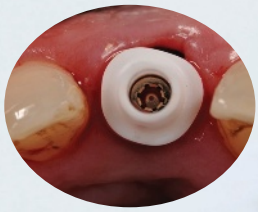
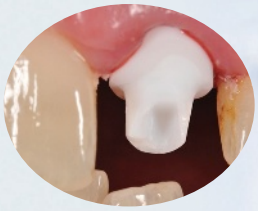
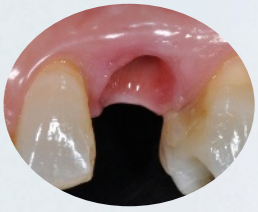
Esthetiline

- the complete anatomical restorative solution







Advancing the science of dental implant treatment

The aim at Neoss has always been to provide an implant solution for dental professionals enabling treatment in the most safe, reliable and successful manner for their patients.

The Neoss Esthetiline Solution is the first to provide seamless restorative integration all the way through from implant placement to final crown restoration. The natural profile developed during healing is matched perfectly in permanent restorative components; Titanium and Zirconia prepapble abutments, custom abutments and copings and CAD-CAM solutions.

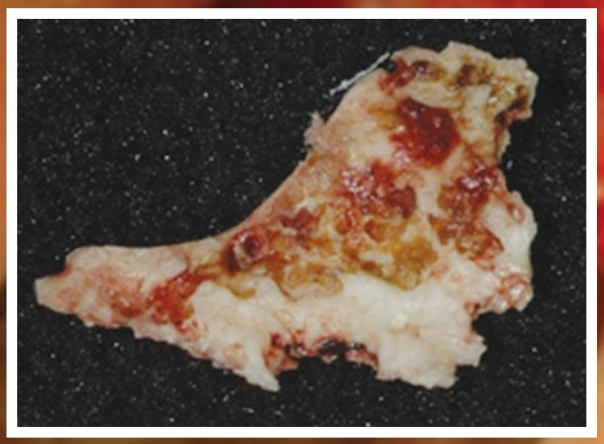
Neoss Inc., 21860 Burbank Blvd. #190, Woodland Hills, CA 91367 Ph. 866-626-3677 **www.neoss.com**

NEOSS™

Volume 5, No. 5 May 2013

JIACD
The Journal of Implant & Advanced Clinical Dentistry

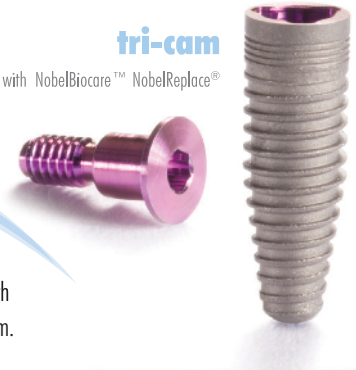
Bone Augmentation with Buccal Plates



BRONJ Treatment with Ozone Therapy

infinity
Dental Implant System

tri-cam
Surgically compatible with NobelBiocare™ NobelReplace®



Familiar Confidence.

The infinity System allows you to place our implants with the familiar confidence you get from your existing system.

Sensible Compatibility.

Designed to work with your existing implant system, you have the flexibility to use your existing surgical drills, drivers, and prosthetics to place and restore the implant.

each infinity implant only
$145.99

Endless Opportunities.

You will notice one difference with the infinity Implant...pricing. We are committed to delivering a compatible implant at pricing that creates significant opportunities for both you and your patients.

Give us a call today to experience infinity!

internal hex
Surgically compatible with Zimmer® Tapered Screw-Vent®

ALL NEW FROM ACE

acesurgical.com **1.800.441.3100**

Our *NuOss* Family Is EXPANDING!

NuOssXC™

EXPANDABLE BONE GRAFTING COMPOSITE

NuOssXC™ the latest development in natural bone substitutes:

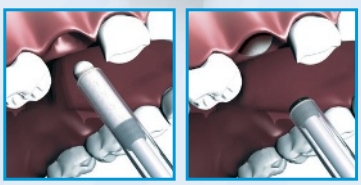
- Supports bone growth in periodontal and oral maxillofacial defects.
- Is a composite grafting material comprised of mineralized de-proteinated bovine granules and purified type I bovine collagen.
- When placed into a bleeding site, the material expands to a predetermined size and shape.
- Available in sinus form and socket form, which is supplied pre-loaded in a delivery syringe.

Features and Benefits:

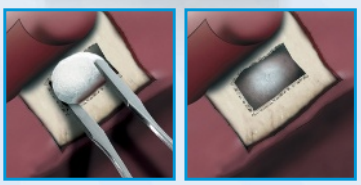
- Expanding composite material allows for placement in a compressed form with self-expansion to fill the entire defect upon hydration.
- Simple implantation technique.
- Composite nature of the material enhances graft stability and minimizes particulate migration.
- Optimizes spacing between particulate to allow for bone ingrowth .

Expansion time:
Immediately upon contact with blood source or by hydration with sterile saline after implantation.

NuOssXC™ Socket



NuOssXC™ Sinus



ACE Surgical Supply Co., Inc • 1034 Pearl Street, Brockton, MA

OSTEOGENICS
BIOMEDICAL

"OUTSTANDING.
A GAME CHANGER. RELEVANT. GREAT. USER-FRIENDLY.
EXCELLENT. REMARKABLE. TESTED.
TIME-SAVING. DEPENDABLE. RELIABLE.
STABLE. PROVEN. IDEAL.
POSITIVE. COST-EFFECTIVE.
GUARANTEED. CERTAIN. EFFECTIVE.
SUCCESSFUL. CONSISTENT.
PREDICTABLE. PREFERRED. SURE."
TRUSTWORTHY

Big words for such a small membrane, but Cytoplast™ TXT-200 Singles have lived up to those words from your colleagues for more than 15 years.

What's Your Sign?

MEET OUR +

Oralife® Plus

A QUALITY COMBINATION

- Cost-effective grafting material
- Validated to maintain osteoinductivity and biomechanical integrity[1]
- Mixture of DBM with mineral-retained cortical and cancellous chips, processed in a manner to retain the naturally-occuring growth factors (BMP) and be a conductive lattice – all in one product[1,2,3]

Click For Our **Quantity Discount Options**

www.exac.com/QuantityDiscountOptions

NEW Oralife Plus Combination Allograft available now!

Oralife is a single donor grafting product processed in accordance with AATB standards as well as state and federal regulations (FDA and the states of Florida, California, Maryland and New York). Oralife allografts are processed by LifeLink Tissue Bank and distributed by Exactech Inc.

1. Data on file at Exactech.
2. **McAllister BS, Hagnignat K.** Bone augmentation techniques. *J Periodontal.* 2007 Mar; 78(3):377-96.
3. **Blum B, Moseley J, Miller L, Richelsoph K, Haggard W.** Measurement of bone morphogenetic proteins and other growth factors in demineralized bone matrix. *Orthopedics.* 2004 Jan;27(1 Suppl):s161-5.

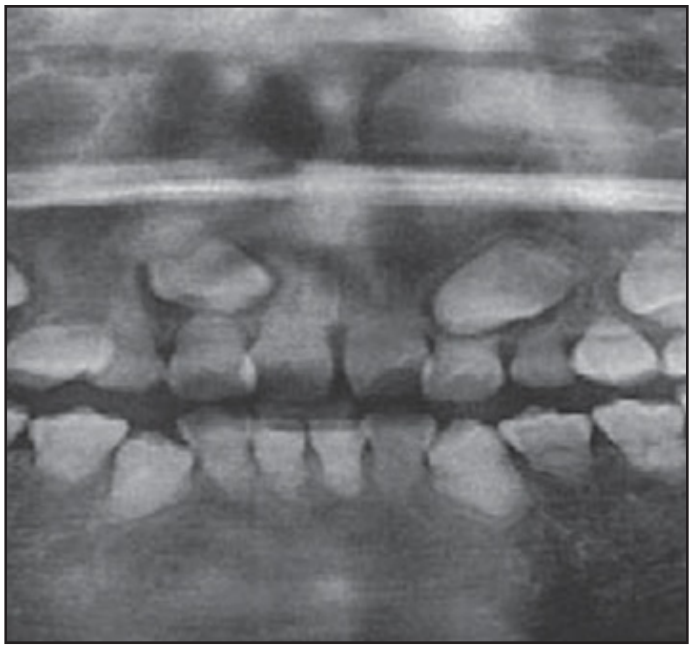
Exactech® DENTAL BIOLOGICS

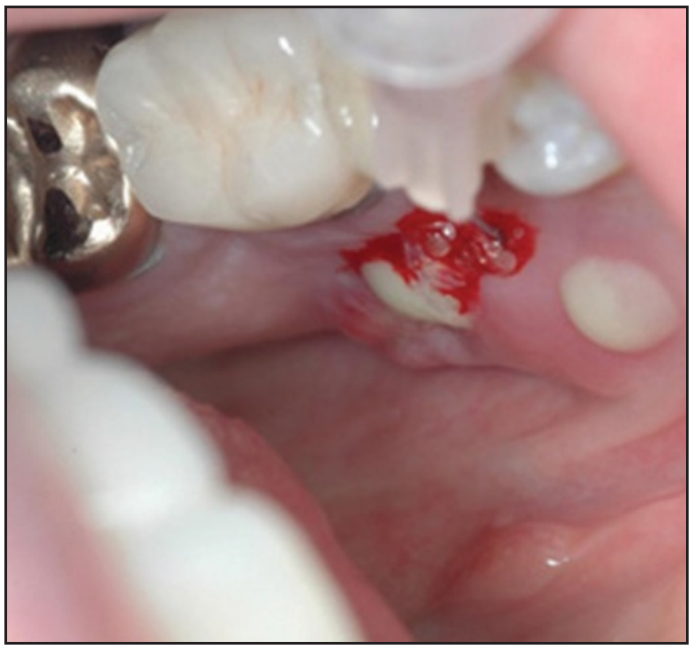
www.exac.com/dental

1-866-284-9690

JIACD
The Journal of Implant & Advanced Clinical Dentistry
Volume 5, No. 5 • May 2013

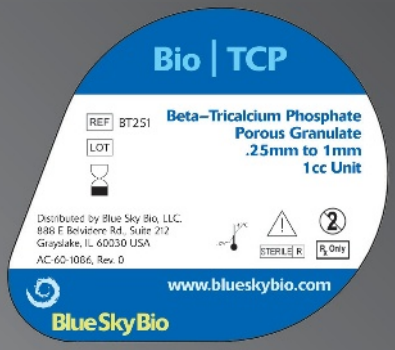
Table of Contents





Compatibility Innovation Value

Shipping World Wide



Bio | TCP - $58/1cc

Beta-Tricalcium Phosphate –
available in .25 to 1mm and 1mm to 2mm

X Cube Surgical Motor with Handpiece - $1,990.00

Including 20:1 handpiece, foot control pedal, internal spray nozzle, tube holder, tube clamp, Y-connector and irrigation tube

Bio | Sutures
All Sutures 60cm length, 12/box

Polypropylene - $50.00
PGA Fast Resorb - $40.00
PGA - $30.00
Nylon - $20
Silk - $15


Bio | One Stage
Straumann Compatible


Bio | Internal Hex
Zimmer Compatible


Bio | Trilobe
Nobel Compatible

Order online at www.blueskybio.com

Blue Sky Bio, LLC is a FDA registered U.S. manufacturer of quality implants and not affiliated with Nobel Biocare, Straumann AG or Zimmer Dental. SynOcta® is a registered trademark of Straumann AG. NobelReplace® is a registered trademark of Nobel Biocare. Tapered Screw Vent® is a registered trademark of Zimmer Dental.

*activFluor® surface has a modified topography for bone apposition on the implant surface without additional chemical activity.

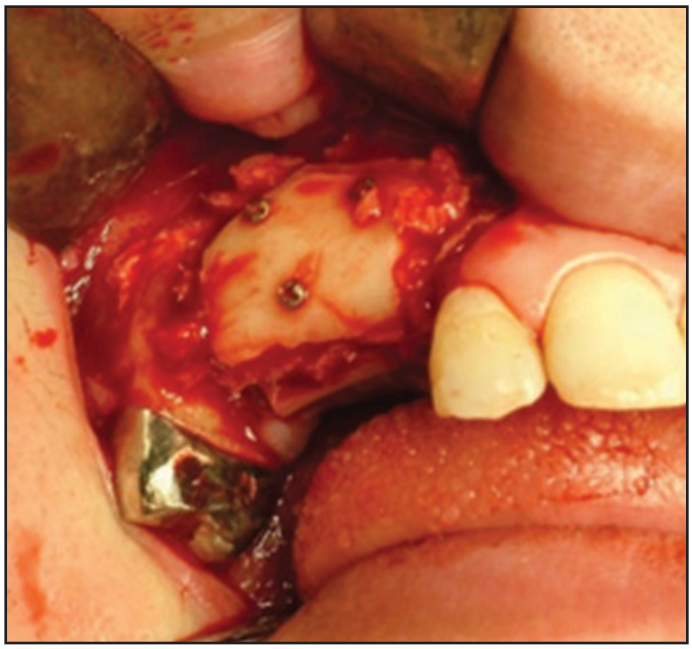
**U.S. and Canada. Minimum purchase requirement for some countries.

