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The official publication of the Canadian Academy of
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de dentisterie restauratrice et de prosthodontie

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Contact: Dr. Hubert Gaucher
hgaucher@sympatico.ca
Due date for submissions: August 5th 2011 / Soumission: 5 août 2011

FALL ISSUE: Implant Dentistry /
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Dr. Yvan Fortin: yvan.fortin@gmail.com
Dr. Hubert Gaucher: hgaucher@sympatico.ca
Due date for submissions: November 4th, 2011 /
Soumissions 4 novembre 2011

Think Outside the Box ... Or Not!

As each year passes it's clear that change is something we face each and every day in our practices. We may go through each day with the hope of some degree of predictability in our schedules, but being in health care, we know that may not stay reliable for too long. People may react differently to the same periodontal therapy, or perhaps to the same restoration type. So many factors play a role in influencing how our day takes shape and what may work or not for our patients. To make matters more complicated, our profession, as a whole is also very dynamic as material choices, treatment modalities and patient expectations continue to increase constantly.

Due to the fact that we constantly face change in our dental lives it's not surprising for us to start challenging some of what's being presented and also look to fall back on those things that at least afford us some predictability. I've always subscribed to the fact that we need to think "outside the box," but at what cost? This issue will focus on various new techniques and materials while also challenging us to look at some of the procedures many of us have been quick to put aside even though they have served as a solid foundation to our treatment success for many years.

Dr. Greg Gillespie discusses common issues we face with indirect restorations, one of the most important being that of patient comfort. Although our clinical success is measured by many factors including longevity, function and esthetics, most patients look at their ultimate long-term comfort as a true measure of our success. Dr. Gillespie discusses the concept of immediate dentin sealing (IDS) as a protocol to assure "clinical success" for our indirect restorations.

Dr. Gildo Santos Jr., and colleagues present a clinical case that transforms an unsightly smile with newer generation all-ceramic restorations. Dental ceramics have developed rapidly over the past decade to provide us with various all-ceramic options for both anterior and posterior teeth. The need for these materials and techniques have been fuelled by the desire of many or our patients to find highly esthetic options that will function well. The authors discuss the use of a leucite-reinforced ceramic system for aesthetic anterior restorations.

Dr. Marc Mollot presents two clinical cases that are designed to create some reflection in our treatment planning of more complex cases. He presents two multi-disciplinary anterior restorative cases that involve orthodontics, periodontics, surgery and prosthetics. Each case is carefully discussed in terms of treatment options and material selection. One is treated with more contemporary ceramic restorations while the other falls back on the traditional porcelain fused to metal option. He reminds us that both have a place in our treatment arsenal and looking at the big picture and the patient's condition will hopefully guide us to make appropriate choices.

Dr. Geoff Knight changes gears and takes things in a completely different direction by challenging us to rethink the concept of "minimally invasive dentistry." He reminds us that the current model of restorative and esthetic dentistry is based on techniques that create some degree of destruction to the dentition. He asks us to consider re-evaluating treatment modalities by considering pharmacological management of dental disease rather than the typical destructive nature of many of our current treatment choices. He demonstrates this with two clinical cases.

Finally I leave you with a clinical case to demonstrate how proper treatment planning and collaboration with a team of specialists can lead to success if it's done in a structured and thoughtful manner. Many of us feel we are listening to what our patients want when it comes to more involved and complex therapies, and then make the assumption that each specialist is on the same page. Well times have changed for both the restorative dentist and individual specialties. We have a responsibility to ourselves and our patients to assure we are on the same page when addressing their chief complaint or desire.

So this brings me back to addressing the statement – "think outside the box". In order for us to grow and expand our horizons it is imperative that one look outside the box and stretch the mind to see what's possible. Remember, we're in a dynamic world and standing still never gets you ahead. Sometimes, however, it's not all that bad to stay "inside the box" that has served as a solid foundation for many of our procedures and techniques for many years. This doesn't imply that we have to stay stuck in our old set ways. This simply means we look at each individual case with some thoroughness, scrutiny, humility, and open-mindedness, when required. It's nice to know that we can leave the door open to the box from time to time. I hope you'll enjoy this issue.

Thank you to all our authors for their contributions to the education of our readership. Once again, I'd like to thank Dr. Hubert Gaucher for his tireless efforts as editor-in-chief. On behalf of our editorial team at *CJRDP,* thank you for your continued support and happy reading!

Paresh Shah, DMD, MS, Cert. Esth. Dentistry
Guest Editor

Sortir des sentiers battus… peut-être pas !

Au fur et à mesure que le temps file, il est clair que le changement est omniprésent dans notre pratique. Nous pouvons passer chaque jour en espérant une certaine constance dans notre horaire de travail, mais comme nous travaillons dans les soins de la santé, nous savons bien que la constance n'est pas de longue durée. Les patients ne réagissent pas tous de la même façon au même traitement parodontal ou au même type de restauration. C'est ainsi que plusieurs facteurs viennent influencer la tournure de notre journée ou ce qui plaît ou non aux patients. Pour compliquer encore plus les choses, notre profession, en tant que telle est très dynamique quant au choix du matériau, des modalités de traitement, et les exigences des patients augmentent constamment.

Comme le changement fait partie intégrante de nos vies, il n'est pas surprenant pour nous de devoir remettre en question ce qui est présenté et de se rabattre sur ce que nous croyons avoir une certaine constance. J'ai toujours admis le fait que nous devons « sortir des sentiers battus », mais à quel prix? Ce numéro traitera de diverses nouvelles techniques et divers matériaux tout en nous mettant au défi de revoir les procédures que nous avons mises de côté même si elles ont constitué une base solide du succès des traitements pendant de nombreuses années.

Le Dr Greg Gillespie aborde les problèmes courants que nous avons avec les restaurations indirectes, l'une des plus importantes étant le confort du patient. Bien que notre succès clinique soit mesuré par plusieurs facteurs, y compris la longévité, la fonction et l'esthétique, la plupart des patients évaluent le confort à long terme comme mesure véritable de notre succès. Le Dr Gillespie discute du concept du scellement immédiat de la dentine comme un protocole pour assurer le succès clinique de nos restaurations indirectes.

Le Dr Gildo Santos Jr. et ses collègues présentent un cas clinique qui transforme un sourire inesthétique en utilisant une nouvelle génération de restaurations en céramique. Les céramiques ont évolué rapidement au cours des dix dernières années et nous ont permis d'offrir diverses options pour les dents antérieures et postérieures. Plusieurs de nos patients poussés par le désir de trouver des options hautement esthétiques dont le fonctionnement est adéquat nous ont forcés à développer des matériaux et des techniques pour répondre à leurs besoins. Les auteurs traitent de l'emploi de céramique renforcée à la leucite pour les restaurations esthétiques des dents antérieures.

Le Dr Marc Mollot présente deux cas cliniques qui sont conçus pour nous faire réfléchir à la planification du traitement de cas plus complexes. Il présente deux cas de restauration de dents antérieures en ayant recours à plusieurs disciplines soit : l'orthodontie, la parodontie, la chirurgie et la prosthodontie. Chaque cas est discuté en détail en termes d'options thérapeutiques et choix de matériau. Pour l'un des cas, une approche plus contemporaine de restauration en céramique a été utilisée, tandis que pour l'autre, il s'agissait d'une restauration céramo-métallique traditionnelle. Le Dr Mollot vient nous rappeler que ces deux restaurations ont une place dans l'arsenal thérapeutique et que le fait de voir la situation dans son ensemble et l'état du patient nous permettra de faire les bons choix.

Le Dr Geoff Knight adopte une direction complètement différente en nous mettant au défi de repenser au concept de la dentisterie peu invasive. Il nous rappelle que le modèle courant de dentisterie restauratrice et esthétique est fondé sur des techniques qui engendrent un certain degré de destruction de la dentition. Il nous demande de considérer la réévaluation des modalités de traitement en envisageant la gestion pharmacologique de la maladie dentaire plutôt que la nature destructive typique de plusieurs de nos choix de traitement courants. Il nous donne deux cas cliniques pour en faire la démonstration.

Finalement, je vous laisse avec un cas clinique pour démontrer comment la planification adéquate du traitement et la collaboration d'une équipe de spécialistes peuvent mener au succès si le tout est fait de manière structurée et réfléchie. Plusieurs d'entre nous ont conscience que nous écoutons ce que nos patients désirent lorsqu'il s'agit de traitements plus élaborés et plus complexes et assumons que chaque spécialiste comprend ou voit les choses de la même façon. Bref, les temps ont changé pour le dentiste de dentisterie restauratrice et les spécialités individuelles. Nous avons la responsabilité envers nous-mêmes et envers nos patients de faire en sorte de parler des mêmes choses lorsqu'il s'agit de prendre en considération leurs plaintes ou de combler leurs désirs.

Revenons à notre titre « sortir des sentiers battus ». Afin de pouvoir grandir et d'élargir nos horizons, il est essentiel de sortir des sentiers battus et de voir ce qu'il est possible de faire. N'oubliez pas que nous vivons dans un monde dynamique et que de rester inactif ne vous donnera pas grand-chose. Parfois, ce n'est pas si mauvais de ne pas sortir des sentiers battus avec plusieurs de nos procédures et techniques que nous avons utilisées depuis plusieurs années et qui sont une base solide. Mais cela ne veut pas dire de s'enliser dans les vieilles coutumes. Nous devons examiner chaque cas individuel avec toute la rigueur, l'humilité et l'ouverture d'esprit lorsque cela est nécessaire. Il est agréable de savoir qu'il est parfois possible de sortir des sentiers battus de temps en temps. J'espère que vous apprécierez la lecture de ce numéro.

Je remercie tous les auteurs de leur contribution à l'éducation de nos lecteurs. Une fois de plus, je remercie le Dr Hubert Gaucher de son dévouement comme rédacteur en chef. Au nom de l'équipe éditoriale à *JCDRP*, je vous remercie de votre soutien continu et vous souhaite bonne lecture.

Paresh Shah, DMD, MS, Dentiste esthétique agréé
Rédacteur invité

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Message from the Membership Committee
Message du Comité des membres

At the Annual 2010 meeting in Calgary, we welcomed 10 new members to the academy. They include Dr. Denis Beauchesne from Georgetown, ON; Dr. David Bergen from St. Catharines, ON; Heather Carr from Halifax, NS; Dr. David Fownes from Pointe Claire, QC; Dr. Bruce Mansbridge from Stoney Creek, ON; Dr. Anh Nguyen from Kingston, ON; Dr. Alexander Rosenczweig from Vancouver, BC; Dr. Joseph Rotondo from Montreal, QC; Dr. Peter Walford from Hornby Island, BC; and Dr. Wayne Wright from Guelph, ON.

Since October, Dr. Bruce Gardener and Dr. Patrick Pedlar both from Burlington, ON; Dr. Brian Goldenberg and Dr. Roxanna Saldarriaga both from Vancouver, BC; and Dr. Nick Seddon from West Vancouver, BC have been accepted as new members. These dentists will be introduced at the Toronto 2011 meeting.

These are very healthy numbers. We have to continue to recruit new members to our great organization all the time. People often ask what exactly is the breakdown of the membership? Here are the numbers for you. As of the annual general meeting this year we had 57 Active, 70 Fellows and 55 Life members for a total of 182.

The academy has streamlined the application procedure so that it is not nearly as onerous as it once was. To become an **Active** member the requirements are the following: 1. Attend a CARDP annual meeting as a guest. 2. Complete the application, which can be downloaded off our web site at www.cardp.com Membership is by invitation so as members we need to encourage our colleagues to join. Friends from study clubs and dental societies would benefit from belonging to our outstanding organization. To share the wealth of talent and expertise I encourage all members to bring a guest to Toronto.

Also of note, after many years of hard work Life membership has been bestowed on Dr. Richard Baxter Rhodes and Dr. Gordon Bayes. Well done gentleman!

Dr. Mary Currie,
Committee Chair / Présidente du comité

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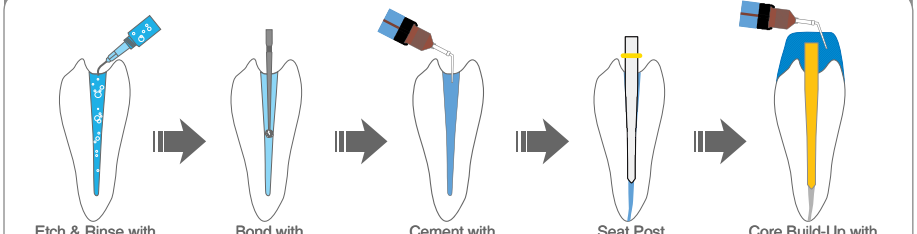

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Content/Sommaire

FEATURES/ARTICLES

Academy News / Nouvelles de L'académie

Esthetic Dentistry / Dentisterie esthétique

Continuing Education in Dentistry / Éducation continue en dentisterie

Case Reports / Rapports des cas

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The paper version of the *Canadian Journal of Restorative Dentistry and Prosthodontics* publishes papers, which are subject to peer review. The *Journal* is primarily electronic with full articles available online; in addition, a print version of the abstracts from each article is also sent to all members of CARDP, subscribers to the print version, dental institutions, and associations. The *Journal* considers articles of original research, reviews, scholarly addresses, literature reviews, case reports, book reviews, historical interest, clinical tips, guidelines, letters to the editor, and so on. Requirements are in accordance with "Uniform requirements for manuscripts submitted to biomedical journals" (http://www.icmje.org). The editorial policies of the journal are in line with those of the Council of Science Editors (http://www.councilscience editors.org/services/draft_approved.cfm). The *Journal* endorses the CONSORT statement (www.consort-statement.org) relating to guidelines for improving the Evidence Based quality reporting of Randomized Clinical Trials (RCTs).

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The *Journal* reserves the right to edit manuscripts to ensure conformity with the Journal's style. Such editing will not affect the scientific content.

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Manuscripts should be double-spaced and between 1,000 and 4,000 words. The manuscript must be sent by e-mail attachment (Word or Rich Text Format only). An abstract of up to 500 words should be provided, and a statement that the study was approved by the relevant research ethics board should be included, where relevant.

The lead author should also provide a brief bio sketch and high-resolution photo of himself or herself (see details regarding illustrations below).

References

References should be numbered consecutively in the text by superscript numerals. Corresponding references should be listed at the end of the text. Exhaustive lists of references are not encouraged. Unpublished sources such as personal communications should be cited within the text and not included in the reference list.

The sequence for journal references should be as follows: author(s); title of paper; journal name abbreviated as in the Index Medicus; year of publication, volume number, first and last page numbers. When there are more than three authors, shorten to three and add "et al."

