

Point of Care



This month's responses for the Point of Care section of JCDA were provided by speakers at the 2004 Pacific Dental Conference, presented in partnership with the Canadian Dental Association. The conference will take place in Vancouver, B.C., from March 4 to 6. For more information visit www.pacificdentalonline.com.

Question 1 Can you suggest some effective over-the-counter treatments for oral ulcerations?

Background to the Problem

There are many causes of ulcerations, a common condition in the oral cavity. The main etiologic factors are trauma, vesicular disease, immunologic factors (recurrent aphthae, bullous disease), hypersensitivity, leucopenia (secondary to immunosuppression, drug-induced toxicities), radiation, microbiological agents and neoplasms.

The most important initial step in the management of oral ulceration is an accurate diagnosis. This often requires the patient to undergo a range of diagnostic tests. For a number of conditions, prescription medications will be necessary; for others, time is the healer.

A number of over-the-counter (OTC) products can provide effective pain relief, providing an inexpensive and effective means of palliation during the time period before a definitive diagnosis can be reached or until the lesion heals by itself. These OTC products must only be considered to provide palliation. If an ulcer doesn't heal within 2 weeks, a definitive diagnosis must be sought.

Management with OTC Products

OTC products for oral ulcerations can either be applied locally or used in the form of mouthwashes. Products applied directly can be classified as covering agents, local anesthetics, oxygenating agents, or cauteries and antiseptics.

Examples of these products include:

- covering agents
OraGard B, Orabase and Orabase Soothe-N-Seal (Colgate Oral Pharmaceuticals; **Figs. 1 and 2**) and Zilactin (Zila Pharmaceutical)
- local anesthetics
Orabase-B (with benzocaine 20%) and Zilactin-B (with benzocaine 10%).
Other products with benzocaine as the active ingredient: Anbesol Liquid Maximum Strength and Anbesol Extra Strength Gel from Whitehall-Robbins (benzocaine



Figure 1: Oral ulceration before application of over-the-counter product.



Figure 2: Oral ulceration 10 minutes after application of Orabase Soothe-N-Seal.

20%), Anbesol Liquid (benzocaine 6.4%), Anbesol Gel (benzocaine 6.4%), Orajel Mouth Sore (Del Pharmaceuticals), Kank-A (Blistex Inc.) and Hurriceine Liquid and Gel (Beutlich Pharmaceuticals).

- oxygenating agents (with hydrogen peroxide)
Peroxyl Mouthrinse (Colgate Oral Pharmaceuticals)
- cauteries and antiseptics
Ora-5 (Premier Dental Products), available through a dental supplier or an 800 number
- mouthrinses (good when condition is multifocal)
Biotene Mouthwash (Laclede)
Orajel Perioseptic (Del Pharmaceuticals)
Amosan (Oral-B)

A mouthwash can also be created by mixing 2 OTC products such as diphenhydramine hydrochloride syrup (4 oz) and Kaopectate Liquid (12 oz; Pfizer) or Maalox suspension (12 oz; Novartis Consumer Health Canada Inc.). ♦



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Dr. Carpenter's seminar "Oral Pathology: Lesions of the Oral Mucosa" will be presented on Friday, March 5.

Suggested Reading

Carpenter WM, Silverman S Jr. Over-the-counter products for oral ulcerations. *J Calif Dent Assoc* 1998; 26(3):199-201.

Question 2 What is the relationship between abrasion, erosion and dentin hypersensitivity?

Background to the Problem

Dentin hypersensitivity has been described as an enigma — commonly occurring yet poorly understood. The condition is characterized by a short, sharp pain arising from exposed dentin in response to stimuli typically thermal, evaporative, tactile, osmotic or chemical and which cannot be ascribed to any other form of dental defect or disease.¹ Incorrect or aggressive tooth-brushing is most frequently identified as the cause of exposed dentin and resulting tooth surface loss, and thus an important causative factor for dentin hypersensitivity. An educational needs assessment study of Canadian dental professionals demonstrated that only 7% of dentists and 5% of hygienists identified erosion as the primary cause of dentin hypersensitivity, while 85% and 94% respectively cited toothbrush abrasion as a reason for dentin tubule exposure.¹

Two processes must occur for the development of dentin hypersensitivity: dentin must first become exposed, through either loss of enamel or gingival recession, and the dentin tubules must be open to both the oral cavity and the pulp.

Erosion² (loss of hard tissue by chemical action), abrasion (loss of hard tissue by physical action other than tooth-to-tooth contact) and their co-effect are very common causes of enamel and dentin surface loss leading to exposure of dentin tubules, especially at the buccocervical region (Fig. 1).³ Enamel is resistant to abrasion by tooth-brushing, with or without toothpaste, but is particularly sensitive to the effects of acid.⁴ Brushing acid-softened enamel has a much increased abrasive effect. Therefore, it is critically important to consider erosive influences (diet or gastric acid) as well as abrasive factors in the etiology and management of dentin hypersensitivity. Carbonated beverages and citrus juices are the common suspects in an erosive diet, but items such as red wine (pH 2.6), white wine (pH 2.3) and yogurt (pH 3.3) should not escape scrutiny as they readily remove the smear layer after a few minutes of exposure.⁵

Management of the Problem

Failure to consider causation in the management of dentin hypersensitivity may result in failure of treatment. All etiological and predisposing factors, particularly related to erosion and abrasion, must be investigated. Consideration should be given to obtaining a detailed, written dietary history in order to identify acidic foods and beverages. Oral hygiene habits — frequency, duration and timing, especially in relation to acid exposures, and brushing technique and force — and the appearance of the brush when it is changed should be taken into account.



