From the Editor

Another academic year has gone by quickly and it is time again to sit down and reflect over it. Overall I think it has been a fun and successful year for most of us. There have been some trying moments and hurdles to cross, but that’s what keeps life interesting! It never ceases to amaze me how much we learn and grow every year, gaining in confidence everyday. This reflects the excellence of the program and the superb guidance that we receive from our faculty.

We are going to miss our newly graduated residents and I wish them all the best in their endeavors. I would also like to take this opportunity to warmly welcome our fresh batch of eager first years: keep the enthusiasm alive! I hope you enjoy reading this issue of the Cutting Edge and viewing the picture album as much as I have enjoyed putting it together. This issue of The Cutting Edge will also be sent electronically. If you did not receive an electronic copy, please email Dr. Claman at claman.1@osu.edu. The next issue will be sent electronically to email addresses of record. No paper copy will be sent unless requested. Coming soon: We will also be placing The Cutting Edge on the OSU College Website.

The Good Life

Angelo Mariotti, DDS, PhD, Chair

Everyday we navigate through a myriad of comments from acquaintances, friends, patients, superiors and even the internet on how to be a better person. Thousands of self-help books have been written with the intent to make you a better person. If you go into a Borders or Barnes & Noble you will find titles like: Wherever You Go There You Are, Food and Mood, Feeling Good: The New Mood Therapy, The Feeling Good Handbook, etc., etc., etc. Many of these books may be satisfactory and others will fall short in some way; and like you, there are many books that I don't want to read and for the others that may appear interesting it seems that I never have enough time to devote to read. With the increasing complexity of our society and how we are connected to it (cell phones, email, text messaging, IM, internet) many graduates (young and old) can be confused regarding their purpose in life.

Chairman’s Note, Continued on page 2

Please Join Us

at the

Buckeye Reception

Monday, September 18, 2006, 5:30 – 7:00 pm

Venue: Manchester Grand Hyatt San Diego
Hope to see you there!
Dear Alumni and Friends,

The past 6 months, since the previous edition of the Cutting Edge, have been a very busy time for the Program. In March, the Program had its Accreditation Site Visit, which went very well. The Program received two commendations and no recommendations or suggestions. I am very grateful for the support of our faculty, residents and staff as we prepared for and went through the Accreditation process.

In April, the Program hosted the annual Periodontal Research Day, with Dr. James Mellonig (University of Texas, San Antonio) as the featured speaker. Faculty, residents, alumni, as well as members of the practicing community and the University of Pittsburgh Graduate Periodontal Program attended the event and enjoyed the camaraderie.

Congratulations to Drs. Jad Elkhoury, Hamed Javadi, Manuel Iravedra, Purnima Kumar, Binnaz Leblebicioglu, and Ehsan Rezvan for becoming Diplomates of the American Board of Periodontology!

As always at the end of an academic year, we had residents coming and going. Our 2006 third year residents have all completed their clinical and MS requirements and have left OSU. Our 2005-2006 Chief Resident, Dr. William “Billy” Cho, whose thesis research was on “The effects of tongue piercing on mandibular gingival attachment levels and tooth chipping”, has moved back to California where he is busy in private practice. Billy presented part of his research results at the recent AADR meeting in Orlando, FL, and will present his final results during the Research Forum of the upcoming AAP meeting. Dr. Sam DeAngelo has moved back to North Carolina, where he has purchased a practice; Sam’s thesis research, which he presented at the recent EuroPerio meeting in Spain, was on “Characteristics of early soft tissue healing and microflora formation around one-stage dental implants”.

Continued on Page 3
Dr. Randy Fitzgerald, who presented his thesis work on “In-Vitro model for characterization of NSAID accumulation by oral epithelium” during the Orlando AADR meeting, has joined the practice of a former alumnus, Dr. Ralph Wilson, in Arizona. We are all very pleased with the accomplishments of our 2006 graduating class.

In July the program welcomed three new first year residents: Drs. Weiting Ho (China Medical University, Taichung, Taiwan), Patrick Kelsey (Creighton University, Omaha, Nebraska), and Stacey Papapostolou (University of Athens, Athens, Greece). We are delighted to have them join our Buckeye family.

The renovation/expansion of the Graduate Periodontal Clinic is almost complete. The changes will add a third implant operating room and digital panoramic radiograph capabilities to our clinic. These improvements will help us further enhance patient services and resident training.

We also had staff changes in the last few months. In May, we welcomed a new staff member, Ms. Chanthanom “La” Romine, who joined our clinic as Dental Assistant. In June, Ms. Electa Lee, our Clinic Supervisor for the last three years, left OSU because of her family move to Virginia. Ms. Joan Sachs has now taken over as Clinic Supervisor.

