CJRDP JCDRP

Canadian Journal of Restorative Dentistry & Prosthodontics

The official publication of the Canadian Academy of Restorative Dentistry and Prosthodontics

Journal canadien de dentisterie restauratrice et de prosthodontie

Publication officielle de l'Académie canadienne de dentisterie restauratrice et de prosthodontie

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Journal canadien de
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Publication officielle de L'Académie canadienne de dentisterie restauratrice et de prosthodontie

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Our Four Main Objectives

The Canadian Academy of Restorative Dentistry and Prosthodontics (CARDP) is a not-for-profit, member-based organization that has Four Main Objectives:

(1) To promote the improvement of the health of the Canadian public, through the advancement of the art and science of restorative and prosthetic dentistry.

(2) To promote the highest standard of professional ethics among its members and amongst the members of the dental profession.

(3) To encourage the quality and the quantity of teaching of restorative and prosthetic dentistry in Canadian university dental schools.

(4) To provide continuing education in restorative and prosthetic dentistry for its members and for members of the dental profession in Canada.

The membership of CARDP consists of invited and proposed (sponsored) individuals who have earned peer recognition for their aptitude in the practice or teaching of restorative dentistry and/or prosthetic dentistry.

Nos quatre buts principaux

L'Académie canadienne de dentisterie restauratrice et de prosthodontie (ACDRP) est un organisme sans but lucratif dont les membres poursuivent quatre objectifs principaux :

(1) Promouvoir l'amélioration de la santé des Canadiens par le biais de l'art et de la science de la dentisterie restauratrice et prothétique.

(2) Améliorer les normes d'éthique professionnelle parmi ses membres ainsi que les membres de la profession en général.

(3) Soutenir la qualité de l'enseignement de la dentisterie restauratrice et prothétique dans les facultés dentaires canadiennes.

(4) Offrir de l'éducation continue à ses membres ainsi qu'aux membres de la profession au Canada en dentisterie restauratrice et prothétique.

Les membres de l'ACDRP sont des individus, invités ou recommandés (commandités) qui ont mérité l'approbation de leurs pairs pour leurs aptitudes dans la pratique ou l'enseignement de la dentisterie restauratrice et/ou prothétique.

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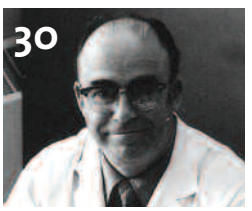

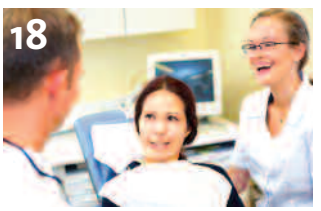

ACADEMY NEWS / NOUVELLES DE L'ACADÉMIE

FEATURES/ARTICLES

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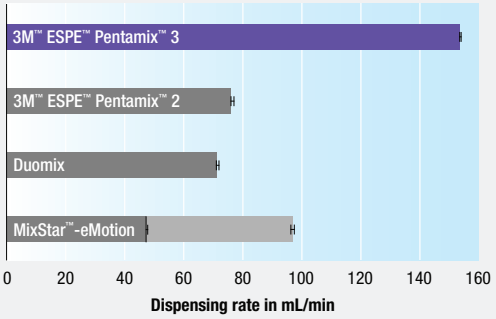

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The Merit of Joining Forces – What's the Point?

This issue invites you to our Annual Scientific Meeting that will be held in Vancouver come September.

CARDP's meetings move from one Canadian city to another thereby allowing regional dentists to attend as guests of the Academy. This unique educational activity typifies the bond among our dedicated members who work voluntarily in order to safeguard the excellence of such annual meetings. The scientific and social programs are prepared months, even years ahead of time so that they might reflect the local, national, and international talents that best represent our profession, concerns and interests. This can only be achieved because our members join forces from sea to sea to secure the advancement of restorative dentistry and prosthodontics in Canada.

The concerted efforts from both our Academy as well as those of The Association of Prosthodontists of Canada exemplify the solidarity invested in our meetings, including the upcoming Vancouver venue. Although both organizations are autonomous and serve their specific missions, they can also pool their resources and their common national vision of excellence for the benefit of the dental community throughout the country. I've had the honour to preside over both entities and readily concur with the messages of Presidents Michael Racich and Brent Beyak who underline the advantages of bettering communications between specialists and generalists "in the name of excellent patient care and solidarity in our profession."

Also of continued merit is the contribution from our industry, which provides support to our respective organizations for top-notch meeting venues, programs, and exhibits on a yearly basis. In joining the ranks of our Academy's sponsors, corporations have the advantage, through our conclave, of reaching out on a national level with the return of establishing strong bases in every region of Canada.

Moreover, joining forces in support of our journal will provide our readers with scientific articles and information that span an ever broader spectrum of clinical knowledge. In this issue, a second article by Mr. Peter Barry on Practice Management addresses the fundamentals of communication in dental practice, based on a review of the human decision-making processes. An emphasis on being "genuine" and projecting one's human and professional values are at the centre of a successful practice. This article helps us keep our focus and underlines the communication intricacies and learning opportunities that every one of our patients can bring to our practice. The next article reaches into the field of Implant Dentistry and deals with bridging root form implants to natural teeth. Dr. Dennis Nimchuk's insights review this difficult topic and his concepts of engagement provide guidelines that can assist clinicians confronted with splinting such contrasting biomechanical systems. How would your own clinical experiences complement those listed by the author? The following topic, on Micro Restorative Dentistry, relates to restoratively driven papilla regeneration. Dr. David Clark's refined microscopic photography supports his detailed clinical procedure, specific armamentarium, and rationale for creating a restorative physiological environment conducive to combined papilla regeneration and diastema closure. The author challenges certain traditional treatment modalities and favours an injection-molded composite filling technique that is best undertaken under microscopy. Will the profession, particularly academia, dare to follow suit? Next, xerostomia's impact on the prosthodontic prognosis is well documented in Dr. Rénald Pérusse's second article discussing the "Differential Diagnosis of Xerostomia." His overview of congenital and hereditary disorders, acquired disorders and iatrogenic factors pertaining to the clinical signs of xerostomia, all emphasize the requisite of frequently updated patient medical questionnaires since an overwhelming number of medications and medical conditions can point clinicians to the cause(s) of xerostomia.

Finally, Dr. Emo Razcjak's second article on Historical Perspectives furthers the origins of the Canadian Academy of Restorative Dentistry and details the career of its co-founder Dr. George H. Gibb. The merit of joining forces in organized dentistry was, and still is, very apparent as we stand on the shoulders of those who had the foresight and dedication to mold our current professional lives. The author will embark on the origins of the Canadian Academy of Prosthodontics in our next issue.

Notwithstanding the extrinsic rewards of contributing to the Academy's mission, joining forces, in whatever fashion, in support of the advancement of restorative dentistry and prosthodontics at a national level, provides us with much wanted intrinsic rewards as well. Above and beyond our important contributions to the social welfare and health of our fellow citizens, we, as dental clinicians, need to feel valuable to the profession that occupies so much of our lives. What better way to earn these intrinsic rewards than by joining forces?

Dr. Hubert Gaucher
Editor-in-Chief

Quel est le mérite d'une action concertée?

Dans ce numéro, nous vous invitons à notre congrès annuel qui aura lieu à Vancouver en septembre. Les congrès de l'ACDRP se tiennent dans des villes canadiennes différentes et permettent ainsi aux dentistes régionaux d'assister en tant qu'invités de l'Académie. Cette activité éducative unique témoigne du lien qui existe entre nos membres dévoués qui travaillent bénévolement afin de sauvegarder l'excellence de tels congrès annuels. Les programmes scientifiques et sociaux sont élaborés des mois, voire même des années à l'avance dans le but de mieux mettre en valeur les talents locaux, nationaux et internationaux qui représentent notre profession, nos intérêts, ainsi que nos préoccupations. Ce n'est que grâce à une action concertée de nos membres d'un océan à l'autre que nous pouvons concrétiser les progrès réalisés en dentisterie restauratrice et en prosthodontie au Canada.

Le travail concerté de notre Académie ainsi que celui de l'Association des prosthodontistes du Canada démontre notre solidarité dans la préparation du prochain congrès à Vancouver. Même si les deux associations sont autonomes et ont leur propre mission, elles peuvent mettre leurs ressources et leur vision nationale de l'excellence en commun au grand bénéfice de la communauté dentaire dans tout le pays. J'ai eu l'honneur de présider les deux associations et je partage l'avis des présidents Michael Racich et Brent Beyak qui soulignent les avantages d'améliorer les communications entre les spécialistes et les généralistes dans la visée « excellence des soins au patient et solidarité dans notre profession ».

La contribution de notre Industrie fournit également un soutien à nos académies respectives concernant le lieu des rencontres, les programmes, les expositions annuelles. En joignant les rangs des commanditaires de l'Académie, les compagnies peuvent, par l'entremise de notre groupe, élargir leurs services au niveau national et établir des bases solides dans toutes les régions du Canada.

De plus, une participation concertée à notre revue permettra à nos lecteurs de prendre connaissance d'articles et d'information scientifiques qui vont bien au-delà des connaissances cliniques. Dans ce numéro, Peter Barry traite des principes fondamentaux de la communication dans la pratique dentaire, basée sur une revue des processus décisionnels. L'accent est mis sur « l'authenticité » et le mérite des valeurs professionnelles et humaines pour une pratique réussie. Cet article nous aide à centrer notre attention et souligne les subtilités de la communication et les possibilités d'apprentissage qui se présentent à nous auprès de chaque patient. L'article suivant aborde l'implantologie et les questions des implants sur dents naturelles. Le Dr Dennis Nimchuck passe en revue ce sujet délicat et son implication fournit des directives pouvant assister les cliniciens aux prises avec la pose d'un système de contention. De quelle façon votre propre expérience clinique peut-elle venir compléter celle décrite par l'auteur? Le sujet suivant, sur la micro dentisterie restauratrice, traite de la régénération des papilles interdentaires. Grâce à des photographies microscopiques d'excellente qualité, le Dr David Clark permet d'exploiter sa procédure clinique détaillée, son instrumentation spécifique et ses raisons pour créer un environnement physiologique favorable à la régénération papillaire et à la fermeture du diastème. L'auteur remet en question certaines modalités de traitement et favorise une technique de remplissage par composite moulé par injection qui est effectuée sous microscope. Est-ce que la profession, particulièrement le monde académique, osera emboîter le pas? Dans son deuxième article, le Dr Rénald Pérusse aborde le diagnostic différentiel de la sécheresse de la bouche et son impact sur le pronostic prosthodontique. Un survol des maladies congénitales et héréditaires, des maladies acquises et iatrogènes relatives aux signes cliniques de la sécheresse de la bouche vient souligner la nécessité de mettre à jour régulièrement le dossier médical du patient puisqu'un nombre important de médicaments et de maladies peuvent être la cause de la sécheresse de la bouche.

Finalement, le deuxième article du Dr Emo Razcjak sur les perspectives historiques nous livre les origines de l'Académie canadienne de dentisterie restauratrice et retrace la carrière de son co-fondateur le Dr George H. Gibb. Le mérite d'une action concertée en dentisterie a été et demeure toujours très évident pour ceux et celles qui ont eu la clairvoyance et le dévouement de donner forme à notre vie professionnelle actuelle. L'auteur exposera les origines de l'Académie canadienne de prosthodontie dans notre prochain numéro.

Sans tenir compte des récompenses extrinsèques que l'on peut récolter en contribuant à la mission de l'Académie, une action concertée, quelle qu'en soit la forme, pour l'avancement de la dentisterie restauratrice et de la prosthodontie au niveau national, apporte également des récompenses intrinsèques. En plus de nos contributions importantes au bien-être collectif et à la santé de nos concitoyens, nous, en tant que cliniciens dentaires, avons besoin de nous valoriser à la profession qui occupe une si grande partie de nos vies. Ce n'est que par une action concertée que nous pouvons nous mériter ces récompenses intrinsèques.

Dr Hubert Gaucher
Rédacteur en chef

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STRUCTURE DES COMITÉS ET MEMBRES

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Académie Canadienne de Dentisterie Restauratrice et de Prosthodontie

CARDP consists of many volunteers that donate a lot of their time and talents. Below is an outline of the council and committee structure of the Academy.
L'ACDRP est constituée de nombreux bénévoles qui offrent leur temps et talents. Ci-bas vous lirez un sommaire de l'organigramme du comité exécutif ainsi que des autres comités.

The main governing body is made up of the executive council, which consists of:

The President, President Elect, Past President, Vice President, and Secretary Treasurer. This year, these positions are filled by:

President
Dr. Michael Racich

President Elect
Dr. Stanley Blum

Past President
Dr. Dennis Nimchuk

Vice President
Dr. Vernon Shaffner

Secretary Treasurer
Dr. Les Kallos

The next governing body below this is the group of councillors made up of representatives from the different regions of Canada. They are:

Dr. Maureen Andrea representing the Atlantic Region.

Dr. Jay McMullen representing the Province of Quebec.

Dr. Kim Parlett representing the Province of Ontario.

Dr. Terry Kolteck representing Manitoba and Saskatchewan.

Dr. Doug Lobb representing Alberta and the Northwest Territories.

Dr Gordon Baynes representing British Columbia and the Yukon.

Below this is the group of committee chairs and their committee members. The committees that exist at this point in the academy are:

CONVENTION COMMITTEE

Dr. Ash Varma, Powell River, BC and
Dr. Les Kallos, Burnaby, BC
(*Co-Chairs*)

ADMISSIONS COMMITTEE

Dr. Cary Letkemann, Ancaster, ON
(*Chair*)
Dr. Mary Currie, Pointe-Claire, QC
Dr. Maurice Wong, Vancouver, BC

NOMINATIONS COMMITTEE

Dr. Mel Sawyer Vancouver, BC (*Chair*)
Dr. David Ellis, Kitchener, ON
Dr. Robert David, Montreal, QC

PUBLICATIONS

Dr. Gorman Doyle, Halifax, NS (*Chair*)

CONSTITUTION AND BY-LAWS COMMITTEE

Dr. Dennis Nimchuk, Vancouver, BC
(*Chair*)
Dr. Gerald Skea, Thunder Bay, ON
Dr. Patrick Arcache, Montreal, QC

PHOTO-ROSTER COMMITTEE

Dr. Peter Woolhouse, Westmount, PQ
(Chair)
Dr. Baxter Rhodes, Ithaca, NY
Dr. Les Kallos, Burnaby, BC

SPECIAL FUNDS COMMITTEE

Dr. E.J. Rajczak, Hamilton, ON (*Chair*)
Dr. Andrew Tynio, Toronto, ON
Dr. Larry Pedlar, Burlington, ON
Dr. Ed McIntyre, Edmonton, AB

COMMUNICATIONS COMMITTE

Dr. Ian Tester, St. Catherines, Ont
(*Chair*)
Dr. Alan Schappert, Saskatoon, SK
Dr. David Blair, St. Lambert, QC
Dr. Brian Friesen, Winnipeg, MB

CONTINUING EDUCATION COMMITTEE

Dr. Jim Donaldson, Thunder Bay, ON
(*Chair*)
Dr. Ed McIntyre, Edmonton, AB

HISTORIAN

Dr. William Sehl, Waterloo, ON

CORPORATE LIASON COMMITTEE

Dr. Dennis Nimchuk, Vancouver, BC
(*Chair*)
Dr. Ed McIntyre, Edmonton, AB
Dr. Cary Letkemann, Ancaster, ON
Dr. Larry Pedlar, Burlington, ON
Dr. Maureen Andrea, Chester, NS
Dr. E.J. Rajczak, Hamilton, ON

ANNUAL SCIENTIFIC MEETING COMMITTEE

(*Appointed by the President*)
Organizing Committee 2008 CARDP
(*September 10–13, 2008*)
Meeting Co-Chairs:
L. Kallos and A. Varma
Scientific Chair:
R. Zokol
Table Clinics:
M. Pearce and A. Tejani
Registration and Webpage:
C. Seimens
Promotion and Sponsorship:
A. Varma and L. Pedlar
University Liaison:
C. Wyatt
AV: M. Pearce
Local Arrangements:
D. Racich and B. Wong

In Memoriam:
Dr. James P. Morreale, DDS

Dr. James P. Morreale, DDS

CARDP was saddened by the recent passing of Dr. James P Morreale on May 6, 2008, in Hamilton, Ontario. Dr. Morreale had been affiliated with the Canadian Academy of Restorative Dentistry and Prosthodontics since 1978.

Dr. Morreale graduated from the University of Toronto, Faculty of Dentistry, in 1961 and practised in Hamilton for 45 years. He was elected to the Hamilton Wentworth Separate School Board in 1970 and served for 22 years. He also served on the boards of many organizations, including Catholic Youth Organization, Children's Aid Society, Theatre Aquarius, Hamilton Philharmonic, Opera Hamilton, and the Hamilton West Liberal Association. Dr. Morreale was the president of the Leander Boat Club, coached St. Mary's High School rowing for 13 years, and was honoured as Hamilton Amateur Coach of the Year in 1999. Dr. Morreale passionately championed the advance of geriatric dentistry; he founded St. Peter's Hospital Geriatric Dental Unit. He also served on the Faculty of the University of Toronto School of Dentistry, and was a lecturer at McMaster University School of Medicine, and Faculty of Physical Education.

Dr. Morreale was a great asset to CARDP and will be sadly missed by our membership.

Dr. Harry Rosen
Receives William John Gies Award

Dr. Harry Rosen, DDS

The Quebec section of the American College of Dentists is pleased to announce that Dr. Harry Rosen will be the recipient of the 2008 William John Gies Award.

The American College of Dentists Fellowship Guide describes this Award as follows:

The William John Gies Award – established 1940, is the highest honour the ACD can bestow upon a Fellow. It is awarded to a Fellow who demonstrates broad, exceptional, and distinguished contributions to the profession and society while upholding a level of leadership and professionalism that exemplifies Fellowship. The impact and magnitude of such contributions must be extraordinary.

Dr. Harry Rosen is the first Canadian to receive this honour. There are approximately 7,000 Fellows worldwide in the American College and it is rare that more than one candidate is selected in any one year. The convocation will take place in San Antonio, Texas on October 16, 2008 in conjunction with the annual meeting if the American Dental Association.

Dr. Rosen is Professor Emeritus, Faculty of Dentistry, McGill University and is actively involved in the Multidisciplinary Residency Program at the Montreal General Hospital.

He was the first president of CARD, 1965 after it was founded in 1964 and was named Honorary Member in 1992.

