From the Editor
Hamed Javadi, DDS, Editor

Since the last issue many wonderful things have happened. Of course opening of the clinic is not one of them. However this long awaited event is closer to reality. Currently, the odds are 5:1 that the new clinic will be finished by the end of the fall quarter. So please, send in your hard earned dollars and you may walk away with a lump sum!!!!

As many may know months of June is when honor is bestowed on all brave soles. After three years of hard work and life long pursuit of virtue, Queen Elizabeth II knighted Sean Connery in his hometown of Edinburgh wearing his clan's kilt.

On the other side of the Atlantic our brave residents were finally awarded their hard-earned certificates. Several events had to be organized for such an occasion. At the first event organized by the first year residents, the third year class was fooled to believe they were going to finally receive their hard-earned certificates. However they walked away with a good buzz and the left over wine. Drs. Brayton and Valverde did not show up for their clinical duties the following day. However Dr. Stoner true to the form, showed up the next day to place his 81st and 82nd implant.

The second ceremony was held at the Solt Mansion. This event was exclusively attended by the residents and their significant others. The guests were treated to bratwurst.

Parting is Such Sweet Sorrow
Angelo Mariotti, DDS, PhD

After three years of superior service to the Section of Periodontology, Philip Preshaw has left for Newcastle Dental School in Newcastle upon Tyne, England and Leo Kupp will soon be departing for the Mayo Clinic in Rochester, Minnesota. During their short tenure at OSU, both have accomplished much. In fact, I do not have enough space to list all of their accomplishments while at OSU, but I would like to highlight some of their more significant successes. Philip Preshaw is a pre-eminent clinical scientist who did much to initiate and support clinical research in our Section. One of his contributions included being a key examiner for a large clinical study evaluating low dose doxycycline on periodontal disease. He also was instrumental in reorganizing and upgrading the literature review in periodontology for our residents. During Leo’s term, he reorganized the clinical and didactic components of the advanced education program to emphasize periodontal regeneration and implantology. He has also stressed the importance of anesthesiology in our clinics and has made IV sedation a common procedure by our residents for patient care. He has codified all of the activities in the graduate clinics by constructing a clinic manual for our residents to follow. Both Leo and Philip have been constant, positive sources of learning within our Section.

Inside This Issue

1 From the Editor
1 Parting is Such a sweet sorrow
2 Voice of the Director
2 Publications
3 Photo Album
10 Politique
11 From the Residents

Dr. Ross was the recipient of a unique humanitarian award this year. His good work and devotion was recognized by the Memphis Dental Society. Congratulations Dr. Ross. You made us all proud.

Also, Dr. Pao-ying Paul Lin received his board certification from the American Board of Periodontology this past May. Congratulations Dr. Lin.
Mariotti con't

Losing Philip and soon Leo has saddened me. Both are friends and colleagues who will not be easily replaced; not solely because of their skill and knowledge but largely because of their panache, good humor, work ethic and character. As Thomas Carlyle once said, "Nothing that was worthy in the past departs; no truth or goodness realized by man ever dies, or can die." So I won't say good-by or farewell because they will always be with us, if not in person then in spirit. It is comforting to know that once a Buckeye, always a Buckeye.

Javadi con't

from Dr. Solt's hometown and some needed words of wisdom. The final event was at OSU Golf Course, designed by the legendary buckeye the Golden Bear. Dr. Kupp personally organized and entertained the crowd during lunch and presented the third year residents with their certificates and their Appreciation Bowls. These silver Bowls are guaranteed to last a lifetime and it not only serves as a memento but also can be very handy when our graduating class is close to retirement and incontinent.

Since saying farewell to our old pals, we welcomed our new friends. Drs Chang, Lavda, Lee, Nguyen, Taylor make up our new recruits. They will have a bright future.

The newly remodeled resident suite is receiving the finishing touches. This was made possible by our alumni's generous donations, which was matched by our Dean, Dr. Henry Fields. This area can not only be used as a quite area to meditate but also can host Dr. Cacchillo's Buckeye victory parties every Sunday afternoon during the football season.

Not all events were fun and games. Unfortunately, we are going to lose Dr Kupp, our program director to Mayo Clinic. Hopefully we will not be direction-less for long. Until the recruitment of a new director, we need to heavily rely on our alumni support. So please contact Dr. Mariotti to recommend an individual to lead the graduate program.

Dr Preshaw has also returned to England and his presence will also be missed.

We also like to thank many of our alumni who continuously help our program. Special thanks to Dr. Carroll for donating the several journals.

As the presidential election closes near, Cutting Edge is conducting its own national surveys. So please see our POLITIQUE section and send us your comments.

