially in the area of the margin and the cervical third of the crown. Many times our laboratory team members have to deal with chamfers that are too shallow or even nonexistent. This shortcoming, along with insufficient axial reduction, results in crowns that are bulky and much less esthetically pleasing (Fig. 1). The solution, of course, is to provide adequate, anatomic axial reduction in conjunction with the preparation of a deeper, definitive chamfer margin.

The “J” Margin

One of the dangers in preparing a definitive chamfer margin is inadvertent creation of a “J” margin. This problem occurs when the apex of the diamond bur passes the edge of the margin, thereby creating a groove inside the margin (Fig. 2). It can lead to inaccuracies when physical scanning of the die is required. The resulting sharp, fragile die margins may be degraded during the laboratory procedures needed to construct the coping and the crown. Dental technicians also find it nearly impossible to build porcelain on these sharp margins, and the end result will

not be as strong as it should be. There is also the possibility that if the crown makes it through the laboratory phase without incident, the tooth itself might be fractured at these fragile margins, especially if a less-than-gentle approach is used in trying-in a restoration with a potentially poor fit.

The “J” margin can be a problem with any restoration requiring a chamfer margin, including a show-no-metal porcelain-fused-to-metal restoration. Because of the potential problems, laboratory dental technicians should report the finding of a “J” margin to the dentist and ask about the possibility of a revision to the preparation and a new impression rather than building the restoration on this preparation defect.

Clinical Solutions

The 6878K series diamond burs, which are similar to gingival curettage burs with pointed tips, are currently being recommended by some manufacturers to prepare teeth for crowns such as Procera AllCeram (Nobel Biocare, Goteborg, Sweden). In my observation of many cases in multiple dental laboratories, use of these burs by most clinicians tends to result in margins that are too shallow. The 856 chamfer bur series, with a bullet tip design (manufactured by Brasseler USA, Savannah, Georgia; Axis Dental Corporation, Irving, Tex.; S.S. White Burs Inc., Lakewood, NJ; and Premier Dental, Plymouth Meeting, Penn.), is an



Figure 1: A postoperative photograph shows bulky posterior crowns due to under-preparation.



Figure 2: The “J” margin.



Figure 3: The 30006 chamfer bur (Brasseler) potentially eliminates the “J” margin because of its centre pin design.

excellent alternative for preparing a proper and definitive margin. Unlike the K series, these diamond burs carry a greater potential for a “J” margin. However, handled correctly, they can produce a true chamfer margin. To prevent the “J” margin, caution must be exercised to avoid exceeding half the depth of the bur tip, as the margin is circumferentially prepared. In addition, the bur selected must be of the appropriate size for the tooth in question.

Another way to prevent this problem is to use a bur with a non-cutting guide pin built into the tip, such as the 30006 diamond bur (Brasseler) (Fig. 3). If you have accidentally created a “J” margin, it is possible to convert it into a modified shoulder margin, which is also acceptable for these types of copings and crowns. To do this, consider using a 10839 end-cutting bur (Brasseler) or another end-cutting bur of similar design to carefully reduce the outer lip of the “J” margin. ♦



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Dr. Adams is one of the presenters at the Pacific Dental Conference, which will be held in Vancouver from March 10-12, 2005. Dr. Adams' sessions, "Excellence in Everyday Esthetics" and "Indirect Composites: Dentistry's Best Kept Secrets!" will be presented on March 10 and 11, respectively.

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Question 2

What are some of the challenges of treating dental patients who take antidepressant medications?

Major depression (one of the so-called mood disorders) affects millions of Canadians, both directly and indirectly, every year. Antidepressant medications are being prescribed at a record rate, not only for the management of depression but also for anxiety disorders, eating disorders and dementia. A total of 3.75 million prescriptions for antidepressants were written in 1998, a substantial increase over the 2.72 million that were written in 1993. Although not a cure, these drugs, usually prescribed in conjunction with psychotherapy and self-help programs, assist the person in coping with his or her particular disorder. Depression is frequently associated with a disinterest in oral hygiene, steady progression of periodontal problems and a tendency toward a more cariogenic diet, factors that often combine to result in moderate to rampant decay.