The residents and I are always appreciative of your continuing support of the program as we keep on receiving referrals for patients who cannot afford periodontal treatment in a private practice setting. Should you need to contact the clinic for a patient referral or any other reason, please call 614-292-4927. You can always reach me at tatakis.1@osu.edu or at 614-292-0371.

During the upcoming AAP meeting in San Diego, California, the Section of Periodontology will host the Buckeye Reception on Monday, September 18, 2006, 5:30 –7:00 pm. I look forward to seeing all of you there.

Best wishes,

Dimitris Tatakis
Our predoctoral program continues to be strong. Our students have consistently performed well on periodontally related questions on the National Boards and on the periodontal exercise of the Regional Boards, this year being no exception. For the ADEX (Formerly NERB) Exam, 75 of the 77 graduating students taking the exam passed the clinical periodontal exercise, giving our school a 97.4 pass rate.

Predoctoral students continue to have strong interest in learning the surgical aspects of periodontics. Thanks to support from Dr. Mariotti and Dr. Solt, this program has continued. In the past year, 24 students enrolled in the elective. As described in previous reports, the elective provides valuable periodontal experiences for interested students. It heightens interest in students specializing in periodontics, which is consistent with an AAP initiative to have more qualified students apply to periodontology programs. Dental students who perform surgical procedures understand the challenges and limitations of performing these procedures in general practice. I believe this helps them in decision-making in practice and makes them better at referring patients.

Each year, 3 graduating dental students are given an award for excellence in periodontics, presented at the convocation ceremony. The American Academy of Periodontology Award went to Jeremy Thompson, an outstanding student who graduated with multiple honors. He received the highest score on our written competency exam in periodontics. Dr. Thompson is currently in an Army GPR Residency and has shown interest in specializing in periodontics. Ruston Edwards received the Quintessence Award for excellence in Clinical periodontics. He is currently in practice in Washington State. Peter Drouillard received the Northeast Society of Periodontology award. He graduated with multiple honors and is currently in an Army Residency Program.

There are many factors at a dental school that determine dental student interest in periodontics. From my perspective as predoctoral director of periodontics, I would like to recognize the dedication of our full time and part time faculty. Also important; I would like to thank all of our postdoctoral students for their teaching effort. They serve as inspirations for our dental students in both the comprehensive care clinic and graduate periodontics clinic settings.

I would like to congratulate Dr. Leblebicioglu for her OSU College of Dentistry Peterson Young Educators award and to Dr. Rawal for being the recipient of the AAP Outstanding Educator Award at Ohio State during the past year. Each has made a significant contribution to predoctoral periodontal education at Ohio State.
Recent Awards of Faculty and Students

Dr. Swati Rawal: 2006 Educator Award of the American Academy of Periodontology, awarded yearly to outstanding educators from individual dental schools.

Dr. Lewis Claman: 2006 College of Dentistry Student Government Teaching Award.

Dr. Donald Morrison, a 1973 Graduate of the OSU Advanced Education Program in Periodontics, received a 2006 award of Commendation by the Alumni Association of the WVU School of Dentistry for "outstanding contributions to dentistry, dental education and the alumni association and his numerous accomplishments in the state of West Virginia, which have helped improve the dental profession".

Dr. Hamad Alzoman: Second place in the Midwest Society of Periodontology 2006 Graduate Student Research Forum for his work: "Osteoprotegerin Inhibits Periodontal Alveolar Bone Loss in Susceptible Animals"

Dr. Jeffery Wessel: In the 2006 AAP In-Service Exams he scored among the top 3% of all periodontal residents in the nation among residents in the same year of training, as well as in the top 4% of all periodontal residents in the national regardless of year of training.

Congratulations to our new DIPLOMATES

2006
Class of 1993: Dr. Binnaz Leblebicioglu
Class of 1998: Dr. Manuel Iravedra
Class of 2003: Dr. Hamed Javadi
Class of 2004: Dr. Jad Elkhoury
Class of 2005: Dr. Ehsan Rezvan
Class of 2005: Dr. Purnima Kumar

2005
Class of 1997: Dr. Robert Eber
Class of 1999: Dr. Theresa Conway
Class of 2006: Dr. Hamad Alzoman
Dr. Purnima Kumar joined our program as full-time faculty on March 1st 2006. She completed her BDS at Annamalai University, India and went on to acquire her MDS in Periodontology at Madras Dental College, India. She then taught and practiced in India and the Middle-East for several years. Finally, she obtained her Certificate in Periodontology and PhD in Oral Biology at OSU in August 2005 and was recently boarded by The American Board of Periodontology.
Chairman’s Choice

This editorial came from Inder Verma, the Editor-in-Chief of Molecular Therapy. Although written for scientists, I believe if we substitute periodontist for scientist and periodontology for science that this editorial relates to those dentists who practice our specialty.