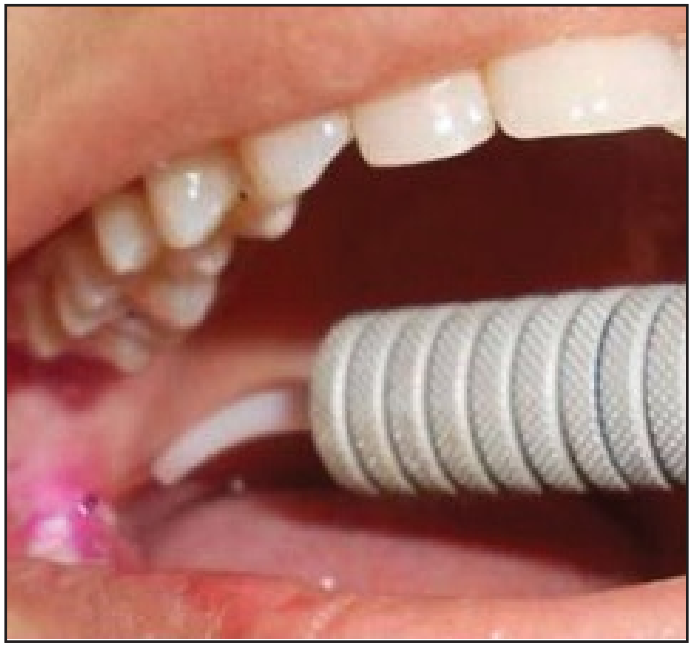
CE

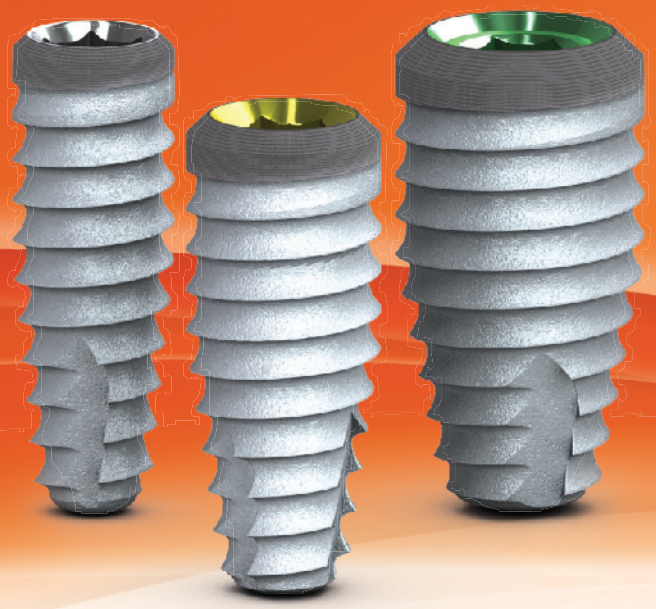
BlueSkyBio

JIACD
The Journal of Implant & Advanced Clinical Dentistry
Volume 5, No. 5 • May 2013

Table of Contents







make the switch

The Tapered Plus implant system offers all the great benefits of BioHorizons highly successful Tapered Internal system PLUS it features a Laser-Lok treated beveled-collar for bone and soft tissue attachment and platform switching designed for increased soft tissue volume.

platform switching

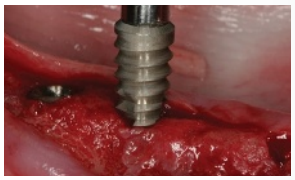
Designed to increase soft tissue volume around the implant connection

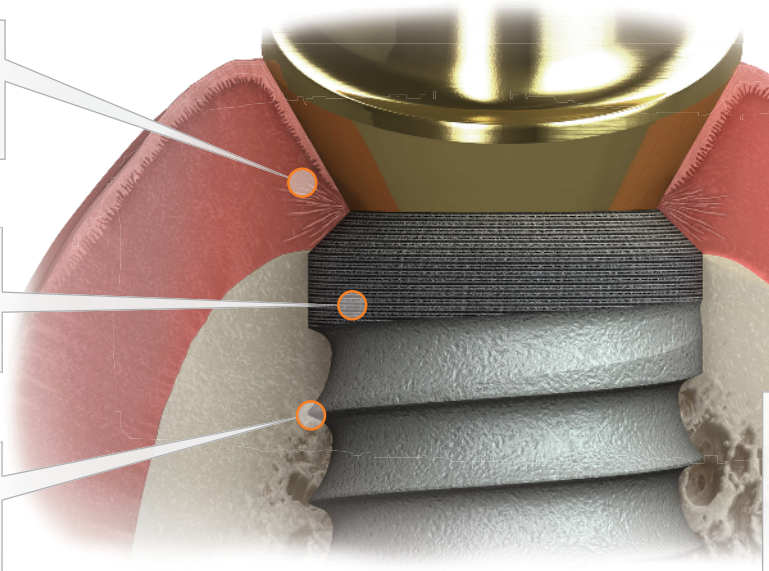
Laser-Lok® zone

Creates a connective tissue seal and maintains crestal bone

optimized threadform

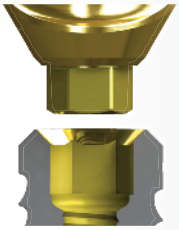
Buttress thread for primary stability and maximum bone compression





prosthetic indexing

Conical connection with internal hex; color-coded for easy identification



For more information, contact BioHorizons Customer Care: 1.888.246.8338 or shop online at www.biohorizons.com

BIOHORIZONS®

SCIENCE • INNOVATION • SERVICE

SPMP12245 REV A SEP 2012

JIACD
The Journal of Implant & Advanced Clinical Dentistry
Volume 5, No. 5 • May 2013

Publisher
LC Publications

Design
Jimmydog Design Group
www.jimmydog.com

Production Manager
Stephanie Belcher
336-201-7475 • stephanie@jimmydog.com

Copy Editor
JIACD staff

Digital Conversion
NxtBook Media

Internet Management
InfoSwell Media

Subscription Information: Annual rates as follows: Non-qualified individual: $99(USD) Institutional: $99(USD). For more information regarding subscriptions, contact info@jiacd.com or 1-888-923-0002.

Advertising Policy: All advertisements appearing in the Journal of Implant and Advanced Clinical Dentistry (JIACD) must be approved by the editorial staff which has the right to reject or request changes to submitted advertisements. The publication of an advertisement in JIACD does not constitute an endorsement by the publisher. Additionally, the publisher does not guarantee or warrant any claims made by JIACD advertisers.

For advertising information, please contact:
info@JIACD.com or 1-888-923-0002

Manuscript Submission: JIACD publishing guidelines can be found at http://www.jiacd.com/author-guidelines or by calling 1-888-923-0002.

Disclaimer: Reading an article in JIACD does not qualify the reader to incorporate new techniques or procedures discussed in JIACD into their scope of practice. JIACD readers should exercise judgment according to their educational training, clinical experience, and professional expertise when attempting new procedures. JIACD, its staff, and parent company LC Publications (hereinafter referred to as JIACD-SOM) assume no responsibility or liability for the actions of its readers.

Opinions expressed in JIACD articles and communications are those of the authors and not necessarily those of JIACD-SOM. JIACD-SOM disclaims any responsibility or liability for such material and does not guarantee, warrant, nor endorse any product, procedure, or technique discussed in JIACD, its affiliated websites, or affiliated communications. Additionally, JIACD-SOM does not guarantee any claims made by manufact-urers of products advertised in JIACD, its affiliated websites, or affiliated communications.

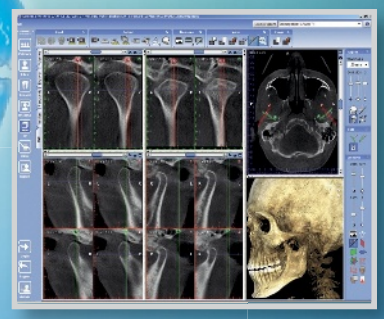
Conflicts of Interest: Authors submitting articles to JIACD must declare, in writing, any potential conflicts of interest, monetary or otherwise, that may exist with the article. Failure to submit a conflict of interest declaration will result in suspension of manuscript peer review.

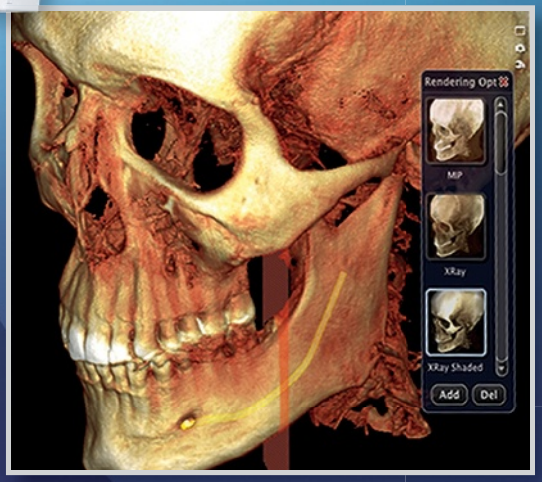
Erratum: Please notify JIACD of article discrepancies or errors by contacting editors@JIACD.com

JIACD (ISSN 1947-5284) is published on a monthly basis by LC Publications, Las Vegas, Nevada, USA.

Introducing the
PLANMECA® ProMax® 3D

Max...





Features

- 5 selectable, single scan fields of view
  Most common uses:
  ø5 x 5.5 cm - Individual tooth or other point of interest
  ø10 x 5.5 cm - Mandible or maxilla
  ø10 x 9 cm - Mandible and maxilla
  ø10 x 13 cm - Mandible or maxilla and sinus
  ø23 x 16 cm - Full maxillofacial image, upper or lower skull
- The smallest and largest fields of view on the market giving the ProMax 3D Max more versatility then any other comparable X-ray unit
- Large view, single acquisition - dual scan for full maxillofacial and skull imaging
  ø23 x 26 - Full skull covers the whole head and is therefore extremely useful for surgical and orthodontic procedures, as well as TMJ, ear, sinus, and airway studies. Using the large volume size, it is possible to generate a 2D cephalometric image with a single mouse click.
- Automatically adjusts volume sizes for children
  When the child patient size is selected, the fields of view (volume sizes) and the dosage parameters are slightly reduced
- More than 36 pre-programmed targets
  From a single tooth scan to the whole skull, the ProMax 3D Max has 18 pre-programmed targets, 5 adult fields of view, 5 child fields of view, and more
- Patented SCARA technology allows limitless imaging possibilities
- Full view, open patient positioning for standing, sitting, and wheelchair accessibility
- Space saving
  A small footprint and compact design make the ProMax 3D Max the smallest large FOV on the market
- High resolution, flat panel technology
- Now compatible with Mac OS environment

PLANMECA®

For more information on
PLANMECA ProMax 3D Max
please call...

1-630-529-2300

or visit us on the web @
www.planmecausa.com

PLANMECA®
ProMax® 3D Max

JIACD
The Journal of Implant & Advanced Clinical Dentistry

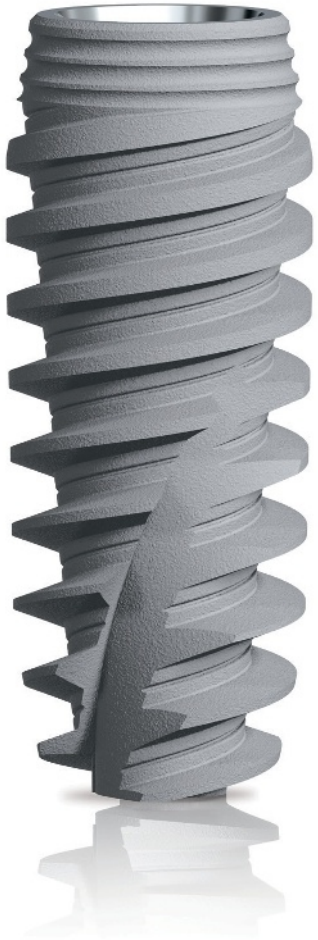
NobelActive™

A new direction for implants.

Dual-function prosthetic connection

Bone-condensing property

Adjustable implant orientation for optimal final placement



Built-in platform shifting

High initial stability, even in compromised bone situations

NOW AVAILABLE WITH NOBELGUIDE™

TIUNITE® SURFACE, 10-YEAR EXPERIENCE
New data confirm long-term stability.

NobelActive equally satisfies surgical and restorative clinical goals. NobelActive thread design progressively condenses bone with each turn during insertion, which is designed to enhance initial stability. The sharp apex and cutting blades allow surgical clinicians to adjust implant orientation for optimal positioning of the prosthetic connection. Restorative clinicians benefit by a versatile and secure internal conical prosthetic connection with built-in platform shifting upon which they can produce excellent esthetic results. Based on customer feedback and market demands for NobelActive, the product assortment has been expanded – dental professionals will now enjoy even greater flexibility in prosthetic and implant selection. Nobel Biocare is the world leader in innovative evidence-based dental solutions. For more information, contact a Nobel Biocare Representative at 800 322 5001 or visit our website.

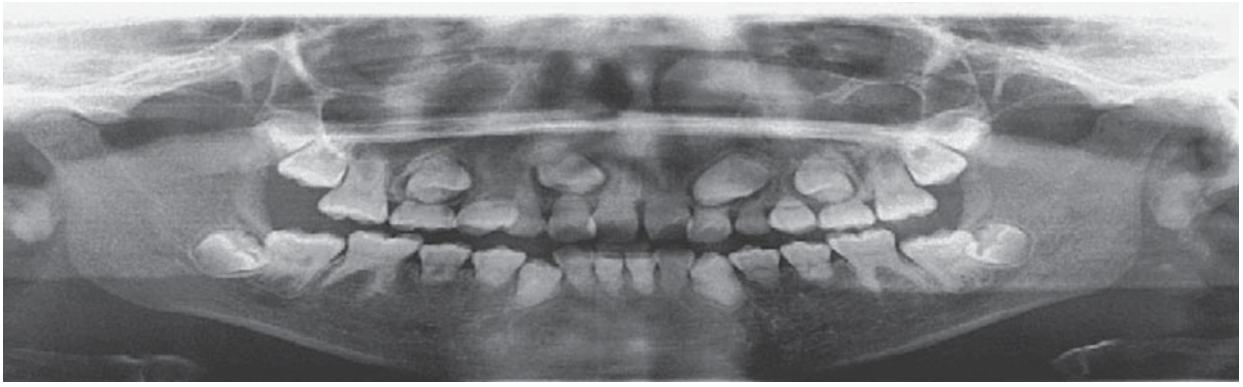
www.nobelbiocare.com/nobelactive

Nobel Biocare USA, LLC. 22715 Savi Ranch Parkway, Yorba Linda, CA 92887; Phone 714 282 4800; Toll free 800 993 8100; Tech. services 888 725 7100; Fax 714 282 9023
Nobel Biocare Canada, Inc. 9133 Leslie Street, Unit 100, Richmond Hill, ON L4B 4N1; Phone 905 762 3500; Toll free 800 939 9394; Fax 800 900 4243

Dentin Dysplasia Type I and II Characteristics in the Adolescent

Anil K. Reddy, DDS, MPH[1] • Celeste M. Abraham, DDS, MS[2]

Abstract



Background: Dentin Dysplasia is classified as Type I and Type II. This article describes a case of dentin dysplasia with a blend of features from both types.

Methods: A developmentally normal 12-year-old male patient, presented for consultation in April 2011. Medical history included an adenoidectomy at 12 months and febrile seizures at 5 years of age. Radiographic evaluation revealed teeth with shortened roots, healthy bone, non-mobile teeth except for physiologic mobility of teeth #7 and #10. An oral pathologist at the dental school evaluated the patient.

Results: The diagnosis based on clinical and radiographic findings was dentin dysplasia.

Conclusions: Treatment implications for dentin dysplasia involve combinations of oral surgical procedures, endodontic, and orthodontic procedures. Definitive treatment may not always be possible therefore creative and alternative options should be considered.