Col NF, Eckman MH, Karas RH, et al. Patient specific decisions about hormone replacement therapy in postmenopausal women. JAMA 1997;277:1140-7.

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Le *journal canadien de dentisterie restauratrice et de prosthodontie* publie des articles revus par des pairs. Le *Journal* est principalement électronique ayant ses articles intégraux en ligne. De plus, une version papier des abstraits de chacun des articles est envoyée à tous les membres de l'ACDRP, aux souscripteurs à la version papier, ainsi qu'aux institutions et associations. Le *Journal* accepte les articles de recherche, les revues, les articles scientifiques, les rapports de cas, les résumés de livre, les anecdotes historiques, les trucs cliniques, les lignes directrices, les lettres à l'éditeur et ainsi de suite. Les conditions essentielles correspondent aux « Exigences uniformes pour les manuscrits soumis à des revues médicales » (http://www.icmje.org). Les politiques en matière d'éditorial pour la revue sont celles adoptées par le Conseil des éditeurs en sciences (http://www.councilscience editors.org/services/draft_approved.cfm). Le *Journal* sanctionne l'énoncé CONSORT (www.consort-statement.org) ayant trait aux normes pour l'amélioration de la qualité des rapports d'études sur les essais cliniques aléatoires.

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Dans la version électronique du *Journal canadien de dentisterie restauratrice et de prosthodontie* y figureront des rapports sur la recherche clinique de haute qualité de même que des rapports de synthèse et les textes de fond de la version papier en plus des **profils de produits** et des annonces concernant l'industrie. Cette version électronique du *JCDRP* sera publiée en même temps que la version papier du Journal et sera distribuée à tous les membres de l'ACDRP ainsi qu'à plus de 5000 autres professionnels dentaires au pays.
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Préparation du manuscrit

Les manuscrits doivent être rédigés à double interligne et compter entre 1000 et 4000 mots. Le manuscrit doit être envoyé par courriel sous forme de pièce jointe (Word ou Rich Text Format seulement). On exige un résumé d'un maximum de 500 mots et un énoncé que l'étude a été approuvée par les comités d'éthique à la recherche lorsque cela est pertinent. L'auteur principal devrait préparer une courte biographie et fournir une photographie à haute définition (voir les détails ci-dessous concernant les illustrations).

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Col NF, Eckman MH, Karas RH, et al. Patient specific decisions about hormone replacement therapy in postmenopausal women. JAMA 1997;277:1140-7.

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Join us in Toronto this September!

The Canadian Academy of Restorative Dentistry and Prosthodontics
l'Académie canadienne de dentisterie restauratrice et de prosthodontie

19th Annual Scientific Meeting, September 22nd—24th, 2011

An Invitation Message from the CARDP President

I am honoured to start this New Year as President of the Canadian Academy of Restorative Dentistry and Prosthodontics.

I was very lucky, early in my career, to be invited to my first CAP/CARD meetings. I felt from the outset that the members of these two academies had something unique to offer; a first-class dental education, engaging mentorship, and above all, enduring friendships from coast to coast. It is my heartfelt wish to continue to build on that legacy during my term as President of CARDP.

A great deal of work takes place behind the scenes in preparation for your annual scientific meeting and for our Journal, as well as the day-to-day task of running our Academy. I want to extend a special recognition to Dr. Cary Letkemann, Convention Chair, to all the Committees, to Dr Hubert Gaucher, Editor-in-Chief of our Journal for his tireless efforts, as well as Alexander/Richardson for making each one of our events more memorable than the last.

As with the dental field at large, our great organization is undergoing transformations while we strive to produce the best meeting experiences in a very competitive market. That is why we need to help each other. Apathy is our only obstacle. I am appealing to each and every one of you to attend this year's Toronto meeting September 22 – 24 and to invite a potential member as well. Don't wait. Mark the dates on your calendar and call a colleague now!

Working on a Committee, contributing an article for the Journal, presenting a Table Clinic, are some of the ways to give back to your Academy. Your participation has never been more important and without you, we will not progress. So plan now to "Attend and Bring a Friend".

See you in Toronto!

Respectfully,
Dr. Kim Parlett

Thursday, September 22nd, Full Day Hands on Course "Esthetics and Occlusion"

Dr Tanaka has published numerous articles and is widely recognized as a research anatomist and for his teaching of advanced restorative procedures. He is highly sought after as a speaker throughout the world, and is known for his exciting presentations and outstanding clinical skills. His educational videotapes on TM Dysfunction, Anatomy and Implants are used in over 80 medical and dental schools and surgery programs throughout the world.

COURSE OBJECTIVES:

To gather, organize, interpret and apply important clinical information for comprehensive treatment planning

- To provide the most "comprehensive" treatment for the Patient
- Avoid esthetic and functional failures
- Learn interdisciplinary treatment guidelines

Friday, September 23rd, Essayists, 1 Hour Presentations

Terry Tanaka D.D.S.	Topic:	Anatomical and Restorative Complications in Implant Dentistry
Jay Gibson B.Sc., D.D.S.	Topic:	The Use of Mini-Implants for Orthodontic Anchorage in Pre- Prosthetic Movement
John E. Davies Bds, PhD, Dsc	Topic:	Mesenchymal Stem Cells and Tissue Regeneration in the Craniofacial Complex
Terry E. Donovan D.D.S	Topic:	Recognition, Management and Prevention of Dental Erosion
Winston W.L. Chee D.D.S.	Topic:	Occlusion as it relates to Implant Supported Structures
Daniel Melker D.D.S.	Topic:	The TEAM Approach to Comprehensive Periodontal and Restorative Treatment

Saturday, September 24th, Clinics, 18 Minute Presentations

Dr. Oliver C. Pin Harry	Topic:	Treatment of Atypical Dental Development using contemporary Fixed Dental Prostheses
Dr. Peter Wolford	Topic:	Restoring Incisal Attrition with Composite Resin
Dr. Peter Fritz	Topic:	Periodontal Radiography
Dr. Daniel Zeiter	Topic:	Periodontal Disease Classification and Accepted Treatment
Dr. Alexandre Tache	Topic:	Ridge Preservation: A key step for Implant Rehabilitation
Dr. Michael Melkers	Topic:	Parafunctional Analysis in Diagnostic and Restorative Dentistry
Dr. Robert Margeas	Topic:	Immediate Extraction, Implant Placement and Provisionalization in the Anterior Maxilla Using the Patient's Natural Tooth

Plus 15 Afternoon Table Clinics, are presented from 2:30 pm—5:30 pm

More information on our Speakers and Thursday, Hands on Course coming in the Next Issue. Visit www.cardp.ca for program updates and registration coming soon!

A Message from the Conference Chair

As Convention Chair, it is my great pleasure to invite you to our 19th Annual Scientific Meeting of the Canadian Academy of Restorative Dentistry and Prosthodontics taking place in Toronto September 22 – 24, 2011. This year's Meeting will be held at the prestigious Fairmont Royal York Hotel. Being the only national dental organization dedicated to all aspects of restorative dentistry and prosthodontics, our Academy will showcase an illustrious gathering of presenters and leading edge topics. It will also offer a wide array of social events to suit all palates.

On Thursday, September 22, our optional, limited attendance Scientific Day will feature the eminent Dr. Terry Tanaka who will present a hands-on program titled "Esthetics and Occlusion". For those who would prefer relaxation, 2 sporting activities are suggested: A golf tournament at Eagle's Nest or Copper Creek, or sailing the Toronto Harbour on Lake Ontario. The day will culminate in a Welcoming Reception back at the hotel. Great food, cocktails, light entertainment and the opportunity to mingle with friends, colleagues and exhibitors make this a convivial occasion.

On Friday, the heart of the Scientific Program will showcase 6 one-hour essayist presentations by Dr. Terry Tanaka, Dr. Jay Gibson, Dr. Terry Donovan, Dr. John Davies, Dr. Winston Chee and Dr. Daniel Melker. They will cover a variety of topics including mini implants for orthodontic anchorage, stem cell research, wear and erosion, occlusal factors relating to implant restorations, hazards to avoid in implant dentistry and the science of saving teeth. For those not attending the Meeting, a Partner's Program will be designed to entertain and delight. Then the evening will be free to enjoy the incredible selection of restaurants and entertainment that Toronto offers.

Saturday is usually the 'meat and potatoes' of the Meeting. The morning will headline 8 eighteen-minute clinical presentations where the speakers have just enough time to give you nothing but the facts. The afternoon is dedicated to table clinics with a wide range of hands-on presentations showing techniques that you can take back to the office on Monday. The entire Meeting will be capped with the President's Gala, including a champagne reception, fine dining and dancing to the 905 Band, one of Canada's foremost party bands. Plan on attending because you wouldn't want your friends to tell you what a great time you missed. I look forward to seeing you there.

Cary Letkemann
Convention Chair

Get Meeting information & Register online soon @ www.cardp.ca

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Soyez des-nôtres en Septembre!

The Canadian Academy of Restorative Dentistry and Prosthodontics
l'Académie canadienne de dentisterie restauratrice et de prosthodontie

19ième Congrès annuel, 22 au 24 septembre 2011

Une invitation du Président de l'ACDRP

Je suis honoré de démarrer cette année en tant que Président de l'Académie canadienne de dentisterie restauratrice et de prosthodontie.

Au tout début de ma carrière, j'ai eu la chance d'assister, comme invité, à des rencontres de l'APC/ACDR. Dès lors j'ai eu l'impression que ces deux académies offraient quelque chose d'unique: une formation dentaire et un mentorat sans pareils, et surtout, des liens amicaux durables d'un océan à l'autre. Je souhaite sincèrement renchérir sur cet héritage durant mon mandat.

Une quantité considérable de travail est nécessaire dans la préparation des congrès annuels ainsi que le Journal de l'ACDRP, en plus de l'administration quotidienne de notre Académie. Je tiens à reconnaître tout spécialement Dr. Cary Letkemann, Président de notre Congrès cette année, tous les Comités, le Dr Hubert Gaucher, Rédacteur-en-chef de notre Journal pour son dévouement intarissable, et en dernier lieu, Alexander/ Richardson qui rendent mémorable chacune de nos rencontres.

Comme partout ailleurs dans le domaine dentaire, notre organisme subit certaines transformations tandis que nous nous efforçons de produire les meilleures expériences dans un marché extêmement concurrentiel. C'est pourquoi nous devons nous entraider. Notre seul obstacle, à vrai dire, c'est l'apathie. Je fais donc appel à chacun parmi vous d'assister au Congrès de cette année à Toronto, du 22 au 24 septembre, et de surcroît, d'inviter un membre potentiel. Ne tardez pas. Notez la date à votre agenda et appelez un collègue dès aujourd'hui.

Plusieurs autres façons existent aussi pour venir en aide à votre Académie, par exemple: oeuvrer sur un comité, contribuer un article pour le Journal, présenter une démonstration clinique. Votre participation n'aura jamais eu autant de portée car, sans vous, nous cesserons de progresser. Alors "Assistez et Invitez".

On se voit à Toronto!

Cordialement,
Dr. Kim Parlett

Jeudi le 22 septembre: Cours pratique journée complète
"Esthétique et occlusion"

Dr. Tanaka est un anatomiste réputé, auteur et enseignant de techniques restauratrices pointues dont les présentations et habiletés cliniques exceptionnelles sont reconnues internationalement. Ses vidéos instructifs sur la dysfonction TM, l'anatomie et les implants sont utilisés dans plus de 80 écoles dentaires et médicales et programmes chirurgicaux à travers le monde.

Obtenir, organiser, interpréter et appliquer l'information clinique pour un plan de traitement integral

- **Donner au patient un traitement des plus complets**
- **Éviter les échecs esthétiques et de function**
- **Apprendre les directives de traitements interdisciplinaires**

Conférenciers du vendredi, Présentations d'une heure

Terry Tanaka, D.D.S.	Topic:	Complications anatomiques et restauratrices en dentisterie implantaire
Jay Gibson, B.Sc., D.D.S.	Topic:	L'emploi de mini implants comme ancrage dans les mouvements pré-prothétiques
John E. Davies, B.Ds., Ph.D., D.Sc.	Topic:	Les cellules souches mésenchymes et la regénération tissulaire du complexe craniofacial
Terry E. Donovan, D.D.S.	Topic:	L'identification, la gestion et la prévention de l'érosion dentaire
Winston W.L. Chee, D.D.S.	Topic:	L'occlusion relative aux restaurations implanto-portées
Daniel Melker D.D.S.	Topic:	*L'approche d'équipe vers un traitement d'ensemble parodontal et restaurateur*

Cliniques du samedi, Présentations de 18 minutes

Dr. Oliver C. Pin Harry	Topic:	Le traitement du développement dentaire atypique à l'aide d'une prothèse dentaire télescopique fixe
Dr. Peter Walford	Topic:	La restauration de l'attrition incisive avec la résine composite
Dr. Peter Fritz	Topic:	La radiographie parodontale
Dr. Daniel Zeiter	Topic:	La classification des maladies parodontales et leurs traitements
Dr. Alex Tache	Topic:	Conservation de la crête
Dr. Michael Melkers	Topic:	Analyse parafonctionnelle en dentisterie diagnostique et restaurative
Dr. Robert Margeas	Topic:	Extraction et placement immédiat d'un implant et temporisation au maxillaire antérieur utilisant la dent naturelle du patient

De plus, 15 démonstrations cliniques seront présentées de 14h30 à 17h30

De l'information supplémentaire sur nos conférenciers et le cours pratique du jeudi apparaîtra dans le prochain numéro. Pour des mises à jour des programmes et l'inscription, référez-vous à www.cardp.ca

Un message du Président du congrès

En tant que Président du congrès, il me fait plaisir de vous convier à notre 19ième congrès annuel de l'Académie canadienne de dentisterie restauratrice et de prosthodontie qui aura lieu à Toronto du 22 au 24 septembre 2011. Cette année, l'événement se tiendra au prestigieux Fairmont Royal York Hotel. Étant donné que notre organisme est le seul au niveau national qui soit dédié à tous les aspects de la dentisterie restauratrice et de la prosthodontie, notre Académie présentera un illustre assemblage de conférenciers et de thèmes de fine pointe. Nous offrirons de plus in grande variété d'activités sociales pour plaire à tous les goûts.

Jeudi le 22 septembre sera une journée scientifique optionnelle et contingentée, animée par le célèbre Dr. Terry Tanaka, qui offrira un programme pratique intitulé "L'esthétique et l'occlusion". Pour ceux qui préfèrent la détente, 2 passe-temps sportifs seront à l'ordre du jour: Un tournoi de golf au Eagle's Nest ou à Copper Creek, ou bien de la voile dans le port du Lac Ontario. La journée se terminera à l'hôtel, pour une réception de bienvenue. La bonne chère, des appéros, de la musique et l'opportunité de rencontrer amis, collègues et exposants agrémenteront cette rencontre conviviale.

