

# JCDA

October 2006, Vol. 72, No. 8

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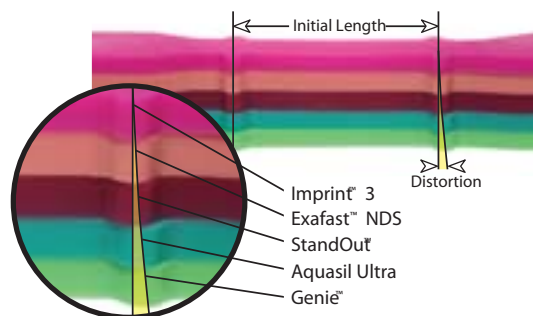
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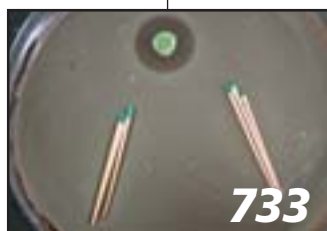
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Dr. John P. O'Keefe

“Working to nurture the active involvement of dental students in our profession is a prime example of an investment in the future.”

## Spread Your Wings with Us

A heartwarming communication from a respected colleague is a great way to start the workday. Dr. Ajit Auluck of Mangalore, India, made my day recently with a delightful email message describing his excitement at being contacted for advice by a dental patient in California who had read his article in the online version of *JCDA*.

Commenting on how impressed he was with the publication's global reach and that it is read by the profession and public alike, Dr. Auluck added that interested dental students ought to be lining up to publish articles in *JCDA*. He felt that publishing in *JCDA* had certainly helped him to “spread his wings.” He was speaking from experience, as earlier this year he was invited to present at an international conference in Vienna as a result of an Austrian surgeon reading another article of his in *JCDA*.

Dr. Auluck, who has just completed a master's degree focusing on oral medicine, is representative of the new breed of global *JCDA* author. Since we started publishing author photos with our articles, I have often been impressed by the youthfulness of the contributors and their impressive academic qualifications. I also find it encouraging that our authors come from so many different cultural backgrounds.

Youth and diversity are certainly well-represented among the participants in this year's CDA/Dentsply Student Clinician Program, which is featured prominently in this edition of *JCDA*. Reading the abstracts from this long-established student research competition reveals just how pertinent these research projects are to everyday clinical practice. Based on this evidence, I would certainly hope that many of these students, working closely with their teachers, will be lining up to submit their work to *JCDA*.

The research findings of Susan Conrod, the competition winner, certainly have a potential impact on virtually every dental office in Canada. Although her results were based on a small sample, the recommendation to sterilize all new burs and endodontic files before use, and to perhaps consider them as single-use instruments unless more rigorous sterilization procedures can be devised, gives me pause for thought. Finding the pragmatic balance between patient safety and practice efficiency can never be far from the mind of all practitioners.

After the competition, I had an opportunity to chat with Susan (who comes from a well-known Nova Scotia dental family) about her project, life as a dental student at Dalhousie University, and her future career aspirations to become an oral and maxillofacial surgeon. Obviously well tutored at home and in school, my impression was that of a future leader of our profession in the making. I feel very thankful to the Canadian Dental Association and Dentsply that such young leaders can meet and network with peers and other members of our profession through this competition.

With its goal to increase student involvement in the advancement of the dental profession, the competition is a great example of our Association, in collaboration with a valued industry partner and Canada's dental schools, investing in the long-term health of our profession. When I am asked what CDA does for members, I believe the answer is “lots,” but often in silent ways over a long period of time. Working in partnership to nurture the active involvement of dental students in our profession is a prime example of such an investment in the future.

Ajit Auluck and Susan Conrod come from different parts of the world, but they have both contributed to and benefited from CDA. I thank them and their young colleagues for their commitment to our profession. The more colleagues that actively engage with our institutions, the richer will be our profession and the public we are privileged to serve. Spreading our wings together, ignoring all boundaries, we can soar to great heights as a profession.

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1. Panagakos FS, et al. *J Clin Dent*. 2005;16(suppl):S1-S19. 2. Davies RM, et al. *J Clin Periodontol*. 2004;31:1029-1033. 3. Gaffar A, et al. *J Clin Periodontol*. 1995;22:480-484. 4. Scannapieco FA. *Compendium*. 2004;25(suppl 1):S16-S25. 5. Gaffar A, et al. *Compendium*. 2004;25(suppl 1):S4-S6. 6. Colgate Web site. Available at: <http://www.colgate.com/app/ColgateTotal/US/EN/HomePage.cvsp>. Accessed April 24, 2006. 7. Amornchat C, et al. *Mahidol Dent J*. 2004;24:103-111. 8. Modéer T, et al. *J Clin Periodontol*. 1996;23:927-933. 9. Fine D, et al. Clinical antimicrobial efficacy of the triclosan/copolymer dentifrice on oral microorganisms. Paper presented at: IADR Annual Meeting, March 8-11, 2006; Orlando, Fla.



Dr. Wayne Halstrom

“Individual efforts alone do not achieve results.”

## To Whom Should We Pay Homage?

Each year as Thanksgiving comes around, we take time to review, reflect and pay tribute. This year my celebrations included a special recognition of the talented and dedicated dentists who have preceded me in the service of our profession.

We in dentistry can be thankful that the results of our labours afford us a comfortable lifestyle and personal satisfaction. Our profession can also be proud that Canadians currently enjoy one of the highest standards of oral health and oral health care in the world.

How did these phenomena occur? I believe we owe much of it to good collective management within the profession, the much-needed foundation that allows us to work toward the goal of optimal oral health for all Canadians, the mission statement of CDA.

In the 10 years that I have spent working in the service of organized dentistry, at both the provincial and national levels, I have yet to meet a committee volunteer, a member of the Board of Directors or an officer who is involved for personal aggrandizement. Such positions come with their fair share of demands, including constant emails, late-night phone calls and time spent away from family and the practice. These are people to whom we must pay homage.

Every level of organized dentistry operates to the best of its ability on long-term strategic plans and the knowledge-based decision-making process. If things do not always proceed as planned, you can be sure that due diligence and the best of intentions have guided the efforts of decision-makers.

One truism strikes me as particularly pertinent — individual efforts alone do not achieve results. It is the spirit of cooperation and collaboration between the national body and the provincial associations that has elevated dentistry to the position it holds in the community

today. For the past 104 years, these collective efforts have been a work in progress, always aiming to improve the oral health of the public while also achieving significant rewards for Canadian dentists.

During the past century, the profession has evolved to keep pace with the times and retain focus. However, at no time has there been a need to tear down the palace. There are some forces at work today that advocate the destruction of the system from which we have all benefited. My advice? Beware the false prophet, stay the course and make improvements within a tried, tested and true formula.

A great example of the national and provincial bodies working together to produce great results took place in August. Along with more than 1,000 fellow dentists, I headed east to St. John's to attend CDA's Annual Convention. Co-sponsored by CDA and the Newfoundland and Labrador Dental Association (NLDA), this meeting was a watershed occasion for the dentists of Canada.

If you were unable to attend, you really missed one! Newfoundland is a very special place — stark yet beautiful, hard but yielding, demanding yet kind to its citizens. Folks there are polite, considerate, always ready to help and imbued with an immense sense of humour. In other words, they are the consummate hosts.

The undertaking was enormous, accomplished with typical Newfoundland flourish. It had been over 30 years since the last national convention was held on the Rock. Given the outstanding accomplishment of this event, I am confident that we will not wait that long again before the dentists of Canada once again convene so close to the Grand Banks.

While in St. John's, it became clear to me that the gathering of colleagues from across the country to share learning and social time is an essential element of who we are as a profession. The convention organizing committee, along with the entire NLDA staff and elected officials, take their place among those to whom we should pay homage.

As you celebrated Thanksgiving, I hope you took a moment to acknowledge how lucky we truly are and to recognize the significant role that others before and among us play in our profession's collective success.

Wayne Halstrom, BA, DDS  
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†Brush, floss, rinse

‡Whole-mouth mean plaque index (PI) scores

§Whole-mouth mean modified gingival index (MGI) scores

¶A randomized, 6-month, controlled, observer-blind, parallel-group clinical trial conducted according to ADA Guidelines; n=237 healthy subjects with mild-to-moderate gingivitis evaluable at both 3 and 6 months. Subjects rinsed twice daily for 30 seconds with 20 mL at least 4 hours apart. Based on home use.

\*\*In a survey of 1000 adult Canadians, selected to be representative of the Canadian population.

††Rinse full strength with 20 mL for 30 seconds twice a day.

1. Sharma, NC, et al. Adjunctive benefit of an essential oil-containing mouthrinse in reducing plaque and gingivitis in patients who brush and floss regularly: A six-month study. *JADA* 2004 April;135:496-504. 2. Oliver, RC et al. Periodontal diseases in the United States population. *J Periodontol* 1998 February; 69(2): 269-78. 3. Ipsos Mouthwash Omnibus Study for Pfizer. December 20, 2001.

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# National Survey on Publicly Financed Dental Care

Canada's dental care system functions well, arguably meeting the needs of most Canadians. Recent surveys have confirmed that a large majority of Canadians report their oral health as good to excellent, and that most readily access dental care through private insurance or personal financing.<sup>1-3</sup>

Yet inequalities in oral health and access to care remain, increasingly garnering the attention of dental professional groups and others. This is not surprising as public financing for dental care has been in decline since its apex in the early 1980s.

But how does Canada reasonably publicly insure for diseases that are largely preventable, yet still cause tremendous suffering among the socially marginalized? This is a complicated policy (if not economic) question, and one that is becoming more relevant now that governments appear to be responding to the professional calls for equity.

Consider that after several years of focused lobbying, dental professional groups played a key role in the establishment of the Office of the Chief Dental Officer at the federal level and in the new public financing initiatives currently coming online in select provinces.

To establish a knowledge base for any potential public dental health care reform, the Community Dental Health Services Research Unit at the University of Toronto is conducting a series of studies on publicly financed dental care, the most significant being a survey of dentists' opinions on such care.

Some dentists may have already received this national survey. We kindly ask that you complete and return the survey in the postage-paid envelope provided. Your input is crucial for the completion of this

research and in helping to shape future government policy.

We hope that you will participate and find this effort worthwhile. Simply put, you can help to improve, for both provider and patient, dental care delivered through public financing.

*Dr. Carlos R. Quiñonez*

*Dr. David Locker*

*Community Dental Health Services*

*Research Unit*

*Faculty of dentistry, University of Toronto  
Toronto, Ontario*

**To request a copy of the survey, please email  
[carlos.quinonez@utoronto.ca](mailto:carlos.quinonez@utoronto.ca).**

## References

- Locker D, Matear D. Oral disorders, systemic health, well-being and the quality of life. Toronto: Community Health Services Research Unit, 2000.
- Statistics Canada. Canadian Community Health Survey. Ottawa: Health Division, Health Reports, 2003.
- Statistics Canada, Centers for Disease Control. Joint Canada/United States Survey of Health. Ottawa: Statistics Canada, Health Analysis and Measurements Group, 2003.

## CDA Supports National Survey

Canada's Committee on Clinical and Scientific Affairs consists of 6 volunteer members with knowledge and understanding of clinical and scientific affairs. The Committee advises and reports to CDA's Board of Directors.

The Committee had the opportunity to review Drs. Quiñonez and Locker's proposal for a survey of dentists' opinions concerning publicly financed dental care. We believe the proposed research project will contribute valuable information to the knowledge base surrounding this issue.

We encourage full participation in this national survey as it is important that the opinions of Canadian dentists are well under-

stood by all of those concerned with the financing of dental care.

*Dr. Robert E. Hallett*

*Chair*

*CDA Committee on Clinical and  
Scientific Affairs*

## Nerve Injuries After Dental Treatment

We enjoyed the review article by Smith and Lung<sup>1</sup> on nerve injuries as a potential complication following injection of local anesthetic. Recently, we were involved in the management of a patient who experienced an ophthalmologic complication resulting from local anesthetic injection.

A 58-year-old man presented for implant surgery in the right maxilla. He denied any significant past medical history. Eight months prior, he had a right maxillary sinus lift performed without complication. At the time of surgery, 3.4 mL of 4% articaine with 1/100,000 epinephrine were given with a 27-gauge needle on an aspirating syringe, 1.7 mL to anesthetize the posterior superior alveolar nerve (PSA), 1.3 mL for regional infiltration of the mucosa



**Figure 1:** Lateral rectus paresis of right eye. When asked to direct his gaze to the right, the patient was unable to abduct his right eye.



**Figure 2:** Resolution of lateral rectus paresis. The patient was able to direct his gaze to the right and to abduct his right eye.

Continued on p. 687

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and 0.4 mL for palatal infiltration. The implant surgery proceeded without complication and was completed in approximately 30 minutes. At the conclusion of surgery, the patient complained of double vision. He exhibited signs of lateral rectus paresis of the right eye, but neither light perception nor pupil reflexes were affected (**Fig. 1**). After about 2 hours, the diplopia resolved with full recovery of lateral rectus function the following day (**Fig. 2**).

Complications associated with dental injection are infrequent and ophthalmologic complications are relatively rare, with an estimated incidence of less than 0.1% of PSA blocks.<sup>2</sup> Several possible mechanisms have been proposed to explain transient diplopia associated with the injection of local anesthetic. Retrograde spread of anesthetic from the pterygoid venous plexus to the

cavernous sinus has been proposed. Here, the location of the abducens nerve in the cavernous sinus places it in close contact with the venous blood and at risk to the effects of the anesthetic. Spread of anesthetic via the communications between the pterygopalatine canal, pterygopalatine fossa and infraorbital fissure is also possible. It has also been suggested that a defect in the bony cavity of the maxillary sinus may permit diffusion of anesthetic into the orbit.<sup>3</sup>

Although any of the proposed mechanisms may have accounted for the diplopia, it is unlikely that direct vascular spread was responsible. There was no evidence of vascular injection nor did the patient develop diplopia immediately. Instead, the patient developed diplopia several minutes after the anesthetic was given, which supports the concept

of anesthetic diffusion toward the abducens nerve.

Interestingly, articaine reportedly has better bone diffusion than other local anesthetics. Iatrogenic lateral rectus paresis and diplopia as a result of dental injection is a possibility. The patient should be reassured that a good prognosis is expected and that the symptoms will resolve within a couple of hours. If resolution does not occur in the expected time frame, an urgent ophthalmologic consultation is warranted.

*Dr. Maico Melo*

*Dr. George Obeid*

*Department of Oral and Maxillofacial Surgery*

*Washington Hospital Center*

*Washington, D.C.*

#### References

1. Smith MH, Lung KE. Nerve injuries after dental injection: a review of the literature. *J Can Dent Assoc* 2006; 72(6):559-64.

Continued on p. 689





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2. Penarrocha-Diago M, Sanchis-Bielsa JM. Ophthalmologic complications after intra-oral local anesthesia with articaine. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; 90(1):21-4.

3. Petrelli A, Steller RE. Medial rectus muscle palsy after dental anesthesia. *Am J Ophthalmol* 1980; 90(3):422-4.

### National Network of Libraries Would Benefit Dentists

Sir Muir Gray, director of the National Electronic Library for Health (UK), recently pointed out in *CMAJ* that “not only do people in developed countries, patients and health care professionals alike, need clear knowledge, they have a right to that knowledge.”<sup>1</sup> He was referring to the fact that Canada, renowned for its leadership in evidence-based health care, does not have a national library of medicine, much less a coordinated national approach for getting the best evidence into the hands of practitioners.

The Canadian Health Libraries Association has proposed a National Network of Libraries for Health ([www.chla-absc.ca/nnlh](http://www.chla-absc.ca/nnlh)) that would allow for coordinated, centralized access to evidence-based knowledge, as well as support by librarians, to all health care providers, researchers and policy makers, regardless of their location or institutional affiliation. This network would capitalize on existing resources and networks within the Canadian health library community and help fill the service and resource gaps.<sup>2</sup> Dentists would benefit from such a network and the CDA Resource Centre would have an important role as part of the network.

While many dentists enjoy library services through an affiliation with a university, hospital or association, others have no library support. All health care professionals, including dentists, would

benefit from a coordination of the many library services and resources that currently exist as well as the development of new resources that a network could provide (such as a clinical question answering service or knowledge translation services).

Surely it is time for Canada to develop a coordinated approach to accessing knowledge and evidence for health care decision-making. We would welcome your support.

Jessie McGowan

Patrick Ellis

Co-chairs, Task Force for the National Network of Libraries for Health  
Canadian Health Libraries Association  
Toronto, Ontario

### References

1. Muir Gray JA. Canadian clinicians and patients need clean, clear knowledge. *CMAJ* 2006; 175(2):129, 131.
2. McGowan J, Straus SE, Tugwell P. Canada urgently needs a national network of libraries to access evidence. *Healthc Q* 2006; 9(1):72-4, 4.



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## Dalhousie Student Wins Student Clinician Program

The 2006 CDA/Dentsply Student Clinician Program took place on August 25 in St. John's, Newfoundland, in conjunction with the CDA Annual Convention.

This national clinical research competition is open to 1 dental student from each accredited dental school in Canada. It is designed to stimulate ideas, improve communication and increase student involvement in the advancement of the dental profession.

The program is an excellent opportunity for dental students to display their research skills in a national forum. Student clinicians provide a brief presentation of their research table clinic to a panel of qualified judges, and winners are selected on a total points basis.

This year, first prize was awarded to Susan Conrod from Dalhousie University for her research project on the effectiveness of routine sterilization procedures of dental burs and endo files. As part of her award, Ms. Conrod will present her research project at the 2006 American Dental Association Annual Session in Las Vegas, Nevada.

Second prize, consisting of a \$1,000 cash award, went to Somayeh Nourian of the University of Toronto for her research project on the accuracy of fit of frameworks for implant-supported fixed prostheses.

"The CDA Convention is a great venue for a national competition, as it allows us to interact with students from other universities and compare educational experiences and career ambitions," notes Ms. Conrod. "I also appreciated the opportunity to meet with dentists and hear their perspectives on the project I was presenting."

Ms. Conrod feels that the program is a meaningful way to recognize students as part of the profession: "Students are treated as professionals and we begin to realize that we have gained the knowledge and skills required to play an important role in health care."

Now in its 36th year of existence in Canada, the Student Clinician Program was once again sponsored by Dentsply International and managed by CDA. Dentsply generously provides the prizes along with the airfare and travel expenses to the conference for the qualifying students.

"The Student Clinician Program is a shining example of Dentsply's corporate philanthropy on behalf of organized dentistry and dental education," says George Rhodes, vice-president of professional relations and corporate communications for Dentsply International.

"Dental schools will play a significant role in the future of clinical and applied oral health research as they conduct such research and serve as training grounds for future investigators," he continues. "That is why Dentsply is proud to be part of a winning program that helps to make an important contribution to continued research."

Dentsply currently sponsors 16 national student clinician programs open to dental students in 35 countries. "We have found success over the years in returning a portion of our earnings to outstanding programs like this one, that help to enhance the future of dentistry," explains Mr. Rhodes.

During the awards gala held for this year's student clinicians in St. John's, the Canadian section of the Pierre Fauchard Academy presented each student with a scholarship recognizing their special efforts in the advancement of dental education over and above their academic careers.

