JOURNAL of the

MASSACHUSETTS DENTAL SOCIETY

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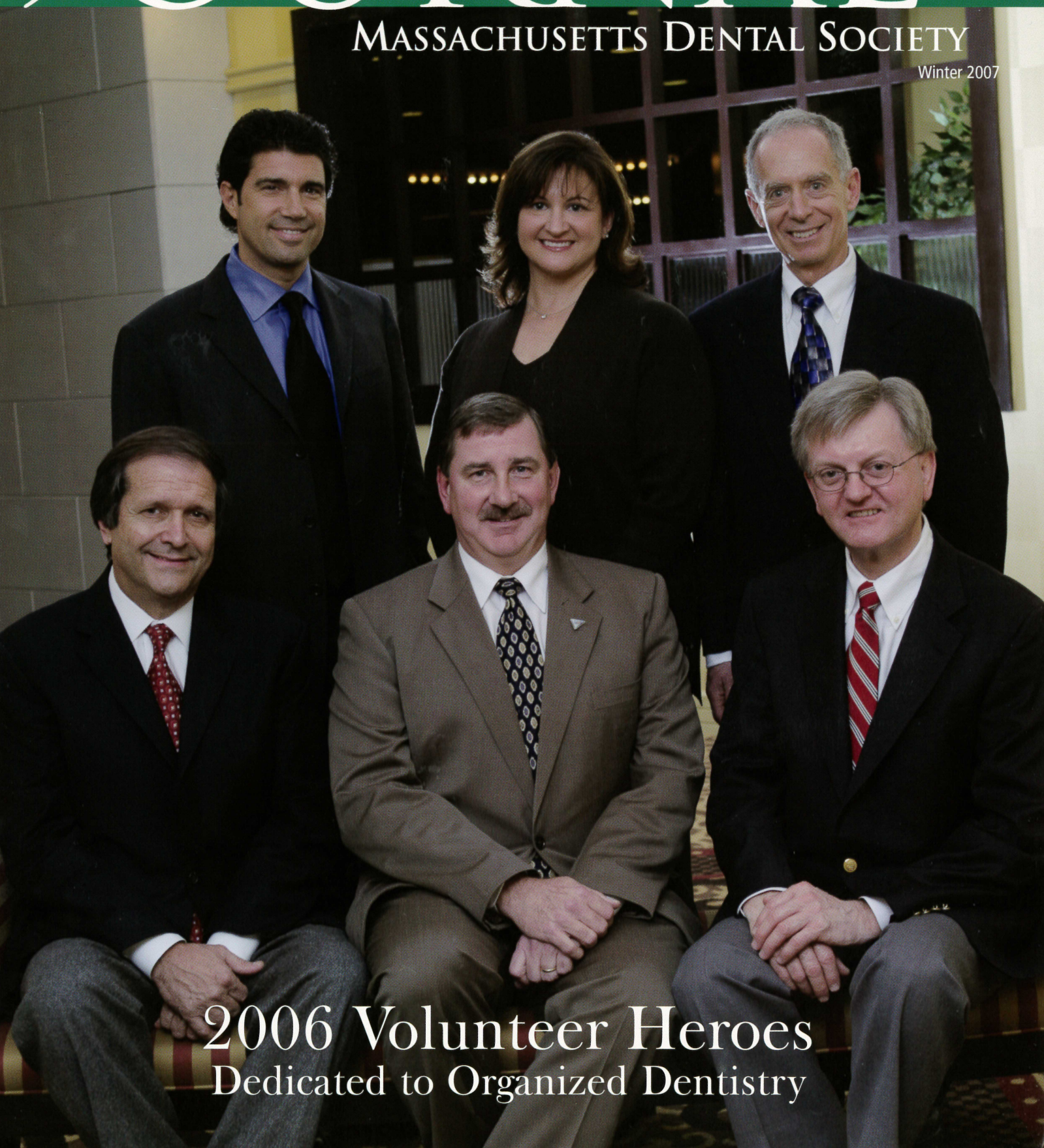

2006 Volunteer Heroes

Dedicated to Organized Dentistry

THE SMOKE NEVER CLEARS

The American Medical Association recently announced that it would no longer hold meetings or conventions at facilities that allow smoking. It is good to see that the AMA is putting its money where its mouth is.

We all know that there is incontrovertible evidence linking smoking to various physical system shutdowns. It is clear how deleterious smoking is to the teeth and supporting tissues, with direct causative links to oral cancer and periodontal disease. In fact, in treatment planning for implant restorations, there is such strong evidence linking smoking to implant failure that it is generally considered not good practice to place fixtures in patients who are heavy smokers, especially in "the esthetic zone." Smoking contributes to infections after oral surgery. There is also recently reported evidence that cigarette smoke can destroy the antioxidants found in saliva, a process whose by-products might accelerate the development of oropharyngeal cancer.

In addition, secondhand smoke is known to affect the health and well-being of family members and fellow workers. There is direct evidence that smoking has a severe negative effect on the economy due to its impact and burden on the health care system, as well as lost work time.

Organized dentistry advocates for specific themes and causes that are worthy and important. A major problem is that "hot" programs that are beneficial and effective often end without follow-up plans. If an issue is addressed on a continuing basis, it becomes part of the normal routine. If not, awareness diminishes and important programs fall by the wayside. During the last decade, there was a strong antismoking program centered on patient education in the dental office. However, there has not been ongoing follow-up. We need to be vigilant in our efforts, no matter how small the impact, because some patients will continue to smoke, no matter what.

