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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Laser Dentistry / Dentisterie laser

Special Issue / Numéro spécial

Dental Materials / Matériaux dentaires

VOLUME 2-4
FALL / AUTOMNE 2009

PEER-REVIEWED –
JOURNAL - REVUE DES PAIRS

PUBLICATIONS AGREEMENT # 40025049

ISSN 1916-7520

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VOL. 2, NO. 4 • FALL / AUTOMNE 2009

Official Publication of the Canadian Academy of Restorative Dentistry and Prosthodontics

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CJRDP/JCDRP is published four times annually by Andrew John Publishing Inc. with offices at 115 King Street West, Dundas, On, Canada L9H 1V1. We welcome editorial submissions but cannot assume responsibility or commitment for unsolicited material. Any editorial material, including photographs that are accepted from an unsolicited contributor, will become the property of Andrew John Publishing Inc.

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Individual Copies
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PUBLICATIONS AGREEMENT NUMBER 40025049
ISSN 1916-7520

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Look How Far We Have Come!

The educator, dental student, and practitioner all understand that in dentistry nothing is static. We work in an ever changing environment with new materials, methodologies, and technologies. Some just come and go while others change the face of dentistry forever; however, we are always fighting the same enemy – dental caries and periodontal disease.

Since the "barber-dentists" of the Renaissance there has been a forward motion to expand our knowledge and scientific curiosity. This issue of *CJRDP* is dedicated to dental lasers and is the first thematic issue we have published. The articles review the history, theory, and practice of dental lasers. To imagine that we now have technology other than the drill and scalpel to practice the art and science of dentistry is such advancement.

We learn from Dr. James Jesse the science of laser technology and that the ruby laser was used to vaporize enamel and dentin in 1964. At the turn of the new millennium brought about the first laser designed specifically for dentistry.

Dr. Ron Kaminer discusses the business behind lasers. He rationalizes why this technology has not been utilized fully. With lasers being produced with reduced cost, more access to continuing education, and patient demand, today's dental offices can reap outstanding financial rewards incorporating this technology.

Dr. Robert Miller, a past scientific presenter at CARDP, comprehensively reviews the challenges associated with hard and soft tissue management with respect to dental implants and the proper use of the appropriate laser wavelengths to address these challenges. He concludes that the laser "appears to be ideal in the treatment of the infected implant" and can result in cell proliferation and repair.

A new periodontal protocol LAPAP (laser assisted new attachment procedure) is case studied by Dr. David Kimmel. This simple but effective procedure "tips the scales in favour of the periodontal regeneration." Dr. Kimmel reviews the methodology and benefits of this minimally invasive treatment which is well received by patients.

The use of the soft tissue diode laser for perio-restorative procedures in the anterior maxilla is addressed by Dr. Ernesto Lee. Management of gingival tissue in the aesthetic zone can make-or-break a case and Dr. Lee assesses the benefits of using this laser: hemostasis, operator control, gingivectomies, and pre-impression gingival troughing.

Dr. David Sarver, an orthodontist, illustrates the versatility of the soft tissue diode laser. The ability to create a smile design by idealizing the position of a bracket is made possible in a single visit by adjusting gingival contour.

With the privilege of practicing the art and science of dentistry comes responsibility to this great profession to offer our patients an ideal in tooth form, function and aesthetics. To accomplish this maintaining a harmonious relationship with hard and soft tissues in an environment comfortable to our patients is a skill we all aspire to. The use of lasers in dentistry is applicable to the entire scope of practice and in the end, if we can treat disease, we win!

I would like to give thanks our authors who took time out of their busy schedules to contribute to this issue of *CJRDP*. It is greatly appreciated.

On behalf of your Editorial team and myself, we wish all our readers and sponsors a Happy Holiday Season and New Year!

Dr. Maureen Andrea
Guest Editor

Voyons un peu où nous en sommes?

L'enseignant, l'étudiant et le clinicien comprennent bien qu'en art dentaire, rien n'est statique. Nous travaillons dans un milieu en évolution avec de nouveaux matériaux, de nouvelles méthodologies et technologies. Certains jouent un rôle plus prépondérant que d'autres. En bout de ligne, nous luttons contre le même ennemi – la carie dentaire et la maladie parodontale.

Depuis les barbiers dentistes de la Renaissance, une approche prospective a été adoptée à vouloir élargir nos connaissances et à satisfaire notre curiosité scientifique. Ce numéro du *JCDRP* est consacré entièrement et pour la première fois aux lasers dentaires. Les articles porteront sur l'historique, la théorie et l'utilisation des lasers dentaires. Quel progrès d'imaginer que nous profitons maintenant d'une technologie autre que la turbine et le scalpel pour pratiquer l'art dentaire!

Nous apprenons du Dr James Jesse la science de la technologie laser et que le laser à rubis était utilisé pour vaporiser l'émail et la dentine en 1964. Le premier laser conçu spécifiquement pour la médecine dentaire a vu le jour avec l'arrivée du nouveau millénaire.

Le Dr Ron Kaminer fait part de ses observations sur les lasers et leur rôle dans la pratique. Il nous donne les raisons pour lesquelles cette technologie n'a pas été utilisée à sa pleine mesure. Les cabinets dentaires peuvent maintenant récolter d'immenses gratifications financières en adoptant cette technologie, car les lasers sont produits à coût réduit, l'éducation continue est de plus en plus accessible et les patients en font la demande.

Le Dr Robert Miller qui a déjà fait des présentations scientifiques à l'ACDRP passe en revue les enjeux associés à la gestion des tissus durs et des tissus mous en ce qui a trait aux implants et à l'utilisation adéquate des longueurs d'onde du laser pour cerner ces enjeux. En conclusion, le Dr Miller révèle que le laser semble être idéal dans le traitement d'un implant infecté et peut entraîner la prolifération et le renouvellement cellulaires.

Le Dr David Kimmel fait l'étude de cas d'un nouveau protocole parodontal appelé le LANAP (laser-assisted new attachment procedure). Ce traitement simple, mais efficace fait pencher en faveur de la régénération parodontale.

Le Dr Kimmel passe en revue la méthodologie et les avantages de ce traitement légèrement invasif qui est bien reçu des patients.

L'emploi du laser à diode pour les tissus mous pour les restaurations parodontales au maxillaire est abordé par le Dr Ernesto Lee. La gestion du tissu gingival dans la zone esthétique peut favoriser ou non un cas. Le Dr Lee évalue les avantages d'utiliser ce laser : hémostase, contrôle de l'opérateur, gingivectomie et crevasse gingival pré-empreinte.

Le Dr David Sarver, orthodontiste, illustre la versatilité du laser à diode. La capacité de créer un motif de bande en arc en idéalisant la position d'un boîtier est rendue possible en une seule visite en ajustant le contour gingival.

Le privilège de pratiquer l'art et la science de la dentisterie va de pair avec la responsabilité de cette belle profession à offrir aux patients l'idéal quant à la forme, la fonction et l'esthétique des dents. Pour arriver à cet art que nous aspirons tous à posséder, il faut créer une harmonie entre les tissus durs et les tissus mous dans un milieu confortable pour les patients. L'utilisation des lasers en médecine dentaire est pertinente à toute la pratique. Nous sommes gagnants si, à la fin, nous pouvons traiter la maladie.

J'aimerais remercier nos auteurs qui ont consacré leur temps précieux à rédiger des articles pour ce numéro du *JCDRP*. Nous vous en sommes très reconnaissants.

Au nom de votre Comité de rédaction et moi-même, nous souhaitons à tous nos lecteurs et commanditaires des Heureuses Fêtes et une Bonne Année!

Dr Maureen Andrea
Rédactrice invitée

2010 Journal Issue Announcement

Annonces des parutions du Journal 2010

WINTER ISSUE: Esthetic Dentistry / PARUTION HIVER: Dentisterie esthétique

Contacts: Dr. Paresh Shah shahp@mts.net; Dr. Hubert Gaucher hgaucher@sympatico.ca

Due date for Submissions: February 3rd, 2010 / Soumissions 3 février 2010

SPRING ISSUE: Implant Dentistry / PARUTION PRINTEMPS: Dentisterie implantaire

Contacts : Dr. Ron Zokol: zokol@interchange.ubc.ca; Dr. Yvan Fortin: yvan.fortin@gmail.com; Dr. Hubert Gaucher:hgaucher@sympatico.ca

Due Date for Submissions: May 3rd, 2010 / Soumissions 3 mai 2010

SUMMER ISSUE: Dental Research / PARUTION ÉTÉ: Recherche dentaire

Contact : Dr. Hubert Gaucher: hgaucher@sympatico.ca

Due Date for Submissions: August 3rd, 2010 / Soumissions 3 août 2010

FALL ISSUE: Occlusion / PARUTION AUTOMNE: Occlusion

Contacts : Dr. Kim Parlett: kptooth@muskoka.com; Dr Hubert Gaucher: hgaucher@sympatico.ca

Due Date for Submissions: November 1st, 2010 / Soumissions 1 novembre 2010

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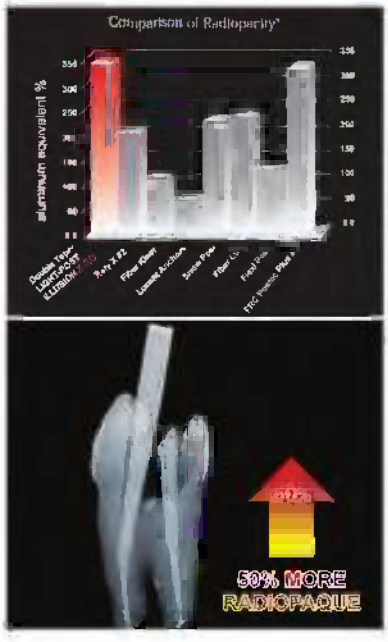

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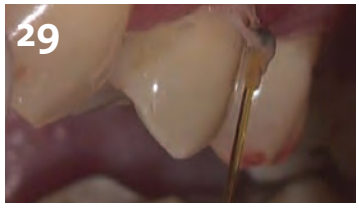
CJRDP JCDRP

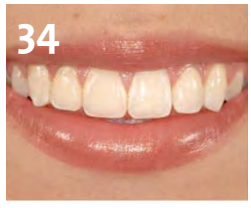
VOLUME 2 • ISSUE 4

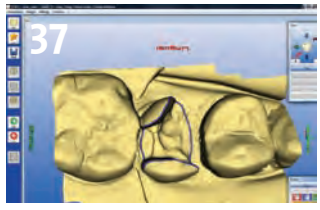
Content/Sommaire

FALL / AUTOMNE 2009

ACADEMY NEWS / NOUVELLES DE L'ACADÉMIE







FEATURES/ARTICLES

Laser Dentistry / Dentisterie laser

INDICATES PEER REVIEWED/
INDIQUE REVUE DES PAIRS

The Canadian Association of Restorative Dentistry and Prosthodontics is proud to introduce its new president, Dr. Vernon Shaffner of Halifax, Nova Scotia

L'Académie canadienne de dentisterie restauratrice et de prosthodontie est fière de vous présenter son nouveau Président : Dr. Vernon Shaffner, Nouvelle Écosse

Dr. Vernon Shaffner

Education: Dalhousie University School of Dentistry, 1969, DDS; Indiana University School of Dentistry, 1972, MsD Prosthodontics.

Teaching Career: Full-time teaching at Dalhousie 1972–1975, Half time 1975–1977, Part time 1977 to present. Associate Professor At Dental Faculty at Dalhousie

Private Practice: part time 1972-1977, full time 1977-2005 and part time 2005 to present

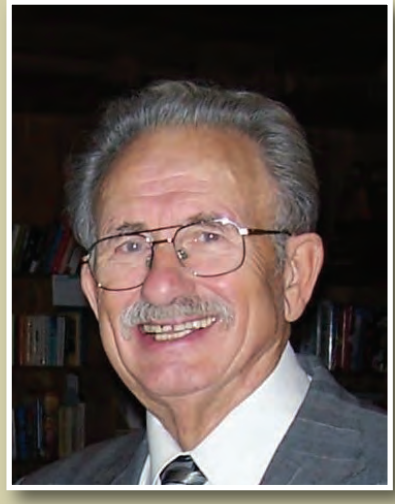
Affiliations: *Membership*; Member, Royal Collage of Dentists Canada; Member, American Collage of Prosthodontics; Nova Scotia Dental Association; New Brunswick Dental Society; Canadian Academy of Restorative Dentistry and Prosthodontics; Canadian Academy of restorative Dentistry (Past President); Association of Prosthodontists of Canada; Canadian Dental Association; Pierre Fauchard Academy.

Family: Wife Dianne, son Jonathan and his wife Kelly and their children Tara, Matthew and Logan; and son Matthew and his wife Melanie and their children Maggie and Hallie.

Hobbies: Skiing, Kayaking, Building cedar strip kayaks, walking the beaches of Nova Scotia.

In Memoriam

It is with great sadness we announce the passing of Dr. Nasser Dubai and Dr. Walter Kowal. Dr. Dubai passed away this past March 2009. While he was not a current member he was the chair for CARDP the year of the amalgamation and many will remember him.



Dr. Walter Kowal

Dr. Walter Kowal, from Toronto, was a CARDP Life/Honorary Member. His daughter Joyce advised of his passing in August of 2007.

Our sincere condolences go out to the family and friends of Dr. Dubai and Dr. Kowal.

JOURNAL NEWS / NOUVELLES DU JOURNAL

From the Editor-in-Chief/ / du Rédacteur en Chef

CONSENSUS at the Montréal Annual Meeting: The *CJRDP/JCDRP* is going Digital!

Consensus au congrès annuel à Montréal: le CJRDP/JCDRP devient aussi numérique!

Dr. Ian Tester, Communication Committee Chair, called to order the Communication/ Journal Meeting with the following CARDP members attending: Executive Committee, Communication Committee, Publication Committee, *CJRDP/JCDRP* Editorial Board, and Andrew John Publishing Inc.

Andrew John Publishing Inc. (AJPI): Mr. John D. Birkby, President, presented a recent industry survey conducted by AJPI indicating that your Journal has been well received and is considered above average compared to other dental publications. All respondents liked the idea of a themed issue along with other topics to be included. Furthermore, a **Combined Conference Program** and **Product Directory** was suggested by industry respondents. Discussions at this meeting resulted in a consensus favouring a fifth issue dedicated to such information for our members and all Annual Meeting participants. The industry also favours an electronic version of the Journal (**e-Journal**) that would be a companion to the printed version. All respondents support both the Journal and the Annual Meeting. All respondents approve of having other "like-minded" organizations recognize our Journal as "Supporting Affiliates" thereby benefiting cohesion in the dental community.

Dr. Hubert Gaucher, Editor, expanded on existing dental e-Journals now available on the Internet and how they function for readers wishing either a full e-version journal subscription or individual articles.