**"THE CDA CONVENTION IS A GREAT VENUE FOR A NATIONAL COMPETITION, AS IT ALLOWS US TO COMPARE EDUCATIONAL EXPERIENCES AND CAREER AMBITIONS," NOTES MS. CONROD, THE COMPETITION WINNER.**

[Read the students' abstracts](#) ▶

JCDA is pleased to publish condensed versions of the abstracts submitted for the CDA/Dentsply 2006 Student Clinician Program. To qualify, the study must fall under the categories of “clinical application and techniques” or “basic science and research.” Students must identify the purpose of the study, provide background information, outline how the study was conducted, and report on the results of the study and its possible significance. The student, selected by his or her own faculty, must be an undergraduate at the time of the presentation, as well as a member of CDA. Nine dental schools participated in the competition this year.

**1st Place** **Dental burs and endo files: are routine sterilization procedures effective?**

By Susan Conrod, Dalhousie University

Disease transmission by indirect contact occurs when dental instruments contaminated by 1 patient are reused on another without sterilization. The purpose of this study was to devise a sterilization protocol for endodontic files and dental burs, which because of their miniature and complex architecture, are often difficult to pre-clean or sterilize.

The sterility of used and new unused dental burs and endodontic files from 5 dental offices before and after sterilization procedures was analyzed. Results indicated that new items as packaged by the manufacturer are not sterile and should be sterilized before first use. Sterilization procedures were 100% effective for unused sterilized burs and files, but were less than 100% effective for all test groups.

The study concluded that there is a need to develop more rigorous sterilization procedures and that if such procedures cannot be devised, perhaps these instruments should be considered single-use devices. •



Susan Conrod

**2nd Place** **Accuracy of fit of frameworks for implant-supported fixed prosthesis**

By Somayeh Nourian and Y. Finer, University of Toronto

A precise fit between the implant-supported prosthesis (ISP) and implant-fitting surfaces is regarded

as essential to protect the load-bearing capacity of the screw-joints and implants from high stresses. A previous study validated a method of duplicating the cylinder position of the intraoral ISP to facilitate a 3D distortion analysis between the ISP frameworks and the implants.

The aim of this study was to develop an improved version of the Implant-Best-Fit (IBF) proprietary software, that includes the angle of rotation of the ISP framework relative to the implants, as well as 3D modelling of the ISPs and implants.

While the current study confirmed the outcomes of the previous study, the output of the new IBF version provides more detailed analysis and includes the angle of rotation of framework relative to abut-

ments, as well as a 3D modelling of the cylinder position of the ISP relative to the implants. It also allows real-time user interaction to rotate and displace the frameworks of the ISP relative to the implants. •



Somayeh Nourian

**Evaporation of different solvents in adhesives**

By Marie-Christine Bourgeois, Marie-Eve Cloutier, Veronic Pelletier, Anne-Sophie Villeneuve, Laval University

The objective of the study was to compare the evaporation rate of different solvents in adhesives with or without nanoparticles. The measures were performed by placing different samples on an electronic balance under constant experimental conditions and by measuring the weight within a precise time frame.

The results were clear: the adhesives with nanoparticles showed a lower evaporation rate than those without nanoparticles. The researchers noted that acetone evaporates much faster, followed by alcohol and water, and concluded that

the use of adhesives with nanoparticles will lower the evaporation of a solvent. Dentists and dental assistants should therefore consider that this process is very technique sensitive. •



Marie-Christine Bourgeois

## A pilot study of the initial clinical presentations and the referral pattern of potentially malignant oral lesions

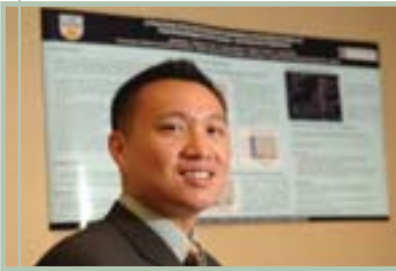
By Jason Chen, University of British Columbia

With the advent of molecular technology, it is becoming increasingly apparent that individuals with oral cancers can have molecular clones of aberrant cells scattered across the epithelium, often in clinically occult regions. Currently, there is a poor understanding of the mechanisms controlling clonal spread.

Some tumours appear to grow confined to 1 anatomical site even when they are large. Such tumours remain at 1 site even when they recur. In contrast, other tumours spread laterally to encompass multiple anatomical sites as a primary lesion or expand to multiple anatomical sites at recurrence.

The physical and topographic characteristics of tissues are known to play a determining role in the direction of cell migration. It is possible that demarcation

of different anatomical sites is associated with changes in the direction of the subtending collagen muscular bundles. Such changes in the subtending features may influence the expansion of tumour clones. •



Jason Chen

## Non-invasive oral rinse assay (NORA) to monitor neutrophil tissue delivery: monitoring susceptibility to infection in neutropenia

By Ali Hooshangui, University of Saskatchewan

Supervisors: Drs. Michael Glogauer and

Chrissy Cheretakis, University of Toronto,

faculty of dentistry, CIHR Group in Matrix Dynamics.

Patients with syndromes and conditions that affect neutrophil levels often present with severe oral diseases including periodontal infections and oral ulcers. Several forms of neutropenia are recognized in children, but because of the low prevalence of this disease, there are no studies reporting the prevalence and severity of periodontal and oral diseases in neutropenic patients.

The objective of the current study was to demonstrate that neutrophil quantification in oral rinses is a

useful and practical method to monitor engraftment and neutrophil delivery to tissues in neutropenic patients. The study also aimed to determine if the salivary quantification assay can be used to predict if and when engraftment will occur in the pediatric hematopoietic stem cell transplantation setting.

The study concluded that the timing of neutrophil tissue delivery is a good indicator of neutrophil functionality and infection susceptibility in the post-bone marrow transplant setting. •



Ali Hooshangui

## Characterization of STR/ort mice temporomandibular joints

By Tarek Korban, V. Landreville, S. LeClerc, A. Kauzman,

R.M. Mason, A. Moreau, and F. Moldovan,

University of Montreal and Imperial College London, U.K.

The STR/ort mouse strain develops naturally occurring osteoarthritis (OA) at a high rate in the medial tibial plateau of the knee. The goal of this study was to investigate whether the STR/ort mouse strain is a viable experimental animal model for the study of OA in the temporomandibular joint (TMJ) and to evaluate the protein expression on the condylar surface, to help understand the disease pathogenesis.

The study concluded that the STR/ort mouse strain appears to develop OA-like lesions in the TMJ with age, especially in males, and this is associated with an overexpression of pro-inflammatory mediators, namely IL1- $\alpha$ , ET-1, B1R and Reg I. These mediators may play a significant role in the initiation and exacerbation of TMJ OA. This in vivo experimental animal model appears to be a promising research tool for a better understanding of the pathogenetic mechanisms involved in OA of the TMJ. •



Tarek Korban

*Photos courtesy of tecklesphoto.com*

## Digital models and virtual treatment planning — the future of orthodontics?

By Liliya G. Nikolcheva, Derek Maheux, Jean-Marc Retrouvey,  
McGill University

For reasons of convenience and economy, orthodontists are beginning to use digital orthodontic study models produced by laser scanning instead of the traditional stone models. The objectives of the study were to compare the reliability of digital orthodontic models of patients with varying severity of malocclusion and to evaluate the cost-effectiveness and time efficiency of stone and digital models.

The differences in measurements between digital and stone models varied between 0.3% (intercanine, intermolar distance) and 25% (crowding). The differences were not significant (*t*-test, *p* values ranging from 0.16 and 0.99) except in the case of maxillary and mandibular crowding, when the digital models consistently underestimated the amount of crowding (*p* = 0.02).

The researchers concluded that digital models are more costly but more time efficient and allow for multidisciplinary treatment planning. Stone models are recommended for use in complex cases with severe malocclusions. •



Liliya G. Nikolcheva

## P2X7 nucleotide receptors enhance osteoblast differentiation and mineral formation

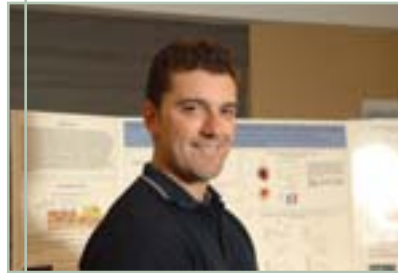
By Joseph T. Rogers, Nattapon Panupinthu,  
Stephen M. Sims and S. Jeffrey Dixon

CIHR Group in Skeletal Development and Remodeling,  
University of Western Ontario

Disruption of the gene encoding the P2X7 receptor leads to decreased periosteal bone formation and impaired skeletal response to mechanical loading. The goal of the study was to investigate the mechanism through which P2X7 receptors regulate osteogenesis. Using *in vitro* studies, calvarial cells were isolated from newborn rodents and differentiated to induce formation of mineralized nodules. Alkaline phosphatase-positive and mineralized areas were quantified at 7-day intervals.

Real-time RT-PCR revealed that expression of osteoblast marker genes was significantly enhanced by BzATP in rat cultures and suppressed in cultures from KO compared to WT mice. In contrast, there were simultaneous increases in the expression of adipocyte marker genes in KO compared to

WT cultures. Taken together, these data establish that functional P2X7 receptors are present in cells of the osteoblast lineage and directly promote differentiation and osteogenesis. •



Joseph T. Rogers

## First dental visit by age one — are Manitoba dentists aware of this recommendation?

By Tijana Stijacic, Herenia Lawrence (University of Toronto),  
and Robert J. Schroth, University of Manitoba

CDA endorses the practice of a first dental visit by 12 months of age. This strategy may be an effective method to ensure children remain cavity free, as age is a significant determinant of early childhood caries (ECC). The small number of pediatric dentists in Manitoba is insufficient to meet this demand. Thus, general practitioners must be aware of the need for and benefits of early examinations so they can begin their crucial role in preventing ECC.

This project studied the practice habits of general practitioners and pediatric dentists in Manitoba, via a mail-out survey. Results showed that only 24.7% recommend children be seen by 12 months of age. Furthermore, only 32.3% were aware of the current definition of ECC and 94.7% feel that nurses and physicians can play a role in ECC prevention.

The study concluded that early examination practice may not be routine for most dentists in Manitoba and that health care providers must familiarize themselves with all preventive measures along the continuum of early childhood development that can keep children from developing ECC. •



Tijana Stijacic

# Jasper Dental Congress is going national for 2007



The Canadian Dental Association (CDA) and the Alberta Dental Association and College (ADA&C) are pleased to announce that they will co-host the 2007 Jasper Dental Congress in Jasper, next year.

**May 24 - 27, Jasper, Alberta, Canada.**

*Details coming soon.*



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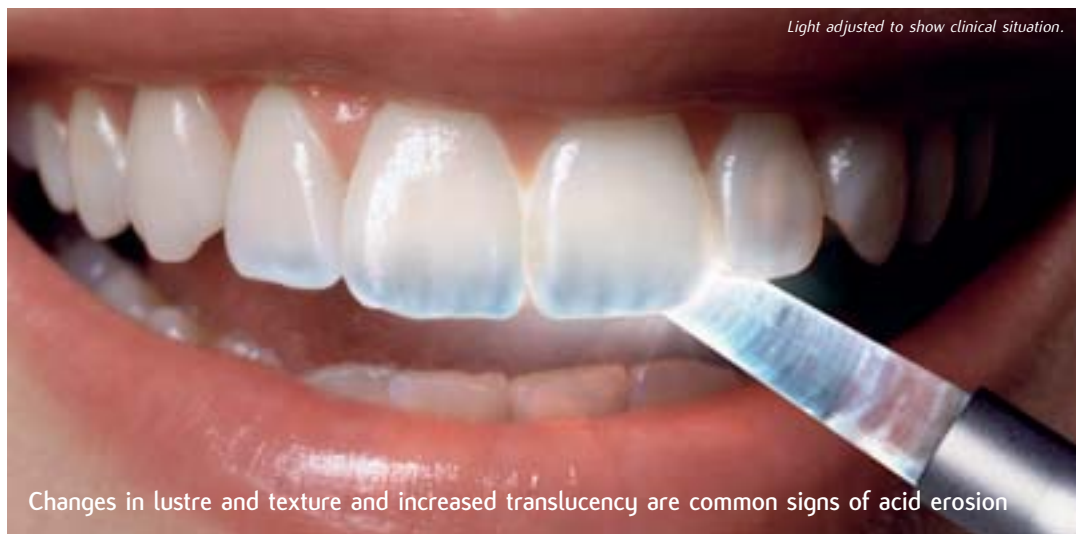
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# Recognizing acid erosion can be as simple as switching on a light.

## Challenges in oral health are evolving

Despite success in reducing the prevalence of caries and periodontal diseases, dentistry now faces new concerns. A spectrum of degenerative conditions is at the forefront of dental issues — specifically the multifactorial challenge of tooth wear.



## The healthy diet paradox

Tooth wear has much to do with the modern, health-conscious lifestyle- and diets that are high in acid. Acidity from fruit juices and soft drinks demineralize and soften the tooth surface, making it more susceptible to wear.

## Early intervention is key

Increasing patients' awareness of tooth wear during routine examinations, along with lifestyle advice, may help to prevent sensitivity. It may also help prevent the need for major restoration.

## Expert advice is now available

As awareness grows about acid erosion, so too does the need for public education and dental management for long-term dental health. With this in mind, product innovation and public education are high on our agenda.

For expert guidance on signs, symptoms and management you can switch on a light or visit [www.dental-professional.ca](http://www.dental-professional.ca)



## 2006 Canadian Dental Students' Conference

Informing dental students about the new electronic products and services available to them as CDA members was one of the many topics covered at this year's Canadian Dental Students' Conference, held August 11 and 12 in Ottawa.

This annual conference brings together junior and senior CDA student representatives from the 10 Canadian dental schools to discuss issues of interest to Canadian dental students. At the Committee on Student Affairs business meeting, held in conjunction with the conference, student representatives held discussions on student debt and rising tuition fees, CDA's professional development program, the National Dental Examining Board (NDEB), DAT exam dates and upcoming dental student conferences.

This year's conference included presentations from representatives of CDA, the Dentistry Canada Fund (DCF), NDEB, the Association of Canadian Faculties of Dentistry, Procter & Gamble, Continovation Services, Inc., Canadian Dental Service Plans Inc. and the American Student Dental Association. ➤



**CDA GRATEFULLY ACKNOWLEDGES  
DCF AND PROCTER & GAMBLE  
FOR THEIR GENEROUS SUPPORT OF  
THE STUDENTS' CONFERENCE.**

## Canadian-led Study Examines Tobacco Use and Heart Attack Risk

All forms of tobacco exposure, including smoking, chewing tobacco and second-hand smoke, increase the risk of acute myocardial infarction, according to results of the INTERHEART study published in *The Lancet* in August.<sup>1</sup>

Along with colleagues from 52 countries, Drs. Salim Yusuf and Koon Teo of McMaster University in Hamilton, Ontario, have been examining the risk of heart attack associated with all forms of active tobacco use and second-hand smoke.

The researchers determined that smokers triple their risk of heart attack over those that never smoke. The study also found that with every cigarette smoked per day, the risk of heart attack increases by about 5%. However, the researchers note that the risk of heart

attack can decrease after quitting smoking, depending on how many cigarettes were previously consumed each day.

"Since the risks of heart attack associated with smoking dissipate substantially after smoking cessation, public health efforts to prevent people from starting the habit, and promote quitting in current smokers, will have a large impact in prevention of heart attack worldwide," says Dr. Yusuf. ➤

### Reference

1. Teo KK, Ounpuu S, Hawken S, Pandey MR, Valentin V, Hunt D, and others. Tobacco use and risk of myocardial infarction in 52 countries in the INTERHEART study: a case-control study. *Lancet* 2006; 368(9536):647-58.

*INTERHEART is a large-scale, international case control study that includes data from more than 27,000 people. It is funded by the Canadian Institutes of Health Research and the Heart and Stroke Foundation of Ontario, and is endorsed by the World Health Organization.*

## DENTAL INDUSTRY

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### Kodak Purchases Caries Detection Software

In July, Eastman Kodak Company announced that it had purchased the assets associated with the Logicon Caries Detector software, previously owned and marketed by Northrop Grumman Corporation and GA Industries.

This software helps dentists diagnose radiographs for proximal caries. It works by extracting image features and correlating them with a database of known caries problems. The software automatically highlights possible abnormalities on patients' digital dental radiographs.

For the past 3 years, the Logicon Caries Detector software has been used in combination with Kodak's intra-oral digital radiography system. Kodak says the recent acquisition represents the first of many planned product introductions in the field of digital imaging and caries diagnosis. For more information, visit [www.kodak.com/dental](http://www.kodak.com/dental).

### Straumann Appoints New Head of Canadian Operations

Straumann announced in August the appointment of Alain Laroche as head of Straumann Canada.

Mr. Laroche has experience as a general manager in the life sciences and med-tech fields with a strong international background in sales and marketing. A medical biologist by training, Mr. Laroche joins Straumann from Advanced Bioelectric, Inc, a start-up company in Quebec involved in researching and developing medical devices for cardiac monitoring.

Straumann is a global leader in implant dentistry and oral tissue regeneration. Its Canadian headquarters are located in Burlington, Ontario. For more information, visit [www.straumann.ca](http://www.straumann.ca).

### Biolase Names Henry Schein as Exclusive North American Distributor

Biolase Technology, Inc. and Henry Schein, Inc. signed a multi-year distribution agreement in August that will see Biolase direct sales and service organizations collaborating with Henry Schein in the marketing, sales and service of all professional Biolase dental laser system products.

Under the terms of the agreement, Henry Schein becomes the exclusive distributor of the complete line of Biolase dental laser systems, accessories and services within Canada and the United States. For more information, visit [www.biolase.com](http://www.biolase.com) or [www.henryschein.com](http://www.henryschein.com).

### Ivoclar Vivadent Invests in Sirona Dental Systems

In July, Ivoclar Vivadent AG announced that it had made an investment in Sirona Dental Systems, Inc. Sirona manufactures high-technology dental equipment, most notably the CEREC System CAD/CAM restoration equipment system for chairside dentistry and its inLab dental laboratory technology.

Ivoclar says that this investment signals its commitment to the growth of CAD/CAM technology within the dental profession. The company feels that CAD/CAM dentistry represents one of the fastest growing sectors within the profession and has expectations for continued rapid growth. Ivoclar Vivadent is a market leader in all ceramic metal-free materials for esthetic dentistry and is a material partner for Sirona's CEREC System and inLab Technology. For more information, visit [www.ivoclarvivadent.com](http://www.ivoclarvivadent.com) or [www.sirona.com](http://www.sirona.com).



### International Dental Trade Show in Germany

The International Dental Show (IDS) is scheduled to take place from March 20–24, 2007, in Cologne, Germany. This global dental trade fair is considered one of the top events for the international dental market. In 2007, organizers expect over 1,600 exhibitors from more than 50 countries to convene at the Cologne Exhibition Centre.

The IDS is held every 2 years and is organized by the Association of German Dental Manufacturers (VDDI). It brings together companies from the worldwide dental sector and presents a wide range of products available on the international dental market. For more information on the 2007 IDS event, visit the VDDI website at [www.vddi.de](http://www.vddi.de).

## Help Design a People-Centred Health System



Do you have creative ideas on how to improve the health care system in Canada?  
If so, you could be rewarded with \$10,000 for your innovative thoughts.

The Canadian Association for People-Centred Health (CAPCH) has launched the People-Centred Health Challenge, to encourage ideas for a better health future in Canada. The challenge is designed to create an exchange of thoughts and ideas to help build a people-centred health system for Canadians — a system designed for the people, by the people.