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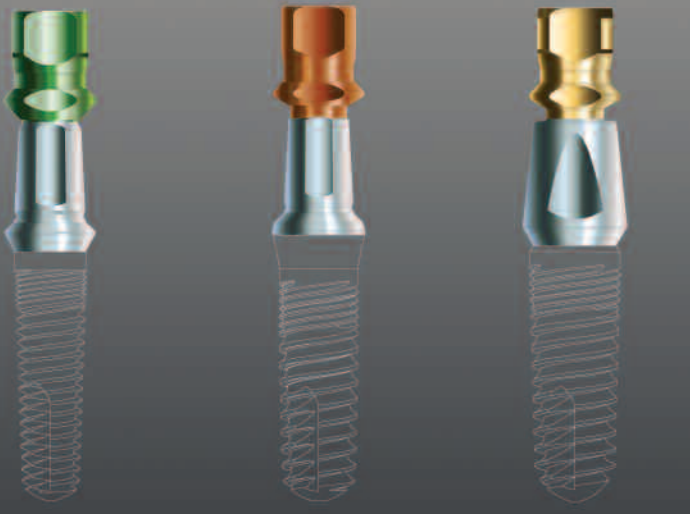

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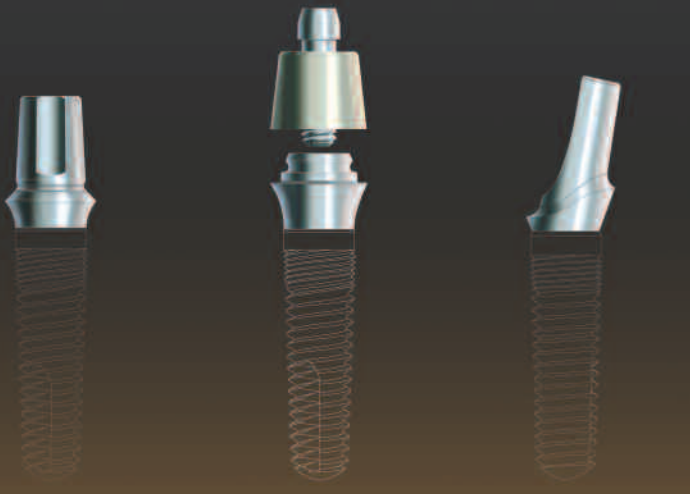

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L'Académie canadienne de dentisterie restauratrice et de prosthodontie

Join us in Vancouver this September!

CARDP ACDRP

Joint Annual Scientific Meeting

September 10th - 13th, Vancouver, BC

APC

Vancouver will host this year's Annual Scientific Meeting - a joint conference of The Canadian Academy of Restorative Dentistry and Prosthodontics and The Association of Prosthodontists of Canada.

"Our Meeting Scientific Chair Dr. Ron Zokol has arranged a dazzling array of national and international speakers who will complement the two day meeting theme: Implants and Tooth Coloured Restorative/ Prosthodontic Materials.

On behalf of The Canadian Academy of Restorative Dentistry and Prosthodontics, I invite you attend the 2008 meeting."

Mike Racich - President, CARDP / ACDRP

Some Featured Speakers...

Robert Miller
Oral Implantology: Yesterday, Today, and Tomorrow

Maxwell Anderson
Good Plaque and Management of Dental Diseases

Charles Goodacre
A New Era for Occlusion: The Use of 3D Digital Technology to Enhance Education and Understanding

Yvan Fortin
Fixed Implant Restoration of the Edentulous Maxilla: The Marius Bridges

Edward Lowe
Modern Esthetic Restorative Materials - Clinical Challenges and Considerations

Dorin Ruse
Adhesive Dentistry: What and How Based on Understanding Why

Harry Rosen
The Blending of Art and Science

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ACDRP

L'Académie canadienne de dentisterie restauratrice et de prosthodontie

Soyez des nôtres à Vancouver en septembre!

CARDP ACDRP

Congrès annuel conjoint

10 -13 septembre 2008, Vancouver

APC

C'est à Vancouver qu'aura lieu le congrès annuel conjoint de l'Académie canadienne de dentisterie restauratrice et de prosthodontie et de l'Association des prosthodontistes du Canada.

'Le directeur scientifique de notre congrès, le docteur Ron Zokol, nous a dressé une liste impressionnante de conférenciers nationaux et internationaux qui se complèteront sur le thème des matériaux restaurateurs/prosthodontiques d'implants.

Au nom de l'Académie canadienne de dentisterie restauratrice et de prosthodontie, je vous convie à cette rencontre 2008.'

Mike Racich - Président CARDP/ACDRP

Quelques conférenciers...

Robert Miller
Implantologie orale : hier, aujourd'ui et demain

Maxwell Anderson
La bonne gestion des maladies dentaires

Charles Goodacre
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Yvan Fortin
Le pont Marius

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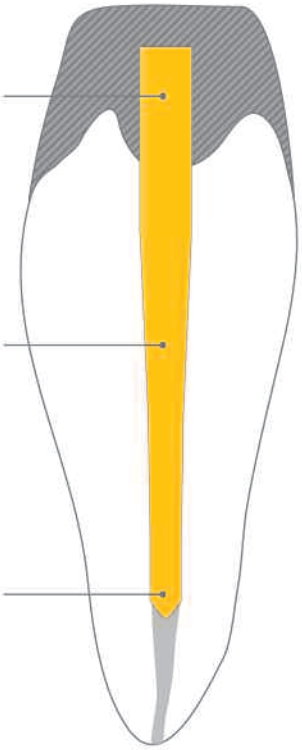

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2008 Annual Scientific Meeting

September 10th - 13th, Vancouver, BC

This year Vancouver has the privilege of hosting both the 16th Annual Canadian Academy of Restorative Dentistry and Prosthodontics General Meeting and the annual meeting of the Academy of Prosthodontics of Canada. Our meeting place will be the very beautiful and intimate Sutton Place Hotel located in downtown Vancouver. Sutton Place has recently undergone a major renovation. It is located in the middle of Vancouver's elegant shopping district. There are plenty of sites to see and places to visit, all within a short distance.

The convention committees have worked very hard to put together a scientific meeting that will prove to be very stimulating, combining ground breaking topics in fast paced lecture format, with case presentations and educational table clinics. For those wanting more, Drs. Chris Wyatt and Ron Zokol have put together a limited attendance University tour, anatomy and scientific session, including lunch at the new UBC dental facility.

As always, there will be an interesting and captivating social program for the partners. And of course, the Thursday outdoor activities of kayaking, sturgeon fishing and golfing will take place. Mark your calendars, because this meeting in Vancouver has all the best that B.C. has to offer, a densely packed educational meeting, lots of activities to take part in, all in a spectacular city that is about to host the 2010 Olympics.

Drs Les Kallos and Ash Varma, Meeting Co-Chairs

Keynote Speaker: Dr. Robert Miller

Dr. Miller received his B.A. from New York University and M.A. from Hofstra University, both in biology. He graduated with honors from New York University College of Dentistry where he received the International College of Dentists Award for clinical excellence. Following graduation, he completed a residency program at Flushing Hospital and Medical Center where he was involved in all phases of dentistry including facial trauma.

Dr. Miller is a board certified Diplomate of the American Board of Oral Implantology/ Implant Dentistry and Diplomate of the International Congress of Oral Implantologists. He is also a Master of the Implant Prosthetic Section of the ICOI and is a Fellow of the American College of Dentists.

Dr. Miller is Chairman of the Department of Oral Implantology at the Atlantic Coast Dental Research Clinic in Palm Beach and lectures on the surgical as well as reconstructive aspects of dental implants. He has lectured nationally on all phases of oral implantology and laser dentistry and has founded The Center for Advanced Aesthetic and Implant Dentistry in Delray Beach, Florida.

Topic: Oral Implantology: Yesterday, Today, and Tomorrow

This lecture will put into perspective the true history of the discipline of oral implantology, including the pre-Branemark concept of osseointegration. Within this historical framework, we will continue by discussing the state-of-the-art in implant dentistry today and emerging technology that will shape our discipline in the future.

Guest Speaker: Dr. Maxwell Anderson

Dr. Max Anderson received his dental degree from the University of Nebraska (1976), his Master of Science in Restorative Dentistry from The University of Michigan (1983) and his Master of Education from George Washington University (1988). He completed a career in the Unites States Navy in 1990 and has served on the faculty of the University of Washington and Indiana University. He served as the Vice President and Dental Director of Washington Dental Service (WDS) a Delta Dental Plan, in Seattle, Washington from 1994 through 2004. His primary research and academic interests are in the management of dental diseases through treating these diseases as bacterial infections and in the analysis of insurance treatment data to identify best practices on risk adjusted populations. He is currently actively consulting regarding risk assessed evidence based dental plan designs and health outcomes.

Dr. Anderson continues his active role in the professional organizations and public service with a primary focus on operative dentistry and cariology. He is the President and CEO of C3 Jian, Inc. a California based biotechnology company developing targeted antimicrobial drugs. Part of the company's research is contracted to and conducted at the University of California at Los Angeles. The company is researching mechanisms to eradicate dental caries, and other infectious diseases, through intelligent drug design. He is the representative to the American Dental Association's Code Revision Committee (CDT-2007 & CDT-2009) for Delta Dental Plans Association and a member of its Dental Policy Committee. He Chairs the ADA's Standards Committee on Dental Informatics Subcommittee on the dental extension of the Continuity of Care Record which is the patient referral record.

More Info Online: www.cardp.ca

Hands on Course with Dr. Ron Zokol:
Head & Neck Anatomy and Dissection

Course Introduction by Charles E. Slonecker, DDS, Ph.D.
The Value of a Review of Head & Neck Anatomy for Dental Practitioners

The major value of Anatomy and its sister basic sciences, Physiology, Biochemistry, Pathology, Pharmacology, Medical Microbiology and Medical Genetics is learning the language that forms the basis for Dentistry and Medicine. It is said that the first and second year students learn 25,000 new terms in their dental education. This is equivalent to fluently learning 3 foreign languages. The relationships of anatomical structures and their physiological activities are frequently forgotten as one enters their clinical training and professional careers.

Learning the anatomical relationships of body structures is introduced in the lecture theatre but confirmed in the dissection laboratory. Learning these structural relationships usually requires a laborious dissection commitment where most of the learning time is devoted to removing skin, fascia, fat and connective tissues in order to expose and learn the structural elements that have been emphasized in the lectures. A postgraduate review of Anatomy almost always reveals to the resident student or the practicing dentist how much anatomical information they have stored in their less than readily inaccessible subconscious memory. A concise and visually focused review of important anatomical structures and their 3-dimensional relationships in the body gives one a sense of confidence that they do know a great deal more anatomy than they think they know.

Our review course in Head and Neck Anatomy is designed to give you a one day review of the structures that are important to today's practicing dentists. A series of lectures on the structure and function of hard and soft tissues. nerves, organs and fascial spaces will precede an afternoon laboratory session where prosected Head & Neck specimens can be reviewed. My experience in teaching Head & Neck Anatomy to dental students, residents and clinicians over the past 44 years has revealed that clinicians who have thought that they have forgotten much of the anatomical knowledge are pleasantly surprised and rewarded by their sense of knowledge following such a review course. I hope that you will join us in September 2008 and experience this unique opportunity to revisit a lecture and laboratory course in Head & Neck Anatomy.

Charles E. Slonecker, DDS, Ph.D., Prof. Em. Anatomy

Guest Speaker: Dr. Yvan Fortin

Presentation Topic: Fixed Implant Restoration of the Edentulous Maxilla: The Marius Bridge

Many patients today are looking for an alternative to a full denture as an elective treatment that is easily accomplished. Patients are most interested in this treatment being provided without bone grafting procedures if possible, while still providing predictable esthetic and phonetic results without oral hygiene compromise. For many dentists, this means recommending various forms of "overdenture solutions" that do not really fulfill patient desires for confident fixed function.

The Marius Bridge was developed to provide a routine restorative method to treat the fully edentulous patient having a moderately to severely resorbed maxilla with a fixed implant restoration.

The Marius Bridge includes 3 aspects:

- a surgical rationale
- prosthesis design
- patient presentation method

The objectives of this program are:

- to demonstrate methods of engaging basal maxillary bone to secure anchorage sufficient for a fixed maxillary restoration without bone grafting in most cases
- to explain a prosthesis design that allows lip support in moderate to advanced resorption situations without compromising dental hygiene or phonetics
- to present the research foundation of a patient removable fixed restoration with 14 years follow-up

More Guest Speakers... (tentative)

Dr. Charles Goodacre – Occlusion: The use of 3D digital technology
Byoung Suh – The science of adhesive dentistry
Dorin Ruse – The materials of cosmetic dentistry
Edward Lowe – The clinical aspects of cosmetic dentistry

Get Meeting Info and Register Online at www.CARDP.ca - Sutton Place Hotel, Vancouver, BC
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d'accueillir le 16ième congrès annuel de l'Académie canadienne de dentisterie restauratrice et de prosthodontie, ainsi que le congrès annuel de l 'Association des prosthodontistes du Canada. Notre lieu de rencontre sera le très beau et intime Sutton Place Hotel, situé au centre -ville, dans la zone des boutiques chics. Cet hôtel a tout récemment été rénové et est idéalement placé pour permettre la visite de nombreux sites environnants.

Les comités organisateurs du congrès ont oeuvré afin de vous offrir des rencontres scientifiques stimulantes, en combinant les sujets de fine pointe sous format de conférences dynamiques, avec présentations de cas et de cliniques de table instructives. Pour ceux qui en voudraient encore plus, les docteurs Chris Wyatt et Ron Zokol ont mis sur pied une visite universitaire, comprenant une session scientifique d'anatomie, au nouveau centre dentaire de UBC. Le repas du midi est inclus.

Comme d'habitude, il y aura un programme social des plus captivants pour les invités. Et bien sûr, les activités de plein air du jeudi : kayak de mer, pêche à l'esturgeon et golf auront lieu. Marquez vos calendriers car ce congrès à Vancouver vous offre tout ce que la Colombie Britannique a de meilleur : un programme éducatif bien étoffé, des activités en abondance, dans le cadre d'une ville spectaculaire qui se prépare pour les Olympiades de 2010.

Docteurs Les Kallos et Ash Varma, co-présidents du congrès

Conférencier principal : Dr Robert Miller

Le Dr Miller a reçu son baccalauréat de New York University et sa maîtrise de l'Université Hofstra, les deux titres en biologie. Diplômé en médecine dentaire de New York University College of Dentistry, on lui décerna le prix d'excellence du International College of Dentists. Suivant sa promotion, il compléta un programme de résidence à Flushing Hospital and Medical Centre où il s'impliqua dans tous les aspects de la dentisterie, incluant les traumatismes faciaux.

Dr Miller est diplômé certifié du American Board of Implantology/Implant Dentistry ainsi que du International Congress of Oral Implantologists (ICOI). Il est aussi Maître de la section prothétique du ICOI et Fellow du American College of Dentists.

Dr Miller dirige le département d'implantologie orale du Atlantic Coast Dental Research Clinic à Palm Beach et est conférencier sur les aspects chirurgicaux et de reconstruction des implants dentaires. Il a parlé au niveau national à propos de toutes les étapes de l'implantologie orale et de la dentisterie au laser et est fondateur du Centre for Advanced Aesthetic and Implant Dentistry à Delray Beach en Floride.

Sujet : L'implantologie orale : hier, aujourd'hui et demain

Cette conférence mettra en évidence l'histoire réelle de la discipline de l'implantologie orale, incluant le concept pre-Brånemark de l'ostéointégration. Dans ce contexte historique nous discuterons de la dentisterie implantaire contemporaine de fine pointe ainsi que des technologies à venir qui influenceront cette discipline dans le futur.

Conférencier : Dr Maxwell Anderson

Le Dr Anderson a reçu son diplôme en dentisterie de University of Nebraska (1976), sa maîtrise en dentisterie restauratrice de University of Michigan (1983) et sa maîtrise en éducation de George Washington University (1988). Il compléta sa carrière dans la marine américaine en 1990 et a fait partie des facultés de University of Washington et Indiana University. Il fut vice-président et directeur dentaire de Washington Dental Service (WDS) un projet Delta Dental à Seattle, Washington de 1994 jusqu'en 2004. Ses intérêts premiers en recherche portent sur la gestion des maladies dentaires en les traitant comme des infections bactériennes et sur l'analyse des données d'assureurs dans le but d'identifier les meilleurs soins pour les populations à risque. Présentement, il est consultant pour l'élaboration de plans dentaires concernant les risques et leurs résultats.

Le Dr Anderson est toujours actif à l'intérieur d'organisations professionnelles et de services publics avec une concentration particulière sur la dentisterie opératoire et la cariologie. Il est PDG de C3 Jian Inc., une compagnie de biotechnologie de la Californie qui développe des médicaments anti-microbiens. Une partie de la recherche se fait à University of California à Los Angeles. Le but de la compagnie est de trouver un mécanisme qui pourrait enrayer la carie dentaire ainsi que d'autres maladies contagieuses. Il est aussi le représentant du American Dental Association Code Revision Committee pour Delta Dental Plans Association et membre de leur comité sur la politique dentaire. Il préside le ADA Standards Committee on Dental Informatics Subcommitte qui s'occupe des dossiers de rérérences de patients.

Pour plus de renseignements en ligne : www.cardp.ca

Cours pratique avec le Dr Ron Zokol :
Anatomie tête et cou et dissection

Introduction du cours par Charles E. Slonecker, D.D.S., Ph.D.

Le mérite de reviser l'anatomie tête et cou chez les praticiens dentaires

Le mérite premier de l'anatomie et des sciences connexes, telles la physiologie, la biochimie, la pathologie, la pharmacologie, la microbiologie médicale et la génétique médicale, est d'apprendre le lexique de base de la dentisterie et de la médecine. Il semblerait que les étudiants en première et deuxième année doivent connaître 25 000 nouveaux vocables en médecine dentaire. Cet exercice équivaut à l'assimilation de trois langues étrangères. Les relations entre les structures anatomiques et leurs rôles physiologiques sont donc souvent oubliées dans un contexte clinique et dans la pratique de la profession.

L'apprentissage des relations anatomiques du corps s'introduit dans la salle de cours mais doit être démontré dans le laboratoire de dissection. C'est une tâche laborieuse et exigeante durant laquelle la majorité du temps est dédiée à enlever la peau, les fascia, la graisse et les tissus conjonctifs. Des études supérieures de l'anatomie révèlent presque toujours à l'étudiant ou au dentiste en pratique à quel point leur mémoire leur fait défaut en ce qui concerne leur rétention des notions anatomiques. Or, une mise à jour concise et visuellement orientée des structures anatomiques et de leurs relations tri-dimensionnelles dans le corps leur procure une assurance qu'ils en savent beaucoup plus sur l'anatomie qu'ils ne le croyaient.