Typically, dentists are willing to donate their time for just causes. In order for people to embrace a cause, it must be continuously publicized. Such efforts *are* working—cigarette smoking among high school students has declined by 40 percent since 1990. These results show that patient education must continue.

Every practice should make patient education as high a priority as regular prophys or oral cancer screenings. Antismoking education could easily be incorporated into the process of regular oral cancer exams. It should also be part of the treatment planning session so patients can better understand why certain procedures do not have a good prognosis when performed on those who smoke.

The American Dental Association and the Massachusetts Dental Society must put our money where our mouths are as our counterparts in the American Medical Association have done. ■

David B. Becker

Arthur I. Schwartz

JOURNAL OF THE MASSACHUSETTS DENTAL SOCIETY

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FINANCIAL SERVICES CORNER

Editor's Note: The following is intended to be informational. You should consult with your financial advisor before investing. This article is brought to you by Eastern Dental Financial Services. Printed with permission from Liberty Publishing, Inc.

EARLY RETIREMENT SOUNDS GOOD—BUT IS IT?

Have you ever reviewed your pay stub and entertained thoughts of an early retirement? Suppose you are age 55 and could take home 60 percent of your pay if you retired now. If you earn a high income, it may seem that would allow you to retire in reasonable comfort. However, before calling it quits, weigh all of the facts carefully to be sure an early retirement makes financial sense for you.

Here are eight rules you should consider if you're thinking about taking an early retirement:

Rule 1. Weigh the differences between the benefits of retiring now and in the future. Retiring at age 55 with, hypothetically, 60 percent of your income may seem like a good deal at first. But if you wait until age 65 to retire, you will have gathered another 10 years of full earnings, along with any increases for promotions, merit raises, and inflation. This will provide you with more money to save for retirement and, ultimately, may boost your Social Security and pension benefits. Also, if you consider the difference in the percentages you will receive now and in 10 years—for example, 60 percent if you leave now versus 80 percent if you retire in 10 years—leaving now may not sound so good after all.

Rule 2. Remember to factor inflation into your decision. If you still think you can manage on 60 percent of your income, remember that inflation will erode your pension. Consider this: If you retire today and receive a pension income of $1,600 per month for life, in 20 years at a 4 percent rate of inflation you will have only the equivalent of $707 in today's dollars.

Rule 3. Prepare for longevity. The longer you live, the more money you'll need in retirement. Also, bear in mind that inflation can erode your financial resources over time. As life spans lengthen, an early retirement plan should include a budget to cushion the financial burden incurred by potentially more years spent in retirement.

Rule 4. Evaluate other retirement income resources. If you already have a sizable retirement nest egg, or if you expect to collect a pension from a previous employer, the size of the pension you could receive from your current employer may not be critical. If so, perhaps you could leave the working world behind, since you will have other funds on which to rely.

However, don't make the mistake of expecting Social Security to provide most of your retirement income. In 2005, the Social Security Administration (SSA) projected that benefits will replace only 40 percent of the average worker's preretirement income. Also, the future of Social Security is uncertain, and cutbacks in other government programs, such as Medicaid and Medicare, may require you to provide even more of your own funds.

Rule 5. Part-time work may make early retirement feasible. If you decide to leave your present company, are you banking on securing employment elsewhere to supplement your pension? The prospect of ongoing income may make it possible to consider an early retirement option even if it doesn't pay a high percentage of your earnings. However, keep in mind that it may be difficult to find another equally high-paying position. Be certain of the earnings and longevity you can expect from your next job before depending on it for income until you permanently retire.

Rule 6. Be aware of the effects early retirement may have on Social Security. If you are under age 65 and continue working after you begin collecting Social Security benefits, you may have to "give back" a portion of your benefits. In other words, your Social Security benefits may be reduced once your earnings exceed a certain income cap.

You should also know that if you continue working after you begin collecting Social Security, a portion of your Social Security benefits might be taxed. The calculation to determine how much of your benefits will be included in your gross taxable income is somewhat complicated. For more information, contact the Social Security Administration.

Rule 7. Taking an early retirement may make sense if the specter of corporate downsizing looms. Is there a chance your company will lay you off if you do not elect to leave on your own? Many companies now lay off high earners as part of their cost-cutting measures. If your company is experiencing financial difficulties and "downsizing" appears imminent, you may get a better deal through early retirement than through the company's severance package.

Rule 8. Understand the potential tax consequences of early retirement. If you opt for early retirement, in some cases you may incur a 10 percent federal income tax penalty for early withdrawals from a qualified plan. Keep in mind that withdrawals taken from an Individual Retirement Account (IRA) before age 59½ may also be subject to a penalty.

Early retirement may be a long-held dream and financially possible. But before calling it quits, analyze your situation carefully. You will have to live with the effects of your decision for the rest of your life. Take the time now to make sure it will still be a smart decision in the long run. ■

GEORGE GONSER, MBA
Mr. Gonser is the managing director of MDSIS.

INSURANCE: IT'S ALL ABOUT CHOICE

FOR MOST THINGS IN LIFE, WE APPRECIATE THE NEED FOR advice from someone who is truly impartial. So with your insurance plans, where there are myriad options available, why should it be any different? Massachusetts Dental Society Insurance Services, Inc. (MDSIS), was founded in 1998 by the Massachusetts Dental Society (MDS) to help members with their insurance needs. The question isn't "Why MDSIS?" but rather "Why anyone other than MDSIS?" The answer is simple:

MDSIS saves you money. The simplest of motives. With access to the industry's best insurance plans and programs, MDSIS is well placed to find you a competitively priced product that meets your needs. From health to short-term disability to 125 plans, MDSIS will do the work for you.