Musings for Young Scientists

What is it to be a scientist? A scientist seeks the truth and pursues it with vigor and open-mindedness, so as to produce a hypothesis that can be sustained by experimentation. In graduate school, we learn the arduous task of conceiving and performing an experiment, and presenting the data to our colleagues and mentor—only to realize, perhaps, that a crucial control was missing. Initially crestfallen, we nonetheless returned to the bench to tackle the problem with renewed vigor. Through iterations of this process, we transitioned from experimentalist to thinker and back to experimentalist. Sir Isaac Newton, when asked how he made his discoveries, replied: “By always thinking about them. I keep the subject constantly before me and wait until the first drawings open little by little into the full light.”

I came to this country in 1971, armed with a Ph.D. in biochemistry and just enough money to pay a security deposit and first month’s rent. I wanted to do the big experiment that would change science and bring fame. Reality set in before long—but I persevered, persisted, and never lost hope. According to Paul Ehrlich, the father of immunology, scientists need the four G’s: Geshick (skill), Geduld (patience), Geld (money), and Gluck (luck). I will add to these a fifth element—passion—passion for your science. Science is hard work and here is no short cut to hard work. Science becomes a way of life, a sort of religious credo. One’s career may go through peaks and valleys, but the life is never dull. It was a mere hundred years ago that Mendel’s laws of inheritance were discovered. Fifty years later, the double-helical structure of DNA was unveiled, and now we have in our hands the blueprint of the entire human genome—all 3.2 billion bases of it. We can now print segments of the genome on a tiny chip to detect the expression of genes of interest. We can extract the scariest of genetic material from a single hair—even from an Egyptian mummy thousands of years old. We can eliminate any gene at will in a mouse so as to study its role in growth, development, and disease. Hardly a day goes by without the announcement of an interesting scientific discovery. Not all news is good—the continuing AIDS epidemic, the new obesity epidemic, the dwindling ozone layer and global warming. Clearly, there is much to do.

With knowledge comes responsibility. Science serves society and therefore, it is in the scientist’s interest to keep the public informed and engaged. A poorly informed society is more likely to be suspicious of science. The great 16th century astronomer Galileo Galilei had to recant his support of the Heliocentric theory of Nicolaus Copernicus when charged of heresy by the Church in 1632. Galileo wrote, “I do not feel obliged to believe that the same god who has endowed us with sense, reason and intellect has intended us to forgo their use.”

Continued on Page 8
There is no doubt that science can and has been used for both good and bad. But does this mean we stop unlocking the secrets of stem cell biology, for example, simply because of the remote chance that certain rogue elements might exploit it for human cloning? I believe that good will far outweighs the evil use of science to help mankind. Scientists nevertheless have a responsibility to humanity. Joseph Priestley, discoverer of oxygen, wrote “It will be an infinite advantage to all states if the following maxims were adopted by all their members. First to think with freedom, second to speak and write with boldness, third to suffer in good cause with patience, and fourth to begin to act with caution but to proceed with vigor. The rapid progress of knowledge is like the progress of a wave of light or of sound. It extends itself not only this way or that way, but in all directions and over all time.”
Resident’s Review

The following review paper was written by Dr. Randy Fitzgerald (Class of 2006)

Class III Furcation Defects

Abstract

The purpose of this review is to give an overview of some of the literature concerning class III furcation involvement including: Diagnosis, prognosis, treatment options and prognosis associated with different treatment options. In order to diagnose furcation defects it is necessary to use a curved probe such as a Nabers probe in conjunction with radiographs. It seems that we are able to detect furcation defects using radiographs about 20% of the time in the maxilla and about 10% of the time in the mandible. The depiction of a furcation arrow may also aid in radiographic diagnosis of mesial and distal furcations in the maxilla. The prognosis of untreated class III furcations ranges from questionable to hopeless. The most successful treatment of class III furcations appears to be root resection which has a success rate of between 60 to 97% followed by tunneling which has a success rate of between 50 to 90%. GTR in class III furcations appears to be relatively unpredictable especially in maxillary molars. Some studies show complete resolution of furcation defects in mandibular molars about 40% of the time with GTR while other show that resolution is variable and if there is some resolution it is usually to a class I or II furcation defect. The option of extraction and implant placement must also be considered for class III furcation involvement in that it offers from 85 to 97% success in the molar region.

Introduction:

This review paper will be focused on class III furcation defects. It will include their diagnosis, treatment options and short and long term prognosis.

Methods:

This paper reviews some of the literature from the 1950s to the present. Pub Med, www.perio.org and the Annals of Periodontology were used to search for information on this topic.

Diagnosis of Class III Furcation Defects:

In order to diagnose furcations defects it is best to use a combination of a curved periodontal probe, such as a Nabers probe and radiographs. The amount of interradicular attachment loss determines the classification of the periodontally involved furcation. Three commonly used classifications were devised by Glickman (1958), Hamp et al (1975) and Tarnow and Fletcher (1984).