Antidepressant Medications

Four major classes of antidepressants exist today: selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs) and other or atypical reuptake inhibitors (RIs). The SSRIs and RIs, the newest classes of antidepressants, are currently the most commonly prescribed antidepressants in Canada. They include such well-recognized names as Prozac (fluoxetine), Paxil (paroxetine), Celexa (citalopram), Effexor (venlafaxine) and Wellbutrin (bupropion). Each person will respond differently to each antidepressant, and the final choice is often made on the basis of trial and error. At least 3 to 4 weeks is required for a given medication to exert the desired effect by beginning to elevate the patient's

mood. Unfortunately, these medications are not without side effects, the intensity of which varies from one patient to another and with the dosage level. The most common side effects include dry mouth (xerostomia), gastrointestinal upset (nausea, vomiting, heartburn), drowsiness, insomnia, headache, sexual disturbances, orthostatic hypotension and tremors. These side effects may be intensified in patients taking other medications, including anxiolytics, lithium or antipsychotics.

Dental Management

Appropriate dental management may necessitate an initial consultation with the patient's physician or psychiatrist to confirm the medication regimen and, if necessary, psychological status. A vigorous preventive dental education program is required to counteract the most frequently reported side effect of antidepressant medication, xerostomia. A protocol for the management of dry mouth should include the following components:

- frequent sipping of water, along with restriction of caffeine and cola beverages
- use of sugar-free gum and candies
- use of saliva substitutes and oral moisturizers
- use of 0.05% fluoride rinses, 0.04% fluoride gels (e.g., GelKam, Colgate Oral Pharmaceuticals, New York, NY), 1.1% fluoride toothpaste (e.g., Prevident, Colgate Oral Pharmaceuticals) and fluoride varnishes (e.g., Durafluor, Pharmascience, Montreal, Que.)

- avoidance of alcohol and alcohol-containing mouth rinses
- restriction or avoidance of tobacco products
- regular monitoring for the development of yeast (*Candida*) infections.
- more frequent recall appointments.

Other potential oral side effects of the SSRIs include dysgeusia, glossitis, stomatitis, discolouration of the tongue and bruxism, the last of which can worsen an already-compromised periodontium.

Other management considerations include any history of associated alcohol or substance abuse (seen in over one-third of patients with depression). Current liver function should be ascertained through the physician before any dental procedures that are likely to induce significant bleeding, such as extractions. In turn, increased vigilance on the part of the dental treatment team is required to detect oral malignancy, which may be associated with the high use of tobacco products in conjunction with alcohol consumption. Among patients taking TCAs, paradoxical hypotensive reactions may occur after use of local anesthetics containing epinephrine. Therefore, care during injection of these drugs is paramount, as is the use of a minimal quantity of epinephrine. Epinephrine-containing retraction cords and hemostatic agents are also contraindicated for patients receiving TCAs or MAOIs.

With sufficient background knowledge of the more common mental illnesses and associated pharmacotherapy, the dental treatment team can provide complete dental care in a safe and compassionate manner. In turn, the dentist and dental staff can contribute to enhancing the patient's self-esteem and can become vital participants in the patient's overall rehabilitation. ♦



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Dr. Clark is one of the presenters at the Pacific Dental Conference, which will be held in Vancouver from March 10–12, 2005. Dr. Clark's session, "The Approach to Dental Care for Patients with Chronic Mental Illness" will be presented on Thursday, March 10.

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Question 3 How do I manage a patient with trigeminal neuralgia?

Trigeminal neuralgia (TGN) is a type of neuropathic pain that is defined by the International Association for the Study of Pain as "a sudden, usually unilateral, severe, brief, stabbing, recurrent pain in the distribution of one or more branches of the fifth cranial nerve." The peak incidence is patients 50–60 years of age; incidence increases with age, and the condition is more prevalent among women. Patients with multiple sclerosis (MS) and hypertension are at greater risk for TGN than the general population.