The association is looking for original ideas about all aspects of the health care system that would empower and inform people in their health care. Your proposal could focus on any aspect of the health care system that would make it more responsive to the needs of the people. Whether you have one piece of the puzzle or a proposal for a whole system, every idea is welcome.

CAPCH is a national non-profit, non-partisan, grassroots organization committed to researching, designing, sharing and implementing in order to make the Canadian health system more responsive to the needs of people. CAPCH was officially launched in October 2005, coinciding with the launch of the book *Journey to Wellness*, written by Dr. Vaughan Glover of Arnprior, Ontario. Dr. Glover has been in private practice for over 30 years and is a founder of CAPCH.

Along with a \$10,000 first prize, submissions deemed most worthy by a panel of judges can win \$5,000 for second place or a \$2,500 third place award. There is a nominal entry fee to defray the administrative costs of the contest.

Entries for the CAPCH Challenge should be received by November 1, 2006. To learn more about the criteria for entries or the judging process, visit [www.capch.ca/contest.htm](http://www.capch.ca/contest.htm) or contact Bonnie Phillips at [bonnie@capch.ca](mailto:bonnie@capch.ca). ♦



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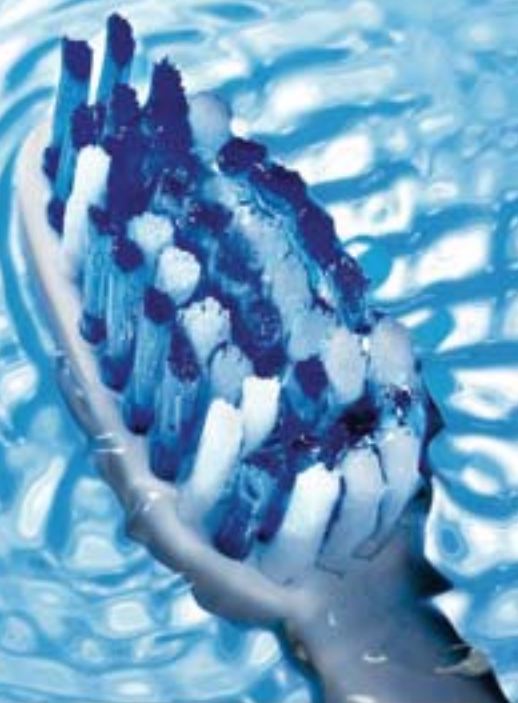
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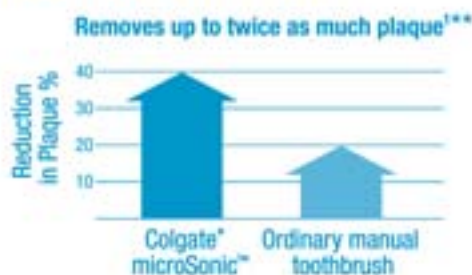
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## Canadian Researcher Honoured by ADA

Former Winnipeg, Manitoba, native Dr. Larry Golub received the American Dental Association (ADA) Gold Medal Award for Excellence in dental research. The award is ADA's highest scientific honour and includes a \$25,000 prize and a 3-year position on the ADA Council of Scientific Affairs. Dr. Golub is the first Canadian to win this award.

Among his research breakthroughs, Dr. Golub helped develop a collagenase-inhibitor drug known as Periostat, which is now used widely for the treatment of periodontal disease.

A graduate of the University of Manitoba, Dr. Golub received his DMD in 1963 and his MSc in Oral Biology in 1965. He completed his certification in periodontology at the Harvard School of Dental Medicine and has been teaching at the State University of New York at Stony Brook School of Dental Medicine since 1973. ♦

## Online Resource for Special Care Patients

The National Maternal and Child Oral Health Resource Center (OHRC) has created an online learning module for dentists who work with children and adolescents with special health care needs. The web-based curriculum includes information on how to provide optimal oral health care for this group, preventive measures that can promote oral health and reduce oral diseases, and behaviour management in the dental office.

Based in Washington, DC, the OHRC supports health professionals, program administrators, educators and policymakers with the goal of improving oral health services for infants, children, adolescents and their families. To consult the online modules, visit [www.mchoralhealth.org/specialcare/](http://www.mchoralhealth.org/specialcare/). ♦



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- Bill Gates

Across the country, dentists are embracing the Dentistry Canada Fund's (DCF) *Oral Health – Good for Life™* Campaign and its objectives. As they review the case statement and hear about the transformational potential arising from the outcomes of this campaign, more and more dental professionals are pledging their support for this cause.

In most cases, these cash donations are being pledged over a four to five year time period; thereby providing a means to significantly expand the size of individual pledges. For instance, a \$ 5,000 gift pledge over four years translates into \$ 1,250 per year, or \$ 104.16 per month. Donors receive a DCF charitable income tax receipt for the full amount of the annual donation.

However, more and more dentists are starting to choose to make a donation of publicly listed securities to DCF's Campaign. Why?

On May 2, 2006, the Federal Government's Budget totally eliminated the capital gains associated with a donation gift of publicly listed securities to public charities in Canada, including the Dentistry Canada Fund.

Consequently, a donor who chooses to make their gift in this manner pays no tax on the capital gain that is triggered by their donation. This new tax break makes such gifts one of the

**Case Example:** In the example below, assume that the combined federal and provincial tax rate is 40 percent and that the donor has made other charitable contributions exceeding \$ 200.

<i>Source: Ottawa Hospital Foundation (www.ohfoundation.ca)</i>	Sell securities and donate cash	Donate the securities directly to DCF.
Fair market value (FMV) of securities	\$10,000	\$10,000
Original cost of securities	\$1,000	\$1,000
Capital gain (FMV less original cost of securities)	\$9,000	\$9,000
Taxable portion of gain	\$4,500 (50% of capital gain is taxable)	\$0 (0% of capital gain is taxable)
Donation tax credit (at 46%)	\$4,600	\$4,600
Tax payable on gain (at 46%)	\$2,070	\$0
Tax savings (tax credit less tax payable on gain)	\$2,530	\$4,600
Net cost of \$10,000 donation (donation amount less tax savings)	\$7,470	\$5,400

easiest and most tax-savvy ways to support DCF's *Oral Health-Good for Life™* Campaign.

### How to Make Such A Gift

Your securities can be transferred directly from your brokerage account to the DCF charity's brokerage account. (Note: Your actual shares must be transferred to DCF and then DCF sells your shares – contact DCF for a step-by-step guide). You will receive an income tax receipt from DCF for the fair market value of your donation, based upon the closing market price on the

day that the securities are received by the DCF charity.

We strongly recommend you consult with your financial advisor if you are considering a donation of securities to DCF.

*"When I learned about the tax advantages of making my campaign gift in this way, it was a no-brainer."*

Dr. Stuart Root,  
Alberta Campaign Chair

For more details about this transformational campaign, please contact Richard Munro, Campaign Director, toll-free at 1.877.363.0326 or by email at [executivedirector@dcf-fdc.ca](mailto:executivedirector@dcf-fdc.ca)

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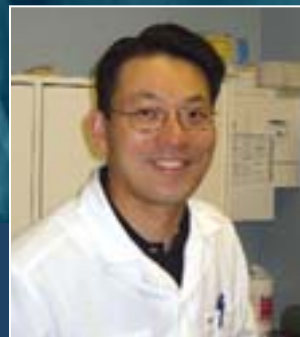
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The Canadian Dentists' Insurance Program is sponsored by the CDA and co-sponsored by participating provincial dental associations. Office Overhead Expense Insurance is underwritten by The Manufacturers Life Insurance Company (Manulife Financial).



Dr. Mel Hum

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# THE DENTAL ADVISOR™

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This month's feature of **THE DENTAL ADVISOR** is taken from the March 2005 issue, Vol. 22, No. 2.

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## Microdentistry

### Q What is microdentistry?

**A** Microdentistry refers to restorative procedures that are minimally invasive. Only the tooth structure necessary to obtain access to, and removal of, a carious lesion is removed. Very small cavity preparations are made with a rounded internal form that may be restored with bonded restorations. This preparation should leave the tooth stronger and the restoration subject to less functional stress than classic G.V. Black cavity preparations. These techniques utilize composites and fluoride-containing materials (glass ionomers, resin-modified glass ionomers) to produce restorations that are nearly invisible and very esthetic. Practitioners are urged to familiarize themselves with the considerable professional literature on diagnosis, treatment planning, cavity preparation and appropriate restorative materials pertinent to these techniques.

#### Types of Carious Lesions

- Small
- Located in pits and fissures
- Do not undermine occlusal surfaces
- Do not result from intrinsic defects

#### Requirements

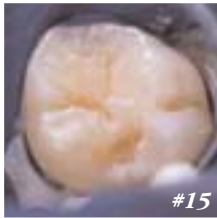
- Small head or specifically designed burs
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- > **Palfique Estelite LV/J. Morita USA**/Tokuyama Dental Corp.
- > **PermaFlo, PermaFlo DC**/Ultradent

#### Clinical Tips and Notes

- Good vision is necessary to distinguish the narrow demarcation between sound and carious tooth structure.
- Caries detection dyes (**Seek**/Ultradent; **Sable Seek**/Ultradent) may be helpful; however, these dyes also stain caries-affected dentin. Glass ionomer restorative material may be used in the case of caries-affected dentin.
- Microdentistry may reduce patient discomfort and allow operative intervention without the need for anesthetic.
- Use syringes of composite with very small needles to adapt composite on pulpal walls and restore the defect from that surface to the exterior contours. This technique may also reduce the inclusion of air bubbles in the filling mass.



Minimally invasive preparations

- Voids may accompany rapid injection of low-viscosity materials into small cavities. Voids compromise properties of the restoration and produce surface imperfections that appear with wear.

Microdentistry is not a replacement for appropriate preventive measures or correct diagnoses that include more traditional operative dentistry procedures. The strictures of classical cavity designs have long proven their value and validity in the long-term restoration of compromised teeth. However, many incipient lesions in enamel, or shallow dentin, will benefit from sealing, fluoride therapy, diet adjustments and proper oral hygiene. When correctly applied, microdentistry is a benefit to both patient and dentist because of its conservative approach in the use of modern materials. ■

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3M ESPE Ketac-Silver Aplicap	3M ESPE	Cement-Restorative	Yes	No	Yes	No	na	91%
3M ESPE Photac Fil Aplicap	3M ESPE	Cement-Restorative	No	Yes	Yes	No	8	88%
Argion AC	VOCO	Cement-Restorative	Yes	No	Yes	Yes	1	ce
Argion Molar AC	VOCO	Cement-Restorative	Yes	No	Yes	Yes	1	81%
Fuji II LC	GC America	Cement-Restorative	No	Yes	Yes	Yes	10	90%
Fuji IX GP	GC America	Cement-Restorative	Yes	No	Yes	Yes	5*	85%
Fuji IX GP Fast	GC America	Cement-Restorative	Yes	No	Yes	No	5	na
GC Fuji TRIAGE	GC America	Sealant	Yes	Yes	Yes	No	2**	92%

\*Capsule/Unit Dose has 5 shades and Powder/Liquid has 1  
\*\* White is self-cure and pink is self- or light-cure (command set)  
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The “Point of Care” section 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](mailto:jokeefe@cda-adc.ca).

## QUESTION 1

What should I think about when examining a child who has a primary tooth below the plane of occlusion?

### Background to the Problem

Infra-eruption or submersion of a tooth is due to a failure in eruption. The causes include ankylosis, impaction, absence of a permanent successor, disturbances in local metabolism, gaps in the periodontal membrane, trauma, infection, chemical or thermal irritation, failure in bone growth and abnormal tongue pressure.

According to the literature, the prevalence ranges between 1.3% and 38.5%. This wide variation is due to the different criteria used for diagnosis, as well as patient age, type of dentition and ethnicity. It occurs most frequently in the early mixed dentition of children about 8 and 9 years old, but can be seen as early as 3 years of age. It is 10 times more likely in the primary dentition than in the permanent dentition, and the mandibular second primary molar is the tooth most commonly affected, followed by the mandibular first primary molar.<sup>1</sup>

Infra-eruption leads to multiple complications, including insufficient development of width and height of supporting bone, increased risk of caries, and gingival hyperplasia and bleeding. If

the permanent successor is present, eruption of a submerged tooth may be delayed or redirected from its normal path into a malaligned position. If the permanent successor is absent, loss of dental arch space is likely, and a midline discrepancy may occur because the mesiodistal width of the primary submerged tooth is greater than that of the contralateral premolar. Also, overeruption of the opposing teeth and tilting of the adjacent teeth can occur, which further contributes to dental malocclusion (Fig. 1).

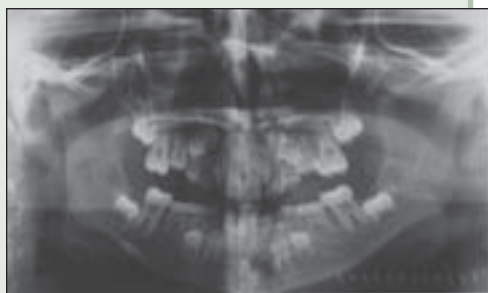
### Diagnosis

Clinical examination reveals that the primary tooth is below the level of the occlusal plane (Fig. 2). Tapping the tooth reveals an abnormal percussive “cracked teacup” sound; if there is ankylosis, the tooth is immobile. Radiographic images show lack of a well-defined periodontal ligament and lamina dura space and fusion of the root with bone. However, fusion may occur in an isolated area, often at the furcation, and this method of detection is therefore unreliable.<sup>1</sup> Sometimes, there is a depression in the marginal bone surrounding the submerged teeth, and often the permanent successor is lacking.

### Management of the Problem

The course of treatment in the primary or mixed dentition depends on whether the tooth is ankylosed and whether a permanent successor is present.

If the tooth is not ankylosed, waiting for normal exfoliation has been suggested; this process is usually delayed by 6 to 12 months relative to the unaffected contralateral tooth. If the premolar is present, spontaneous eruption is possible.<sup>2</sup> To prevent tipping of the adjacent tooth and overeruption of the opposing tooth, restoration of the occlusal surface is recommended, including a stainless steel crown or composite



**Figure 1:** Panoramic radiograph displays mesial tipping of maxillary and mandibular first permanent molars due to submergence of the maxillary and mandibular second primary molars.



**Figure 2:** Clinical photographs of submerged mandibular first and second primary molars.

resin buildup.<sup>3</sup> Extraction is recommended if there is a progressive, deep infraocclusion below the gingival margin, severe tipping, ectopic eruption of the permanent successor or formation of caries and abscess.

If the permanent successor is absent, the decision to extract depends on the condition of the tooth, the amount of root support, the degree of occlusion and the patient's preference. If a malocclusion exists, the patient should be referred to an orthodontist for evaluation, as extraction of the nonankylosed submerged tooth may influence future orthodontic treatment.

The vast majority of submerged teeth are ankylosed.<sup>4</sup> If ankylosis is diagnosed, the tooth should be monitored until it interferes with eruption of the succedaneous tooth or until tipping of the adjacent teeth or supraeruption of opposing teeth occurs. It can then be temporarily treated with a stainless steel crown or composite resin buildup to maintain space. As the teeth continue to erupt, the ankylosed tooth is once again left out of eruption. If the dentist notices that tipping is occurring and space is being lost, the tooth should be extracted and space maintenance should be undertaken until the permanent successor has erupted.<sup>5</sup>

Effective diagnosis and careful management of a patient with an infraerupted primary tooth can reduce the need for complex orthodontic treatment in the future. ♦

## THE AUTHORS



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## References

1. Teague AM, Barton P, Parry WJ. Management of the submerged deciduous tooth: I. Aetiology, diagnosis and potential consequences. *Dent Update* 1999; 26(7):292-6.
2. Kuroi J, Thilander B. Infraocclusion of primary molars and the effect on occlusal development, a longitudinal study. *Eur J Orthod* 1984; 6(4):277-93.
3. Teague AM, Barton P, Parry WJ. Management of the submerged deciduous tooth: 2. Treatment. *Dent Update* 1999; 26(8):350-2.
4. Antoniadis K, Kavadia S, Milioti K, Antoniadis V, Markovitsi E. Submerged teeth. *J Clin Pediatr Dent* 2002; 26(3):239-42.
5. Proffit WR. Contemporary orthodontics. 3rd ed. St. Louis (MO): Mosby Co.; 2000. p. 430-1.

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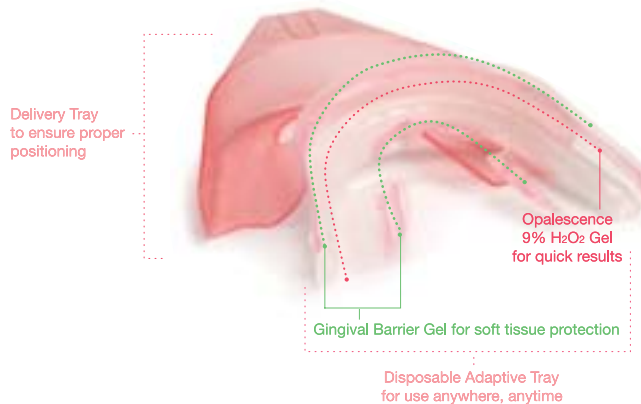
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## QUESTION 2

## How do I manage incisor alignment in the mixed dentition?

**Background**

Incisor irregularity or poor alignment of the permanent incisors in the early mixed dentition is a common clinical problem. Because of increased awareness of dental esthetics in our society, parents occasionally express concern about this problem when their children are still very young. In addition, some clinicians believe that improving alignment in the mixed dentition results in greater long-term stability and reduces the risk of periodontal problems associated with ectopic eruption. Early interventions may also benefit those who may not have an opportunity for comprehensive orthodontic treatment in the future.

In most cases, alignment problems are caused by inadequate space between the primary canines; however, displacement and/or rotation of the incisors does sometimes occur in the presence of adequate space.

**Management of Incisor Alignment**

Incisor alignment can be accurately assessed after eruption of the lateral incisors. The first step is to determine the cause of any problems observed and the orthodontic diagnosis. A clinical examination and review of the appropriate clinical records, including orthodontic study models and a panoramic radiograph, are useful in this regard. Specifically, the clinician must determine whether poor alignment of the incisors is due to inadequate space between the primary canines. The options for management are observation or interceptive orthodontics, disking of the

primary teeth, extraction of the primary canines or referral to a specialist.

**No Deficiency of Arch Length**

Dentists occasionally see patients whose incisors have erupted with rotation and/or displacement, even though adequate space is available. In many of these patients, the alignment improves spontaneously over time. However, in cases where self-correction is minimal, orthodontic correction with fixed or removable appliances is required. A fixed appliance that is commonly used to improve alignment in the mixed dentition is a 2 × 4 preadjusted, fixed edgewise appliance, consisting of bands on the first molars and brackets on the 4 incisors. If such an appliance is used in the maxillary arch, the relationship of the developing canines to the roots of the lateral incisors must be assessed. Any movement of the lateral incisor roots toward the canine crowns can lead to irreversible damage to the roots. Labial or distal flaring of the lateral incisor crowns is a good clinical warning sign of potential problems (**Figs. 1a, 1b**). In these cases it is advisable not to engage the lateral incisors in the arch wire.

**Minor (1–4 mm) Crowding**

Minor crowding of the incisors is the most commonly encountered scenario. Disking the primary canine is a conservative method of managing these cases. In most patients, up to 2 mm of crowding can be corrected by disking the mesial surface of the deciduous canines; 4 mm of space can be gained by disking the mesial *and* distal surfaces, which allows distal migration of the deciduous canines. Reduction should be done symmetrically to maintain coincident midlines. Disking is best done with a narrow carbide bur (e.g., 169L) in a high-speed handpiece or a one-sided diamond disk. In most cases local anesthetic is not required, and an interproximal wedge can be used to protect the papilla. Fluoride varnish can be applied to the cut surface to minimize sensitivity and the risk of interproximal caries.