The Glickman classification divides furcation involvement into 4 grades:

- Grade I: Pocket formation is detectable into the furcation flute but the interradicular bone is still intact.
- Grade II: There is loss of interradicular bone into the furcation but the bone loss is not through and through.
- Grade III: Loss of interradicular bone, equaling a through and through defect.
- Grade IV: Through and through interradicular bone loss with gingival recession so the furcation is visible.

The Hamp classification divides furcation involvement into 3 degrees:

- Degree I: Horizontal bone loss penetrating into the furcation less than 3mm.
- Degree II: Horizontal bone loss penetrating into the furcation greater than 3mm.
- Degree III: Through and through defect.

The Tarnow and Fletcher classification is based on vertical bone loss in the furcations:

- Sub class A: 0 to 3 mm of vertical attachment loss in the furcation.
- Sub class B: 4 to 6 mm of vertical attachment loss in the furcation.
- Sub class C: Greater than 7 mm of vertical attachment loss in the furcation.
**Diagnosis:**

In 1980 after evaluating 387 molars in 100 patients Ross and Thompson reported that there was a 90% incidence of furcation involvement in the maxilla and a 35% incidence of furcation involvement in mandibular teeth. They also reported that mesial and distal furcations of maxillary molars were two times as likely to have furcation involvement as buccal furcations. They also found that they were able to detect furcation involvement using radiographs 22% of the time in maxillary molars and only 8% of the time in the mandibular molars.

Harderopf et al in 1987 using radiographs to determine furcation involvement described a furcation arrow which was depictable radiographically on the mesial and distal surfaces of maxillary teeth with furcation involvement. They concluded that a mesial furcation arrow was depictable 19% of the time for degree I furcations, 44% of the time for degree II furcations and 55% of the time for degree III furcations. As far as distal furcation involvement they concluded that a furcation arrow was depictable radiographically 12% of the time for degree I furcations, 30% of the time for degree II furcations and 52% of the time for degree III furcations.

In correlating pre surgical to post surgical furcation involvement findings Zappa et al. using 12 patients and 6 clinicians and found that presurgical furcations measurements were generally overestimates of the true furcation depth.

Interradicular bone loss may not only be induced by advancing plaque but also may be the product of pulpal pathosis or trauma from occlusion. In order to differentiate between pulpal pathology and bone loss due to periodontitis tooth vitality should be checked. If the tooth is vital a periodontal lesion is probably the etiology. If the tooth is non vital root canal therapy should precede periodontal therapy in which the interradicular bone loss may resolve. If the furcation defect does not heal by 2 months after root canal therapy the furcation involvement is likely to be also associated with periodontitis. Heavy occlusion may also cause interradicular radiographic radiolucency. In such cases the tooth may have increased mobility and probing depth but it may not be possible to probe into the furcation. In this case occlusal adjustment should precede periodontal therapy. If the lesion truly was due to hyper occlusion the lesion should resolve in a couple of weeks after adjusting occlusion along with the tooth becoming more stable.

**Prognosis**

In assigning a prognosis to teeth with class III furcation involvement Becker et al. gave a tooth a hopeless prognosis if it had a class III furcation in combination with one or more of the following: Loss of over 75% of supporting bone. Pocket depths greater than or equal to 8 – 10 mm, hypermobility, poor crown to root ratio severe root proximity or a history of repeated periodontal disease. McGuire in1991 classified teeth with a class III furcation as Questionable.

**Treatment:**

The treatment of class III furcations will be divided into surgical and nonsurgical categories with the nonsurgical being scaling and root planing and the surgical being:

- Root separation/resection with some comparison to implants
- Tunneling
- GTR

**Non-surgical treatment of class III furcations**

A retrospective study that spanned between 15 and 53 years conducted by Hirschfield and Wasserman on nonsurgical therapy and the retention of mandibular class III molars found that with repeated scaling and root planing and soft tissue curettage they lost only 77 out of 764 mandibular teeth with class III furcations.

Although Hirschfield showed good results in maintaining class III furcations with nonsurgical treatment most of the literature shows that it is very difficult to treat teeth with furcation involvement nonsurgically and the main reason seems to be due to lack of access. A study conducted by Bower et al. where they looked at the furcations of 103 mandibular molars found that 50% of the teeth had furcation entrances narrower than their curettes which had a width of between 0.75 and 1.0 mm. 50% of the furcations were narrower than .75mm of these 63% were on the buccal and 37% were on the lingual. They concluded that narrow diameter ultrasonic tips may be more reliable at removing plaque and calculus in furcations than curettes.