Notre cours d'une journée sur l'anatomie tête et cou propose la révision des structures utiles aux dentistes d'aujourd'hui. Une succession de conférences portant sur la structure et la fonction des tissus mous et durs, des nerfs, des organes et des espaces du fasciès précéderont un après-midi en laboratoire durant lequel des spécimens préparés de tête et cou pourront être examinés. Ma propre expérience, longue de 44 ans, dans l'enseignement de l'anatomie tête et cou aux étudiants, aux résidents et cliniciens, a démontré que ceux-ci, qui croyaient avoir tout désappri des notions de l'anatomie, sont agréablement surpris et gratifiés par leurs redécouvertes suite à un tel cours. Je souhaite que vous vous joindrez à nous en septembre 2008 afin de profiter de cette expérience unique.

Charles E. Slonecker, D.D.S., Ph.D., Prof. Em. Anatomie

Conférencier : Dr Yvan Fortin

Sujet : Restauration fixe implanto-portée au maxillaire édenté : le pont Marius

Bon nombre de patients de nos jours voudraient une solution différente et facile qui remplacerait la prothèse complète comme traitement de prédilection. Ils préféreraient ne pas subir de greffe osseuse sans pour autant sacrifier l'esthétique et la phonétique ou compromettre leur hygiène buccale. Chez plusieurs dentistes, ceci implique la recommandation d'une variété de prothèses hybrides qui ne rencontrent pas précisément les attentes des patients en ce qui a trait à la fonction de la prothèse fixe.

Le pont Marius a été développé pour fournir à l'édenté complet qui présente une résorption modérée à sévère au maxillaire, une restauration implantaire fixe.

Objectifs

- Démonstration chirurgicale : méthodes d'engagement de l'os basal maxillaire qui procurent un ancrage adéquat pour la restauration fixe sans greffe osseuse dans la plupart des cas
- Conception prothétique : modèle de prothèse qui assure le support de la lèvre dans les cas de résorption modérée à avancée sans compromettre l'hygiène buccale ni la phonétique
- Démarche de présentation au patient : le fondement d'une restauration avec pièce fixe amovible en exposant un cas de recherche avec un suivi de 14 ans

Autres conférenciers...(provisoire)

Dr Charles Goodacre — L'occlusion : utilisation de la technologie digitale 3D

Byoung Suh — La science de la dentisterie adhésive

Dorin Ruse — Les matériaux de la dentisterie esthétique

Edward Lowe — Les aspects cliniques de la dentisterie esthétique

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Death of a "Salesman" Birth of a "Helping Professional"

(People Love to "Buy" but Hate to be "Sold"to)

By Mr. Peter Barry, CMC, RRDH

ABSTRACT

For most dentists the concept of "selling" was not something they signed up for when applying to dental school. In fact for many clinicians, especially first-decade dentists when they hear the word "sales" it conjures up images of manipulating people into parting with their hard-earned money. The underlying mentality is that; we are a medical profession and should simply be able to tell people what they need and they should just trust us and understand our advice. This viewpoint can be somewhat self limiting because most of us practice in a fee-for-service environment where even if the patient has dental insurance, the average policy does not completely cover a lot of what modern dentistry has to offer. This means that our ability to deliver optimal health and wellness to society will rest largely on our ability to inspire our patients to desire and pay for what we can do for them.

RÉSUMÉ

Être « vendeur » n'est certainement pas inné chez la plupart des étudiants qui s'inscrivent à la faculté de médecine dentaire. En fait, pour plusieurs dentistes qui pratiquent depuis plus dix ans, le mot « vente » évoque pour eux des images de personnes manipulées à dépenser de l'argent difficilement gagné. En tant que professionnels, il semble que nous pouvons tout simplement proposer aux patients les services et soins dont ils ont besoin, et ces derniers devraient avoir confiance en nous et écouter nos conseils. Ce point de vue peut être limitatif en soi car nous sommes rémunérés à l'acte, et même si le patient a une assurance dentaire, sa police d'assurance ne rembourse peut-être pas complètement tous les bons soins qu'il est possible d'obtenir de nos jours. Il ne nous reste plus qu'à suggérer à nos patients les soins que nous jugeons nécessaires et espérer qu'ils acceptent et qu'ils sont prêts à en défrayer le coût.

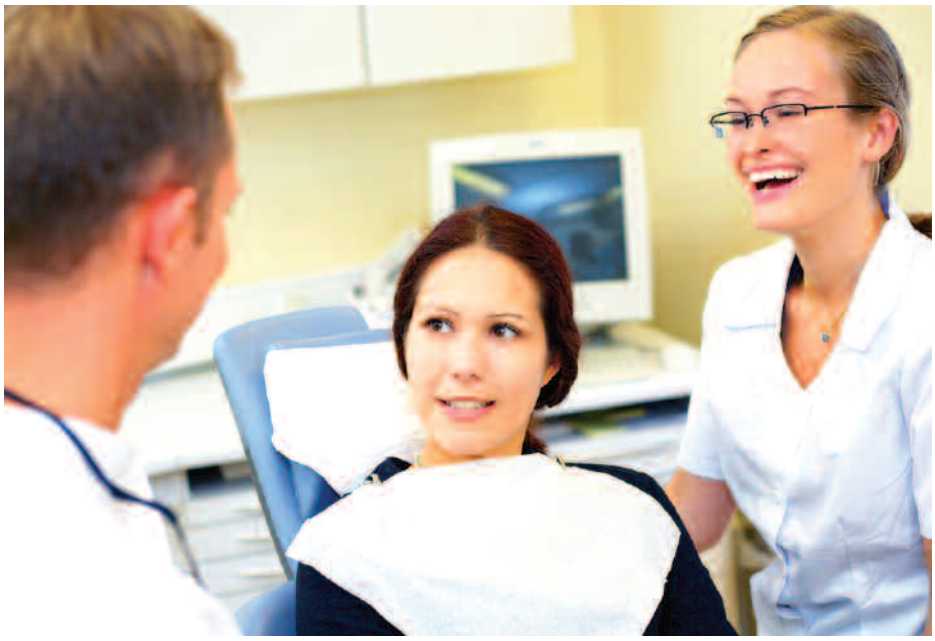
About the Author

Peter Barry is a speaker, writer, Practice Mastery Coach™, and founder of Successful Practice Architects. He is the creator of "The Dental Olympics Advantage™ Growth & Development Programs." He is also a member of the Academy of Dental Management Consultants and Speaking Consulting Network. Peter coaches dental teams through the implementation of successful and highly profitable systems of patient care and business operation. He provides customized group and one-on-one personal development success training. He can be reached at: peter@practicemastery.com/416-568-5456

So what is it about this concept of "Selling" that so many of us in our profession feel so uncomfortable with? Is "selling something to someone" really a bad thing? Or is it our approach to selling that determines its ethics and integrity? Does it have to be a manipulative dishonourable process or can it be something beautiful and empowering that connects us to people and empowers us to help them? I think the answer to this question depends largely on how we perceive and define the process of "selling" in our own mind. My observation is that it is the old school negative approach to "selling" usually applied by what we call "pushy sales people" that most clinicians have an aversion to. You know the ones … the fast talking … manipulative … sly … heartless … dishonest sales person who has poor listening skills and could care less about what you think because they are focused on one thing only "closing the deal and getting your money." Selling doesn't have to occur this way. How we decide to deliver the selling/buying experience to our patients is completely within our control. It is a conscious choice each of us can make.

How you define the process of "sales" in your own mind will be powerful in influencing how you deliver the buying experience. I recently asked a group of dentists who said they hate "selling" to create an ideal definition of term "sales" based on how they feel about it … here is what they came up with …"sales is a process of coercing someone into buying something they don't want or think they need." Wow! If that's how you allow yourself to see selling then everything you say to your patient during a case presentation will be tainted with this negative belief system. In silent, powerful, and unseen ways you will unconsciously project or mirror these beliefs on to your patients through your choice of words, body language, and through your overall approach to the entire process.

Your underlying motives and beliefs have everything to do with how you present yourself and your ideas to people. With all the beautiful advances modern dentistry has to offer today, if we are to succeed as clinicians in the 21st century it is imperative that we don't view case presentations as a process of convincing customers or pushing them into things. That's why we must redefine the term "Sales" and give it a more positive and purposeful meaning that can guide us towards delivering a more positive buying experience to our patients. The great philosopher Plato said "the beginning of wisdom is the definition of terms." Our new improved meaning for selling should be based on the process of what we are really trying to achieve when we communicate with patients. It should sound something like this … "sales is a process of engaging someone intellectually while enabling them to commit themselves emotionally to make the decisions and take the actions towards a desirable outcome" or more simply put "sales is a process of helping people to make decisions that will add to their quality of life." This means that our entire case presentation must be converted from the all too common one-sided regurgitation of dental information (product and services dump) to a more interactive process that gets patients involved and guides them towards discovering for themselves that which is in their best interest. When you sell with ethics and integrity you don't have to approach people with the intent of selling them something: rather, your goal will be to gain rapport and understand their objectives so you can help them get what they need.



Have you ever been sold something and then days or even months later wondered why you bought it? When you came to the conclusion that you were "sold to," how did you feel – about yourself, the salesperson who sold it to you, and the company that he/she works for or owns? However, you've also bought products and services that were unnecessary but you didn't feel the same negativity towards the salesperson or the company. Why? In those instances, you were an integral part of the purchasing process. If your sales process is a one sided regurgitation of procedures and techniques then this may not be very emotionally appealing to patients and they will not buy. To counter this challenge many sales training programs, seminars, or books on selling present it as a series of strategies, gimmicks, or attempts to control behavior – all designed to get a potential buyer to say "Yes." The problem with these teachings is that they often promote manipulative sales techniques. They teach strategies like tie downs, open probes, get them while their hot, overcome objections, up sell (would you like a crown with that) … probe for the close (any reason we can't schedule today?). These manipulative sales techniques may raise your batting average slightly on a per incidence bases but they do not form the foundation for long-term trusting mutually rewarding relationships with patients who are committed to preserving and enhancing their life-long dental health in partnership with your office. In fact; while coaching hundreds of dental professionals it is my observation that when patients say "yes" based on how they were sold in many cases they may not actually be "committed" to the treatment they are accepting. If you pressure patients into accepting treatment you can often get them to "comply" with treatment, but when they comply (act of being pressured into something) they do not emotionally commit themselves to the process or to the potential positive outcomes. Have you ever noticed the common phenomenon

with patients who hesitantly accept treatment under sales pressure? They are often very difficult to completely satisfy? No matter how good you make the clinical outcome they seem to find reasons to be dissatisfied. Then on other hand I'm sure you have had patients for whom you were not fully satisfied with your clinical excellence yet this patient just loved your work and referred their friends and co-workers. I believe the difference between these two scenarios lies mostly in the level of commitment that was achieved with the patient during the selling process (case presentation). There is a big difference between compliance and commitment. When patients comply with care we tend to become mostly responsible for them. When they commit to care they tend to take more responsibility for themselves and for the clinical outcomes. Committed patients tend to become more positively involved in their care which is evidenced by their behaviour in the practice – following clinical instructions, realistic expectations of clinical outcomes, keeping their appointments and paying on time etc. Pressure sales is what most of us have an aversion to because it can lead to pressure case acceptance which means that we end up babysitting the patient through the entire process while looking like a pushy salesman and feeling undervalued and underappreciated.

Human beings are emotional creatures who process all decisions they make with their emotions/feelings. This means that when our patients walk into our practice they walk in with all of the emotional baggage related to things that are going on in their life at any one time – trips, job, relationships, other health concerns, family goals/challenges, new car, self image and self esteem issues, rent, credit card debt, going back to school, etc. For basic procedures that are mostly covered by insurance we can usually get away with telling them what they need without focusing on their current life circumstances and they'll usually accept treatment. However; when the fees get higher and the complexity of care becomes more involved we must factor into our communication the fact that patients have a life outside the office and then with the patient in the driver seat we must embark on a co-discovery journey of fitting the dentistry into their lives not into their mouths. To do this well we must reconnect with our authentic non-dental self. Which is the way we thought and spoke before the world of dentistry started crowding out our thinking with dental terms and industry jargon. This is why social skills are so important. These have little to do with talking, or having the "gift of gab." They're more about communicating with people – asking questions, listening, understanding, and having empathy and rapport.

Social skills are demonstrated when you ask questions and listen, when you understand different behaviour or communication styles, and when you adjust your style to fit other people's styles. It's the ability to understand the unspoken. To read body language. To pick up on voice tones, inflection, and facial expressions. It's being able to intuitively crawl inside other people, then think and see the world as they do. It's the willingness to listen to people without biases. To understand their viewpoint. To suspend your view of how things are and understand their beliefs and opinions. Excellent social skills help us jump on board other people's trains of thought and ride with them as co-passengers. This is the stage on which the fullest scope of modern dental services can be delivered.

Selling really is a process of guiding people towards self discovery and hope. It's a process of engaging a person's heart and imagination towards something that does not yet exist in their lives. Selling is best achieved by listening to people. In fact, listening is the greatest skill you can use for strengthening your communication excellence. It is also the greatest tool we have for releasing potential in others. This talent can save a marriage, make you a better negotiator, heal a damaged friendship, increase your sales, or strengthen your leadership and team unity. It has been said that the greatest need of the human soul is the need to feel heard and understood. Give the gift of "High Level Listening" to your patients on a daily basis and you will in fact be strengthening your ability to sell by leading them towards great decisions that will add to the quality of their lives. One of the easiest ways to distinguish the difference between an effective treatment coordinator or dentist and one who needs more skills development is to watch how that person interacts with the patient. When he or she does all or most of the talking, it's likely acceptance of treatment will either be delayed (I need more information, I want to think about it, etc.) or denied completely. People really don't care how much you know or what you can do until you show how much you care. Patients don't like "product dump" speeches. When they sense one coming on they will tend to tune you out.

The next time you discuss treatment options with a patient ask yourself the following four questions.

1. Whose dental condition/opportunity is it?
2. Who's recognizing the condition/opportunity?
3. Who wants to treat it?
4. Who's accepted all potential treatment outcomes?

If the answer to any of these questions is you, and not the patient, then we do not have patient involvement. No one can force health on a patient, it has to be desired – a goal. No one can force a patient to show up for appointments. They show up for appointments that they want and they also

show more appreciation for treatment they choose. The process of patient involvement is called co-diagnosis. Co-diagnosis is the development of a partnership. It's the act of assisting patients to "discover" themselves and participate in the diagnosis. People really are interested in themselves. Our job is to help them to discover themselves and any potential problems/opportunities. It's the patient's job to decide what level of health and wellness they choose for themselves. We dental professionals spend an awful lot of time trying to convince people to have their dentistry done. We are excited about all the options that we can provide. But we fail to realize that before we can get the patients enthusiasm, we must first help them develop their desire for the services. Patients will only agree to services they want (not need). The Greek philosopher Socrates talked about the use of questions to guide people towards developing ideas and conclusions in their own mind. By leading people through a series of focus questions we facilitate their "ah ha" moments but they take ownership of their breakthrough thoughts. Do you lead your patients through a process of self discovery that lets you highlight the range of possibilities available to them – possibilities that they would not have identified without you?

The following are 10 tips we can use to strengthen our case presentation skills and increase case acceptance.

1. View the patient as an ally and adopt a healthy view of selling
2. Listen twice as much as you speak
3. Take notes during the presentation
4. Make a comprehensive chart including information regarding the unique life circumstances, views, and emotional desires of the person attached to the teeth
5. Begin creating an ongoing list of deep probing open ended questions
6. Take the time to connect on a personal level with your patients
7. Identify their needs
8. Fit the dentistry into their needs
9. Don't sell raw dentistry (products and procedures). Communicate beyond this; to the quality of life impact (features and benefits) the dentistry will have on their lives
10. Your values and attitudes are projected to patients. Be open and honest and they will trust you

At the end of the day it comes down to this, we are all born as human beings not as customers or patients. We are all people – our patients are not customers, they are people. Without people we have nothing, but with people we have something bigger than dentistry. By embracing the human condition we can change our language and the patients overall perception of us and what we have to offer. We can all boost our case presentation skills and enhance case acceptance by learning to more effectively communicate in our patient's language.

Dentistry is a helping profession and "sales" is a helping process. By altering our thinking and approach slightly we can easily shift the focus from "Us" and the procedures we sell to "The Customer" and the quality of life impact our services will have on their lives. This shift in thinking will enable us to communicate with our patients in a more buyer-based, service-focused and solution driven way, and we will bring honour and dignity to this whole concept of selling within the profession dentistry.

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Diagnostic différentiel de la xérostomie

PARTIE 2

Dr. Rénald Pérusse DMD, MD, LMCC, FRCD(C), C.S. (ODQ)

RÉSUMÉ

Nous avons, dans un article précédent, discuté du syndrome d'aplasie des glandes lacrymales et salivaires (AGLS) et du diagnostic différentiel des différents désordres héréditaires syndromiques ou non syndromiques pouvant être associés à la présence d'une agénésie salivaire. La découverte de ces désordres chez l'adulte est plutôt inhabituelle si l'on fait exception de certains cas marginaux ayant échappé à l'attention de l'équipe médicale ou dentaire.

En revanche, plusieurs désordres systémiques ainsi que certains facteurs iatrogéniques peuvent favoriser l'apparition d'une dysfonction salivaire chez l'adulte, sujet que nous nous proposons d'aborder dans le cadre de cet article consacré au diagnostic différentiel de la xérostomie.

Discussion

La prise de médicaments, l'usage de drogues, la maladie de Sjögren, le diabète mellitus, la chimiothérapie et la radiothérapie cervicofaciale représentent les principales causes de xérostomie chez l'adulte. D'autres désordres systémiques peuvent aussi avoir un impact non négligeable sur la fonction salivaire. C'est le cas notamment des connectivites, des hépatopathies auto-immunes, de l'infection au VIH, de l'hépatite virale C chronique, de la maladie cœliaque, de la fibrose kystique du pancréas, de la sarcoïdose, de l'hémochromatose, de l'amyloïdose, de l'insuffisance rénale chronique et de certains conditions psychiatriques telles l'anxiété, la dépression et l'anorexie-boulimie[1,2] (tableau 1).