**Substantial Crowding (5 mm or More)**

A deficiency of 5 mm or more usually requires removal of the primary



**Figure 1a:** Incisor alignment before treatment with a 2 × 4 appliance. Note distal flaring of the lateral incisors.



**Figure 1b:** Periapical radiographs obtained after treatment demonstrate damage to the roots of the lateral incisor.



**Figure 2:** Midline shift after unilateral extraction of the primary canines.



**Figure 3:** Successful outcome after placement of a lower lingual holding arch in the mixed dentition. Note the excellent alignment of the incisors and maintenance of arch length.

canines to achieve incisor alignment. The space created will allow the incisors to unravel with lateral movement. Spontaneous correction into perfect alignment is unlikely, but several studies have shown significant improvement without further intervention. Space deficiency of this degree is a reliable predictor of future crowding of the entire arch, and consultation with a specialist is therefore recommended. Extraction of the primary canines moves the crowding problem into the posterior segments, where it will probably need to be addressed through comprehensive orthodontics in the future.

If a decision to extract is made, multiple factors should be considered.

- **Symmetry:** Even if there is crowding on only one side, canines should be extracted symmetrically within each arch. Unilateral extractions can cause drifting of the incisors and a midline discrepancy (Fig. 2).
- **Mandibular arch:** Removal of the primary mandibular canines allows the incisors to tip lingually and erupt vertically, resulting in increased overbite and overjet. In addition, mesial movement of the posterior teeth and overall loss of arch length may occur. Placement of a lower lingual holding arch provides an easy and effective solution to prevent these adverse effects. The bar should have a smooth, rounded contour with contact on the cingula of the lower incisors. This will encourage improved alignment while the incisors unravel, prevent any lingual or vertical movement, and preserve existing arch length (Fig. 3).
- **Maxillary arch:** A discussion with the parent regarding the risks and benefits of extracting

the primary maxillary canines is recommended. Removal of the primary canines will improve incisor alignment, but this is usually accompanied by a temporary esthetic impact that may not be acceptable to the patient or parent. If done before the patient is 11 years of age, an additional benefit is prevention of impaction of the permanent canines. Impacted canines are difficult to manage orthodontically and can cause resorption of the roots of the lateral incisors. Extraction of the primary canines should therefore be considered for patients with ectopically erupting permanent canines and a crowded anterior segment. ♦

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## Further Reading

- Foley TF, Wright GZ, Weinberger SJ. Management of lower incisor crowding in the early mixed dentition. *ASDC J Dent Child* 1996; 63(3):169-75.
- Kau CH, Durning P, Richmond S, Miotti FA, Harzer W. Extractions as a form of interception in the developing dentition: a randomized controlled trial. *J Orthod* 2004; 31(2):107-14.
- Shapira Y, Kuftinec MM. Early diagnosis and interception of potential maxillary canine impaction. *J Am Dent Assoc* 1998; 129(10):1450-4.

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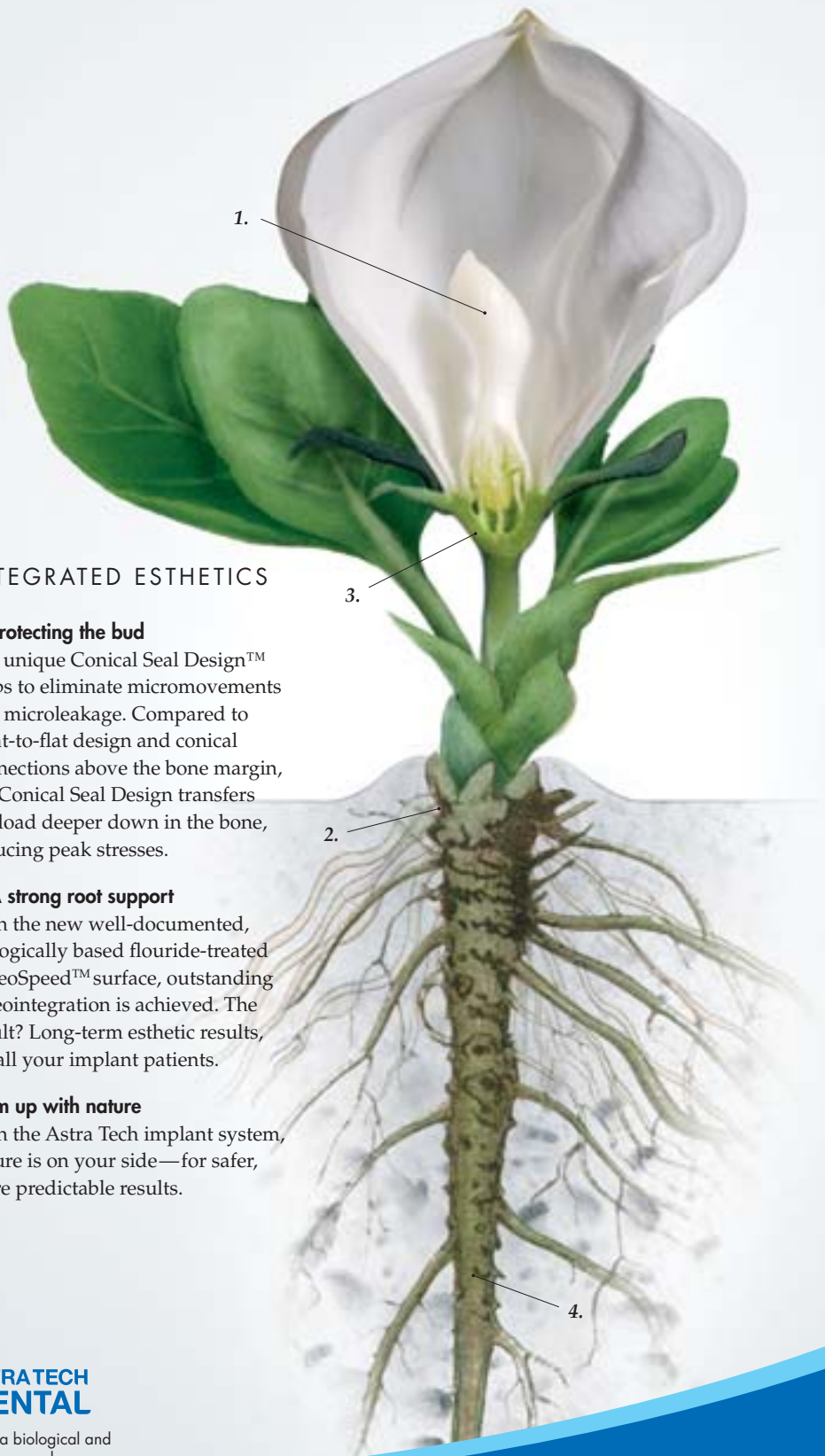
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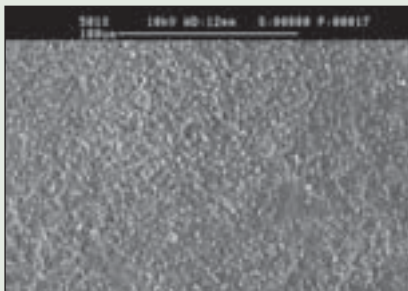
## QUESTION 3

## Why and how should I remove the smear layer after root canal instrumentation?

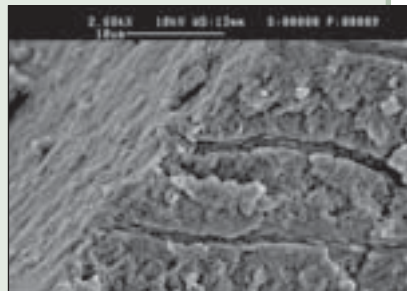
## Background

Chemomechanical instrumentation of root canals creates a smear layer, an amorphous structure 1–2  $\mu\text{m}$  thick composed of both organic (pulp tissue, microorganisms) and inorganic (dentin debris) materials (Fig. 1). These substances may also be packed to a depth of 40  $\mu\text{m}$  into the dentinal tubules, also known as smear plugs (Fig. 2). By covering the root canal walls and occluding the dentinal tubules, this material prevents optimal penetration of chemicals, medications and root filling agents into the lateral canals and dentinal tubules. Therefore, after root canal preparation is completed, a final rinsing procedure should be performed to remove the smear layer and smear plug (Figs. 3 and 4). This procedure allows effective action of chemicals and intracanal medication within the root canal system and permits a better bond between sealers and dentinal walls. For removal of not only the inorganic but also the organic components of the smear layer, a final rinse with first sodium hypochlorite (NaOCl) and then an acid is recommended. NaOCl has the

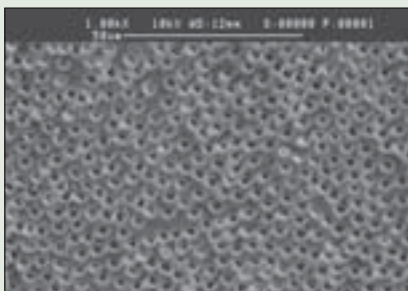
unique capacity to dissolve pulp tissue and is an established bactericidal agent. It also has excellent dissolving action on the other organic components of the smear layer. Demineralizing agents such as EDTA (ethylenediaminetetra-acetic acid) and citric acid can dissolve inorganic dentin particles. These acids are highly biocompatible and show high efficiency in removing the smear layer, but they seem to have little or no antibacterial action. Therefore, antiseptics such as detergents (EDTA-C, EDTA-T) or detergents plus tetracycline antibiotics (BioPure MTAD, Tulsa Dental Products, Tulsa, Okla.) have been added to EDTA and citric acid, respectively, to increase their antimicrobial capacity. Prevention and elimination of infection in the root canal system is one of the most important steps for a successful root canal treatment, and the irrigating solutions play an important role in achieving this goal. Performing a final rinse for removal of the smear layer is one more tool for a good treatment outcome, especially when one-appointment therapy is performed and an antibacterial medication is not used.



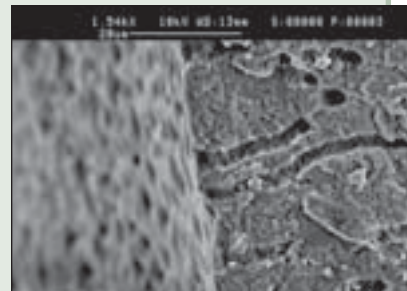
**Figure 1:** Micrograph showing the root canal surface covered with smear layer.



**Figure 2:** Micrograph showing the entrances of the dentinal tubules filled with smear plugs.



**Figure 3:** Micrograph showing that the root canal wall is free of smear layer.



**Figure 4:** Micrograph showing dentinal tubules free of smear plugs.

## Procedure

Once the shaping procedure is completed, the canals should be thoroughly rinsed with NaOCl to remove the organic components of the smear layer. All of the NaOCl must then be removed with suction. Reaching the apical third of the root canal is very important. This can be achieved by using a 30-gauge irrigation needle tip and trying to get 1 to 2 mm short of the working length. A #25-30 master apical file must be used for the irrigation needle tip to reach this point. Each canal must then be rinsed for 3 minutes using 5 to 10 mL of a chelator irrigant (15%–17% EDTA, EDTA-C, EDTA-T, or 10% citric acid) and applying an up-and-down motion to the needle. After removal of the smear layer, a final rinse with NaOCl appears beneficial to eliminate any microorganisms that may be inside the dentinal tubules. Then, 1 mL of a 5-mL portion of MTAD must be injected into the canal and allowed to sit for 5 minutes; the

canal is then rinsed with the remaining 4 mL of MTAD, which is removed by suction. The manufacturer does not recommend irrigation with any other irrigant after MTAD. After these procedures, the canal is ready for interappointment medication or for obturation. ♦

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The author has no declared financial interests in any company manufacturing the types of products mentioned in this article.

## QUESTION 4

### Why should chlorhexidine be used as a root canal irrigant?

#### Background

The major objective in endodontic therapy is to disinfect the entire root canal system. This goal can be accomplished with mechanical instrumentation and chemical irrigation, in conjunction with medication of the canal between treatment sessions.

The current irrigant of choice is sodium hypochlorite (NaOCl). It is an effective antimicrobial agent and acts as an excellent tissue solvent. However, NaOCl can be toxic to the periapical tissues, causing severe inflammatory reactions. In addition, it tends to discolour and corrode operatory items, and it has an unpleasant odour. Instrumentation combined with NaOCl irrigation

#### Further Reading

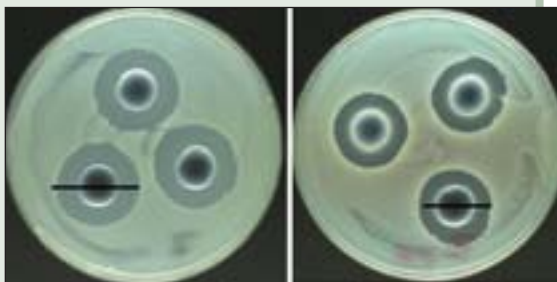
- Czonstkowsky M, Wilson EG, Holstein FA. The smear layer in endodontics. *Dent Clin North Am* 1990; 34(1):13–25.
- Haapasalo M, Endal U, Zandi H, Coil JM. Eradication of endodontic infection by instrumentation and irrigation solutions. *Endod Topics* 2005; 10(1):77–102.
- Scelza MF, Antoniazzi JH, Scelza P. Efficacy of final irrigation — a scanning electron microscopic evaluation. *J Endod* 2000; 26(6):355–8.
- Torabinejad M, Handysides R, Khademi AA, Bakland LK. Clinical implications of the smear layer in endodontics: a review. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002; 94(6):658–66.
- Zehnder M. Root canal irrigants. *J Endod* 2006; 32(5):389–98.

has been shown to yield negative results on culture in 37% to 63% of cases. However, even with the use of NaOCl, reliable elimination of organisms from root canal systems remains an elusive goal, and bacteria frequently survive the cleaning and shaping procedures.

#### Chlorhexidine in Endodontics

Chlorhexidine (CHX), a cationic bisguanide with a pH of 5.5 to 7, was developed more than 50 years ago during investigation of antiviral agents. It had poor antiviral but good antibacterial efficacy.

CHX is a wide-spectrum antibacterial agent and is active against gram-positive and gram-negative bacteria, facultative anaerobic and aerobic bacteria, spores and yeasts (Fig. 1). Being cationic, CHX binds electrostatically to the negatively charged surfaces of bacteria, damaging the outer layers of the bacterial cell wall and rendering it permeable. The resulting penetration of CHX into the cell causes precipitation of the cytoplasm. Its cationic properties also allow CHX to bind electrostatically to the surfaces of the teeth and the CHX molecules are gradually released from the teeth, as the concentration of CHX in the oral environment decreases. This reversible mechanism of uptake and release of CHX is known as “substantivity.” For example, 2% CHX that had been in a root canal for up to 12 weeks still showed antimicrobial activity. CHX has low grade of toxicity.



**Figure 1:** Agar diffusion test with 2% chlorhexidine (left) and 0.2% chlorhexidine (right). The antibacterial effect is concentration-dependent.

CHX has some limitations, including an inability to dissolve organic matter, lack of action on the smear layer, and lack of effect on biofilms. Because CHX forms a precipitate when mixed with NaOCl, interaction with NaOCl should be avoided.

### Suggested Clinical Protocol for Irrigation in Endodontics

1. NaOCl solution should be employed throughout instrumentation. The canals should always be filled with fresh NaOCl to dissolve the organic matter present in the canal and to increase the working time of the irrigant.
2. If removal of the smear layer is desired, the canals can be thoroughly rinsed with aqueous EDTA (ethylenediaminetetra-acetic acid) or citric acid once the shaping procedure is completed.
3. After the smear layer is removed, a final rinse with an antiseptic solution such as 2% CHX appears beneficial. CHX is particularly helpful in retreatment cases, where high proportions of

gram-positive bacteria can be expected in the root canal system.

Other indications for the use of CHX are for patients allergic to NaOCl or where it would not be desirable to have NaOCl in contact with periodontal tissues such as perforations or open apices.

Finally, 2% CHX has been suggested for use as an intracanal medication either alone (in liquid form), mixed with a vehicle (in gel form) or mixed with calcium hydroxide (either in gel form or in a slurry preparation). ♦

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### Further Reading

Basrani B, Lemonie C. Chlorhexidine gluconate. *Aust Endod J* 2005; 31(2):48-52.  
Zehnder M. Root canal irrigants. *J Endod* 2006; 32(5):389-98.



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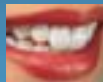
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## Titanium Trauma Splint: An Alternative Splinting Product

Aly Adatia, BSc, DDS; David J Kenny, BSc, DDS, PhD, FRCD(C)

*“Clinical Showcase” is a series of pictorial essays that focus on the technical art of clinical dentistry. The section features step-by-step case demonstrations of clinical problems encountered in dental practice. If you would like to propose a case or recommend a clinician who could contribute to this section, contact editor-in-chief Dr. John O’Keefe at [jokeefe@cda-adc.ca](mailto:jokeefe@cda-adc.ca).*

Dental injuries such as extrusion, severe intrusion, lateral luxation, severe subluxation and avulsion often require stabilization to facilitate repair or regeneration. Light wire and composite resin (Fig. 1), button-bracket orthodontic and resin bandage splinting techniques are time consuming and technique sensitive, and a dentist and an assistant are required for optimal results.<sup>1</sup> Once placed, these splints may be uncomfortable because of their bulk, they may hinder oral hygiene, and some splints may cause short-term speech impairment.<sup>2</sup> The titanium trauma splint (TTS) (Medartis AG, Basel, Switzerland; North American agents: Medartis Inc., Kennett Square, Penn.), which has recently been made available in Canada through Patterson Dental, offers solutions to many of these problems and has been in use at the Toronto Dental Trauma Research Unit since 2005. The TTS is just 0.2 mm thick and can therefore be readily adapted to the patient’s dentition and is easily inserted and removed by a clinician working alone. This splint facilitates oral hygiene, limits tooth mobility because of

its rhomboid mesh structure and is more comfortable than wire and composite resin splints.

### Case Report

A 16-year-old male presented with avulsion of teeth 11 and 21. The incisors had been stored in water for 6 hours before presentation. The apices of both incisors were mature. After discussion with the patient and his parents, the decision was taken to perform extraoral root canal therapy and to replant the 2 incisors.

Endodontic therapy consisted of access, biomechanical preparation and obturation with gutta-percha and sealer. Coronal access was closed with a base of glass ionomer cement (Photac-Fil cement, 3M ESPE, Minneapolis, Minn.), and a final restoration of composite resin (Z100 resin, 3M ESPE) was placed. Finally, the root surfaces were debrided of adherent periodontal ligament<sup>3</sup> by polishing with flour of pumice in a rubber cup. The incisors were stored in normal saline before replantation.

Following provision of local anesthesia, the injury site was thoroughly



**Figure 1:** Wire and composite resin splint.



**Figure 2:** Titanium Trauma Splint (TTS) used as a template for placement of acid etch gel.



**Figure 3:** Acid etch gel in place.



**Figure 4:** Appearance after gel has been washed off and etched teeth have been dried.



**Figure 5:** Placement of bonding agent.



**Figure 6:** TTS being tacked in place and light cured.



**Figure 7:** Temporarily bonded TTS holding all teeth in place.



**Figure 8:** TTS finished and secured with flowable composite.



**Figure 9:** TTS at time of splint removal.

irrigated with normal saline and moistened gauze. Any clotted blood remaining in the sockets was gently curetted and the socket rinsed with normal saline. The incisors were then replanted with help from the patient and his parents to identify their original positions. Before splinting, occlusion was assessed to ensure that there were no interferences.