MDSIS saves you time. Of course you could spend days, weeks, even months finding the best policies for you and your staff . . . but do you really have that time to spend? Let MDSIS use our experience and expertise to do the time-consuming "legwork" for you.

MDSIS ensures you have the right insurance coverage. Do you have enough insurance coverage if the worst should happen? Are you paying for insurance coverage that you don't need? The experts at MDSIS will make sure that the policy you choose will be right for your needs.

MDSIS is on your side during a claim. Filing a claim can be a stressful process. Having an expert on your side—someone who knows the process and speaks the same "language" as an insurer—can make this process quicker and easier.

MDSIS is your insurance industry resource. From newsletter and journal articles, to district meetings and presidential visits, to Yankee Dental Congress presentations and Minuteman Lectures, to our continually updated Web site *(www.mdsis.org)*, MDSIS is here for you. For the new Health Care Reform Law, look to MDSIS to provide the education and direction you need to help you prepare, understand, and thrive under this law.

MDSIS compares policies and provides alternatives. Although at first glance some insurance plans and policies may seem the same, after reviewing the technical language you may discover they are quite different. Because of the often-difficult-to-understand terminology, exceptions, enrollment guidelines, plan options, and eligibility requirements, it is frequently said that few purchases made by consumers are more confusing or require more careful study.

MDSIS provides a no-obligation benefits/insurance consultation and evaluation of your office. Do you want an expert to review your office's current benefits and insurance structure? MDSIS will gladly provide this valuable service at no cost for all members. For example, an MDS dentist contacted MDSIS asking for a benefits/insurance consultation. We met with the dental staff and outlined a game plan to restructure the benefits and accompanying insurance. As a result, the benefits were enhanced with a health, short-term disability/long-term disability/life and 125 plan, a strategic policy was established, and money was saved. Utilizing MDSIS's services saved this client more than $40,000. This peace-of-mind service can help you make sure that your benefits and insurance plans match your corporate objectives.

MDSIS has the experience. The collective experience of the MDSIS staff is 55 years and counting. We utilize our experience in all facets of the operation to add value to your operation. With more than 1,500 clients and growing, MDSIS has the experience that counts.

MDSIS was formed to help dentists and support organized dentistry. If you currently work with another broker, does it provide the services that MDSIS does? Does it promote and fund dental access initiatives such as the MDS Mobile Access to Care (MAC) van program, dental legislative agenda, and continuing education, or contribute to the MDS Foundation? All brokers receive commissions, but all of our after-expense commissions directly fund various dental industry initiatives. ■

We were formed by you, for you. Make us your broker today.
Contact MDSIS at (800) 821-6033 to learn how we can add value to your practice.

MDSIS—Experience the benefits.

3rd Annual Wine and Food Tasting

On October 27, 2006, the MDS Foundation once again hosted a successful Wine and Food Tasting at the State Room in Boston to kick off the 2006–07 Annual Giving Campaign. Celebrity chefs from Azure, Ciao Bella, and Aura restaurants were on hand to serve their favorite recipes.

Diabolique Infusions, a unique whole-foods-infused liquor company, poured tasty bourbon, rum, and tequila cocktails. All proceeds from this event benefited the MDS Foundation, which is dedicated to improving access to dental care for the underserved population of Massachusetts and enhancing educational opportunities for those who wish to pursue a career in dentistry.

In addition to the fine chefs who dedicated their time and food to make this evening possible, the MDS Foundation would like to express its gratitude to the following companies for their sponsorship: MDS Insurance Services, Inc., Gentle Dental Associates, Blue Cross Blue Shield of Massachusetts, Floral Reflections, and Identity, Inc.

Visit these fine establishments next time you're in Boston:

- **City Bar and Azure Restaurant,** the Lenox Hotel, 61 Exeter Street
- **Ciao Bella Restaurant,** 240A Newbury Street, near the Prudential Center
- **Aura Restaurant,** the Seaport Hotel, One Seaport Lane

2006–07 Annual Giving Campaign

Don't forget to make your annual contribution to the MDS Foundation. Donate online at ***www.mdsfoundation.org***, through your MDS membership dues statement, or by contacting Tara Brady at **(800) 342-8747, ext. 269**. Your participation could make the difference in the lives of needy children and adults who cannot afford dental care.

Register Now!

MDS Foundation
3rd Annual Casino Night & Texas Hold 'Em Tournament

Immediately following Opening Ceremony at YDC 32

Thursday, January 25, 2007
8:00–11:00 p.m. at the Sheraton Hotel

Register online at
www.yankeedental.com
using codes 918E and 919E

Going Above and Beyond

Since 1996, *the Massachusetts Dental Society has been honoring those member dentists who have dedicated their energy, skills, and time to the profession of organized dentistry. They are the "Volunteer Heroes"—those members who have gone above and beyond to help the MDS achieve its goals, inspire colleagues, and advance the profession.*

This annual recognition is the Society's way of saying "thank you" to those deserving members who give so much of themselves to organized dentistry.

On the following pages, you will meet the 2006 Volunteer Heroes and learn their thoughts on the impact volunteers have on the Society and the profession, what they have gained—both professionally and personally—from their volunteer experience and why the volunteer's role in the profession is so important to the future of dentistry.

Richard S. Doff, DMD, MS

Why did you choose to join the MDS?

I **joined the Massachusetts Dental Society** because it was a requirement of my specialty group, the American Academy of Periodontology, to be a member of the American Dental Association and the state society. I learned about the MDS from the local study club, Parkway Dental Society, a number of whose members were active at the state level and went on to become MDS presidents. I started to understand that the Society was not a faceless organization but a group of my peers.

Why is involvement in organized dentistry important to you?