KEY WORDS: Dentin dysplasia, adolescent, oral pathology, treatment planning

1. Private Practice and Clinical Assistant Professor, Baylor College of Dentistry TAMHSC, Department of Pediatric Dentistry, Dallas, Texas, USA

2. Associate Professor, Baylor College of Dentistry, TAMHSC, Department of Periodontics, Dallas, Texas, USA

BACKGROUND

Dentin dysplasia is a genetic disorder of dentin that was first described by Ballschmiede.[1] This disorder is subdivided into Type I (radicular dentin dysplasia) and Type II (coronal dentin dysplasia) according to Shields.[2] Type I is of unknown etiology and may be considered an allelic disorder of the DSPP gene (dentin sialophosphoprotein) or a mixed phenotype. A mutation in the DSPP signal peptide series of genetic codes has been identified in one type II family.[3, 4] Type I is characterized by teeth that exhibit normal crowns, abnormal roots, and an autosomal dominant genetic pattern. This form affects the root formation by the induction of disorganization in the deposition of root dentin. The basic defect seems to lie in a disturbance in Hertwig's epithelial root sheath. Radiographic representation has displayed from roots that appear shorter and more pointed than normally expected as well as an abnormal pulp chamber shape and an absence of root canals. Radiographs may show total or partial lack of pulp chambers and root canals. Both the primary as well as the secondary dentin may be affected. Because the roots are short, the teeth are generally lost prematurely. The reason being, there is a larger crown to root ratio and the general increase in masticatory force as the child becomes older and the muscles of mastication become stronger. A half-moon appearance on radiograph is usually seen if the pulp chambers of the permanent teeth are not completely obliterated. From time to time, periapical cysts/periapical radiolucencies have been found to be associated with Type I dentin dysplasia on non-cariogenically involved teeth. Those individuals with type I have experienced pain caused by severe mobility of teeth, especially after eating a meal.

Type I dentin dysplasia has four subtypes.[5] In Type 1a, there is no pulp chamber and there is no root formation; there are some periradicular radiolucencies. Type 1b has a solitary horizontally positioned pulp, which is crescent-shaped; the roots are short in length and there are several periapical radiolucencies. Type 1c has a vertical or horizontal crescent-shaped pulpal vestige that surrounds a central area of dentin; there are with significant, shortened root lengths. Some periapical radiolucencies exist in Type 1c. In tTpe 1d, there is a visible pulp chamber and canal; the root length is very close to normal. Type 1d may display large pulp stones that are located in the coronal portion of the canal and may create a full appearance of that area. Root constriction of the pulp canal has been seen in type 1d and some periapical radiolucencies have been noted as well.

Coronal dentin dysplasia (Type II) also follows an autosomal dominant pattern. The basic defect is a gene mutation termed dentin sialophosphoprotein (DSPP) that is mapped to the long arm of chromosome 4(4q13-21).[3,4] The dental literature has shown that dentinogenesis imperfecta type II and coronal dentin dysplasia share the DSPP gene loci and the proteins encoded by that gene. The crowns of the deciduous teeth have a brown to gray discoloration with an opalescent luster similar to dentinogenesis imperfecta. A constriction of the tooth at the CEJ creates a bulbous appearance of the crown on radiographs. The pulp chambers and the root canals are obliterated prematurely, but the length of the root is not changed, as it is in Type I. The length of the root is normal and frequent periapical radiolucencies are not usually seen. The pulp chamber is sometimes referred to as rectangular shaped ("bow-tie" appearance in molar teeth and" thistle" shape

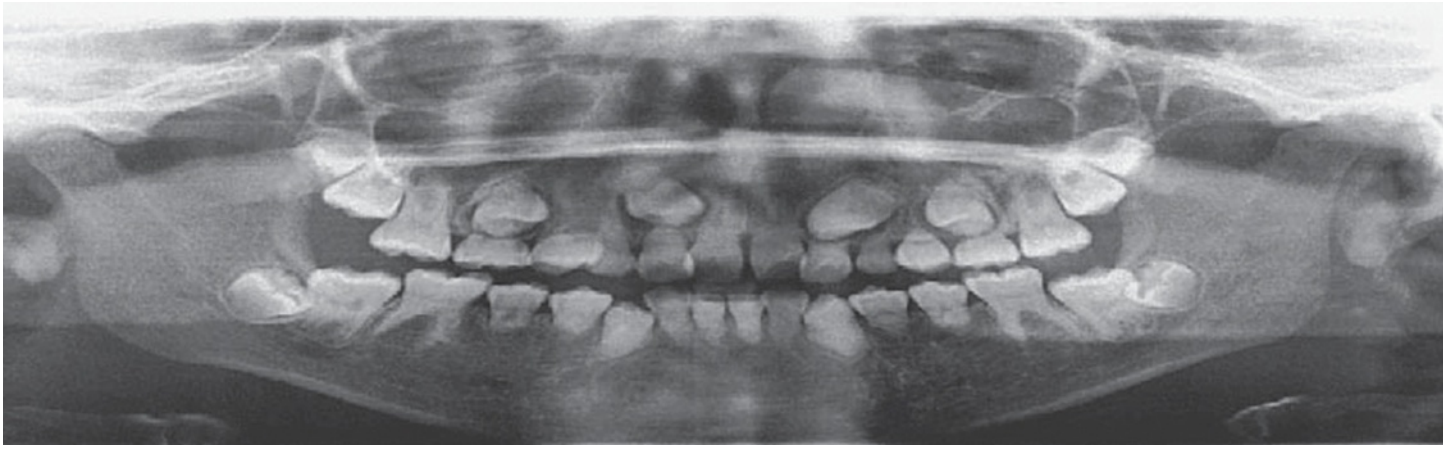


Figure 1: Panoramic radiograph of patient. Notice the mixed dentition and characteristics consistent with Dentin Dysplasia.

in single rooted teeth). Pulp stones may be seen within the enlarged pulp chamber. A third type of dentin dysplasia (focal odontoblastic dysplasia) has also been described in the literature.[6]

Treatment of radicular dentin dysplasia may take place in a variety of ways.[7] Management may require extraction if spontaneous exfoliation of primary teeth does not occur. Due to the disorganization of the dentin in type I, routine endodontic therapy may be difficult to perform. Surgical endodontic therapy has been attempted in cases where the root length is adequate and a canal space has been created with the use of dental rotary instrumentation.[8, 9] Treatment for type II is easier than that of type I, especially after the permanent teeth erupt. With the coronal form, there is a propensity for the occurrence of periapical pathology. Since the pulp chambers are still present in Type II, conventional endodontic treatment can be done on permanent teeth. If pulp stones are present, endodontic treatment could be more challenging. It is important that the patient maintain meticulous oral hygiene and be seen for routine dental appointments for monitoring of their condition.[8,9,10]

CASE REPORT

A twelve year-old male patient presented to the pediatric clinic at the Baylor College of Dentistry for consultation in April of 2011. He was referred by a general dentist who evaluated him one month before. The patient is developmentally normal and in good health with a history of mouth breathing. This young man is active in various sports including basketball, soccer, and baseball. Medical history included an adenoidectomy and overnight hospitalization twice for seizures at the age of 12 months and then again at 5 years of age. Fever was also present at the time of the seizures. His mother reported that he had the unusual habit of eating sponges.

In the Frankl Classification Scale, (classification of a child's behavior in the dental clinic), he was identified as a Class III (cooperative and somewhat shy). In the analysis of his occlusion, Angle's Class I was noted. There was a 6mm horizontal overjet and a 2 mm vertical overbite. Crowded dentition was noted in both the maxillary and mandibular arches.

The patient presented to the Department of Pediatric Dentistry Clinic for clinical and radio-

graphic evaluation (Figure 1). Radiographic evaluation revealed teeth with shortened roots and bone which appeared healthy. Teeth appeared radiographically to have had excessive mobility but clinically there was no mobility noted with the exception of Grade 1 mobility on teeth #7 and #10. Teeth #3, #14, #19, and #30 displayed small pulp chambers with pulp stones. Teeth #20, #21, and #29 revealed a possible thistle-shaped pulpal presentation. An oral pathologist in the school evaluated the patient and stated that the most likely diagnosis based on current findings was that of dentin dysplasia. Parental written informed consent was obtained for the case report and disclosure of the child's photographs.

In October 2011, the patient was referred to the Genetic Counseling Office of Children's Medical Center in Dallas for evaluation of the abnormalities noted in his dentition. Several genetic disorders affecting teeth were considered in the differential diagnosis such as dentinogenesis imperfecta, ectodermal dysplasia, and hypophosphatasia. None of these disorders was confirmed at the Center. Blood alkaline phosphatase levels were also analyzed; a skeletal survey was obtained. The alkaline phosphatase levels were found to be 209 units/liter (normal range: 200 units/liter to 495 units/liter). The skeletal survey was normal other than the anomaly found in the dentition. No genetic syndrome was identified as a possible cause of his dental abnormality.

Considerations for a treatment plan for the patient were to extract Tooth C and Tooth H and orthodontically extrude #6 and #11 into their respective positions. However, upon consult, the orthodontic department declined to proceed with treatment due to the lack of root formation; this was not a viable option. Another possible alternative was to extract tooth A and J to facilitate the eruption of #4 and #13 but it was decided against proceeding in this manner as well due to the lack of root formation. No definitive orthodontic treatment was initiated.

At the present time, recommendations to his parents include advisement regarding regular dental prophylaxis, performance of good oral hygiene, and execution of good nutritional intake to minimize the potential occurrence of carious lesions have been made. Regular recall appointments to the pediatric dentist will provide an opportunity to intervene quickly if this patient develops a problem. If teeth are lost because of the dentin dysplasia, prosthesis can be considered in the future. This can help keep the other teeth in position, as well as allowing the patient to eat and speak normally.

Correspondence:
Celeste M. Abraham, DDS, MS
Associate Professor,
Texas A and M University Baylor College of Dentistry
Department of Periodontics
3302 Gaston Avenue
Dallas, Texas, 75246
USA
Phone: 214-8282-8467
Fax: 214-874-4563

Disclosure
The authors report no conflicts of interest with anything mentioned in this article.

References

1. Ballschmiede G. In: Malformations of the Jaws and Teeth. Herbst E, Apffelstaedt M, editor. New York: Oxford University Press; 1930. Dissertation, Berlin, 1920; p. 286.
2. Shields ED, Bixler D, El-Kafraway AM. A proposed classification of heritable human dentin defects with a description of a new entity. Arch Oral Biol 1973; 18: 543-553.
3. Wang, S-K, Chan H-C, Rajderkar S, Milkovich RN, Uston KA, Kim J-W, Simmer JP, Hu JC. Enamel malformations associated with a defined dentin sialophosphoprotein mutation in two families. Eur J Oral Sci 2011; 119(Suppl. 1):158-167.
4. Lee KE, Lee SK, Jung SE, Lee Zh, Kim JW. Functional splicing assay of DSPP mutations in hereditary dentin defects. Oral Dis. 2011 Oct; 17(7):690-5.
5. Toomarian L, Mashhadiabbas F, Mirkarimi M, and Mehrdad L. Dentin dysplasia type I: a case report and review of the literature. Journal of Medical Case Reports 2010, 4:1. Published online 2010 January 7. Doi: 10.1186/1752-1947-4-1
6. Eastman, John Russell, Melnick, Michael, and Goldblatt, Lawrence I. Focal odontoblastic dysplasia: dentin dysplasia type III? Oral Surgery, Oral Medicine, Oral Pathology Volume 44, Issue 6, December 1977, Pages 909–914.
7. Guideline on Oral Health Care/Dental management of Heritable Dental Developmental Anomalies: Reference Manual: American Academy of Pediatric dentistry: American Academy of Pediatric Dentistry Council on Clinical Affairs. Guideline on oral health care/dental management of heritable dental development anomalies. Pediatr Dent 2008-2009; 30(7 Suppl):196-201.
8. Naik VV, Kale AD. Dentin Dysplasia: Single-tooth involvement? Quintessence Int. 2009 Mar; 40(3):183-6.
9. Rocha CT, Nelson-Filho P, Silva LA, Assed S, Queiroz AM. Variation of dentin dysplasia type I: Report of atypical findings in the permanent dentition. Braz Dent J. 2011; 22(1):74-8.
10. Barron, MJ, McDonnell, ST, Mackie Iain, and Dixon, MJ. Hereditary Dentine Disorders: Dentinogenesis Imperfecta and Dentine Dysplasia. Orphanet Journal of Rare diseases 2008, 3:31.

PIEZOTOME2
Piezo.Ultrasonic.Surgery.Unit

3x's THE POWER!

PIEZOTOME2 and IMPLANT CENTER2

- Three times more power than ***PIEZOTOME1***!
  (60 watts vs 18 watts of output power in the handpiece)
  Procedures are faster than ever, giving you a clean and effortless cut
- ***NEWTRON LED*** and ***PIEZOTOME2 LED*** Handpieces output 100,000 LUX!
- Extremely precise irrigation flow to avoid any risk of bone necrosis
- Selective cut: respect of soft tissue (nerves, membranes, arteries)
- Less traumatic treatment: reduces bone loss and less bleeding
- 1st EVER Autoclavable LED Surgical Ultrasonic Handpieces
- Giant user-friendly 5.7" color touch-control screen
- Ultra-sharp, robust and resistant tips
  (30+ Surgical & 80+ Conventional)

Autoclavable LED's | Progressive Pedal | Controlled Power

IMPLANTCENTER2
Piezo • Ultrasonic • Surgery & Implantology Unit

All the benefits of the PIEZOTOME2...PLUS...

- ***I-Surge*** Implant Motor (Contra-Angles not included)
- Compatible with all electric contra-angles (any ratio)
- Highest torque of any micro-motor on the market
- Widest speed range on the market

SATELEC ACTEON

ACTEON North America • 124 Gaither Drive, Suite 140 Mount Laurel, NJ 08054
Tel - (800) 289 6367 • Fax - (856) 222 4726
www.us.acteongroup.com • E-mail: info@us.acteongroup.com

Treatment of Bisphosphonate Related Osteonecrosis of the Jaw (BRONJ) with Oxygen-Ozone Therapy: A Case Report

Griffin Cole, DDS, NMD, IBDM, FIAOMT[1]

Abstract

Bisphosphonate related osteonecrosis of the jaw (BRONJ) is recognized as a condition caused by trauma to dentoalveolar structures that have a limited capacity for bone healing due to the effects of bisphosphonate therapy. This trauma, thought to be related to dental surgery or other obvious oral trauma can now include what may be referred to as "micro-trauma", a result of every day mastication and home care. BRONJ manifests as exposed, non-vital bone involving the maxillofacial structures and is thought to be related to a defect in jaw bone physiologic remodeling or wound healing. The strong inhibition of osteoclast action precipitated by bisphosphonate therapy, coupled with an oral flora which is conducive to bacterial invasion and cell proliferation of wound sites leads to the inhibition of normal bone turnover.