### Splinting Procedure

A 52-mm TTS splint was adapted to match the patient's dentition and arch form. With the TTS held in the desired position, 37% phosphoric acid was applied to the rhomboid openings in the splint (Figs. 2 and 3); 30 seconds later, the splint was removed, the acid was rinsed off and the teeth were allowed to dry (Fig. 4). The splint was also rinsed to remove etchant. Bonding agent (Scotchbond, 3M ESPE) was then applied to the etched areas (Fig. 5) and the splint placed such that the openings matched the etched sites. The bonding agent was then light cured for 10 seconds with a LED light to tack the splint in place peripheral to the avulsed teeth (Figs. 6 and 7). Flowable composite

resin (Filtek Supreme Plus resin, 3M ESPE) was then applied to the openings in the TTS mesh on the teeth adjacent to the injured teeth and light cured (Fig. 8). Only a thin layer of flowable composite is required to fill the openings, which minimizes the need for finishing and trimming. Once the adjacent, noninjured teeth were secured to the TTS, the 2 replanted incisors were secured to the TTS using the same technique. Final trimming of the splint to remove excess length and to smooth sharp edges was completed with a fine diamond bur. If necessary, the resin may be trimmed with a finishing bur to reduce bulk and ensure comfort.

A final check of occlusion was performed and the patient was given instructions for care. A radiograph was taken with the splint in place as a reference for re-assessment appointments.

After an appropriate interval, the radiographic examination was repeated and the splint removed (Fig. 9). The interval between examinations and the decision to remove the splint will vary with the particular injury. A carbide or diamond bur was used to separate the affected teeth from the remainder of the splint (Figs. 10 and 11), and a



**Figure 10:** TTS being cut to separate the replanted teeth from the rest of the arch.



**Figure 11:** Appearance after TTS has been peeled off all but the replanted teeth.



**Figure 12:** Composite reduced to the level of the TTS for easy removal by peeling back.

heatless green stone was used to reduce the composite resin to the level of the splint (Fig. 12). The TTS was then peeled off (this can be done by hand or with hemostats). Final polishing and removal of the residual composite was achieved with finishing disks to minimize enamel damage and reduce sensitivity.

### Conclusions

The TTS can be applied in much less time than a custom light wire and composite splint, and removal and clean-up are much easier. The adaptability of the splint to adjacent teeth facilitates the etch-bond stage, as the splint can be easily tacked to adjacent teeth before application of flowable composite. These features make it much easier for a clinician working alone to stabilize the splint in the presence of oral injury and bleeding. The esthetics, ease of cleaning and comfort are apparent in the figures, and tooth mobility can be controlled by application of resin between the joints if more rigidity is desired. The costs for light wire splints are minimal, and the amount of composite resin used is approximately the same. The cost of the TTS is approximately Can\$57, which is billed as a laboratory fee. Sports dentists or dental emergency clinicians who treat trauma would benefit most from the ease and time-saving features of this splint. Benefits to the patient are comfort, ability to keep the device clean and overall appearance. ❖

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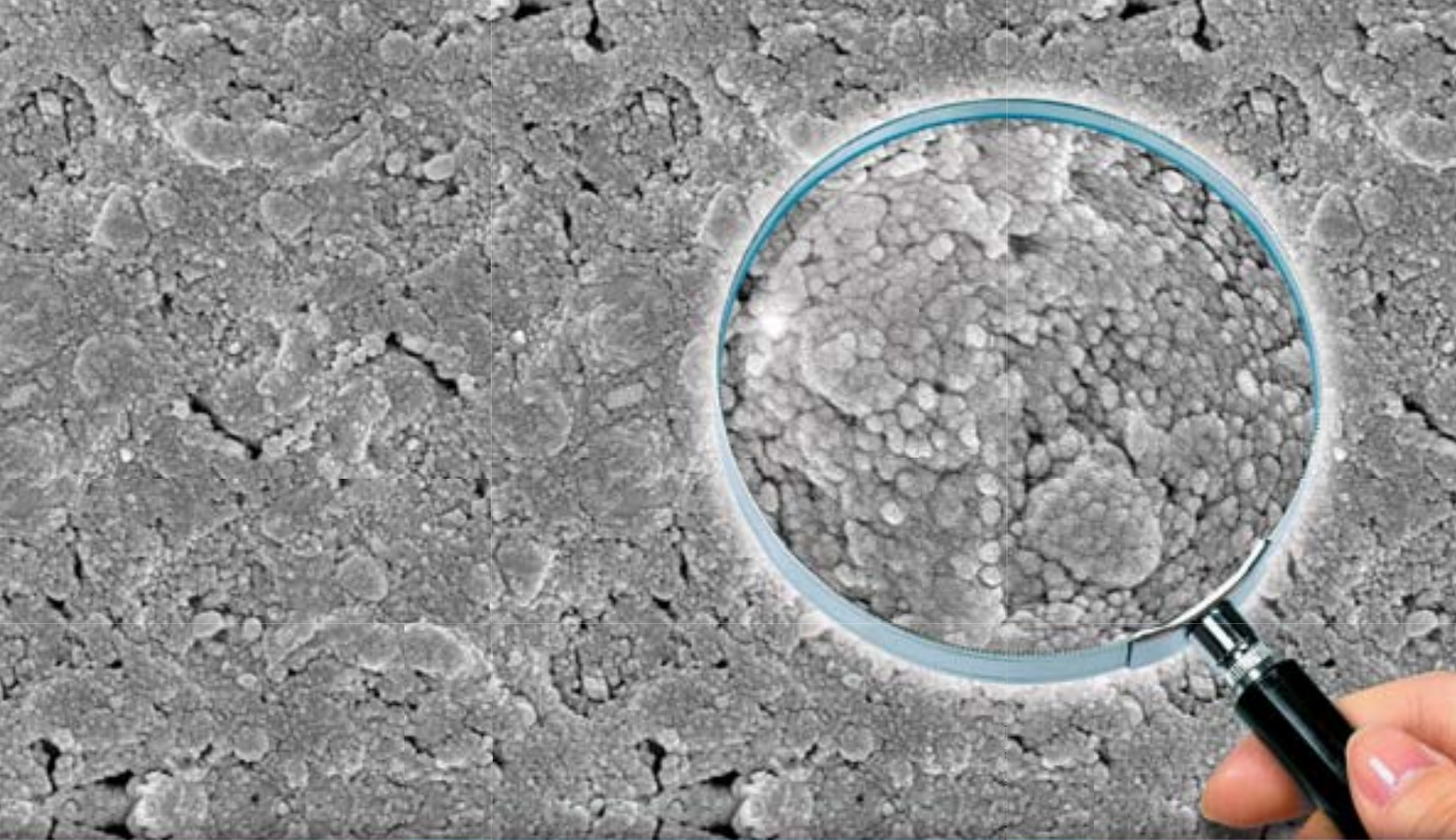
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### References

1. von Arx T, Fillipi A, Lussi A. Comparison of a new dental trauma splint device (TTS) with three commonly used splinting techniques. *Dent Traumatol* 2001; 17(6):266–74.
2. Filippi A, von Arx T, Lussi A. Comfort and discomfort of dental trauma splints — a comparison of a new device (TTS) with three commonly used splinting techniques. *Dent Traumatol* 2002; 18(5):275–80.
3. Kenny DJ, Barrett EJ, Casas MJ. Avulsions and intrusions: the controversial displacement injuries. *J Can Dent Assoc* 2003; 69(5):308–13.



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# Dental Faculty Shortage in the United States and Canada: Are There Solutions?

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This article has been peer reviewed.

Over the past several decades, many orthodontic teaching positions have remained unfilled and, despite many efforts, the situation doesn't seem to change. Currently, there is a need for approximately 300 dental faculty.<sup>1</sup> Many of these positions have been open for years and the shortage has reached crisis proportions. To solve this problem, the implicit and explicit requirements regarding hiring and retention of those in dental teaching positions must change. If no one fills these positions, dental programs will not be able to train future dentists properly and public health will suffer.

The problem is not only to fill the current open positions, but also to address future needs.<sup>2</sup> Most dental faculty are in their 50s and 60s and succession plans seldom exist.<sup>3–5</sup> According to estimates, approximately 210 new full-time dental faculty will be needed each year just to maintain current numbers in the United States (6,400 full-time equivalent positions).<sup>6–8</sup> In addition to retiring, faculty are also abandoning educational careers to pursue private practice<sup>2,8,9</sup> or are planning to do so in the future.<sup>10</sup> The reasons are primarily work-related and not necessarily exclusively economic.<sup>2,9–11</sup>

Currently, part-time faculty are responsible for a large proportion of the duties that were previously carried out by full-time staff.<sup>6,8,10</sup> This may be a provisional solution, although

disadvantages may include lack of staff involvement in the teaching process.

Why are Canadian and American dentists not filling these positions? Among the most important reasons are low salaries compared with private practice earnings; the inability to practise outside the university to supplement income; and the requirements (PhD and expertise in attracting grants) for successful tenure.<sup>4,12–14</sup>

Several solutions have been proposed.<sup>5</sup> For most dental graduates, the decision to enter academia is difficult because of the need to repay the large loans they needed to support their education.<sup>6</sup> If more training stipends<sup>6,15</sup> were available, student loans would be considerably lower. Salary support is also very important in retaining faculty.<sup>10</sup> Other proposed solutions include allowing greater flexibility in moving through academic ranks and making special adjustments for dentistry<sup>7,8,16,17</sup>; with help from the professional organizations, making academia more attractive to potential immigrants<sup>4,15,18</sup>; following the medical model,<sup>4</sup> whereby faculty can supplement their salary through practices in the school clinics; using federal stipends to subsidize dental training on the condition that the student enters academia for a number of years<sup>2,15</sup>; temporarily changing the rules to allow foreign-qualified academics to fill the gaps<sup>4</sup>; soliciting funds from dental graduates to support faculty salaries at their alma mater; and supplementing

salaries through better intramural or extramural practice conditions.<sup>10</sup>

Why are immigrants not filling faculty positions? Recognition of previous academic and professional training is a key obstacle. Only a few professional organizations have made efforts to facilitate the recognition of foreign professional credentials.<sup>19</sup> Even in the European community, where dental licences are valid in all member countries, restrictions apply. In the future, common guidelines and procedures for educating dentists may be possible, allowing dentists to practise anywhere in the world after meeting some reasonable conditions for licence<sup>20</sup>; however, current differences in dental training among countries make this approach untenable. Hiring foreign dental faculty has advantages — new expertise and experience and an effective way to fill open positions temporarily.<sup>15</sup> However, in the long term, attractive conditions must be offered, in addition to simplifying the recognition of dental qualifications.

Another important consideration is the need for experienced faculty to mentor young colleagues as they develop the skills necessary to succeed in the academic arena.<sup>2,3</sup> Unfortunately, the middle-aged faculty who are best qualified to provide such guidance are the most scarce.<sup>3</sup> As a result, the initial experience of many young faculty may be frustrating, leading them to rapid abandonment of academia.<sup>2,3</sup> Succession planning with careful selection, mentorship and retention of young faculty is key to stability as the older generation retires.<sup>21</sup>

As noted above, significant change in current conditions and requirements must take place to address the current shortage of dental faculty. We must either make dental academic careers more attractive to Canadian dentists or simplify the recognition process and bridging or upgrading programs for foreign-qualified dental faculty. The deadline for finding a solution to the problem is getting closer. ♦

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## References

- Meskin LH. Those who can, do. *J Am Dent Assoc* 2000; 131(4):428, 430, 432.
- Johnson W. The lost generation. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 85(6):627.
- Laskin DM. Factors influencing oral and maxillofacial surgeons to select or leave academic careers. *J Oral Maxillofac Surg* 1994; 52(2):174–6.

- Tuncay OC. American perspective — part II. Strategies for the survival of the species. *Clin Orthod Res* 2001; 4(2):63–4.
- Livingston HM, Dellinger TM, Hyde JC, Holder R. The aging and diminishing dental faculty. *J Dent Educ* 2004; 68(3):345–54.
- Editorial: the manpower needs of dental education and dental research. *J Dent Educ* 1974; 38(3):138–9.
- Kennedy JE. The role of tenure and the development of clinical tracks for faculty. *J Dent Educ* 1981; 45(10):663–9.
- Kennedy JE. Faculty status in a climate of change. *J Dent Educ* 1990; 54(5):268–72.
- Moore RN. Faculty mobility in academic dentistry. *J Am Coll Dent* 1985; 52(4):16–21.
- Kula K, Glaros A, Larson B, Tuncay O. Reasons that orthodontic faculty teach and consider leaving teaching. *J Dent Educ* 2000; 64(11):755–62.
- Laskin DM. Learning to keep our teachers. *J Oral Maxillofac Surg* 1991; 49(2):1263.
- Trotman CA, Bennett E, Scheffler N, Tulloch JC. Faculty recruitment, retention, and success in dental academia. *Am J Orthod Dentofacial Orthop* 2002; 122(1):2–8.
- Chaytor DV. Prosthodontics 1966–2042: changes in prosthodontic education, past and future. *J Can Dent Assoc* 2005; 71(5):329. Available from URL: <http://www.cda-adc.ca/jcda/vol-71/issue-5/329.html>.
- Tedesco L, Martin M, Banday N, Clarke M, DeChamplain R, Fazekas A, and others. 3.1 Scholarship and the university. *Eur J Dent Educ* 2002; 6 Suppl 3:86–96.
- Till MJ, Posnick WR, Walker JD. Toward solving the manpower shortage in dental education. A look at recruitment. *J Am Coll Dent* 1975; 42(4):230–40.
- Mumma RJ. Reactor paper to: Kennedy JE. The role of tenure and the development of clinical tracks for faculty. *J Dent Educ* 1981; 45(10):663–9.
- Kennedy JE. Alternatives to traditional tenure. *J Dent Educ* 1984; 48(9):506–8.
- Johnston LE Jr. Charity begins at home... *Am J Orthod Dentofacial Orthop* 1998; 113(3):16A–17A.
- Janingan M. Immigrants: how many is too many? Who should get in? Can we tell them where to live and what to do? *Maclean's* 2002; 115:20–7.
- Schleyer T, Eaton KA, Mock D, Barac'h V. Comparison of dental licensure, specialization and continuing education in five countries. *Eur J Dent Educ* 2002; 6(4):153–61.
- Logan NS. Promoting the recruitment and retention of minority faculty. *J Dent Educ* 1997; 61(3):273–76.

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# The Burden of Debt for Canadian Dental Students: Part 2. A Report on Survey Participants and an Analysis of Dental Education Costs

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## Abridged Version

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There are many anecdotes, but few facts about the issue of dental students' debt in Canada. This second of a 4-part series about dental students' debt attempts to remedy this situation. In January 2004, students at Canada's 10 dental schools were invited to participate in a survey on costs, debt and other factors related to attending dental school in Canada.

**Purpose:** The aims of the survey were to measure the total costs of attending dental school in Canada, examine the magnitude of debt accumulation for Canadian dental students, and explore how educational costs and related debt are affecting students' professional choices within dentistry. The study was supported by the deans of the dental schools. The survey was reviewed by senior administrators at each dental school and translated into French by a staff member at McGill University's faculty of dentistry.

**Materials and Methods:** The design of the survey was based on simplified questionnaires used in Canada and the United States to investigate student financing issues. The survey provided previously inaccessible demographic information about levels of debt amongst dental students. Statistical analysis, primarily with simple descriptive statistics and regression analysis, was undertaken with SPSS version 13.

The overall response rate, based on the number of students registered in each program and the number who responded, was 42.4%. Only 1 student responded from the University of Montreal. The response rate from Laval University was 9%; the response rate at the 8 other dental schools across Canada ranged from 38.8% to 66.4%. Although

students completing international degree or qualifying programs accounted for 8% of respondents, we excluded this group from the analysis because of their unique prior experience of dentistry and because their financial circumstances are typically different from those completing the full 4-year program.

**Results:** A typical survey respondent had completed 4 years of post-secondary education, was in first-year dental school, was single with no dependents, did not work outside of classes, lived in rented accommodation, and walked to school. Sex and racial data for the current study was broadly similar to recent findings for the 2003 graduating class in the United States.

Reported costs to attend dental school varied widely among Canadian dental schools. Overall costs for all dental students surveyed exceeded tuition fees by a considerable amount. Choice of school and year of study had a significant effect on the overall costs of attending dental school. Almost 40% of the variation in the cost of attending dental school was due to the variation among schools and year of study. The difference in median costs reported for dental students attending school, according to school and year of study, was \$38,500 (range \$52,000 [years 1 and 2 at Saskatchewan] to \$13,500 [year 3 at Laval]).

**Conclusions:** The study yielded key data about the demographics of the respondents. The variation in the reported costs to attend Canadian dental schools was marked. The choice of university attended by dental students and the year of study in the dental program had the greatest impact on the overall costs of attending dental school. ♦

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# Dental Service Use and its Correlates in a Dentate Population: An Analysis of the Saskatchewan Population Health and Dynamics Survey, 1999–2000

Julie Kosteniuk, MA; Carl D'Arcy, PhD

## Abridged Version

The complete article is published in the electronic JCDA at [www.cda-adc.ca/jcda/vol-72/issue-8/731.html](http://www.cda-adc.ca/jcda/vol-72/issue-8/731.html)

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Oral health is increasingly recognized as a health outcome that varies according to our social environment and individual behaviours.

**Objectives:** To document the frequency of self-reported dental service use within a 2-year period by a large sample of dentate Saskatchewan residents aged 18 years and older; explore the correlates associated with dental service use for men and women separately; and examine the age, gender and income distribution of dental insurance coverage. We use an ideal-type health cycle, adapted from previous research, to provide a conceptual framework to guide this study and to aid in understanding the social structural and individual pathways to oral health.

**Methods:** The 1999–2000 Saskatchewan Health and Dynamics Survey provided a representative sample for analysis. It comprised 5,003 dentate respondents (mean age 45.5 years; 52.3% women), 18 years and older randomly selected and interviewed by telephone. The response rate was 77%.

**Results:** Of those interviewed, 77% of women and 67% of men reported a dental visit within the previous 2 years. For women, logistic regression analysis indicated that when all other factors were held constant, the odds of dental service use within the last 2 years were higher among those who were aged 18–19 years, had post-secondary education or technical certification, were in the highest household income adequacy category, held dental insurance and engaged in such preventive behaviours as regular general checkups, eye checkups, skin self-examination and not smoking daily. For men, the odds of dental service use within the

last 2 years were greater if they had education at or beyond the secondary level, were students, were in the upper or highest income adequacy levels, held dental insurance and engaged in preventive health behaviours. Dental insurance coverage was strongly associated with household income adequacy and peaked among both men and women aged 30–49 years.

**Conclusions:** The results highlight 4 issues relevant to public oral health. The first concerns gender and dental visits: women were more likely than men to have had a dental visit within the last 2 years, and the factors associated with dental service use varied slightly with gender. The second concerns the social inequities that were evident in dental service use, particularly with respect to income, education and age. Third, regardless of household income adequacy, people with dental insurance were more likely to use dental services than those without dental insurance. Fourth, regular health-related behaviours that involved health professionals, such as general medical checkups and eye checkups, were associated with recent use of dental services.