My involvement in organized dentistry has kept me connected, informed, and educated, while providing me with an opportunity for personal growth. At an early age, I learned from my father, who was in the construction trade, that being part of an organization of peers was important for representing your interests in discussions with groups with which you deal, which in our case would be state and federal legislators and insurance companies.

Please describe the extent of your volunteer experience in dentistry.

My volunteer experience began at the Parkway Dental Society, where I served as secretary/treasurer, vice president, and president. I then asked Mike Swartz, who was also involved at the district level, how I could be more active. Mike recommended me as assistant district editor, in which capacity I had the privilege of working with Herb Schilder, who was editor. In 1987, Herb felt I was ready to take over as editor, a post I continue to hold today.

Elsewhere, I have been involved at Yankee Dental Congress as a speaker, presiding chair, room coordinator, and member of numerous committees. I have been teaching in the graduate and undergraduate clinics at Tufts part-time for the past seven years.

How has your volunteer experience impacted you professionally and personally?

My volunteer experience has given me the opportunity to meet many people who I would not ordinarily have met. It has fostered personal growth due to the responsibilities and necessary speaking engagements. I have also had the chance to work with and learn from Phyllis Basile, the Metropolitan District executive director, who is the "glue" for the district.

The only downside has been the time spent away from my family. However, when I look at my children, Jeff, Ben and Amy, as adults today, they have turned out to be well-adjusted members of society, probably thanks to my wife, Ellie.

What do you feel are the most important issues facing organized dentistry today?

Changing demographics will force dentistry to change. Due to the discrepancy between the large number of retiring dentists, the stable number of new dentists, and the fact that people are just keeping their teeth longer, there will be a shortage of dentists.

How has the practice of dentistry changed since you began your career?

Since I began practicing, there have been numerous changes, beginning with the change from "wet-fingered" to "glove-fingered" dentistry. There has been a huge increase in federal and state regulations with the accompanying paperwork. Periodontal treatment has gone from full-mouth treatment to localized procedures such as cosmetic and functional hard- and soft-tissue grafting, crown lengthening, regeneration, and treatment of localized breakdown.

What would you say to a fellow dentist to convince him or her to get more involved in organized dentistry?

To my fellow dentists I would say the world has gotten small and dentistry is no longer an individual working in an office with his or her staff as a "cottage" industry. Federal and state regulations keep changing, so you need to keep current. Attending Society meetings gives you the opportunity to discuss issues with other dentists. You can bury your head in the sand, but it won't change what is happening around you.

Thus the major selling point is "You are not alone." The problems you have are shared by many fellow dentists. ■

Richard S. Doff, DMD, MS
Residence: Needham
Office Location: Needham
Specialty: Periodontics
Education: Tufts University School of Dental Medicine; Specialty training: Ohio State University College of Dentistry
Number of Years in Practice: 30
Number of Years of MDS Membership: 30

"To my fellow dentists, I would say . . .'You are not alone.' The problems you have are shared by many fellow dentists."

Bruce M. Field, DDS

Why did you choose to join the MDS?

I **joined the Massachusetts Dental Society** to interact with colleagues. Additionally, my participation allows me to keep abreast of issues that are important to the profession of dentistry.

Why is involvement in organized dentistry important to you?

Being involved in organized dentistry allows me to be a part of my profession over and above interacting with patients and staff.

Please describe the extent of your volunteer experience in dentistry.

I have been involved with various committees, and am currently chair of the Allied Dental Health Professional Committee, whose oversight includes aiding the expansion of our local community college's dental hygiene and assisting education programs. I also served as president of the Worcester District Dental Society in 1998–1999.

How has your volunteer experience impacted you professionally and personally?

Being involved with organized dentistry has allowed me to meet my objectives of interacting with my colleagues. It gives me a satisfying feeling to know that I am supporting and contributing to our profession of dentistry.

What do you feel are the most important issues facing organized dentistry today?

Overall, I believe that maintaining the personal relationship of dentist to patient, which we in dentistry seem to enjoy more than some of our colleagues in related professions, is the most important issue.

What would you say to a fellow dentist to convince him or her to get more involved in organized dentistry?

I hope that the new dentists entering our profession recognize the value of sharing their professional experiences with their colleagues. Whether they are opening their own private practice or joining a new practice, the fulfilling value of meeting their fellow professionals as colleagues and not as competitors cannot be underestimated. In order to enjoy a full professional life experience, devoting time to patients, staff, and colleagues is extremely important. For those who feel that the added cost of dues and assessments is a consideration, I would say compare that to a union member paying union dues: the returns are greater than the contributions. There are some areas we cannot address as individuals. We need to be unified, although free to express our differing opinions, in order to maintain one of the most fulfilling professional experiences that exists—dentistry. ■

Bruce M. Field, DDS

Residence: Northborough

Office: Auburn

Specialty: Orthodontics

Education: State University of New York at Buffalo (SUNYAB)—DDS; U.S. Army Rotating Dental Internship; Baltimore School of Dental Surgery (University of Maryland)—Certificate of Orthodontics

Number of Years in Practice: 29

Number of Years of MDS Membership: 29

"The fulfilling value of meeting fellow professionals as colleagues and not as competitors cannot be underestimated."

Laura B. Glicksman, MS, DMD

Laura B. Glicksman, MS, DMD

Residence: Needham

Office Location: Needham

Specialty: Orthodontics

Education: Tufts University—BSEE, DMD, and Certificate of Orthodontics; Tulane University—MS

Number of Years in Practice: 6

Number of Years of MDS Membership: 6

"As the face of the profession changes, our leadership needs to reflect that change."