We have also decided to dedicate a page in each issue to introduce one of the residents to our readers.

HAVE FUN with the sharpest Cutting Edge.

If you have any comments or suggestions, please contact us.

Your editor;
Hamed Javadi, D.D.S.

Voice of the Director
Leo Kupp, DDS, PhD

. The most exciting event in the graduate periodontics program at OSU is the nearly finished construction of our new clinic. A few more weeks and we will be moving into our state-of-the-art 16 operatory clinic. The new clinic is equipped with central nitrous oxide, two implant sedation suites, a patient education room, laboratory and computer capabilities in every cubic. In addition to our new clinic the graduate students have moved into their new study/lounge room with a great view of the newly remodeled football stadium. Also, due to the generosity of our alumni we will begin another renovation project when construction begins on our new conference room. Again we have our eye on the future; the conference room will be totally digital as the old Kodachromes give way to electronic conferencing. The graduate students are now using digital cameras and radiography. These are very exciting times for our section and graduate program.

This past June we were extremely proud to see our third year graduates enter their professional careers. Jason Augustine has moved to Phoenix, AZ, James Brayton went back to Kalamazoo, MI, Jason Stoner is in Charlotte, NC and our past chief resident Ana Valverde returned with her husband to San Jose, Costa Rica. We all wish this exemplary group success in their personal and professional lives. As one group leaves another enters and this year we welcome Elbert Chang (OSU), Maria Lavda (Greece), Hoang Nguyen (CWRU) and

PHOTO ALBUM

Drs Mariotti and Marucha show the residents how to watch grass grow in Columbus, OH

Directors last words cont'

Ryan Taylor (OSU). We are very pleased that these bright eager students have joined our program, and we have high expectations for the Class of 2003.

I want to take this opportunity to thank our alumni who have risen to the challenge and raised the needed funds for our new conference room-you people are the best! I also want to thank our part-time faculty for their continued participation in the graduate program. Thanks to Drs. Tim Coffelt, Jim Palermo and Fred Alger-you make the program better and the students truly appreciate your efforts! The faculty and students presented six abstracts at the AADR meeting in Washington D.C. and published five scientific articles since January. Dr. Phil Marucha is a co-investigator on a large NIH sponsored grant to study the effects of stress and aging on healing and John Walters has begun his fourteenth consecutive year of funded research-we are very proud of their accomplishments. In 1999 we celebrated the 50th anniversary of our program and the future never looked brighter. 2000 has been a great year for OSU. As you may have heard I have accepted a new position at the Mayo Clinic in Minnesota and will be gone shortly after you receive this newsletter. I have been blessed to work here with the staff, students and faculty and I will always look back on my years here with fond memories. Take care and see you at the meetings!
Drs Stoner, Valverde, Augustin, and Brayton finally receive their hard-earned certificates.

Who are these drunk people?

It's worse than Wild Turkey!!

That Korean whisky kick my behind!!!!

Enjoying the picnic with friends and Korean Rum, courtesy of our new fellow Dr. Lee
:Pick it up
: No you pick it
: I pick it up last time
: well, I ain't doing it again
The Greek Connection
The new resident room

With our alumni's help and support, the resident can enjoy a state of the art resident room, equipped with computer stations, and a resident kitchen.
The state of the art clinic is closer to finish. After several months of waiting, the plumber decided to show up again.
The best lookin **periodontal** program in North America

The not so photogenic individuals were asked to leave
If I were PRESIDENT

Let the race begin! In the first of such series, we have elected to interview Dr. Joe Will, our beloved chief resident. Watch out Gore and Bush. Here comes one of the Will Brothers.

Why should we elect you to be the President of the United States?

My message of compassionate fascism. Certain God-given liberties should not only be protected, but also enforced. I make ownership of a toothbrush and waxed floss mandatory. That is fascism. But I’d also subsidize toothpaste. That’s compassion.

How would you raise money for your campaign?

Corporate sponsorships. It’s a little dodgy legally, but people will know the company I keep— the company that keeps me. I’m in talks with Lifecore Dental Implant and makers of Periglass to be the Official Backbone of the Chief Will 2000 Campaign. Now that’s a team you can not beat. Try some today.

What is your campaign slogan?

"WIT, the slogan of any periodontitis..Whatever it takes.”

Which of your activities would present the greatest challenge to your spin-doctors?

My plan to double the number of White House interns. And also invade Canada to bring an end to war of 1812. Javadi tells me they have lots of fresh water we can pipe down to our desert states.

How much personal information do the voters have the right to know about you?