Waerhaug also concluded that problems with furcation management has to do with the inability to gain access to into furcations to remove plaque. Wylam et al. in comparing open to closed flap debridement of class II and III furcations in 60 teeth scheduled for extraction found that even with open debridement 91% of the furcal surface was still covered with plaque and calculus compared to closed debridement at 93% and control and 98%. Most studies comparing the efficacy of hand instruments to ultrasonics in debriding furcations found that ultrasonics were more effective than hand instruments especially in narrow furcations. Leon and Vogel looked at 33 molars
with furcation involvement from class I to class III. Their results showed no difference between hand and ultrasonics for class I but ultrasonic debridement was significantly more effective in class II and III furcations than debridement with hand instruments. An in-vitro study conducted by Auplish in comparing diamond coated ultrasonic tips (sonicparo) to traditional ultrasonic tips (sonicrecall) to Gracey Curettes on a manikin found the diamond coated ultrasonic tips to be the most efficient at debridging furcations followed by traditional ultrasonic tips followed by Gracey curettes. Matia in 1986 looked at 50 mandibular molars with class II and III furcations also found ultrasonics able to remove more calculus in narrow furcations than curetts.

**Surgical treatment Class III furcations**

**Root separation and resection:**

The process of root separation/resection was first described in 1915 by GV Black. Berholtz also described how to do the process in 1972. It requires endodontic treatment and if possible the crown preparation prior to the procedure. It may consist of the removal of a root at the cementoenamel junction with preservation of the entire crown or dividing the tooth into a bifurcation or trifurcation and removal of the root and part of the crown or leaving them separated. Berholtz followed 40 patients with 45 root resective procedures for up to 11 years. Out of the 40 patients 29 were observed at 1 year, 36 were observed at 2 years, 21 were observed at 5 years and 17 were observed at 10 years. During this time 3 of the teeth were extracted, 2 because of marginal apical communication and one due to a perforation during the root canal. During the first five years the average pocket depth on the side of the resection became significantly deeper than the other surfaces but did not change from 5 to 10 years. Bone loss in the ten years averaged 5.0% for the resection side and 2.7% for the other surfaces. Mobility could not be assessed because most of the teeth were splinted.

Baston et al also conducted a long term study on resected teeth that took place from 1972 to 1993 at the University of Washington. During this time 32 patients had 49 root resections. Out of the resected teeth they extracted 4 of them equaling 8%. One tooth was extracted for endodontic reasons, 2 for caries and one for strategic purposes. At the end of the study 44 resected molars remained and had been in service for an average of 12 years.

Langer et al in 1981 reviewed the charts of 100 patients who had root resection at least 10 years prior to the study and included 50 maxillary and 50 mandibular molars. They had 38 out 100 resected teeth fail in the 10 years. 15.8% of the failures occurred in the first 5 years and 55.3% between 5 and 7 years. Mandibular molars failed twice as much as maxillary molars and the #1 cause of failure was root fracture at 47.4%, followed by progressive periodontal destruction 26.3% followed by endodontic failures 18.4% followed cement washouts 7.9%.

Carnevale published a 10 year longitudinal study on resected molars in 1998. The study included 72 patients each with at least one tooth they could treat with resection plus osseous surgery and a contralateral molar that could be treated with osseous alone as a control. They resected a total of 175 teeth 97 in the maxilla and 78 in the mandible. The patients were enrolled in a maintenance program every 2-6 months and were evaluated at 3, 5 and 10 years. At the end of 10 years 12 test teeth were lost. Four due to endodontic failure, 3 due to root caries, 3 due to periodontal disease recurrence, and 2 due to root fracture this equaled a ten year survival rate of 93% compared to a survival of control teeth of 99%. Hou in 1999 followed 85 teeth with class II and III for an average of 6.7 years ranging from 5 to 13 years. 55 were treated with a crown and sleeve telescopic denture without resection and compared to 33 resected molars with a crown and sleeve telescopic denture. During the study, none of the teeth failed and they noticed improvements in periodontal parameters of resected molars with class II and III furcations to those that did not have resection.

Another study conducted by Erpenstein compared 34 hemisected molars over an average of 3 years. 7 out of the 34 treated teeth failed, 6 for endodontic reasons and 1 for periodontal reasons.