Une revue attentive de l'histoire pharmacologique doit être complétée chez tous les patients souffrant de xérostomie. En effet, plus de 400 à 500 médicaments, selon les études consultées, peuvent favoriser l'apparition d'une xérostomie en raison de leurs effets anticholinergiques ou sympathomimétiques. Bon nombre de ces médicaments sont utilisés couramment en clinique : anxiolytiques, antipsychotiques, antidépresseurs tricycliques, antidépresseurs de dernière génération (inhibiteurs du recaptage de la sérotonine, de la noradrénaline et de la dopamine), antiparkinsoniens, antihistaminiques, anticonvulsivants, narcotiques, anticholinergiques (antispasmodiques), décongestionnants, amphétamines, anorexiants, bronchodilatateurs, diurétiques, bêta-bloquants, bloquants des canaux calciques, inhibiteurs de l'enzyme de conversion de l'angiotensine, antirétroviraux, lithium, anti-inflammatoires non stéroïdiens.[1] Cette liste n'est pas exhaustive. Le traitement de la xérostomie d'origine médicamenteuse repose sur l'arrêt du médicament responsable et, si nécessaire,

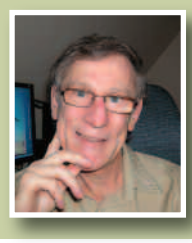

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Tableau 1. Diagnostic différentiel de la xérostomie

Désordres congénitaux et héréditaires
• Aplasie salivaire isolée
• Aplasie des glandes lacrymales et salivaires (AGLS)
• Syndrome lacrymo-auriculo-dento-digital (LADD)
• Dysplasie ectodermique anhydrotique
• Anomalies du 1er et du 2e arc branchial
Désordres acquis
• Maladie de Sjögren
• Connectivites : arthrite rhumatoïde, lupus érythémateux, sclérodermie, connectivite mixte
• Hépatopathies auto-immunes : cirrhose biliaire primitive, cholangite sclérosante, hépatite auto-immune
• Infections virales chroniques : hépatite C, VIH, HTLV-1
• Endocrinopathies : diabète mellitus, diabète insipide, thyroïdite auto-immune
• Désordres digestifs : déficiences nutritionnelles, maladie cœliaque, fibrose kystique du pancréas, pancréatite auto-immune
• Désordres métaboliques : hémochromatose, amyloïdose
• Désordres granulomateux : sarcoïdose, granulomatose de Wegener
• Néphropathies : néphrite interstitielle, insuffisance rénale chronique
• Désordres psychiatriques : anxiété, dépression, anorexie/boulimie
Facteurs iatrogéniques
• Médicaments, drogues
• Radiothérapie, chimiothérapie, chimioradiothérapie
• Réaction du greffon contre l'hôte

sur la prise d'un sialogogue ou d'une salive artificielle. Plusieurs drogues illicites, d'autre part, peuvent causer une xérostomie. Ce phénomène est principalement observé avec le cannabis, la cocaïne, l'héroïne, la métamphétamine (Crystal Meth) et la 3,4-méthylène-dioxy-méthylamphétamine (MDMA, Ecstasy).

La maladie de Sjögren constitue par ailleurs une cause importante de xérostomie. La maladie de Sjögren est une pathologie relativement fréquente, de nature auto-immune, rencontrée chez environ 0,5% de la population.[3] La plupart des cas sont notés chez des femmes, après la cinquantaine. La cause de la maladie de Sjögren demeure imprécise, bien qu'il s'agisse vraisemblablement d'un désordre multifactoriel dans lequel des facteurs environnementaux (virus?), génétiques (susceptibilité conférée par les marqueurs HLA-B8 et HLA-DR3) et immunologiques seraient impliqués. La maladie de Sjögren existe sous deux formes soit la maladie de Sjögren primaire et la maladie de Sjögren secondaire. La maladie de Sjögren primaire, désigné aussi de syndrome sec (sicca syndrome), se présente classiquement sous forme d'une xérostomie et d'une xérophtalmie. La sécheresse qui prend place dans le syndrome sec n'est pas confinée cependant à la bouche et aux yeux mais touche aussi les voies aériennes supérieures, la région génitale et la peau (xérodermie). La maladie de Sjögren primaire survient de façon isolée, sans désordre associé. La maladie de Sjögren secondaire, en revanche, est souvent observée dans le cadre d'une connectivite, le plus souvent l'arthrite rhumatoïde et plus rarement le lupus érythémateux systémique, la sclérodermie systémique diffuse et la connectivite mixte.[3] La maladie de Sjögren peut aussi être rencontrée chez les malades souffrant d'une cirrhose biliaire primitive, d'une cholangite sclérosante, d'une hépatite auto-immune, d'une pancréatite auto-immune et d'une thyroïdite auto-immune (Hashimoto).[3] Une hyperplasie des glandes salivaires majeures peut être démontrable chez 30% à 50% des patients. Cette hyperplasie est plus fréquente chez les malades souffrant d'une maladie de Sjögren primaire. Un certain nombre de complications peuvent être par ailleurs observées : vascultites, néphrite, pneumonite interstitielle, atteinte du système nerveux central ou périphérique, lymphomes et pseudo-lymphomes. La prévalence des lymphomes non-hodgkiniens, notamment, est 44 fois plus élevée chez les patients souffrant d'une maladie de Sjögren primaire, ces derniers ayant tendance à se manifester au niveau des parotides mais aussi au niveau de certains sites extra-salivaires.[4] D'autres désordres lympho-prolifératifs tels les gammapathies monoclonales, la macroglobulinémie de Waldeström et la maladie de Hodgkin peuvent être aussi rencontrés.[4]

De façon quelque peu surprenante, il n'y a pas de consensus clair dans la littérature concernant les répercussions que pourrait entraîner la chimiothérapie sur la fonction salivaire. Des changements histologiques sous forme d'inflammation aigue, de dégénérescence acinaire et de modifications de l'architecture canalaire ont été décrits au niveau des glandes salivaires mineures et majeures chez des animaux de laboratoire et chez certains sujets traités à l'aide d'antimétabolites et d'anthracyclines.[5] Toutefois, l'impact de ces changements sur le débit salivaire semble beaucoup plus mitigé. Certaines études rapportent en effet une baisse du débit salivaire pendant la chimiothérapie alors que d'autres ne démontrent aucune réduction significative du débit salivaire à court, moyen et à long terme chez des patients soumis à différents protocoles de chimiothérapie.[5] Les répercussions de la chimiothérapie sur la composition salivaire (immunoglobulines, protéines totales, albumine, lysozyme, amylase) demeurent tout aussi imprécises.[5] Ceci est attribuable au fait que certaines études présentent des lacunes importantes sur le plan méthodologique et qu'il est très difficile de comparer les différents protocoles de chimiothérapie entre eux. Plusieurs études publiées au cours de la dernière décennie confirment par ailleurs que la xérostomie est une complication fréquente chez les patients recevant de la chimioradiothérapie pour différents cancers de la sphère ORL. Dans une étude récente de phase II, tous les patients traités pour des carcinomes épidermoïdes inopérables de la région cervicofaciale à l'aide d'une chimiothérapie d'induction (docétaxel, cisplatine, 5-fluorouracil) et d'une chimioradiothérapie complémentaire faisant appel aux mêmes agents ont développé une xérostomie de grade I (25%), II (70%) ou III (5%) selon les critères proposés par l'OMS.[6] Les différents protocoles préconisés pour la chimiothérapie d'induction et la chimioradiothérapie complémentaire, les doses d'antinéoplasiques administrées pendant le traitement, le type de radiothérapie utilisée dans le cadre de la chimioradiothérapie (conventionnelle, hyperfractionnée, modulation d'intensité) ainsi que la prise ou non d'amifostine sont autant de paramètres pouvant affecter le taux de survenue de la xérostomie. Il ressort cependant de plusieurs études que la chimiothérapie d'induction elle-même n'aurait qu'un impact très limité sur le débit salivaire.[7,8] En revanche, la chimiothérapie complémentaire qui est administrée de concert avec la radiothérapie après la chimiothérapie d'induction favorise

l'apparition d'une xérostomie importante, phénomène imputable aux effets radiosensibilisants des antinéoplasiques.[6]

La xérostomie représente l'une des complications les plus classiques de la radiothérapie cervicofaciale. La sévérité de la xérostomie est largement déterminée par la dose totale de radiation administrée, la fraction des glandes salivaires majeures incluses dans le champ de radiation et la capacité des cellules souches mésenchymateuses à repeupler le tissu salivaire irradié.[5] Une réduction importante du débit salivaire est déjà démontrable après la première semaine de traitement et atteint son maximum à la fin de la radiothérapie.[5,9,10] Bien qu'une certaine récupération de la fonction salivaire soit parfois observée après la radiothérapie, imputable à l'adaptation du patient, l'hyperplasie compensatoire des glandes salivaires controlatérales ou la résistance accrue des glandes salivaires accessoires à la radiothérapie,[5] des changements irréversibles prennent habituellement place lorsque les doses de radiation sont supérieures à 60 Gy.[5,10]

Les glandes parotides exposées à la radiothérapie sont initialement le site d'une réaction inflammatoire aigue caractérisée par une infiltration de polynucléaires neutrophiles, d'éosinophiles et de mastocytes.[5] Cette réaction inflammatoire aigue est elle-même associée à une dégénérescence et une nécrose des cellules acinaires séreuses ainsi qu'à une dilatation des canaux intercalés et interlobulaires. Des changements similaires sont aussi notés au niveau des glandes sous-maxillaires où les cellules acinaires muqueuses, toutefois, sont très peu affectées par les effets de la radiothérapie.[5] Par la suite, une inflammation chronique, une destruction supplémentaire des cellules acinaires séreuses, une atrophie et une fibrose consacrent le caractère irréversible de la xérostomie causée par la radiothérapie. Bien que les cellules acinaires muqueuses soient plus résistantes aux effets de la radiation ionisante que les cellules acinaires séreuses, il n'y a pas de différence significative quant au statut fonctionnel des glandes sous-maxillaires et des glandes parotides pendant un traitement de radiothérapie.[5]

Les répercussions de la xérostomie sont multiples. Pendant la radiothérapie, la xérostomie est une source fréquente de dysgueusie, d'hypersensibilité dentinaire et de candidose buccale. De plus, la xérostomie aggrave de façon notable la radiomucosite provoquée par la radiothérapie, rendant les muqueuses encore plus sensibles et inflammées. Les effets de la xérostomie se font sentir longtemps après la radiothérapie, interférant de façon notable avec la mastication, la déglutition, la phonétique et la digestion. À cet égard, il a été démontré que la xérostomie affecte de façon significative la qualité de vie globale des patients, particulièrement chez les femmes et les jeunes sujets ayant reçu de la radiothérapie conventionnelle pour un carcinome épidermoïde de la sphère ORL.[9] Les caries rampantes, les parodontopathies, la dysgueusie et la candidose récurrente ou chronique constituent d'autres complications tardives de la radiothérapie cervicofaciale. Plusieurs facteurs contribuent à l'apparition des caries de radiation soit la xérostomie elle-même, le développement d'une flore bactérienne plus cariogène (Lactobacillus, Streptococcus mutans), les modifications physico-chimiques de la salive (plus acide et plus visqueuse), le changement des habitudes alimentaires et le relâchement de l'hygiène dentaire. Les caries de radiation peuvent avoir un effet dévastateur sur la dentition. L'éducation du patient, le maintien d'une hygiène buccale rigoureuse, la prise de pilocarpine ou de substituts salivaires ainsi que le recours à des applications topiques de fluor (fluorure de sodium neutre à 1.1%) sur une base quotidienne jouent un rôle déterminant dans la prévention de ces caries.

Plusieurs études publiées au cours des dernières années démontrent que la radiothérapie conformationnelle en modulation d'intensité permet de limiter les doses de radiation administrées aux glandes salivaires pendant le traitement des cancers de la sphère ORL. Grâce à des collimateurs multilames contrôlés par des logiciels sophistiqués, la radiothérapie conformationnelle en modulation d'intensité utilise des faisceaux de radiation d'intensité différente adaptés aux caractéristiques morphologiques de la tumeur tout en épargnant les tissus sains avoisinants, ce qui constitue un avantage marqué par rapport à la radiothérapie conventionnelle.[10,11] Certaines études récentes nous permettent aussi d'apprécier qu'un impact encore plus important sur la xérostomie peut être obtenu lorsque la radiothérapie en modulation d'intensité est associée à un transfert chirurgical de la glande sous-maxillaire dans l'espace sous-mentonnier, préservant ainsi cette dernière des effets de la radiation ionisante.[12] Dans le même ordre d'idée, la prise d'amifostine, un agent cytoprotecteur administré par voie parentérale, permet de réduire la xérostomie précoce et tardive chez les sujets recevant de la radiothérapie conventionnelle pour un cancer de la sphère ORL.[10] Toutefois, cette protection conférée par l'amifostine n'a pas été démontrée dans une étude récente portant sur des patients traités par chimioradiothérapie (cisplatine et radiothérapie conventionnelle), résultat qui, selon les auteurs de l'étude, serait attribuable au fait que les doses d'amifostine n'étaient probablement pas suffisantes.[13] Il faut signaler à cet égard que la chimioradiothérapie engendre une xérostomie nettement plus sévère que la radiothérapie conventionnelle chez les malades traités pour des cancers de la région cervicofaciale, en raison de la radiosensibilisation conférée par la chimiothérapie.[6]

Outre la maladie de Sjögren, plusieurs désordres systémiques peuvent être associés à la présence d'une xérostomie (tableau 1). Certains de ces désordres sont relativement courants dans la population générale. C'est le cas notamment du diabète mellitus, de l'hépatite C et de l'infection au VIH. On estime que près de deux millions de canadiens souffrent de diabète. Ce dernier existe principalement sous deux formes soit le diabète de type 1 et de type 2. Le diabète est caractérisé par la présence d'une hyperglycémie secondaire à une déficience relative (type 2) ou absolue (type 1) en insuline. Une étude récente révèle qu'environ 75% des patients diabétiques sont aux prises avec une xérostomie.[14] Cette dernière pourrait être secondaire à une neuropathie autonomique ou à la dysfonction endothéliale engendrée par la microangiopathie diabétique. Une hyperplasie bilatérale des glandes parotides et/ou des glandes sous-maxillaires est souvent démontrable à l'examen clinique des patients diabétiques. Sur le plan histologique, cette atteinte des glandes salivaires majeures prend la forme d'une atrophie acinaire, d'une infiltration graisseuse et d'une accumulation de gouttelettes lipidiques intracytoplasmiques.[14] Malgré la forte prévalence de la xérostomie et de l'hyperplasie des glandes salivaires majeures chez les patients diabétiques, il n'existe pas de données convaincantes dans la littérature nous permettant de confirmer de façon formelle la présence d'une hyposalivation causée par le diabète, évoquant ainsi la possibilité que la xérostomie soit en partie subjective ou secondaire à des changements affectant la composition de la salive plutôt que le débit salivaire lui-même.[1]

Une hyperplasie des glandes salivaires majeures peut être observée chez environ 4% à 8% des patients infectés par le VIH.[2] Cette hyperplasie est secondaire à une infiltration des glandes salivaires par des lymphocytes CD8, un processus s'inscrivant dans le cadre d'une lymphocytose diffuse à CD8, laquelle touche aussi les glandes lacrymales, les ganglions, le poumon, le rein, le foie et le tractus gastro-intestinal. Les glan-

des salivaires affectées par cette lymphocytose peuvent être aussi le site de multiples kystes lympho-épithéliaux (hyperplasie lymphoïde kystique) que l'on peut parfois palper cliniquement. Les désordres salivaires liés au VIH intéressent plus particulièrement l'enfant et l'adulte entre 20 et 50 ans. Dans ce dernier groupe, ils affectent plus souvent les hommes que les femmes, ce qui les distinguent à ce titre de la maladie de Sjögren, notée du reste chez des sujets généralement plus âgés. Diverses études démontrent par ailleurs que la fonction salivaire est altérée de façon significative chez les sujets infectés par le VIH et que cette atteinte n'est pas forcément provoquée par la thérapie antirétrovirale.[1] À cet égard, il faut préciser que la présence de l'antigène p-24 du VIH peut être démontrée dans les cellules acinaires et canalaires des glandes salivaires mineures de la lèvre inférieure chez les patients aux prises avec un désordre salivaire lié au VIH.[15] Plusieurs études confirment enfin que les malades souffrant d'un désordre salivaire relié au VIH sont plus à risque de développer un lymphome parotidien de type MALT au même titre que les sujets aux prises avec une maladie de Sjögren.

Un syndrome sec caractérisé par la présence d'une xérostomie et d'une xérophtalmie peut être observé chez un nombre substantiel de malades porteurs d'une hépatite chronique C. Ce syndrome sec peut mimer la maladie de Sjögren primaire mais présente certaines distinctions sur le plan clinique et histologique. Sur le plan clinique, notamment, le syndrome sec apparaissant dans le cadre de l'hépatite chronique C ne démontre pas d'affinité particulière pour la femme, est rarement associé à l'apparition d'anticorps anti-SSA et anti-SSB et comporte une fréquence accrue de vasculites, de cryoglobulinémie et d'hypocomplémentémie.[1,2,16] Les changements histologiques, quant à eux, sont généralement moins sévères et se présentent sous forme d'un infiltrat lymphocytaire périvasculaire sans destruction des canaux salivaires composé prioritairement de lymphocytes CD8.[2,16] La présence de l'ARN du virus de l'hépatite virale C (HCV) peut être détectée par RT-PCR (reverse transcriptase polymerase chain reaction) dans le tissu salivaire chez un certain nombre de patients souffrant d'un syndrome sec, suggérant ainsi un rôle direct du HCV dans la pathogenèse de ce syndrome.[17] Deux autres mécanismes pourraient aussi contribuer à l'apparition du syndrome sec chez ces patients soit un mimétisme moléculaire impliquant une protéine cytosolique des cellules acinaires salivaires et certaines protéines du HCV (protéine E1 et E2) ainsi qu'une déposition de complexes immuns dans le tissu salivaire favorisée par les concentrations élevées d'ARN viral circulant.[17,18]

Certaines hépatopathies auto-immunes peuvent être associées à la présence d'un syndrome sec. C'est le cas principalement de la cirrhose biliaire primitive et de la cholangite sclérosante et plus rarement de l'hépatite auto-immune. D'autres désordres chroniques comme la fibrose kystique du pancréas, la sarcoïdose, l'hémochromatose et la granulomatose de Wegener sont des sources possibles de xérostomie.
Mentionnons enfin que l'anxiété chronique et la dépression sont des causes relativement fréquentes mais sous-estimées de sécheresse buccale.

Conclusion

Le diagnostic différentiel de la xérostomie est très large et comprend un certain nombre de conditions héréditaires ou acquises auxquelles le prosthodontiste peut être confronté dans le cadre de sa pratique.
Certaines de ces conditions sont relativement communes comme le diabète, la maladie de Sjögren, l'arthrite rhumatoïde, le lupus érythémateux, la sclérodermie, l'hépatite chronique C, la dépression et l'anxiété chronique. La radiothérapie, la chimioradiothérapie ainsi que la prise de divers médicaments anticholinergiques et sympathomimétiques représentent par ailleurs des causes fréquentes de xérostomie que l'on se doit de rechercher attentivement au questionnaire du patient. La xérostomie constitue une source de morbidité importante chez certains patients et peut avoir un impact direct sur le pronostic dentaire et prosthodontique.