Dr. Gaucher presented a motion to have AJPI launch an e-CJRDP/JCDRP version at the start of 2010. This motion was passed unanimously by all meeting attendees.

In addition, AJPI received support from all members present to launch an **e-*CJRDP/JCDRP* NEWS feature** that would be e-mailed to all readers of the Journal. Each **e-Journal News** capsule would highlight forthcoming topics and authors in the printed version, announce new initiatives/ events from CARDP and from the Journal's affiliate supporters, present related dental news and information that would not be normally be published in the Journal, and offer new products and services available from the industry. AJPI is aiming to start e-News in the first quarter of 2010 and received the full support from all members present.

Dr. Gaucher and Mr. Birkby

***CJRDP/JCDRP* Editorial Board Meeting: Dr. Hubert Gaucher, Editor-in-Chief**, called the meeting to order and thanked Dr. Ian Tester for his initiatives and active working relationships with all members of the academy and AJPI over these many years. Some results of an electronic journal membership survey undertaken recently at the request of its editor were highlighted including the following:

- 87% of the respondents considered the overall design and look of the Journal to be Good to Excellent
- 79% of the respondents rated the overall content of the Journal to be Good to Excellent
- 87.5% of the respondents find the information contained in the Journal useful in their daily practice
- 92% of respondents considered the Journal Same as Most or Better Than Most other Canadian dental journals (i.e., appearance, content quality, value to the reader)

The integral Membership Journal Survey results are accessible on CARDP's Membership Section for all to peruse and to also complete the joined **Membership Journal Contribution Form**. This form allows all members to involve themselves in the Journal's affairs at either the management level, the editorial board level, or as contributing authors. There is something for everyone and all able bodies are called on deck to enjoy the breeze as your Journal sails into the world of the Internet.

In closing, Dr. Gaucher thanked all the editorial board members present, as well as AJPI for their support in publishing the Journal, their team work and dedication to the academy's objectives. He also underlined the important commitment and well appreciated contributions of guest co-editors in the coming issues of the Journal.

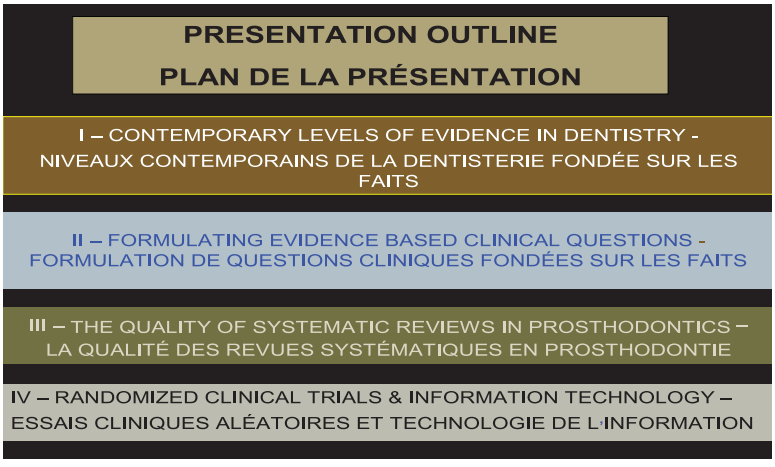
Synergy Between the Journal and the Scientific Program at the Montréal Joint Meeting

Synergie entre le Journal et le Programme scientifique au Congrès conjoint à Montréal

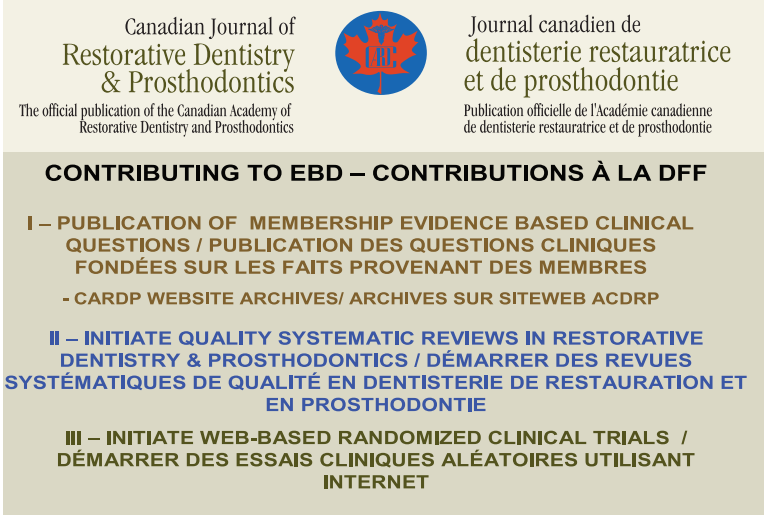
Clinical Trials and Clinical Choices

Essais cliniques et Choix cliniques

The topic of **Clinical Trials and Clinical Choices** (*CJRDP/JCDRP*, Editorial, Vol. 2-1, March 2009) was expanded upon by Dr. Hubert Gaucher, Editor, while presenting at the Scientific Program addressing the theme of "Tomorrow's Dentistry Today."



The Editor of *CJRDP/JCDRP* has formulated the following objectives in support of Evidence Based Dentistry:



This integral PowerPoint presentation can be reviewed on the Journal Section of CARDP'S Website www.cardp.ca

The CARDP/APC Joint Scientific Meeting – Montreal, Quebec September 24 to 26, 2009: A GRAND SUCCESS

Le Congrès scientifique conjoint de l'ACDRP et de l'APC 24 au 26 septembre, 2009 UN FRANC SUCCÈS

By/Par Dr. Chris von Rosenbach

The annual CARDP Scientific meeting is always an event to look forward to. This year was no exception. Under the joint sponsor ship of the Canadian Academy of Restorative Dentistry and Prosthodontics and the Association of Prosthodontists of Canada, the meeting's theme was "Tomorrow's Dentistry Today." The setting couldn't have been more perfect. The sparkling, new Westin Hotel, in downtown Montreal, is just a five minute walk from the beautiful Notre Dame Cathedral, and all the sights and sounds of the old city. The walking tour is definitely to be recommended as a wonderful introduction to historic Old Montreal.

As usual, the pre-meeting activities offered fellowship and fun in a more informal setting. For those who went kayaking on the Lachine Canal, the fun was to be had in an aquatic format. The golfers who didn't manage to avoid the water hazards, had some of the same. For those who couldn't wait for the dental sessions to begin, Dr. Claude Martel presented an informative Hands-On Clinic that addressed the current and future capabilities of the CEREC CAD-CAM technology system. This was certainly a thought-provoking presentation.

The traditional opening reception on Thursday night provided the first opportunity for registrants to come together as a group. With a buffet featuring Montreal smoked meat (served by none other than a carver direct from Schwartz's) set up in the exhibitor's area and a bar conveniently located nearby, conversation started to flow (perhaps not with same majesty as the near-by St. Lawrence River but certainly with the same volume!).

Under the capable guidance of Dr. Robert David, the scientific program got underway on Friday. First up were the team of
Dr. Lesley David (who thanked her dad for her fabulous head of hair!) and Dr. John Zarb speaking on Current Concepts in Computer-Guided Implant Solutions. This very high-quality presentation from two rising stars was followed by one from an established and well-known name, Dr. Pierre Boudrias. Speaking on the topic of zirconia and its application in conventional and implant dentistry, Dr. Boudrias displayed his in-depth understanding of this topic in an excellent session. Then, we were lucky enough to entice Dr. Paulino Castellon north from the

Cajun sunshine of Louisiana. He continued the theme of Tomorrow's Treatment Today with a very informative talk on how new technologies, such as CT guidance, have positively impacted our ability to deliver predictable implant-supported treatments to our patients.

Our next speaker was based in Montreal and came to us from the field of medicine. Dr. Ashook Oommen had his audience spellbound with his very entertaining presentation on living a longer, healthier life. Among his recommendations: eating five carrots per week can reduce stroke risk by 68%; walking daily reduces all cancer risk by 40%; upper body strength training three times per week is crucial for maintaining physical health; and his most popular recommendation (which received an enthusiastic round of applause): regular sex and 1 to 3 glasses of wine (a daily prescription!).

Dr. Stefan Holst, who holds an assistant professorship at the University of Erlangen-Nurenburg, in Germany was up next. As difficult as it was to follow Dr. Oomen, Dr. Holst gave a superb presentation on the impact that new technologies, including conoscopic holographic-based techniques, are having on digital impression taking. He emphasized the team approach between the dentist and dental technician to optimize treatment outcomes with these new technologies. Finishing off the day was our own Dr. Izchak Barzilay, speaking on the maintenance of implants in the face of the many complications that can arise, once the implant supported restoration becomes subject to the rigors of daily use. Many useful tips, based on long years of clinical experience, were shared by this very experienced clinician.

After an evening of enjoying fine meals in the old Montreal restaurant district, the 7 am breakfast meeting for CARDP members was a challenge, but we managed! Afterwards, everyone returned for the next day's presentations, under the chairmanship of Dr. Barzilay. Evidence-based Dentistry was the theme of presentations from our own journal's editor-in chief, Dr. Hubert Gaucher, and from Dr. Chris and Anne von Rosenbach; both of these presentations demonstrated how and why the ability to access and assess underlying evidence is a key skill in providing Tommorow's Dentistry Today. Dr. Francince Albert (also the current president of APC) gave a most enlightening lecture on Anterior Bonded Porcelain Veneers. Her talk emphasized assessing the current literature to support treatment decisions. Dr. Jean-Francois Brochu continued the research-focused theme, as his presentation flowed from computed tomograpy image, to computer-based planning, to the surgery itself. The key concept that emerged from these sessions was how important proper planning and communication are to the ultimate success of every procedure.

Mr. Peter Barry, who has had articles published in our *CJRDP*, gave an informed presentation that focused on the importance of active listening to our communication process. Effective communication allows us to successfully manage our practices and, perhaps most importantly, to successfully present our clinical treatment proposals to our patients. One subject that engages us all is determining when a tooth should be extracted in favour of an implant. The decision-making process was assessed from an endodontic perspective by Dr. Michael Auerbach, and from a periodontal perspective by Dr. Mark Spatzner.

The next speaker was Dr. Fred Muroff, whose presentation focused on the periodontal effects of orthodontic treatment. As many treatment plans involve pre-prosthetic orthodontics, this topic was timely and useful. Dr.'s Bobby Baig and Mario Rotella rounded out a fine morning with a session discussing research on some specific topics: burr-cutting efficacy – use them once; comparing PVS versus polyether implant impression techniques – PVS wins!; the use and misuse of verification jigs; and open versus closed-tray accuracy – use closed trays!

After another excellent lunch, meeting attendees moved to the table clinic area, where 17 excellent small group presentations awaited. Dr. Patrick Arcache assembled a diverse group of presenters, who demonstrated why the table clinic portion remains a perennial favourite at the CARDP meeting.

The sponsors for the meeting were especially supportive this year and special thanks go to Dr. Dennis Nimchuk for the excellent job he and his committee did in arranging very solid sponsorship support for this wonderful annual meeting.

Our learning completed, the only thing that remained was to enjoy the President's Champagne Reception and the Gala Dinner and Dance. Outgoing President Stanley Blum gave a heart-warming and emotional farewell address and introduced our incoming President, Dr. Vernon Shaffner. The band was first rate and, judging from the twirling and whirling happening on the dance floor, a good time was had by all.

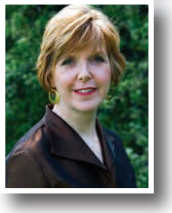
The 2009 CARDP Annual Meeting in Montreal was a great success and testament to the hard work of the members of the Montreal organizing committee, under the capable chairmanship of Dr. Jay McMullen, as well as to the diligence and creativity of our CARDP administrative professionals, David Alexander and Glen Richardson.

Practice Management: "The Amazing Power of Listening"

Mr. Peter Barry, founder of Successful Practice Architects, and past contributor of a series of practice management articles in the initial issues of the *CJRDP/JCDRP* expanded on the theme of "The Amazing Power of Listening (The 21st Century Formula of Success). The resounding success of Mr. Barry's presentation with participants is an indication that we can all benefit from receiving coaching in the area of interpersonal skills in our daily lives as well as for our professional services.

For more information please contact Mr. Barry at peter@practicemastery.com.

Evidence Based Dentistry in a Do-It-Yourself World



Dr. Christian von Rosenbach and Anne von Rosenbach presented the topic of "Evidence Based Dentistry in a Do-It-Yourself World." Their detailed presentation pertaining to successfully conducting a literature search in PubMed was very well received by the participants and offered the working tools necessary for all to support the *CJRDP/JCDRP* endeavours to publish our readers' EBD questions. These presenters have been invited to contribute a series of articles on this topic in order to further acquaint our readers with this most essential and contemporary practice management tool.

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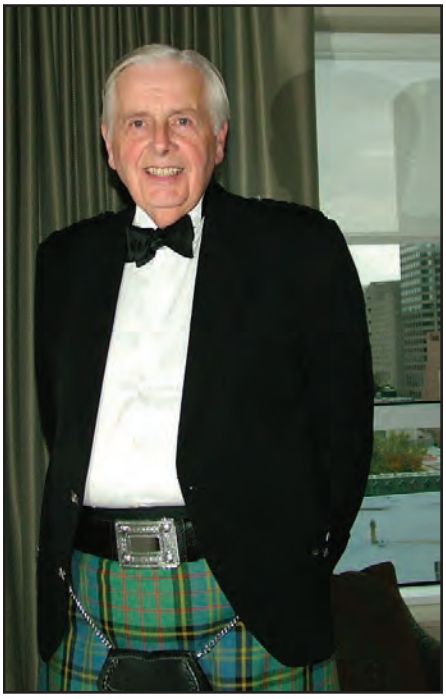

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Alan Miller, President / CEO

Alan, tell us about your background and your interest in the industry.

I have always been drawn to technology and my background in the medical and dental markets is lengthy. For over 25 years, I've been involved in the design and sale of some of the most innovative medical and dental products in the world. Starting at only 18 as an EMT, then at 19 training doctors and nurses on external cardiac defibrillators, and eventually at 21, I was the youngest representative to sell and train physicians on implantable cardiac pacemakers. Eventually, I was introduced to the dental field by my brother who is a dentist. I have been involved with some of the most exciting technologies for dentistry, intraoral cameras, digital x-ray, high speed curing lights, and now, over a decade with lasers.

Will you share with us the process and thinking behind the development of the Picasso laser?

Sure. As you know, Picasso is an amazing soft tissue diode laser! From my years of experience, I took all of the great things from all of the really good lasers out there, spent two years in development, and created a product that truly fits the needs of dentists globally. Picasso is easy to use and has received FDA market clearance for all four of the major functions: surgery, periodontics, root canal treatment, and laser whitening. Picasso is truly portable and it is also really attractive! Having spent so much time with the dental community gave me the knowledge to effectively develop the perfect "brush" for the dental "artist" and that's why we named it Picasso. It is a "breakthrough in technology and a breakthrough in price."