Fugazzotto compared root resected molars to implants in a retrospective study conducted in 2001. He reviewed a total of 701 root resected molars in 628 patients and 1,472 molar implants in 1,102 patients that had been in service for 13 and even greater than 15 years. His results showed that out of the 701 resected molars 678 were still in service after 15 plus years equaling 96.8% success rate. Lone standing second molars had the lowest success rate at 75%. All other resected molars ranged from 95.2% to 100% success with the most commonly resected tooth being the mandibular molar with a success rate of 99.4%. Out of the 1,472 placed implants 1,428 were still in service after 13 years equaling a 97.0% success rate. Mandibular molars had the lowest success rate at 84.0%. Mandibular molar showed the highest success rate at 98.4%. Both the resected molars and the implants showed the highest degree of failure when they were stand alone terminal abutments equaling 30.4% of the resected molar failures and 37.8% of the molar implant failures. He concluded that both were highly successful as long as they were not used as stand alone terminal abutments.
Table 1 Success of Resected Molars

<table>
<thead>
<tr>
<th>Author</th>
<th># of Resected Procedures</th>
<th>Years in Study</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berholtz</td>
<td>45</td>
<td>10</td>
<td>93%</td>
</tr>
<tr>
<td>Baston</td>
<td>49</td>
<td>12 avg</td>
<td>89%</td>
</tr>
<tr>
<td>Langer</td>
<td>100</td>
<td>10</td>
<td>62%</td>
</tr>
<tr>
<td>Carnevale</td>
<td>175</td>
<td>10</td>
<td>93%</td>
</tr>
<tr>
<td>Hou</td>
<td>85</td>
<td>6.7 avg</td>
<td>100%</td>
</tr>
<tr>
<td>Erpenstein</td>
<td>34</td>
<td>3 avg</td>
<td>79%</td>
</tr>
<tr>
<td>Fugazzotto</td>
<td>701</td>
<td>15</td>
<td>96.8%</td>
</tr>
</tbody>
</table>

**Tunneling**

Furcation tunnel preparation is the process of creating an access between roots to allow access for plaque removal. A prerequisite for tunneling is a short root trunk and a wide furcation entrance. The root trunk should not be longer than 1/3 of the total root length which correlates to approximately 4mm for the vast majority of mandibular 1st molars and about 40% of mandibular 2nd molars and maxillary molars. Mandibular 1st molars are the prime candidates for tunneling because most have a furcation entrance of greater than .5mm whereas most of maxillary 1st molars have a furcation entrance less than .5mm.

Hamp et al. performed a prospective study that lasted for 5 years on tunneling. The study included 7 tunneled teeth including 6 lower molars and 1 upper 1st premolar. During this time 3 teeth failed due to caries the success equaled 57.1%.

Little et al. also conducted a prospective study on tunneling which lasted 5.8 years. They included 18 teeth 13 of which were maxillary molars and 5 were mandibular molars. Their study had 2 teeth fail due to caries with a success rate of 88.9%.

In 1989 Hellden et al. published a retrospective study that lasted between .8 to 8.9 years with an average of 3.1 years. They looked at 149 tunneled teeth out of which 33 were maxillary molars that had double tunnels. In this time 10 teeth failed 6 due to caries. The success rate in this study was 93.3%.

Another retrospective study conducted by Kuhrau and published in 1990 looked at 14 teeth all of which were mandibular molars over a 4 – 8 year period with a mean of 5.8 years. They had 2 teeth fail both due to caries with a success rate of 85.7%.

Eicholz et al. also conducted a retrospective study that ranged from 1 – 5 years with an average length of 2 years. Their study consisted of 68 teeth all of which were mandibular molars. Out of the 68 reexamined teeth 5 of them failed for other reasons than caries. They had a success rate of 92.6%.

Table 2 Tunneling success

<table>
<thead>
<tr>
<th>Author</th>
<th># of Teeth Tunneled</th>
<th>Years of Study</th>
<th>Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamp</td>
<td>7</td>
<td>5</td>
<td>57.1%</td>
</tr>
<tr>
<td>Little</td>
<td>18</td>
<td>5.8</td>
<td>88.9%</td>
</tr>
<tr>
<td>Hellden</td>
<td>149</td>
<td>3.1 avg</td>
<td>93.3%</td>
</tr>
<tr>
<td>Kuhrau</td>
<td>14</td>
<td>5.8 avg</td>
<td>85.7%</td>
</tr>
<tr>
<td>Eicholz</td>
<td>78</td>
<td>2 avg</td>
<td>92.6%</td>
</tr>
</tbody>
</table>
Guided Tissue Regeneration:

One of the first clinicians to evaluate GTR in class III furcations was Pontoriero et al.\textsuperscript{30} A prospective study conducted by them in 1989 consisted of 21 patients all of which had degree III furcation defects in mandibular molars. They used Gore-Tex membranes without any filler material in test teeth and membranes were removed after 1-2 months. Control teeth consisted of the exact process without a membrane. The patients were maintained every 2 weeks for 6 months after which the defects were reevaluated. Their results showed out of the 21 treated teeth 8 completely healed, 10 were partially healed and 3 were still open. In the control group none of the through and through group healed with complete closure.\textsuperscript{30} Later in 1995 Pontoriero et al.\textsuperscript{31} assessed the ability to close class III furcations in maxillary molars. This prospective study included 11 patients with bi-lateral class III maxillary furcation defects. One side was treated with a Gore-Tex membrane and the other treated with open flap debridement as the control. The membranes were removed after 6 weeks and re-examined after 6 months. The results showed some gain in attachment over control but none of the furcations changed from degree III involvement.\textsuperscript{31}