Why did you join the MDS?

It never occurred to me not to join the MDS. Part of being a professional is belonging to one's professional society.

Why is involvement in organized dentistry important to you?

Organized dentistry is the best way for my voice to be heard in shaping the future of dentistry as a profession as well as the environment in which we practice. Involvement in organized dentistry also keeps me connected with other dentists. As a specialist, I need to keep abreast of developments in other areas of dentistry, as well as my own, in order to provide my patients with the best interdisciplinary treatment. My contacts through the dental society provide a resource for information, as well as referrals.

Please describe the extent of your volunteer experience in dentistry.

In 2005–2006, I served as a member of the MDS Women's Leadership Task Force; I am chair of that group for 2006–2007. The Women's Leadership Task Force is charged with increasing the involvement of women and encouraging them to assume leadership roles within the Society. By increasing the number of women involved in organized dentistry, the MDS leadership will begin to be more reflective of the membership as we look to the future. I was also a delegate to the MDS House of Delegates for the Metropolitan District Dental Society in 2006. I like knowing that my opinion counts in the formation of MDS policy.

I am currently a participant in the MDS Leadership Institute, whose goal is to teach leadership skills to a new group of potential future MDS leaders. After the first session, I feel encouraged by the passion and enthusiasm of this group of dentists who see the future of organized dentistry as a priority.

As a dental student, I was a member of the "Smile Squad," which educated local schoolchildren about dental health and home care. We went into elementary school classes where some of the third grade students had little-to-no experience with dentists.

How has your volunteer experience impacted you professionally and personally?

My volunteer experience has impacted me professionally by introducing me to a large network of dentists with whom I can discuss patient care and office management issues. I have gained many insights into running my own practice through conversations with more experienced dentists.

Personally, I really enjoy the opportunity to get together with other dentists. I have met many people through the dental society whom I may not have met otherwise. I also enjoy the satisfaction of working on projects that will impact the profession of dentistry and those for whom we care.

What do you feel are the most important issues facing organized dentistry today?

Access to care for underserved populations is an important issue facing dentistry. All children and adults in the state should have access to basic dental care. The MassDentists CARE and Mobile Access to Care (MAC) programs are so important for us to continue and expand.

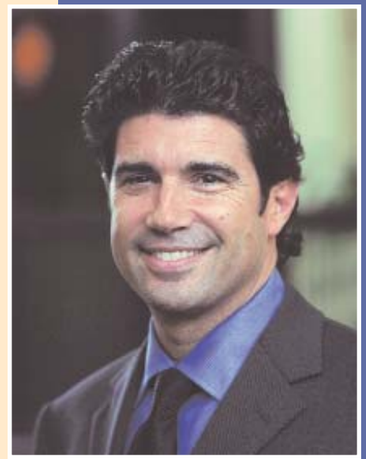
Politically, the Society must continue to advocate for the interests of dentists. Our voice is more powerful as a whole than as individuals.

Within organized dentistry, I believe it is important for all dentists to feel that they are being represented by the Society. As the face of the profession changes, our leadership needs to reflect that change. The MDS leadership must consist of men and women, as well as people of various ethnicities, in order to mirror the population of dentists practicing in the state.

What would you say to a fellow dentist to convince him or her to get more involved in organized dentistry?

It is very important to me that my voice be heard regarding issues that affect my practice, my staff, my patients, and me. Through my involvement in the MDS, I know that when I have something to say, I have a forum in which to say it. ■

Vincent J. Mariano, DMD



Vincent J. Mariano, DMD

Residence: Longmeadow

Office Location: East Longmeadow

Specialty: Prosthodontics

Education: Tufts University School of Dental Medicine

Number of Years in Practice: 22

Number of Years of MDS Membership: 22

"[We] must never lose sight of the fact that much of our past success as a profession has been based on honesty, integrity, and personal service to the public."

Why did you join the MDS?

I joined the Massachusetts Dental Society because many of my mentors encouraged me to be part of organized dentistry.

Why is involvement in organized dentistry important to you?

Organized dentistry provides an avenue for having the most impact on both the profession and the people we serve.

Please describe the extent of your volunteer experience in dentistry.

For the past 15 years, I have been chair of the Valley District Dental Society Education Committee. In 1998, I founded Dental Connections, the dental auxiliary continuing education program for the Valley District Dental Society—the most successful educational program for dental auxiliaries in the state. I have been assistant clinical professor of postgraduate prosthodontics at Tufts University School of Dental Medicine since 1993, and I am founder and president of the Tufts Prosthodontics Alumni Charitable Organization, Inc., a private, nonprofit organization dedicated to supporting the Tufts postgraduate prosthodontics program with its alumni worldwide.

How has your volunteer experience impacted you professionally and personally?

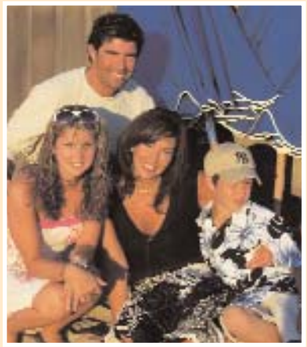
Whatever time and effort I have contributed to organized dentistry has been returned tenfold in the friendships and knowledge I have acquired, and the business success I have achieved.

What do you feel are the most important issues facing organized dentistry today?

Dentistry—and dentists—must never lose sight of the fact that much of our past success as a profession has been based on honesty, integrity, and personal service to the public. This good public perception is being threatened today by unorthodox professional competition, insurance company dictates on treatment, and product manufacturers pushing the envelope of product and technology releases without adequate scientific support.

How has the practice of dentistry changed since you began your career?