What sets AMD LASERS and Picasso apart or ahead of similar products?

At AMD LASERS, alongside our employees, our customers are our number one asset! We talk to our clients about a complete laser "solution" during their purchase, just not the product. I think this kind of approach ensures that our clients are educated on all aspects of fully integrating Picasso into their practice. We designed Picasso to be easy-to-use, right out of the box, but it has enough features that expert lasers users have been more than satisfied with the ability to vary pulse interval and duration. The ability for Picasso to output to 7 watts has given it a huge advantage to offer all 4 major uses including surgery, perio, endo, and laser whitening. The entire package of Picasso, accessories and training make it the best value in the world. We train each of our global distribution partners on our product and "laser solution" ensuring our product, service and support are offered at the same level as buying Picasso direct.

2009 has been a really difficult year for almost every business, but I understand that your sales have been unbelievable and have even surpassed expectations. Is my information correct?

You know, some people have been shocked that during such an economically unsure time, I would launch a new product. My competitors have steadily raised prices over the years and were content to overcharge for their units and were happy selling just a few lasers here and there. I believed enough in lasers to build in quantity and quality and to put a Picasso in EVERY operatory. I was expecting to sell 2,000 Picasso units in our first 12 months but I grossly underestimated the overwhelming response. The only thing that held us back from becoming the #1 company in the world our first year was production capacity. We should finish the year right at 6,000 units and are increasing production to meet projected sales of 40 - 50,000 units next year. Am I excited at the response? Oh yeah! Putting my life savings into my businesses was risky but it out tobe the best investment ever! The support has been amazing from the industry leaders. Picasso has already been shipped to over 40 countries and we now have an incredible customer base around the world.

"Picasso is truly portable, and it is also really attractive! "

Indianapolis, Indiana seems an unlikely place to build a world class brand like AMD LASERS and Picasso. What was the idea behind making that area of the country your worldwide headquarters?

Indiana has propelled itself into the global bioscience and technology arenas. Being from this area, you realize there are some really great things about building a business here. Centrally located, we can ship to every corner of the globe easily. "Hoosiers" as we are called have a great work ethic and Indianapolis simply has a great cost-of-living. Locating AMD LASERS, National Laser Technology, and ICLE at our state-of-the-art production and training facility reduces our overhead and at the same time increases our output of products and services.

CE FDA

AMD LASERS, National Laser Technology, and ICLE Global Corporate Headquarters

We understand you have just launched a third laser company - International Center for Laser Education (ICLE.) Tell us about this new venture.

After a five year career with one of the major laser companies, I recognized there was a market need for dentists to have a more affordable alternative to new lasers which cost around $80,000, so I started National Laser Technology - the world's largest after-market laser company which services and sells refurbished hard and soft tissue dental lasers for a third of the cost of a new unit. I really wanted to make lasers affordable for every operatory so I started AMD LASERS in 2006 and developed the world's most affordable soft tissue laser. The ICLE was created to offer world class laser certification and training that is ultra-affordable and complements every Picasso purchase. Simple and easy to understand laser training is our key to satisfied Picasso clients. The ICLE offers education in many formats including hands-on, seminars, webinars, and through on-line, and DVD based training.

"I tried many different lasers in my clinic. This is by far the best value and best quality diode laser on the market today."

Arun K. Garg, DMD
Aventura, FL

What about new products? You obviously have a hit a home run with Picasso but are you planning or in the development of other products?

Yes, we are always looking for ways not only to improve on the Picasso experience but are in the research and development stages for some additional products. In 2010, AMD LASERS will continue to lead the world in our quest to equip every operatory with our cost-effective laser technology.

If you were to speak with a dental professional that is contemplating a laser purchase, what guidance would you share with them?

I would have to say that purchasing laser technology is one of the most solid investments a practice can make. Start by using Picasso on simple time and cost saving procedures like laser troughing and gingivectomies. Picasso cuts and coagulates with minimal thermal collateral damage and post-op patients are simply more comfortable and heal faster. Hygienists love Picasso for decontamination and aphthous ulcer treatments.

The AMD LASERS production team ensuring quality control while shipping over 100 Picassos a day.

"Picasso can immensely improve the patients' dental experience."

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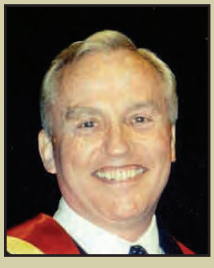

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Textbook Review:

Lasers in Dentistry by Dr. Stephen Parker

Reviewed by Dr. Ron Zokol, Director, Pacific Implant Institute, Vancouver, BC, Canada.

The author designed this publication to be an authorative reference for students and dental practitioners in their early learning curve of laser technology. As such, it is a generic and scientifically founded text that covers the history, safety factors, and clinical applications for the use of lasers in dentistry over the full wavelength spectrum of dental laser technology.

The author is an acknowledged expert in his field having achieved mastership status with the Academy of Laser Dentistry, and having served as its president as well as editor for its *Journal*.

This material in this textbook is generic, giving no special attention to specific products. It provides a succinct history in the evolution of laser technology and its progress within the field of dentistry. The author explains the science of laser technology and the broad spectrum of its application throughout the series of wavelengths in the visible and infrared spectrum. The author uses numerous colour images to illustrate its use in a variety of clinical applications including general dentistry, periodontics, endodontics and implantology.

The simplicity and organization of this textbook makes it a quick and easy read. As such, it does not provide for any comprehensive understanding of the use and application of any specific laser product. The field of laser technology is continually advancing, and there are currently clinical applications actively being used today and speculations in this text. However, this should not deter anyone from reading this textbook if their purpose was to understand laser technology and its potential applications in dentistry.

The book can be ordered from the British Dental Association website at: www.bda.org/shop/bdj-books/.

Laser Dentistry from A to Z

By Dr. James Jesse, DDS

Technology and dentistry have been progressing together with the "idea" of making the dental experience "more pleasant" for the patient and less stressful for the dentist. Anybody who has experiences belt drive to electric high speed will concur.

As dentists we are driven to change for two reasons:

1. For our patients, we want to provide better service.
2. For ourselves, we want dentistry to be "easier," "faster," and "better."

Unfortunately, there is often more emphasis on faster rather than better; however, twenty-first century dentistry can provide both. Laser dentistry has made it possible to improve the patient experience and has improved the dentistry we provide. As lasers continue to evolve, we are able to provide a higher standard of care than ever before.

Laser is an acronym for

L = light
A = amplification by
S = stimulated
E = emissions of
R = radiation

The theory of light amplification by the stimulated emission of radiation was first postulated by Albert Einstein. In 1916, in his treatise, "Zur Quantum's theoric der Strahlung," he developed the theory of spontaneous and stimulated emission of radiation. What is important from his treatise is that, as an atom absorbs a quantum of energy it is pumped to an excited state or higher energy level, Einstein found that electrons have separate energy levels. An electron excited by energy moves to the outer orbit of the atom. When it returns to its natural state a photon of energy or light is emitted. Lasers are devices which gather and harness the light. During stimulated emission an outside source is used to excite the already excited atoms to release stored energy. Here, the excited photon and the released photon stimulate two more excited atoms producing a chain reaction. The end results are photons of identical wavelength travelling in the same direction as well as oscillating together in phase.

Characteristics of Laser Light

Spatial and temporal beam
coherency – laser light is in phase (same time and space).
Monochromaticity – laser light is all one wavelength (the same color).
Collimation – laser light travels in a straight line.

Active Medium of Lasers

Solid State Laser: Active medium is suspended in a transparent crystal. The host material is grown in or "doped" with atoms that will create the desired wavelength – erbium, neodymium, holmium, etc.

Gas Lasers have a hollow tube filled

About the Author
James Jesse, DDS, graduated from Loma Linda University's acclaimed School of Dentistry in 1973. He has been running a private practice in Colton, California for the past 34 years. In addition to his busy practice, Dr. Jesse has returned to his alma mater as an assistant professor teaching applications of the YSGG laser to hundreds of dental students. He is also part time faculty at the Columbia University's School of Dentistry in New York.

Dr. Jesse is an active member of the American Dental Association, the California Dental Association, and the Academy of Operative Dentistry. Dr. Jesse also lectures nationally and internationally, with the Masters of Laser Dentistry group, on various topics including laser application in dentistry and endontics. Dr. Jesse continues to explore and advance new techniques in laser treatments.

He can be reached at jamesjessedds@aol.com.

with the appropriate gas or mixture of gasses – carbon dioxide, argon.

Liquid Dye Lasers have the dye dissolved in methanol or water solvent.

Diode Laser: Semiconductor crystals, pumped electronically.

Lasers have the following advantages:

- The have the ability to seal blood vessels
- They can seal lymphatic vessels
- They can seal nerve fibres
- They can reduce mechanical trauma
- They cause minimal scarring
- They are very precise
- They reduce the need for sutures
- They promote a dry operating field with increased visibility because of little or no hemorrhaging
- They cause minimal post-op swelling
- Clinically, we see a 90% reduction in post-op pain due to decrease in conduction
- There is less damage to non-target tissue
- There is a reduced bacterial count, so you can treat patients at risk with bacteremias safely after lasing bacteria on the surface

Laser Effects on Tissue

Reflection – Laser light is bounced off the surface of the target tissue without penetration or interaction.

Scattering – Individual molecules and atoms take the laser beam and deflect the beam power into directions other than the intended direction.

Transmission – Laser light travels through the tissue unchanged.

Absorption – Atoms and molecules that make up the tissue, convert the laser light energy into heat, chemical, acoustic, or non-laser light energy.

Common Dental Laser Wavelengths

First generation:

- CO_2
- Nd:YAG
- Argon
- Excimer

Second generation:

- Diode

Third generation:

- Erbium:YAG

Fourth generation:

- Er,Cr:YSGG

CO_2 (carbon dioxide) (first generation)

- 10,600 nm wavelength
- Gas laser
- Continuous, gated
- Non-contact
- Used *only* for soft tissue procedures
- Still used in medical applications
- A few models still available in dentistry

Nd:YAG (neodymium:YAG) (first generation)

- 1,064 nm wavelength
- Solid state laser
- Free running pulsed
- Contact/non-contact
- Used only for soft tissue procedures

Argon (first generation)

- 488,514.5 nm wavelengths
- Gas laser
- Continuous, gated
- Contact/non-contact
- Soft tissue, photopolymerization, curing of composite fillings

Excimer (first generation)

- Nm wavelength
- Gas laser
- Continuous, gated
- Non-contact
- Hard tissue procedures

Diode (second generation)

- 800–900 nm wavelengths (830)
- Solid state semiconductor chip laser
- Continuous/gated
- Contact/non-contact
- Soft tissue/LLLT

ER:YAG (third generation)

- 2,090 nm; 2,900 nm wavelengths
- Solid state lasers
- Pulsed
- Contact/non-contact
- Soft tissue, hard tissue

Er,Cr:YSGG (fourth generation)

- 2,780 nm wavelength
- Solid state laser
- Pulsed
- Contact/ non-contact
- Soft tissue/ hard tissue

Important Dates in the History of Dental Lasers

Early 1900s

Einstein theory and Bohr's theory are the first major developments in lasers.

MASER in 1950s

Microwave Amplification by Stimulated Emission of Radiation (MASER). This was the first device to put Einstein and Bohr's theories to the test.

1960

Theodore H. Maiman produced the first ruby laser by inserting a ruby rod into a photographic flashlamp.

1964

Townes, Basov, and Prokhorov receive the Nobel Prize for the development of the laser. Stern and Sognnaes used the ruby laser to vaporize enamel and dentin.

1966

Leon Goldman used the laser clinically on enamel and dentin. Goldman, Stern, and Sognnaes are recognized as the first to use lasers on tooth structures. One of their findings was that the heat build-up in teeth generated by early continuous wave lasers caused damage to the pulp.

1989

Introduction of the first true dental laser, the erbium:YAG laser, which was imported to dentistry from plastic surgery.

Formation of first laser company for dentistry (American Dental Laser)

2000

Introduction of the Er,Cr:YSGG laser, only wavelength designed exclusively for dentistry.

The Benefits of Lasers

Almost all dental specialties can benefit from the use of lasers on a daily basis.

In restorative dentistry I use the laser for CL-I – CL-VI cavity preps mostly without anesthesia. I use a laser instead of packing cord to trough before every crown impression. It is faster and less traumatic for the patient. In surgery, I use a laser for all incisions. The patients have less bleeding, which allows me a much clearer view of the surgery site, and less post-op discomfort. Tissue contouring is also easier and more predictable with a laser than a blade. As well, periodontal treatments are now less invasive and the outcomes clinically are improved.

There are special "tips" for endo that have the potential to dramatically change the way

traditional endodontics are performed. We see better debridement and sterilization with a laser.

All patients love the idea of no injection if there is no pain. Most patients accept local anesthetic because the alternative is usually horrific. With lasers I am able to perform better dentistry faster, a win for the patient and a win for me.

As dentists, we should be guided by the compass not the clock. All too often, we don't change because our main concern is time and not quality. With the goal of being minimally invasive, a laser in the dental operatory is one of my "no brainers."

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Lasers:

Financial Freedom or Financial Disaster?

Ron Kaminer, DDS

Dental lasers, like all forms of technology, go through a cycle of events before gaining acceptance for everyday use in daily practice. The early adopters, like me, represent a core of practitioners that want to be the first, the leaders, in incorporating new technology into their practices. They are willing to go through the bumps and bruises as long as they are the first ones on the block to practice with this device. Once the early adopters have bought up the technology, sales for companies become quite slow and sales tactics often become somewhat shady. The next groups of dentists need to carefully evaluate the technology to rationalize its purchase. In this brief review, we will try to decipher the dental laser mystery, and hopefully clarify how this piece of technology is a must have, which will change the way you practice.

Lasers can assist the practitioner in performing a wide variety of procedures. The laser's properties are wavelength dependent and no one laser can do everything very well. Hence, it is not surprising that many "Laser" dentists have multiple

About the Author

Ron Kaminer maintains two practices in Hewlett and Oceanside New York. He has been using lasers for over 20 years and currently has diodes, ErCrYSGG, and Er/NDYAG lasers in his practices He has lectured internationally and nationally on various topics including laser dentistry and minimally invasive dentistry. He is a clinical consultant for numerous Dental companies, including, Ultradent, GC America, Lares USA, and Fotona. He can be reached at whitertth@aol.com.

lasers in their practices. To clarify the dental laser mystery, we can divide lasers into two categories: soft tissue lasers and hard tissue lasers.