The American Association of Oral and Maxillofacial Surgeons (AAOMS) has established guidelines1 to eliminate pain, control infection, and minimize the progression of bone necrosis but there remains no established clear treatment modality for BRONJ. It is important to note that at the current time, the following options for treatment of BRONJ have been recommended: 1) Stop Bisphosphonate therapy altogether; 2) Alternated dosing of Bisphosphonate therapy – on and off; 3) Antibiotic therapy – up to 6 months or longer; 4) Palliative treatment – chlorhexidine rinses and pain medications.

Definitive and repeatable successful treatment of BRONJ is a goal that has yet to be achieved. Numerous methods for the treatment of BRONJ have been documented with varying degrees of success. This article documents treatment of a single case of BRONJ utilizing Oxygen-Ozone therapy.

KEY WORDS: Bisphosphonate related osteonecrosis of the jaw, BRONJ, Oxygen-ozone therapy, mandible

1. Private practice, Austin, Texas, USA

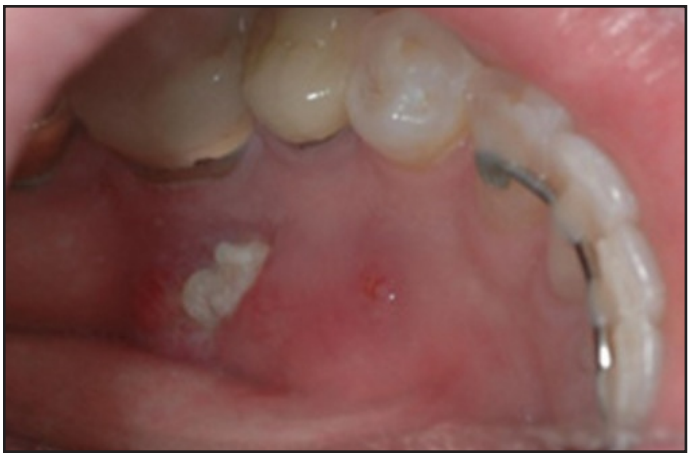


Figure 1: Initial presentation of bone necrosis on the lingual aspect of the posterior lingual mandible.

CASE REPORT

The following case of Stage 3 BRONJ (the highest stage established by The American Association of Oral and Maxillofacial Surgeons[1]) was treated successfully using oxygen-ozone therapy as the sole means of treatment. Although ozone has been mentioned briefly in the scientific literature[2-4] as a promising treatment modality, this documented case lays the groundwork for a predictive, non-invasive and non-surgical protocol.

Ozone therapy acts by stimulating endogenous antioxidants and preventing oxygen free radicals by blocking the xanthine/xanthine oxidase pathway. Ozone also increases the concentration of red blood cells and hemoglobin, and creates reepithelization of soft tissue over the wound.

This 61 year old female patient was referred to our office for BRONJ evaluation and treatment by the Indiana University School of Dentistry. She presented with a history of breast cancer, Sjogren's Disease, systemic lupus erythematosus (SLE), Raynaud's phenomenon, goiter, and depression. She had a 10+ year history of

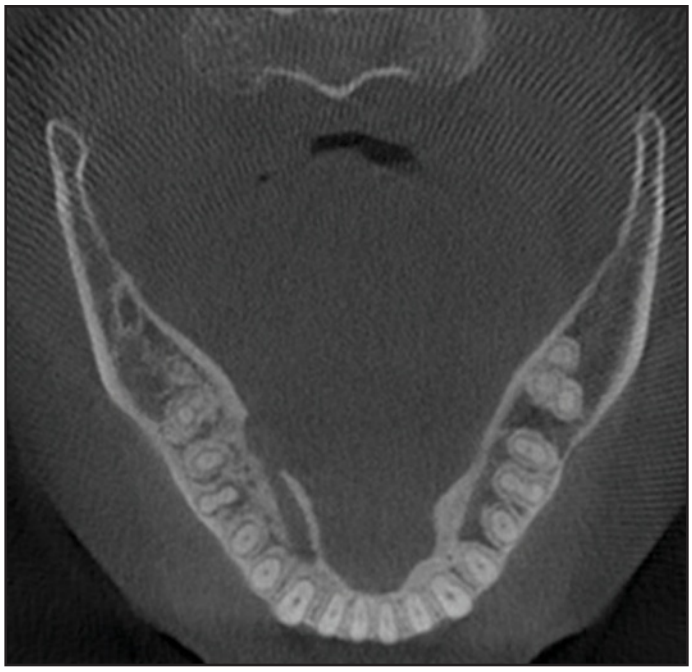


Figure 2: Axial view CBCT scan slice showing disruption of the lingual cortical plate of the right mandible.

Fosamax and Boniva use. The patient described intense pain in area of bone exposure along with difficulty masticating and swallowing food. She explained that pain medications provided only minor, temporary relief. Upon clinical examination which included a cone beam computed tomography scan and full oral evaluation, one site of bone necrosis was found on the lingual aspect of the right mandible (Figure 1) spanning from first bicuspid to mid-first molar. Axial view CBCT scan slices (Figure 2) show disruption of the mandibular cortical plate in the area of the suspected BRONJ lesion. Interviews with the patient combined with clinical history of the lesion suggested that "micro-trauma" resulting from daily mastication and home-care may have been the etiology.

After informed consent was obtained, a treatment protocol was initiated (Table 1). The treatment regimen consisted of four visits over a

Table 1: BRONJ Ozone Therapy Treatment Protocol	
1	Using a 30 gauge short needle, 6 ml of a 25mg/L mixture of ozone gas was injected into the site, just proximal and distal to the actual bony exposure.
2	Ear insufflation (utilizing damp gauze over stethoscope pads) at 15mg/L ozone gas for 4 minutes.
3	Nasal insufflation (running ozone through olive oil) at 25mg/L ozone gas for 22 minutes.
4	Application of jojoba-ozone cream (Orazone) to site, and patient instructed to apply 3-4 times a day.

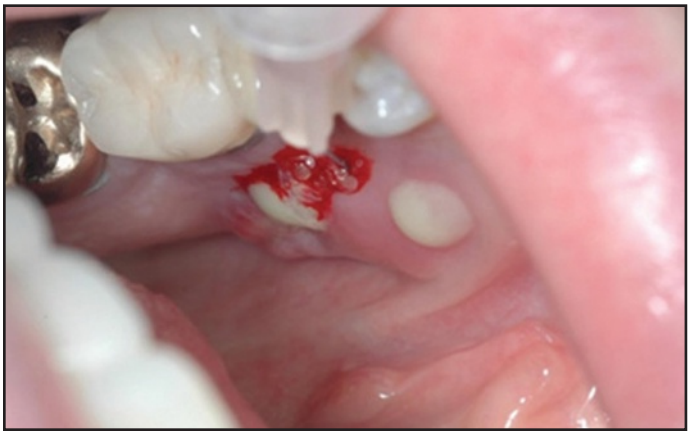


Figure 3: Ozone site injection at site of necrotic bone.

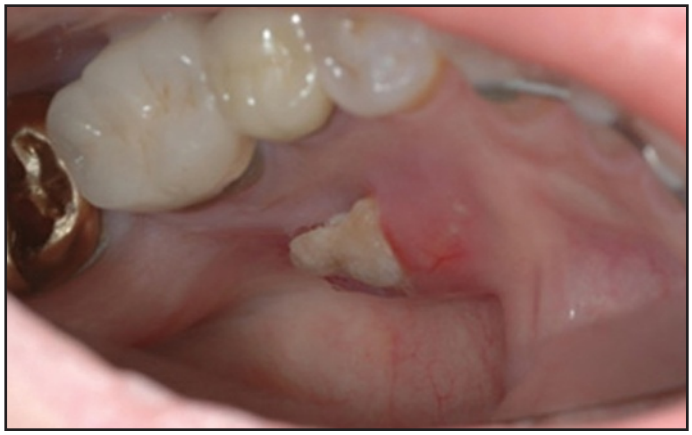


Figure 4: Appearance of the BRONJ lesion 4 months after initial treatment.

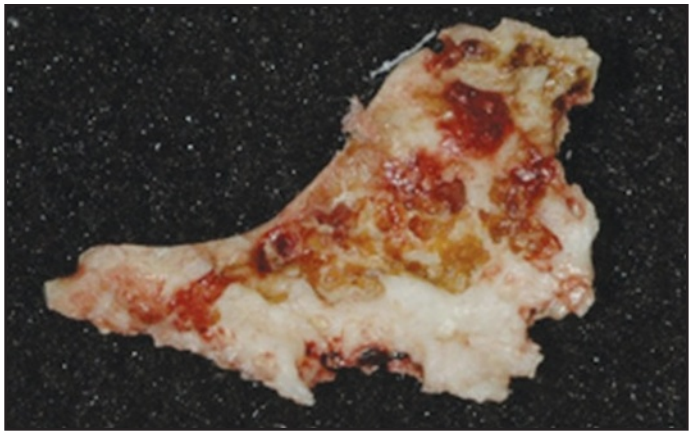


Figure 5: Sequestered bone removed from BRONJ site 4 months after initial treatment.

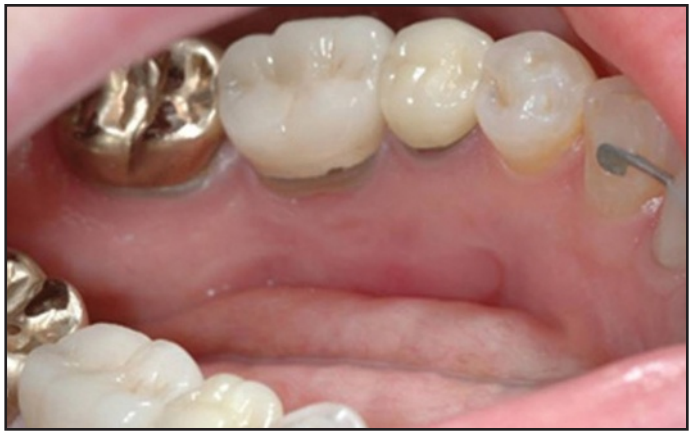


Figure 6: Appearance of BRONJ site 6 months after initial treatment. Note the complete disappearance of the previous lesion and the lack or erythema.

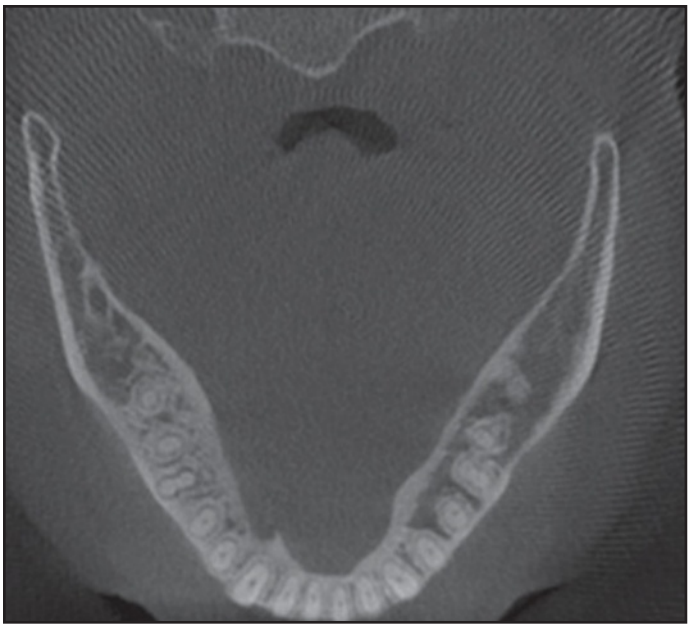


Figure 7: CBCT scan slice showing improvement of the lingual cortical plate of the right mandible 6 months after initial treatment.

6-month period of time and involved ozone site injections (Figure 3) and insufflation of the nose and ear. This protocol was repeated once in August, October, and November of 2011. Figure 4 documents the appearance of the lesion at the November appointment. During this visit, a small section of bone was removed from the suspected BRONJ site and sent for pathologic evaluation. Pathologic evaluation of the biopsy specimen confirmed "septic non-vital bone." Soon after this visit, the patient noted that a large piece of bone loosened from the site of the BRONJ lesion and she was able to manually remove it from her mouth (Figure 5). By December 2011, the site of the BRONJ lesion appeared to have fully healed (Figure 6) and the patient reported a cessation in pain associated with the area. An updated CBCT scan of the mandible showed improved consistency of the cortical plate (Figure 7).

This case report provides evidence of a promising treatment modality for BRONJ. As this was only a single case, additional studies with larger patient pools following this protocol may be warranted.

Correspondence
Dr. Griffin Cole
1301 W, 25th Street, Suite 402
Austin, TX 78705
Phone: 512-472-3565
Email: griffincole@yahoo.com

Disclosure
The author reports no conflicts of interest with anything mentioned in this article.