Nothing’s out of bounds. I deeply regret release of “A Will Brother Goes to Columbus” video.

What would be your favorite presidential perk?

I’m looking forward to having my own air force. Not only does it allow you to impose your will on other countries, but also if you’re dating, you can order flyovers after dinner during dessert.

Whom would you appoint to your cabinet?

Janice Welch as secretary of Defense. Dr. Kamran Haghkhat at Transportation. Drs Hatfield and Cacchillo as National Security Advisers. Javadi will be the Press Secretary. I am considering Drs Marriott or Kupp to head the CIA. All the ambassadorships will be up for auction on eBay.

What’s the biggest problem in the world? How would you fix it?

Skyrocketing gas prices. The solution? Hostages. I’d detain some visiting nationals from OPEC countries and park them in a plane on a runway. Something has to be done about the gas prices.

Write the first news headline about your administration.

CANADA FALLS IN LIGHTING STRIKE

What person, living or dead would you model yourself after?

P.I. Bränemark, Doc Holiday, Holk Hogan

What books would be requires White House reading?

The Catcher in the Rye, and JOP.

Whom would you pardon?

No one, everyone is equal when it comes to justice. Even when the x-ray shield is not hung properly.

What would you legalize?

Carrying firearms and pistol duel.

What would you veto everytime it hit your desk?

Anything to do wit Oral Surgeons

What three objects must you have in the Oval Office?

A mucoperiosteal elevator

Who would get an invitation to stay in the Lincoln Bedroom?

Think eBay
Thanks

Your generosity has made the quest for excellence achievable. We have collected $95,618.00 with $12,500.00 still to be received. In the next issue we will list the donors.

POSITION AVAILABLE

Director of Advanced Education in Periodontology
at The Ohio State University

The Department of Periodontology at The Ohio State University, College of Dentistry invites applications for a full-time, tenure track position, the primary duty being directorship of the Advanced Education Program in Periodontology. The applicant must have a DDS/DMD or equivalent degree and be a Diplomate of the American Board of Periodontology or board eligible. Responsibilities will include research, teaching and management of the advanced education program in periodontology and graduate education. Ideal candidates are Diplomates with an MS or PhD, evidence of expertise in conscious sedation, pre-implant and implant surgery, and a history of funding from extramural sources or significant research accomplishment. Salary and rank will be commensurate with credentials and experience. The Ohio State University is an equal opportunity/Affirmative Action Employer. Qualified women, minorities, Vietnam-era Veterans, disabled veterans and individuals with disabilities are encouraged to apply. It is the policy of the Ohio State University to limit access to communications and letters of references to those directly involved with the selection process. However, these materials may be deemed to be public record under Ohio’s Open Records Law. Applicants must be eligible for licensure in Ohio.

Please send nominations, applications and inquiries to the address below. In addition to a paper copy, the search committee would be pleased to receive your applications or nominations on a diskette or by email. Applications should include a cover letter stating the reason for interest in this position, a CV and the names/addresses of three references. The search committee will begin to review applications on December 1, 2000 and will continue to receive them until the position is filled.

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Peri-implantitis
Hamed H. Javadi, D.D.S.

Introduction

The most exciting changes in dentistry in the past several years have occurred in implant dentistry. Dental implants have become a viable restorative option. Since the introduction of the Branemark Technique and the Noble Biocare implants, many other techniques and systems have been introduced to the dental clinician with similar success rate. Many studies have reported above 90% success. This low failure rate has been achieved due to careful planning and surgical technique. As the number of implant placement increases, the clinician may face new problems. Most failures are identified when osseointegration is not adequate and leads to clinical mobility of the implant fixture. This undesirable outcome may be due to mechanical overloading, or early loading of the titanium fixture, or infection. If these findings are discovered before the clinical mobility manifest itself, the implant is classified as a failing implant and only a few treatments are available to return the implant to health. Otherwise the implant may become unsalvageable and would be categorized as a failed implant with removal the only choice.

After prosthesis placement, the infection of the peri-implant tissue has been investigated in the past several years and has been named peri-implant mucositis and peri-implantitis. The biological events involved in peri-implantitis mimic those of periodontitis. The bacteria involve in peri-implantitis seem to be similar to periopathogens. Many investigators have shown presence of gram negative rods in peri-implantitis pockets. The purpose of this paper is to review the Peri-implantitis pathogens and rational in treatment of it.