Figure 1: Patient shows signs of generalized gingival recession exposing significant amounts of dentin. The exposed dentin demonstrates the typical effects of surface loss due to both erosion and abrasion.

Elimination or modification of these factors should be the principal aim of management.⁶ Dietary advice should minimize erosion and oral hygiene instruction should minimize abrasion. Opportunities for their co-effect should be avoided by ensuring that all abrasive influences, such as tooth-brushing, occur before any tooth-softening effects of erosion, i.e., tooth-brushing should occur before meals rather than after, and in any event, not within 2 to 3 hours of acid intake. In its Consensus-based Recommendations for the Diagnosis and Management of Dentin Hypersensitivity,¹ the Canadian Advisory Board on Dentin Hypersensitivity recommends tooth-brushing remote from mealtimes and avoiding overly frequent or aggressive tooth-brushing to modify or remove predisposing factors. Depending on the severity and extent of the condition, reversible procedures (such as desensitizing toothpastes) should be employed before nonreversible procedures (such as resins). ♦



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Dr. Addy's seminar "Dentin Hypersensitivity: A Toothwear Phenomenon?" will be presented on Thursday, March 4.

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1. Canadian Advisory Board on Dentin Hypersensitivity. Consensus-based recommendations for the diagnosis and management of dentin hypersensitivity. *J Can Dent Assoc* 2003; 69(4):221–6.
2. Braem M, Lambrechts P, Vanderle G. Stress-induced cervical lesions. *J Prosthet Dent* 1992; 67(5):718–22.
3. Davis WB, Winter PJ. The effect of abrasion on enamel and dentine and exposure to dietary acid. *Br Dent J* 1980; 148(11-12):253–6.
4. Addy M, Absi EG, Adams D. Dentine hypersensitivity. The effects in-vitro of acids and dietary substances on root-planed and burred dentine. *J Clin Periodontol* 1987; 14:274–9.
5. Addy M. Dentine hypersensitivity: new perspectives on an old problem. *Int Dent J* 2002; 5:367–75.

Question 3 Why does incomplete anesthesia occur following an inferior alveolar nerve block?

Incomplete anesthesia creates painful experiences for patients and increases stress and frustration for clinicians. The incidence for incomplete anesthesia following an inferior alveolar nerve block (IANB) is reported to be 15%.¹

Skeletal anatomy plays an important role in a clinician's ability to find a bony landmark for the IANB. The external and internal oblique ridges on the ramus help to determine the location of the IAN and the entry point of the needle. Unfortunately, the shape of the internal oblique ridge varies such that, if very wide, it becomes difficult to negotiate the needle around the plate of bone. The location of the mandibular foramen (the entry point of the IAN into the mandible) also varies. Both of these anatomical factors can lead to missed blocks and incomplete anesthesia.

Unusual neuroanatomy can also affect the ability to obtain profound anesthesia. Accessory nerves can innervate the dentition from different locations arising from the IAN or the mylohyoid nerve.²

One solution to these anomalies is to use a higher block such as the Gow-Gates injection, which is likely to overcome these anatomical anomalies.

A second factor that can contribute to incomplete anesthesia is the needle. The average depth for the IANB is 25 mm. With a short needle (also 25 mm), an injection to the hub is required. If the patient is larger than average, a deeper injection is required. Some clinicians are uncomfortable with this, because of the taboo associated with injecting to or beyond the hub. A deeper injection may cause a loss of orientation of angle and depth, but this can be avoided with the use of long needles (35 mm).

Some clinicians use 30-gauge needles for their blocks. If success is not satisfactory, a 25-gauge needle can be used to increase the stability of the needle. Needles deflect when inserted into tissue. A 30-gauge needle might deflect as much as 4 mm from the straight line, whereas a 25-gauge needle only deflects 1 mm when inserted to a depth of 25 mm.^{3,4} Another issue with respect to needle gauge is aspiration. The 25-gauge needles are more reliable aspirators. Both 30- and 27-gauge needles might be in the middle of a vessel and not yield a positive aspiration when the aspirating ring is depressed. Obviously, an intravascular injection will result in no anesthesia.

Patients who are the most difficult to anesthetize are sometimes least cooperative because of past negative dental experiences. Pain experienced by virtue of being difficult to anesthetize creates anxiety. When these patients are asked to open their mouths, they exhibit a very small freeway space that makes finding a landmark and visualizing the pterygomandibular area impossible. Also, when some of

these patients feel the initial needle prick, they instinctively close their mouth, which increases the difficulty of the injection. It is important for the clinician to elicit cooperation from these patients. Phrases such as "Please point your chin up and open your mouth wide — it will really help the freezing work" may help. Other options include oral sedation or nitrous oxide with oxygen sedation.