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Differential Diagnosis of Xerostomia

PART 2

Dr. Rénald Pérusse, DMD, MD, LMCC, FRCD(C), C.S. (ODQ)

ABSTRACT

In a previous article we discussed the aplasia of lacrimal and salivary glands (ALSG) syndrome and the differential diagnosis of the various syndromic and nonsyndromic hereditary disorders that may be associated with the agenesis of a salivary gland. It is unusual to discover these disorders in adult patients if we make an exception of some borderline cases that escape the attention of a medical or dental team.

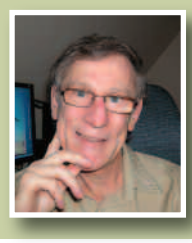
Even so, several systemic disorders and some iatrogenic factors can foster the onset of a salivary dysfunction in an adult patient. We address this issue in this article on the differential diagnosis of xerostomia.

Discussion

The use of medication and drugs, Sjögren's syndrome, diabetes mellitus, chemotherapy, and cervico-facial radiotherapy are the main causes of xerostomia in adults. Systemic disorders too can have an appreciable impact on salivary function, most notably collagenosis, autoimmune hepatopathy, human immunodeficiency virus (HIV) infection, chronic infection with the hepatitis C virus, coeliac disease, cystic fibrosis of the pancreas, sarcoidosis, hemochromatosis, amyloidosis, chronic renal failure, and some mental conditions such as anxiety, depression and anorexia/bulimia[1,2] (Table 1).

A careful review of previous pharmacotherapy must be done for all patients presenting xerostomia. According to the studies consulted, some 400 to 500 medications, if not more, can foster the onset of xerostomia because of their anticholinergic or sympathomimetic effects. Many of these medications are commonly used in clinical settings: anxiolytics, antipsychotics, tricyclic antidepressants, latest-generation antidepressants (serotonin, noradrenaline and dopamine re-uptake inhibitors), antiparkinsonians, antihistamines, anticonvulsants, narcotics, anticholinergics (antispasmodics), decongestants, amphetamines, anorexiants, bronchodilators, diuretics, beta blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, antiretrovirals, lithium, and non-steroidal anti-inflammatory drugs.[1] This list is not exhaustive. The treatment of medication-induced xerostomia will be based on stopping the use of the drug in question and, if necessary, the taking of a sialogogue or use of an artificial saliva. In addition, several illegal drugs can cause xerostomia. This phenomenon is observed mainly with cannabis, cocaine, heroin, methamphetamine (crystal meth) and 3,4-methylenedioxymethamphetamine (MDMA, Ecstasy).

Sjögren's syndrome too is a leading cause of xerostomia. This syndrome is a relatively



About the Author

Dr. Rénald Pérusse holds a Doctorate of Dental Medicine and a Doctorate of Medicine. He teaches and practises as an oral medicine specialist at Université Laval, Faculty of Dental Medicine. He has authored or co-authored one volume, three CD ROMs, and 52 scientific articles. His fields of interest are the oral manifestations of systemic disorders, medical urgencies, and dental pharmacology.

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Table 1. Differential diagnosis of xerostomia

Congenital and Hereditary Disorders
• Isolated salivary gland aplasia
• Aplasia of lacrimal and salivary glands (ALSG)
• Lacrimo-auriculo-dento-digital syndrome (LADD syndrome)
• Anhydrotic ectodermic dysplasia
• Anomalies of the first and second branchial arches
Acquired Disorders
• Sjögren's syndrome
• Collagenosis: rheumatoid arthritis, lupus erythematosus, scleroderma, mixed collagenosis
• Autoimmune hepatopathies: primary biliary cirrhosis, sclerosing cholangitis, autoimmune hepatitis
• Chronic viral infections: hepatitis C, HIV, HTLV-1
• Endocrinopathies: diabetes mellitus, diabetes insipidus, autoimmune thyroiditis
• Digestive disorders: nutritional deficiencies, coeliac disease, cystic fibrosis of the pancreas, autoimmune pancreatitis
• Metabolic disorders: hemochromatosis, amyloidosis
• Granulomatous disorders: sarcoidosis, Wegener's granulomatosis
• Nephropathies: interstitial nephritis, chronic renal failure
• Mental disorders: anxiety, depression, anorexia/bulimia
Iatrogenic Factors
• Medications, drugs
• Radiotherapy, chemotherapy, chemoradiotherapy
• Graft-versus-host reaction

frequent autoimmune pathology encountered in about 0.5% of the population.[3] Most cases are observed in women over 50 years of age. The cause of Sjögren's syndrome is still unclear, although by all appearances it is a multifactorial disorder involving environmental (perhaps a virus), genetic (susceptibility conferred by the HLA-B8 and HLA-DR3 markers) and immunological factors. There are two forms of the syndrome: primary Sjögren's syndrome and secondary Sjögren's syndrome. Primary Sjögren's syndrome, also referred to as dry-eye or sicca syndrome, presents classically as xerostomia and xerophthalmia. The dryness caused by the syndrome is not limited to the mouth and eyes but also affects the upper airways, genitals, and skin (xeroderma). Primary Sjögren's syndrome occurs in isolation, with no associated disorder. Secondary Sjögren's syndrome, however, is often observed in the context of collagenosis, most often rheumatoid arthritis and, more rarely, systemic lupus erythematosus, diffuse systemic scleroderma, and mixed collagenosis.[3] Sjögren's syndrome may also be encountered in patients with primary biliary cirrhosis, sclerosing cholangitis, autoimmune hepatitis, autoimmune pancreatitis, and autoimmune thyroiditis (Hashimoto).[3] Hyperplasia of the major salivary glands can be observed in 30 to 50% of patients. This hyperplasia is more frequent among patients with primary Sjögren's syndrome. Some complications can also be observed: vasculitis, nephritis, interstitial pneumonitis, impairment of central or peripheral nervous system, lymphoma, and pseudo-lymphoma. The prevalence of non-Hodgkin's lymphomas in particular is 44 times higher among patients with primary Sjögren's syndrome, as these lymphomas tend to appear at the parotids and also at some extra-salivary sites.[4] Other lymphoproliferative disorders, such as monoclonal gammopathy, Waldenström's macroglobulinemia and Hodgkin's disease may also be encountered.[4]

Somewhat surprisingly, there is no clear consensus in the literature on the possible repercussions of chemotherapy on salivary function. Histological changes such as acute inflammation, acinar degeneration and modification of the ductal architecture have been observed in the minor and major salivary glands of laboratory animals and some patients being treated with an antimetabolite or anthracycline.[5] However, the impact of such changes on salivary secretion seems much more mixed. In fact, some studies report reduced salivary secretion during chemotherapy, while others show no significant reduction of salivary secretion in the short-, mid- or long-term for patients subjected to various chemotherapy protocols.[5] The impact of chemotherapy on saliva composition (immunoglobulins, total proteins, albumin, lysozyme, amylase) is also still unclear.[5] This is attributable to the fact that some studies have significant methodological shortcomings and that it is very difficult to compare the various chemotherapy protocols with each other. Moreover, several studies published in the past decade confirm that xerostomia is a frequent complication in patients undergoing chemoradiotherapy for various otorhinolaryngology (ORL) cancers. In a recent phase II study, all the patients being treated for an inoperable epidermoid carcinoma in the cervico-facial region by means of induction chemotherapy (docetaxel, cisplatin and 5-fluorouracil) and a concurrent chemoradiotherapy with the same agents developed a xerostomia of grade I (25%), II (70%), or III (5%), using WHO criteria.[6] The various protocols recommended for induction chemotherapy and concurrent chemoradiotherapy, antineoplastic dosages during treatment, type of radiotherapy used as part of the chemoradiotherapy (conventional, hyperfractionated, intensity-modulated), and whether or not amifostine is to be used are all parameters that can affect the rate of incidence of xerostomia. However, several studies show that induction chemotherapy alone would have only a very limited impact on salivary secretion.[7,8] In comparison, chemotherapy administered concurrently with radiotherapy subsequent to induction chemotherapy fosters the onset of significant xerostomia, a phenomenon that is imputable to the effect of antineoplastics on radiosensitivity.[6]

Xerostomia is one of the most classical complications of cervico-facial radiotherapy. Its severity is broadly determined by the total dose of radiation administered, the percentage of the major salivary glands within the radiation field, and the capacity of the mesenchymal stems cells to repopulate the radiated salivary tissue.[5] Salivary secretion is significantly reduced by the end of the first week of treatment, and it reaches its maximum by the end of the radiotherapy.[5,9] Although some recovery of the salivary function is sometimes observed after radiotherapy by virtue of the patient's adaptation, the compensatory hyperplasia of the contralateral salivary glands or the increased resistance of the accessory salivary glands to radiotherapy,[5] irreversible changes usually occur when the doses of

radiation exceed 60 Gy.[5,10]

Parotid glands exposed to radiotherapy are initially the site of an acute inflammatory reaction characterized by an infiltration of multinuclear neutrophils, eosinophils and mastocytes.[5] This acute inflammatory reaction is itself associated with a degeneration and necrosis of the serous acinar cells and a dilation of the intercalated and interlobular ducts. Similar changes are also observed in the submaxillary glands; however, the mucous acinar cells are affected very little by radiotherapy.[5] Thereafter, chronic inflammation, further destruction of serous acinar cells, an atrophy and a fibrosis establish the irreversible character of a xerostomia caused by radiotherapy. Although mucous acinar cells are more resistant to the effects of ionizing radiation than serous acinar cells, there is no significant difference as regards the functional status of the submaxillary and parotid glands during a course of radiotherapy treatment.[5]

Xerostomia has many repercussions. During radiotherapy, xerostomia is a frequent source of dysgeusia, dentinal hypersensitivity and oral candidiasis. In addition, xerostomia noticeably aggravates the radiomucositis triggered by the radiotherapy, which makes the mucous membranes even more sensitive and inflamed. The effects of xerostomia are felt long after the radiotherapy, as xerostomia interferes especially with mastication, deglutition, phonetics, and digestion. In this regard, it has been shown that xerostomia significantly affects a patient's overall quality of life, particularly for women and young patients who have undergone conventional radiotherapy for an ORL-related epidermoid carcinoma.[9] Rampant caries, periodontal diseases, dysgeusia, and persistent or chronic candidiasis are other late complications of cervico-facial radiotherapy. Several factors contribute to the onset of radiation-related caries, namely xerostomia itself, the development of bacterial flora that are more cariogenic (*Lactobacillus, Streptococcus mutans*), the physical-chemical changes in the saliva (more acidic and more viscous), changes in eating habits, and lax dental hygiene. Radiation-related caries can have a devastating effect on dentition. Patient education, rigorous oral hygiene, the taking of pilocarpine or saliva substitutes, and daily topical fluorine applications (1% neutral sodium fluoride) have a determining role in preventing these caries.

Several studies published in recent years indicate that intensity-modulated conformal radiotherapy allows for limiting the dose of radiation to which the salivary glands are exposed during treatment of ORL cancers. By means of multileaf collimators controlled by sophisticated software, intensity-modulated conformal radiotherapy uses radiation beams of varying intensity that match the morphological characteristics of a tumour, thereby sparing the surrounding healthy tissue, which has definite advantages over conventional radiotherapy.[10,11] Some recent studies enable us to discern that the impact of ionizing radiation on xerostomia can be controlled even more by coupling intensity-modulated radiotherapy with a surgical transfer of the submaxillary gland to the submental region.[12] Along the same lines, taking amifostine, a cytoprotective agent administered by parenteral route, allows for reducing early and late xerostomia in patients undergoing conventional radiotherapy for an ORL cancer.[10] However, the protection conferred by amifostine was not demonstrated in a recent study on patients undergoing chemoradiotherapy (cisplatin and conventional radiotherapy); according to the authors of the study, this finding would be attributable to the fact that the doses of amifostine were probably insufficient.[13] It must be noted in this regard that xerostomia is clearly more severe after chemoradiotherapy than after conventional radiotherapy among patients being treated for cervico-facial cancers because of the radiosensitivity caused by chemotherapy.[6]

Apart from Sjögren's syndrome, several systemic disorders may be associated with a case of xerostomia (see Table 1). Some of these disorders are relatively common in the general population, most notably diabetes mellitus, hepatitis C, and HIV infection. It is estimated that nearly two million Canadian suffer from one of the two main forms of diabetes: type 1 and type 2. Diabetes is characterized by hyperglycemia secondary to a relative insulin deficiency (type 2) or an absolute insulin deficiency (type 1). A recent study shows that about 75% of diabetic patients have xerostomia,[14] which could be secondary to an autonomic neuropathy or an endothelial dysfunction caused by diabetic microangiopathy. A bilateral hyperplasia of the parotid glands and/or the submaxillary glands is often observable under clinic examination of diabetic patients. Histologically, this damage to the major salivary glands takes the form of an acinar atrophy, a fatty infiltration and an accumulation of intracytoplasmic lipid droplets.[14] Despite the marked prevalence of xerostomia and hyperplasia of the major salivary glands among diabetic patients, the literature offers no convincing data that would formally confirm the existence of a hyposalivation caused by diabetes, which raises the possibility that xerostomia is partly subjective or secondary to changes affecting the composition of saliva rather than its secretion.[1]

Hyperplasia of the major salivary glands may be observed in about 4 to 8% of patients with an HIV infection.[2] This hyperplasia is secondary to an infiltration of the salivary glands by CD8 lymphocytes, occurring in conjunction with a diffuse CD8 lymphocytosis that also affects the lacrimal glands, ganglia, lungs, kidneys, liver, and gastrointestinal tract. The salivary glands affected by this lymphocytosis may also be the site of multiple lymphoepithelial cysts (cystic lymphoid hyperplasia) that can sometimes be palpated clinically. The salivary disorders linked to HIV affect primarily children and adults between the ages of 20 and 50. Of the adults, they affect men more often than women, a fact that distinguishes them from Sjögren's syndrome, which is generally observed among more elderly patients. Various studies show, moreover, that salivary function is significantly altered among patients with an HIV infection, and that this impairment is not necessarily caused by antiretroviral therapy.[1] In this regard, it should be noted that the HIV p-24 antigen may be found in the acinar and ductal cells of the lower labial minor salivary glands of patients with an HIV-related salivary dsyfunction.[15] Lastly, several studies confirm that patients with an HIV-related salivary dysfunction are more at risk of developing a MALT-type lymphoma of the parotid gland, as are patients with Sjögren's syndrome.

Sicca syndrome, characterized by the presence of both xerostomia and xerophthalmia, can be observed in a substantial number of patients with a chronic hepatitis C infection. While sicca syndrome may resemble primary Sjögren's syndrome, it can be distinguished clinically and histologically. At the clinical level, sicca syndrome – in the context of chronic hepatitis C – has no particular affinity for women, is rarely associated with the appearance of anti-SSA and anti-SSB antibodies, and has a higher frequency of vasculitis, cryoglobulinemia and hypocomplementemia.[1,2,16], As regards histological changes, they are generally less severe and manifest as a perivascular lymphocytic infiltrate without destruction of

the salivary ducts composed primarily of CD8 lymphocytes.[2,16] The presence of the RNA of the hepatitis C virus (HCV) can be detected by reverse transcriptase polymerase chain reaction (RT-PCR) in the salivary tissue of some patients with sicca syndrome, which would suggest that the HCV has a direct role in the pathogenesis of this syndrome.[17,18] Two other mechanisms could also contribute to the onset of sicca syndrome among such patients, namely molecular mimicry involving a cytosolic protein of the salivary acinar cells and some proteins of the HCV (E1 and E2 proteins), and deposits of immune complexes in the salivary tissue fostered by high concentrations of circulating viral RNA.[17]

Some autoimmune hepatopathies can be associated with sicca syndrome, most notably primary biliary cirrhosis and sclerosing cholangitis and, more rarely, autoimmune hepatitis. Other chronic disorders, such as cystic fibrosis of the pancreas, sarcoidosis, hemochromatosis and Wegener's granulomatosis are possible causes of xerostomia. We note, lastly, that chronic anxiety and depression are relatively frequent but under-estimated causes of buccal dryness.

Conclusion

The differential diagnosis of xerostomia is very wide ranging and includes a number of hereditary or acquired conditions that prosthodontists may encounter in their practices. Some of these conditions are relatively common, such as diabetes, Sjögren's syndrome, rheumatoid arthritis, lupus erythematosus, scleroderma, chronic hepatitis C, depression, and chronic anxiety. When questioning patients, practitioners must also be careful to screen for a history of radiotherapy, chemoradiotherapy, and the use of various anticholinergic and sympathomimetic medications. Xerostomia is a significant source of morbidity among some patients and may have a direct impact on dental and prosthodontic prognosis.

Disclosure

The author declares no competing financial interest and warrants the originality of this article.

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Canadian Academy of Restorative Dentistry and Prosthodontics:

Its Origins, Its History **PART 2**

Académie canadienne de dentisterie restauratrice et de prosthodontie :

ses origines et son histoire **PARTIE 2**

By Dr. Emo Rajczak, DDS

In the inaugural issue of this journal, reference was made to the history and origin of the Canadian Academy of Restorative Dentistry and Prosthodontics and a short biography of one of the co-founders of CARD, Dr. George A. Brass, was presented.

Dans l'Édition inaugurale de ce Journal, nous avons fait référence à l'histoire et à l'origine de l'ACDRP et avons présenté une brève biographie d'un de ses co-fondateurs, le Dr George Brass.

Unfortunately some erroneous information regarding the organizational meeting of CARD was communicated and this author, hat in hand, is obliged to apologize and revise that initial narrative.

As could be expected, the first published history of an organization which originated 44 years ago would be subject to scrutiny and to subsequent correction by charter members. In that context, your humble reporter confesses to great shortcomings in investigative reporting and a faulty memory.

We are indebted to charter member, Dr. Rod Fraser, for some monumental corrections. Being averse to throwing anything away, he searched his files and supplied me with a copy of the original minutes of the inaugural organizational meeting of CARD which took place on Sunday, June 28, 1964, as previously stated, at the Faculty of Dentistry, University of Alberta.

In order to be accurate, it seemed best to include, as an appendix, the minutes of this historic meeting in their entirety, along with its accompanying list of charter members. This is offered to disavow Napolean's definition of history as "a set of lies agreed upon," a crime, of which, neither Harry Rosen nor I want to be accused. Again, through the kindness of Dr. Rod Fraser, we also include a photograph depicting a number of the early members who were present at the 1965 inaugural scientific session of CARD held in Montreal.