Peri-implantitis
Placement of implants, submerged or non-submerged, in the oral cavity leaves part of the implant exposed to the oral cavity. The microbiota that inhabit the oral cavity can colonize this part of the implant. If the accumulation of bacteria persists, a destructive inflammatory response initiates that resembles the gingivitis and periodontitis. The inflammatory reaction of the peri-implant tissue and eventual loss of surrounding bone has been termed peri-implantitis. Peri-implantitis needs to be differentiated from peri-implant mucositis. Peri-implant mucositis is a reversible inflammatory condition of the soft tissue that does not result in loss of bone. Pontoriero et al experimentally induced peri-implant mucositis in humans, reaffirming the similar association between bacterial plaque and peri-implant mucositis as exists with bacterial plaque and gingivitis. Other investigators demonstrated that ligature placement and subgingival plaque at both implant and teeth in animal models resulted in initiation and progression of destructive process affecting the surrounding bone and soft tissue. The destructive process was more rapid around implants compared to natural tooth. The authors argued such rapid progression might be due to lack of a junctional epithelium at the base of the soft tissue-implant interface and lack of cementum.

Peri-implantitis is an inflammatory process resulting in bone loss around implant. This may occur after initial surgical phase and after prosthetic placement has been completed. Many investigators have looked at the microbiological players. Rosenberg et al reported 2 distinct implant failures. He noted that infection or trauma could cause failed implants. Spirochetes and motile rods were dominant around infected failed implant, however traumatically failed implants exhibited bacterial species associated with periodontal health. Becker and et al looked at failing implants and tested for presence of Actinobacillus actinomycecomitans (Aa) Bacteroides intermedius (Bi) Bacteroides gingivalis (Bg). 27.8% of the sites had Aa in less than 0.1% concentration. Bg was detected in 37.5% and was in moderate concentration (1.0%- 9.9% in 88% of the sites and in high concentration 10% or more in 11% of the sites tested). Bi was present in 35.4% of the sites, 88% in moderate concentration and 11% in high concentration. Mombelli showed that pockets around failing implants contained high numbers of gram negative anaerobic rods including Prevotella intermedia, and
Fusobacterium sp. while healthy site showed high percentage of coccoïd forms. In a separate study, Mombelli et al. found 86% were coccoïd cells and over 80% of the cultivated bacteria were Gram-positive in the edentulous population with healthy implants. In addition, black pigmented bacteroid species and fusobacteria were rarely found in these edentulous patients. Others have confirmed these findings. Rams et al. noted that healthy implant in edentulous patients were mainly non-motile coccoïd, followed by filamentous rods. Augthun reported the frequent presence of Aa in deep peri-implant bone pockets in 12 edentulous patients with 18 unsuccessful implants. He also reported the dominance of Prevotella intermedia, Prevotella buccae, Prevotella oralis, Prevotella melaninogenica, Prevotella denticola, Fusobacterium nucleatum, Capnocytophaga species, and Eikenella corrodens. He also discussed selective reproductive of small number of species that can be responsible for progression of peri-implant inflammation similar to periodontitis. This study however was ill prepared to detect other putative periopathogens such as Bacteroides forsythus and some strains of Porphyromonas gingivalis as explained by the author. Salsetti et al. found P. nigrescens was present in 87% of failing implants as compare to 29% of control implants. He also found P. micros, F. nucleatum to be frequently present in failing implant pockets.

Lisgarten and Lai compared the presence of bacteria around failing implants and those present in adult periodontitis and recurrent or refractory periodontitis. They reported B. forsythus to be present at the frequency of 59%, spirochetes 54%, Fusobacterium 41%, P. micro 39% and P. gingivalis 27% in failing implant pockets. The most frequent species for adult periodontitis were B. forsythus 83%, Fusobacterium 80%, spirochetes 79%, P. gingivalis 59%, P. micro 51% and E. corrodens 37%. Recurrent and refractory periodontitis samples were 85% B. forsythus, 83% Fusobacterium, 60% P. gingivalis, 59% spirochetes, 56% C. rectus and 56% P. micros. The authors concluded that periodontal pathogens in failing implants are similar to that of periodontitis. In a recent study, Lee et al. investigated the microflora around healthy implants in partially edentulous patients. They found oral streptococci, capnocytophagae, Veillonella parvula, Peptostreptococcus micros, and Fusobacterium nucleatum predominantly colonized implants. P. gingivalis and B. forsythus were seen in only a few successfully osseointegrated implants.

Above mentioned studies suggest that microbiota associated with healthy implant differ from failing implants. Even though none of the studies showed that periodontal pathogens and peri-implantitis pathogens is exactly the same; there are overwhelming evidence to suggest microbial population around the failing implants are Gram-negative rods and spirochetes. Rams et al. showed that as the pocket depth increased so did the population of spirochetes. Others have shown increase in the number of Gram-negative anaerobic bacteria. Newman and Flemming published a list of bacteria associated with stable implants and failing implants. Mombelli declared that like periodontitis, peri-implantitis is a site-specific disease.