Le vendredi sera le coeur du programme scientifique. On y introduira 6 présentations d'une heure chacune, proposées par Dr. Terry Tanaka, Dr. Jay Gibson, Dr. Terry Donovan, Dr. John Davies, Dr. Winston Chee et Dr. Daniel Melker. Un assortiment de sujets seront discutés: les mini implants pour ancrage orthodontique, la recherche sur les cellules souches, l'usure et l'érosion, les facteurs occlusaux relatifs aux restorations implantaires, les dangers à éviter en dentisterie implantaire et la science de la sauvegarde des dents.

Ceux et celles qui n'assisteront pas au congrès pourront profiter d'un programme agréable conçu pour vous enchanter. La soirée sera ensuite libre pour découvrir l'innombrable sélection de restaurants et de divertissements qu'offre Toronto. Samedi matin, 8 présentations cliniques brèves de 18 minutes se succèderont durant lesquelles les conférenciers n'auront le temps que de vous fournir uniquement les faits. L'après-midi sera consacré aux démonstrations cliniques qui vous soumettront des techniques concrètes et pratiques. Le congrès sera couronné par le Bal du Président comportant la réception au champagne, une cuisine raffinée et de la danse au son du 905 Band, l'une des plus réputées au Canada. Soyez-y puisque vous ne voudriez pas regretter tous les plaisirs que vos amis auront goûtés! Au plaisir de vous voir,

Dr. Cary Letkemann
Président du congrès

Plus d'information sur le congrès et la possibilité de vous inscrire en ligne suivront bientôt @ www.cardp.ca

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Immediate Dentin Sealing: Increasing Long-Term Predictability of Indirect Restorations

Scellement immédiat de la dentine : augmentation de la constance à long terme des restaurations indirectes

By Dr. Gregory Gillespie

About the Author

Dr. Gillespie received his dental degree from the University of Washington School of Dentistry and maintains a full time practice in Vancouver, WA focusing on general dentistry with an emphasis on implant dentistry. His vision of comprehensive dentistry focuses on effective treatment planning and utilizing the best dental materials available. Dr. Gillespie lectures nationally and is associated with Catapult Elite. As a member of this select group of clinicians, he is involved in ongoing evaluations of the latest materials and techniques in dentistry.

ABSTRACT

Long-term "clinical success" of indirect restorations is categorized in many ways: In addition to a patient's comfort, the practitioner must also ensure the longevity of the restoration, functionality, and esthetics. Done properly, immediate dentin sealing (IDS) is one technique that accomplishes these goals. In this article, the author explains what IDS is, discusses its beneficial factors, and outlines the procedural steps involved in effective IDS.

RÉSUMÉ

Le succès clinique à long terme des restaurations indirectes est catégorisé de plusieurs manières : en plus de penser au confort du patient, le praticien doit aussi assurer la longévité de la restauration, sa fonctionnalité et son esthétique. Lorsqu'il est fait de manière adéquate, le scellement immédiat de la dentine est une technique qui atteint les objectifs mentionnés auparavant. Dans cet article, l'auteur définit le scellement immédiat de la dentine, énonce les facteurs bénéfiques et donne les étapes à suivre pour réussir ce scellement.

Long-term clinical success of indirect restorations is categorized in many ways. The patient's satisfaction with the restoration over the immediate term and long-term largely determines whether the outcome is a "clinical success." From the patient's perspective, satisfaction for the entire procedure rests in comfort – from the preparation stage, weeks of temporization, cementation, and finally to function. Maintaining comfort consistently remains a lofty goal for the practitioner, but is the most basic of expectations from the patient. Yet comfort comprises only a portion of what the practitioner would consider "clinical success." In addition to the patient's comfort, the practitioner must also ensure the longevity of the restoration, including no catastrophic failures, marginal ridge or cuspal fractures, microleakage, delamination or debonding, the minimization of microfractures, and protection of the pulp. Such specifications simply address functionality without consideration of the esthetic result. Given the enormity of factors qualifying "clinical success," fulfillment of patient's comfort, functionality, and esthetics are difficult to simultaneously achieve, yet should still routinely be met regardless of the indirect material of choice. Simple reason suggests the need for techniques to improve chances of "clinical success" for the patient and practitioner alike. Done properly, immediate dentin sealing (IDS) is one technique that accomplishes this goal.

What Is IDS?

Immediate dentin sealing (IDS), also known as "resin coating," consists of sealing freshly cut dentin at the time of preparation with a dentin bonding agent. The clean, uncontaminated dentin surface optimizes the bonding procedure, allowing deeper resin penetration into dentinal tubules. A resin coated preparation preserves dentin bonds for cementation and greatly decreases bacterial contamination during temporization.[1–3]

After the preparation is completed, a 3-step etch-rinse or 2-step self-etch adhesive system is layered and light cured. Currently, 2- and 3-step adhesive systems are preferred over 1-step adhesive systems (all-in-one or 7th generation bonding) due to the increased hydrophobic surface formed during the adhesive process.[4] The formation of the resin hybrid layer reinforces collagen prone to collapse during the impression and cementation phases.[5–7] Additionally, sealing the dentin prior to the impression accounts for film thickness of the adhesive system, and removes concern of an imperfect fit of the permanent restoration.[4,8] Pre-polymerization of the bonding agent allows maturation of the bond during temporization without the stress associated with the cementation, or luting, process.[9]

Figure 1. Dark surface contaminates on a non-resin-coated preparation after temporary removal.

At the final seating appointment the temporary is removed, the preparation cleansed, and an additional layer of the bonding resin is light-cured in conjunction with the resin-luting agent. Ultimately, sealing the dentin at the time of preparation preserves the adhesive layer and significantly increases bond strengths of the permanent restoration,[4,8,10–12] regardless of the type of luting agent chosen.[13]

Beneficial Factors of IDS

Immediately sealing the dentin following tooth preparation for indirect restorations (inlay, onlay, veneer, or crown) increases the likelihood of long-term "clinical success." The following four specific beneficial factors are outlined further below.

Factor 1: Decreased Sensitivity

Hydrodynamic theory suggests fluid movement through dentinal tubules highly contributes to patient's sensitivity.[14,15] Physical obstruction of the tubules with a filled resin dramatically diminishes sensitivity during the temporization phase and immediately post-cementation.[16,17] Studies indicate that sealing the dentin decreases sensitivity even up to one-month post-cementation,[18] thereby decreasing risk of erroneous continual treatment recommendations such as root canal therapy. Anecdotally, the author reports increased patient comfort and decreased sensitivity when immediate dentin sealing is performed.

Factor 2: Reduced Bacterial Contamination

Provisional restorations are fabricated in a manner to facilitate removal after a short interval. Hence, bacterial contamination due to microleakage often develops during the temporization phase.[1] Contamination from bacteria and temporary cements greatly decrease the bonding efficacy of luting agents. A recent study cites an astonishing 83–97% drop in maximum bond strength when resin-coating occurred after provisionalization (in preparation for final bonding) measured against final bonded restorations where the IDS technique had been utilized.[4] Resin-coated preparations remain protected and clean, virtually eliminating dark surface contaminates that often appear beneath temporary restorations (Figure 1). Immediate dentin sealing improves protection from dentin tubule penetration by bacteria, facilitating mechanical cleansing of the preparation from any residual contamination.

Factor 3. Reduced Errors at Seating Appointment

Seating accuracy of the final restoration increases when patients maintain complete proprioception without administration of local anesthetic. Local anesthetic at the seating appointment often remains optional with resin-coated preparations due to the patient's increased comfort and decreased sensitivity during the provisionalization stage.[4,17] Consequently, precision of occlusal equilib-

Figure 2. Preoperative view of tooth #3 prior to preparation (caries noted on mesial and distal interproximal surfaces).

Figure 3. Isolated prepared tooth #3 prior to immediate dentin sealing.

Figure 4. Acid etchant application (37% phosphoric acid, Ultra-Etch, Ultradent).

Figure 5. Bonding resin application to primed surface (Optibond FL, Kerr Corporation).

ration and adjustment increases leading to greater initial patient satisfaction.

Factor 4. Increased Bond Strengths

Perhaps most compelling, current research demonstrates immediate dentin sealing may significantly improve shear bond strength.[4,8,10–12, 21] Remarkably, no statistically significant differences in bond strengths were recorded with direct immediate bonding (i.e., direct bonding with composite resin) versus delayed bonding with resin-coated preparations seated after 2,7, and 12 weeks of provisionalization.[4] Increased shear bond strengths were found when IDS was used with all luting agents; including resin-modified glass ionomer (RMGI), total-etch adhesives, and self-adhesive luting cements.[13]

Procedural Steps to Effective IDS

Appropriate Bonding Protocol

Proper isolation must be achieved after completion of the indirect preparation (Figures 2 and 3). This includes complete hemostasis and salivary control. If cord is used, placement occurs before initiation of the bonding procedure. Etchant (37% phosphoric acid) is applied and rinsed thoroughly (Figure 4). Optionally, a desensitizing/disinfectant agent (Gluma, Heraeus; Tubulicid Red, Global Dental Products) is then applied in scrubbing motion for 20 seconds, and air thinned.[22] The primer/bonding agent (Optibond FL (4th generation), Optibond SoloPlus (5th generation) or Optibond XTR (6th generation), Kerr Corporation) is then applied for an additional 20 seconds in multiple coats (Figure 5) and light cured for 15–20 seconds. The author prefers Optibond FL for immediate dentin sealing given its' well documented clinical performance.[4,23,24]

Impress with Polyvinylsiloxane

Upon completion of the adhesive bonding procedure, active energy remains on the preparation surface.[25] This layer is often referred to as the "oxygen-inhibited layer" and its role in adhesive dentistry is debated.[26,27] Regardless, remaining unpolymerized resin tags of the sealed dentin may interact deleteriously with polyvinylsiloxane (PVS) and polyether impression materials.[28] Covering the preparation with petroleum jelly (air-blocking) (Figure 6.) and performing an additional light cure reduces the formation of

Figure 6. Petroleum jelly application prior to additional light cure (air-blocking).

Figure 7. Extrusion of low-viscosity polyvinylsiloxane impression material (Take 1 Advance, Kerr Corporation).

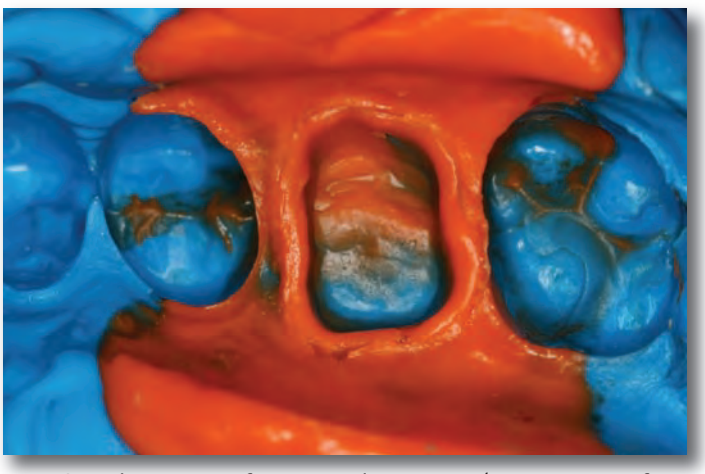

Figure 8. Final impression of resin-coated preparation (note proper set of PVS material).

Figure 9. Seating of temporary restoration with non-resin temporary cement (Tempbond NE, Kerr Corporation).

that layer[4,28]. The preparation is further scrubbed with alcohol, or hand-piece manipulation with pumice to ensure no interaction of surface energy with impression materials. PVS impression materials set properly and record accurate impressions after altering the active surface (Figures 7 and 8), whereas polyether impression materials still demonstrated incomplete setting reactions under similar conditions.[28]

Excess resin at the margin impedes subgingival penetration of the impression material. This is eliminated through the removal of the top cord (when using a double cord technique) or by carefully moving an explorer around the boarder of the margin while maintaining hemostatsis.

Temporary Fabrication

Resin based temporaries bond to sealed preparations unless a separating agent is applied. Petroleum jelly or Pro-V coat (Bisco) must be liberally applied before fabrication of the temporary.[4,17] Additionally, utilization of non-resin temporary cements (Tempbond NE, Kerr Corporation) diminish chances of bonding a temporary restoration to resin-coated preparations[4] (Figure 9).

Cementation Protocol

The practitioner will notice the absence of dark bacterial contamination upon temporary removal (Figure 10). Mechanical manipulation with pumice and chlorhexidine scrub ensures a clean surface for bonding the luting agent (Figure 11). The practitioner chooses an appropriate luting agent; all types are compatible with immediate dentin sealing.[13] The priming step may be omitted but a fresh layer of bonding agent is applied then light-cured in conjunction with the resin luting cement when utilizing a total-etch bonding technique for cementation (NX3, Kerr Corporation) (Figure 12 to 14). The cementation procedure is unchanged with a primed resin cement (Multilink Automix, Ivoclar Vivadent) or self-adhesive resin cement (Maxcem Elite, Kerr Corporation).

Conclusions

Immediate dentin sealing enhances long-term "clinical success" for both the patient and practitioner. The extra steps required over traditional preparation and provisionalization

Figure 10. Clean preparation immediately following temporary removal (note absence of bacterial contamination).

Figure 11. Mechanical cleansing of preparation with 2% chlorhexidine.

Figure 12. Luting final restoration (E.Max, Ivoclar Vivadent) with total-etch resin cement (NX3, Kerr Corporation).

Figure 13. Easy clean up of gel phase following tack cure of resin luting agent (NX3, Kerr Corporation).

Figure 14. Final buccal view of bonded restoration (note natural transition from restoration to natural tooth structure).

techniques more than recuperate time lost with the positive advantages gained. The patient's comfort is enhanced with decreased sensitivity and increased seating accuracy, while the practitioner's confidence is reinforced through reduced bacterial contamination and improved bond strengths.

Conflicts

Dr. Gillespie has received financial support from Kerr Corporation.

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Minimal Intervention Esthetic Dentistry

Intervention minimale en dentisterie esthétique

By Dr. Geoff Knight BDSc, MSc, MBA, PhD

About the Author

Geoff Knight is a general dentist and internationally noted dental speaker with special interests in minimal intervention esthetic dentistry.

He has pioneered a number of innovative clinical procedures in esthetic dentistry and the pharmacological management of caries. He has consulted widely across the dental industry and is named on several patents.