In this issue, the other co-founder, Dr. George H. Gibb is profiled. Together, with Dr. Brass, he was instrumental for the establishment of the Canadian Academy of Restorative Dentistry which, in 1992, was united with the Canadian Academy of Prosthodontics to form our present organization. The first meeting of the united organization was held in Halifax, October 28, 29, and 30, 1993 under the presidency of the late Dr. George Scott.

George H. Gibb

Dr. George H. Gibb (circa 1968).

Dr. George H. Gibb was born in 1915, in Hill Spring, Alberta, a small town on the plains of southern Alberta where his father owned a farm and raised wheat and it was there he entered public school. Being a member of the Church of the Latter Day Saints he took his senior matriculation in Cardston, Alberta, which was a predominantly Mormon community. He then entered Brigham Young University in Provo, Utah from 1937 to 1939. He served the customary missionary period to which Mormon young men are committed. Due to a lack of funds in the family he served his mission in Canada rather than overseas. When war broke out he joined the armed services of his country and served from 1941 to 1946 in the Canadian Dental Corps, eventually serving as a supply sergeant. Two and a half of those years were spent in Europe. Perhaps his time with the dental corps was influential in his choosing dentistry as a career.

Upon returning home he re-enrolled at the University of Alberta, receiving his Bachelor of Science degree in 1950 and his DDS in 1952.

He practiced in Medicine Hat for a year where he was chairman of the Medicine Hat Dental Society. Subsequently, he practiced in the town of Vulcan after which, in 1955, he moved to the University of Washington in Seattle, as a full-time clinical instructor where he served under the legendary Dr. Gerald D. Stibbs, also a Canadian, and received from him private instruction in clinical restorative dentistry.

He became a member of the prestigious George Ellsperman Gold Foil Study Club and actively participated until 1959 when he accepted a position with the Department of Restorative Dentistry, University of Alberta, with the rank of assistant professor. In 1957, he became a member of the American Academy of Gold Foil Operators, a national academy formed to promote finer dentistry particularly in the use of gold foil as a restorative material. At that time, he was one of a handful of Canadians to be elected to that important organization.

In 1961, he ascended to the rank of associate professor and became the head of the Department of Restorative Dentistry.

In 1964, along with Dr. Brass he co-founded the Canadian Academy of Restorative Dentistry (CARD). Their motivation in forming the academy was to have it assist in the unified promotion of better restorative dentistry in Canada. It started as a nucleus of only a few teachers from several faculties of dentistry in Canada and grew to a thriving group of over 200 members.

Dr. Gibbs' personal diary contained some notable entries regarding CARD, one of the most significant follows:

June 28, 1964

"Today we had our inaugural meeting of the Canadian Academy of Restorative Dentistry. I was in charge of this meeting, which consisted of a business and organizational meeting in the morning and a clinic period in the afternoon, at which eight dentists, including myself did gold foil restorations. It was an extremely successful meeting all round."

The appended minutes record the important deliberations that were instrumental in establishing the Canadian Academy of Restorative Dentistry.

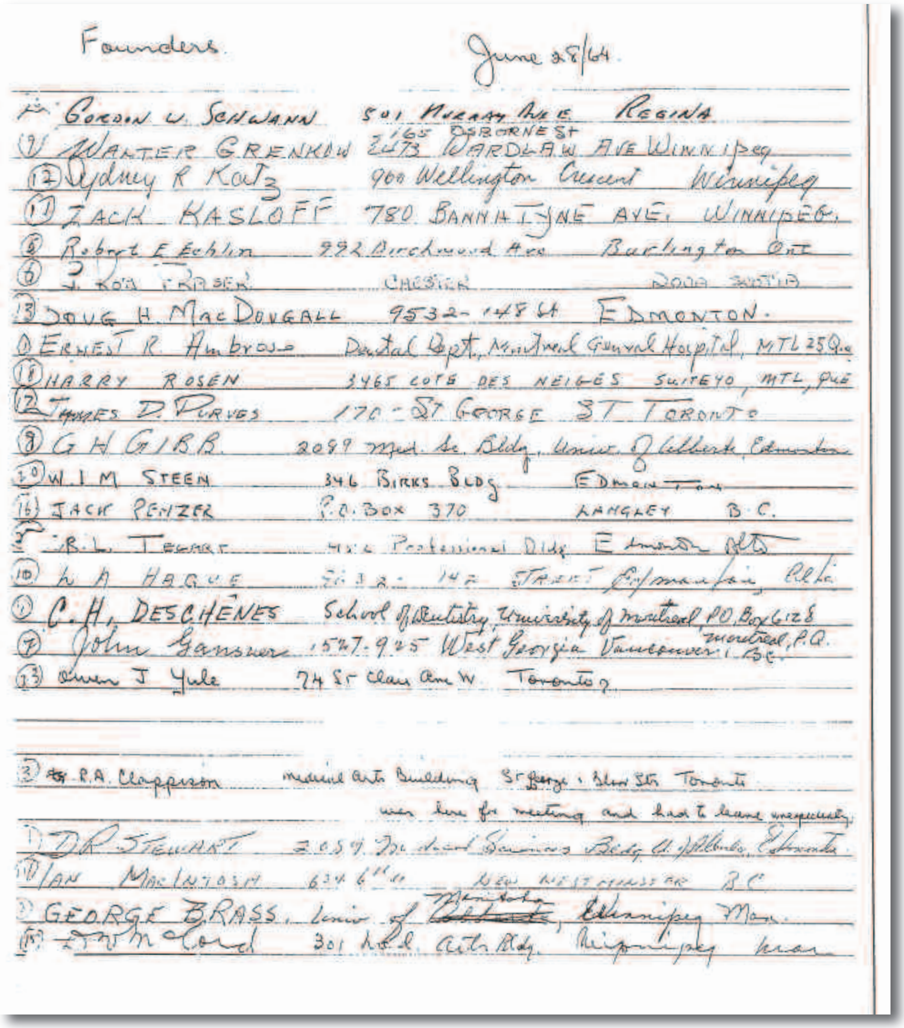
A later entry refers to the historic first annual scientific session.

June 1965

I have just returned from Montreal where I attended the first annual meeting of the Canadian Academy of Restorative Dentistry. It was held at the McGill School of Dentistry under the direction of Dr. Harry Rosen. It was an excellent meeting. The morning was taken up with lectures and the afternoon with clinics. All were excellently done. In the evening we had a dinner meeting at which Dr. George Brass and I were honoured and given plaques for our having founded the Academy. This plaque is now one of my prized possessions."

Together, Drs. Gibb and Brass were responsible for making application to the Canadian Dental Association for a "Specialty" in Restorative Dentistry. Although this did not come to fruition, it helped to set the groundwork for the eventual recognition of prosthodontics as a specialty and the Association of

Dr. George Gibb (left) with his two sons, Dr. Kent Gibb (centre) and Dr. Ronald Gibb (right) (circa 1978).


Founders June 28/64

Gordon W. Schwann 501 Murray Ave Regina
(9) Walter Grenkow 165 Osborne St / 2473 Wardlaw Ave Winnipeg
(12) Sydney R Katz 900 Wellington Crescent Winnipeg
(11) Zack Kasloff 780 Bannatyne Ave. Winnipeg.
(6) Robert E Echlin 992 Birchwood Ave Burlington Ont
(6) J. Rod Fraser Chester Nova Scotia
(13) Doug H. MacDougall 9532-148 St Edmonton.
(1) Ernest R Ambrose Dental Dept, Montreal General Hospital, MTL 25 Que
(18) Harry Rosen 3465 Cote des Neiges Suite 40, MTL, Que
(12) James D. Purves 170 - St George St Toronto
(8) G H Gibb 2099 Med. Sc. Bldg, Univ. of Alberta, Edmonton
(10) W. I M Steen 346 Birks Bldg Edmonton
(16) Jack Penzer P.O. Box 370 Langley B.C.
(2) R.L. Teskey 4x2 Professional Bldg Edmonton Alta
(10) L A Hague [illegible] 142 Street Edmonton, Alta
(1) C.H. Deschênes School of Dentistry, University of Montreal, PO Box 6128 Montreal, P.Q.
(7) John Gansner 1527-925 West Georgia Vancouver, B.C.
(13) Owen J Yule 74 St Clair Ave W Toronto

(3) R.A. Clappison Medical Arts Building St George & Bloor Sts Toronto
was here for meeting and had to leave unexpectedly
(1) D.R. Stewart 2059 Medical Sciences Bldg U of Alberta, Edmonton
(11) Ian MacIntosh 634 6th [illegible] New Westminster B.C.
(3) George Brass, Univ of ~~Alberta~~ Manitoba, Winnipeg Man.
(15) [illegible] McLeod 301 Med. Arts Bldg. Winnipeg Man

Prosthodontists of Canada as the body representing the specialty.

Forever dedicated and always busy, he acted as an examiner for the National Examining Board from 1962 to 1973 and found time in 1965 to organize the Edmonton Gold Foil Society for which he acted as a mentor until his untimely death.

Dr. Gibb was known as a consummate listener to all points of view and was adept at securing a consensus that would advance the greatest progress. Consequently, his presence was invaluable on numerous university committees associated with faculty policies and student curriculum, and also on the Dean's Advisory Committee. In 1976, he was appointed an assistant dean.

Dr. Gibb was a dedicated teacher not only to his students but also he was in demand as a speaker by many dental societies and associations throughout Alberta and Canada.

George Gibb's love of dentistry had to be, not only contagious, but inspirational. He married his sweetheart, Verda Larson and from this union there are four children all of whom have a connection to dentistry. Two sons who became dentists and two daughters, one of whom became a dental assistant and the other became a dentist's wife.

Fittingly, in 1978, he was elected an Honourary Member of the Canadian Academy of Restorative Dentistry, the organization to which he and his friend George Brass, gave birth.

Capping his career, he was elected an Honourary Member of the Royal College of Dentists (Canada) on September 8, 1979, in Quebec City where his friend, Dr. George Brass delivered the citation. Unfortunately, Dr. Gibb, was too ill to attend and subsequently died on October 4, 1979.

In perusing the written memories of George Gibb's colleagues it was abundantly evident that he was a quiet, compassionate man of great dignity who knew how to unite people in a common effort to achieve worthy goals. One of those goals was the formation of the Canadian Academy of Restorative Dentistry, one half of the heritage of our present organization.

In subsequent issues the founders of the Canadian Academy of Prosthodontics, the other half of our heritage, will be featured.

Appendix A:

Canadian Academy of Restorative Dentistry

Minutes of Inaugural Meeting and First Scientific Session

The inaugural meeting of the Canadian Academy of Restorative Dentistry was held Sunday, June 28, 1964 at 9:A.M. at the Faculty of Dentistry, University of Alberta. Dr. George Brass acted as chairman, Present were twenty-three men who had expressed their interest and wish to form such an Academy (see Appendix B).

Following prolonged discussion of the broad terms of reference for the Academy, agreement was accepted, that the sphere of activity of the Academy should be those phases of dentistry where treatment is performed on the teeth for the purpose of retaining the teeth.

Qualification for membership should include a deep active interest in Dentistry and be skillful above the average in the performance of restorative procedures. He must have made previous contribution to the arts and science of the profession, must have attended two meetings and performed either clinically or through the presentation of a paper. This active interest is to be a continuing interest.

At present the size of the organization was left open. The following officers were elected.

President: Dr. Harry Rosen; Vice-President: Dr. Rod Fraser; Secretary-Treasurer: Dr. James Purves; Program Committee: Dr. Harry Rosen and Dr. C.H. Deschenes; Chairman of Constitution: Dr. Jack Penzer; Provincial Representatives: Dr. Jack Penzer (BC); Dr. George Gibb (Alberta); Dr Gordon Schwann (Saskatchewan); Dr. George Brass (Manitoba)

The initiation fee was stipulated as $50.00; the annual fee to be determined at a later date.

The business meeting adjourned to be reconvened in the afternoon where eight

members provided a very stimulation scientific session devoted to "Gold Foil." The following members participated.

Dr. Douglas MacDougall (Class III Foil); Dr. George Gibb (Class III Foil); Dr. John Ganser (Class III Foil); Dr. Jack Penzer (Class III Foil); Dr. Harry Rosen (Class V Foil); Dr Walter Grenkow (Class V Foil); Dr. George Brass (Class V Foil); Dr. Ernest Ambrose (Class V Foil).

Minutes of the Executive Meeting – Monday, June 29th at 8:30 A.M. – Caravan Motel

The following points were discussed and decisions reached.

1. The secretary-treasurer was requested to obtain the necessary stationery including application forms providing a curriculum vitae for each member. A suitable certificate and emblem was to be developed.
2. Members are to provide topics which they would be prepared to offer on an annual program.
3. New members are to become associate members only, to attend two meetings, as such, before acceptance into full membership.
4. The Canadian Academy of Restorative Dentistry has as its ultimate aim, the attainment of the role as a section of the Canadian Dental Association and not the recognition as a specialty group. Through clinicians and published papers it is felt that the programs of future conventions and that of the Journal of the Canadian Dental Association might be succinctly assisted.
5. Dr. Owen Yule was instructed to bring in a recommended constitution to be submitted to the membership at the next meeting.
6. Preliminary discussions regarding a program was made.
7. The executive agreed to meet again in the fall in Montreal.
8. The dates of the next annual meeting will be May 29th and 30th, 1965 in Montreal. The venue to be decided at a later date. It is to be noted that the National meeting begins May 30th in Quebec City.

Appendix B

Chartered Members in Attendance at the Inaugural Meeting of the Canadian Academy of Restorative Dentistry.

Ernest R. Ambrose (Montreal, QC); George Brass (Winnipeg, MB); R.A. Clappison (Toronto, ON); C.H. Deschenes (Montreal); Robert E. Echlin (Burlington, ON); Rod Fraser (Chester, NS); John Gansner (Vancouver, BC); George H. Gibb (Edmonton, AB); Walter Grenkow (Winnipeg, MB); L.A. Hague (Edmonton, AB); Sydney R. Katz (Winnipeg, MB); Doug H. MacDougall (Edmonton, AB); Ian MacIntosh (New Westminster, BC); D.V. McCord (Winnipeg, MB); Jack Penzer (Langley, BC); James D. Purves (Toronto, ON); Harry Rosen (Montreal, QC); Gordon W. Schwann (Regina, SK); W.I.M. Steen (Edmonton, AB); D.R. Stewart (Edmonton, AB); R.L. Tegart (Edmonton, AB); Owen J. Yule (Toronto, ON).

PAST **PRESIDENTS** / **PRÉSIDENTS** ANTÉRIEURS

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

Dennis Nimchuk	2007
Gorman Doyle	2006
Allan Osborn	2005
William H. Sehl	2004
Cary D.L. Letkemann	2003
Brian N. Friesen	2002
Hubert Gaucher	2001
Bernard Linke	2000
Robert J. David	1999
Michael R. Roda	1998
Edward W. McIntyre	1997
Allan R. Mills	1996
Graham G. Matheson	1995
Anthony H. Sneazwell	1994
George K. Scott	1993

Canadian Academy of Prosthodontics

Dennis P.A. Nimchuk	1992
Carl J. Osadetz	1991
David H. Charles	1990
Nasser Dibai	1989
Bruce M. Jackson	1988
Harry L. Gelfant	1987
Emmanuel J. Rajczak	1986
Robert E. Hoar	1985
Andrew Tynio	1984
Michael W. Balanko	1983
Paul S. Sills	1982
Paul Jean	1981
Leon A. Richardson	1980
Arthur H. Irvin	1979
Richard C. McLelland	1978
Francoise Michaud	1977
Herbert Ptack	1976
Douglas V. Chaytor	1975
Georges A. Zarb	1974
W. Brock Love	1973
Jacques Fiset	1972
A. Harris Crowson	1971
Donald Kepron	1970
Jean Nadeau	1969
Alan D. Fee	1968
William G. Woods	1967
Kenneth M. Kerr*	1966
James E. McCutheon	1965
Wilfred D. Clark (charter meeting)	1964
Charles H. Moses	1963
R. Lawrence Twible	1962

Canadian Academy of Restorative Dentistry

Craig Naylor	1992
Ernest R. Ambrose	1991
Leonard L. Kahane	1990
Andrew Tynio	1989
Stanley S. Kucey	1988
Vernon B. Shaffner	1987
Daniel C.T. MacIntosh	1986
Edward J. Abrahams	1985
Berl L. Mendel	1984
J. Ivan Johnston	1983
B. Larry Pedlar	1982
Norman C. Ferguson	1981
E.S. Morrison	1980
Earl V. Gowda	1979
George K. Scott	1978
Owen J. Yule	1977
Robert B. Telford	1976
Robert A. Clappison	1975
Emmanuel J. Rajczak	1974
Walter V. Grenkow	1973
Douglas H. MacDougall	1972
D. Blake McAdam	1971
Sidney R. Katz	1970
Jacques Fiset	1969
William R. Scott	1968
James D. Purves	1967
J. Rod Fraser	1966
Harry Rosen	1965

Can Dental Root Form Implants Be Successfully Bridged to Natural Teeth?

Dr. Dennis Nimchuck, DDS

ABSTRACT

Osseointegrated implants have a high degree of success and can be used in a wide variety of restorative designs.[1–4]The concept of fabricating fixed bridges supported by both natural teeth and implants, however, has been shown to pose certain problems. These problems do not universally occur nor are the reasons well understood.[5–9] Successful clinical applications of tooth-pontic-implant combinations do occur and are not always contraindicated.

RÉSUMÉ

L'ostéointégration donne un taux de réussite élevé et peut être utilisée pour une vaste variété de restaurations.[1–4] Le concept de jumeler des ponts fixes sur des dents naturelles et des implants a semblé toutefois poser certains problèmes. Ces problèmes ne sont pas universels et on n'en comprend pas bien les raisons.[5–9] Des applications cliniques de jumelage de dents naturelles, pontiques et implants sont possibles et ne sont pas toujours contre-indiquées.

Natural teeth are retained to the jawbone by a periodontal membrane that acts as a suspensory and proprioceptive ligament. It is universally recognized that this periodontal membrane attachment apparatus allows a natural root to have a displacement action resulting in a potential stress-absorbing capability and that this type of root displacement or micro-movement commonly occurs, in varying degrees, as a consequence of either functional or parafunctional forces. Integrated root form implants, however, do not have the same capacity for movement since the periodontal membrane is absent. For all intents and purposes integrated dental implants may be considered ankylosed.