Continuing education today is not just necessary but critical to a successful career. Ninety percent of what I do today is different than in 1984, when I had my training at Tufts.



What would you say to a fellow dentist to convince him or her to get more involved in organized dentistry?

I would say to them that there is no better place than organized dentistry to open your world to so many personal and professional opportunities capable of changing your life and the lives of others. ■

John Pietrasik, DDS

Why did you choose to join the MDS?

I joined the MDS immediately after becoming an associate in my Chelmsford practice. At the time, I was mainly interested in the educational opportunities and the prospect of being a member of a group that would advocate for dentists in the community, legislature, and insurance industry. When I began practicing, my partner, Dr. Ron Chaput, was very active in the Society. His involvement demonstrated to me the advantages of being part of an organization that works to maintain and improve the quality of the dental profession.

Why is involvement in organized dentistry important to you?

Organized dentistry is important because it is instrumental in determining the future of the profession. It is essential that dentists become involved so that we, as a group, continue to have a voice and are better able to influence the direction of dentistry in the coming years. Organized dentistry also affords us the opportunity to interact with our peers so we can exchange ideas, information, and experiences, and have a positive impact on our profession.

Please describe the extent of your volunteer experience in dentistry.

Most of my volunteer work has been with the Yankee Dental Congress. In 1983, I began volunteering when a classmate from Georgetown asked me to serve on the Sign Committee. I eventually became chair of the committee and have since chaired six other committees at YDC. In 2003, I was privileged to serve as general chair of YDC 28. I am currently chair of the task force working on the transition of the YDC venue from the Hynes to the Boston Convention & Exhibition Center in South Boston.

How has your volunteer experience impacted you professionally and personally?

Volunteering gives me a sense of personal satisfaction, but there is nothing more rewarding than working with a group of dedicated individuals on a particular project and watching it come to fruition. Most of all, being a volunteer has been fun. Being involved with YDC for the past 20 years has given me the opportunity to meet and work with some wonderful people, many of whom have become good friends. On a professional level, being involved with educational programs has helped me stay current on new materials, technology, and procedures.

What do you feel are the most important issues facing organized dentistry today?

One challenge we face is educating our new dentists about the value of membership and the importance of volunteerism. This process needs to begin in dental school. The continued effectiveness of our organization and the ability to provide adequate and quality programs will be diminished if we see a decline in membership and volunteers. We must continue to develop initiatives that demonstrate the value and benefits of membership for all.

How has the practice of dentistry changed since you began your career?

Almost every procedure I perform and material I use has changed since I graduated in 1980. When I began practicing, I did not wear gloves or a mask. The introduction of infection control and universal precautions has allowed us to better protect ourselves, our staffs, and our patients. Advances in technology have given us digital radiography, lasers, intraoral photography, CAD/CAM, endodontic rotary instrumentation, and computer charting. More patients are seeking cosmetic procedures, including whitening, veneers, and bonding procedures. These changes only serve to emphasize the need for more continuing education.

What would you say to a fellow dentist to convince him or her to get more involved in organized dentistry?

I would emphasize the fact that if we are not involved in determining the future of dentistry, we lose control of our destiny. Being involved only requires that you give a little of your time. The benefits are many, including having a voice in determining dentistry's future and feeling the satisfaction that you have contributed to improving your profession. ■

John Pietrasik, DDS

Residence: Bedford

Office: Chelmsford

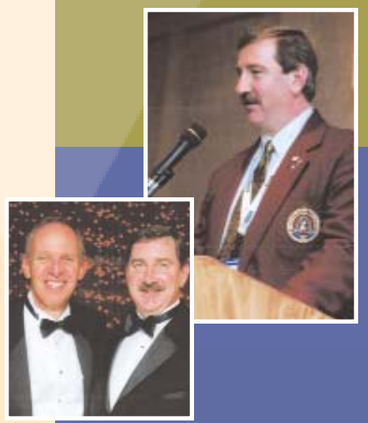
Specialty: General Dentistry

Education: Georgetown Dental School

Number of Years in Practice: 26

Number of Years of MDS Membership: 26

"We must continue to develop initiatives that demonstrate the value and benefits of membership for all."



Roger J. Wise, DDS

Why did you choose to join the MDS?

When I joined in 1973, the North Shore District Dental Society was extremely well organized and membership was an absolutely essential component of being a dental professional.

Why is involvement in organized dentistry important to you?

As a specialist, failure to participate in organized dentistry would distance you from the hand that feeds you.

Please describe the extent of your volunteer experience in dentistry.

My very early experience—30 years ago—was volunteering to give a table clinic at a very young Yankee Dental Congress. As time went on, I was able to utilize that experience to create multiple lecture topics, which I have presented at YDC over the years and right up to today. I even gave table clinics at the North Shore District Dental Society (NSDDS) meetings and volunteered as program chair, which led to working through the system to eventually become president of the NSDDS eight years ago.

How has your volunteer experience impacted you professionally and personally?

Personally, I feel the most rewarding aspect of volunteering has been to learn to work to solve problems with my fellow colleagues. An example would be the experience of organizing, conducting, and participating in our Society's Executive Committee meetings. These meetings are, to me, what our business friends might utilize in running a Board of Directors of a successful company. Getting things accomplished by discussing, voting, and even disagreeing is a very unique learning experience that I may have otherwise never experienced. This experience offers you the opportunity to be respected for your hard work and leadership by your fellow colleagues, which is just another part of being a consummate professional.

What do you feel are the most important issues facing organized dentistry today?