He has been published in Quintessence International, Australian Dental Journal, *and* Journal of Periodontal Research. *He has produced a series of clinical videos and written numerous articles on esthetic and adhesive dentistry that have been translated and published internationally in a number of languages*

ABSTRACT

The current clinical model of restorative and esthetic dentistry is founded upon highly invasive restorative techniques. These lead to the chronic destruction of dentition, resulting in a need for high-end care. Enlightened restorative dentistry should be based upon mineralization rather than mutilation, and esthetic dentistry should be based upon augmentation rather than amputation. This article discusses several options in minimally invasive dentristry.

RÉSUMÉ

Le modèle clinique courant de dentisterie restauratrice et esthétique est fondé sur des techniques restauratrices très invasives. Ce qui entraîne la destruction chronique de la dentition et le besoin de soins de haut de gamme. La dentisterie restauratrice éclairée devrait être fondée sur la minéralisation plutôt que sur la mutilation, tandis que la dentisterie esthétique devrait être fondée sur la mise en valeur plutôt que sur l'amputation. Cet article traite des diverses options de dentisterie peu invasive.

The current clinical model of restorative and esthetic dentistry is founded upon highly invasive restorative techniques. The long-term effects of this over-preparation are chronic destruction of the dentition, resulting in the high-end care that is so often promoted at seminars to dental practitioners.

Minimal intervention esthetic dentistry is not about drilling smaller cavities or conservative crown preparations, but the re-evaluation of treatment modalities based on the pharmacological management of dental disease and changes to the current amputation model of clinical care. Since the late 1990s it has been acknowledged that caries infected dentine will stabilize beneath a restoration1 and that creating a biological seal at the cavo margin (isolating the lesion from the overlying biofilm) reduces the viability of bacteria remaining within the lesion and prevents further caries progression.[2]

Despite this, many dentists strive to remove caries-infected dentine during cavity preparation and leave behind the slightly demineralized caries

Figure 1. Arrested caries.

Figure 2. Occlusal cavity in upper second molar.

affected dentine believing it to remineralize into sound dentine. This is based upon the widely held notion that bacterially infected dentine is irreversibly decomposed, unable to remineralize, and should be removed prior to restoration placement.

The removal of carious dentine prior to completing cavity preparation infers that the dentine pulp complex is the only vital tissue in the body that lacks a front-line physiological response to bacterial invasion creating a single point of tissue vulnerability in the body against infection. It has been shown[3] that demineralized dentine is more effective in reducing the viability of streptococcus mutans than dentine treated with an antibacterial substance (silver fluoride and potassium iodide) This raises the hypothesis that there are substances released by carious dentine that may inhibit bacteria viability. Furthermore, when silver fluoride and potassium iodide are applied to the surface of demineralized dentine there is a substantial reduction in bacterial viability[3] suggesting an anti bacterial synergism between silver fluoride and potassium iodide with demineralized dentine. Arrested root caries demonstrates the ability of a tooth to self heal by remineralization of carious tooth structure. Figure 1. Arrested caries are inevitably black as sulphur salts become incorporated into the remineralizing tissues. Remineralized lesions remain resistant to further caries attack unless there are dramatic changes in the oral environment. This is partly due to the remineralization process that transforms carbonated apatite with a demineralization pH of around 5.5 into a complex of hydroxyl and fluorapatite[4] that resists demineralization to a pH of around 4.5. Preventing biofilm formation prevents caries progression.[2] Both the application of ozone[5] and silver fluoride/ potassium iodide[6] to dentine prevents biofilm formation and may play a role in caries management.

Glass Ionomer Cements

Glass ionomer cements pharmacologically assist with the remineralization of carious dentine by providing a source of fluoride, calcium, or strontium ions (depending upon the glass ionomer used) that can penetrate over 100 microns into dentine to assist with the formation of hydroxyl and fluorapatite in the demineralized tissue.[7,8] Glass ionomer cements have further benefits when treating caries as they prevent demineralization at the perimeter of the restoration unlike composite resin that offers no such protection.

The Pharmacological Management of Dental Caries

Following is an approach for the pharmacological management of a carious lesion using silver fluoride/potassium iodide and glass ionomer cement:

- Figure 2 shows occlusal caries on an upper second molar.
- Enamel was removed and a moat was prepared in sound dentine with a #3 slow-speed round bur at the dentino-enamel junction around the perimeter of the caries (Figure 3).
- The preparation was etched with 37% phosphoric acid for 5 seconds, washed with water, and dried with oil free air (Figure 4).
- Silver fluoride was applied to the preparation, with a microbrush (Figure 5).
- This was followed by potassium iodide until the precipitation turned from cloudy white to clear (Figure 6).
- The cavity was then washed and dried with oil free air (Figure 7).
- After isolating the preparation from moisture with cotton rolls, an auto-cure glass ionomer cement was placed into the preparation to slightly overfill the cavity. Silver fluoride/potassium iodide enhances the bond strength between auto cure glass ionomer and dentine[10] (Figure 8).
- A 3 cm square piece of freezer bag was placed over the unset glass ionomer and the patient asked to occlude into centric occlusion for 4 minutes until the glass ionomer had cured (Figure 9).
- As the freezer bag acted as an occlusal matrix, once the glass ionomer had set, minimal contouring was required to complete the restoration (Figure 10).

Cosmetic Dentistry

Dental implants have unquestionably improved the well-being of millions of people over the past 30 years and dentists are constantly invited either by mail or the Internet to attend courses that will improve their skills in this particular facet of dentistry.

Figure 3. Open lesion through enamel to expose caries.

Figure 4. Etch with phosphoric acid for 5 seconds, wash and dry.

Figure 5. Apply Riva Star Solution 1 (silver fluoride).

Figure 6. Apply Riva Star Solution 2 (potassium iodide). Apply solution until white precipitate clears.

Figure 7. Wash and dry cavity prior to glass ionomer placement.

Figure 8. Apply auto-cure glass ionomer cement into cavity.

Figure 9. Place a freezer bag over the occlusal surface of the cavity and ask the patient to close in retruded occlusion for 4 minutes until the restoration sets.

Figure 10. Minimal contouring required to complete the restoration.

Figure 11. Fractured root of upper central incisor.

Figure 12. Direct composite resin bridge 16 years after initial placement.

While before and after photographs are impressive, the astute observer would like to see pictures of the same prosthesis beyond 10 years for while there is more than 30 years of clinical experience with dental implants long-term clinical photographs do not seem to be part of the promotional literature.

A recent study measuring the success of dental implants of 10 years and beyond confirms the high retention rate. However, when the incidence of peri-implantitis and mechanical problems with the prosthetics are factored in, the percentage of implants free of complications was less than 50%. [11,12] This may well be less successful than other prosthetic procedures dentists apply to the dentition and is a timely reminder that there is a continual maintenance factor that has to be taken into account with implant use. The rigidity of an implant in a flexing dentition would suggest an increased propensity for porcelain to fracture in this environment. A porcelain crown on a root filled tooth may be less prone to fracturing than an implant supported crown in the same location.

Non-invasive Management of a Missing Upper Incisor

The following clinical case is presented to show there are conservative options that provide a functional and esthetic alternative to replacing a missing tooth.

- Figure 11 shows a patient with a fractured root on an upper right central incisor that required extraction.
- The clinical situation was managed by placement of a direct resin bridge without tissue preparation. Figure 12 shows the prosthesis 16 years after placement.
- Lingual view of direct resin bridge showing conservative preparation (Figure 13).

Conclusions

The current clinical model of restorative and esthetic dentistry leads to the chronic destruction of the dentition. Enlightened restorative dentistry should be based upon mineralization rather than mutilation and esthetic dentistry should be based upon augmentation rather than amputation.

Silver fluoride has been used to arrest caries,

Figure 13. Lingual view showing conservative preparation.

primarily in deciduous teeth since the early 1970s. After application, free silver ions react with oral sulphides to form silver sulphide, staining the teeth black. The application of potassium iodide immediately after silver fluoride application forms silver iodide that is a low solubility creamy white non-staining precipitate with significant antibacterial properties.

Disclosure

The author has a financial Interest in Riva Star.

Videos and references

Clinical videos of the minimal intervention techniques and texts of many of the references sighted may be viewed on the author's web site. www.dentalk.com.au.

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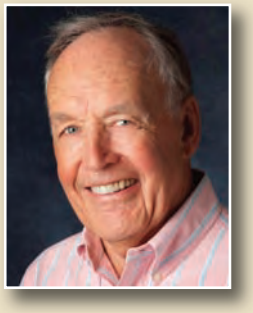
Mastering Clinical Advancements

Gérer les progrès cliniques

By Dr. John N. Nasedkin, DDS, FRCD(C), FADM



About the Author

Dr. Nasedkin is a consultant prosthodontist in Vancouver Canada, who has taught occlusion/TMJ and esthetics on every continent. He is a past-president of the American Equilibration Society and a member of the Pacific Coast Society of Prosthodontists, CARDP, the American Academy of Cosmetic Dentistry, and other many prestigious organizations. He is the co-editor of the book, Occlusion: The State of the Art. *He is the mentor of the first esthetic study club in Canada and a clinical assistant professor at the University of British Columbia. He can be contacted at: jnasedkin@telus.net or www.drnasedkin.com.*

ABSTRACT

The learning process leading to changes in the way dentists provide clinical services for their clients can be a slow and arduous journey. Changes suggested by advertisements, journal articles, technician suggestions and lectures attended, require effort for us to implement in our practices. The mentor/clinical application model which is a principal method in British Columbia is encouraged for greater application across Canada.

RÉSUMÉ

Le processus d'apprentissage menant aux changements dans la façon dont les dentistes fournissent des services cliniques à leurs clients peut être un parcours lent et ardu. Les changements suggérés par les annonces, les articles de journaux, les techniciens et la participation à des conférences exigent un certain effort de notre part pour mettre ces changements en pratique. Le modèle d'application clinique/mentor, principale méthode en Colombie-Britannique, est encouragé partout au Canada.

Dentists are inundated with advertisements and promises of new materials and technologies at every turn. Keeping up has become a full-time job with the difficulty of determining which of these so-called promises merit introduction into one's regular practice activity. There is no better place to make these decisions than a study club.

Dentistry has long followed the mentorial model where an expert in a specific subject shares knowledge with dentists who become his students. Study club activities vary from province to province and country to country, but some noticeable trends are apparent. Evening sessions or study clubs generally follow the format of a mentor lecture followed by discussion and perhaps case presentations. Some literature reviews can occur but these activities are short and sweet and only useful to a degree. Frequently the group will have dinner in association with the activity and this can, on occasion and unfortunately, become the principal reason for attending.

In Ontario the lecture method predominates as the learning experience. Centers like The Dental Learning Centres in Oakville offer a lecture room with adjacent clinical demonstration suite www.tdlc.ca for more information). In Toronto the Centre for Continuing Dental Education of the University of

Toronto, is a beautifully equipped lecture room in a central setting (visit www:utoronto.ca/cde for more details). Various other groups with specific interests have established programs which sometimes use the operatories of dentist's offices for clinical learning programs on weekends. Interestingly the predominant clinical programs in Ontario are almost exclusively related to implant surgical treatments.

In BC we have a long tradition of clinical restorative study clubs dating back nearly 100 years. The original groups were the foil study clubs which have morphed into the American Academy of Gold Foil Operators. Several of the gold foil study club mentors became the formative instructional staff when the University of Washington dental school was begun in the post-war period.

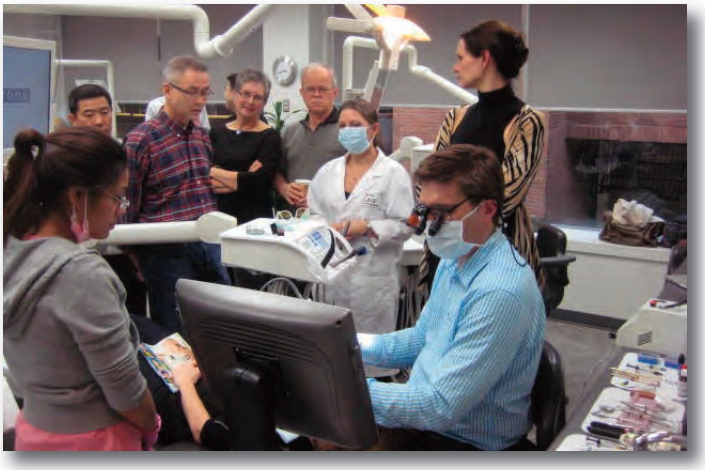
For more than 25 years, we had a clinical teaching facility at the College of Dental Surgeons of BC in Vancouver. This was recently revitalized by the Study Club Alliance of BC and re-opened as the Sirona Learning Centre. Here we have a 30-seat lecture room, an adjacent glassed demonstration operatory, and 12 fully equipped dental chairs. The prevailing study club model is a half day per month in which a lecture is followed by clinical experience on the dentist's patient to convert knowledge at a challenge level into clinical experience. We also have a complete clinic for continuing dental education at UBC. There is a complete webcasting camera set-up so the demonstrations and lectures can be transmitted on-line across the province (www.sironalearningcentre.org).

My own study club is known as TEST – The Esthetic Study Team – meeting for 26 years. The accompanying photos were taken at our January session where Corrie Paulsen of 3M Espe conducted a Digital Impressioning clinical workshop on the Lava Chairside Oral Scanner. Our current theme is CAD/CAM restorations and we will next meet with representatives of CEREC and use the AC Bluecam for digitally scanning then designing and completing restorations using the In-Lab milling machine. In September of 2008 we had a clinical demonstration of the iTero scanner. Our objective is for each member or our group to develop personal experience with the use of digital technology.

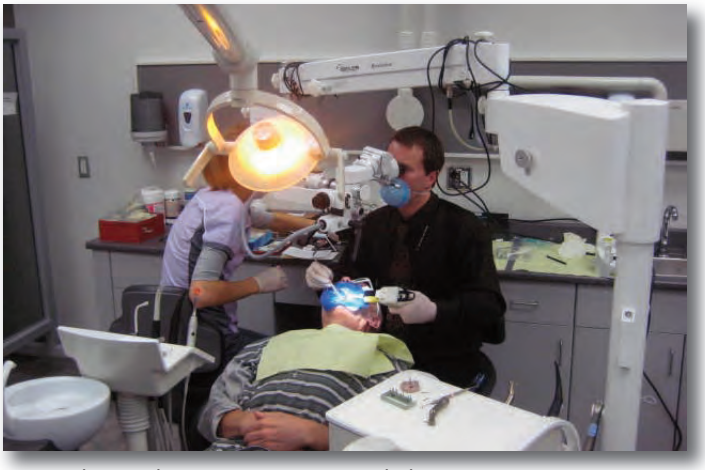
Dental assistants and staff members are encouraged to participate in the clinical teaching sessions since it is their understanding and commitment to a process which insures its successful application. Study club members are provided with teaching aids to assist in this implementation for use in staff meetings and in the essential training sessions required for all for staff members.