Soft tissue lasers can be the least expensive way that dentists can get involved with laser technology. The most common soft tissue laser is the diode laser. Its wavelength falls in between 810 and 1064 nm, and its energy is absorbed by pigment and hemoglobin. These lasers cut soft tissue very well, are good coagulators, and are easy to learn how to use. These lasers cost between $3,500 and $15,000 with little variation between the least and most expensive models. Because of their relative low cost, diodes are the most common form of lasers seen in daily practice today. NDYag lasers are lasers that cut soft tissue very well, and have been extensively studied for the treatment of periodontal disease. They cost approximately $60,000, but can do many things a diode cannot do.

Hard tissue lasers can be divided into two wavelengths, ErYag, and ErCrYSGG. Both work in similar fashion and their energies are absorbed by water and hydroxyapatite, with wavelengths falling in the 2760–2940 nm range. These lasers can cut hard and soft tissue very well, making them very versatile tools for the general practitioner. They represent the most expensive class of dental lasers, with prices approximately $80,000. One company has actually bundled an NDYag and an ErYag into one unit, making it the most complete all around laser in dentistry today.

As previously mentioned, lasers are not an inexpensive piece of technology. In order not to have buyer's remorse, one must carefully evaluate if the laser will add something, some way into the practitioner's daily routine. With the recent addition of an inexpensive diode laser into the market (under $5, 000), the dentist can add an incredible tool into their daily routine with little financial risk. Even so, lasers must fulfill one of two criteria to justify their expense. They either must make your life easier in your daily routine or allow you to provide care to your patients above and beyond what could be achieved by traditional means. Diodes allow you to abandon the packing of cord for impressions, allow you to treat and contain minor periodontal conditions, and allow you to excise soft tissue with minimal anesthesia and post-op pain. Diodes actually fill both criteria, making them a must have in today's practice. Their inexpensive cost breaks down the usual financial barrier involved in the decision-making process. I predict that over the next five years, diodes will become a staple in every dental office.

NDYag lasers are a far more expensive option with one major advantage over diodes; NDYag lasers can effectively treat periodontal disease with results rivalling traditional means. The major difference is NDYag periodontal surgery removes the diseased tissue and allows the body to heal naturally from the inside out. Scientific studies confirm its effectiveness. As the procedure requires no sutures, it is far less invasive than conventional surgery, with minimal bleeding and post-operative pain. Patients when given an option, almost always choose laser surgery over traditional means. With price tags over $60,000, the practitioner must evaluate if he/she does or will treat periodontal disease in their practice. Laser-assisted periodontal surgery, can add a tremendous amount of money to the bottom line of a practice. Fees for these procedures are typically 2/3 to 3/4 of the fees of what the specialist would charge and since these patients are placed on three or four month recall, the hygiene department gets a boost as well. These lasers also fulfill both previously mentioned criteria and in the right practice make a tremendous investment that will lead to financial success.

Hard tissue lasers are the most expensive option of the one's being discussed. They allow the practitioner to perform a wide variety of procedures. Routine restorative can usually be done without anesthetic, and minor soft tissue procedures can be done with only topical anesthetic. Periodontal, endodontic, and oral surgical applications make this laser very versatile with everyday use. Patients love this high-tech option of having their teeth fixed. The newest hard tissue lasers have drilling speeds that rival traditional high-speed hand pieces. One company has created a laser that has an NDYag and an ErYag in one unit. With just the touch of a button, the dentist can switch between wavelengths, maximizing the benefits of each. The ErCrYSGG or the combo ErYag/ NDYag laser costs in the vicinity of $80,000; however, this price point tends to scare off some dentists, regardless of the laser's benefits.

Lasers in general represent outstanding investments in our practices. One must look past cost and focus on return of investment, to really appreciate this technology. Return of investment can be broken down to financial and emotional. Will the laser make me more money? Or, Will it make my day go better? are both valid reasons to own a laser.

By using diode lasers to treat minor periodontal conditions, we can add a bottom line profit to our practices. By using diodes to trough around tissue, we eliminate the aggravation of packing cord and even the occasional bleeder when we pull the cord. Diodes are an essential option in every practice and with the addition of a low cost diode, the financial barrier to purchase is essentially removed.

NDYag lasers can add a tremendous amount of money to the annual gross of a practice. With the typical cost of laser-assisted periodontal surgery being approximately $4,000 for a full mouth of treatment, just doing one case per month will add almost $50,000 to the bottom line and pay for the laser in just 18 months. Add to that an additional 24 re-care appointments per year (assuming the patient was already going twice per year), with an average fee of $100, the potential return of investment of owning an NDYag laser is $52,400 for the first year.

ErYag and ErCrYSGG lasers, when utilized appropriately can also add a tremendous amount of revenue to the bottom line of any practice. The hard tissue laser allows dentists to be more productive per visit due to the need for little to no local anesthetic. Adding procedures such as closed crown lengthening, gingivoplasty, and other minor soft tissue procedures all add tremendous amounts of money to annual gross. The combo ErYag and NDYag laser allows the dentist all of the benefits mentioned above, plus adding laser assisted periodontal treatment for additional financial benefits. Most dentists report a six figure increase in their income once this laser is incorporated into their daily routine.

The integration of lasers in today's dental practices has been slow. High costs, lack of information for the dentist, and pure fear of the technology has kept many dentists away from lasers. Slower sales, causing company sales person turnover, further contribute to the dentist's apprehension of adding this technology into their practice. Passionate early adopters have begun to teach laser "newbies" on the benefits of dental lasers. There is more continuing education available on lasers than ever before. New owners need to get proper training to fully utilize their lasers. Once trained, the dentist will use the laser multiple times every day and with everyday use, buyer's remorse will

never exist and financial rewards will always be achieved.

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LASER DENTISTRY / DENTISTERIE **LASER**

The Use of Lasers in Oral Implantology

By Robert J. Miller, MA, DDS, FACD, DABOI

The desire to find a laser applicable for dental procedures began shortly after the first operational ruby laser was demonstrated in 1960.[1] The challenge for laser engineers has been to balance the effects of directed light energy on both hard and soft tissue. Laser interactions with both types of tissue tends to be wavelength specific. Each wavelength may target specific tissue components such as melanin, hemoglobin, hydroxyapatite, or water containing tissue.[2] Parameters such as pulse duration, repetition rate, and fluence become variables in how a wavelength reacts with its specific target tissue.[3] Laser interactions with gingival and biocalcified tissues have been studied using a variety of different wavelengths and altering laser parameters. Most soft tissue lasers, whose target tissues may be melanin, hemoglobin, or water, have limited usage in cutting biocalcified tissues.[4]

The affinity, or lack of affinity, of a laser for water becomes an issue in terms of a lasers ability to effectively cut, ablate, or coagulate tissue, and is a factor in the laser's depth of penetration into soft tissue. Too much affinity for water is not desirable because the laser will not penetrate tissue deep enough to seal off capillary beds and the lymphatic system. Too little affinity for water can result in deep tissue penetration leading to tissue necrosis and, in the case of implant dentistry, unpredictable tissue response and healing.[5]

Oral implantology is a multi-modal discipline and represents the confluence of all of the specialties of dentistry. The complexities in treatment planning cases involving den-

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tal implants and the manipulation of soft and biocalcified tissues represent the greatest challenge in dentistry. When we add to that the use of biocompatible implanted devices, the challenge of finding appropriate laser wavelengths becomes that much more critical. Lasers may be used to supplement or entirely replace the use of traditional cutting instruments for implant placement, compress the wound response, enhance implant esthetics and sculpt emergence profile, implant maintenance, and repair of the ailing implant.[6]

Laser Types

Several types of lasers have been tested regarding their applicability to oral implantology procedures. The laser types evaluated include Nd:YAG, Ho:YAG, GaAlAs, CO_2, Er:Yag, and Er,Cr:YSGG.[7] The procedures may be broken down into three major areas; osseous, soft tissue and treatment of the implant surface. Laser effects may be further broken down to those in vaporization versus ablation modes. In vaporization mode, the primary effect is thermal interaction with tissue. If the temperature rise is significant, permanent alteration of the implant surface may occur. If the laser in used in ablation mode with a water coolant, a hydrokinetic effect may be observed with relatively insignificant temperature rise.[8] With the exception of treatment of the implant surface, laser interactions with soft and hard tissue are more widely reported and extensively used.

Implant-Related Laser Procedures

The earliest use of lasers in oral implantology involved soft tissue manipulation.[9] In a typical two-stage implant placement, the implant is placed at the osseous crest and then covered by soft tissue during its integration phase (Figure 1). At the secondary surgery to expose the implant, the tissue immediately covering the implant cover screw is removed to allow placement of a healing abutment, impression post, or final abutment for temporization. Typically, this surgery is accomplished using a scalpel or tissue punch that approximates the outer diameter of the implant. This necessitates the use of a local anesthetic for patient comfort and hemostasis. The use of a laser to perform the second stage obviates the need for an anesthetic and creates hemostasis at the implant site. This procedure is carried out by first locating the center of the implant cover screw with a periodontal probe or explorer. A topical anesthetic may be used if the exact position of the implant is not readily apparent. The laser is then used to expose the center of the cover screw and then, in a widening circular motion, the full diameter of the implant is exposed.[10] This procedure may only be carried out if there is adequate attached gingival (Figure 2). If the implant exposure will be outside of the zone of attached gingiva, a standard surgical approach is suggested to apically reposition tissue to ensure that the implant will have adequate tissue coverage. If this is not done, a secondary soft tissue graft procedure may be necessary with less predictable results. It is critical not to use a laser system that has a high thermal effect. If the laser cuts in vaporization mode, the cover screw may fuse with the implant body making it unusable. It may also alter the polished collar or neck region, resulting in gap formation at the implant/abutment interface, with resultant bacterial percolation, or soft tissue problems as a result of pitting and increased bacterial colonization.[11]

Figure 1. Two-stage implant healing with complete soft tissue coverage.

Figure 2. Second phase uncovering of integrated implant using the Er,Cr:YSGG laser.

Laser procedures may also be employed after exposure of the implant. These procedures include gingival recontouring to create harmonious gingival architecture for emergence profile of the implant crown and parabolic sculpting for ovate pontic areas of the implant restoration.[12] These soft tissue modifications may also be carried out with no anesthetic and immediate hemostasis. The degree of tissue ablation and depth of cutting can be altered by changing the power setting on the laser unit, defocusing the laser beam, or a combination of both. Again, it is critical not to use a laser that may cause thermal changes to the implant surface or necrosis of soft tissue.

Soft tissue esthetics and stability is dependent on a number of variables and can be researched in great depth from the periodontal literature. The most important parameter in predictable soft tissue profile is the creation of parabolic osseous contours. In the edentulous ridge, or following implant placement, parabolic architecture is often lost. We know that regrowth of the dental papilla is dependent on corresponding interproximal osseous support that mimics the soft tissue profile.[13] Traditionally, rotary cutting instruments or hand chisels are used to create this parabolic architecture. Lasers, cutting in ablation mode, can accomplish this task. Lasers that cut in vaporization mode may cause coagulation, charring, or burning of bone.[14] This effect may destroy osteocytes and denature growth factors which are responsible for bone growth and maturation, thus delaying healing and causing unpredictable tissue contours. Studies have shown that osseous procedures that can be carried out using lasers include ridge recontouring, creation of parabolic architecture, decortication of bone during graft procedures, bone harvesting, removal of pathology, and lateral window creation for maxillary sinus grafting (Figure 3).[15] As with soft tissue surgery, the depth of cut may be controlled by altering the power setting or distance of the laser tip from the surface of the bone.

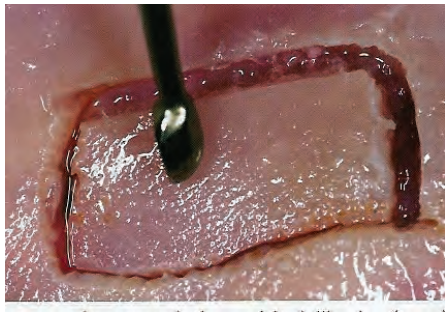

Figure 3. Preparation of lateral wall window for sinus grafting comparing rotary instrumentation (superior, right) and laser ablation (inferior, left).

(Reprinted by permission - Dr Hans-Joachim Roos; Memmingen, Germany.)

With regard to decortication of bone and harvesting of cortico-cancellous block grafts, the laser is used in a manner that is consistent with rotary cutting instrumentation. By using the laser in ablation mode, and thereby minimizing thermal effects, healing is faster and there may be less post-operative discomfort following surgery. Removal of pathology, which may include apical granulomas, cysts, retained roots, or foreign bodies, may be accomplished with far less bone removal than with traditional instrumentation. In addition, certain lasers may have a bacteriocidal effect at the surgical site.[16]

Care of the implant patient does not end following implant placement and reconstruction. Maintenance of the implant patient and treatment of soft tissue or osseous lesions around implants are critical for implant success. With respect to maintenance of the implant site, we know that implants may suffer from the same disease process as natural teeth.[17] This peri-implantitis may be only a soft tissue problem, or it may be a combination of soft and hard tissue problems. A concern during the maintenance procedure is the potential for scoring the implant abutment or prosthesis. Traditional hand or ultrasonic instrumentation cannot be used on metal because of the risk of roughening the surface. This may lead to increased plaque and bacterial build-up and make it more difficult for patient home care. The peri-implant attachment is, at best, a weak hemi-desmosomal attachment and is easily violated.[18] This makes traditional maintenance procedures less than ideal for implant sites than for natural teeth. The erbium-based laser systems seem to be ideally suited for debridement of the implant surface. Plaque and calculus are easily and definitively removed from metal surfaces without any thermal effects. Lasers settings are generally kept on soft tissue parameters and the laser tip used in a defocused mode. A balance must be maintained between the ablative effects on implant contaminants and the potential for soft tissue changes around the implant. Using the laser in defocused mode will generally protect the soft tissue while debridement is carried out. Alternatively, there may be sites where the patient's home care is adequate, with little or no peri-implant build-up, and soft tissue inflammation and supra-bony pocketing may exist. In this case, an ablative technique is not indicated. Several different laser types have been evaluated for use within the gingival pocket.[19] The bacteriocidal effects of pulsed laser light may result in decreased pocket depth and reduced collagenase activity, thus allowing reattachment higher up on the implant surface.[20]

If the peri-implant disease process is more advanced, and there exists an osseous component to the lesion, an entirely different approach must be employed. Bacterial colonization of the roughened surface or bioactive coating of the implant cannot be treated by conventional maintenance procedures (Figure 4).[21] Treatment of the combined defect by laser treatment of the periodontal pocket may achieve symptomatic relief of bleeding and soft tissue edema, but this is not definitive treatment of the lesion. In this case, flap surgery must be used to expose the implant and surrounding osseous lesion. Traditionally, granulomatous lesions have been removed using a variety of techniques. Early techniques employed hand instrumentation and ultrasonics. This results in incomplete removal of infected tissue and alteration of the implant surface. This generally produces a fibrous interface rather than reintegration of the implant. The next generation of treatment modalities involved the use of tetracycline paste and citric acid (40%, ph1).[22] Tetracycline may only be used on a non-coated implant and while it has an anti-bacterial effect, it may interfere with the calcium-phosphate bond of bone. This will actually delay osseous healing. Citric acid is used on both titanium and HA covered implants. However, debridement of the HA surface is incomplete and surrounding soft and hard tissue may be burned as a result of the acidic ph. It may also soften the remaining crystalline HA, making it more prone to breakdown after surgery (Figure 5).