We expect that recent efforts to conduct a national survey of Canadians' oral health, particularly if it is longitudinal, will present a further opportunity to use the conceptual model presented in this paper. Future research into the interactive effects of the social environment and health-related behaviours and resources on the oral health of Canadians may provide further evidence for targeting segments of the population most in need of federally funded oral health strategies. ♦

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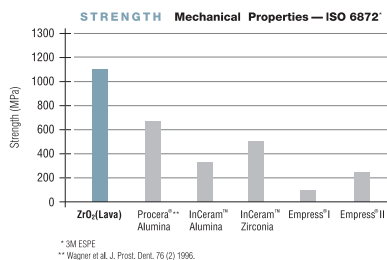
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# Evaluation of Antimicrobial and Antifungal Effects of Iodoform-Integrating Gutta-Percha

Emre Bodrumlu, DDS, PhD; Tayfun Alaçam, DDS, PhD

## Abridged Version

The complete article is published in the electronic JCDA at [www.cda-adc.ca/jcda/vol-72/issue-8/733.html](http://www.cda-adc.ca/jcda/vol-72/issue-8/733.html)

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The destruction of microbial pathogens is key to endodontic success. Medicated gutta-percha (MGP) containing 10% iodoform has been developed to inhibit microbial growth. This new form of gutta-percha has been shown to have antimicrobial effects against *Streptococcus viridans*, *Staphylococcus aureus* and *Bacteroides fragilis*.

**Objective:** The aim of this study was to evaluate and compare the antimicrobial and antifungal effectiveness of MGP and regular gutta-percha cones over different time periods using the disk diffusion method.

**Methods:** *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans* were inoculated on agar plates at 37°C, and 2 strains of *Enterococcus faecalis* were inoculated at 44.5°C. Constant inoculums for all microorganisms were transferred to specific fluid growth media before the experiment. The organisms were grown overnight in the following media: *E. faecalis* (ATCC 29212 and ATCC 47077 strains), *P. aeruginosa*, *S. aureus* and *E. coli* were spread on Mueller-Hinton agar, and *C. albicans* was spread on Sabouraud agar supplemented with glucose. Before the experiments, MGP cones were soaked for 1 hour by complete immersion in 2 mL sterile water in a test tube to release free iodine. After the soaking procedure, same-sized MGP cones, conventional gutta-percha cones and disks impregnated with povidone-iodine were placed on the inoculated plates. The plates were incubated aerobically for 24, 48 and 72 hours at 37°C and the antimicrobial effects of MGP, iodoform-free gutta-percha and the iodine-impregnated disks were determined

by measuring the diameter of zones of inhibition. For each strain, experiments were performed in triplicate, and the average value was determined. The Kruskal-Wallis test was used to compare *k* independent samples.

**Results:** Uniform growth was evident on all control plates. Samples from triplicate trials yielded consistent results. Povidone-iodine inhibited all strains for up to 72 hours. No inhibition zone was seen around regular gutta-percha cones. MGP was statistically more effective than regular gutta-percha ( $p < 0.05$ ). MGP inhibited the growth of all pathogens for 24 hours. The largest mean inhibition zone with MGP cones occurred with *S. aureus* (mean diameter 10.5 mm), followed in descending order by *C. albicans* (9.3 mm), *E. faecalis* (ATCC 29212) (8.3 mm), *E. faecalis* (ATCC 47077) (7.0 mm), *E. coli* (4.0 mm) and *P. aeruginosa* (3.6 mm). However, in some cases, this effectiveness did not persist over time; specifically, the antibacterial effect of MGP against *E. coli* and *P. aeruginosa* had dissipated after 48 and 72 hours. MGP was moderately effective against *C. albicans* over all time periods, whereas regular gutta-percha exhibited no antifungal activity.

**Conclusions:** The antibacterial and antifungal characteristics of MGP may indicate an advantage over conventional gutta-percha. The results of in vitro studies cannot be directly extrapolated to clinical conditions, but they permit preliminary comparisons. It will be important to conduct further investigations to confirm these findings in vivo. ✦

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# Conservative Management of Regional Odontodysplasia: Case Report

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## ABSTRACT

Regional odontodysplasia is an uncommon developmental anomaly affecting a localized area of the dentition. The affected teeth are often grossly malformed and develop abscess soon after eruption. Although extractions are often required, in some milder cases the teeth may be retained for a long period. The treatment plan should be based on the degree of involvement as well as functional and esthetic needs in each case. This article describes a conservative treatment approach in a 10-year-old boy with regional odontodysplasia.

**MeSH Key Words:** bicuspid/abnormalities; incisor/abnormalities; molar/abnormalities; odontodysplasia/therapy

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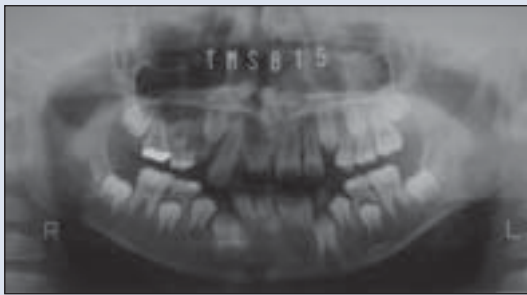
Regional odontodysplasia (RO) is an uncommon, nonhereditary developmental anomaly affecting dental tissues derived from both the mesoderm and ectoderm.<sup>1</sup> The prevalence of this condition is not known, as reports have mainly been of cases. It has been suggested that RO is slightly more common in females, but its incidence does not tend to be higher in any particular ethnic group.<sup>2</sup>

The criteria for diagnosis are mainly clinical and radiographic, sometimes supplemented by histologic findings.<sup>2</sup> Clinical examination reveals affected teeth that are atypically shaped with surface pits and grooves and yellowish or brownish discoloration.<sup>1</sup> The condition is usually unilateral,<sup>2–5</sup> although exceptions can be found.<sup>6–8</sup> The anomaly is usually localized in one arch, with incidence higher in the maxilla.<sup>1</sup> Rarely, almost all teeth of the same arch are affected.<sup>9</sup> In cases where both arches are involved, the presentation is usually unilateral.<sup>10</sup> The affected teeth most often occur as a continuous series, although occasionally

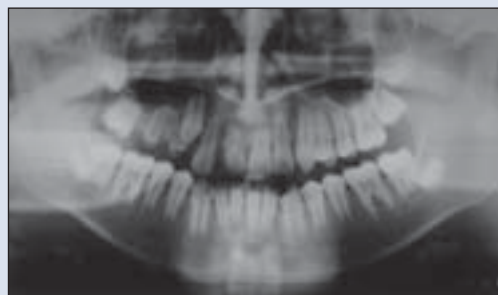
the anomaly will “skip” a tooth or group of teeth.<sup>11</sup> Eruption of the affected teeth is often delayed or failed.<sup>3</sup>

Radiographically, the anomalous teeth appear less opaque than unaffected teeth, and the demarcation between enamel and dentin is not distinct.<sup>1</sup> The pulp chambers and root canals are wide, giving the appearance of “ghost teeth.”

Histologically, areas of hypocalcified enamel are visible and enamel prisms appear irregular in direction.<sup>7</sup> Coronal dentin is fibrous, consisting of clefts and a reduced number of dentinal tubules; radicular dentin is generally more normal in structure and calcification.<sup>7</sup> Pulpal calcification of various degrees is also commonly seen.<sup>12</sup> The mineral content of the affected enamel has been found to be higher than that of dentin in microradiographic studies.<sup>12</sup> The greater density of the enamel is not evident in conventional radiographs, probably because of the thinness of the enamel layer in affected teeth.



**Figure 1:** Orthopantomogram of the patient taken at 10 years of age, showing the "ghost tooth" appearance of teeth 11, 14 and 15.



**Figure 2:** Orthopantomogram taken at age 11.5 years, showing very thin radicular dentin in teeth 11, 14 and 15. The roots of teeth 12 and 13 appear normal.



**Figure 3:** Frontal view of the patient at age 12.5 years, showing tooth 11 with hypoplastic, short crown. Mild hypoplasia is also seen on tooth 13.



**Figure 4:** Occlusal view of the patient's maxillary arch, showing hypoplastic, discoloured right premolars.



**Figure 5:** Buccal view of the patient taken 6 months after placement of the composite restorations on teeth 11, 13, 14 and 15.

The management of RO is somewhat controversial and revolves around the question of whether to remove the affected teeth.<sup>2-5</sup> Although many clinicians prefer to extract the anomalous teeth as soon a diagnosis of RO is made,<sup>6,7,10</sup> some prefer to retain them until skeletal growth is complete as long as they are free of infection.<sup>4,13</sup> In this article, a case of RO managed by a conservative approach is described.

### Case Report

A 10-year-old boy attended the author's clinic for a routine checkup. His prenatal, birth, medical and family history were unremarkable. Extraoral examination revealed nothing of note. The boy was at the late mixed dentition stage, with all primary second molars retained. The maxillary right permanent first and primary second molars were grossly hypoplastic and heavily restored. The maxillary right permanent central incisor was also grossly hypoplastic and discoloured and had a short crown. The maxillary right permanent lateral incisor was distally tilted but its coronal structure appeared normal. No dental abscess was seen clinically.

An orthopantomogram revealed enlarged pulp chambers and short roots in the maxillary right permanent central incisor and first molar (**Fig. 1**). Development of the maxillary right premolars was delayed and they showed ill-defined enamel and dentin. A diagnosis of RO was made. The maxillary right permanent first molar was subsequently extracted because of its poor prognosis. Timely extraction would also facilitate mesial drift of the adjacent permanent second molar. The boy was then seen regularly to monitor the eruption of the maxillary right premolars and to watch for signs or symptoms of infection in the maxillary right central incisor.

The maxillary right premolars erupted when the boy was 11 years of age, but the teeth had grossly hypoplastic and discoloured crowns as well as thin radicular dentin (**Fig. 2**). The maxillary right permanent canine erupted at 12.5 years of age, and was only mildly affected, with localized enamel hypoplasia on the buccal surface. The maxillary right central incisor remained infection free (**Figs. 3 and 4**). The labial-buccal surfaces of these teeth were restored with composite resin to improve their appearance (**Fig. 5**). Supragingival margins were placed





**Figure 6:** Periapical radiograph taken at age 14.5 years, showing continued root development in tooth 14.



**Figure 7:** Periapical radiograph of tooth 11 showing amorphous calcification in the coronal half of the pulp chamber.

to avoid jeopardizing periodontal health. All teeth remained sound when the boy was seen at 14.5 years of age, and the apical half of the maxillary right first premolar appeared well developed (**Fig. 6**). The adjacent second premolar had also attained a root length similar to that of the first premolar, but its pulp chamber remained enlarged and radicular dentin was very thin on the mesial side. Some amorphous calcification was also seen in the pulp chamber of the maxillary right central incisor (**Fig. 7**).

## Discussion

The etiology of RO is still unknown and such conditions as viral infections, local trauma, vascular defects, irradiation, metabolic disturbance, rhesus incompatibility and medications during pregnancy have been suggested as possible causes.<sup>1</sup> Some patients may also present with systemic anomalies, such as facial asymmetry.<sup>8</sup> In the current case, etiologic factors could not be identified and no systemic involvement was seen. Although dentinal dysplasia, amelogenesis and dentinogenesis imperfecta show some similarities to RO, these conditions affect the entire dentition in contrast to the segmental involvement seen in RO.

Treatment of RO has given rise to controversy, the main concern being whether to remove the affected teeth. The rationale for early extraction is that many of the anomalous teeth are not restorable and would develop dental abscess soon after eruption.<sup>12</sup> On the other hand, retaining noninfected teeth helps maintain the alveolar bone, averts the need for a removable prosthesis and eliminates the psychological effects of premature tooth loss.<sup>2,4,13,14</sup>

As there is no general agreement on the best treatment for these patients, dentists should consider such factors as the patient's age, medical history, degree of involvement, the presence or absence of pathosis and the attitude and expectations of the child and parents.<sup>1,2,14</sup> The aims of treatment should include improving function and esthetics, reducing the psychological impact of early tooth loss and facilitating normal jaw growth.<sup>1,2</sup> If a decision is made to retain the anomalous teeth, regular review is mandatory.

In the present case, the patient was managed conservatively, as the anomalous

teeth remained free from infection. The aim was to retain those teeth until skeletal growth was complete; at that time, the patient could be reassessed for dental implants and other rehabilitation methods. The anomalous teeth were localized in a single quadrant, had hypoplastic and discoloured crowns and were delayed in eruption — all of which are typical features of RO.<sup>1</sup> The pulpal calcification seen in the central incisor is also a common finding.<sup>12</sup> One interesting feature of the present case was the apparent “gradient of seriousness” in the buccal segment, ranging from localized enamel hypoplasia in the canine to malformed crown and root in the second premolar. The continued root development, as seen in the maxillary right first premolar, was an atypical finding that has been reported only occasionally.<sup>4,5,11,13</sup> The reason why the anomaly “skipped” the maxillary right lateral incisor was not clear, but this feature has also been reported occasionally.<sup>11</sup>

Although the patient and parents were satisfied with the results, the restorative treatment carried out in this case cannot be considered optimal because the esthetics and function of the patient's dentition were not fully restored. Patients and parents whose demand for esthetics is higher may find this option inadequate. Indirect composite veneers, which can be used without enamel reduction, might produce better esthetic results. However, extensive restorative work on anomalous teeth may not be practical, in view of the large coronal pulp chambers and thin enamel and dentin.<sup>4</sup>

In cases where parents and patients prefer not to retain anomalous teeth, extraction and replacement with a removable prosthesis would be required.<sup>11</sup> Autotransplantation with sound teeth from unaffected quadrants could also be a viable option,<sup>2,5</sup> but this is limited by the availability of suitable donor teeth.

The long-term prognosis for the anomalous central incisor and second premolar is poor because of the poorly developed coronal and radicular structures. Extraction of these teeth will be necessary when the patient's skeletal growth is completed. The first premolar, despite having a malformed crown, has developed a relatively well-formed root. Extracoronary restoration could probably be attempted after elective endodontic treatment and core buildup.<sup>13</sup> Should this be unsuccessful, the area could be incorporated into the final rehabilitation plan. Definitive rehabilitation may consist of dental implants, fixed or removable prostheses or a combination of these.<sup>2</sup>

### Conclusions

A case of conservative management of RO is presented. As seen in this case, affected teeth might show different degrees of malformation. Although those with gross hypoplasia and infection should be extracted, others that are free from infection can be retained. The treatment plan should be based on degree of involvement as well as functional and esthetic needs in individual cases. ✦

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*The author has no declared financial interests.*

### References

1. Hamdan MA, Sawair FA, Rajab LD, Hamdan AM, Al-Omari IK. Regional odontodysplasia: a review of the literature and report of a case. *Int J Paediatr Dent* 2004; 14(5):363–70.
2. Cahuana A, Gonzalez Y, Palma C. Clinical management of regional odontodysplasia. *Pediatr Dent* 2005; 27(1):34–9.
3. Ansari G, Reid JS, Fung DE, Creanor SL. Regional odontodysplasia: report of four cases. *Int J Paediatr Dent* 1997; 7(2):107–13.
4. Marques AC, Castro WH, do Carmo MA. Regional odontodysplasia: an unusual case with a conservative approach. *Br Dent J* 1999; 186(10):522–4.
5. von Arx T. Autotransplantation for treatment of regional odontodysplasia. Case report with 6-year follow-up. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 85(3):304–7.
6. Ozer L, Cetiner S, Ersoy E. Regional odontodysplasia: report of a case. *J Clin Pediatr Dent* 2004; 29(1):45–8.
7. Courson F, Bdeoui F, Danan M, Degrange M, Gogly B. Regional odontodysplasia: expression of matrix metalloproteinases and their natural inhibitors. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003; 95(1):60–6.
8. Guzman R, Elliott MA, Rossie KM. Odontodysplasia in a pediatric patient: literature review and case report. *Pediatr Dent* 1990; 12(1):45–8.
9. Yuan SH, Liu PR, Childers NK. An alternative restorative method for regional odontodysplasia: case report. *Pediatr Dent* 1997; 19(6):421–4.
10. Gomes MP, Modesto A, Cardoso AS, Hespagnol W. Regional odontodysplasia: report of a case involving two separate affected areas. *ASDC J Dent Child* 1999; 66(3):203–7.
11. Gerlach RF, Jorge J Jr, de Almeida OP, Coletta RD, Zaia AA. Regional odontodysplasia. Report of two cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 85(3):308–13.
12. Kinirons MJ, O'Brien FV, Gregg TA. Regional odontodysplasia: an evaluation of three cases based on clinical, microradiographic and histopathological findings. *Br Dent J* 1988; 165(4):136–9.
13. Melamed Y, Harnik J, Becker A, Shapira J. Conservative multidisciplinary treatment approach in an unusual odontodysplasia. *ASDC J Dent Child* 1994; 61(2):119–24.
14. Hanks PA, Williams B. Odontodysplasia: report of two cases. *Pediatr Dent* 1998; 20(3):199–203.

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F O R Y O U®

# Multidisciplinary Management of Hypodontia in Adolescents: Case Report

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## ABSTRACT

The purpose of this article is to describe a team approach to treatment of hypodontia in adolescent dentition. A case report of hypodontia with a microdontic lateral incisor in a Class I malocclusion illustrates the principles of case management. Multidisciplinary consultation during treatment planning and coordination and appropriate timing of subsequent interdisciplinary dental care enables the clinician to provide the optimum care. The scope of orthodontic and restorative management depends on the severity of the hypodontia.

**MeSH Key Words:** anodontia/therapy; dental prosthesis, implant-supported; dental restoration, permanent; orthodontic space closure

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**H**ypodontia is the developmental absence of 1 or more teeth.<sup>1</sup> Oligodontia is the term conventionally used in cases where 6 or more teeth are missing and anodontia, a much more rare finding, describes the developmental absence of all teeth.<sup>2</sup> The prevalence of hypodontia in the primary dentition ranges from 0.08% to 1.55%.<sup>1</sup> In the permanent dentition, prevalence has been reported to range from 2.3% to 11.3% depending on the population investigated.<sup>3–5</sup> Hypodontia of third molars has a prevalence of 9% to 37%.<sup>6</sup> Hypodontia in the primary dentition has no significant sex distribution, but in the permanent dentition females are affected more frequently than males by a ratio of 3:2.<sup>5</sup>

The etiology of hypodontia is unknown<sup>7</sup>; however, a definite familial trend has been reported.<sup>8,9</sup> Brook<sup>9</sup> suggests that most cases of hypodontia have a polygenetic inheritance pattern and that the risk of relatives having hypodontia will depend on a combination of numerous genetic and environmental factors,

each with a small effect. Hypodontia may also occur with no hereditary history. An association between hypodontia and microdontia has been found and affects females more than males.<sup>3,9</sup> Conversely, the incidence of supernumerary teeth is greater in males, with an association between hyperdontia and macrodontia.<sup>3,9,10</sup> Hypodontia has been found in association with impaction of permanent canines, maxillary canine–first premolar transposition and taurodontism.<sup>5</sup>

Although not all reports are in agreement, it is generally accepted that, excluding third permanent molars, the second mandibular premolar is the most frequently missing permanent tooth representing 40% to 50% of the total number of developing missing teeth.<sup>11,12</sup> Hypodontia affecting the maxillary lateral incisor is next in terms of frequency (25%), followed by the maxillary second premolar (20%) and the mandibular central incisor (6.5%).<sup>11</sup> These 4 teeth account for 90% of absent teeth in hypodontia studies.<sup>11,13</sup>



**Figure 1a:** Clinical views of malocclusion at initial presentation.



**Figure 1b:** Radiographic views at initial presentation: orthopantomographic view and periapical views of incisor area.