Dentistry's challenges are minimized by first-hand experience. The objective of clinical workshops and study clubs is to directly transfer new information into everyday skillsets.

Even when assisting a colleague, a dentist adds to his/her memory bank of case history and some experience which is useful in one's own office. In Canada the learning experience varies from province to province and within the provinces themselves. We encourage the use of the mentor/clinical model for your esthetic and restorative advancement in continuing dental education.

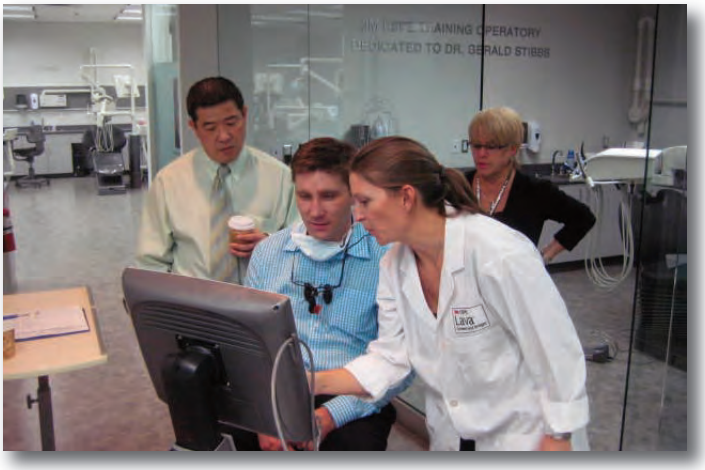


Dr. Brian Baird scans his preparation watched by members of TEST and Corrie Paulsen in the white coat.



Dr. David Monaghan prepares a crown with the microscope.

Dr. Monaghan scans his tooth preparation.



Dr. Ed Lowe, Dr. Baird, and Corrie Paulsen prepare data for transmission to the LAVA milling facility.

A Collaborative Approach to Patient Care: Keys to Success

Les clés du succès : Une approche collaborative aux soins du patient

By Dr. Paresh Shah, DMD, MS, Cert. Esthetic Dentistry

About the Author

Dr. Paresh Shah has been in private practice in Winnipeg since 1992. His post-secondary education at the University of Manitoba includes a BSc (microbiology) in 1983, a MSc. (physiology) in 1987, and a DMD. in 1991. Dr. Shah's interests and expertise lie in cosmetic, restorative, and implant dentistry. He has taken over 1,000 hours of advanced education from programs all over North America.

Besides serving as a past board member for the Manitoba Dental Association, Dr. Shah is currently on the executive of the Canadian Academy of Esthetic Dentistry as a founding member. Dr. Shah is also involved in organized dentistry, clinical teaching, and serves as a clinical consultant for several dental manufacturers.

ABSTRACT

Today dentists are challenged with an increased complexity in esthetic challenges and demands. We are faced with an ever-changing selection of materials, procedures and requests from patients. Furthermore, many people present with aesthetic, functional, and occlusal problems that require extensive treatment. At the heart of all this is what is best for our patients to achieve their treatment goals. Communication with the patient and the entire team of dentists and specialists is important to achieve treatment success. The following clinical case will review the concept of true interdisciplinary dentistry and how the restorative dentist working harmoniously with specialists can achieve more predictable and stable results for their patients.

RÉSUMÉ

De nos jours, les dentistes doivent savoir répondre aux besoins de plus en plus complexes des patients en matière de dentisterie esthétique. Le choix des matériaux, des procédures et les demandes de la part des patients changent constamment. De plus, de nombreux patients présentent des problèmes esthétiques, fonctionnels et occlusaux qui requièrent un traitement parfois très long. Ce qui en ressort en bout de ligne c'est la satisfaction des patients qui ont obtenu ce qu'ils désiraient. La communication avec le patient et l'équipe de dentistes et de spécialistes est importante à la réussite du traitement. Le cas clinique suivant passera en revue le concept de la vraie dentisterie interdisciplinaire et la façon dont les praticiens en dentisterie restauratrice travaillant en harmonie avec les spécialistes peuvent obtenir des résultats prévisibles et souhaités.

Figure 1. Smile (unretracted) initial presentation.

Figure 2. Smile (retracted) initial presentation with retainers to replace missing teeth.

Figure 3. Smile (retracted) initial presentation without retainers.

Esthetic dentistry in today's terms encompasses much more than having a straight, white smile. Our patient's not only want to look better and feel younger, their expectations are far greater. What's esthetically pleasing to one person may not be for the next. Ideal esthetics should not only deal with appearance, but also provide optimal function and stability. There's little point of having brighter teeth if the restorations last for only a year or don't allow you eat or speak properly? Furthermore, dentistry is not only far more sophisticated today, but the expectations of our patients quite often transcend the "usual and customary" of basic general dentistry and involves many aspects of the specialty disciplines. It has become more common to find orthodontists, periodontists, and oral surgeons working as a team to help coordinate a healthy, stable, and optimally esthetic result. To achieve these results it is imperative for the specialists involved to have a working understanding of the restorative challenges and goals from the outset. To that end, it is equally imperative that the restorative dentist also has a good working knowledge of other related disciplines. We all know that restorative dentistry, periodontal health, material selection, and occlusion are the foundation of an average general practice. However, in today's climate that may not be enough to provide the most optimal treatment for many of our patients. The restorative dentist has an obligation to integrate and facilitate the disciplines necessary to create the most functionally stable and esthetic result when required. A variety of disciplines may be necessary to achieve successful completion of the patient's treatment goals. These may include any of the following: orthodontics, oral surgery, periodontal therapy/surgery, and perhaps orthognathic surgery.

The concept of interdisciplinary dentistry is not a new one. Many dentists may believe they practice interdisciplinary dentistry, but it's how the process is managed and carried out that is most important. This requires a change in how we approach our patients in everyday general practice.[1] It also requires gaining the extra knowledge to be able to treat these cases properly. Peter Dawson has said: "to have an accurate starting point, every problem to long term health must be recognized … planning the complete process to a visualized end point should come first."[2] Richard Roblee separates the various levels of dentofacial therapy into three main categories: unidisciplinary therapy, multidisciplinary therapy, and interdisciplinary therapy.[3,4] Each approach varies in their degree of sophistication and similarly in their degree of success. Interdisciplinary dentistry involves a structured collaboration between the restorative dentist and the specialists involved in the patient treatment. Furthermore, there is a common working knowledge between all parties. The providers work together, think alike, and have common goals for the patient's complete treatment plan. The following case provides an example of how treatment can get side-tracked without adequate communication and provides some solutions on how to perhaps avoid similar consequences when a group works collaboratively during treatment.

Case Report

A 20-year-old female patient presented with numerous congenitally missing teeth that she wished to have replaced with dental implants. She was happy with her appearance and current smile (Figure 1) but wasn't thrilled with having to indefinitely wear retainers to replace her missing teeth (Figure 2). On initial examination, it was apparent that some of her tooth proportions and tissue heights were out of balance (Figure 3), but she stated that this

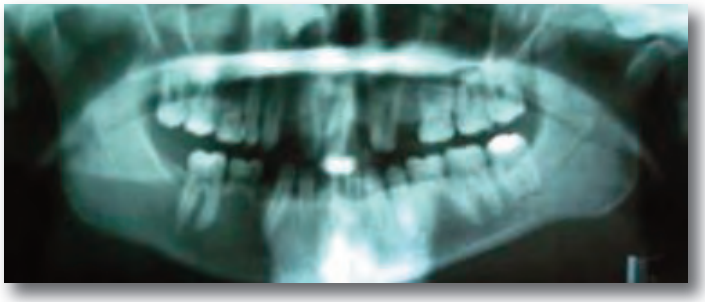


Figure 4. Panoramic radiograph displaying missing permanent dentition and inadequate root spacing for implants.

Figure 5. Periapical radiographs (maxillary anteriors) on initial presentation displaying inadequate spacing and root alignments for implants.

Figure 6. Mounted diagnostic casts (wax-up) to visual and discuss idealized goals.

Figure 7. Orthodontic retreatment to correct alignment.

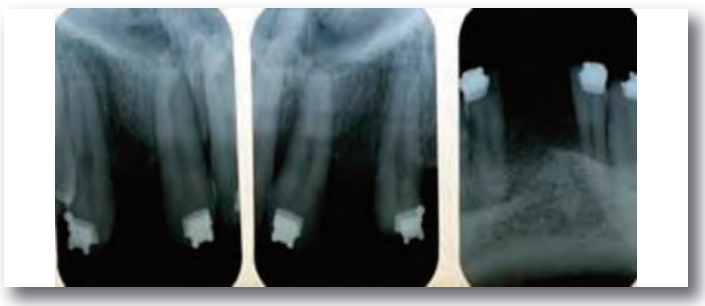


Figure 8. Periapical radiographs to monitor progress of root alignment and spacing. Root alignments are approaching a more favourable position for implant placement.

Figure 9. Diagnostic waxup to final contour to assess for bone grafting and implant placements.

was never a concern of hers and that she simply wanted to have her missing teeth replaced with dental implants. When the subject of orthodontics was suggested the patient explained that she had already completed 4.5 years of orthodontic treatment and has been wearing retainers for almost 9 months. She had already seen some other specialists but her treatment had not been followed up by anyone and the communication between the providers was not consistent.

We received permission to update some radiographs and contact her orthodontist to obtain some history on her treatment. It was evident from the panoramic radiograph and intraoral views (Figures 4 and 5) that there were missing permanent teeth, retained primary teeth, and inadequate root alignments to facilitate ideal implant placement. Her orthodontist explained that there was little to no communication between the various dentists and specialists involved so no ideal goals regarding implant therapy were discussed initially. He was happy to retreat the patient once a comprehensive treatment was developed if she so chose. At this stage, I suggested a consultation with the orthodontist and oral surgeon would be helpful and developed a diagnostic wax-up of our treatment goals in consultation with the patient (Figure 6).

At the interdisciplinary consultation visit the treatment goals of the patient were reviewed with the oral surgeon and orthodontist. The mounted diagnostic wax-up gave all providers a "road map" of treatment objectives. The oral surgeon asked that he be kept apprised of the root positioning as orthodontics continued so that he would have adequate room for implant placement. The patient was also informed that bone grafting would be required after orthodontics. The patient resumed orthodontics once again (Figure 7) and progress was monitored closely from a restorative and surgical point of view by all

Figure 10. Surgical guides are provided to the implant surgeon to facilitate appropriate placement.

Figure 12. Custom zirconia abutments (mandible) with soft tissue.

Figure 11. VPS impression of maxillary implants with impression copings in place.

Figure: 13. Custom zirconia abutments (maxilla) with soft tissue.

three providers. Progressive periapical radiographs were taken throughout the orthodontic treatment and shared with the oral surgeon (Figure 8). We also took measurements of the coronal spacing to assure the widths of the prosthetic teeth would be balanced. The patient wasn't concerned about tissue heights as her smile didn't reveal those features. She had already now reached over 5 years of orthodontics and wished to achieve her goal of receiving implants rather than perfecting every detail of her smile.

Once adequate space appropriation[5] was achieved and the root alignments deemed suitable by the surgeon, another mounted diagnostic wax-up was made to allow fabrication of surgical guides for bone grafting and subsequent implant placements (Figures 9 and 10). The patient continued to wear retainers, which we modified to fit over the following year while her bone grafting (iliac crest) healed and implants were finally placed by the surgeon. A total of 9 implants were placed and once integration was confirmed by the surgeon, impressions were made to begin the restorative phase of treatment (Figure 11). We had discussed esthetics from the outset of treatment with the patient and advised her that in order to make her smile as pleasing as possible we had to address the shapes of her of existing teeth. Her original central incisors were narrow and their root forms were divergent prior to retreatment with orthodontics (see Figures 2 and 3). Her canines were also quite square on the incisal edge. She once again reiterated that she was not concerned about her gingival heights and so the team as a whole did not spend too much time focusing on those issues, but rather on the primary goal of achieving adequate spacing for prosthetics with implants and occlusal harmony. To that end, the laboratory fabricated custom zirconia abutments for the implants (Figures 12 and 13). The abutments were seated in the mouth to verify adaptation and positioning. (Figure 14). The final design of the restorations was completed after taking

Figure 14. Custom abutments seated intra-orally to verify position and fit.

Figure 15. Diagnostic wax-up (maxilla) of existing teeth allows final restorations to be created in a balanced manner.

Figure 16. Diagnostic wax-up (mandible) of existing teeth allows final restorations to be created in a balanced manner.

Figure 17. Retracted smile with implant crowns and transitionally bonded composite restorations.

Figure 18. Final smile (unretracted) post treatment.

into account the changes in contour required to make the patient's existing teeth more symmetrical. This was done using a diagnostic wax-up on the final master cast and approved by the patient (Figures 15 and 16). The patient had already committed to extensive treatment with the implants and restorations that she wasn't ready to do indirect veneers on her existing teeth at this time. For this reason, we used the diagnostic wax-up as a guide to improve the shape of her existing teeth to balance with the implant restorations. This transitional bonding with a nano-composite using a multiple shade layering technique allows for a highly aesthetic result.[6,7] The finish and polish retention of the composite allowed for a nice match to the ceramic crowns (Figure 17). Furthermore because the patient's occlusion was harmonized and spaces made symmetrical, she is now able to change over her transitional bonding one unit at a time (or more) depending on her financial situation. Her final smile wasn't altered significantly from her initial (Figure 18) but we were able to achieve her goals of replacing her missing teeth with dental implants and allowing her not to wear retainers anymore. She now has control over how she will proceed with the remaining restorations as she sees fit.

Summary

Although we could have chosen several other treatment options, the final result was deemed a success based on the treatment objectives of

the patient. Her primary goal from the beginning was to have her missing teeth replaced with dental implants. However, somewhere along the way this was not initially discussed in a collaborative fashion among the dentists and specialists involved. By the time the patient had completed almost 5 years of treatment, the case had to be reassessed and the treatment objectives collaboratively focused upon by the treating practitioners. Granted, due to her age, it would have been best to wait for implant placement until her 20s, but she could at least have had less orthodontic treatment and perhaps some conservative fixed appliances rather than the retainers she didn't feel comfortable with.