The Er,Cr:YSGG laser appears to be ideal in the treatment of the infected implant. SEM studies have shown that, when used in ablation mode at the highest settings (6 W), no alteration of the implant surface occurs even when used on softer, commercially pure implants. In addition, it has been shown to be effective in completely removing the most dense surface materials, including crystalline HA (Figures 6). The treatment includes both ablative and regenerative techniques. Following exposure of the implant defect, the YSGG laser is used to remove all granulomatous tissue to the base of the defect. The laser tip is then turned to the implant body and, in a defocused mode, is used to completely debride and decontaminate the implant body. Care must be taken not to use the tip too close to the surface of the implant or sparking may occur. This represents removal of the titanium oxide layer and may damage the laser tip. This layer is only a few microns thick and immediately reforms when exposed to oxygen.[23] There is no measurable change the titanium surface using SEM analysis. Research has shown that the Nd:YAG and Ho:YAG lasers are contraindicated for decontamination of the implant surface. At higher power settings, the CO_2 and Er:Yag laser may alter the surface characteristics of the implant. The laser can now be used to decorticate the osseous crypt to create bleedings points and allow growth factors to come into contact with the implant body. The last step is the use of a graft material to fill the osseous defect and a membrane to protect the grafted area.[24] When possible, the implant prosthesis and abutment are removed and a sterilized cover screw placed in the implant to allow complete coverage by the membrane. Resorbable membranes are preferred to allow conservative recovery of the implant after healing. Implants are allowed to heal for 3–4 months before uncovering if unloaded. If the implant prosthesis cannot be removed, the procedure is identical except for closure. It is recommended that a cyanoacrylate tissue glue be used to seal the peri-implant tissue collar to

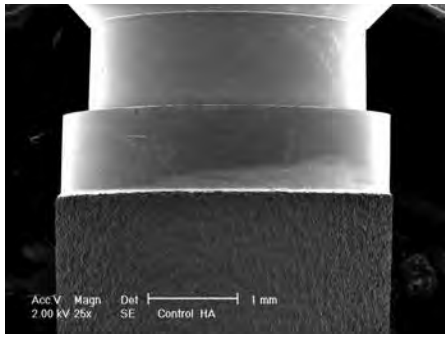

Figure 4. Control hydroxyapatite coated CP-2 implant.

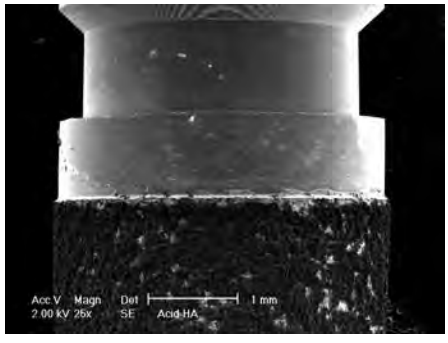

Figure 5. HA coated implant treated with 40%, ph1 citric acid for 3 minutes.

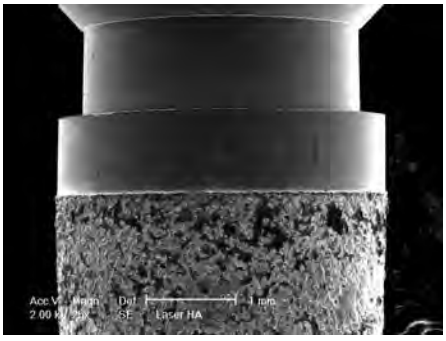

Figure 6. HA coated implant treated with Er,Cr:YSGG laser for 3 minutes.

prevent percolation of fluid and bacteria into the grafted site.

Current research includes the use of lasers to create the implant osteotomy in place of a conventional spiral drill. Osteo-regeneration and integration of implants has been observed using the Erbium:YAG laser for implant site preparation.[25] However, precision of the osteotomy cannot be controlled as compared to conventional implant drills. Another novel use for lasers is for decreasing the time of osseointegration by topical application of laser light to the peri-implant soft and hard tissue after implant placement. Low level light energy is absorbed by endogenous chromophores in mitochondria and cell membranes. It can be demonstrated that mitochondrial metabolism of fibroblasts increases following laser illumination in a proscribed protocol. This photodynamic therapy results in increased synthesis of DNA and RNA proteins resulting in cell proliferation and repair. By using resonance frequency analysis of implants over six weeks, it can be demonstrated that the torque removal values of laser irradiated implants is significantly higher than a control group.[26]

The use of lasers in oral implantology represents a major paradigm change when compared to traditional instrumentation. The selection of a laser-based approach is now based on our understanding of the biology of soft and hard tissue healing rather than empirical convenience. As with all relatively new procedures the current body of knowledge and research protocols suggests that a new standard of care is emerging that will benefit both practitioner and patient.

SYNOPSIS

Concepts of implant design and surgical manipulation of soft and hard tissue have changed dramatically over the past fifty years. Surgical instrumentation for oral implantology has now witnessed a paradigm shift with the introduction of laser surgery. The precision of lasers now rivals that of traditional surgical armamentarium with the added benefit of more patient comfort and faster healing. The use of lasers for implant procedures will enable practitioners to treat patients more conservatively and enhance patient acceptance of this modality.

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Laser Assisted New Attachment Procedure

By David Kimmel, DMD

ABSTRACT

This article presents a general over view of what the Laser Assisted New Attachment Procedure (LANAP) is and the benefits of its use to patients and the restorative dentist.

RÉSUMÉ

Cet article donne un aperçu de LANAP et des avantages de son utilisation chez les patients et pour le dentiste.

LANAP: What Is It?

As a restorative dentist, periodontal disease not only complicates treatments, but, can be a stumbling block in obtaining patient acceptance of treatment. It is often the case that the foundation in which the restorative dentistry is needed is not stable enough to restore, or once the periodontal disease is stabilized, the patient is left with compromised esthetics. Equally important, the teeth, no matter how they are restored, are going to be difficult for the patient to maintain over time. Patients, once being informed of the need for periodontal therapy and subsequent referral to a periodontist, often decline treatment.

Unfortunately, in many cases, once the patient is referred to the specialist they don't keep their appointment, nor do they return back to the referring dentist for further care. They tend to avoid dental treatment all together. Often, this is the result of experiences friends and family members have had after undergoing periodontal surgery. In some cases, patients will start therapy and stop after only one quadrant of surgery.

Unfortunately, for restorative dentists in the United States, one in three patients have some form of periodontal disease.[1] Patients often seek treatment from us for a cosmetic concern. In many of these cases, we cannot address their initial concern until the periodontal disease has been addressed.

For some time, different treatment options have been tried in order to meet these patients' needs. In the late 1980s, the first step toward accomplishing this goal was brought to the market. American Dental Technologies developed the first laser for use in dentistry.[2] Since then, numerous clinicians and researchers have tried to develop laser techniques that would be

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effective against periodontal disease. Two such restorative dentist and laser pioneers are Dr. Delwin McCarthy and Dr. Robert Gregg. In 1998, they first published their findings on periodontal bone regeneration.[3] Later, in 2007, histological proof of not only osseous generation but new cementum mediated attachment was published by Dr. Raymond Yukna.[4] The protocol that was developed by Dr. Gregg and Dr. McCarthy has been termed, LANAP, an acronym for Laser Assisted New Attachment Procedure.

LANAP is a rather simple but elegant protocol. It tips the scales in favour of the periodontal regeneration. A key component of the protocol is the Nd:YAG laser; specifically the Periolase MVP 7 by Millennium Dental. The wavelength of this laser is 1064 nm. It can be utilized to achieve peak powers in the 1,000's of joules and has the ability to vary the pulse duration (length of time of each laser pulse). This wavelength of laser light, 1,064 nm, is selectively absorbed in pigmented tissue. This absorption of the laser energy allows for the selective removal of diseased epithelium and the destruction of the pigmented bacteria associated with periodontal disease (Figure 1). The high peak powers that can be achieved with this laser give a depth of penetration into the tissue that further allows this laser to effect periodontal disease. The variable pulse durations of the Periolase is a feature of this laser that allows this laser to selectively remove diseased epithelium and to form a thermogenic clot that acts as a barrier membrane (Figure 2). LANAP, however, is not just about the laser. It is a protocol that deals with inflammation, the infectious process, occlusion, tooth mobility, and an osseous component.

A Quick Overview

There is no initial periodontal therapy started prior to LANAP. The LANAP procedure (Figure 3 and Figure 4a and 4b) is generally completed in two visits, although, it can be done in one. On average, each of the two visits are two hours long. The patients are seen at a one week post op for an evaluation and then at 30 days post op to have a supragingival prophylaxis. Thereafter, prophylaxes are done every three months. The patients are closely monitored during this time. At one year, a postoperative evaluation is done which includes full periodontal probing and full mouth radiography. At that time, phase 2 dentistry can be initiated once it has been confirmed that the periodontal condition is stable.

Figure 1. Selective removal of diseased epithelium and decontamination of pocket utilizing the high peak powers of the Periolase MVP7 Nd: YAG laser.

Figure 2. Formation of a thermogenic clot by use of long pulse durations of the Periolase MVP7.

In general, during this year, no restorative work that requires disturbing the periodontal tissue is done. Subgingival cleaning and probing are discouraged. As many of the patients that are indicated for LANAP have avoided dentistry for years, they often require some restorative dentistry prior to LANAP as they would not be able to wait a year before undertaking the needed restorative treatment. In this case, direct restorations are placed as needed and when indirect restorations are indicated, temporaries are placed with the understanding that the final restorations will be place at a later date.

One of the remarkable aspects of LANAP is patient acceptance. Even patients that have traditionally avoided dental treatment or have experienced traditional surgery in the past, accept LANAP. They are looking for an alternative to traditional surgery and are familiar and comfortable with the use of lasers for LASIK treatment for their eyes. They consider laser treatment for periodontal disease a viable alternative. Clinically, what immediately becomes apparent is that post operatively there is none to minimal discomfort.

After the procedure, the patient can see that the tissues feel and look healthier. Since LANAP is not a resective procedure, the recession associated with traditional surgery is not present. Consequently, the patients do not have the root sensitivity or longer appearing teeth. All of this reinforces to the patient that they have made a good decision on their treatment choices.

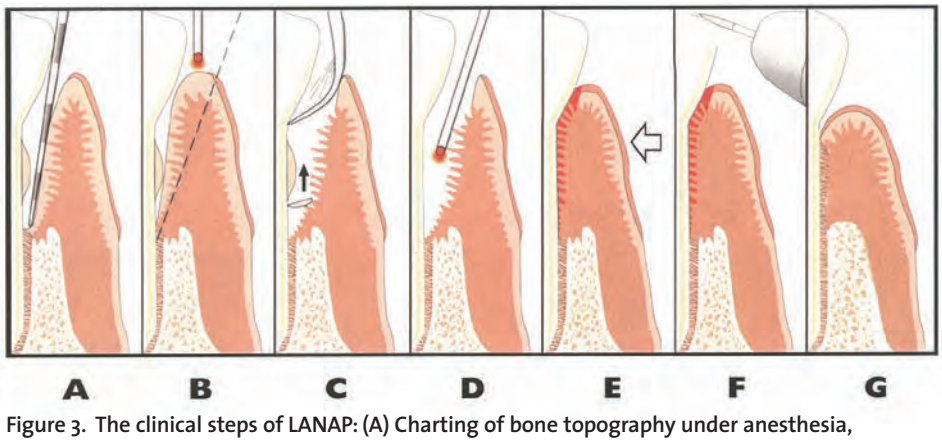

Figure 3. The clinical steps of LANAP: (A) Charting of bone topography under anesthesia, (B) optic fibre is oriented parallel to the root surface and (C) removal of calcified plaque and calculus by use of Pezio ultrasonic scaler (D) A second pass with 650 us "long pulse" laser finishes debriding the pocket and achieving hemostasis with a thermal fibrin clot. (E) Gingival tissue is compressed against the root surface to close and aid in the stabilization of the fibrin clot. (F) The wound is stabilized, the teeth splinted if necessary, and occlusal trauma is minimized by occlusal adjustment to promote healing. Oral hygiene is stressed and continued periodontal maintenance is scheduled. (G) No probing is performed for at least 9 to 12 months.

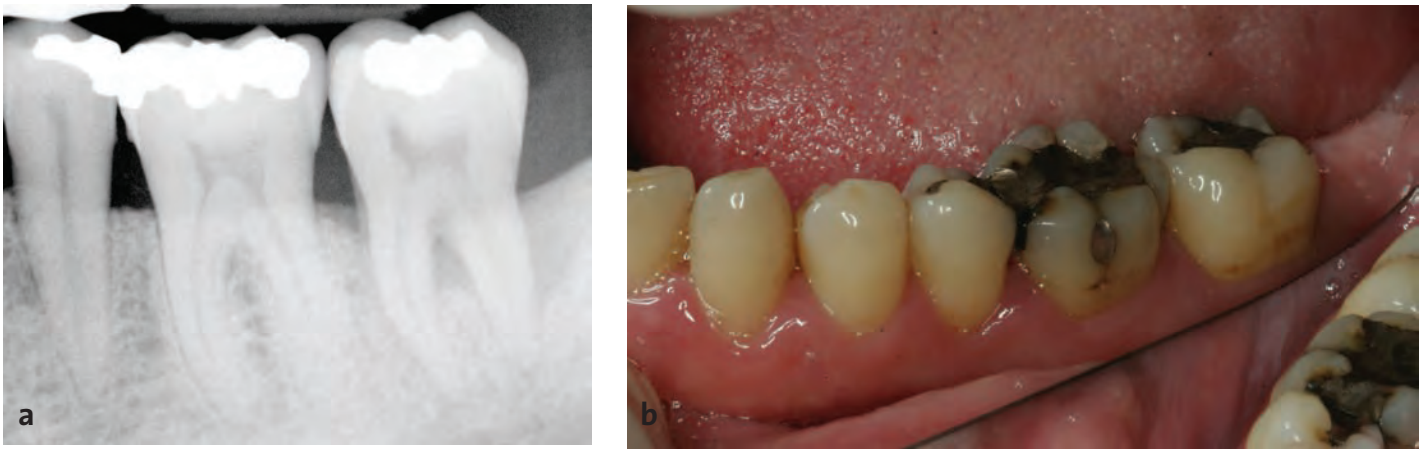

Figure 4. Preoperative clinical radiograph (a) and photo (b) of typical LANAP case.