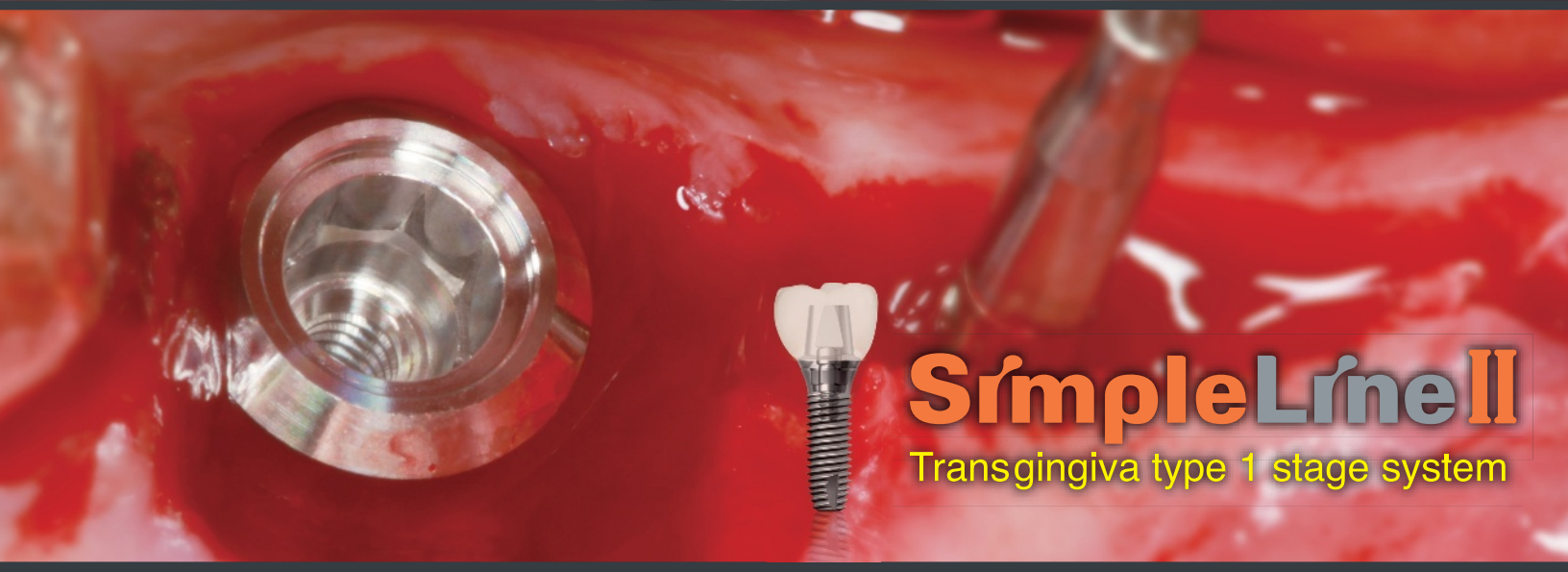
References

1. Advisory Task Force on Bisphosphonate-Related Ostenonecrosis of the Jaws, American Association of Oral and Maxillofacial Surgeons. American Association of Oral and Maxillofacial Surgeons position paper on bisphosphonate-related osteonecrosis of the jaws. J Oral Maxillofac Surg. 2007 Mar;65(3):369-76.
2. Ripamonti CI, Maniezzo M, Pessi MA, Boldini S. Treatment of osteonecrosis of the jaw (ONJ) by medical ozone gas insufflation. A case report. Tumori. 2012 May-Jun;98(3):72-75.
3. Agrillo A, Filiaci F, Ramieri V, Riccardi E, Quarato D, Rinna C, Gennaro P, Cascino F, Mitro V, Ungari C. Bisphosphonate-related osteonecrosis of the jaw (BRONJ): 5 year experience in the treatment of 131 cases with ozone therapy. Eur Rev Med Pharmacol Sci. 2012 Nov;16(12):1741-1747.

www.dentium.com

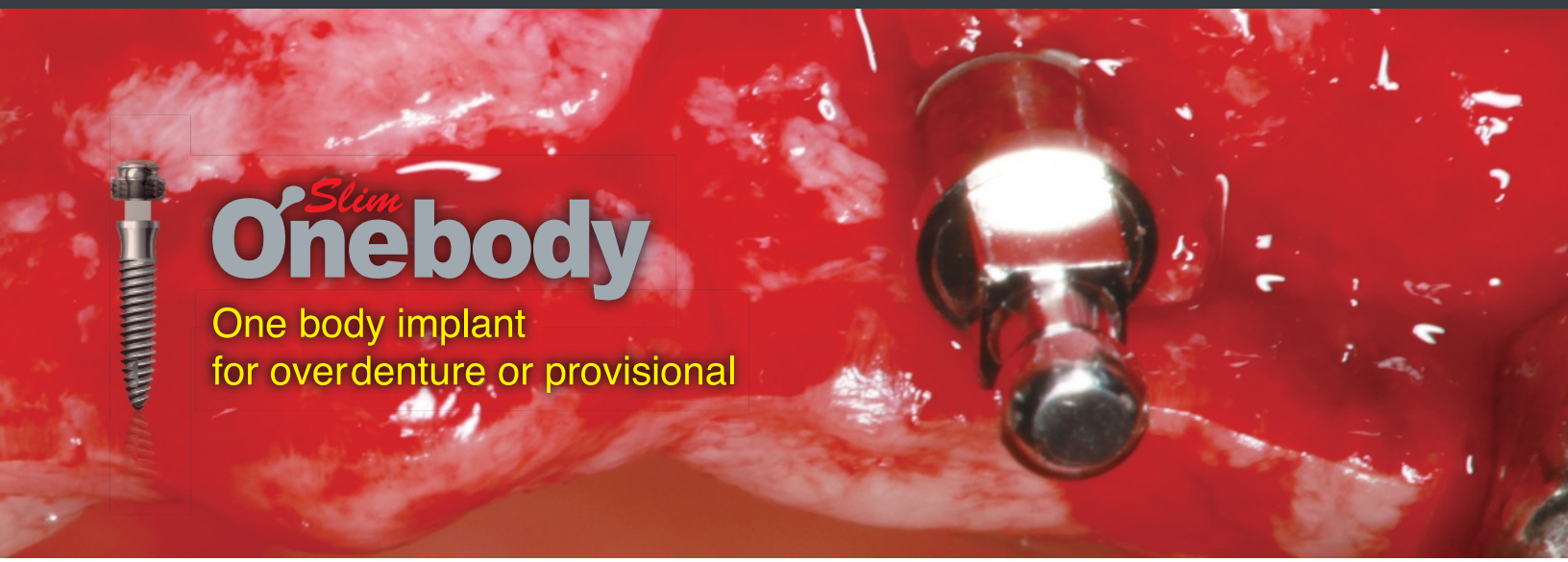
SuperLine

Submerged type with tapered body
for immediate loading



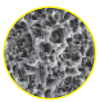
SimpleLine II

Transgingiva type 1 stage system



Slim Onebody

One body implant
for overdenture or provisional



All with S.L.A. surface treatment
for successful osseointegration with proven record

Dentium
For Dentists By Dentists

3105 Trade Tower 159, Samsung-dong, Gangnam-gu, Seoul, Korea
T +82-2-501-8560 **F** +82-2-567-9578 **E-mail**:biz@implantium.com

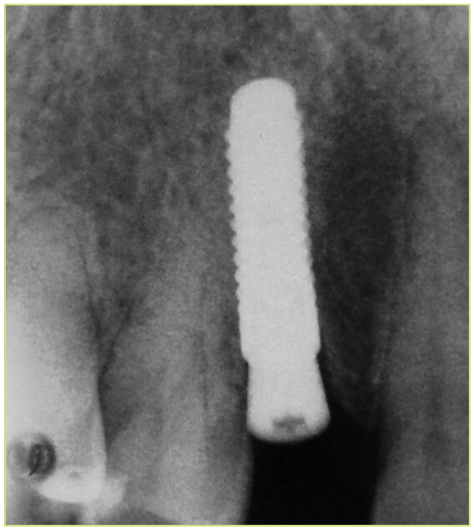
Australia +61-2-9874-0183
Colombia +57-1-601-1929
Hong Kong +852-2322-8232
Kazakhstan +7-727-244-0459
Morroco +212-661-15-02-99
Russia (Implant.ru) +7-495-638-0778
Turkey +90-322-459-2956
Bulgaria +359-32-642056
Croatia +385-52-851-897
Indonesia +62-21-588-3788
KSA(Implant) +966-1-562-0000
Pakistan +92-21-3536-3525
Russia (Dentium Shop) +7-495-627-6370
UK +44-845-0176-262
Chile +52-2-243-1890
Egypt(Implant) +20-2-2671-7578
Iran +98-21-4426-5178
KSA(Lab) +966-1-447-2250
Peru +51-1-348-1874
Singapore +65-6767-1311
Uzbekistan +99-871-244-3055
China(Beijing) +86-10-6280-0505
Egypt(Lab) +20-2-2575-4193
Iraq +964-770-160-9090
Kuwait +965-6666-9111
Poland +48-22-501-3808
Syria +961-1-25-45-35
Vietnam +84-909-504-034
China(Shanghai) +86-21-5878-6737
France +33-146-023-282
Italy +39-2-331-01743
Lebanon +961-1-254-515
Portugal +351-273-328-637
Taiwan +886-2-2706-1279
USA +1-877-304-6752
China(Shenzhen) +86-755-2398-3420
Greece +30-210-522-9911
Jordan +962-6-565-9968
Malaysia +60-3-4270-7669
Romania +40-765-261-764
Thailand +66-2-612-9133

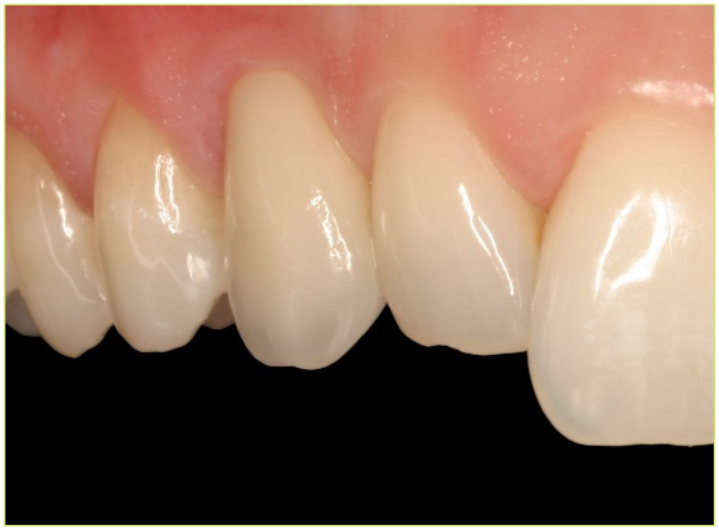
straumann®

DID YOU KNOW?

Roxolid implants deliver more treatment options

Roxolid is optimal for treatment of narrow interdental spaces.





Contact Straumann Customer Service at 800/448 8168 to learn more about Roxolid or to locate a representative in your area.

www.straumann.us

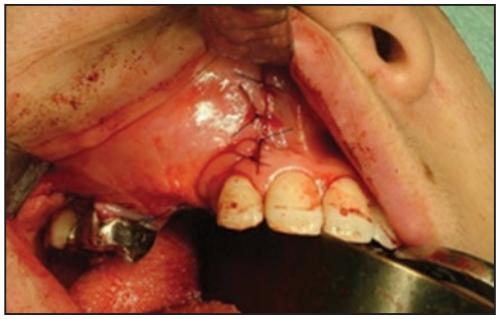
Case courtesy of Dr. Mariano Polack and Dr. Joseph Arzadon, Gainesville, VA

COMMITTED TO
SIMPLY DOING MORE
FOR DENTAL PROFESSIONALS℠

Alveolar Ridge Augmentation with a Buccal Bone Graft from the Mandibular Molar Region

Shinya Yura[1] • Mitsuru Kozakai[2]

Abstract



Background: Implant placement in the posterior mandible and maxilla is frequently complicated by the presence of inadequate bone quantity and quality. We describe a procedure for buccal bone grafting with two mandibular buccal shelf cortical plates for bone augmentation of the ridge crest with palatal-buccal and vertical defects.

Surgical technique: A buccal bone graft with two mandibular buccal shelf cortical plates was applied for bone augmentation of the ridge crest with palatal-buccal and vertical defects. The cortical bones were harvested by splitting the outer cortical plate and the removed bones were then shaped to place on the exposed alveolar crest. The bone graft was placed in the top and buccal sides of the defect and fixed with titanium screws. After decompression of the periosteum, the mucoperiosteal flap was repositioned and carefully closed with a 5-0 nylon mattress suture.

Results: Three months after the bone graft operation, implant placement could be performed with conventional technique.

Conclusions: A buccal bone graft with two mandibular buccal shelf cortical plates such as we used is suitable for bone augmentation of the ridge crest with palatal-buccal and vertical defects. Furthermore, it is minimally invasive, safe, and reliable.

KEY WORDS: Bone augmentation, mandible, dental implants

1. Department of Oral and Maxillofacial Surgery, Tonami General Hospital, 1-61, Shintomi-cho, Tonami-city, Toyama-ken, 939-1395, Japan.

2. Entrance Dental Clinic, 188-3, Aoshima, Shogawa-cho, Tonami-city, Toyama-ken, 932-0314, Japan.

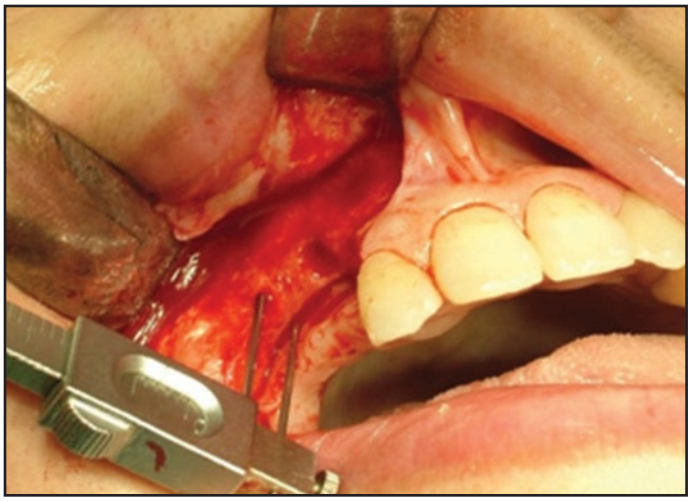


Figure 1: Maxillary donor recipient site measurements to receive harvested bone.

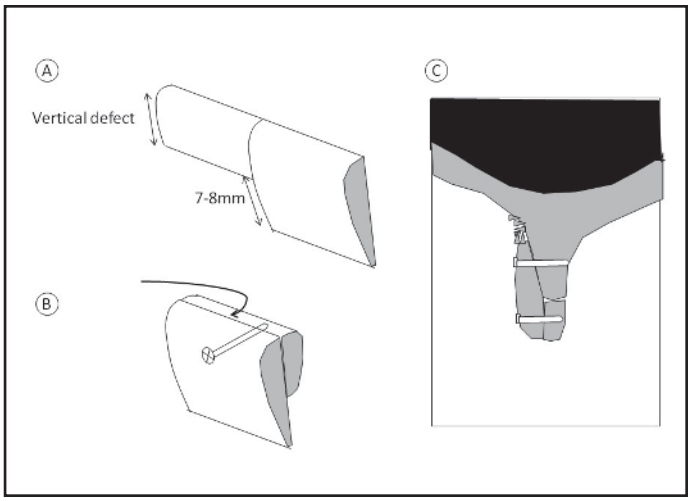


Figure 2: (A) Multiple pieces of buccal cortical plate were harvested from the molar region of the mandible. (B) The harvested pieces of bone were fixed into a single unit with a titanium screw. (C) The single unit graft was secured to the maxillary recipient site with multiple fixation screws to provide both vertical and horizontal augmentation.

INTRODUCTION

Implant placement in the posterior mandible and maxilla is frequently complicated by the presence of inadequate bone quantity and quality. Various surgical therapeutic solutions have been described to overcome the anatomic limitations in this area. In bone augmentation to the alveolar ridge crest with palatal- buccal defect, buccal bone graft is applied.[1] Buccal bone grafting is a safe bone augmentation technique with a wide range of applications. The hardness of the mandibular cortical bone is an advantage for bone augmentation.[2] However, the augmentation of bone height defect and the plasty of the smooth ridge crest appearance are usually difficult because of its hardness. The curve of cortical bone on the mandibular buccal molar region is similar to that of the ridge crest. We therefore describe a procedure of the buccal bone graft with two mandibular buccal shelf cortical plates for bone augmentation of the ridge crest with palatal-buccal and vertical defect.