Managing a patient with TGN requires a comprehensive understanding of the condition. There are no specific diagnostic tests for TGN. Therefore, a detailed history, clinical examination and cranial nerve examination are mandatory, and magnetic resonance imaging (MRI) may be helpful. The clinical characteristics of TGN usually help in the diagnosis. The brief episodes (lasting from a few seconds to less than 2 minutes) are characterized by shock-like "electric" pain of severe intensity, but patients are generally

asymptomatic between episodes. The episodes may occur spontaneously but are usually triggered by normally nonpainful stimuli, such as a light touch, wind contacting the skin or shaving. The maxillary and mandibular divisions of the trigeminal nerve are most often affected, although the ophthalmic division can be affected in 1% to 2% of cases. The pain usually does not cross the midline of the face, but the condition is bilateral in 3% to 5% of patients. TGN may also present entirely intraorally, which poses a diagnostic challenge to clinicians and patients.

The pathophysiology of TGN is not completely understood; however, research indicates that the most likely site for the generation of trigeminal pain is within the nerve itself, at the point called the root entry zone. Evidence suggests that a major causative factor for TGN is compression of the trigeminal nerve root at or near the dorsal root entry, usually by an ectatic basilar artery. Plaques of demyelination at the point of trigeminal nerve entry in the

pons, as seen in MS, are another etiologic factor. TGN is diagnosed in 1% to 5% of patients with MS; in a small proportion of patients with MS, TGN is in fact the first manifestation of the disease. Tumours, usually posterior fossa meningiomas or neuromas, are found in 2% of patients with TGN. In most patients, however, TGN is idiopathic.

The differential diagnosis for TGN is extensive and includes a number of pathological conditions affecting the teeth, temporomandibular joints, sinuses, nose, eyes and neck. Conditions that have considerable similarity to TGN include cluster headache, short-lasting unilateral neuralgiform headache, cracked tooth syndrome, post-herpetic neuralgia and giant-cell arteritis.

Pharmacological Management

Although only a few randomized controlled trials (RCTs) have been conducted, pharmacotherapy is the mainstay of TGN treatment. TGN responds poorly to anti-inflammatory drugs, acetaminophen or opioids. Antiepileptic agents are the main type of drugs used to manage this condition.

Carbamazepine (400 to 2400 mg per day) has been considered the gold standard in TGN treatment, in spite of its side effects (drowsiness, dizziness, nausea, unsteadiness, idiosyncratic hematologic and hepatic effects, potent drug interactions) and the blood level monitoring that is required. The benefits of carbamazepine become evident within hours to days.

Although no RCTs have been published, oxcarbazepine, a newer drug that is a daughter drug of carbamazepine, has been effective in longitudinal studies. This drug seems better tolerated and has fewer side effects and drug interactions. Serum electrolytes must be measured if the patient is receiving high doses. A 300-mg dose is equipotent to 200 mg of carbamazepine.

Other drugs for TGN that have been tested in RCTs include baclofen, L-baclofen, dextromethorphan, lamotrigine, pimozone, proparacaine, tizanidine, tocainide and topiramate. Drugs that have been used for TGN and described in case reports (with no controls) include capsaicin, clonazepam, gabapentin, phenytoin and valproic acid. Baclofen or lamotrigine can be considered if the side effects of carbamazepine are intolerable. Gabapentin has been effective in other types of neuropathic pain and can also be considered in this situation. However, dextromethorphan, pimozone, tizanidine, tocainide and topiramate are either ineffective or have unacceptable side effects. The evidence for use of topical agents (clonazepam, phenytoin and valproic acid) is poor.