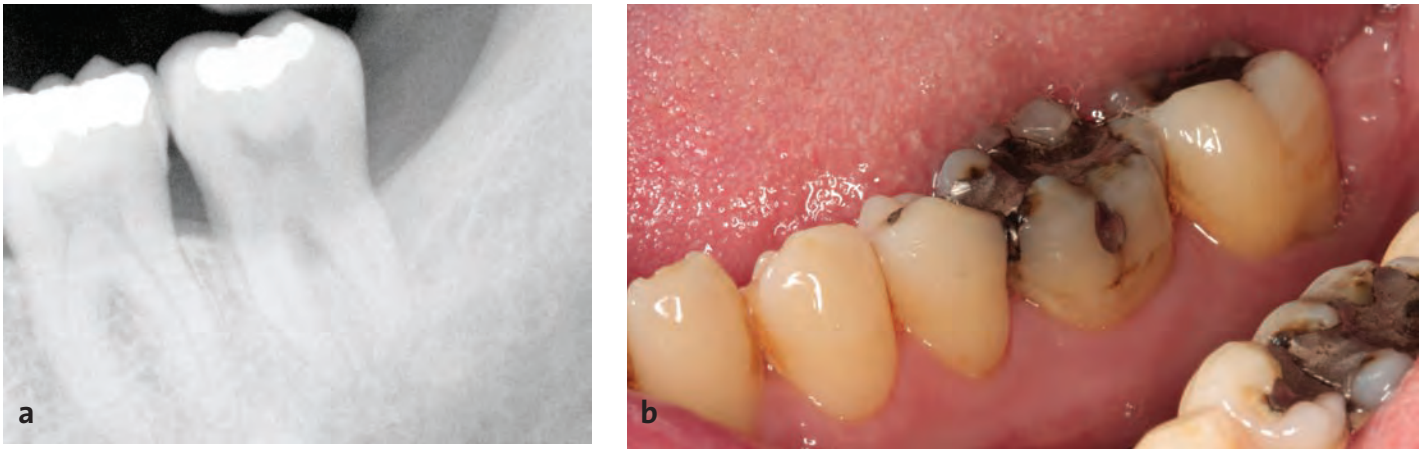

Figure 5. Twelve months post LANAP with only minor recession and resolution of a 9 mm pocket.

As a restorative dentist, LANAP allows a more ideal crown to root ratio and naturally appearing gingival contours. This in turn makes periodontal maintenance for the patient far more manageable. It all leads to the long term success of periodontal patients after being treated with LANAP. What I find rewarding, is LANAP allows patients that are fearful of dentistry to not only seek out treatment, but to continue their dental care. After LANAP treatment, patients realize how much dentistry has changed and they continue their care.

Disclosure

The author is a clinical instructor for the Institute for Advanced Laser Dentistry. The IALD is a division of Millennium Dental, which manufactures and sells the Periolase laser.

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Use of the 810 nm Diode Laser:

Soft Tissue Management and Orthodontic Applications of Innovative Technology

By David M. Sarver, DMD, MS

ABSTRACT

Innovative technologies such as the diode laser have provided considerable benefit to dental patients and professionals. Facilitating efficient cutting of tissue and subsequent coagulation, the soft tissue laser enhances tissue healing and can reduce postsurgical complications. Due to the conservative nature of treatment accomplished with the laser, this technology is very useful in orthodontic procedures. The diode laser is utilized in both esthetic enhancement of the smile, and treatment management of soft tissue issues that impede efficient orthodontic treatment. Its clinical application will be illustrated in a series of orthodontic cases.

RÉSUMÉ

Les avantages des technologies innovatrices telles que le laser à diode sont considérables pour les patients et les dentistes. En facilitant la coupe efficace du tissu et la coagulation qui s'ensuit, le laser pour les tissus mous améliore la cicatrisation et peut réduire les complications postopératoires. En raison de la nature conservatrice du traitement réalisé par laser, cette technologie est très utile pour les traitements orthodontiques. Le laser à diode est utilisé à la fois pour l'amélioration esthétique du sourire et la gestion du traitement des problèmes de tissus mous qui empêchent une correction orthodontique efficace. Son application clinique sera illustrée dans une série de cas en orthodontie.

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USE OF THE 810 NM DIODE LASER: SOFT TISSUE MANAGEMENT AND ORTHODONTIC APPLICATIONS OF INNOVATIVE TECHNOLOGY

Over the last several years, laser technology has helped dental professionals improve the level of care provided to their patients. For orthodontic procedures, lasers are now being used to reshape gingival soft tissues for esthetic finishing and solve issues involving altered tooth eruption. This advanced laser technology is significantly and efficiently improving the design, health, and overall appearance of orthodontic patients' smiles, while also enhancing their chairside experiences. Orthodontists' interest in smile design has dramatically increased as a result of both their collaboration with dentists in interdisciplinary treatment and as the potential of laser-assisted dentistry is more readily understood by orthodontists.

One contemporary dental laser is the 810 nm diode laser (i.e., Odyssey, Ivoclar Vivadent, Amherst, NY), which has numerous benefits for orthodontic treatments. It is manageable in size and low in cost. Because in most cases only topical anesthesia is necessary, the orthodontist does not need to introduce injection syringes to the patient; this is particularly beneficial in the open orthodontic clinic where siblings are often observing treatment. Additionally, patients are not burdened with the profound sensation of local anesthesia and its prolonged effects.[1,2]

The diode laser separates and coagulates at the same time, facilitating immediate hemostasis and resulting in minimal bleeding. Healing is rapid and there is a reduced potential for infection. Postoperative complications are minimal and sutures are unnecessary. The diode laser has an affinity for only soft tissue, thereby preventing damage to the surrounding bone and enamel – a significant advantage for the orthodontist. Finally, orthodontic procedures can be accomplished in less time and in fewer visits.[1,2]

Effect of the 810 nm Laser on Soft Tissue

Dental laser energy has an affinity for different tissue components. The 810 nm diode laser, for example, has energy and wavelength characteristics that specifically target the soft tissues. It has an affinity for hemoglobin and melanin, which are the components that provide color – or pigmentation – to the tissue. Other wavelengths of lasers are attracted to water, which is located at the surface of the tissue. Since the 810 nm diode laser has an affinity for hemoglobin and melanin, it is more efficient and better equipped to address deeper soft tissue problems.[5–8]

The light energy released by the diode laser transforms into heat, resulting in the vaporization of cells, a process referred to as the photothermal effect. The diode laser's optical fiber is the mechanism that delivers this energy to the tissue. The degree to which the tissue absorbs this energy depends on its affinity to the laser's wavelength, the clinician-selected energy output (which is dictated by the darkness of the tissue), the time of exposure, and the characteristics of the targeted tissue.[1,3] The absorbed energy increases the temperature of the targeted tissue, immediately resulting in a sequence of tissue reactions (e.g., which ranges from warming and welding to coagulation, protein denaturalization, vaporization, drying, and carbonization depending on the amount of heat used) according to the specific desire and under the direct control of the clinician.[4]

This instantaneous reaction is termed *ablation*. Ablation is the separation of the tissue, which results in an incision that is sealed, sanitized, and protected by a biodressing (Figure 1). This is of paramount importance because it is what enables clinicians to modify soft tissues in a clear field without bleeding.

Whereas a surgical scalpel cuts tissue via friction, the diode laser does so through light energy that is delivered in either a continuous or pulsed mode. When used in the continuous mode, soft tissue absorbs continuous energy, thereby resulting in higher levels of heat. The more heat generated, the more postoperative discomfort may be experienced by the patient. The pulsed mode, however, allows for beneficial cooling between pulses of energy. Therefore, for soft tissue procedures, it is this author's recommendation that the diode laser generally be used at a low power setting (e.g., 1.0 W to 1.8 W) and in the pulse mode.

Use of the Diode Laser in Orthodontic Smile Design

Orthodontists often focus on occlusal goals, arranging the teeth in the most esthetic position possible, and then reshaping incisal edges at the end of treatment. They occasionally overlook the other elements of an esthetic smile (e.g., ideal incisal contour, height/width proportion, embrasures, contacts, gingival contour (Figure 2) that can be precisely corrected or enhanced with the soft tissue diode laser.

Figure 1. The cutting action of the diode laser seals and coagulates as it proceeds, resulting in a very clean surgical margin termed a *biodressing*.

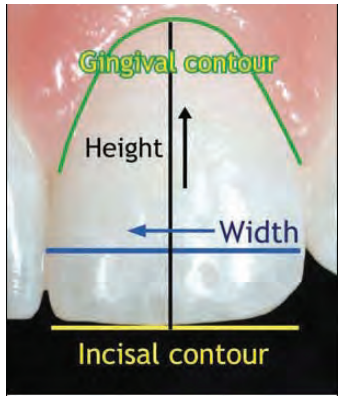

Figure 2. Many orthodontists can benefit from a greater understanding of the impact of height/width ratios, gingival shape, and gingival contour on esthetics.

The patient in Figure 3, for example, had undergone orthodontic treatment, but her finished smile was not as esthetic as it could be. The gingival heights of the anterior teeth were not ideal, which resulted in an asymmetric smile. The right central incisor had a narrow gingival apex and asymmetric gingival shape, while the left central incisor had a flat gingival shape and was disproportionately short (Figure 4). The diode laser was used to recontour the gingival shape (Figure 5); four weeks postoperatively, the patient's smile had significantly improved (Figure 6). Precise shaping was possible due to the "tactile feedback" of the laser's fiber. As there was virtually no bleeding, the clear surgical field enabled the clinician to easily visualize the intended tissue contour.

In orthodontic smile design, the method used for bracket placement depends on the needs of each individual case. For accurate bracket placement, however, the entire crown should always be visible. It is often ideal to address compromised tooth proportion prior to orthodontic bracket placement. To do so, the orthodontist first meas-

Figure 3. Case 1. Once orthodontic treatment was finished and appliances removed, the esthetic finish was less than optimal.

Figure 4. Tooth #8(11) had a narrow gingival apex and asymmetric gingival shape, while tooth #9(21) had a flat gingival shape and was disproportionately short.

Figure 5. The diode laser was used to reshape tooth #9 (i.e., its marginal shape and length); tooth #8 was made more symmetric.

Figure 6. At four weeks postoperatively, the patient had fully healed. The final smile was significantly enhanced by the finishing contouring provided.

ures the amount of incisal display when the patient's lips are at rest and in a smile. In this case, only 5 mm of the maxillary incisors were displayed in her smile due to delayed passive eruption (Figure 7). As a result of the gingival encroachment, the bracket would have had to be placed well below the center of the tooth (Figure 8), but this would result in incisor intrusion and even less tooth display on smile. After probing the anterior teeth and taking into account the biologic width, it was determined that a gingivectomy/gingivoplasty using the 810 nm diode laser would provide adequate crown exposure to permit more ideal bracket placement (Figure 9). Specifically, the patient would gain 5 mm in crown length and with normal reestablishment of the attachment apparatus would yield a 4-mm gain in incisal height.

At the bracket placement appointment, the diode laser was used to remove the excess gingival tissue. The result was a dramatic increase in crown access and display that would permit proper bracket placement after the laser procedure (Figures 10 and 11.)

The diode can also be used to finish smiles in orthodontic treatment, such as when the patient has disproportionate crown width and height (Figure 12). The gingival margins of the patient's lateral incisors were slightly below the gingival heights of the central incisors and canines. One treatment option was to orthodontically intrude the lateral incisors so the gingival margins more closely approximated the ideal width and height and to place porcelain veneers to restore the length of the tooth. The other option was to use the diode laser to lengthen the lateral incisors to improve tooth proportion, then to remove the brackets and rebond them, thereby extruding the anterior teeth to more closely match the smile arc (Figure 13). Once the Odyssey soft tissue laser was used to lengthen the lateral incisors (Figure 14), realignment was completed to enhance the esthetics of the patient's smile (Figure 15).

Management of Altered Tooth Eruption via Combined Laser/Orthodontic Therapy

Orthodontists are under constant pressure from patients and parents to finish treatment in a timely manner. An unexpected benefit of the soft tissue laser is the ability to control tissue response due to poor oral hygiene and to remove tissue so that clinicians can access slowly erupting or even unerupted teeth.

When orthodontic patients do not follow adequate oral hygiene regimens, the removal of orthodontic appliances may result in enlarged interdental papillae and gingival margins (Figure 16).

In order to remove the enlarged papillae from this patient, the laser's tip was wiped across the bulky tissue, and ablation reduced the bulky papillae and removed pseudopockets, facilitating improved cleaning (Figure 17). When treating the enlarged gingival margins, the author again took advantage of the laser's precision to shape the gingival margins against the tooth's

Figure 7. Case 2. This 12-year-old patient illustrates how soft tissue management prior to bracket placement can facilitate the goals of the orthodontist in smile design.

Figure 8. Due to the gingival encroachment, the orthodontic bracket must be placed well below the center of the tooth, resulting in incisor intrusion and further decreasing incisor display.

Figure 9. After periodontal probing, it was determined that sufficient tooth height could be gained to place the bracket more superiorly, resulting in a favorable outcome.

Figure 10. At the appointment for orthodontic appliance placement, anterior crown height of the central incisors was increased to more than 10 mm.

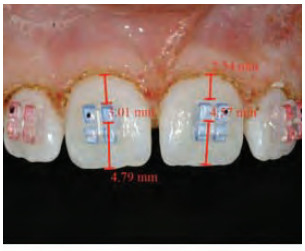

Figure 11. Because of the clear field provided by the biodressing, brackets could be placed in the desired position in a single visit.

Figure 12. Case 3. This patient's maxillary lateral incisors were disproportionate in terms of width and height; the gingival margins also required management with the laser.

Figure 13. The diode laser was used to lengthen the lateral incisors. The brackets were then removed and re-bonded, extruding the anterior teeth to more closely match the smile arc.

Figure 14. The lateral incisors were lengthened to meet the proportionality requirements of the anterior teeth; brackets were placed to finish the anterior tooth position.

Figure 15. The final smile was greatly improved, the smile arc was idealized, and tooth proportion was now esthetic.

Figure 16. Case 4. Poor oral hygiene, despite repeated reinforcement instructions from the orthodontist, resulted in hypertrophic gingiva and papillae, creating pseudopockets, which were even more difficult to keep clean.

Figure 17. The hypertrophic papillae were ablated and the gingiva recontoured to provide a better cleaning environment.

Figure 18. At 4 weeks, there is a much more attractive and healthy intraoral picture.

Figure 19. Case 5. Orthodontic treatment can be impeded by altered tooth eruption. Management of treatment can be facilitated by tissue modification with the diode laser.

Figure 20. A small window was opened in attached gingival tissue. Note the clean margins and the availability of the tooth surface for preparation and bonding of a bracket.

Figure 21. A bracket was bonded to the canine surface and the archwire was engaged.

Figure 22. At 6 weeks, the canine had moved enough to reset the bracket more ideally.