Loading dynamics is a complex issue when fixed bridges are made on natural teeth because of different existing tooth root numbers, different root sizes and morphology, different bone location densities and because of different zones of mechanical force applications. These dynamics become even more complex and can become a clinical issue when a movable tooth abutment is connected to a non-movable implant abutment. The primary concern is that when a prosthesis is loaded, displacement may occur at the natural root and cause an implant abutment to accept the brunt of applied loading forces. Several different solutions have been proposed and attempted to compensate for the differential in root to implant displacement. These include: internal flexion elements in the implant abutment connector, telescopic copings that are cemented or are free floating, and the use of internal non-rigid keyway attachments (stress-breakers).

About the Author

Dr. Dennis Nimchuk is a certified specialist in prosthodontics and is in private practice in Vancouver, BC.

The two main problems observed and associated with an implant-pontic-tooth complex prosthesis are:

1. Progressive bone loss at the implant from excessive shear forces being accumulated.
2. Intrusion phenomenon of the natural root. This problem seems to develop particularly when non-rigid connectors are utilized or when copings or telescopes are used with provisional cement or with no cement.[2,3]

The concept of overload as a contributing factor to crestal bone loss is well supported[5] and it is very plausible that root displacement at one end of a bridge may transfer unfavourable load to a non-resilient implant abutment at the other end. The explanation of intrusion phenomenon, however, is less well understood. In the case of telescopes or non-rigid connectors, several explanations have been offered as to why intrusion occurs.[9–13] Some authors propose that the periodontal ligament may atrophy due to disuse or lack of stimulation and the ligament space dimension itself may change allowing a change in the root position. Another is that transfers of micro shockwaves to the natural tooth may happen and may orthodontically intrude the tooth into the socket. In these instances, the principle predisposing factor is the feature of non-rigidity of the bridge connection, which in turn, enables the movement of the tooth. Other possible causes of intrusion have been assigned to the creation of friction between the matrix and patrix of an attachment where occlusal forces depress the tooth and friction between the non-rigid components cause the eventual intrusion of teeth. Similarly, micro-jamming of food particles within the matrix of a keyway attachment may cause a similar intrusion, as impaction of particles will prevent the tooth from rebounding to its original position. In the case of non-cemented telescopes, saliva, plaque, and debris may again induce an action of hydraulic interfacing which may depress the tooth. In the case of using provisional cement with telescopes, cement dissolution and subsequent volumetric changes of the cement interface may have similar rebounding effects causing tooth intrusion.

The prevailing attitude in the profession is to avoid connecting root form implants to natural teeth and this is for the most part a prudent philosophy.[13] There are, however, circumstances where treatment would be much less complex, with much less morbidity and would be much less costly, if implants could be connected to natural teeth without adverse effects. Recent studies in this area have shown that although some problems arise from connecting implants to natural teeth there is a success rate that seems to be encouraging.[14–18]

A Proposal for Management of the Problem

As with many clinical situations, optimized case selection will go a long way to minimizing problems. Disadvantageous mismatching of abutments should be avoided, such as having a small implant in porous bone connected to a weak-rooted mobile tooth in an area of concentrated compressive loading. Abutment resistance to displacement, whether a natural tooth or an implant, at each end of the bridge would seem to be a sensible consideration when contemplating a tooth-pontic-implant prosthetic.

Prudent Concepts of Engagement

(a). The implant abutment should be of substantial size and be in Type I or Type II quality bone, which can optimally withstand an increase in functionally or parafunctionally generated shear forces, which can manifest in this type of hybridized bridge system.

(b). The pontic should be of short span, preferably only a single tooth to minimize oblique and tortional forces on the abutments.

(c). The natural tooth abutment should have superior stability, preferably being long rooted with negligible mobility and in the case of the posterior maxilla being multi-rooted well encased in sound bone to minimize root displacement.

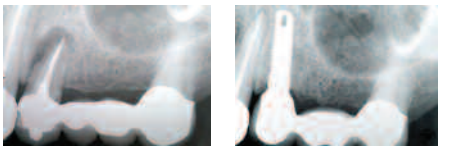
(d). Both abutment connectors should be of a rigid connector design. Non-rigid attachments or keyways should be avoided as they increase incidence of root intrusion.

(e). If telescopes or copings are utilized, avoid using temporary cements and particularly avoid the no-cement coping technique as the absence or loss of a rigid connection will induce the highest incidence of intrusion.

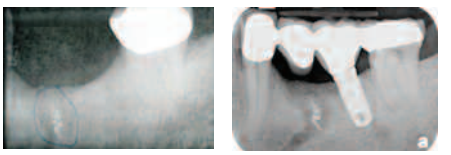
(f). Use highly retentive cements with superior retentive preparation design features at the abutment to resist cementation failures.

(g). Take care to eliminate or minimize unbalanced tooth contacts in excursive movements and in centric contact.

(h). Consider bruxism to be a risk factor and manage bruxism with an anti-bruxism splint, preferably placed on the arch which contains the bridge.



Figures 1a (before) and 1b (after) show the joining of an implant at the 1.4 position to a natural tooth at the 1.7 position.



Figures 2a (before) and 2b (after) illustrate the joining of a natural tooth at the 3.3 position to an implant at the 3.5 position where an additional intermediary implant at the 3.4 position would require the surgical eradication of an embedded foreign body and where the additional implant surgery placement would create a surgical hazard to the unfavourable mental foramen position. In these case examples; the "Prudent Concepts of Engagement" (a–h), have been applied and both restorations proceeded uneventfully with less risk, less time, less morbidity and less cost to the patient.

Case Examples

Figure 1a (before) and Figure 1b (after) illustrate the joining of an implant at the 1.4 position to a natural tooth at the 1.7 position. The placement of an additional intermediary implant at the 1.5 or 1.6 location would require a sinus elevation procedure where there may also be a complication with the sinus lining. This is a situation where the patient would not allow a sinus elevation procedure.

Conclusions

The connection of pontics to natural teeth on one end and osseointegrated implants on the other end has generally been regarded as a condition to avoid in dental restorative treatment planning. While there is evidence of problems, which supports an avoidance of certain types of connected hybrid pros-

thesis, there is also considerable emerging evidence that this type of restoration can be successfully applied.[19–21] Guidelines for the implementation of connecting integrated implants to natural teeth have been described.

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CARDP's Executive has recently concluded a publishing agreement with Andrew John Publishing Inc. The Academy's new Journal will have a circulation of 2,500 and be published three times a year, starting this May, followed by issues in August and December.

Editor – Dr. Hubert Gaucher
Associate Editors – Drs. Maureen Andrea, Emo Rajczak, and Dennis Nimchuk

The success of this Journal will depend on membership editorial contributions. Please consider submitting original articles, reviews, or participating in any of the following areas;

I – **Articles (Original, Reviews, Case Reports):** Please refer to the attached "Instructions to Authors" for details. Due dates are February 26, July 15, and October 30, 2008.

II – **Membership News:** Please forward any news of interest to the profession.

III –**Young Authors Awards Fund:** Financial contributions to this fund will recognize a dentist with 5 years' experience or less in practice and/or a graduate student in Canada, who will receive a $1,000 award for the best published article of the year.

IV – **Dental Student Award Fund:** Financial contributions to this fund will recognize a dental student in Canada, who will receive a $500 award for the best published article of the year.

V – **Section Editors:** Should you wish to serve as a section editor, please contact me and indicate your subject(s) of interest. It is important that a significant number of members become involved to reflect the broadest spectrum of member interests. Section editors for specific fields of interest (e.g., Dental Materials, Occlusion, Oral Biology, Microdentistry, CAD/CAM, Ceramic Restorations, Implant Dentistry) would be submitting articles and/or identifying potential Journal authors/contributors in their respective field.

If you have any comments or suggestions about submissions or would like to become more involved in the Journal, please contact me at:

hgaucher@sympatico.ca
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Fax: (418) 658-5393

Please visit www.cardp.ca for the CJRDP/JCDRP Instructions to Authors.

Demande de communications

Journal canadien de dentisterie restauratrice et de prosthodontie

Le bureau de l'Académie canadienne de dentisterie restauratrice et de prosthodontie a conclu une entente avec Andrew John Publishing Inc. La nouvelle revue de l'Académie aura un tirage de 2500 exemplaires et sera publiée trois fois par année, soit en mai, en août et en décembre.

Rédacteur en chef – Dr Hubert Gaucher
Rédacteurs adjoints – Drs Maureen Andrea, Emo Rajczak, et Dennis Nimchuk

Le succès de cette revue repose sur la contribution de tous les membres. On demande aux membres de bien vouloir soumettre des articles originaux, des comptes rendus ou participer à ce qui suit :

I – **Articles (originaux, comptes rendus, rapports de cas) :** Veuillez consulter le formulaire ci-joint « Instructions aux auteurs » pour plus de détails. Les dates d'échéance sont le 26 février, le 15 juillet et le 30 octobre 2008.

II – **Nouvelles aux membres :** Veuillez nous envoyer toute information pertinente à la profession.

III – **Bourse pour les jeunes auteurs :** Les contributions financières à cette bourse permettront de remettre une bourse de 1000 $ à un dentiste ayant moins de 5 ans de pratique et/ou à un(e) étudiant(e) gradué(e) au Canada pour le meilleur article publié au cours de l'année.

IV – **Bourses pour étudiant(e)s en Médecine dentaire :** Les contributions financières à cette bourse permettront de remettre une bourse de 500 $ à un étudiant ou une étudiante en Médecine dentaire au Canada pour le meilleur article publié au cours de l'année.

V – **Rédacteurs d'une section :** Si vous désirez agir à titre de rédacteur d'une section, veuillez communiquer avec moi et indiquer les sujets qui vous intéressent. Il est important qu'un grand nombre de membres participent pour mieux délimiter la polyvalence des domaines d'intérêt des membres. Les rédacteurs d'une section pour divers domaines (p. ex., matériaux dentaires, occlusion, biologie orale, microdentisterie, CFAO, céramique dentaire, dentisterie implantaire), pourraient soumettre des articles et/ou identifier des auteurs ou collaborateurs dans leur domaine respectif.

Si vous avez des commentaires ou des suggestions à faire ou si vous désirez vous impliquer davantage dans la revue, veuillez communiquer avec moi :

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Veuillez consulter notre site web www.cardp.ca pour les "Instructions aux auteurs" du CJRDP/JCDRP.

Restoratively Driven Papilla Regeneration:

Correcting the Dreaded "Black Triangle"

Dr. David J. Clark, DDS

ABSTRACT

When a clinician faces the difficult challenge of papilla regeneration, there are many options available. In this article, I present a feature case that includes restorative treatment followed by papilla regeneration; a discussion of the pertinent literature is included. This case explores a cost-effective, minimally traumatic, and predictable approach. I then briefly review other traditional treatment modalities that are available to resolve this clinical dilemma, including orthodontic treatment or re-treatment, prosthetic intervention, and microsurgical papilla-regeneration procedures.

RÉSUMÉ

Plusieurs options s'offrent au clinicien qui se voit aux prises avec un cas de régénération des papilles. Dans cet article, je présente un cas de dentisterie restauratrice suivie d'une régénération des papilles, ainsi qu'une discussion sur la documentation pertinente. Ce cas permet d'explorer une approche efficace en termes de coût, marginalement traumatique et prévisible. Je passe brièvement en revue les autres modalités de traitement classiques disponibles pour traiter ce problème clinique, y compris le traitement orthodontique ou la reprise d'un traitement orthodontique, la réalisation d'une prothèse implantaire et une intervention microchirurgicale de régénération des papilles.

About the Author

Dr. David Clark, DDS, is the founder of the Academy of Microscope Enhanced Dentistry, an international association formed to advance the science and practice of microendodontics, microperiodontics, microprosthodontics, and microdentistry. He is a course director at the Newport Coast Oral Facial Institute in Newport Beach, California. Dr. Clark served Clinical Research Associates in the "Update Series" lectures and as an interim Dentist/Researcher from 2005 to 2007.

Dr. Clark authored the first comprehensive guide to enamel and dentinal cracks based on 16-power magnification in the Journal of Esthetic and Restorative Dentistry. *He has written numerous articles relating to minimally invasive dentistry, biomimetic endodontic shaping, and the role of advanced magnification in modern dental practice.*

Dr. Clark has developed new techniques and materials, including the endo-restorative casting; a new shape for the class II composite, the "Clark Class II"; and a matrix and interproximal management system, the Bioclear Matrix System, that promises a real advancement for both bonded porcelain and direct composites. He has helped pioneer the concept of biomimetic micro-endodontics, which is a significant departure from Schilderean shaping.

Figure 1. Preoperative view highlights the failing silicate restorations accompanied by blunted papilla or "black triangle."

Figure 2. Immediate postoperative view.

Figure 3. Six week follow up demonstrates the favourable response of the papilla to restorative intervention.

When a clinician faces the difficult challenge of papilla regeneration, there are many options available. In this article, I first explore a cost-effective, minimally traumatic, and predictable approach. I then briefly review other traditional treatment modalities that are available to resolve this clinical dilemma.

Feature Case

Although the focus of this article is papilla regeneration, the feature case begins as a restorative treatment (Table 1). This case is selected to demonstrate an important principle: Any restorative procedure involving the interproximal area is a candidate for papilla regeneration.

Images 1–3 demonstrate preoperative, immediate postoperative, and 6-week postoperative views. The patient originally presented with failing silicate restorations on the mesial of the upper right lateral incisor and the distal of the right central incisor. This 86-year-old patient requested that the only the one interproximal area be treated, and that the right canine-lateral area could be restored subsequently.

Local anesthetic was administered and rubber dam placed. Figure 4 demonstrates modern non retentive composite preparations with infinity edge margins. A new matrix design, the Bioclear Matrix System™ (Figure 5) diastema closure matrix allows a smooth yet aggressive cervical curvature that facilitates direct composite architectures that are extremely conducive to papilla regeneration. (See Table 2 for a complete Armamentarium List.) This is due to two inherent features. The first feature is the ability to forgo a traditional wedge, and to use the papilla as a wedging force. A traditional wedge would have created a flat cervical shape. Flat cervical shapes lack the static pressure needed to regenerate papillae (Figure 6). The second feature is a complete anatomic shape that permits the clinician to simply remove the matrix after photo polymerization with little to no interproximal finishing.

Table 1

Clinical steps for combined papilla regeneration and diastema closure

1.	Teeth are aggressively cleaned with rubber cup and flour of pumice
2.	Interproximal areas are aggressively sprayed with high pressure sodium bicarbonate.
3.	If defective restorations are present, the affected areas are re-prepared with "saucer preparations." Infinity edge margins are created with coarse and fine diamonds.
4.	Bioclear™ Diastema closure matrices are placed.
5.	Total etch technique is utilized.
6.	Bonding resin is placed but not light cured.
7.	Flowable composite is injected into the cervical area, and then light cured.
8.	Tooth separation is then created with a wedge or Interproximator™.
9.	Bonding resin is placed followed with a small amount of flowable composite then followed with paste composite placement.
10.	Light curing all three components of step 9 together.
11.	Sculpting and polishing. Final polish with new diamond impregnated polisher.
12.	High level magnification throughout the procedure is recommended.

Note: for strict papilla regeneration, steps 3, 6, 7, and 8 are eliminated as the contact area of the affected teeth is already present.

Figure 4. Rubber dam placement is not mandatory but is helpful. The preparations are not "bevelled" per se, instead the correct description is a "saucer" shape with and infinity edge margin.

Table 2

Armamentarium List

1.	Coarse Pumice Sullivan Schein www.sullivanschein.com
2.	Prohy-Jet by Dentsply . www.dentsply.com or Vector unit www.bioclearmatrix.com
3.	Bur kit at Clinical Research Dental wwww.clinicalresearchdental.com or SS White Burs Inc www.sswhiteburs.com
4.	DCUUI or EDCUUI matrix from Bioclear Matrix Systems www.bioclearmatrix.com and Clinical Research Dental 1-800- 265- 3444
5.	37% Phosphoric gel etch-3M Inc. www.mmm.com
6.	Optibond Solo Plus-Kerr Inc. www. kerrdental.com
7.	Filtek Flow flowable Composite-3M Inc
8.	Original Interproximator w/ Handle-Bioclear Matrix Systems
9.	Filtek Supreme Plus paste composite-3M Inc.
10.	Jazz Composite Polishers SS White Burs Inc. or Composite Polishers-Clinical Research Dental
11.	Operating Microscope at varying magnification, 2.5x to 16x-Global Surgical Inc. www.globalsurgical.com

Table 3

Magnification Based Protocol for Margin Evaluation of Porcelain or Composite

Sub	⇠⇢	Plus
Short	⇠⇢	Long
Under-Contoured Emergence Profile	⇠⇢	Rounded Emergence Profile

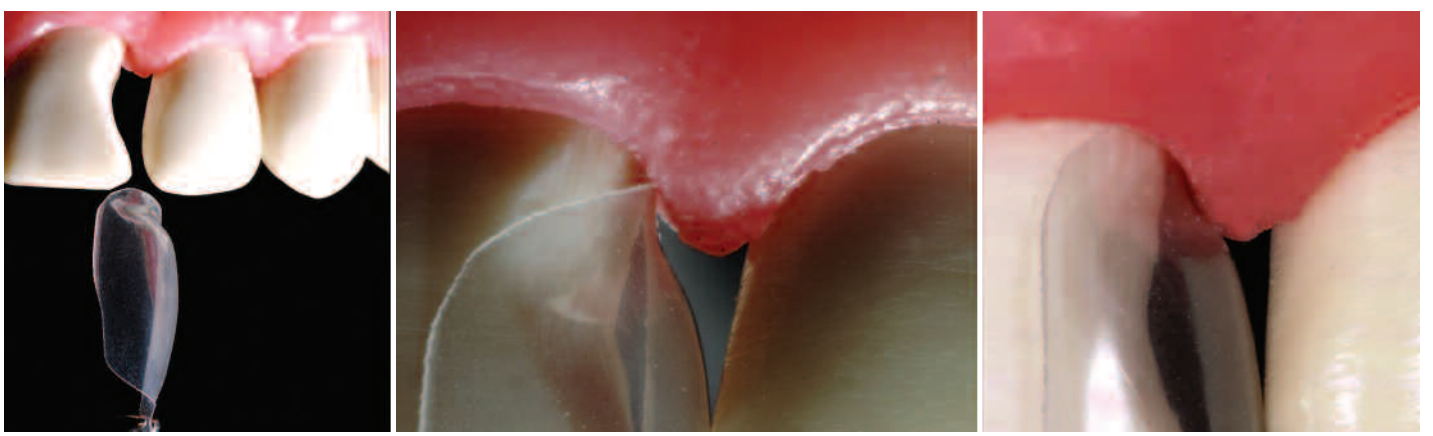


Figure 5. Bioclear matrix with aggressive cervical curvature which transitions rapidly to an anatomic root shape. Although the Mylar matrix is very thin – 75 microns – it holds its form because of various patented features. As the matrix slides into the sulcus the papilla is engaged. The papilla stabilizes the matrix, and the matrix in turn "squeezes" the papilla.