SURGICAL TECHNIQUE

An anterior-posterior crestal incision was made in the right posterior maxilla and supplemented by buccal-releasing incisions at the anterior and posterior ends of the horizontal incisions. Mucoperiosteal flaps were elevated to expose the alveolar crest and the size of the harvested bone was then measured (Figure 1). The selected donor site for this case was the mandibular molar region. Dual pieces of long and short cortical bones were harvested by splitting the outer cortical plate using a fissure bar and bone chisel. The two removed bony plate pieces were fixed to one another with a titanium screw to form a "single unit

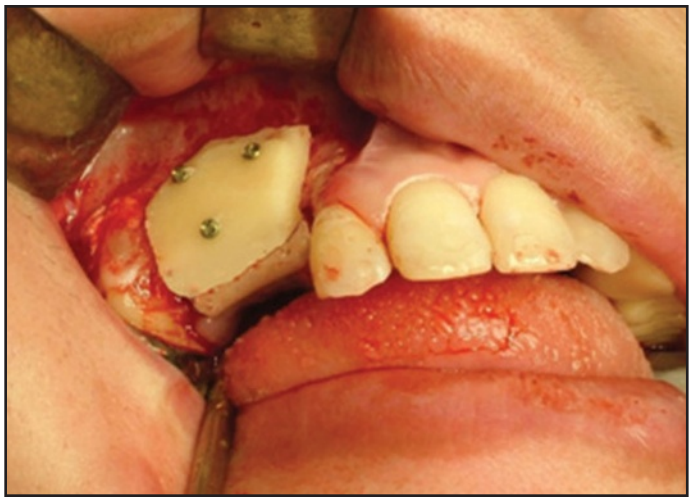


Figure 3: The single unit graft was secured to the maxillary recipient site with multiple fixation screws to provide both vertical and horizontal augmentation.

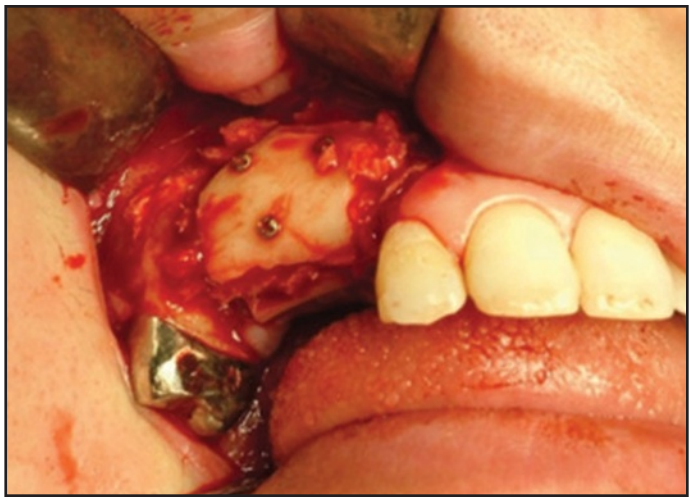


Figure 4: Harvested mandibular bone chips placed at periphery of grafted bony plates.

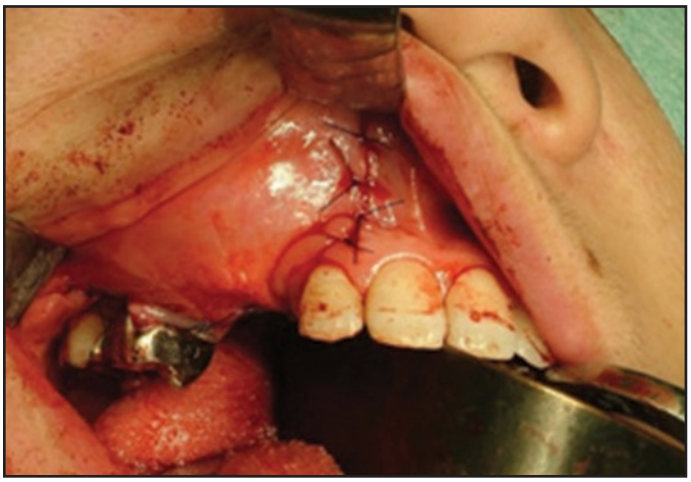


Figure 5: The mucoperiosteal flap was repositioned and carefully closed with 5-0 nylon sutures.

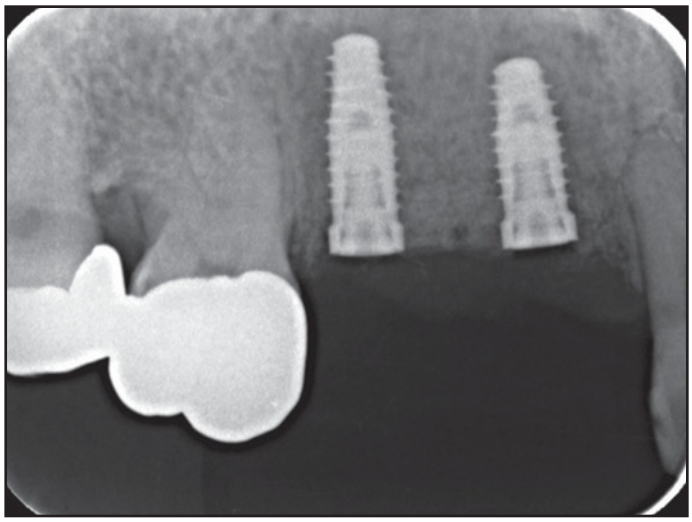


Figure 6: Dental X-ray image after implant placement.

graft" (Figure 2). The single unit graft was then placed on the top and buccal side of the defect, and fixed with additional titanium screws (Figure 3). To achieve a smoother form, bone marrow chips were harvested from the mandibular molar region and placed in gaps between the alveolar crest and fixed cortical plates (Figure 4). The mucoperiosteal flap was repositioned with periosteal releasing incisions and carefully closed with a 5-0 nylon mattress suture (Figure 5).

After two months of healing, submucous vestibuloplasty was performed at the site of the bone graft operation in the maxilla. After the removal of the titanium screws which secured the grafted bone, artificial der-

mis (Terdermis, TERUMO Co., Ltd., Tokyo, Japan) was placed on the exposed periosteum and sutured to the edges of the mucosa.[1,2] Epithelialization was observed within four weeks after surgery.[3,4] Three months after the bone graft operation and one month after the submucous vestibuloplasty operation, implant placement was performed (Figure 6).

DISCCUSION

A buccal bone graft is usually applied for bone augmentation of the ridge crest with palatal-buccal defects. Bone harvesting from the mandibular molar region is a less invasive technique and may reduce complications such as mental nerve paresthesia or bone exposure.[5] Mandibular cortical bone has sufficient hardness for implant placement. Adequate bone volume for the placement of fixtures can be obtained by the procedure.[5,6] However, the augmentation of vertical bone defect and the plasty of the smooth ridge crest appearance are usually difficult because of its hardness. The buccal bone graft with two mandibular buccal shelf cortical plates that we used is suitable for bone augmentation of the ridge crest with palatal-buccal and vertical defect. Furthermore, it is minimally invasive, safe, and reliable.

In submucous vestibuloplasty, we used artificial dermis for protection of the exposed periosteum.[1] The collagen layer of the graft may be useful for shortening the healing period and decreasing scarring. In addition, the grafts may minimize patient discomfort from postoperative pain and bleeding.[3,4,7] Furthermore, the procedure does not need harvested tissue such as a split-thickness skin graft or a palatal mucosal graft.

Correspondence:
Dr. Shinya Yura
Department of Oral and Maxillofacial Surgery,
Tonami General Hospital
Email: Yura@p1.coralnet.or.jp

Disclosure
The authors report no conflicts of interest with anything mentioned in this article.

Reference

1. Yura S, Kato T, Ooi K, Izumiyama Y. A combination of three minimally invasive surgical procedures for implant in the posterior maxilla with insufficient bone quantity. Oral Surg Oral Med Oral Pathol Oral Radiol Endodo 2008; 106: e1-e5.
2. Thorwarth M, Srour S, Felszeghy E, Kessler P, Schultze-Mosgau S, Schlegel KA. Stability of autogenous bone grafts after sinus lift procedures: A comparative study between anterior and posterior aspects of the iliac crest and an intraoral donor site. J Oral Maxillofac Surg 2005; 100: 278-284.
3. Yura S. Analgesic effect of artificial dermis for repair of oral mucosal defects. Jpn J Orofac Pain 2008; 1: 43-46.
4. Yura S. Repair of oral mucosal defects using an artificial dermis: Factors related to period required for epithelization. Jpn J Oral Diag/Oral Med 2010; 23: 7-10.
5. Sawa Y, Takimoto A, Watanabe G, Mano A, Shimoda M, Kawano D. Evaluation of autogenous buccal bone grafts harvested from the mandibular molar region for dental implant treatment. Jpn J Oral Maxillofac Surg 2006; 52: 172-178.
6. Pelo S, Boniello R, Gasparini G, Longobardi G, Amoroso PF. Horizontal and vertical ridge augmentation for implant placement in the aesthetic zone. Int J Oral Maxillofac Surg 2007; 36: 944-948.
7. Yura S, Ooi K, Izumiyama Y. Repair of oral mucosal defects using an artificial dermis: Factors related to postoperative scar contractures. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011; 112: 161-163.

Less pain for your patients.[1]
Less chair side time for you.[1]

INTRODUCING

Mucograft®
collagen matrix

Mucograft® is a pure and highly biocompatible porcine collagen matrix. The spongious nature of Mucograft® favors early vascularization and integration of the soft tissues. It degrades naturally, without device related inflammation for optimal soft tissue regeneration. Mucograft® collagen matrix provides many clinical benefits:

For your patients...

→ Patients treated with Mucograft® require 5x less Ibuprofen than those treated with a connective tissue graft[1]

→ Patients treated with Mucograft® are equally satisfied with esthetic outcomes when compared to connective tissue grafts[2]

For you...

→ Surgical procedures with Mucograft® are 16 minutes shorter in duration on average when compared to those involving connective tissue grafts[1]

→ Mucograft® is an effective alternative to autologous grafts[3], is ready to use and does not require several minutes of washing prior to surgery

Ask about our limited time, introductory special!

Mucograft® is indicated for guided tissue regeneration procedures in periodontal and recession defects, alveolar ridge reconstruction for prosthetic treatment, localized ridge augmentation for later implantation and covering of implants placed in immediate or delayed extraction sockets. For full prescribing information, visit www.osteohealth.com

Osteohealth®
REVOLUTIONIZING REGENERATION®

For full prescribing information, please visit us online at
www.osteohealth.com or call 1-800-874-2334

References: [1]Sanz M, et. al., J Clin Periodontol 2009; 36: 868-876. [2]McGuire MK, Scheyer ET, J Periodontol 2010; 81: 1108-1117. [3]Herford AS., et. al., J Oral Maxillofac Surg 2010; 68: 1463-1470.

LASER – An Effective Surgical Alternative for Pericoronal Flap Excision in the Third Molar Region

Col (Dr) S K Rath[1] • Capt (Dr) Rajat Lanzara[2]
Lt Col (Dr) Manab Kosala[3] • Brig (Dr) S K Roy[4]

Abstract

Purpose: Laser surgery has been shown to exhibit advantages over scalpel surgeries in many procedures. The advantages include less post-operative pain, hemostasis and healing without scar formation. The study sought to compare the post-operative complications of scalpel surgery and laser assisted surgery in the case of pericoronal flap excision.

Materials and Methods: Forty patients requiring pericoronal flap excisions were randomly selected and divided equally into two groups. Twenty patients underwent excision with scalpel and half with laser assisted surgery. Cases were observed after 24 hours and 7 days for post-operative pain with VAS scale, restriction in opening mouth and swelling. Appropriate statistical analysis was carried out to compare the parameters and find effectiveness of the procedures.

Results: Statistical analysis confirmed that all the parameters signifying post-operative complications of excision of pericoronal flap were less in laser assisted surgery.

Conclusions: The study demonstrated significant difference in pain parameters post operatively between scalpel and laser. The amount, frequency and duration of post-operative pain were less in case of surgical protocols using laser. The swelling and restriction of mouth openings were also comparatively more in case of scalpel surgery.

KEY WORDS: Dental Laser, pericoronal flap surgery, pain scale, post-surgical pain

1. Sr Spl, Army Dental Centre, R & R Hospital, Delhi Cantt, India
2. Dental Officer, Army Dental Centre, R & R Hospital, Delhi Cantt, India
3. Gd Spl, Army Dental Centre, R & R Hospital, Delhi Cantt, India
4. Commandant, Army Dental Centre, R & R Hospital, Delhi Cantt, India

INTRODUCTION

The eruption of the mandibular third molar is associated with various complications associated with the lack of space in the alveolar ridge.[1] The third molar, being the last molar of the arch to erupt, has increased chances of getting impacted or partially erupted. The impacted third molar may be classified as mesioangular, horizontal, vertical, distoangular, buccoangular, linguoangular and inverted.[2] Most impacted mandibular third molars are generally indicated for extractions if they are symptomatic. But vertically impacted third molars which are not completely erupted, covered partially or completely by a thick band of fibrous tissue (pericoronal flap) may not be necessarily indicated for extraction of the tooth.

This thick band of fibrous tissue is referred to as the "pericoronal flap" which is a flap of gingiva covering an unerupted tooth, especially the lower third molar.[3] This tissue overlying the erupting tooth often causes pain and recurrent infection causing various signs and symptoms such as swelling, cellulitis and restriction in opening mouth.[4] In such cases the modality of management varies from surgical excision of flap to non-surgical management by administration of antibiotics, analgesics and various other methods.

The conventional surgical excision of pericoronal flap using surgical blades under local anesthesia has traditionally been the method of choice. The disadvantages of using a surgical blade involve difficulty in access to the third molar region,[5] intra-operative pain, bleeding and post-operative complications.[6] An alternative to the surgical blade is soft tissue diode laser therapy. LASER is an acronym for Light Amplification by Stimulated Emission of Radiation. Lasers are commonly named for a substance which is stimulated to produce the coherent light beam.

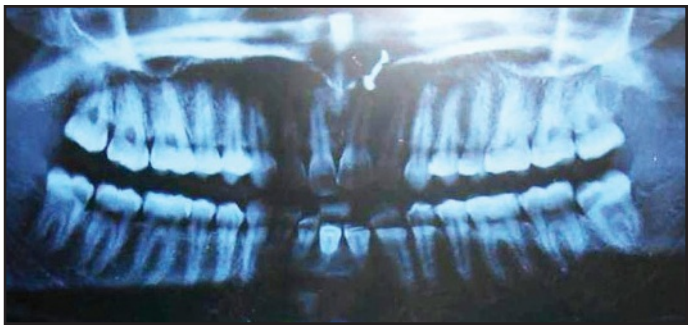


Figure 1: Panoramic radiograph showing impacted third molars.