Gantes in 1991\textsuperscript{32} evaluated the treatment of mandibular class III furcation defects using either citric acid root conditioning in combination with buccal and lingual coronally placed flaps (14 defects) or the same treatment in combination with FDBA. The 2 groups were evaluated after 6 months. Their results showed no significant differences between study and control groups. There was a mean gain in attachment in control groups of 2.6 and 2.2mm. For test groups there was a mean gain in attachment of 1.9 and 1.5 mm.\textsuperscript{32}

Later in 1994 Garrett and Gantes\textsuperscript{33} tried GTR in class III furcation defects using ePTFE membranes. They had 14 defects in their test group and 12 in their control group. The control consisted of open flap debridement with citric acid conditioning and coronally positioned flap.\textsuperscript{33} Membranes in the test group were removed after 6 weeks and evaluations were conducted between 52 – 60 weeks. Improvements in soft tissue furcation classifications were observed in 4 out of the 12 control defects and also in 4 out of the 14 test defects. As far as improvement in hard tissue, 1 class III defect in the control and 3 in the test group improved to a class from a class III to a class II.\textsuperscript{33}

Eickholz and Hausmann performed 2 studies on GTR one in 1997\textsuperscript{34} and another in 1999.\textsuperscript{35} In both of their studies they evaluated class II and III furcations. Also in both studies they used ePTFE membranes and bioabsorbable. In the first study they had 18 class III defects that were treated with ePTFE or bioabsorbable membranes and used digital subtraction to evaluate the results. In the first study ePTFE membranes were removed 4 – 6 weeks after the first surgery. Evaluations were made at 6 months post surgery. Their results in the first study showed no statistical significance between the two types of membranes and a gain in vertical attachment of 1.58 +/- 1.37mm. No horizontal gain was reported in this study.\textsuperscript{34} The second study was conducted in the same manner except they had 10 class III furcation defects that were treated with ePTFE and bioabsorbable membranes and they were evaluated at 24 months. In this study they had a average gain in vertical attachment level of 1.78 +/-1.43mm and 4 out of the 10 improved to a I/I defect, one improved to a 0/I/II defect one improved to a I/II defect and 4 remained class III defects.\textsuperscript{35}

Palioto et al.\textsuperscript{36} studied the difference between using ePTFE membranes alone and in conjunction with Bio-Oss by treating 20 total defects in which they showed no statistical difference between using a membrane alone or using a membrane plus Bio-Oss.\textsuperscript{36}

<table>
<thead>
<tr>
<th>Author</th>
<th># of Treated teeth Healed</th>
<th># of Defects completely Healed</th>
<th># of Defects Partially Healed</th>
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<tr>
<td>Pontoriero</td>
<td>21 mandibular molars</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Pontoriero</td>
<td>11 maxillary</td>
<td>0</td>
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</tr>
<tr>
<td>Garrett</td>
<td>14</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Eickholz &quot;99&quot;</td>
<td>10</td>
<td>0</td>
<td>6</td>
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</table>

Conclusion

While the untreated or nonsurgically treated class III furcation appears to have a questionable to hopeless prognosis the surgical options of resection or implants offers up to high 90% success rates for 10 to 15 years. Tunneling may provide an adequate treatment but the clinician should be aware of the high probability of carious formation in the furcation and provide the patient with fluoride treatment at periodontal maintenances. GTR in class III furcations in the maxilla may not be worth the patient’s time or money but in the mandible appears to provide at least some increase in clinical attachment level with some complete resolution and reduction to a class I or II furcation defect. Therefore a grade III furcation does not condemn the tooth to certain extraction and may be treated by several different surgical approaches.
References

Photo Album

WELCOME TO OUR NEW FIRST YEAR RESIDENTS!

Program Director Dr. Dimitris Tatakis with Dr. Patrick Kelsey, Dr. Stacey Papapostolou and Dr. Weiting Ho

AADR March 2006, ORLANDO FL

Dr. Claman and Dr. Cho

Dr. Cho and Dr. Fitzgerald at the poster presentations

Dr. Tatakis with Billy Cho and Randy Fitzgerald
Left to right: Dr. Khoury, Dr. Tataakis, Dr. Alzoman, Dr. Wessel, Dr. Chang, Dr. Cho and Dr. Chou at the Graduate Research Forum

Out in the chilly Chicago weather

Having a good time!
RESEARCH DAY, April 2006

Standing: Dr. Chou, Dr. Khoury, Dr. Wessel, Dr. Chang, Dr. Shapiro, Seated: Dr. Burrell, Dr. Stilley, Ms. Jody Schilling (visiting candidate), and Dr. Maney

Dr. Brumfield, Dr. Claman and Dr. Palermo

Dr. Sam DeAngelo (left) and Dr. Billy Cho (right) presenting their research
Dr. James Mellonig’s lecture

At lunch with Dr. Mellonig

Dr. James Mellonig and Dr. Angelo Mariotti

Dr. Leblebicioglu, Dr. Claman, Dr. Rawal and Dr. Emecen

Friendly supervision by Dr. Tatakis and Dr. Mariotti
PERIO PROM, June 2006

It's over at last!