Table 4

Parameters to be Combined with Factors from Table 1 to Maximize the Total Potential for Tissue Health

1.	Residual cement and calculus apical to finish lines
2.	Root roughness from errant bur movements
3.	Micro-roughness and porosities of porcelain or composite
4.	Microleakage

Figure 6. Images from personal library; (Left image) Traditional flat Mylar matrix in position. (Centre image) Traditional wedge in position. (Right image) The result of these traditional composite matrixing techniques. "Black triangle" is the outcome.

Figure 7. Facial view of diastema closure matrices fully seated.

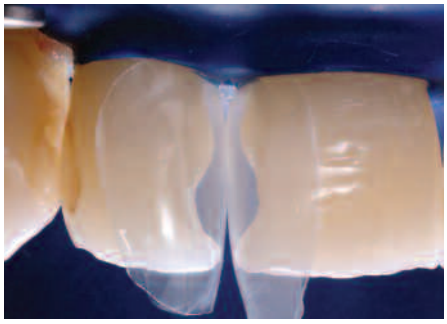


Figure 8. Backlit view of matrices. Gingival edge of matrix is now 3 mm sub-gingival.

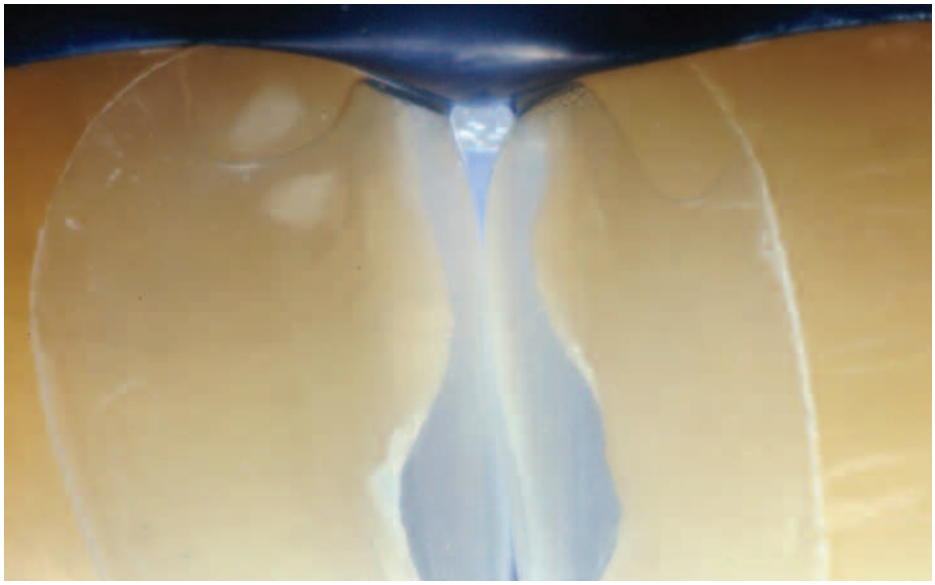


Figure 9. Backlit view of matrices with a drop of water used to lubricate their insertion. Because of ideal adaptation and because their pre-curved shape does not exit the sulcus, bleeding is rare.

When the finish is extremely smooth and there is a lack of a gingival ledge, tissue health can be ideal, even with very round embrasure form. This modern view of cervical curvature is in sharp contrast to the outdated notion that prosthetic and restorative embrasures should be flat (see Tables 3 and 4).

The case continues with both of the matrices are in position (Figures 7–10). Total etch remains as the most robust method when bonding to large enamel areas, especially on uncut enamel (Figure 11).[1] There is no need to stabilize the Bioclear matrices as their patented design makes them self-stabilizing. Alternatively a metal matrix can be utilized but must first be hand burnished and annealed over an alcohol torch (not pictured).

Figure 10. Palatal view showing anatomic features of matrix

Figure 11. Gel etch in use. A finger can be lightly rested against matrices during rinsing, however in this case as in most cases the matrices did not need to be braced during rising and drying steps.

After placing bonding agent, an initial small increment of flowable composite is carefully injected to both teeth to fill this crucial cervical area (Figure 12) (light curing not pictured). Advanced magnification is paramount for this step. Advanced magnification has become the standard for optimal soft tissue response.[2] Flowable composite

Figure 12. (Left image) Initial increment of flowable is demonstrated on simulation model. Note the angle of flowable composite canula, poised to begin injection. (Center image) 2 mm increment is placed and photo-polymerized. (Right image) For demonstration purposes the matrix is removed and the ivorine tooth is partially extruded to demonstrate cervical shape and impeccable marginal integrity.

rather than paste composite is preferred for this first increment. Paste composite would be nearly impossible to place in this "claustrophobic" area without voids and without disturbing the matrices.

We again return to the case. Once the cervical undercuts are established, (Figures 13 and 14) a wedge or Interproximator (Figure 15) is placed to separate the teeth enough to compensate for the thickness of the Mylar.

Figure 13. Initial increment of flowable composite placed and cured.

Figure 15. At this point, a traditional wedge can be inserted to gain tooth separation to compensate for the Mylar thicknesses. However the soft silicone "Interproximator" is used instead because it will not elicit the patient discomfort typical of a traditional wedge as it presses the palatal tissue.

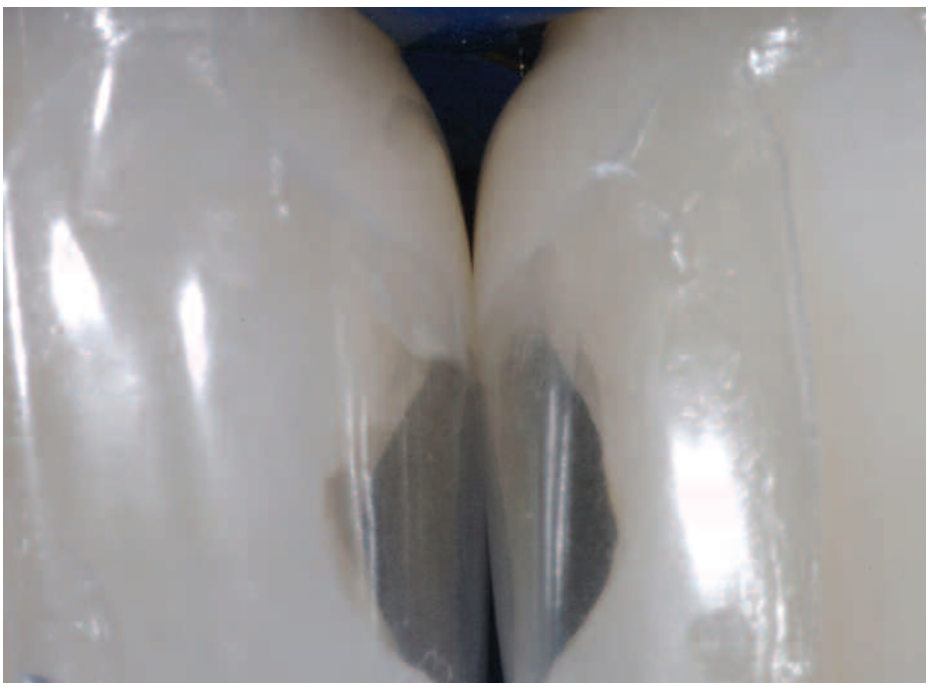


Figure 14. High magnification view of the image in Figure 13.

Otherwise, when the matrices are removed the contact may be open. Once the matrices are removed, the teeth spring back to establish a snug contact. This staged wedging technique has been employed for some time by some of the masters of composite dentistry but is not well publicized.

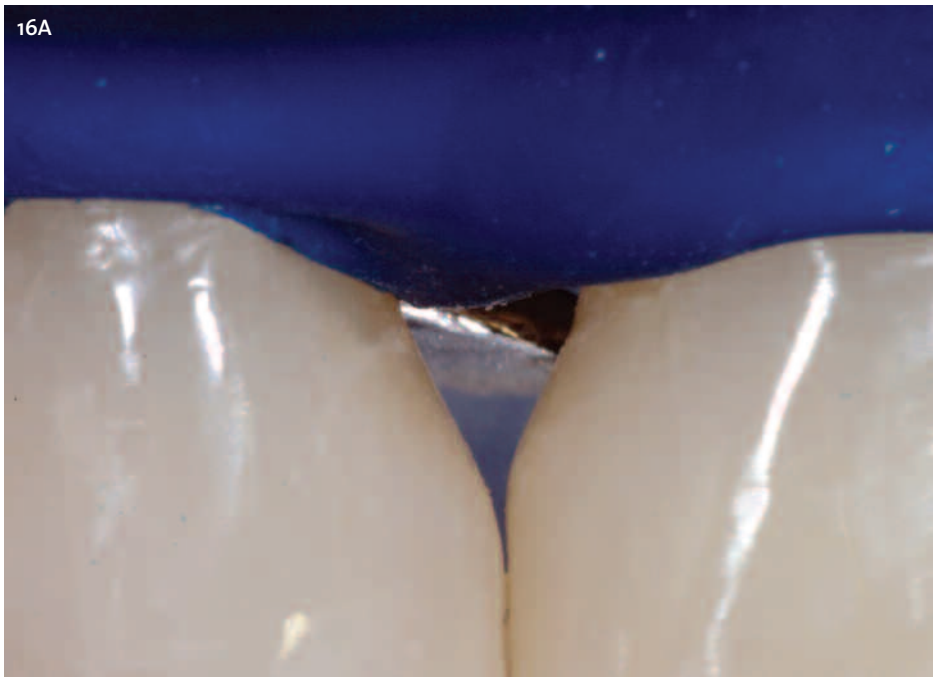
Figures 16A and 16B demonstrate the advantage of anatomically shaped matrices. Once the matrix is removed, the smooth and extremely durable surface is visible. The new goal of composite dentistry is to do little or preferably no interproximal finishing. That is because a "Mylar composite finish" has no oxygen inhibited layer. We have studied extracted teeth under the microscope and discovered that that an undisturbed interproximal Mylar finish stays mirror smooth for years, even decades.

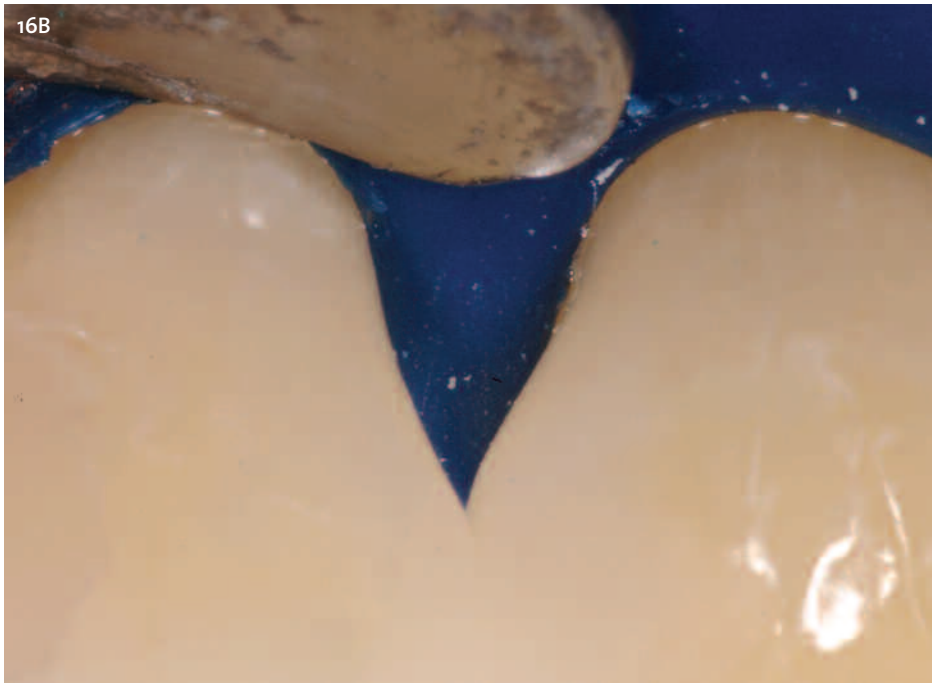
Conversely interproximal areas which were "polished" by the dentist are often gouged, rough and stained.

Literature Review

Tarnow's study[3] has become a standard in calculation of crestal bone to contact area distance when predicting the stable papilla height. His study, based on 288 patients, showed that when the contact point was within 5 mm of the crestal bone, the papilla was present in 100% of samples. When the distance was 7 mm, the papilla was present in only 27% of samples.

In reality there are other important components that will skew Tarnow's 5 mm rule in a favourable or unfavourable direction. There are many factors that determine papilla height. These include root proximity,





Figures 16A and 16B depict high magnification views from facial and palatal views. Notice the untouched Mylar finish in the interproximal.

cervical profile (roundness of clinical crown), distance from contact to interproximal crestal bone height, oral hygiene habits, adult orthodontic treatment, occlusion, host factors, previous trauma, and iatrogenic treatment mishaps. In a classic study, two papillae were surgically excised from 16 dental students.[4] Of the 32 specimens, 22 papillae did not return to their original shape, a startling 69% attrition rate.

Once a clinician becomes aware of the somewhat fragile yet flexible nature of the interdental papilla, the art of regeneration can become more commonplace. The act of squeezing a water balloon (Figure 17) mimics the adaptable nature of interdental gingiva.

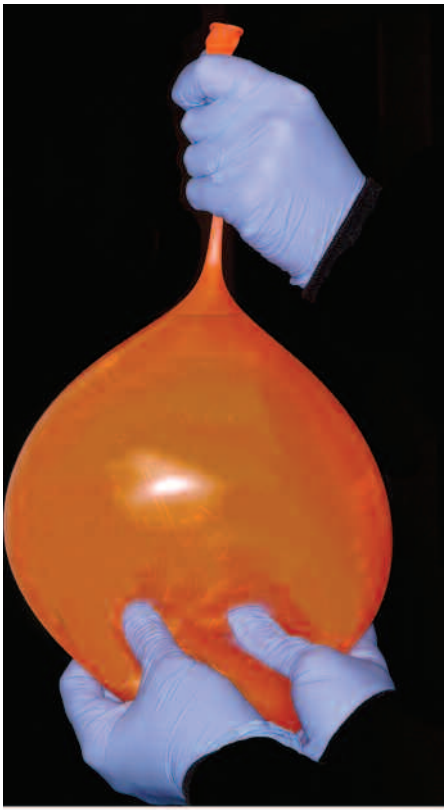


Figure 17. When pressure is applied to certain areas of the water balloon, the balloon simply swells elsewhere. The interdental papilla has a very similar response to the water balloon.

Case Summary

Natural interproximal embrasures are constructed with a wide range of cervical shapes and varying root proximities (Figure 18). Because gingiva adapts to a wide range of shapes, clinicians today can create convenient interproximal shapes if the restorations are smooth and without a sharp marginal ledge. Bridge abutments and exotic implant emergence profiles have aptly demonstrated this clinical reality. Restoratively driven papilla regeneration should become a viable option for all restorative dentists.

Ethics and Diastema Closure

Many esthetic procedures that we routinely provide can actually improve the structural integrity of the tooth and also facilitate better health of the surrounding gingiva. Diastema closure, at least in the anterior sextant, often fails to provide either of these secondary benefits. Sadly, the esthetic diastema closure often results in significant compromises in the root/crown architecture, and increased plaque retention with subsequent deterioration in periodontal health. Increased caries activity often follows.

Tables 3 and 4 highlight a magnification-based approach to the multiple factors that determine the gingival reaction to prosthetic and restorative intervention into the sulcus and peri-crestal zones. You will see that a bulbous contour is far less detrimental than other oft ignored and clinically unseen factors.[2] Any discrepancy greater than 50 microns will cause untoward tissue response. If we are to "do no harm" as we embark on elective diastema closure, we must elevate our game.[5–7]

Traditional Treatment Modalities for Correction of Gingival Diastema (Black Triangle)

Orthodontic Treatment or Re-Treatment

Many adult orthodontic cases are undertaken to correct the problem of crowding. Often times the "unraveling" of incisors will result in a dramatic improvement in the esthetics of tooth position, but with the unfortunate side effect of blunted papillae. The dreaded "Black Triangles" or gingival diastema can be a source of significant patient dissatisfaction and potential litigation.

One option that has been undertaken frequently in the past is to re-treat the case orthodontically. The affected teeth are aggressively stripped in the interproximal areas with lightning strips or with a high-speed hand piece and diamond burs. The dental arches are then essentially collapsed to approximate the roots. Consequently, the inderdental papillae are compressed, similarly to the "water balloon effect" described earlier in the article. Gradually the papillae swell or creep incisally to engage the contact area. The downside? Significant. Orthodontic re-treatment is time consuming, requires multiple appointments, is expensive, with potential compromise in tooth position and arch size. The loss of tooth enamel as the contact areas are stripped can be significant and is irreversible.

Figure 18. Extracted lower molar demonstrates the highly variable and round nature of the cervical portion of most human teeth.

Prosthetic Intervention

Porcelain laminate veneers or full coverage porcelain crowns are a proven successful solution. Occasionally, the act of tissue retraction combined with negative effects of the interim prosthesis can negatively impact the outcome. The reaction of the papilla during this process can be unpredictable. In a worst case scenario the "black triangle remains or worsens.

The potential also exists that the papilla health becomes compromised. Unsightly cyanotic and engorged tissues can be the end result.

Microsurgical Papilla-Regeneration Procedures

Masters of periodontal microsurgery such as Drs. Dennis Shanelec, Peter Nordland, and Adrianna McGregor have demonstrated very acceptable outcomes using a microsurgical papilla-regeneration procedure. However, this incredibly nuanced procedure is beyond the scope of most general and periodontal specialty practices.

Summary

Until now there were very few dedicated tools or techniques for restoratively driven papilla regeneration. Previous attempts at both diastema closure and papilla regeneration using direct composites often ended with significant compromise in periodontal health. The interdental papilla serves as both an esthetic and functional asset, and anatomically ideal interproximal composite shapes can serve as a predictable scaffold to regain this valuable gingival architecture. The reader is strongly cautioned that to attempt this elective procedure using no magnification and without appropriate materials may not be in the patient's best interest, and that non treatment or referral is recommended. This extremely rounded, injection-molded composite filling technique is new. Once again, technological advancements allow changes to perform techniques that were previously unthinkable. Slowly, the profession will change their thought patterns, retrain their hands and minds, and allow this substantial clinical evolution in restorative dentistry.

Disclosure

Dr Clark has a financial interest in the Bioclear Matrix System. He has no financial interest in any of the other products mentioned in this article.

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