Excision of pericoronal flap brings about relief in symptoms and it also eases the eruption of the tooth. The excision of the pericoronal flap can be done manually with the help of a scalpel or using lasers**.** Laser surgery has been shown to exhibit several advantages over scalpel surgery for many procedures. Some of these advantages include hemostasis, less intra-surgical pain, reduced postoperative swelling, less quantity of anesthesia required, and even reduced postoperative pain.[7,8] The laser also plays a significant role in creating the proper environment for the establishment and organization of a sufficient and stable clot to promote healing.

Several studies[9] have emphasized the need to assess patient related factors such as postoperative pain, infection, swelling and loss of function prior to making treatment decision. A significant amount of information is available in the literature about the application of laser therapy in oral soft tissue for different intraoral periodontal procedures, but no comparative study to evaluate the effectiveness of excision of pericoronal flap using laser and conventional scalpel techniques is evident. Therefore, the present study is an attempt to compare the outcome of

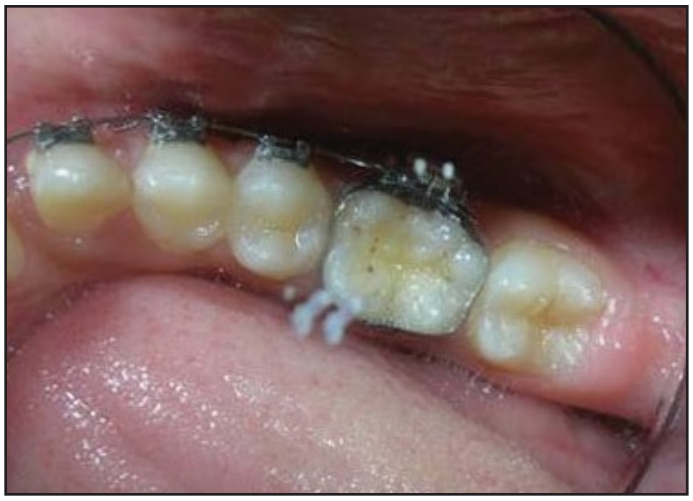


Figure 2a: Group A – Presurgical presentation.

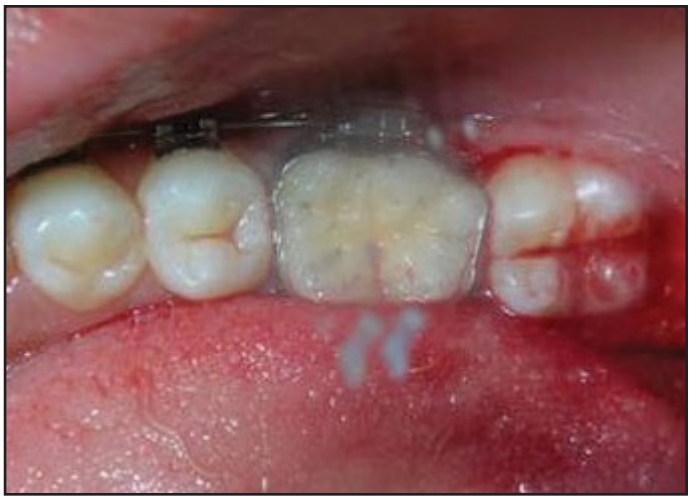


Figure 2b: Intrasurgical photo after scalpel use.

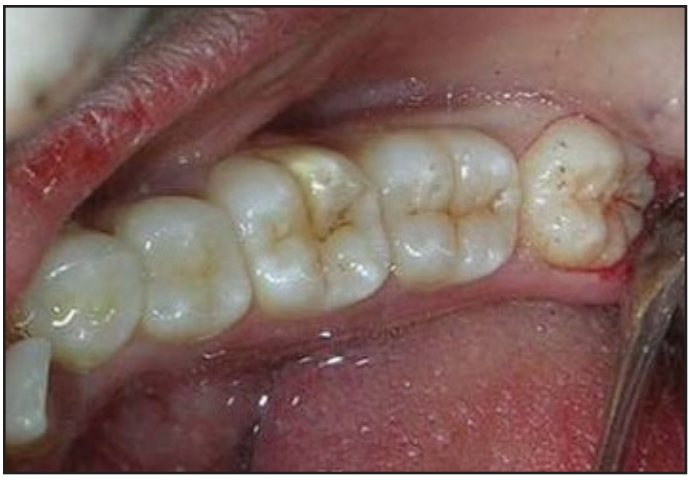


Figure 2c: Group A at 7 days healing.

two surgical modalities using conventional and laser therapy for excision of pericoronal flaps.

MATERIALS AND METHODS

Study Population

Forty patients including 22 males and 18 females between 18-30 years were selected from the Outpatient Department of Army Dental Centre (OPD) and were referred to Department of Periodontology. The study protocol was reviewed and approved by the institutional ethical committee. The informed consent was taken from all patients participating in the study. The following inclusion and exclusion criteria were kept in mind during selection of cases.

Inclusion Criteria

1. All selected cases from the OPD referred were evaluated by an experienced Periodontist.
2. Patients having vertically erupting mandibular third molars after radiographic examination.
3. Mandibular molars having covered with pericoronal flap either partial or complete.
4. Age between 18-30 years.
5. Non-pregnant and systemically healthy patients.
6. Non-smokers.
7. Patients undergoing surgery for first time.

Exclusion Criteria

1. Non-compliant patients.
2. Physically and mentally handicapped patients.
3. Patients on any medications such as antibiotics or analgesics.
4. Patients with any debilitating systemic diseases.
5. Patients having history of drug allergy

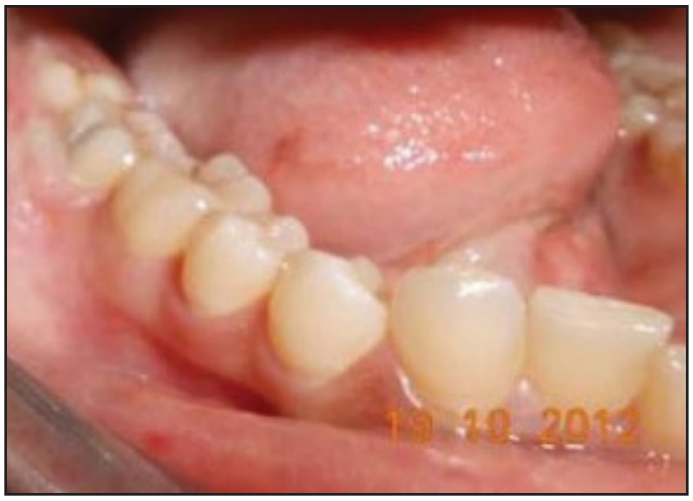


Figure 3a: Group B – Presrugical presentation.

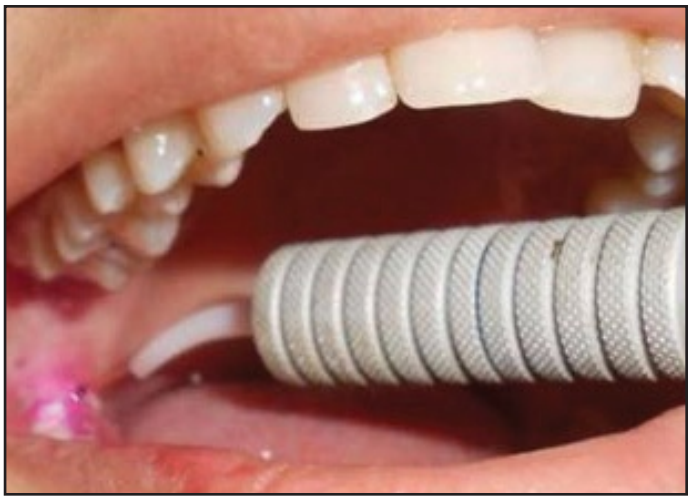


Figure 3b: Diode laser use for Operculectomy.

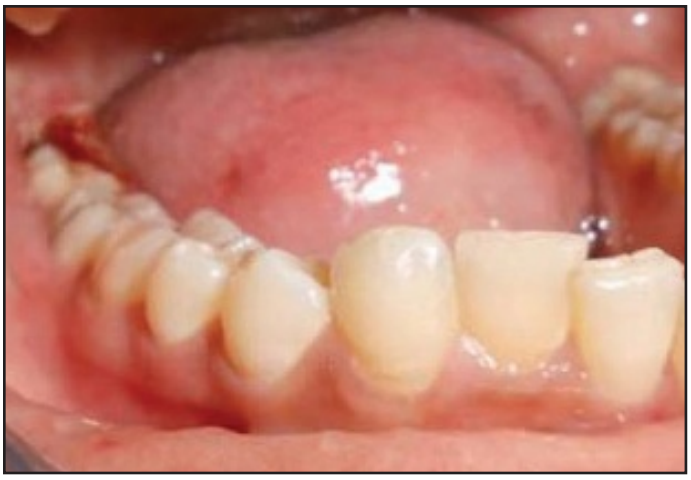


Figure 3c: Intrasurgical photo after laser use.

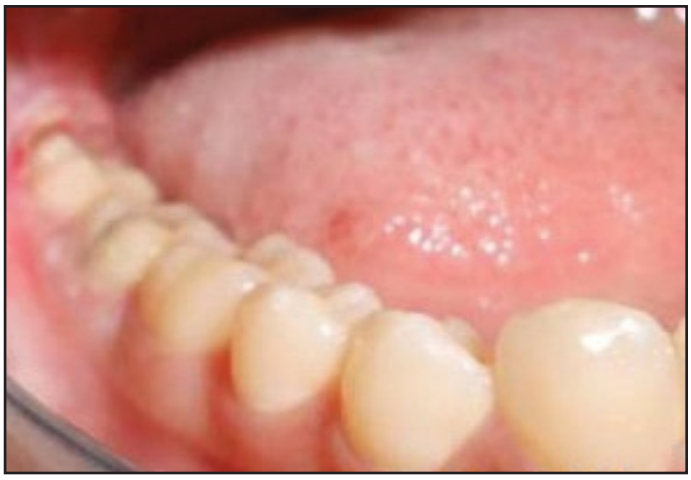


Figure 3d: Group B at 7 days healing.

At the first appointment, patients' case histories were recorded with a complete oral and periodontal examination. Routine hematologic examination, urine analysis, periapical and panoramic radiographs (fig. 1) were advised for diagnosis. The subjects were divided into two groups with twenty in each, depending on the modalities of surgical procedure followed. In group A, the pericoronal flap excision was done with scalpel blade and in the group B with laser.

SURGICAL PROCEDURES

All surgeries were performed utilizing 2% xylocaine with adrenaline 1:100,000 local anesthetic agent. Surgeries were performed under direct supervision of periodontal faculty. Surgical techniques included excision of pericoronal flap manually using scalpel blade or excision with the help of laser. All these surgeries were performed following standard instrumentation and protocols.

In Group A, patients pericoronal flap excision

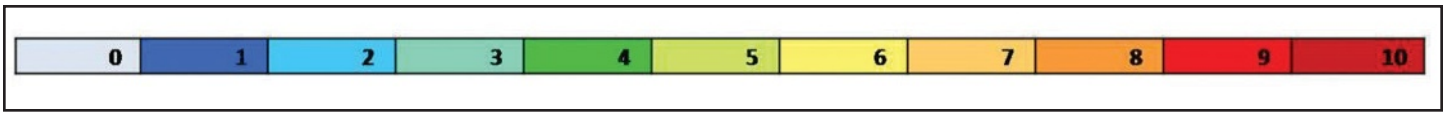


Figure 4: Visual analogue pain scale.

was done using scalpel blade. For the technique, the flap was held with a pair of hemostats, and the whole band of tissue was excised with #15 and #12 blade (figs. 2a-2c). In Group B, the excision of the pericoronal flap was done using a laser in a stitching type of motion going up and down to remove the tissue lying over the distal end of the occlusal surface (figs. 3a-3d). The laser was dragged in a continuous up and down motion going deeper at every step in back and forth motion. The tissue was grabbed with a cotton plier and with further back and forth movement a wedge was created to excise the tissue. The procedure resulted in the formation of tissue tags which were removed with a laser followed by irrigation with hydrogen peroxide. The remnants of the ablated tissue were removed using sterile gauze dampened with saline. No sutures were placed after laser treatment.

Following surgery, all the patients were discharged with a post-operative course survey. Patients were reviewed after 24 hours and then 7days on parameters of swelling, pain and discomfort during eating and speech, ability to open mouth. Patients were also asked to measure their pain on a standard 10 cm Visual Analog Scale and to describe the frequency of pain during the time period. The complications were recorded as per guidelines of the study by Lopez.[10]

PAIN ASSESSMENT

It was felt that patients' self-reporting were the most reliable measure of pain. To assess intensity, the patients were instructed to complete a pain diary or questionnaire by locating their pain on a scale that is visual analogue scale (VAS) (fig. 4) of 0 to 10 with 0 being no pain at all and 10 the worst pain they have ever felt.[11] In the present study the VAS responses were completed by each patient intraoperatively, 24 hours, and 7 days post-operatively recorded by a common observer to remove inter-observer bias. After completion, all recordings were analyzed, which included comparison of postoperative pain and the degree of functional complications after the two treatment techniques. All patients were instructed to use the same analgesic containing Ibuprofen and paracetomol. The patients were asked to place a vertical marks in the

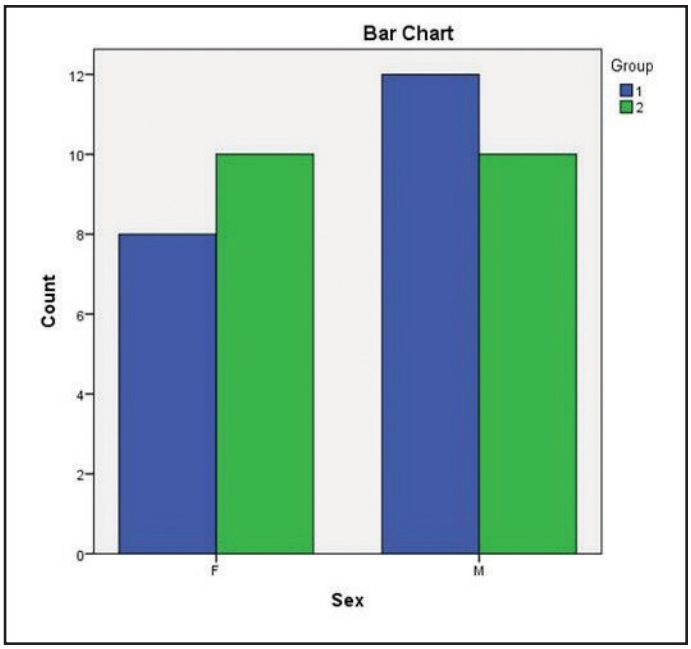


Figure 5: Distribution of age and sexes in Groups A and B.