Dr. Randy Fitzgerald and wife Katie

Dr. Leblebicoglu and husband Bulant

The second year girls: Drs. Stilley, Chang, & Maney

Dr. Sam DeAngelo and wife Kristen

Dr. William Cho and girlfriend Sarah
Dr. Messick and wife Marilyn

Sharing a few laughs: Sam with Dr. Mariotti

Dr. Swati Rawal and Dr. Pinar Emecen

Ms. Laura McAllister, Ms. Joan Sachs and Ms. Linda Hallberg-Henson

Bonding moments: Ms. Barbara Clark and Dr. Chang

Dr. Tatakis and his graduating third years
TWINS FESTIVAL RESEARCH STUDY, TWINSBURG, OHIO, August 2006

Research booth at the festival

Our amazing group of volunteers!

Woman Power!
PICNIC AT REED ROAD PARK, AUGUST 2006

Time to grow up you guys!

Dr. Walters with wife Dr. Ann Walters

The whole team of grillers

Big girls love the swings too!

Dr. Solt with Cleverson and Weiting

Pat’s “Heisman Pose”
The Section would like to recognize the generosity of our alumni and friends that have made donations. The Section would like to thank the following doctors for their continued support:

<table>
<thead>
<tr>
<th>Alger, Fred</th>
<th>Hall, Timothy</th>
<th>Morrison, Donald</th>
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<td>App, George</td>
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<td>McCuen, Joel</td>
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<td>Meek, Winfield</td>
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<td>Glazer, Sanford</td>
<td>Moore, Timothy</td>
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Ways You Can Help

**Gifts of Cash**... Have an immediate and direct impact on our ability to further our goals and achieve our objectives. The College can accept checks, credit cards and automatic withdrawals as forms of a cash gift. Checks should be made payable to the Ohio State University Foundation. If you know the number of the fund you would like to support, please indicate that number or fund name on the memo part of the check.

**Pledges**... Allow you to fulfill a commitment over a period of time, usually not to exceed five years, and afford us the ability to plan and implement programs with confidence. The College has received many pledges over the last few years to support its campaigns and priorities.

**Gifts-in-Kind**... Equipment, products, books and journals, and other resources that we need to achieve our academic and programmatic goals. Gifts-in-kind can also include appreciated securities, real estate and personal property.

**Deferred or Planned Gifts**... Give you the opportunity to support our academic and programmatic goals in the context of your own long-term financial plans. These can take many forms including life income gifts, charitable lead trusts, wealth replacement trusts, life estate contracts and life insurance policies.

For more information, please do not hesitate to contact our development office at 614-292-9790 or visit our website at [http://dent.osu.edu/alumni/support.php](http://dent.osu.edu/alumni/support.php).
### Upcoming Events

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<tr>
<td>August 24-27, 2006</td>
<td>Ohio Dental Association Meeting</td>
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<td>September 16-19, 2006</td>
<td>American Academy of Periodontology, San Diego</td>
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<tr>
<td>October 16-19, 2006</td>
<td>American Dental Association Meeting, Las Vegas</td>
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<tr>
<td>August 24-27, 2006</td>
<td>Ohio Dental Association Meeting</td>
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<tr>
<td>October 7, 2006</td>
<td>Ohio Academy of Periodontists, Columbus</td>
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<tr>
<td>December 8, 2006</td>
<td>Section of Periodontology Holiday Party, location &amp; time TBA</td>
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<td>February 23-25, 2007</td>
<td>Midwest Society of Periodontology, Chicago</td>
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<td>March 8-10, 2007</td>
<td>Academy of Osseointegration, San Antonio</td>
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<td>March 17-21, 2007</td>
<td>American Dental education association meeting, New Orleans</td>
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<td>March 21-24, 2007</td>
<td>American Association for Dental Research, New Orleans</td>
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<tr>
<td>April 20, 2007</td>
<td>Periodontal Research Day, 8:30 am to 4:30 pm</td>
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College of Dentistry  
Section of Periodontology  
Postle Hall  
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Columbus, Ohio 43210  
Meter: 21550-011000-61801-10000 E4A11