Organized dentistry must stay committed to embracing change yet protecting our autonomy as individual practitioners. Having autonomy was perhaps what attracted many of us to the career of dentistry. Today, corporations are involved with continuing education programs, research at dental schools, and large regional dental meetings by offering significant financial support. Dental practitioners must continually read journals to avoid overzealous or premature product endorsements and/or use without sufficient evidence or proper technique.

How has the practice of dentistry changed since you began your career?

Completely. Computers, implants, tissue engineering, and restorative materials have enhanced patient expectations and extended our treatment horizons beyond anything imaginable 30 years ago. Multidisciplinary care now demands that all dental specialists be able to communicate and work together. Today's dental graduates must be smarter and more talented than ever before in the history of our profession.

What would you say to a fellow dentist to convince him/her to get more involved in organized dentistry?

Isolation in your own world of private practice will only further distance you from your colleagues. There is no better way to feel good about yourself than through the rewards of membership in organized dentistry. My career would have been less fulfilling had I not been influenced by my own professional mentors, who were always involved in organized dentistry. ■

Roger J. Wise, DDS

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Office Location: Swampscott

Specialties: Periodontics and Orthodontics

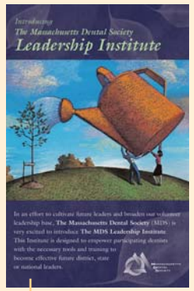
Education: Emory University—DDS; Boston University School of Dental Medicine—Certificate of Periodontics and Certificate of Orthodontics

Number of Years in Practice: 33

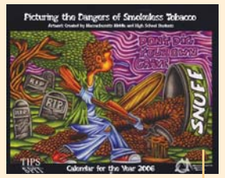
Number of Years of MDS Membership: 33

"Organized dentistry must stay committed to embracing change yet protecting our autonomy as individual practitioners."

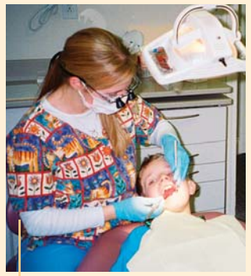
Year in Review—2006



MDS Leadership Institute holds first meeting in Fall 2006.



2006 calendar produced for *Tips on Spit*℠ program.



MDS participates in Give Kids a Smile.

Council on Communications produces new statewide TV campaign.

Four Guest Board Members selected to attend Board of Trustees' meetings.

Networking event held for women dentists.

Jerry Seinfeld performs at YDC 31.

MDS appoints Task Force on Bioterrorism. Dr. Andrea Richman named chair.

MDS introduces Dental Alert forensic identification program on Society's Web site.

(((DENTALALERT)))

Mobile Access to Care (MAC) van launched at YDC 31.

MDS and WCVB-TV (Channel 5 in Boston) collaborate on *Give Dentistry a Try*℠ television campaign.

LEXI-COMP

MDS endorses Lexi-Comp, Inc. as information technology provider.

Women's Leadership Task Force holds first all-day seminar.

LANDS' END

Lands' End begins business relationship with MDS Business Services program.

MDS Insurance Services, Inc., (MDSIS) recognized by Harvard Pilgrim Health Care as one of the "Elite" insurance brokers. MDSIS was also honored with a Gold Partner Award presented by HR Concepts and was recognized by the American Dental Association for its Direct Reimbursement program.

MDS Insurance Services, Inc.

Gentle Dental donates $20,000 to MDS Foundation.

MDS aids members impacted by spring flooding.

5th Annual MDS Foundation golf tournament held at Walpole Country Club.

House of Delegates approves new membership category for allied dental health professionals.

Dr. Alan Gold installed as MDS president and Dr. Milton Glicksman elected MDS vice president at 142nd House of Delegates.

MDS sponsors "Smiling Cow" in Jimmy Fund's CowParade fundraiser.

MDS Communications Department honored with more than a dozen local and national awards from four separate organizations for publications and public awareness programs.

Dr. Kevin Toomey named general chair of YDC 34 in 2009.

4th annual Beacon Hill Day held at State House.

Dr. Robert Faiella elected ADA first district trustee.

Council on Communications launches oral cancer awareness campaign.

AmeriVault®
Excellence in Data Protection™

MDS endorses AmeriVault for online data back-up services and recovery.

MDS supports ADA's 20th Annual New Dentist Conference held in Boston.

MDS FOUNDATION
SOMETHING TO SMILE ABOUT

MDS Foundation approves $233,000 in grants to six dental hygiene and assisting schools.

MDS Foundation holds 3rd Annual Wine and Food Tasting event.

Six members honored as MDS Volunteer Heroes.

Mobile Access to Care Dental Van arrives at MDS.

Management of Asymptomatic Wisdom Teeth

THOMAS B. DODSON, DMD, MPH
Dr. Dodson is a visiting oral and maxillofacial surgeon at Massachusetts General Hospital (MGH) in Boston and director of the Center for Applied Clinical Investigation at MGH, as well as an associate professor of oral and maxillofacial surgery at Harvard School of Dental Medicine.

Author's note: The preparation of this manuscript was funded in part by the Center for Applied Clinical Investigation and Education and Research Fund of the department of oral and maxillofacial surgery at Massachusetts General Hospital.

The author would like to recognize the American Association of Oral and Maxillofacial Surgeons and the Oral and Maxillofacial Surgery (OMS) Foundation Alliance for their foresight and ambition in funding and supporting the Third Molar Clinical Trials that generated the publications cited in this article.