Many practitioners choose to treat all aspects of a case, sometimes oblivious of the challenges that lie ahead. If the restorative dentist is not comfortable to perform some of the treatment, specialists should be consulted. It is equally important to assemble an interdisciplinary team of specialists that understand how to work together in a structured manner. The restorative dentist has an obligation to visualize the end point to completion and then coordinate the team to make sure the desired outcome is achieved. An interdisciplinary approach allows one to provide comprehensive treatment to all patients and provides the ability to stage treatment for those who cannot afford to do all of it at once. It is critical for all members of the team to have a working knowledge of what the others are doing and provide structured collaboration to achieve the occlusion, function and aesthetics the patient desires.

Acknowledgements

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Conflicts

None declared.

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Metal Free Ceramics: A Clinical Case

Céramique sans métal : Un cas clinique

By Dr. Gildo Coelho Santos Jr., DDS, MSc, PhD;
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ABSTRACT

All-ceramic restorations have been an option largely utilized to restore anterior and posterior teeth due to their excellent esthetic and several ceramic systems are available in the market to fabricate partial restorations and crowns. The improvement of the resin cements and adhesive systems has allowed an effective adhesion between these materials and the dental structure.

This paper reports the use of an all-ceramic system, IPS Empress from Ivoclar/Vivadent. The background of the case is discussed and the clinical diagnosis and treatment plan of a patient are outlined. This clinical report describes the procedures used for the restoration of maxillary anterior teeth and mandibular incisors with a leucite-reinforced system. This case illustrates that ceramic coping with the latest ceramic layering systems are a highly aesthetic alternative to metal-ceramic restorations.

RÉSUMÉ

Les restaurations en céramique sont une option largement utilisée pour réparer les dents antérieures et postérieures en raison de leur excellent caractère esthétique et de la disponibilité sur le marché de plusieurs systèmes pour les restaurations partielles et les couronnes. L'amélioration des résines-ciments et des adhésifs a permis une meilleure adhésion entre ces matériaux et la structure dentaire.

Cet article traite de l'utilisation d'un matériau en céramique, IPS Empress de Ivoclar/Vivadent. L'historique du cas est mentionné et le diagnostic et le plan de traitement ont été schématisés. Ce rapport clinique décrit les procédures utilisées pour la restauration des dents antérieures du maxillaire et des incisives de la mandibule en utilisant une céramique renforcée à la leucite. Ce cas illustre que les couronnes en céramique réalisées avec les derniers systèmes céramo-céramiques sont des options très esthétiques aux couronnes céramo-métalliques.

Figure 1. Maxillary and mandibular anterior teeth presenting full gold crowns.

Figure 2. Closer view of full gold crowns.

Figure 3. Occlusal view of maxillary teeth.

Figure 4. Occlusal view of mandibular teeth.

While metal-ceramic systems still represent a high-strength mode of treatment associated with positive long-term success rates, there are a number of disadvantages, mainly aesthetics and biocompatibility. The past decade has seen the emergence of a number of novel all-ceramic crown and bridge systems with the capability of restoring anterior, posterior and multiple units. The search for new methods has been driven in part by patients who have increasingly high expectations in aesthetic dentistry and who also have concerns about the biocompatibility of metals intra-orally.[1]

Recent developments in dental materials have led to the introduction of a large number of all-ceramic systems for full-coverage restorations. Some systems were developed as a single-layer glass-ceramic (Dicor, Dentisply/Caulk; IPS Empress, Ivoclar/Vivadent), while others with a bi-layer design (In-Ceram, Vident, Procera, Nobel Biocare).[2]

Clinical evaluations of all ceramic crowns are promising, and success rates of 98.4% over a period of 2–3.5 years have been reported.[3] In a recent study,[4] the success rate for single crowns on the anterior dentition after a 5-year period of evaluation was reported as 100%. The following report describes the restoration of six anterior maxillary teeth and four anterior mandibular teeth and utilizing the IPS Empress (Ivoclar/Vivadent) all-ceramic system.

Case Report

A 25-year old female in excellent health came to our office with the chief complain being the appearance of her anterior upper and lower dentition teeth that had been restored with full gold (Figures 1–4). The patient disclosed that her appearance was causing problems on her social life and it was difficult to find a job. During the treatment planning session, the patient was given the option of PFM (porcelain fused to metal) or metal-free restorations. The patient chose to have all the teeth restored with the metal-free IPS Empress. Initial impressions were taken for study models and laboratory-made provisionals (Figure 5).

The occlusion was analyzed pre-operatively, clinically, and with the aid of mounted study models on a semi-adjustable articulator. A diagnostic wax-up was completed and the final outline form of the new restorations were deemed to be aesthetically satisfactory and approved by the patient.

Figure 5. Provisional restorations made at the laboratory

Figure 6. Initial cut with carbide bur in order to remove full gold crown.

Figure 7. Full gold crown sectioned.

Figure 8. Teeth preparation. (Note the modified shoulder finish line, necessary for all-ceramic crowns.)

Figure 9. Upper and lower set of provisionals in place.

Figure 10. Right side view of the crowns. Note the proper contour and alignment obtained with the final restorations.

Figure 11. Left side view of the crowns.

Figure 12. One week follow-up. Close-up of gingival margins of the crowns on teeth #11 and #21, note the health of the tissue margins.

Figure 13. Final result. There is excellent colour-matching with the rest of the teeth and superior lifelike esthetics.

Figure 14. Close-up of the Empress crowns after cementation.

At the tooth preparation/registration stage, all full-gold crowns were cut using a 1/4" round carbide burr (Figures 6 and 7) and the abutment teeth were refined using modified shoulder diamond burrs with coarse and superfine grit (Figure 8). After refinishing the margins, a small unimpregnated retraction cord was placed (Ultrapack #000, Ultradent) followed by a second cord (Ultrapack #00, Ultradent) impregnated with haemostatic solution (Hemodent, Ultradent). The final full-arch impression was made with a combination of a heavy and light viscosity polyvinyl siloxane (Take 1, Kerr) for the upper and lower arch. The provisionals were adapted to the teeth preparations (Figure 9) and the occlusion was checked and adjusted. Before the cementation of the provisionals, an interocclusal record at the patient's maximum intercuspidation position and a face bow transfer were obtained. After the cementation of the provisionals with non-eugenol temporary cement (TempBond NE, Kerr) another impression of the upper arch was made with irreversible hydrocolloid (Jeltrate, Dentsply/Caulk) in order to replicate the incisal guidance on the articulator. The shade was determined with a shade guide (Vitapan 3D Master, Vita)

During the final appointment all abutment teeth were cleaned of temporary cement, the crowns were inserted and the length, contour, and shades were inspected (Figures 10 and 11). All restorations were cemented with resin luting cement (Variolink II, Ivoclar/Vivadent). The patient received post-operative care instructions, and a recall appointment was scheduled for one week later. At the recall appointment the occlusion was checked. The margins were inspected to ensure that there was perfect integration of the soft tissue around the crowns (Figure 12). The patient was extremely happy with the final result (Figures 13 and 14).

Discussion / Conclusion

All ceramic systems indicated excellent esthetics, biocompatibility, and short-term clinical evaluations and have demonstrated high success rates.[5,6] The IPS Empress was first introduced almost 20 years ago. In a process composed of several stages, controlled crystallization is used to produce leucite crystals, measuring a few microns, in the glass matrix. The semi-finished product of leucite-reinforced ceramic powder is pressed into

ingots and sintered. These ingots are the basic components from which restorations are pressed. According to the manufacturer, IPS Empress Esthetic is the material of choice when it comes to the fabrication of pressed, highly-esthetic single tooth restorations. In addition to the excellent strength values, the leucite glass-ceramic ingots are also distinguished for their exceptional esthetics.

Marquardt and Strub (2006)4 found that the survival rate of 27 single crowns made with IPS Empress 2 after a 5-year period of observation was 100%. They also observed that the level of accuracy of fit (crown retention, marginal quality, and marginal adaptation) and esthetics accomplished was deemed very satisfying. Walia (2009)7 presented a similar case restored with Procera crowns, the authors also reinforced the superior esthetics achieved with an all-ceramic system and highlighted the excellent marginal fit.

For the purpose of this case report, it may be concluded that the IPS Empress provided restorations exhibiting excellent marginal fit and aesthetics.

Conflicts

None declared.

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Traditional versus Contemporary? A Comparative Multidisciplinary Case Report: Implant Fixed Prosthetic Treatment

Traditionnel vs contemporain? Un rapport de cas multidisciplinaire comparatif : traitement prothétique implantaire fixe

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ABSTRACT
In virtually every industry, rapid changes are occurring as a result of technological innovation. In dentistry, changes in materials and techniques have provided patients and practitioners with many contemporary options. With that in mind, many proven traditional techniques have continued to be employed with much success. As restorative dentists, we must consider all available options in order to help deliver the best possible treatment to each patient on a case by case basis.

This article will feature the treatment plans, techniques, and materials for two multidisciplinary fixed restorative reconstructions – one employing a more traditional approach, the other a more contemporary one.

RÉSUMÉ

Dans presque que toutes les industries, les innovations technologiques engendrent des changements rapides. En dentisterie, les changements dans les matériaux et les techniques ont donné aux cliniciens et aux patients plusieurs options contemporaines. Il ne faut pas oublier que plusieurs techniques traditionnelles éprouvées continuent d'être utilisées avec grand succès. En tant que dentistes en médecine dentaire restauratrice, nous devons retenir toutes les options disponibles afin de traiter du mieux possible chaque patient en fonction de chaque cas.

Cet article traitera des plans de traitement, des techniques et des matériaux utilisés pour deux reconstructions prothétiques multidisciplinaires fixes – la première utilisant une approche plus traditionnelle tandis que la deuxième une approche plus contemporaine.

Case Report 1: Traditional Approach

Initial Presentation

A 43-year-old man presented at his regularly scheduled recare appointment. He indicated that he wanted to pursue having his "front teeth fixed." He indicated a desire to "close gaps, have straighter and whiter teeth" as well as have "more even upper front teeth."

In profile, the patient was skeletal class I with 3 mm overjet and 30% overbite. He exhibited an average height maxillary lip line and his facial and maxillary dental midlines were coincident. He was, however, obviously facially asymmetrical. As well, he was brachecephalic and had very well developed muscles of mastication.

Intraoral Examination

Upon intraoral examination, the following observations were noted (Figures 1–6):

- Uneven maxillary teeth – inverted smile line
- Crowded mandibular anterior teeth
- Missing #12 from childhood, #13 in position of #12
- Failing bridge #14 - #12 fixed partial dentures (FPD) – porcelain fracture on all three abutments
- #13 endodontically treated. #14 apical radiolucency secondary to pulpal necrosis
- #11 lost in 1982 hockey accident – replaced with endosseous root form dental implant
- #11 Implant retained porcelain-fused-to-metal (PFM) crown – colour, angulation, and contour undesirable
- #21 Severe discoloration
- #22 Pegged lateral incisor – rotated
- Flat occlusal plane
- Signs of wear and bruxism

Restorative Treatment Options

It was immediately evident that in order to address all of the patients concerns, restorative treatment would have to be undertaken on a minimum of six teeth (#14 through #22 inclusive). A *contemporary approach* to restoring this particular case would likely involve use of all-ceramic restorations. All-ceramic restorations are highly esthetic, primarily due to their relative translucency as compared to PFMs. If all-ceramic restorations were deemed to be the restorations of choice in this case, a zirconia implant abutment would be required in the #11 position. There would be little sense placing a metal abutment under an all ceramic crown; the #11 restoration would always appear "grey" as compared to the adjacent teeth. Even if an aggressive opaque layer were used, the optical qualities of one restoration would be difficult to impossible to reproduce on the others.

In consideration of the above, the following would be a contemporary restorative option for this case:

- All-ceramic bridge with zirconia framework #14– #12
- New zirconia implant abutment #11
- All-ceramic crown (alumina or zircona coping) #11
- All-ceramic crowns or veneers #21 and #22
- Optional: consideration of #13 implant declined

A more *traditional approach* would involve the use of a metal abutment and PFM restorations. Although with special care and design PFMs can be made to be very esthetic, they can have limitations in their optical qualities. They are, however, very durable and carry with them many years of research and clinical success.[1] The following would be a traditional restorative option for this case:

- Metal titanium or cast UCLA abutment #11
- PFM bridge #12 – #14
- PFM crowns # 11, #21, and #22

Final Treatment Plan

Rationale for recommending a more traditional approach to restorative treatment was based upon the results of the initial intraoral and extraoral examination. In this case, it was determined that the patient exhibited high force factors. As well, consideration was given to the fact that the patient had a moderate lip line and an average expectation for esthetics, yet understood that strength was an important factor in determining the long-term outcome. Finally, because this case required multiple crowns and a bridge, supported by both teeth and by implants, a single common restorative system (i.e., PFM or all ceramic) would lead to a more consistent visual outcome. For these reasons, the following final treatment plan outlined below was proposed and accepted.

Orthodontics

- Idealize crowding and expand arches
- Set up for new maxillary anterior restoration

Restorative

- Maxillary and mandibular take-home whitening
- Lengthen maxillary anterior teeth. Correct reverse smile line.
- Achieve a consistent shade across maxillary anterior
- Achieve bi-lateral symmetry of

Figure 1. Pre-treatment smiling.

Figure 2. Pre-treatment centric view.

Figure 3. Pre-treatment maxillary view.

Figure 4. Pre-treatment mandibular view.

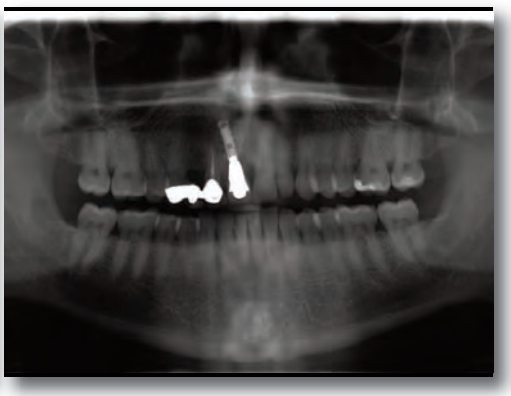

Figure 5. Pre-treatment panoramic radiograph.