Several studies have shown that reduction of microflora alleviates the clinical signs and symptoms, which further implicates the flora as an etiological factor. Mombelli and Lang in 1992 treated a selected group of patients with antibiotics. After mechanical debridement and irrigation with 0.5% chlorhexidine, a regimen of ornidazole 1000 mg for ten days was administered systemically. Bleeding scores improved immediately and probing depth improved over duration of the observation period.

**Diagnosis of Peri-implantitis**

An early and reliable detection of active peri-implantitis is needed to cease the progression of the disease with appropriate treatment. Traditional periodontal markers, such as probing depth and radiographic bone loss, are not able to identify prediction of periodontitis or peri-implantitis. They are suited however to measure existing injury to the tissue. Bleeding on probing as predictive value for progression of peri-implantitis was investigated by Jepsen et al. They showed that bleeding on probing had a 97% negative predictive value for continuing attachment loss in peri-implantitis. Bleeding on probing had also been shown to be a high (99%) negative predictive value for progression of periodontitis. Therefore, it seems that a bleeding on probing can be a valuable indicator of peri-implant stability. Mombelli and Lang have reviewed diagnosis and treatment of peri-implantitis. They list presence of inflammation, bleeding, bone loss, and pocket depths greater than 5 mm as criteria that need to be addressed in order to assess the health of the peri-implant tissue.
Others have looked into biological markers that have been identified in active periodontal destruction\textsuperscript{13,23,33}. Salcetti et al\textsuperscript{11} found elevated levels of PGE\(_2\), IL-\(\beta\), and Platelet Derived Growth Factor (PDGF) in mouths with failing implant sites as compared to mouths with healthy implants\textsuperscript{11}. When Peri-implant Crevicular Fluid (PCF) was examined in patients exhibiting peri-implantitis elevated levels of IL-\(\beta\) were detected\textsuperscript{23}. However, others have shown that PGE\(_2\) and matrix metalloproteinases (MMPs) are not good indicators in the early peri-implantitis\textsuperscript{20}. Aspartateaminotransferase has been shown to indicate the risk of future active periodontal disease but its assessment in peri-implantitis is not useful\textsuperscript{2xv}.

**Treatment Options**

Due to its similarity to periodontitis, clinicians and investigators alike have used treatment modalities established in treating periodontitis. Some authors have reported use of GBR for treatment of the severe cases of peri-implantitis\textsuperscript{2xv}. Some have used local chemotherapeutic with some success\textsuperscript{17} early peri-implantitis. There is general consensus that bacteria should be eliminated from the surface of the implant. Endotoxins and other contaminants are also deemed hazardous and their removal has been strongly advocated\textsuperscript{19}. This controversial topic lacks any in vivo research. Various means have been conceived for detoxifying the diseased implant. Laser treatment, low speed rotary instrument followed by chlorhexidine gel for 5 minutes, 0.12% chlorhexidine application treatment for one minute, citric acid cleansing for 30 seconds, Chloramine-T disinfection, use of tetracycline impregnated fibers, and hydrogen peroxide have all been examined with limited success\textsuperscript{19}.

Use of local antibiotics in treatment of the periodontal disease has been studied for many years. Many studies have shown that either local or systemic delivery of antibiotics as an adjunct to scaling and root planing can have advantageous effects in slight to moderate periodontitis.

**Summary**

A dental implant can fail by either infection or mechanical over loading. Infection of the peri-implant tissue leading to bone loss is termed peri-implantitis. Microbiological analysis of peri-implantitis has showed dominance of spirochetes, motile rods, \textit{P. micros}, \textit{Fusobacterium}, and Gram-negative rods. In contrast, failing implants because of occlusal trauma have a different microflora. Due to peri-implantitis similarity to periodontitis, many have investigating the effectiveness of periodontal treatment in treating peri-implantitis. However, more research is required. Many of the detoxification modalities have yielded different results when examined by different investigators\textsuperscript{26}. Since there are not any recognized criteria for failing implants, the research can be hard to interpret. Other periodontal pharmaco-therapeutics methods have yet to be investigated. One such therapy is use of low-dose doxycycline regimen, which has shown promising results in treatment of adult periodontitis\textsuperscript{2xvi}. Since peri-implantitis is a new site specific disease, new research aimed at alleviating and eliminating the disease is prudent.

**Reference**


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The Cutting Edge 14
Your latest issue of The Cutting Edge