Table 1: Distribution of Patients According to Age and Sex in both the Groups

Age Group	Group A			Group B		
	Female	Male	Total	Female	Male	Total
18-21	0	4	4	2	3	5
22-25	3	4	7	3	3	6
26-30	5	4	9	5	4	9
Total	8	12	20	10	10	20

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Age in Years	A	20	24.65	3.646	0.815
	B	20	24.65	3.774	0.844

position between the two extremes 0-none to 10-extreme, which best described their personal perception of degree of discomfort expressed.

POST-OPERATIVE SWELLING ASSESSMENT

To assess swelling after surgeries, the levels of complications were classified as mild, moderate and severe. None to minimal swelling meant little or no discomfort; moderate was any swelling that bothered the patient and mildly affected normal function; and severe was considered any swelling that could even disrupted the patient's daily functions. None to minimal swelling ranged from no abnormal feeling or visible change in appearance to a feeling of ''fat'' or enlargement of intra- or extra oral soft tissue correlating to the surgery; moderate swelling indicated a slight visible change in the size/ shape of the soft tissue in addition to the feeling; and severe swelling was defined as a very noticeable change in the size/shape of the soft tissue.

MOUTH OPENING ASSESSMENT

In our study the mouth opening was measured as inter incisal distance from incisal tip of maxillary incisor to that of mandibular incisor with the help of a metallic scale. The extent of mouth opening is measured in millimeters. The readings were taken after 24hrs and after 7 days post-surgery. Post-operative data on different complications

Table 2: Sex-Group Cross Tabulation					
			Group		Total
			A	B	
Sex	F	Count	8	10	18
		% within sex	44.4%	55.6%	100.0%
		% within group	40.0%	50.0%	45.0%
		% of total	20.0%	25.0%	45.0%
	M	Count	12	10	22
		% within sex	54.5%	45.5%	100.0%
		% within group	60.0%	50.0%	55.0%
		% of Total	30.0%	25.0%	55.0%
Total		Count	20	20	40
		% within sex	50.0%	50.0%	100.0%
		% within group	100.0%	100.0%	100.0%
		% of total	50.0%	50.0%	100.0%

associated with both type of surgeries noted at 24hrs and 7 days post operatively were compiled and subjected to statistical analysis using

RESULTS

The present comparative study consisting of 40 subjects of different age groups with both the sexes involved random selection of the patients. Table 1 & Fig- 5 depict the distribution of age groups in Groups A and B. The group statistics show mean and standard deviation of 24.65, 3.646 and 24.65, 3.774 for group A and group B respectively. Intergroup comparison shows the mean difference of 0.000, p value 1.000 and standard error of difference of 1.173. The above analysis shows that both

Table 3: Comparison of reduction in Pain by VAS Score of both the groups from 24 hrs to 7 days

		Mean	N	Std. Deviation	Std. Error of Mean
Group A	24hrs	5.95	20	1.234	0.276
	7 days	2.65	20	0.933	0.209
Group B	24 hrs	4.75	20	1.118	0.250
	7 days	1.35	20	0.587	0.131

Table 4: Intergroup Comparison of VAS score

	Mean	Std. Deviation	Std Error of Mean	95% Confidence Interval of the Difference		t-value	p-value
				Lower Bound	Upper Bound		
Group A 24hrs-7days	3.300	1.031	0.231	2.817	3.783	14.313	0.0001
Group B 24hrs-7days	3.400	0.821	0.184	3.016	3.784	18.525	0.0001

the groups were homogeneous in respect to age group before the initiation of the treatment.

Table II shows the sex distribution in the study with Pearson Chi Square value of 0.404 with p value 0.525 signifying the identical sex distribution in both the groups. So it clearly indicates the randomization of subject selection.

A pain reduction (Table III) of approximately 56% as measured by VAS scale from 24hrs to 7 days of treatment (5.95 after 24hrs to 2.65 after 7 days) in Group A was noted. In Group B, on the other hand, mean reduction in pain was 72% from 24 hours to 7 days. There was a significant difference of value of VAS score observed between Group A and Group B after 24 hours. In both the groups the reduction in the intensity of pain as compared after 24 hours and 7 days of treatment by VAS score was significant P-value (< 0.001) for both the groups (Table IV).

After 24 hours the mean ability to open mouth was 20.25mm which turned to normal in all 20 cases after 7 days of treatment in Group A. Similarly in Group B the mean ability to open mouth was 26.75 mm after 24hours which turned to normal after 7 days of treatment (Table V).

Table VI shows the distribution of patients

according to the post-operative swelling. In Group A cases with scalpel surgery, 12 patients developed mild swelling whereas only 6 patients of Group B developed the same. All the cases were followed at 24 hours and seven days interval and there was no fall out.

DISCUSSION

The aim of this study was to compare the post-operative subjective effects of laser and conventional techniques after pericoronal flap excision in human beings. The diode laser is now a viable alternative to the scalpel in soft tissue surgery. The employment of the laser in stomatology has brought to, compared with traditional methods, a great implement in technical treatment of lesions of oral mucosa resulting in a relevant quickening of the healing process and in an improvement of the post-surgical outcome, which in turn increases the patients' compliance. The treatment of hyperkeratosis and leukoplakia of oral mucosa, the removal of benign neoplastic or dysplastic lesions, the treatment of vascular lesions, undoubtedly represent the main goals of the laser assisted oral medicine.

The nucleus of a diode laser consists of a semi-conductive material, the diode (Indium, Gallium, Arsenic). The most common laser used in oral-dental surgery has a wavelength of 810nm or 980nm and shows a high affinity for the hemoglobin; so that this type of device is particularly devoted to the treatment of vascular lesions both by removal directly or by means of lesion clotting. Moreover, all the other surgical procedures can be performed with Diode LASER concerning both the major and minor oral surgeries. Diode lasers, on the basis of their photo-chemical and photo-mechanical features, are particularly indicated in both superficial and middle-deep surgery of soft tissues. So they represent a valid instrument in most dental surgery. Moreover, Diode laser is strongly indicated in treatment on mucous-membranous lesions with concomitant newly forming vessels and consequently with hemorrhagic risk. Another positive consideration about laser surgery, compared to traditional blade-surgery, concerns not only the clinical results but also the running surgical procedures and especially the post-surgical comfort of the patient.

Table 5: Descriptive Statistics for Mean Ability to Open the Mouth

Case Summeries		
24hr		
Group	No. of Patients	Mean
A	20	20.25
B	20	26.75

There are very few studies comparing the postoperative effects of laser and conventional techniques, which can justify the use of LASER for intraoral soft tissue surgery. In our study, patients treated with the Diode laser had significantly less postoperative pain and functional complications compared to scalpel surgery. The laser technique offers some advantages, such as a relatively bloodless surgical and post-surgical event; the ability to precisely coagulate, vaporize, or cut tissue; sterilization of the wound site; minimal swelling and scarring; no suturing in

Table 6: Distribution of patients according to post-operative swelling				
	Group A		Group B	
	No. of Patients		No. of Patients	
Grade	24hr	7 days	24hr	7 days
Mild	12	0	6	0
Moderate	6	0	0	0
Severe	2	0	0	0
Normal	0	20	14	20
Total	20	20	20	20

most cases; little mechanical trauma; reduction of surgical time; decreased post-surgical pain; and high patient acceptance.[12-19] There is abundant evidence confirming markedly less bleeding,[17,18] particularly of highly vascular oral tissues, with LASER surgery.[15] Some reports suggest that LASER-created wounds heal more quickly and produce less scar tissue than conventional scalpel surgery,[16] which was also observed in our study, although contrary evidence also exists.[19,21]

Postoperative pain from oral surgical procedures has been claimed to be reduced in LASER surgery.[17] It is theorized that this may be due to the protein coagulum that is formed on the wound surface, thereby acting as a biologic dressing and sealing the ends of the sensory nerves.[16] On the other hand, the superpulse mode, which was used in this study, releases bursts of higher peak powers and shorter pulse durations in the microsecond range. This mode allows the surgeon to deposit pulses of higher peak power into tissue with control, to confine the exposure to pulses that are within the thermal relaxation time of the tissue (which is the time needed by the tissue to release the absorbed heat via conduction or circulation), and to use pulse repetition rates that allow cooling between individual pulses to reduce heat accumulation.[22] The use of this mode may have beneficial effects on the control of post-surgical complications by preventing carbonization or charring, which may interfere with wound healing.

In our study same analgesics were given in all cases but the effect of painkillers may be different for different patients. That is where pain measurement can be taken as bias and a limitation in this study.

Although it has many advantages, the laser technique requires some precautions. The laser beam may be reflected from shiny metal surfaces, such as retractors or mouth mirrors, and cause

eye injury. Protective eyewear must be worn by the operator and assistants. The patient's eyes, throat, and delicate oral tissues outside the surgical site must be protected from accidental beam impact through use of safety glasses and wet towels or gauze packs. Clinicians experienced in laser surgery have emphasized the need for an adequate shield, such as a flat-bladed instrument or silver foil, between the gingiva and teeth.

CONCLUSION

The study demonstrated significant difference in pain parameters post operatively between scalpel and laser. The amount, frequency and duration of post-operative pain were less in cases of surgical protocols using laser. The swelling and restriction of mouth openings were also comparatively more in cases of scalpel surgery. Moreover, on the basis of previous author's experience, the clinical results obtained under laser with the parameters used have been satisfactory. The different mechanisms of interaction between laser and tissues and the photo-dynamic properties of laser devices, previously discussed, justify the attitude to spread the employment of laser devices in the treatment of the different types of lesions of oral soft tissues, contemporary reducing discomfort and improving healing processes.

In the future, protocols will be modified and re-tuned by various laser user groups after discussion of their experiences and results. These results will be incorporated into new procedures which will bring LASER Assisted Periodontal Therapy to a newer, more effective level.

Correspondence:
ARMY DENTAL CENTRE
RESEARCH & REFERRAL
DELHI CANTT 1100
INDIA
Tele No: Mob: +918800507126
Email: drrathfamily@yahoo.com

Disclosure
The authors report no conflicts of interest with anything mentioned in this article.

References

1. Ades AG, Joondeph DR, Little RM, Chapko MK: A long-term study of the relationship of third molars to changes in the mandibular dental arch. Am J Ortho Dentofacial Orthop1990; 97:323 – 27.
2. Garcí a AG, Sampedro FG, .Gandara RJ, Gandara VP, Somoza MM, Pell-Gregory Classification is reliable as a predictor of difficulty in extracting impacted lower third molars. British Journal of Oral and Maxillofacial Surgery, 2000; 38. 6: 585-7.
3. American Academy of Periodontology. Glossary of Periodontal Terms, 4th ed. Chicago: American Academy of Periodontology; 2001:27
4. Al-Khateeb TH, Bataineh AB Pathology associated with impacted mandibular third molars in a group of Jordanians. J Oral Maxillofac Surg 2006; 64:1598-601.
5. Ramfjord S,Knowles J,Nissle R, Shick R. Longitudinal study of periodontal therapy ; J Periodontol 1973; 44:66-77.
6. Raffetto. LASERs for initial periodontal therapy, Dental Clin N Am.2004;48:923-36.
7. Romanos, Nentwig. Diode LASER (980nm) in oral and maxillofacialsurgical procedures: Clinical observations based on clinical applications. J clin LASER Med Surg 1999;17(5):193-7.
8. Fontana, Kurachi, Mendonca. Microbial reduction in periodontal pockets under exposition of a medium power diode LASER: an experimental study in rats, LASERs Surg Med. 2004;35(4):263-8.=
9. Gunn CC. The Gunn Approach to the Treatment of Chronic Pain, 2nd edn. New York: Churchill Livingstone; 1996;3: 129-33.
10. Lopez A, Serra, Nart J, Santos A et al. Assessment of morbidity after periodontal respective surgery J Periodontol 2011;45: 112-6.
11. Wewers ME & Lowe NK (1990) A critical review of visual analogue scales in the measurement of clinical phenomena. Research in Nursing and Health 1990; 13: 227-36.
12. American Academy of Periodontology. LASERs in periodontics (position paper). J Periodontol 2002; 73: 1231-1239.
13. Schuller DE. Use of the LASER in the oral cavity. Otolaryngol Clin North Am 1990;23:31-42.
14. Pogrel MA, McCracken KJ, Daniels TE. Histologic evaluation of the width of soft tissue necrosis adjacent to carbon dioxide LASER incisions. Oral Surg Oral Med Oral Pathol 1990;70: 564- 8.
15. Kaplan L, Raif J. The Sharplan carbon dioxide LASER in clinical surgery: 7 years experience. In: Goldman L, ed. The Biomedical LASER. New York: Springer-Verlag; 1981:89-97.
16. Fisher SE, Frame J W, Browne R M, Tranter RMD.A comparative histological study of wound healing following CO2 LASER and conventional surgical excision of canine buccal mucosa. Arch Oral Biol 1983; 28: 287-91.
17. Abt E. CO2 LASER treatment for gingivectomies reduces hemorrhaging, post-op pain. Clin LASER Mon 199210: 8-12.
18. Hobbs ER, Bailin PL, Wheeland RG, Ratz JL. Super pulsed LASERs: Minimizing thermal damage with short duration, high irradiance pulses. J Dermatol Surg Oncol 1987;13: 955-64.
19. Buell BR, Schuller DE. Comparison of tensile strength in CO2 LASER and scalpel skin incisions. Arch Otolaryngol 1983; 109: 465-7.
20. White JM, Goodis HE, Rose CL. Use of the pulsed Nd:YAG LASER for intraoral soft tissue surgery. LASERs Surg Med 1991; 11: 455-61.
21. Frame JW. Removal of oral soft tissue pathology with the CO2 LASER. J Oral Maxillofac Surg 1985;43:850-5.
22. Esen E, Haytac MC, Oz A. Gingival melanin pigmentation and its treatment with the CO2 LASER. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2004; 98: 522-7.

MIS INNOVATIONS

CPK
It's Free. Just Ask for It!

Purchase any MIS implants in multiples of 5 (minimum 10 implants) and receive one free CPK - Complete Prosthetic Kit, with each implant.

MIS' Complete Prosthetic Kit (CPK) contains the components you need to restore a "straightforward" implant case.

First time MIS user?
Ask for our free implant delivery system.

*The offer cannot be combined with other offers. Free items may not be returned or exchanged.

MIS offers a wide range of innovative kits and accessories that provide creative and simple solutions for the varied challenges encountered in implant dentistry. To learn more about MIS visit our website: misimplants.com or call us:

866-797-1333 (toll-free)

MIS® USA
Make it Simple