**Figure 1c:** Lateral cephalogram at initial presentation.

In approximately 80% of reported cases of hypodontia, only 1 or 2 teeth are missing; in 10%, 4 or more teeth are missing, while in fewer than 1%, 6 or more teeth are absent.<sup>5</sup> Permanent first premolars, first molars and canines are very rarely developmentally absent; their absence is usually associated with severe hypodontia or oligodontia.<sup>14</sup> A meta-analysis by Polder and colleagues<sup>15</sup> on reported data from 1936 to 2002 found that the prevalence of hypodontia in Europe and Australia was higher than in North America. Hypodontia may occur in isolation or in association with such syndromes as ectodermal dysplasia, Down's syndrome Ellis van Crevald syndrome and such conditions as cleft lip and palate.<sup>5,16-19</sup>

Hypodontia presents significant challenges for the clinician.<sup>5</sup> Treatment options will depend on the severity of the case. Simple adhesive bridges may resolve mild hypodontia cases or it may be appropriate to close the resultant spaces by orthodontic movement of adjacent teeth. In more severe cases, a combined orthodontic-restorative-surgical approach may be necessary with orthodontic treatment needed to relocate space in preparation for later conventional fixed prostheses or implants.<sup>20-22</sup>

This case report of an adolescent female who presented with significant hypodontia illustrates the importance of an accurate diagnosis and an effective treatment plan that relies on appropriate coordination among orthodontist,

an oral surgeon and prosthodontist in terms of timing of interventions. The timing of extraction of retained primary teeth is also critical to the final result. This case report shows that it is sometimes better to delay the removal of retained primary teeth to maintain the surrounding dento-alveolar bone until implants are feasible.

### Case Report

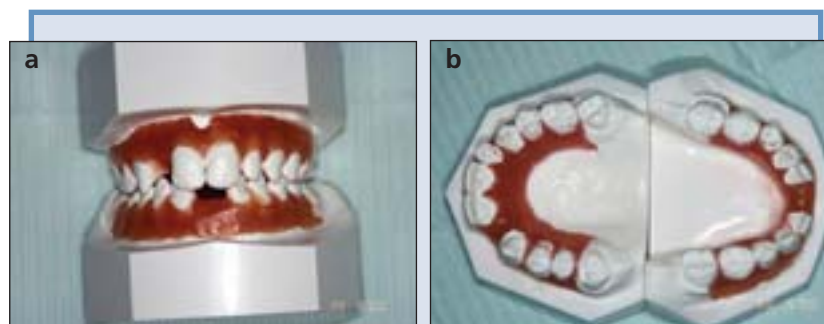
A girl, aged 12 years 9 months, was referred by her family dentist for orthodontic care to the Graduate Orthodontic Clinic, University of Western Ontario. The patient's presenting complaint was "the missing grown-up teeth and what happens next." Her general medical and dental histories were nonsignificant and she had no family history of any oral or dental anomaly. The patient was a regular attendee at dental appointments and had no history of extractions. Extraoral examination revealed a well-balanced face with normal facial profile and normal skeletal dental base relations. Intraoral examination revealed a Class I malocclusion in the late mixed dentition (**Figs. 1a to 1c, Table 1**). A 2-mm maxillary median diastema was present and the maxillary left lateral incisor (tooth 22) was microdontic. Oral hygiene and gingival status were good and no caries was found. Radiographic examination confirmed that 12 teeth were developmentally missing: teeth 18, 17, 12, 25, 27, 28, 38, 35, 31, 41, 45 and 48. Significant external root resorption was found in the retained primary teeth 75 and 85 (**Fig. 1b**).

**Table 1** Cephalometric analysis at initial presentation and at debonding

Cephalometric analysis	Normative values	Initial presentation (age 12 years, 9 months)	Debonding (age 15 years, 5 months)
<b>Skeletal</b>			
<i>Anteroposterior</i>			
SNA angle; °	80 ± 2	79	77
SNB angle; °	78 ± 2	77	76
ANB angle; °	2 ± 2	2	1
Facial angle; °	88 ± 5	85	86
Maxillary convexity; mm	2 ± 1	1	0
A point perpendicular to nasion; mm	0 ± 0.5	-3	-4
Pogonion perpendicular to nasion; mm	-4 ± 3	-8	-7
Wits; mm	-1	-3	-1
<i>Vertical</i>			
Mandibular plane angle; °	26 ± 4	31	31
Facial axis; °	90 ± 3	89	90
Y axis to SN; °	64-68	69	69
SN/GoGn; °	32 ± 4	38	39
Maxillary/mandibular plane; °	28 ± 4	32	32
Lower vertical face height; %	55	57	57
Upper vertical face height; %	45	43	43
<b>Dental</b>			
Maxillary incisor to sella-nasion; °	103 ± 5	98	104
Maxillary incisor to palatal plane; °	110 ± 5	104	112
Maxillary incisor to A vertical; mm	5 ± 1	4	5
Mandibular incisor to Md plane; °	90 ± 5	86	85
Mandibular incisor to APg line; mm	1 ± 2	1	2
Mandibular incisor to NB line; mm	3-4	3	4
Interincisal angle; °	130 ± 5	140	131
Maxillary incisal edge display; mm	2-3	6	4
<b>Jarabak analysis</b>			
Saddle angle (N-S-Ar); °	123 ± 5	123	125
Articular angle (S-Ar-Go); °	143 ± 5	148	144
Gonial angle (Ar-Go-Me); °	128 ± 7	126	128
Upper gonial angle (Ar-Go-N); °	52-55	51	52
Lower gonial angle (N-Go-Me); °	70-75	75	76
Anterior cranial base (S-N); mm	68-74	72	73
Mandibular corpus (Go-Me); mm	64-76	75	77
ACB: corpus ratio	1 : 1	1 : 1.04	1 : 1.05
Posterior cranial base (S-Ar); mm	30-36	34	35
Ramus (Ar-Go); mm	39-49	40	42

continued

Cephalometric analysis	Normative values	Initial presentation (age 12 years, 9 months)	Debonding (age 15 years, 5 months)
PCB: ramus ratio	3 : 4	3 : 3.5	3 : 3.6
Posterior face height as % of anterior face height (S-Go/N-Me)	54–59 clockwise; 65–75 counter-clockwise	59.5	59
Soft tissue analysis			
Frankfort plane to glabella; °	90 ± 3	89	87.5
Subnasale to glabella vertical; mm	6	4	4
Pogonion to glabella vertical; mm	0	-4	-3
Lower lip to E plane; mm	-2 ± 2	-2	-3.5
Facial contour angle (G-Sn-Pg); °	12	13	11



**Figure 2:** Pretreatment diagnostic setup: (a) labial view; (b) occlusal views.

Given the patient's presenting malocclusion, a multi-disciplinary team approach involving orthodontics, oral surgery and advanced restorative dentistry was essential in the consultation process, treatment planning and later clinical management of this case. The various treatment options open to the patient were considered. Nonintervention was not an option. Selective extraction of the retained primary teeth or their retention with buildups were also inappropriate options, given the severity of the hypodontia, the resultant poor esthetics and the malocclusion and poor root formation in 2 of the 3 retained primary molars. Limiting treatment to just 1 dental specialty, such as orthodontics, was also unrealistic. Orthodontics alone could not close the spaces or deal appropriately with the anterior occlusal asymmetry arising from the absent tooth 12.

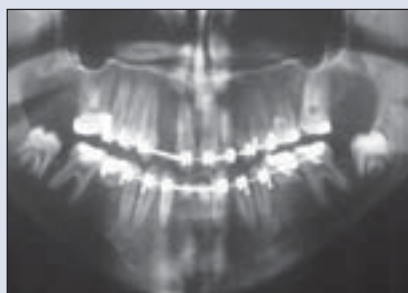
In consultation with the patient, a combined orthodontic–restorative–surgical team approach to care was adopted. The objectives of orthodontic treatment were to correct the malocclusion and align the teeth in preparation for later prosthodontic care. To assist the multidisciplinary consultation process, a diagnostic setup was prepared and, with the patient's consent, a

treatment plan was agreed to involving all 3 specialties (Fig. 2). The orthodontic treatment took a non-extraction approach using a pre-adjusted fixed appliance system (Figs. 3a, 3b). Treatment commenced when the patient was 13 years and 1 month old. The patient was reviewed regarding her prosthodontic–restorative needs during orthodontic treatment and before debonding (Fig. 3c). Debonding was completed when the patient was 15 years and 5 months old (Figs. 4a and 4b, Table 1). Due to poor esthetics, teeth 71 and 81 were extracted following debonding (Fig. 4a). Conventional orthodontic retainers with replacement dental units were fitted initially with a view to the long-term insertion of implants and placement of final suprastructure fixtures (Fig. 5). The orthodontic goals during both the active and retentive phases were achieved with good treatment outcome.

The patient was followed in the Graduate Orthodontic Clinic until maturation of her gingival unit and completion of her skeletal growth. Two years after debonding, the patient was assessed in the fixed prosthodontic and oral surgery departments for final management of the edentulous spaces. When she was 19 years old, 3 implants



**Figure 3a:** Clinical view of orthodontic appliance in situ before debonding.



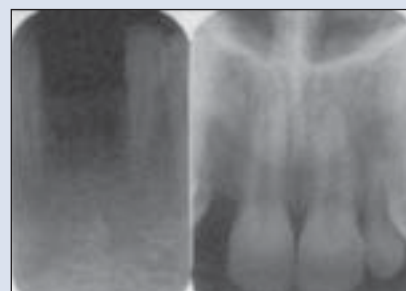
**Figure 3b:** Orthopantomographic view before debonding.



**Figure 3c:** Lateral cephalogram at debonding.



**Figure 4a:** Clinical views of occlusion following debonding and before buildup of the microdentic maxillary left lateral incisor.



**Figure 4b:** Radiographic views following debonding: orthopantomographic view and periapical views of incisor area.



**Figure 5:** Orthodontic Hawley retainers with dental units used in the interim period between debonding and placement of final crowns.

were placed at teeth 12 and 45 and in the mandibular midline area. Due to the lack of dentoalveolar bone in the mandibular midline area, an augmentation bone graft was necessary and was carried out 6 months before implant insertion using bone harvested from the right external oblique ridge. No surgical complications arose and subsequently coronal fixtures were placed in teeth 12, 31, 41 and 45 (Figs. 6a and 6b). The microdentic tooth 22 was built up to ensure symmetry with 12 (Fig. 6a). For now, the mandibular left primary second molar, which has good function, is being retained. In the long term, this tooth will be replaced with an implant as well. The patient, now aged 23 years, continues to be reviewed annually.

## Discussion

Hypodontia, microdontia, supernumerary teeth and megadontia tend to be associated, and a number of researchers have proposed explanations for these associations.<sup>3,9,14</sup> Brook<sup>9</sup> attempted to unify the etiologic explanation for these associated dental features, proposing a multifactorial hypothesis with genetic and environmental components. Brook's model suggests that hypodontia and microdontia form one extreme on a scale, with megadontia and supernumerary teeth at the other end. His model explains the previously reported finding that males with hypodontia have more significant microdontia than females. Kjaer and co-workers<sup>17</sup> suggest that the wide variation in the presentation of hypodontia





**Figure 6a:** Clinical views of occlusion, patient aged 21 years, 2 years following placement of implants and final crowns.



**Figure 6b:** Radiographic orthopantomographic view, 2 years following placement of implants and final crowns.

imply that the etiology is different for each case. They demonstrate that teeth located near the ends of peripheral nerve branches are most often affected by agenesis. They report hypodontia cases in which, on orthopantomographic examination, tooth agenesis is associated with the absence of the mandibular canal. They propose that, in cases of ectodermal dysplasia and Ellis van Crevald syndrome, the oral mucosa and supporting structures have a role in the etiology of hypodontia. In our case report, microdontia was found in association with the hypodontia but no family history of hypodontia could be found to support a genetic basis for this patient's presentation. No mucosal or bony abnormalities, which would have supported Kjaer's model, were found during clinical and radiographic examination.

This case report illustrates the need for a multidisciplinary team approach to care, not only at the treatment planning stage, but also throughout the entire course of treatment. The main objectives in the management of any hypodontia case are to improve esthetics and restore masticatory function; both were achieved in this case. Given that the patient presented in early adolescence, the timing of treatment and the coordination of care were additional critical components. Orthodontic treatment involved significant time, as implants and final prosthodontic restorations had to be delayed until gingival maturation and skeletal development were complete. Good coordination was achieved among all 3 dental specialties throughout

the treatment. In cooperation with the patient, a combined treatment plan was agreed to and the patient was reviewed at planned intervals both during active orthodontic treatment and later during retention. All pretreatment orthodontic goals were achieved without complication. Both arches were correctly aligned, with coincident midlines. Normal buccal and incisor relations were restored. The result was both occlusally and periodontally stable, while allowing appropriate access for later implant insertion. Restorative and oral surgeries were timed appropriately and both were carried out without complication.

One complication arose in the management of this case. Pretreatment bone levels in the mandibular midline area were low (**Fig. 1b**). Further bone loss occurred following extraction of the primary central incisors and before implant insertion, resulting in the definitive need for dentoalveolar bone augmentation. Carrying out the 2 mandibular primary central incisor extractions nearer the time of implant insertion may have been a better option. However, for patient esthetics, these teeth were removed and esthetic replacements placed on retainers.

### Conclusions

Marked hypodontia demands coordinated treatment planning and appropriate timing of the delivery of care by various dental specialties. Management of hypodontia in adolescent patients permits optimum orthodontic control of the developing occlusion. This literature review and case report of hypodontia illustrate the principles of case management.

Multidisciplinary referral or consultation is important in treatment planning. Planning for space management is best carried out before initiating orthodontic treatment. A diagnostic setup is an essential adjunct to the treatment planning process. Tooth size measurements provide valuable data for evaluating the final tooth position and morphology. Careful consideration should be given to the timing of extraction of primary teeth and, if possible, extraction should coincide with implant insertion. ✦

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## References

- Whittington BR, Durward CS. Survey of anomalies in primary teeth and their correlation with the permanent dentition. *N Z Dent J* 1996; 92(407):4–8.
- Silva Meza R. Radiographic assessment of congenitally missing teeth in orthodontic patients. *Int J Paediatr Dent* 2003; 13(2):112–6.
- McKeown HF, Robinson DL, Elcock C, al Sharood M, Brook AH. Tooth dimensions in hypodontia patients, their unaffected relatives and a control group measured by a new image analysis system. *Eur J Orthod* 2002; 24(2):131–41.
- O'Dowling IB, McNamara TG. Congenital absence of permanent teeth among Irish school-children. *J Ir Dent Assoc* 1990; 36(4):136–8.
- Larmour CJ, Mossey PA, Thind BS, Forgie AH, Stirrups DR. Hypodontia — a retrospective review of prevalence and etiology. Part 1. *Quintessence Int* 2005; 36(4):263–70.
- Egermark-Eriksson I, Lind V. Congenital numerical variation in the permanent dentition. D. Sex distribution of hypodontia and hyperodontia. *Odontol Revy* 1971; 22(3):309–15.
- Goodman JR, Jones SP, Hobkirk JA, King PA. Hypodontia: 1. Clinical features and the management of mild to moderate hypodontia. *Dent Update* 1994; 21(9):381–4.
- Arte S, Nieminen P, Pirinen S, Thesleff I, Peltonen L. Gene defect in hypodontia: exclusion of EGF, EGFR, and FGF-3 as candidate genes. *J Dent Res* 1996; 75(6):1346–52.
- Brook AH. A unifying aetiological explanation for anomalies of human tooth number and size. *Arch Oral Biol* 1984; 29(5):373–8.
- Symons AL, Stritzel F, Stamation J. Anomalies associated with hypodontia and the permanent lateral incisor and second premolar. *J Clin Pediatr Dent* 1993; 17(2):109–11.
- Rose JS. A survey of congenitally missing teeth, excluding third molars in 6000 orthodontic patients. *Dent Pract Dent Rec* 1966; 17(3):107–14.
- Aasheim B, Ogaard B. Hypodontia in 9-year-old Norwegians related to need of orthodontic treatment. *Scand J Dent Res* 1993; 101(5):257–60.
- Rolling S. Hypodontia of permanent teeth in Danish schoolchildren. *Scan J Dent Res* 1980; 88(5):365–9.
- Hobkirk JA, Brook AH. The management of patients with severe hypodontia. *J Oral Rehabil* 1980; 7(4):289–98.
- Polder BJ, Van't Hof MA, Van der Linden FP, Kuijpers-Jagtman AM. A meta-analysis of the prevalence of dental agenesis of permanent teeth. *Community Dent Oral Epidemiol* 2004; 32(3):217–26.
- Kjaer I. Prenatal development of the maxillary primary incisors related to maturation of the surrounding bone and to postnatal eruption. In: Davidovitch Z, editor. Biological mechanisms of tooth eruption and root resorption. Birmingham (AL): EBSCO Media; 1988. p. 233–6.
- Kjaer I, Kocsis G, Nodal M, Christensen LR. Aetiological aspects of mandibular tooth agenesis — focusing on the role of nerve, oral mucosa, and supporting tissues. *Eur J Orthod* 1994; 16(5):371–5.
- Ribeiro LL, Das Neves LT, Costa B, Ribeiro Gomide M. Dental anomalies of the permanent lateral incisors and prevalence of hypodontia outside the cleft area in complete unilateral cleft lip and palate. *Cleft Palate Craniofac J* 2003; 40:172–5.
- Kumasaka S, Miyagi A, Sakai N, Shindo J, Kashima I. Oligodontia: a radiographic comparison of subjects with Down syndrome and normal subjects. *Spec Care Dent* 1997; 17(4):137–41.
- Thind BS, Stirrups DR, Forgie AH, Larmour CJ, Mossey PA. Management of hypodontia: orthodontic considerations. Part II. *Quintessence Int* 2005; 36(5):345–53.
- Forgie AH, Thind BS, Larmour CJ, Mossey PA, Stirrups DR. Management of hypodontia: restorative considerations. Part III. *Quintessence Int* 2005; 36(6):437–45.
- Huang LH, Shotwell JL, Wang HL. Dental implants for orthodontic anchorage. *Am J Orthod Dentofacial Orthop* 2005; 127(6):713–22.

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# Congenital Epulis: A Surprise in the Neonate

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## ABSTRACT

A newborn infant with congenital epulis can be a striking sight for both parents and health care professionals involved in neonatal care. These tumours of the infant mouth can be remarkably large, occupying much of the oral cavity and posing a risk of airway obstruction or interfering with feeding. Dentists should be able to recognize these swellings as they may be asked to consult and provide information to parents and other practitioners regarding treatment of these lesions.