Figure 23. After an additional 6 weeks, the canine tooth had been moved into its final position for the case to be finished.

crown. In this case, the patient exhibited an immediate response to the laser and, approximately four weeks postoperatively, showed marked improvement (Figure 18).

In the past, orthodontic treatment was often delayed or compromised by the incomplete or late eruption of the targeted teeth. Partially erupted teeth can be of particular concern when the clinician must place orthodontic brackets. When a tooth was partially erupted, treatment options were limited. The clinician either had to wait for the tooth to erupt through the tissue or have a periodontist remove the tissue – both of which added time to the treatment process. With the diode laser, however, orthodontists have the ability to remove the covering tissue (Figures 19 through 23). Due to the laser's ability to immediately seal the incision with a biological dressing, the brackets could be placed on the patient in a single visit.

Additional Applications

Aphthous ulcers continue to be one of the most uncomfortable conditions orthodontic patients experience, and these ulcers can prolong treatment. There are treatments available, but most of the options do not eliminate the pain – they simply offer temporary relief. The diode laser is providing a welcome solution. With the diode laser, it takes approximately one day for the ulcer to heal and disappear. Patients are pleased because the pain from the ulcer is eliminated immediately, and the process takes a matter of minutes.

Conclusion

Diode lasers exemplify how critical technology is in modern dentistry. As clinicians are becoming more knowledgable about the benefits of laser use in therapy, they are growing more comfortable with applying lasers to several different procedures. Whether orthodontists are correcting excessive gingival display or aiding in crown lengthening, laser technology is dramatically increasing the level of care to patients. Not only are lasers making a practice more effective and efficient, but they are also providing a more comfortable patient experience.

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SIROLaser Advance Delivers Excellent Results in Connection with Ceramic Restorations

By Dr. Helmut Goette

ABSTRACT

If bleeding occurs during impression-taking and treatment, this can have a serious impact on the quality of ceramic restorations. The CEREC user Dr. Helmut Goette deploys the SIROLaser Advance to overcome this problem. In this article he describes his therapy approach with reference to a typical case.

RÉSUMÉ

Les avantages des technologies innovatrices telles que le laser à diode sont considérables pour les patients et les dentistes. En facilitant la coupe efficace du tissu et la coagulation qui s'ensuit, le laser pour les tissus mous améliore la cicatrisation et peut réduire les complications postopératoires. En raison de la nature conservatrice du traitement réalisé par laser, cette technologie est très utile pour les traitements orthodontiques. Le laser à diode est utilisé à la fois pour l'amélioration esthétique du sourire et la gestion du traitement des problèmes de tissus mous qui empêchent une correction orthodontique efficace. Son application clinique sera illustrée dans une série de cas en orthodontie

Today, lasers are widely used in endodontics, periodontics, and dental surgery. Sirona's compact and powerful SIROLaser Advance now plays an indispensable role in my CEREC treatment procedures. I use it for hemostasis purposes and to define the preparation margins.

About the Author
Dr. Helmut Goette is a dentist in Bickenbach, Germany, and a certified CEREC trainer and lecturer.

It is essential to prevent bleeding at all stages of the CEREC procedure. The contamination of the anti-reflective powder with blood during impression-taking is especially critical. The data can be flawed, resulting in incorrect height readings and inaccurate dimensions of the proximal box. To achieve an absolutely clean environment I apply a rubber

dam and use the SIROLaser Advance to arrest any bleeding.

Bleeding is especially problematical during adhesive bonding. Blood and saliva contamination can destroy the etched microretentive enamel and dentine surfaces. Proper adhesive bonding is then impossible, and treatment failure is the consequence. A combination of the SIROLaser Advance and a rubber dam effectively rule out such contamination.

Case Study: Hemostasis Prior to Impression-Taking.

A 38-year-old male patient came to my dental practice complaining of bite oversensitivity in tooth 25. The oral examination revealed an extended glass-ionomer filling with a replacement palatinal cusp and a missing mesial contact point. I recommended a replacement filling, as glass ionomer is not indicated for cusp replacement and this was the cause of the oversensitivity. The tooth was vital. A radiograph did not reveal any signs of periapical periodontitis. After the defective filling had been removed copious bleeding occurred in the mesial proximal box (Figure. 1).

With the aid of the SIROLaser Advance I arrested this bleeding and then exposed and defined the preparation margin (Figure 2). For this purpose I selected the "periodontal germ reduction"-program preset (1.5 W and 10 Hz). In addition I prepared a distal box, and defined an additional preparation margin with the aid of the SIROLaser Advance.

The outcome was a clear and dry representation of the operation site for the preparation. The CEREC bluecam optical impression yielded a clearly defined 3-D model. The automatic detection function had no trouble in marking the preparation margins (Figure 3). Thanks to the rubber dam, the optical impression and the adhesive bonding of the restoration were performed under absolutely dry conditions (Figure 4).

I chose CEREC Blocs (shade: S2-M) for the restoration. Adhesive bonding was performed by means of Syntac-Heliobond (Ivoclar Vivadent) in combination with Tetric EvoCeram (Ivoclar Vivadent), shade A2. The restoration was inserted with the aid of an ultrasonic handpiece. Hemostasis remained effective throughout the treatment process. As a result repeated laser therapy was not required prior to adhesive bonding.

Summary

I am using the SIROLaser Advance for CEREC treatment with great success. It is ideal for hemostasis during impression-taking and treatment, as well as for gum contouring and for the correction of the preparation margin.

Please note this article was first published in the German Laser Journal.

Goette: *"With the SIROLaser Advance and the rubber dam I achieve an absolutely clean environment."*

Figure 1. Pronounced sulcus bleeding following the removal of old filling.

Figure 2. Clear, dry representation of the operation site following laser therapy.

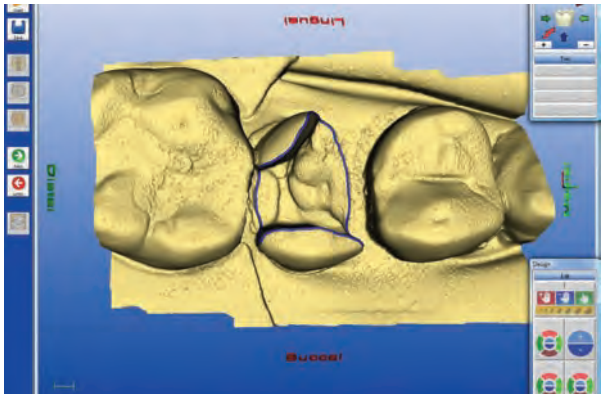

Figure 3. The automatic margin detector functions perfectly.

Figure 4. Thanks to the rubber dam, the try-in of the restoration takes place under dry conditions.

Influence of Light Cure and Storage Time on the Diametral Tensile Strength of a Resin-based Luting Cement

By Anderson Pinheiro de Freitas, DDS, MSc, PhD, Luciana Fávaro Francisconi, DDS, Paulo Afonso Silveira Francisconi, DDS, MSc, PhD and Gildo Coelho Santos Jr. DDS, MSc, PhD

ABSTRACT

To evaluate the influence of light cure and storage time on the diametral tensile strength (DTS) of a dual resin-based luting cement 20 specimens were prepared with the aid of a metallic matrix with 2 mm x 4 mm of diameter, which was filled with Rely-X ARC (3M ESPE, St Paul, MN), and randomly distributed into 4 different groups (*n* = 10): light cured for 40 seconds and stored in distilled water at 37°C for 1 hour (Group 1) or 24 hours (Group 2); chemically cured in a dark room and stored in distilled water for 1 hour (Group 3), or 24 hours (Group 4). After storage, the specimens were submitted to a diametral tensile strength test on a Universal

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Test Machine (Instron 8872). The means and the standard deviation of each group in MPa were: Group 1 80.0 ± 5.7; Group 2 80.2 ± 10.2; Group 3 59.7 ± 3.0; Group 4 70.3 ± 8.3. Statistical analysis revealed that, (1) light-cured groups exhibited the highest diametral tensile strength, regardless the storage time, and (2) storage time caused an increase in the final diametral tensile strength of the chemically cured groups.

RÉSUMÉ

Pour évaluer l'influence de la photopolymérisation et de la durée de conservation sur la force de traction ultime d'un ciment de scellement à base de résine composite double, 20 échantillons ont été préparés avec l'aide d'une matrice métallique de 2 mm sur 4 mm de diamètre, laquelle était remplie de Rely-X-ARC (3M ESPE, St-Paul, MN) et distribués au hasard dans 4 groupes différents (n = 10) : photopolymérisation pendant 40 secondes et conservés dans de l'eau distillée à 37 °C pendant une heure (Groupe 1) ou 24 heures (Groupe 2); durcissement chimique dans une pièce sombre et conservés dans de l'eau distillée pendant une heure (Groupe 3) ou 24 heures (Groupe 4). Après l'entreposage, les échantillons ont été soumis à un test de force de traction ultime sur une machine d'essai universelle (Instron 8872). Les moyennes et l'écart-type de chaque groupe en MPa étaient : Groupe 1 : 80,0 ± 5,7; Groupe 2 : 80,2 ± 10,2; Groupe 3 : 59,7 ± 3,0; Groupe 4 : 70,3 ± 8,3. L'analyse statistique a révélé que (1) les groupes de photopolymérisation avaient la force de traction la plus élevée, peu importe la durée de conservation et (2) le temps de conservation a entraîné une augmentation de la force de traction ultime des groupes à durcissement chimique.

An adequate cure of resin-based luting cements is an important requirement for restoration stability and biocompatibility.[1] Many of the resin cements commercially available on the market today are categorized as dual-cure materials. These materials are chemically cured when the base paste and the catalyst are mixed, and light cured when they are submitted to light.[2] In their composition one can find peroxides and amines, which are found in chemical cure systems, as well as camphoroquinone, a photosensitizer, which is used in light-cure materials.[3]

Dual-cure cements bring advantages of both kinds of cements (light cured or chemically cured),[3] such as providing an adequate cure in deep areas and an increase in working time.[4] Studies have shown that the mechanical properties of resin-based luting cements correlate well with the degree of conversion of particles forming these cements.[5] Additionally, it is known that components of the resin that did not share the reaction may be harmful to the restoration, causing local tissue irritation and possibly an increased potential for secondary caries lesions.[6] Also, fracture toughness is an intrinsic property of these materials and is the measure of a material's resistance to crack propagation.[7,8] In general, higher fracture toughness value indicate more effective cure.[6]

The aim of this study was to evaluate the influence of light cure and storage time on the diametral tensile strength (DTS) of a resin-based luting cement in order to elucidate important properties of these materials and their clinical applicability. The null hypothesis considered was that the kind of the cure and the storage time do not interfere with the diametral tensile strength of the resin cement used in this experience.

Material and Methods

To evaluate the influence of light cure and storage time on the diametral tensile strength of resin-based luting cements, 40 specimens were made and randomly divided into four different groups. The specimens were obtained from dual cure resin cement commercially available, Rely-X ARC (3M/ESPE, St. Paul, MN, USA), a double-paste mixing material indicated for bonding indirect restorations. It has working time approximately two minutes and self-curing time of approximately 10 minutes. The samples were obtained by using a metallic matrix with a 2 mm thickness containing circular perforations of 4 mm diameter. These matrixes were filled with cement after manipulation according to the manufacturer's instructions.

Figure 1. Metallic matrix.

Each group was submitted to one of the following procedures (n = 10):

- Group I: light cured during 40 seconds and stored for one hour
- Group 2: light cured during 40 seconds and stored for 24 hours
- Group 3: chemically cured in a dark room and stored one hour
- Group 4: chemically cured in a dark room and stored for 24 hours

The light activation was achieved with a quartz-tungsten-halogen curing unit (XL 3000 – 3M Dental Products, St Paul, MN)

with 570 mw/cm² of potency, for 40 seconds. Chemical cure only, without the presence of light, was made possible by protecting the samples surface with a polyester strip covered with a black protector.

The samples were stored in distilled water at 37ºC during 24 hours. For the DTS tests, after the storage time established for each group, the specimens were positioned in a universal Testing machine (Instron 8872) which had a constant speed of 0.5 mm/minute, with a cell load of 100 N, thus allowing a reading with an accuracy of 5 g.

Figure 2. Disc specimen mounted in the testing device assembled for DTS testing.

The discs were placed in this machine in their vertical position related to their diameter with a sheet of absorbent paper between the disc and the machine surfaces. Load was applied until failure occurred. DTS values were calculated using the formula:[9]

$$\sigma_x = \frac{2p}{\pi DT}$$

Where σ_x is DTS, P is the force (N), D is specimen diameter (mm) and T is thickness (mm). Means and standard deviations (SD) were calculated and data statistically analyzed with one-way ANOVA and Tukey-Kramer test.

Results

Mean values +/– standard deviations obtained for each group were (in Kgf/cm²): Group 1 80.0 +/– 5.7; Group 2 80.2 +/– 10.2; Group 3 59.7 +/– 3.0; Group 4 70.3 +/– 8.3. The distributions of the results for the four groups were normally distributed.

Values obtained were submitted to statistical analysis, Anova-2 Way test for each group individually reveled that there were a statistically significant difference between the groups ($p = .014$). A Tukey-Kramer test revealed that there was statistically significant difference ($p < .05$) between groups as shown at Table 1.

Table 1. Mean diametral tensile strength values (MPa ± SD)

Group 1	80.0 ± 5.7	a
Group 2	80.2 ± 10.2	a
Group 3	59.7 ± 3.0	b
Group 4	70.3 ± 8.3	c

Same letter represent mean values that are not significantly different ($P > .05$)

Discussion and Conclusions

A luting cement having appropriate properties and utilizing appropriate handling during cementation procedures is essential to achieve clinical success with bonded restorations. The final result must be an intimate bond between the restoration and the tooth structure via the medium of the resin cement, suitable to withstand the rigors of the oral environment.[9]

According to Wathen (2000)[10], adhesive luting procedures, when properly executed, restore the ability of the tooth to withstand forces to that of an intact tooth. Therefore, the choice of using of an appropriate resin luting cement when indicated can provide prostheses with higher long-term clinical function.

While halogen-light activation is a valuable adjunct to facilitate the polymerization of luting cements, some products are formulated as to be too dependent on light activation, which this may lead to an inadequate cure and poorer clinical performance.[11] However, if a cure occurs not only by light activation, but also by chemical activation when light intensity is weak, such as in the case of metallic or ceramic crowns that prevents the action of the light on the resin cement due to their opacity, a higher degree of success may be possible.[3,5]

To evaluate the properties of the resin cements it is necessary to use some extrinsic analysis criteria due to the fact that direct measures of cement conversion cannot be easily accomplished. Polymerization is studied indirectly by measuring flexural strength, the modulus of elasticity, surface hardness, and other measures that are indicators of the resin cement properties.[1] DTS values may therefore indicate the cohesive resistance of a resin cement and thus provide a numerical parameter for evaluating the degree of conversion of the monomers during polymerization.