Local anesthetic and vasoconstrictor molecules are sensitive over time to light, temperature extremes and oxygen. Incorrect storage can lead to degradation of the contents of the cartridge before the expiry date. This will obviously lead to incomplete anesthesia. Clinicians should store local anesthetics at room temperature and away from light, and should not stockpile supply.

The final factor to be considered is the environmental pH into which the anesthetic is being injected. An acidic environment is an unfavourable one for the lipid soluble molecules of the local anesthetic, as fewer local anesthetic molecules will enter the nerve. There are 2 situations where the pH of the tissues can become more acidic. The first is infection. The second is injection with a local anesthetic with vasoconstrictor that is by nature acidic. Enough of this acidic solution can actually decrease the number of anesthetic molecules able to cross the lipid membrane of the nerve, therefore decreasing the anesthetic's effectiveness. To avoid this problem, the clinician can use solutions without vasoconstrictor in areas of infection, or after 1 or 2 cartridges of vasoconstrictor-containing solution have been used and there is still a need for more anesthetic. ♦



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Dr. Isen's seminar "Advanced Local Anesthesia" will be presented on Thursday, March 4.

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1. Kaufman E, Weinstein P, Milgrom P. Difficulties in achieving local anesthesia. *J Am Dent Assoc* 1984; 108(2):205–8.
2. Roda RS, Blanton PL. The anatomy of local anesthesia. *Quintessence Int* 1994; 25(1):27–38.
3. Aldous J. Needle deflection, a factor in the administration of local anesthetics. *JADA* 1968; 77(3):602–4.
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Further Reading

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- Malamed S. Handbook of local anesthesia. 4th ed. St. Louis: Mosby; 1997.

Question 4 Is it safe to provide dental treatment during pregnancy?

Background to the Issue

A recent European study indicated that only 55% of dentists felt they were sufficiently informed about treating pregnant patients.¹ While the postpartum period is the absolute safest time to provide treatment, emergency dental treatment can be provided at any time during pregnancy as long as adequate precautions and care are taken. Under most circumstances, emergency treatment consisting of restorations, endodontic treatment and extractions can be performed.

For elective treatment, the preferred timing of treatment is the second trimester. During the latter part of the third trimester, the patient may find it uncomfortable to be in the supine position in the dental chair, because of pressure of the fetus on the vena cava. Dentists are advised not to perform elective dental treatment during the first trimester when fetal organs are developing.

Maintaining good oral hygiene is very important during pregnancy because of the increased risk of developing gingivitis secondary to local factors and altered blood hormone levels (Fig. 1). Hygiene appointments should be scheduled in each trimester of pregnancy. For most patients with normal pregnancy, there is no contraindication to routine scaling and polishing. If there are signs of a problem pregnancy, dentists are advised to consult with the medical professional caring for the patient during pregnancy before initiating this type of treatment.

Specific Management Advice

Dentists caring for pregnant patients should consider the following:

- There is no best or worst time of day to schedule an appointment for a pregnant patient. The time when the patient feels most comfortable is the best guide to scheduling.
- There is no contraindication to taking a prudent number of radiographs to aid in the diagnosis and treatment of specific oral problems during pregnancy. Naturally, the patient should wear a lead apron, the beam should be properly collimated and high-speed film should be used.
- Medications should be kept to a minimum during pregnancy. Most of the medications administered by dentists pose no threat to the fetus. Tetracyclines (including doxycycline) must not be administered during pregnancy. Aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) are contraindicated during the third trimester. Dentists are advised to prescribe



Figure 1 : Severe gingivitis in pregnant patient.

acetaminophen for minor pain during pregnancy. For more severe pain, a narcotic analgesic such as acetaminophen with codeine may be given in minimal doses, especially in the first trimester.

- During the third trimester, it is advisable to keep the dental chair in a semi-reclined position, to avoid the “supine hypotension syndrome” (which may cause the patient to lose consciousness) due to pressure of the gravid uterus on the vena cava. If this problem does arise, gently turn the patient on her left side.
- Finally, if you have any doubts or concerns about any aspect of treating the pregnant patient, don't hesitate to contact her attending physician. ♦



Dr. Barbara Steinberg is clinical professor of surgery at Drexel University College of Medicine, Philadelphia, Pennsylvania.

Dr. Steinberg will be presenting 2 seminars on March 4 (“Dental and Medical Considerations in Treating the Premenopausal Female Patient” and “Dental and Medical Considerations in Treating the Mature Female Patients”) and 1 seminar on March 5 (“Indications for Antibiotic Prophylaxis”).

Reference

1. Pistorius J, Kraft J, Willerhausen B. Dental treatment concepts for pregnant patients — results of a survey. *Eur J Med Res* 2003; 8(6):241–6.

Further Reading

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The responses for the Point of Care 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.