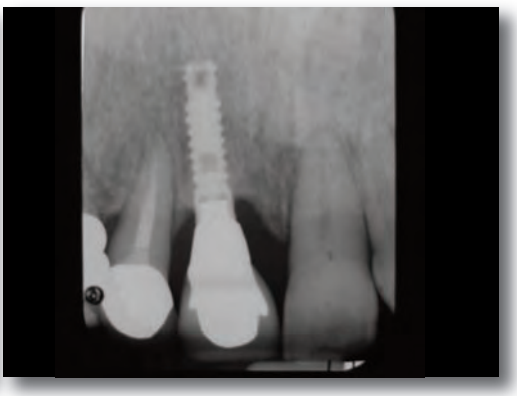

Figure 6. Pre-treatment panoramic radiograph.

maxillary anterior sextant
- Treat #14 endodontically
- Traditional restorations (PFM bridge #14–#12; maintain metal UCLA abutment #11) Abutment level impression (PFM #11, #21, and #22)
- Occlusion goals (group function right side; cuspid guided left side)

He was referred for full-mouth fixed orthodontic treatment. Orthodontic treatment time elapsed was 21 months. Once in retention, endodontic treatment of #14 was completed. After 6 months of retention (to ensure a stable occlusion) the teeth were prepared ensuring a shoulder margin to help hide and potentially grey margins. After several weeks of temporization, a dual cord technique for retraction was employed (Ultrapak, Ultradent) and a final abutment level impression of tooth #11 as well as the other C and B units was made. PFM restorations were fabricated, adjusted, and custom stained and glazed. Restorations were sandblasted and luted using a resin-modified glass ionomer (Rely-X, Luting Plus3M). A maxillary night-guard and mandibular retainer were fabricated (Figures 7–14).

Case Report 1: Traditional

Discussion

When undertaking an anterior reconstruction, mixing FPD restorative systems within a particular case is less desirable. Blending PFM with all ceramic, or even blending one all-ceramic system with another can lead to a compromised esthetic result. Practitioners can expect a far more homogeneous final outcome if they employ the use of a common FPD system whenever possible for all restorations employed in a case. For obvious reasons, placing highly translucent restorations directly beside non-translucent restorations should be avoided, especially in the maxillary anterior.

In this case specifically, an argument could be made that simply veneering #21 and #22 would be a more conservative solution to addressing their colour and contour issues. With that in mind, being placed directly next to PFMs on #11, #12, #13, and #14, there would be an obvious visual difference to even the untrained eye. Once the decision was made to use a metal implant abutment and PFM bridge on one side of the maxillary anterior, this determined the need for the same FPD technology (PFM crowns) on the other side. As displayed with this particular case, when careful attention is given to factors such as margin design, adequate tooth reduction, and careful laboratory technique, PFM restorations can provide for a very esthetic outcome. Furthermore, PFM crowns continue to be a dependable long-term restoration. Bond strengths of porcelain to semi-precious alloys continue to be high and reliable (Figures 15–18).[2]

Figure 7. Post-orthodontic centric view.

Figure 8. Post-orthodontic maxillary view.

Figure 9. Post-orthodontic mandibular view.

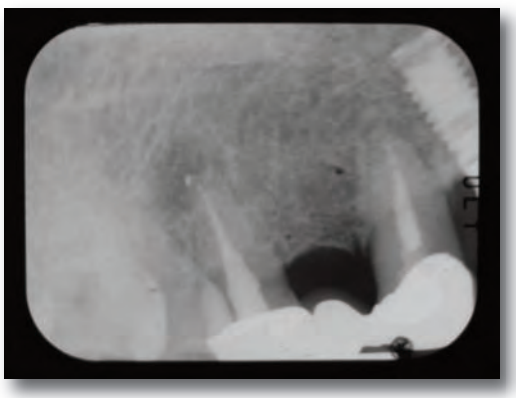

Figure 10. Non-surgical root canal therapy #14.

Figure 11. Preparation day.

Figure 12. Abutment-level polyether impression.

Figure 13. Abutment-level final cast.

Figure 14. Porcelain-fused-to-metal crowns.

Figure15. Post-treatment occlusal view.

Figure 16. Before.

Figure 17. After.

Figure 18. Post-treatment smiling.

Case Report 2: Contemporary

Initial Presentation

This 29-year-old single male presented by referral from another practitioner. His chief complaint was that he had "crooked lower teeth and three of his front teeth were knocked out in a sports accident." He indicated a clear desire to better his overall appearance and improve his teeth esthetically.

In profile, the patient was skeletal class II with 5 mm overjet and 50% overbite. He had a retruded mandible and exhibited a high maxillary lip line. He was facially symmetrical but his facial and dental midlines were non-coincident.

Intraoral Examination

Upon intraoral examination, the following observations were noted (Figures 19–23).

- Missing #21 and # 22 – avulsed months earlier
- Teeth #11 and #12 tilted into edentulous space
- M/D width of edentulous space *less* than M/D width of #11 and #12 combined.
- Tooth #31 fractured and unrestorable
- Satisfactory colour and contour of remaining natural teeth
- Crowded mandibular anterior teeth
- Little to no signs of bruxism

Restorative Treatment Options

A *contemporary approach* to restoring this particular case would involve use of all ceramic restorations. The following would be a contemporary restorative option for this case:

- Zirconia abutments #21 and #22
- All-ceramic crowns #21 and #22

A more *traditional approach* would involve PFM restorations. The following would be a traditional restorative option for this case:

- Metal titanium or case UCLA abutments #21 and #22
- PFM crowns #21 and #22

Final Treatment Plan

Rationale for recommending a more contemporary approach to restorative treatment was based upon the results of the initial intraoral and extraoral examination. In this case, unlike case report 1, it was determined that the patient exhibited low to moderate force factors. Furthermore, consideration was given to the fact that the patient had a high smile line and an above average expectation for a highly esthetic outcome. Finally, because the case required maxillary anterior dental implant restorations directly adjacent to unrestored natural teeth, a high level of translucency and esthetics was required to achieve a bilaterally homogeneous outcome.[3]

For these reasons, the following final treatment plan was proposed and accepted:

Orthodontics

- Remove #31 – to treat orthodontically to three lower incisors
- Idealize mandibular crowding
- Set up for new maxillary anterior restoration

Restorative

- Achieve bi-lateral symmetry of maxillary anterior sextant
- Contemporary restorations: zirconia abutments #21 and #22 – custom

Figure 19. Preoperative smiling.

Figure 20. Pre-treatment centric view.

Figure 21. Pre-treatment maxillary view.

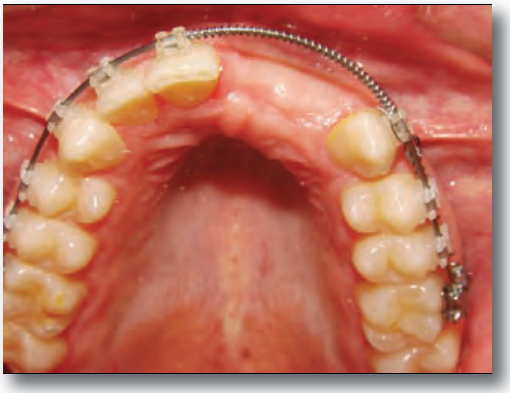

Figure 22. Pre-treatment mandibular view.

Figure 23. Pre-treatment panoramic radiograph.

Figure 24. Post-orthodontic maxillary view.

Figure 25. Post-orthodontic mandibular view.

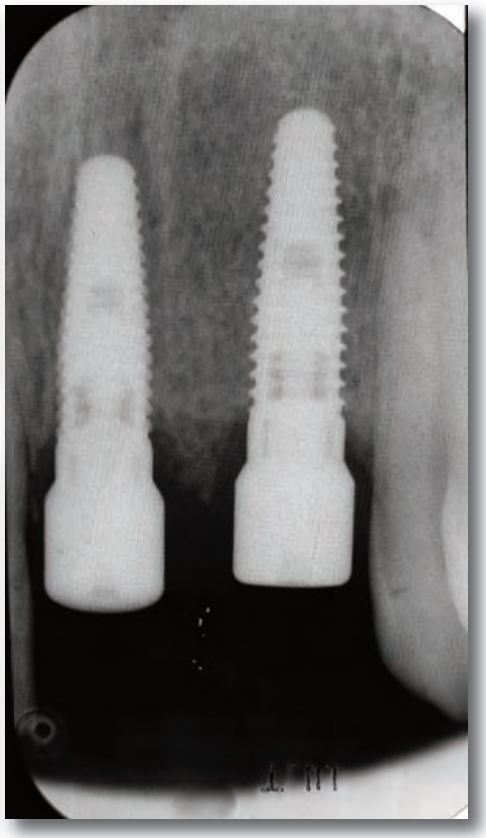

Figure 26. Implant placement of tooth #21 and tooth #22.

Figure 27. Implant-level polyether impression.

Figure 28. Implant-level master cast.

fabricated (fixture implant) level impression). All-ceramic crowns (alumina copings) #21 and #22

- Occlusion goals (cuspid guided bilaterally)

Tooth # 31 was extracted. The patient was referred for full-mouth fixed orthodontic treatment. Treatment time elapsed was 12 months. Once orthodontics was completed, but before debanding, a surgical guide was fabricated and he was referred to the periodontist to have two root form dental implants (Nobel Biocare) placed in the #21 and #22 positions. After successful osseointegration of the implants was confirmed, temporary abutments were placed and adapted to help develop emergence profile and tissue contours. At 6 months post-orthodontics (to ensure a stable occlusion), an implant-level final impression was made. Zirconia abutments and alumina-reinforced all-ceramic crowns (Procera All Ceram, Nobel Biocare) were fabricated. Abutments were torqued to 35 N/cm. Final crowns were luted using a resin-modified glass ionomer (Rely-X Luting Plus, 3M). A maxillary nightguard and mandibular retainer were also fabricated (Figures 24–28).

Case Report 2: Contemporary

Discussion

There is little debate that all-ceramic crowns are highly esthetic restorations. However, when optimal esthetics are required for dental implant restorations, consideration must be given to the translucency of the abutment underneath.[4] As previously discussed, there would be little advantage to placing an all-ceramic crown with a metal abutment underneath.

In this case specifically, it would have been difficult to achieve anything better than an average result by placing metal abutments and PFMs on #21 and # 22 directly adjacent to natural, unrestored teeth #11 and #12. No matter what level of attention to detail, there would have always been a visible difference in opacity and an underlying "greyness" to the restored teeth. As well, given the patients' high smile line, there would be an increased risk of discoloration of the vestibular peri-implant tissues.[4,5]

Today, zirconia abutments are widely available commercially for use with most dental implant systems. Zirconia abutments offer a reliable alternative to titanium or cast abutments.[6] They can withstand clinical loads above those expected during mastication.[7] Although not the same translucency as natural teeth, zirconia abutments still offer a relative translucency and the opportunity to employ all ceramic crowns as final restorations. They also offer an excellent solution for patients with thin periodontal biotype where there is a fear of greying or "purple" gingivae overlying an implant restoration site.[5,8]

As with titanium, zirconia abutments can be custom designed or purchased as stock components. What is not well known, however, is that unlike titanium, zirconia is a

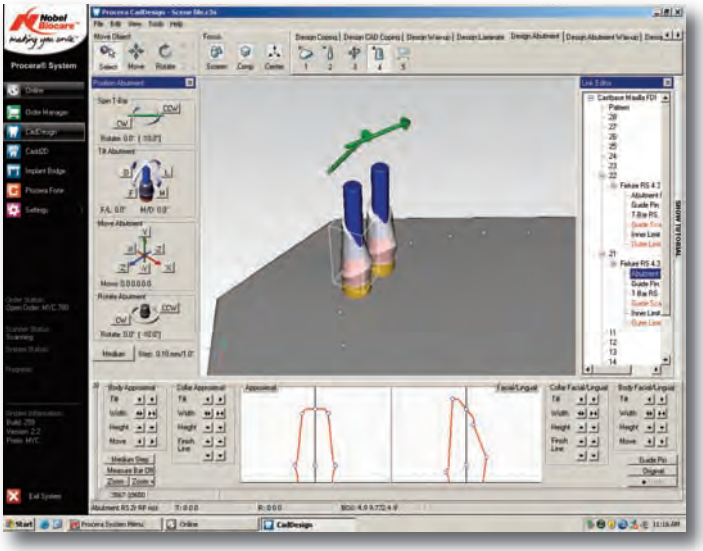

Figure 29. Computer-aided design fabrication of zirconia abutments.

Figure 30. Zirconia abutment..

Figure 31. Abutment placement.

Figure 32. Before.

Figure 33. After.

Figure 34. Post-operative smiling.

very technique-sensitive material in its' handling and adjustment. When grinding zirconia products special attention must be given to not cause overheating. There is a significant body of evidence demonstrating that the crystalline structure of zirconia is negatively affected when adjusted, no matter how carefully. After adjusting, even under copious amounts of water, or with "heatless" abrasives with minimal pressure, many zirconia products require re-sintering. For this reason, purchasing grossly over-contoured zirconia abutments and aggressively grinding them to proper contour should be avoided. Using custom-designed zirconia abutments will help to reduce the need for aggressive adjustment (Figures 29–31).

Finally, alumia-reinforced all-ceramic crowns provide an excellent alternative in the anterior as either natural or implant supported restorations.[9] Combining alumina-reinforced crowns and zirconia abutments allows a restoration to remain relatively translucent; a significant advantage when restoring in the esthetic zone next to natural, unrestored teeth (Figures 32–34).

Conclusion

Many factors require consideration in deciding suitability of materials for a given case. Although both contemporary and traditional restorations can be used in the esthetic zone successfully, only a thorough intraoral and extraoral examination will highlight the factors that will help determine the best restorative options available to formulate a final treatment plan.

Acknowledgement

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Conflicts

None declared.

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Understanding Self-Adhesive Resin Cements (G-CEM by GC America)

Compréhension des ciments résines auto-adhésifs

By Dr. Parag R. Kachalia

About the Author

Dr. Parag R. Kachalia is an assistant professor of restorative dentistry at University of the Pacific's Arthur A. Dugoni, School of Dentistry. He serves as the director of new technologies, course director for fixed prosthodontics and is a core faculty member within Pacific's prestigious complex and esthetic rehabilitation program. He is a published author in the areas of digital dental photography, digital fixed prosthodontics, and financial management. His research is primarily focused on advances of CAD/CAM dentistry as well as new technologies entering the restorative marketplace.