**MeSH Key Words:** gingival neoplasms/complications; gingival neoplasms/congenital; granular cell tumor/congenital; infant, newborn

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The congenital granular cell tumour of the newborn, also known as congenital epulis, is rare. It occurs on the gingiva of the anterior alveolar ridge of the jaws. These lesions behave in a benign manner and no recurrent or metastatic lesions have been reported.<sup>1</sup> They are seen 3 times more frequently in the maxillary alveolus than in the mandibular alveolus and the female to male ratio is 10:1.<sup>1-3</sup> The typical location is the alveolar ridge of the maxilla near the canine, but the mandibular region can also be involved.<sup>3</sup>

The etiology of the condition is unknown. Several theories have been suggested, namely, myoblastic, odontogenic, neurogenic, fibroblastic, histiocytic and endocrinologic.<sup>1,2</sup> There are usually no associated dental abnormalities or congenital malformations,<sup>4</sup> except for occasional reports of a hypoplastic or absent tooth and the possibility of mild mid-face hypoplasia.<sup>4,5</sup>

The tumour presents in the alveolar mucosa as a smooth-surfaced sessile or pedunculated mass with a normal to reddish colour.<sup>6,7</sup> Its size varies from several millimetres to a few centimetres in diameter, and it may interfere with respiration or feeding.<sup>8,9</sup>

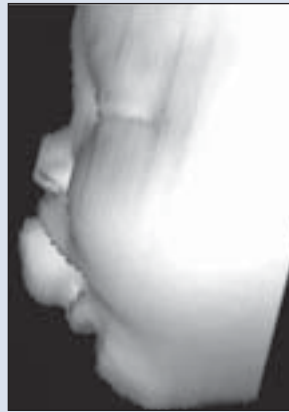
The diagnosis is usually clinical, although difficulties may occur when the index of suspicion is low or when the origin of the tumour is hard to determine. In such cases, the differential diagnosis is wide and imaging has a contributing role to play. Antenatal ultrasonographic features of congenital epulis have been described sporadically,<sup>10-13</sup> but postnatal ultrasonographic findings have seldom been described. Correlative prenatal ultrasound and postnatal magnetic resonance imaging (MRI) findings have been reported.<sup>4</sup>

Surgical excision is generally indicated and no recurrences have been reported. Spontaneous regression of the lesion is rare.<sup>14</sup> Histologically, the lesion is similar to the granular cell tumour, although pseudoepitheliomatous hyperplasia does not occur in the congenital epulis. Thus, the tumour mass comprises sheets of large, closely packed cells showing fine, granular, eosinophilic cytoplasm.<sup>15</sup>

This report documents the presentation and management of a congenital granular cell tumour of the maxillary alveolar ridge found in a newborn and treated with prompt surgical excision.



**Figure 1:** Appearance of a large mass of the oral cavity arising from the gingiva of the anterior maxilla in a neonate female.



**Figure 2:** Three-dimensional CT scan showing the large mass protruding through the mouth.



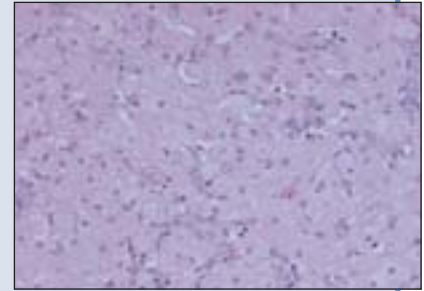
**Figure 3:** T1 weighted MRI image in the sagittal plane showing a mass attached to the anterior maxillary gingiva.



**Figure 4:** Lesion ready for removal in the operating room with patient's airway secured using an oral endotracheal tube.



**Figure 5:** Excised pedunculated lesion.



**Figure 6:** Granular cells present in the histologic specimen.

## Case Report

A newborn girl was referred immediately after delivery for examination of a mass protruding from her mouth (**Fig. 1**). The pregnancy was normal and vaginal delivery occurred at 37 weeks. An ultrasound performed in the 29th week of gestation showed no abnormalities. No family history of hereditary diseases was reported.

On clinical examination, a midline, pedunculated, 3-cm-diameter round soft tissue mass exhibiting a smooth erythematous surface and located in the midline was found to be attached to the anterior gingiva of the maxilla. The mass prevented normal closure of the mouth and interfered with breastfeeding. The mass posed no immediate airway concerns. Feeding by a nasogastric tube was instituted.

General physical examination, including laboratory tests, were otherwise normal. Conventional ultrasonography with Doppler imaging showed a nonhomogeneous, solid, space-occupying lesion measuring 3 cm. The origin and extension of the mass could not be confidently determined based on ultrasonographic findings alone.

Computed tomography (CT) (**Fig. 2**) and MRI (**Fig. 3**) were performed to determine the extent and characteristics of the soft tissue mass. Both techniques revealed a lobular well-defined mass arising from the maxillary ridge, displacing the upper lip, without involvement of the unerupted teeth and without extension into the soft palate or intracranially. There was no significant enhancement of the lesion indicating that it was probably not vascular in nature.

Although congenital epuli can complicate general anesthesia by interfering with endotracheal intubation, this was not a factor in this case. The lesion was gently pushed to the side, the airway was visualized and an oral endotracheal tube was inserted (**Fig. 4**). The lesion was completely excised under general anesthesia, with minimal intraoperative hemorrhage (**Fig. 5**). Regular oral feeding was initiated immediately after surgery and was well tolerated. The infant was able to breastfeed on the third day after surgery and was discharged with her mother on the fifth day. At 2 weeks after surgery, the

patient was reviewed and was noted to be thriving and gaining weight.

Histologic examination of the specimen revealed an unencapsulated lesion covered with squamous epithelium. The lesion was composed of homogeneous cells with granular eosinophilic cytoplasm and basophilic centrally located nuclei (Fig. 6). These findings were consistent with congenital granular cell tumour of the newborn.

## Discussion

Congenital epulis, also known as granular cell tumour of the gingiva, congenital granular cell myoblastoma, or Newmann's tumour, following the first published case,<sup>16</sup> is encountered exclusively in newborns. The tumour usually arises at the future site of the maxillary canine or the lateral incisors, but the unerupted teeth are not involved. The etiology remains unknown and controversial. Congenital epulis differs from other granular cell tumours encountered in adults by its exclusive origin from the neonatal gingiva, the scattered presence of odontogenic epithelium, the more elaborate vasculature and the lack of interstitial cells with angulate bodies.<sup>15</sup>

The clinical presentation consists of a lobular or ovoid, sessile or pedunculated swelling covered by a smooth mucosal surface, usually in the maxilla. A provisional diagnosis is often made clinically at birth and is confirmed histologically. Although the histogenesis of congenital epulis is not certain, it is thought to be a non-neoplastic, degenerative or reactive lesion.<sup>17-19</sup> Its distinct visual presentation usually allows for direct clinical examination at birth. When the lesion is large and interferes with feeding and breathing, the treatment is simple surgical excision under either local or general anesthesia. Complete surgical excision is curative. Recurrence following incomplete excision has not been reported,<sup>9</sup> making wide surgical excision unnecessary. Some very small lesions have reportedly undergone spontaneous regression.<sup>14,20</sup>

Imaging in cases of congenital epulis may be important, especially for antenatal diagnosis using ultrasound<sup>10-13</sup>; the earliest reported case was identified in a 31-week-old fetus.<sup>14</sup> In our case, ultrasound performed in the 29th week of gestation did not reveal any abnormality, suggesting that the tumour may have become apparent only at a later stage.

The CT and MRI findings of congenital epulis in our patient were in accordance with previous descriptions.<sup>14</sup> Accurate mapping of the lesion with MRI ruled out maxillary and intracranial extension and was thus an important part of the preoperative planning.

The differential diagnosis of a large mass in the fetal or neonatal oral cavity should include such congenital malformations as encephalocele, dermoid cysts or teratoma and benign and malignant neoplasms including hemangioma, lymphatic malformations, melanotic or

pigmented neurectodermal tumours of infancy and rhabdomyosarcoma.

The congenital epulis is an oral mass that presents at birth in neonates. The lesion likely develops late in utero as it is often not detected on antenatal ultrasound. While the lesion is visually impressive and equally distressing, it is ultimately a benign lesion. If there is any fear of airway obstruction or difficulty with feeding, then prompt surgical treatment is necessary. Dentists may be consulted initially regarding such cases and should be aware of the potential for airway compromise and familiar with the differential diagnosis. ♦

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## References

1. Chami RG, Wang HS. Large congenital epulis of newborn. *J Pediatr Surg* 1986; 21(11):929-30.
2. Inan M, Yalcin O, Pul M. Congenital fibrous epulis in the infant. *Yonsei Med J* 2002; 43(5):675-7.
3. Bernhoft CH, Gilhuus-Moe O, Bang G. Congenital epulis in the newborn. *Int J Pediatr Otorhinolaryngol* 1987; 13(1):25-9.
4. Koch BL, Myer C 3rd, Egelhoff JC. Congenital epulis. *AJNR Am J Neuroradiol* 1997; 18(4):739-41.
5. Sunderland R, Sunderland EP, Smith CJ. Hypoplasia following congenital epulis. *Br Dent J* 1984; 157(10):353.
6. Majid ZA, Siar CH, Ling KC. Congenital fibrous epulis: a case report. *Med J Malaysia* 1986; 41(2):179-82.
7. Eppley BL, Sadove AM, Campbell A. Obstructive congenital epulis in a newborn. *Ann Plast Surg* 1991; 27(2):152-5.
8. Chindia ML, Awange DO. Congenital epulis of the newborn: a report of two cases. *Br Dent J* 1994; 176(11):426-8.
9. Merrett SJ, Crawford PJ. Congenital epulis of the newborn: a case report. *Int J Paediatr Dent* 2003; 13(2):127-9.
10. McMahon MG, Mintz S. In utero diagnosis of a congenital gingival granular cell tumor and immediate postnatal surgical management. *J Oral Maxillofac Surg* 1994; 52(5):496-8.

11. Pellicano M, Zullo F, Catizone C, Guida F, Catizone F, Nappi C. Prenatal diagnosis of congenital granular cell epulis. *Ultrasound Obstet Gynecol* 1998; 11(2):144-6.
12. Lopez de Lacalle JM, Aguirre I, Irizabal JC, Nogues A. Congenital epulis: prenatal diagnosis by ultrasound. *Pediatr Radiol* 2001; 31(6):453-4.
13. Song WS, Kim JW, Kim YG, Ryu DM. A case report of congenital epulis in the fetus. *J Oral Maxillofac Surg* 2005; 63(1):135-7.
14. Kusakawa J, Kuhara S, Koga C, Inoue T. Congenital granular cell tumor (congenital epulis) in the fetus: a case report. *J Oral Maxillofac Surg* 1997; 55(11):1356-9.
15. Bork M, Hoede N, Korting GW, Burgdorf WH, Young SK. Diseases of the oral mucosa and the lips. Philadelphia, PA: WB Saunders; 1996. p. 293.
16. Neumann E. Elin fall von congaliter epulis. *Arch Helik* 1871; 12:189.
17. Zarbo RJ, Lloyd RV, Beals TF, McClatchey KD. Congenital gingival granular cell tumor with smooth muscle cytodifferentiation. *Oral Surg Oral Med Oral Pathol* 1983; 56(5):512-20.
18. Lifshitz MS, Flotte TJ, Greco MA. Congenital granular cell epulis. Immunohistochemical and ultrastructural observations. *Cancer* 1984; 53(9):1845-8.
19. Monteil RA, Loubiere R, Charbit Y, Gillet JY. Gingival granular cell tumor of the newborn: immunoperoxidase investigation with anti-S-100 antiserum. *Oral Surg Oral Med Oral Pathol* 1987; 64(1):78-81.
20. Jenkins HR, Hill CM. Spontaneous regression of congenital epulis of the newborn. *Arch Dis Child* 1989; 64(1):145-7.

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Prosthodontist or endodontist needed to associate, partner, or share office in an established periodontal practice in a growing area of Vancouver. Part/full-time. Proven record of previous endodontics services. 3,333 sq. ft. of space with 6 operatories and available space for expansion. Call: (604) 939-8467 or email: [info@periodentalimplants.com](mailto:info@periodentalimplants.com). D1735

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**BRITISH COLUMBIA - Vancouver:**

We are committed to creating beautiful smiles! Are U? We are seeking a full-time certified dental assistant and dental receptionist to join our busy, modern Oakridge dental office. Please fax resume to: Dr. Marcy Schwartzman, (604) 266-0784. D2441

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#### SITE CHIEF, ADULT DENTISTRY

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The Subdivision Chief, Adult Dentistry at the Foothills Medical Centre (FMC), will provide Subdivision oversight, clinical dental staff management and clinical supervision for the Dental Health Services at the FMC; collaborate with and provide technical assistance to the Clinic Manager in the management of the FMC Dental Clinic. The Chief will also supervise and provide direct patient care. May supervise dental residents in a developing GPR Program.

- Graduated with a Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD) from an accredited School of Dentistry and qualified with the National Dental Examining Board of Canada
- Completion of at least one year of postgraduate patient care training
- Must have an Alberta Dental License or be eligible to acquire the Alberta Dental Licensure prior to commencing
- Masters in Oral Medicine or equivalent experience with Special Care Needs patients, is preferred
- Certification in Intravenous Sedation preferred
- BLS required, ACLS preferred
- 3-5 years experience in a leadership role

#### DENTIST - SPECIAL CARE DENTISTRY

##### Qualifications / Experience:

- Graduated with a Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD) from an accredited School of Dentistry and qualified with the National Dental Examining Board of Canada
- Completion of at least one year of postgraduate patient care training
- Must have an Alberta Dental License or be eligible to acquire the Alberta Dental Licensure prior to commencing
- Masters in Oral Medicine or equivalent experience with Special Care Needs patients, is preferred
- Certification in Intravenous Sedation preferred
- BLS required, ACLS preferred

#### PEDIATRIC HOSPITAL DENTISTS (2)

##### Qualifications / Experience:

- Graduate Degree in Pediatric Dentistry from an accredited institution and qualified with the National Dental Examining Board of Canada.
- Eligibility for membership / registration with the Alberta Dental Association and College.
- Nasoalveolar Molding Appliance and speech appliance training an asset
- Current BLS/PALS

Please submit your curriculum vitae and three letters of reference to:

Dr. Eduardo Kalaydjian, Regional Division Chief, Dentistry and Oral Health  
Foothills Medical Centre 1403, 29 Street NW Calgary Alberta T2N 2T9

Tel: (403) 944-4695 Fax: (403) 944-1277 Email: Eduardo.kalaydjian@calgaryhealthregion.ca www.calgaryhealthregion.ca

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**SASKATCHEWAN - Wadena:** Community located in east central Saskatchewan 2 hours from Regina and Saskatoon, is seeking the services of a full-time dentist to complement existing Health Services. Progressive community with excellent amenities to raise a family. Incentives available. Interested individuals are urged to call: 1-888-338-2145. Fax: (306) 338-3804, email: town.of.wadena@sasktel.net. D2702

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**UNITED STATES - Arizona and Illinois:** A unique and exciting opportunity is available for general dentists in central Illinois and sunny Arizona. Earn between 250-350k per year with paid malpractice and health insurance while working in a great environment. The group is owned and operated by Canadians and will look after all immigration needs. Email: dwolle@gmail.com, fax: (312) 274-0760 or call: (630) 706-0647. D2456

**VANCOUVER ISLAND:** Associate for Comox Valley family practice. Must be interested in future purchase and transition to owner as associate. Reply: Box 1357, Comox, BC, V9M 7Z9 or email: Covaldentist@shaw.ca. D2005

**YUKON - Whitehorse:** Associate and hygienist required for a 5-operator, growing, modern practice. We require individuals who are skilled, confident with an affinity for teamwork.

Whitehorse is a rich, dynamic city, a centre for sports and the arts. Murray Dental Centre, 4069 4th Avenue, Whitehorse, YT, Y1A 5W5. Tel: (867) 633-4401, fax: (867) 633-4402, email: murraydental@northwestel.net D2732

**YUKON - Whitehorse:** Land of the midnight sun. Come for the adventure. Associate required. Specialists, are you looking for a Northern Exposure? Check out our website: www.klondike-dental.com. Phone Dr. Pearson at home: (867) 668-4618, fax: (867) 667-4944 or Berni at work: (867) 668-3152. D1828

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## CDA Fund Performance (for period ending August 31, 2006)

	MER	1 year	3 years	5 years	10 years
<b>CDA Canadian Growth Funds</b>					
Aggressive Equity fund (Altamira)	up to 1.00%	11.8%	12.6%	13.2%	8.9%
Common Stock fund (Altamira)	up to 0.99%	14.3%	16.6%	8.5%	8.6%
Canadian Equity fund (Trimark) <sup>†1</sup>	up to 1.50%	7.8%	10.9%	7.2%	8.6%
Dividend fund (PH&N) <sup>†2</sup>	up to 1.20%	8.1%	13.7%	10.7%	16.9%
Income Trusts fund (Sceptre)	up to 1.45%	9.6%	22.4%	n/a	n/a
Special Equity fund (KBSH) <sup>†3</sup>	up to 1.45%	9.2%	14.2%	7.1%	12.2%
TSX Composite Index fund (BGI) <sup>††</sup>	up to 0.67%	14.8%	18.5%	11.7%	10.1%
<b>CDA International Growth Funds</b>					
Emerging Markets fund (Brandes)	up to 1.77%	14.2%	12.7%	13.9%	2.9%
European fund (Trimark)	up to 1.45%	14.8%	7.4%	-4.5%	3.0%
International Equity fund (CC&L)	up to 1.30%	10.0%	4.0%	-2.5%	2.0%
Pacific Basin fund (CI)	up to 1.77%	13.5%	5.0%	1.1%	-0.4%
US Large Cap fund (Capital) NEW	up to 1.46%	-2.3%	-0.3%	n/a	n/a
US Small Cap fund (Trimark)	up to 1.25%	-0.1%	0.8%	-6.8%	n/a
Global fund (Trimark) <sup>†4</sup>	up to 1.50%	9.1%	6.1%	5.1%	8.7%
Global Stock fund (Templeton) <sup>†5</sup>	up to 1.77%	8.6%	9.4%	2.1%	n/a
S&P 500 Index fund (BGI) <sup>††</sup>	up to 0.67%	0.7%	1.8%	-2.8%	6.0%
<b>CDA Income Funds</b>					
Bond and Mortgage fund (Fiera)	up to 0.99%	0.6%	3.3%	4.3%	5.3%
Fixed Income fund (McLean Budden) <sup>†6</sup>	up to 0.97%	0.6%	5.2%	5.6%	6.7%
<b>CDA Cash and Equivalent Fund</b>					
Money Market fund (Fiera)	up to 0.67%	2.9%	2.2%	2.2%	3.2%
<b>CDA Growth and Income Funds</b>					
Balanced fund (PH&N) <sup>†7</sup>	up to 1.20%	4.7%	7.6%	3.9%	6.5%
Balanced Value fund (McLean Budden) <sup>†8</sup>	up to 0.95%	6.7%	9.3%	6.7%	8.9%

CDA figures indicate annual compound rate of return. All fees have been deducted. As a result, performance results may differ from those published by the fund managers. CDA figures are historical rates based on past performance and are not necessarily indicative of future performance. The annual MERs (Management Expense Ratios) depend on the value of the assets in the given funds. MERs shown are maximum.

<sup>†</sup> Returns shown are those for the following funds in which CDA funds invest: <sup>1</sup>Trimark Canadian Fund, <sup>2</sup>PH&N Dividend Income Fund, <sup>3</sup>KBSH Special Equity Fund, <sup>4</sup>Trimark Fund, <sup>5</sup>Templeton Global Stock Trust Fund, <sup>6</sup>McLean Budden Fixed Income Fund, <sup>7</sup>PH&N Balanced Pension Trust Fund, <sup>8</sup>McLean Budden Balanced Value Fund.

<sup>††</sup> Returns shown are the total returns for the index tracked by these funds.

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