Surgical Treatment

It may be unnecessary to consider surgery if pain control is good and the side effects of medication can be tolerated

by the patients. Unfortunately, little information is available to clinicians and patients on when to consider surgery. If pharmacological treatment fails (which occurs in approximately 30% of cases) or there is an obvious structural etiologic factor (e.g., brain tumour), surgical management, through appropriate referral to a neurosurgeon, is required. Surgical options include peripheral nerve block (by mechanical, thermal or chemical means), surgery at the gasserian ganglion (e.g., percutaneous radiofrequency rhizotomy), surgery at the posterior fossa (e.g., microvascular decompression and partial rhizotomy) and gamma knife radiosurgery.

Summary

A primary focus of general dental practice is diagnosis and treatment of trigeminal pain. There are numerous types of trigeminal neuropathic pain of nondental origin that a dental practitioner must understand, including TGN. An understanding of the causes, pathophysiology, clinical manifestations and available treatment options for this type of pain will allow appropriate referral and treatment. Referral to a family doctor, neurologist or another dental practitioner with speciality training in orofacial pain for further assessment and management is recommended whenever definitive diagnosis of orofacial pain cannot be made by the dentist. ♦

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Question 4 Is it true that facial pain may be the initial presenting symptom in a patient with cancer of the lung?

Unilateral orofacial pain may be the result of numerous conditions, including migraine headaches, cluster headaches, chronic paroxysmal hemicrania, facial herpes zoster, glossopharyngeal neuralgia, giant-cell arteritis, trigeminal neuralgia (TGN), sinus disease, temporomandibular joint disorders (TMD), dental decay, dental abscess, fractured or cracked tooth, and metastatic diseases of the head and neck. When a diagnosis cannot be made, the pain is usually referred to as atypical facial pain.

Although not typically considered, lung cancer must be included in the differential diagnosis of unilateral facial pain in any patient who is a smoker or former heavy smoker. Pain associated with lung cancer has been reported to usually occur in or around the ear, in the jaws or in the temporal region. It has been described as sharp, intermittent, burning, shooting, throbbing, severe and debilitating. Because the pain is unilateral, it may be confused with TGN. However, TGN episodes are shorter and generally resolve with the appropriate anticonvulsant medications. Another difference is that the pain of TGN is often evoked by a stimulus (e.g. simple touch, shaving, brushing teeth), whereas the pain associated with lung cancer is in most cases continuous. It is thought that a lung mass adjacent to or infiltrating the vagus nerve can refer pain to the area of the ipsilateral ear through the convergence of general somatic and visceral afferent nerves in the medulla. The general visceral signals can also cause vague ipsilateral facial pain via convergence at the level of the descending nucleus of the trigeminal system.

Diagnostic Approach

A patient presents in your office with a chief complaint of moderate to severe pain on one side of the head, concentrated around the temporomandibular joint as well as the ear and temporal area. First, rule out any dental causes for the pain (e.g., dental abscess, dental decay). Next, rule out TMD factors (intracapsular and extracapsular disorders). Neurology and otolaryngology consultations may be required to rule out primary headache disorders, giant-cell arteritis, neuropathic pain disorders and sinus disease. Magnetic resonance imaging would be considered to rule out conditions such as acoustic neuroma.

When a definitive diagnosis cannot be made, investigations for lung cancer should be undertaken, especially if the patient has a high risk of cancer (e.g., substantial smoking history). Several publications have now identified referral of pain to the face in association with lung cancer. The facial pain often manifests 6 to 9 months before the lung cancer is diagnosed. Once the lung cancer has been diagnosed,

removal of the lesion by resection or radiation therapy has resulted in complete resolution of the facial pain. **Figure 1** is a chest radiograph of a patient with lung cancer.

Summary

In summary, although unilateral facial pain in the temporal or auricular regions (or both) may be associated with a variety of conditions, clinicians must be astute in ruling out the possibility of lung cancer. They should pay particular attention to pain that has been previously identified as facial pain of unknown cause in a patient with a history of smoking or exposure to secondhand smoke or other airborne carcinogens. These patients should undergo chest radiography as part of their assessment. Through its early presentation as unilateral severe facial pain, lung cancer could be diagnosed in a more timely manner, which might result in a more favourable long-term prognosis. ♦



Figure 1: Cancer of the lung discovered on a chest radiograph.

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