What cement should I use? In years past this was a relatively simple question to answer when dentistry was essentially limited to metal ceramic or metal restoration. As restorative materials have continued to evolve and the demand for a natural looking smile has increased the decision of which cement should be used has become more and more complicated. Today's ceramic materials display incredible levels of translucency and cements have had to evolve, so that they blend into the restoration and minimize potential opaquing issues that are prevalent in traditional powder-liquid type cements. Traditionally, ceramic restorations have been cemented utilizing resin-based systems with excellent success; however, these multi-step systems tend to be quite technique sensitive and meticulous control of the environment is paramount to success. Over the last seven to 10 years numerous manufacturers have invested tremendous resources to develop cements that display many of the excellent physical properties of resin cements yet minimize the traditionally difficult technique. Along with these advancement many research papers and product technical bulletins have been released comparing things such as shear, tensile, and compressive bond strengths, yet very little information has been shown relating laboratory testing to clinical relevance in the hands of practitioners. This synopsis will correlate various physical properties traditionally discussed in published media and the clinical relevance of each of these properties. The ultimately goals for all cements that will provide a link between prepared tooth structure and fixed restoration are biocompatibility, caries inhibition, high strength (shear, tensile, and compressive), low solubility, colour stability, radiopacity, low film thickness, low levels linear expansion, and predictability of use, intentionally or unintentionally.

Biocompatibility

Essentially luting cements should not have a negative impact on the body tissue and fluids that they may come in contact with. Additionally they should have a very low chance of creating any type of potential allergic response for the patient, clinician, and auxiliary staff that may handle the material. In regards to resin cements that require light polymerization biocompatibility must also be tested in regards to incomplete polymerization. In restorations that exceed 2 mm in thickness a self or dual-cure luting agent should be considered to minimize the biocompatibility risk of partially polymerized resins.[1]

Caries Inhibition

The critical point of failure for any restorative material is at the interface between the restoration and the natural tooth structure. In terms of indirect restorations this area represents the marginal interface with minimal or no microleakage. An ideal cement would have sufficient fluoride release or other cariostatic components to protect this interface and prevent caries propagation at the margin.[2]

Shear Bond Strength

Shear bond strength is routinely tested for when evaluating various restorative materials. When one thinks of shear bond strength, it's like a hook on a wall being held on with adhesive and the hook is holding a towel. Clinically speaking this shear movement would relate to the force exerted between the cement and prepared tooth structure on an axial wall of a full coverage restoration when a pulling force is applied.

Shear bond strength measurements are generally taken over various time spans to test both immediate bond that is achieved as well delayed bond strength. The bond strength studies are conducted utilizing water storage as well as thermo cycling. Thermo cycling is meant to measure the hot and cold (5-55 Celsius) temperature swings that result from eating and drinking. As taper on a preparation increased a given cements tensile strength, it is also tested when a vertical pulling force is applied.

Tensile Bond Strength

Similar to shear bond strength, tensile bond strength is often cited in literature in regards

adhesive bonding. In relation to tensile strength one must imagine the palms of one's hands together again and slowly peeling apart from the fingertips down to the wrists. This action in terms of a restorative material would cause tension and pulling apart of a bond that may be formed. In clinical terms one must consider a resin bonded bridge replacing a maxillary later incisor that utilizes the lingual surfaces of the adjacent canine and central incisors. If a blunt force was applied to the lateral incisor pontic and retainers pulled away from their corresponding lingual surfaces this would be as a result of a tensile bond failure. In relation to a full coverage restoration that is undergoing a vertical pulling force when an individual is chewing a piece of gum, a tensile bond is being maintained between the restoration and the adhesive cement as well as the adhesive cement and the prepared tooth surface. Similar to shear strength, tensile bond strength studies are conducted utilizing times ranging from immediate bond to bond strength post multicycle thermocycling. Thermocycling is simply a laboratory procedure that is used to simulate oral environment over a given period of time. G-CEM, self-adhesive resin cement actually improves bond strengths to the dentin, enamel and Zirconia restoration after thermocycling.[5]

Compressive Strength

At any one time, all forces are in play. Tensile bond strength and shear bond strength are primarily referred to in terms of crown removal or dislodgement. Equally important to these two measurements is that of compressive strength. When one thinks of compressive strength it is essentially a measurement where force is applied to a given flat surface of restorative material until it breaks. A high compressive strength is particularly important when one thinks of a resin cement that may be placed under a partial or full coverage ceramic restoration that will undergo biting pressure. A proper compressive strength is important in the occlusal region to prevent compression of the restoration and potential fracture if the compressive strength is too low. In today's world of digitally designed restorations it is not uncommon to see gaps between the prepared tooth surface and the underside (intaglio) of a milled restorations. These gaps form when highly defined occlusal tables are prepared and tooling of the milling systems are forced to under-mill these defined anatomical forms. When this occurs, the resin cement is essentially acting as a mini buildup to support the biting force that may be placed on the restoration. A high compressive strength is also important at the marginal interface. It is understood that all restoration will exhibit a minor gap at the marginal interface and that this interface will ideally be filled with cement. Under biting pressure a given amount of compression will occur at the margin and the chosen cement should have enough strength to hold up to this force and not undergo marginal wear. If the chosen cement has a low compressive strength this area of cement can fracture and potentially lead to marginal leakage and loss of restoration integrity.

Cohesive and Adhesive Properties

Anytime an adhesion must occur between one material and another the cohesive and adhesive properties of the material must be taken into account. If a cemented restoration is to come off in one's mouth as a result of a pulling force this failure may have occurred at a few different levels. Essentially if the bond between the restoration and the cement gave way cleanly this would be considered an adhesive failure. Additionally if the cement completely adhered to the restoration but separated from its dental/enamel interface this would also be considered an adhesive failure. In the event that the cement properly adhered to both the tooth and restoration interface, yet the restoration came free under a tensile force a cohesive failure most likely occurred. A cohesive failure is generally observed when the bond strength to the given substrates is greater than inherent physical properties of the cement itself; in essence the cement is separating from itself. A cohesive plateau is reached when the bond to any given substrate matches the tensile strength of the cement itself. Bond strengths greater than this amount generally lack any clinical significance.

Low Solubility

An ideal cement should be completely impermeable to oral fluids and resist washout over the lifespan of the fixed restoration. The integrity of the restoration's marginal seal is paramount to the long-term success of the restoration. Generally speaking, resin cements have very low solubility over time when restorations are placed in an environment with proper moisture control.3 G-CEM has been shown to have very low solubility in comparison to other self-etching resin cements in the marketplace.[5]

Colour Stability

As dentistry continues to evolve and the expectations of patient's rise, it is imperative that dental restorations blend in with one's smile. Clinicians, auxiliary staff, and laboratory technicians all do their part in preparing teeth properly, selecting ideal shades, and creating lifelike restorations. In terms of all ceramic restorations the final result cannot be deemed a success until the restoration is cemented in one's mouth and properly blends in with the adjacent teeth. Being that all ceramic restorations have a certain amount of translucency the colour of the chosen cement can play a significant role in the final appearance of the restoration. Furthermore the cement must display the proper characteristics, so that the color of the cement stays true over time and does not degrade. G-CEM is available in four different shades to allow the practitioner the freedom to choose an accurate underlying cement colour and not deleteriously effect the final restoration with a one size fits all mentality.

Radiopacity

An often overlooked area when considers cements is its radiopacity. At the marginal interface of all restorations a micro-gap exists. If the cement that fills this area does not have the proper radio-opacity the margin may appear open when a digital radiograph is magnified. Ideally the radio-opacity of one's chosen cement should be at least as radio-opaque as enamel, so that the marginal interface does not have the appearance of radiographic decay. Additionally, by being radio-opaque radiographic evidence can aid in identifying residual cement that may have migrated below the gum line upon restoration cementation. G-CEM capsules have a radio-opacity that is 25% more opaque than 3M-ESPEs Unicem (Clicker Version).[5]

Low Film Thickness

It is imperative that cements have a manageable film thickness. Historically one downside of resin cements has been their

relatively high film thickness and a higher incidence of tilted castings because of uneven cement thickness. If the film thickness is too high, restorations may not seat appropriately and may lead to a clinically unseated crown that leads to a bite that may seem too high to a patient. One of the other issues if film thickness is too high is that the cement may break internal to itself. Many of today's self adhesive resin cements have film thickness measurements that are less than the 22–25 microns characteristic of zinc phosphate. Properly mixed G-CEM demonstrates a film thickness of approximately 12 microns.[5]

Low Levels of Linear Expansion

The ideal cement should have the versatility to be used in many applications as well as with many restorative materials.4 Ceramic materials are highly prevalent in today's world and require a cement that does not have an extensive amount of expansion that could lead to fracture and catastrophic failure of the restoration. Additionally these cements must maintain essentially zero expansion when they are exposed to water. Equally important expansion should be minimized anytime a pre-fabricated or a custom post is cemented within a canal space. Excessive expansion can lead to fracture of a patient's root and deem the tooth non-restorable. Generally speaking self adhesive resin cements have a very low level of expansion and most recently G-CEM demonstrated less than 0.2 % expansion over 28 days. Similar to glass ionomer cements G-CEM released fluoride; however it does not have the expansion issues that were prevalent with pure glass ionomer cements.

Predictability of Use

Repeatable results are of paramount importance. Time and time again results may be obtained in a laboratory setting; however, these results are only relevant if repeatability is possible in a clinical environment. Numerous studies overtime have shown that in a hand-mixed cement system, operator technique can greatly influence cement performance in either a positive or negative manner. Additionally the delivery systems of the cement should allow for both intracanal delivery for post systems as well, intra-prep delivery for partial coverage restorations, and intra restoration delivery for full coverage restorations. The ideal delivery system should be consistent over multiple restorations in a manner that minimizes any potential waste. G-CEM's automix tip is substantially smaller than its competitors allowing for a greater number or restorations to be cemented per/ml of material in each syringe.

Conclusion

Resin cements have truly evolved over time and for the vast majority of multi and single unit restorations G-CEM can be the go-to cement of choice. The complicated multi-step resin cements can be reserved for intricate veneer deliveries that may require a higher bond strength due to lack of inherent retention. In addition autopolymerizing cements can be used for metal, metal-ceramic, and all ceramic restorations in a predictable repeatable manner with easy cleanup.

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For further information three G-CEM videos can be found at the websites below:
http://www.gcamerica.com/multimedia/index.php
http://www.gcamerica.com/multimedia/22.php
http://www.gcamerica.com/products/operatory/G-Cem/

READERS' CORNER / COIN DES LECTEURS

Fall Occlusion Issue Well Received
Numéro Occlusion, automne, bien apprécié

Re: Article - Rinchuse and Kandasamy

Sir/Madam,
I just read this article over a 12-hour period including checking many of the refs. Here is one orthodontist that entirely agrees with the authors who have done an absolutely outstanding job. This is the nearest attempt to a gold standard, Cochrane-level analysis, I have seen in over 35 yrs of practice. I looked hard for something to disagree with, on a literature and/or clinical experience, empiric basis – all to no avail!

Dentistry needs more efforts like this to ensure our day-to-day practices, clinically, are based on science and not (as is all too frequent) glossy, coloured ads and weekend courses. One would hope that upcoming students are exposed to this level of intense scrutiny of the available data.

Yours collegially.
Andrew F. Thompson, Dental Specialist
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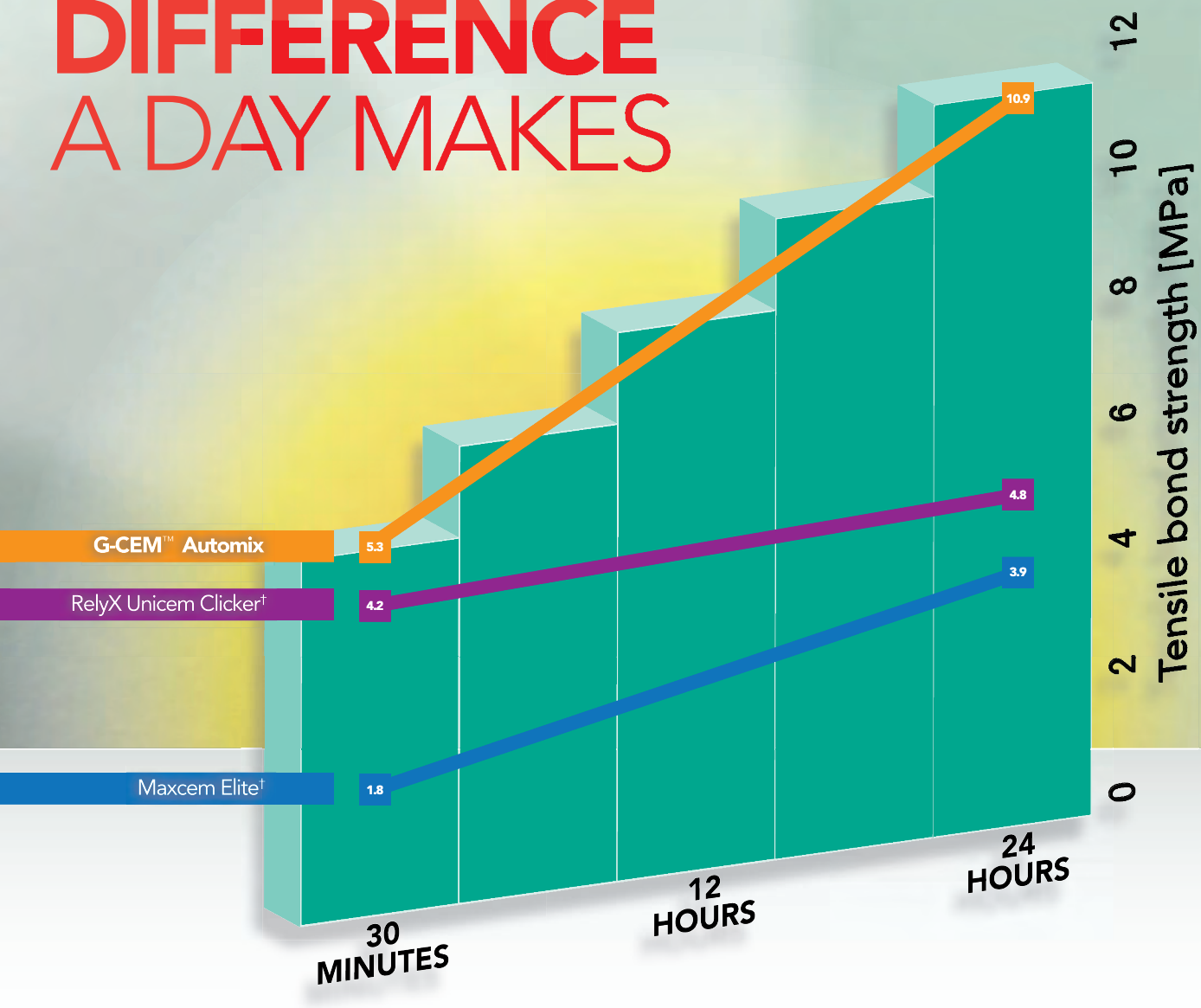

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