In the present study, the extent of polymerization of the cement cured by the chemical component alone was significantly lower than that presented by chemical and light curing together. These findings are in agreement with other studies.[2,12,13]

The increase on the DTS values after 24 hours, when the cement was cured without benefit of light, indicates that dual-cured resin cements may be used for cementation of opaque prostheses. In these cases, light curing of the margins provides an initial stability for the crown, which is complemented and completed by the chemical reactions.[1]

After the statistical analysis and discussion of the results, the authors concluded that:

1. The light cured groups exhibited the highest DTS values, independent of the storage time;
2. Storage time in distilled water caused an increase in the final DTS of the chemically cured groups and did not interfere with the light cured ones.

Disclosure

The authors declare no competing financial interests.

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Laser-Assisted Gingival Tissue Procedures in Esthetic Dentistry

By Ernesto A. Lee, DMD, DCD

ABSTRACT

Soft tissue lasers are increasing in popularity among clinicians in part due to their potential value in preprosthetic gingival procedures. The ability of soft tissue lasers to control moisture and facilitate hemostasis appears particularly promising for clinicians excising gingival tissues, performing esthetic crown lengthening, and using resective techniques for gingival troughing—and these applications will grow as practitioners become more familiar with such technologies. This presentation highlights the use of the 810 nm diode laser for perio-restorative procedures in the anterior maxilla.

RÉSUMÉ

Les lasers pour les tissus mous sont de plus en plus en demande par les cliniciens en partie en raison de leur valeur potentielle pour les interventions préprothétiques des gencives. La capacité des lasers pour les tissus mous de contrôler l'humidité et de faciliter l'hémostase semble particulièrement prometteuse pour les cliniciens faisant une excision des tissus gingivaux, un allongement de couronne et utilisant des techniques de résection pour les creux gingivaux. Ces applications se développeront au fur et à mesure que les practiciens connaissent mieux ces technologies. Cette présentation souligne l'utilisation d'un laser à diode de 810 nm pour le traitement périodontique de restauration du maxillaire inférieur.

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Though soft tissue lasers have not been widely accepted by the dental community, they offer the potential to enhance preprosthetic gingival procedures while exhibiting decreased biologic side effects. An evaluation of their clinical benefits is necessary to ascertain the advantages of their application in restorative dentistry procedures.

Laser-Assisted Gingivectomy / Gingivoplasty

The removal of gingival tissue for restorative purposes is usually performed in order for a clinician to gain access and deliver treatment to areas located below the gingival margin. Depending on the particular clinical scenario, one or more surfaces may be involved around a single tooth or multiple teeth. Additionally, situations may present where gingival excision is required for the purposes of facilitating moisture control throughout the restorative procedure, even though the area to be treated is located supragingivally (e.g., in cases where gingival inflammation is present, posing a risk of bleeding in conjunction with the attendant increase in crevicular fluid flow).

Alternatives for gingival tissue removal include the use of a scalpel, electrosurgery, and/or lasers.[1,2] The traditional surgical approach utilizing a scalpel blade exhibits the disadvantage of eliciting bleeding, which is a concern particularly if restorative dentistry is to be performed subsequently. Alternatively, electrosurgery has been utilized effectively to excise gingival tissue, while simultaneously providing adequate hemostasis,1 and is therefore preferred by many restorative dentists. Heat generation with this technique, however, occurs to a degree where irreversible damage to the alveolar crest may result,[1,3] leading to recession and exposure of restorative margins, which negatively affects the esthetic zone. Lasers offer the potential of increased operator control and minimal collateral tissue damage. Diode lasers, specifically, operate at a wavelength that is easily absorbed by the gingival tissues,[4] while posing little risk of damaging the tooth structure. Despite this, caution should still be exercised to avoid thermal injury resulting from excessive heat generation.

Esthetic Crown Lengthening

Despite the clinical naiveté expressed by many surgeons, esthetic crown lengthening is a technically demanding endeavor that requires gingival incisions exhibiting a higher degree of precision than that achieved with a scalpel blade, regardless of the operator's skill level. The fine tip of the diode laser offers superb control and can be easily manipulated to precisely create the gingival margin contours required to successfully perform esthetic crown lengthening procedures (Figure 1).

Prior to any such treatment, the area should be probed and bone sounding (i.e., biologic width) should be performed. The amount of attached gingiva, the location of the crest of bone, and how much crown lengthening is needed will determine if a full flap and osseous recontouring is the appropriate method of treatment versus a gingivectomy with a scalpel or a dental laser.

Additionally, since esthetic demands are the driving force behind treatment,[5] a provisional restoration must be frequently placed during the same appointment. Laser incisions are completed while achieving excellent hemostasis so that inadequate moisture control is not a factor interfering with the fabrication of the temporary and adjunctive restorative procedures.

The 810 nm soft tissue diode laser (i.e., Odyssey, Ivoclar Vivadent, Amherst, NY) offers unprecedented control of the tissue sculpting procedure. Fine revisions of the incision line are achieved with ease with a degree of coagulation, resulting in excellent hemostasis and a clean surgical field.[6] The diode laser exhibits little or no affinity for the dental hard tissues, metal alloys, or porcelain and, therefore, may be utilized in close proximity to the root surface or existing restorations or implants.[4] This can be accomplished with little or no effect on the cementum layer, without concerns of conducting an electrical current through the tooth structure or an existing metallic restoration, and without the potential occurrence of thermal injury to the pulp (Figure 2).

From a technical perspective, the diode laser may be used with the fiber tip either in contact to cut or in close proximity to treat the target area. The unit under evaluation includes an aiming light to facilitate guidance of the laser beam during non-contact use. Placement of the tip directly in contact with the surgical site for cutting, however, enhances tactile feedback while providing the operator with a sense of familiarity relative to other dental cutting or drilling procedures. Power settings are adjustable, and the laser beam may be delivered in a constant or pulsed mode.[7]

The gingivectomy technique with a diode laser is slightly different than electrosurgery. Since the energy is concentrated at the tip of the fiber and tissue penetration is shallow, the laser beam must be oriented along the incision plane while the ablation is advanced through the layers (Figure 2). In the author's experience, this results in soft tissue removal that is somewhat slower than what is possible with electrosurgery, although operative control is significantly increased. Alternatively, the laser beam may be applied in a constant mode to provide faster cutting, but this could lead to increased thermal transfer to the adjacent tissues. Temperatures higher than 200°C will result in carbonization and formation of a charred layer, which absorbs heat and may interfere with adequate energy transfer from the laser. Removal of the carbonized residue from the tooth structure may be cumbersome, and could become an esthetic concern when translucent all-ceramic restorations will be placed subsequently. The operator must adjust his or her technique and laser settings to achieve an acceptable balance between optimum cutting efficiency and the reduction of charred layer formation.

In addition, depending on the degree of gingival tissue excised and the periodontal biotype, an external bevel gingivectomy may be required to develop natural contours from the new gingival margin location. This surgical beveling was traditionally performed with a scalpel, knife, surgical nippers, or a round diamond, resulting in a large, bleeding surface wound that would contribute to the patient's postoperative discomfort. In contrast, preparing the external bevel gingivectomy with a diode laser produces a bloodless environment as well as a clean surgical field that lends itself to the successful completion of the restorative procedure at hand (Figure 3).[6]

The degree of coagulation and hemostasis achieved with the diode laser results in a dry operating field that facilitates the immediate fabrication of a provisional restoration, avoiding the exposure of subgingival root surfaces and open embrasure spaces. This is a distinct advantage in the management of the esthetically aware patient. Laser surgery is well tolerated by the tissues, and the short-term healing response compares favorably to scalpel incisions and electrosurgery (Figure 4).[6]

Figure 1. Diode lasers provide unsurpassed operator control, allowing for precise tracing of a pre-established incision design.

Figure 2. Gingival excision is achieved in layers with excellent hemostasis and a clean surgical field.

Figure 3. The diode laser may be utilized to perform a bloodless external bevel gingivectomy, facilitating the immediate placement of provisional restorations.

Pre-Impression Gingival Troughing

Impression procedures are the key factor in the fabrication of indirect restorations.[8] The intraoral structures must be replicated in vivo and precisely duplicated in the laboratory environment. Exposure of subgingival finish lines in conjunction with adequate moisture control are prerequisites for the achievement of accurate impressions.[1,8] A double-cord retraction technique has been advocated to mechanically displace the sulcus, providing access to the finish line so that it may be adequately captured by the impression material.[8] Although capable of yielding excellent results, the double retraction cord technique is considered cumbersome by many clinicians. An alternative method utilizes electrosurgery to resect the gingival wall of the sulcus, therefore creating a trough along the finish line where the impression material will be subsequently syringed.[1] One problem with electrosurgery, however, is the fact that lateral heat generation will cause necrosis of the alveolar crest. Recession has been a consistent side effect of this technique, which is detrimental within the esthetic zone. Additionally, hemostasis is not always effective with plasmatic extravasation occurring as a result of soft tissue trauma (Figure 5).

Diode lasers offer clinicians the potential of utilizing a resective technique for gingival troughing, which simplifies the impression procedure while providing adequate hemostasis and allowing improved control of heat transfer to the adjacent tissues (Figure 6).[6] Provided that necrosis of the alveolar crest is avoided, healing following gingival excision with a diode laser should lead to the regeneration of the dentogingival complex to preoperative or near preoperative gingival margin levels. Therefore, thermal energy generation and transfer must be controlled by using the laser beam in a pulsed mode whenever possible, as well as implementing the use of cooling methods such as running an air current or incorporating a water spray throughout the procedure.

The quality and duration of hemostasis achieved facilitate the completion of multiple accurate impressions (Figure 7). This is becoming of particular importance given the increasing popularity of zirconia frameworks, which cannot be soldered to compensate for impression inaccuracies as is the case with metalceramic techniques.

Conclusion

Diode laser units are characterized by their compact dimensions and relatively low cost. Their use in pre-prosthetic soft tissue management offers a number of potential advantages. Gingival excision and esthetic crown lengthening procedures can be performed with unprecedented levels of precision while achieving excellent hemostasis. Though diode lasers demonstrate great effectiveness when utilized for gingival troughing prior to taking definitive impressions, questions still remain regarding heat generation and transfer to the adjacent tissues. Assuming that a protocol can be developed to consistently apply this technique without eliciting alveolar crest necrosis, diode lasers would be a welcomed addition to the restorative dentist's armamentarium, in terms of clinical effectiveness, practicality, and cost efficiency.

Figure 4. Post-operative appearance two weeks following laser-assisted esthetic crown lengthening with immediate provisionalization.

Figure 5. Preoperative view of abutment(s) prior to definitive impressions. Please note inflamed tissues and presence of bleeding.

Figure 6. Gingival troughing with the diode laser exposes finish lines while providing excellent hemostasis. Heat transfer to the alveolar crest must be carefully monitored.

Figure 7. Access to preparation margins coupled with adequate moisture control results in consistently successful impression taking.

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Smile Reminder Introduces New Extend Platform for External Messaging & Patient Acquisition

Extend Platform's First Feature, ZubuMail, Launched at ADA 2009

Leading patient communication service Smile Reminder unveiled at the American Dental Association's 150th Annual Session in Honolulu, Hawaii, its brand new Extend Platform and ZubuMail, the first of a series of features on the new platform. ZubuMail, an external communication and patient acquisition tool, is intended to increase the efficiency and profitability of dental practices nationwide by leveraging data-targeting models to create customized direct mail campaigns that are both precise and cost effective.

"Doing efficient and effective external marketing is an integral part of building a practice in the dental industry," says Smile Reminder VP of Marketing Mark Olson. "Our Extend Platform and ZubuMail will address this need by providing the right strategically-driven technologies to help dental practices grown and thrive. ZubuMail is an excellent example of making direct mail more efficient and effective."

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WebDental.com Goes Social

Popular Dental Industry Web Site Launches Social Network

WebDental.com announced that after 13 years of serving the dental industry as a trusted information resource, the website has launched a new online community to bring dentists closer to their colleagues.

When WebDental.com was created 13 years ago, Cary Feuerman, DMD. and Giovanni Castellucci, DMD set out to create the best online dental information resource. Originally the site served as a directory, sharing information from other disparate dental resources online. Patients were also able to find the nearest dental office through the site.

To Feuerman and Castellucci's surprise, the most popular section of the site was a community forum where dentists could use extremely limited tools to ask questions and share information directly with other dental professionals. Based upon overwhelming demand for increased one-on-one communication between dentists, hygienists,
lab technicians and oral surgeons, WebDental.com was completely rebuilt as an online community to better facilitate those conversations.

"We are extremely happy, but not surprised by the overwhelming reaction to the new site," said Cary Feuerman, co-founder of WebDental. "In a short time, we have attracted some of the best dental professionals from around the world to contribute to the site and share their experiences and insight."

The new WebDental has re-launched with added features including:

- Member Blog Posts
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U.S. Dentists Soon to Have New Anti-snoring Device

Calgary-based MPowRx Health and Wellness Products Inc. (MPowRx) announced today that the United States Patent and Trademark Office has granted United States Patent 7,533,674 entitled "Tongue Retention Device." The awarded patent broadly covers the MPowRx™; Snoring Solution and underscores the innovate nature of the device. This patent complements a previously awarded US Design Patent D461,240 entitled "Tongue Retention Device."

The MPowRx™ Snoring Solution (www.isleepsound.com), distributed in Canada by a leading national distributor Patterson Dental (www.pattersondental .com), is being embraced by dental professionals who recognize the large unmet clinical need in the treatment of snoring.

"We are excited to extend this clinically proven device to the 56 million American's who suffer from snoring," says Nancy Markley of MPowRx. The MPowRx™; Snoring Solution was developed by noted Dr. Leslie Dort, Calgary dentist and dental sleep medicine researcher, in response to growing incidence, and unmet need for a simple, cost effective and clinically proven treatment.

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BIOMET 3i Canada Introduces their Alliance with Bisco Canada

Two leading dental companies announced their official partnership on November 1, 2009. BIOMET 3i Canada, a leader in implant dentistry with one of the most comprehensive implant product lines, and Bisco Canada, a pioneer and leader in restorative dental materials, have created a unique synergy partnership to bring higher value to dentists in Western Canada.

This unprecedented Western Canadian alliance combines and offers the exceptional scientific pedigrees of both companies to the dental marketplace in a more efficient manner. The focal point of this alliance will be to provide many opportunities to help dentists develop, promote and deliver high standards of patient care in their practices while providing support and service through Bisco Canada's talented customer service team based out of Richmond, BC. The convergence of BIOMET 3i Canada and Bisco Canada's strengths will only result in better dentistry.

Please do not hesitate to contact either **Bisco Canada 800.667.8811** or **BIOMET 3i Canada 800.363.1980** for more information on how this partnership can comprehensively elevate your clinical experience.

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