Introduction

Decision-making for symptomatic third molars (M3s) is generally straightforward. A challenging decision that oral and maxillofacial surgeons face daily is managing asymptomatic M3s. For the purposes of this discussion, asymptomatic M3s can be impacted or erupted. The M3s are asymptomatic by history, physical examination, and radiographic examination. Specifically, the patient has no report of pain, cheek biting, foul odor or taste in the region, or the like. On physical examination, the M3 is erupted, functional, and hygienic, or it is not visible and not in communication with the oral cavity—i.e., the M3 cannot be detected by probing the gingival sulcus with a periodontal probe. On radiographic examination, the only positive finding is the presence of one or more M3s (see Figure 1).

Common sense dictates that the absence of symptoms does not equal absence of pathology. The purpose of this article is to review the literature to find evidence supporting (or refuting) a strategy for operative intervention for asymptomatic M3s. Rephrased as a question, this article's purpose is to answer the following: "Among patients with asymptomatic M3s, when is it prudent to remove M3s electively as opposed to monitoring them?" There currently exists no perfect answer to this question addressing all clinical situations and patient parameters. There is, however, a growing body of data facilitating management recommendations for asymptomatic M3s.

To date, five studies offer management insight into the asymptomatic M3.[1-5] The specific aims of this article are to (1) review cross-sectional and longitudinal periodontal outcomes for asymptomatic M3s that are visible or can be probed through the sulcus with a periodontal probe; (2) review periodontal outcomes of asymptomatic M3s that are not visible and cannot be probed; (3) highlight outcomes in terms of the periodontal health of the adjacent second molar (M2) following M3 extraction; and (4) review caries experience of asymptomatic M3s erupted to the occlusal plane.

There are two key take-home messages to be derived from this paper. First, use liberally the periodontal probe when evaluating the asymptomatic M3. The frequency of periodontal disease is quite high in patients with asymptomatic M3s. Second, after M3 extraction, the periodontal health of the adjacent M2 usually (>90 percent) is stable or improves.

Clinical Situation 1:

Asymptomatic visible or nonvisible M3s that can be probed. Using a cross-sectional study design, Blakey et al. enrolled a sample with four asymptomatic M3s and adjacent M2s.[1] This sample was followed over time to assess changes in periodontal health and caries experience. (The other studies cited in this review are based on this original study cohort.) The subjects were between the ages of 14 and 45. Probing depths (PDs) were recorded at six sites per tooth, including the M3s. The primary variable of interest was the presence or absence of periodontal disease around the M2 or M3. Periodontal disease was defined as being present if any site around the M3 or distal of the M2 had PDs >5 mm.

In brief, the sample was composed of 329 subjects (48 percent male, 79 percent white) with a median age of 25 years. At baseline, periodontal disease was evident in 25 percent (n = 82) of the subjects with asymptomatic M3s. Risk factors for periodontal disease were subject's age, tooth location, and eruption status. Subjects older than 25 years were two times more likely to have periodontal disease than subjects younger than 25. Mandibular M3s were five times more likely to have periodontal disease than maxillary M3s. M3s erupted to the occlusal plane were five times more likely to have periodontal disease than M3s below the occlusal plane.

In this sample of young subjects with asymptomatic M3s, there was a surprisingly high frequency of periodontal disease. This finding begs the question, "What happens to the periodontal status of these teeth over time?" Do the PDs improve, stabilize, or deteriorate? If the PDs increase over time, extraction of asymptomatic M3s may be indicated.

In another study, White et al. followed the sample described above for at least 24 months to measure changes in PDs in the M3 region.[2] Subjects whose M3s could not be probed were excluded from analyses (see Clinical Situation 2 outlined below). The primary predictor variable was the periodontal health at baseline in the M3 region. Subjects with any PDs >4 mm in the M3 region were classified as having periodontal disease present, while subjects with PDs <4 mm were classified as not having periodontal disease present. The outcome variable was change in periodontal health at least 24 months after the baseline examination. Subjects having at least one PD increase by >2 mm were classified as having progression of periodontal disease. For PDs <2 mm, the periodontal disease was classified as stable.

Figure 1. In this panoramic radiograph, no bony abnormalities are noted in the maxilla or mandible and there are no significant radiographic findings associated with the M3s.

The sample was composed of 254 subjects with 329 M3s. Twenty-four months after the baseline examination, 24 percent of subjects had evidence of periodontal disease progression. For subjects with PDs >4 mm at baseline, 38 percent had evidence of disease progression. For subjects with PDs <4 mm at baseline, 3 percent had evidence of disease progression. Subjects with PDs >4 mm at baseline had a 13-fold-increased risk for disease progression when compared to subjects with PDs <4 mm at baseline.

Clinical Situation 2:

M3s that are not visible and cannot be probed. About 20 percent of the sample had M3s that could not be probed at baseline and were excluded from the initial analyses. What were the outcomes of that group? Phillips et al. recently submitted an article for publication addressing that question.[3] From the original sample described above, 146 subjects with 369 M3s that could not be probed were followed for at least 24 months after the baseline examination. During the follow-up period, 35 percent of the M3s converted from teeth that could not be probed at baseline to teeth that could be probed at follow-up. Additionally, 19 percent of the M3s had periodontal disease present at follow-up as evidenced by PDs >4 mm. The anatomic position of M3s is not static over time, even in subjects over 25 years of age. Asymptomatic impacted M3s that cannot be probed need to be monitored over time for changes in position and periodontal health.

Findings of this review suggest that in cases where the PDs in the M3 region are >4 mm, even if the patient reports no symptoms, extraction of the M3 may be indicated to improve periodontal health. Some may argue that M3 extraction would have no effect or could worsen the preexisting periodontal disease, especially on the distal aspect of the adjacent M2. What data are present, however, to suggest that M3 extraction may improve the periodontal health?

Richardson and Dodson completed an evidence-based review of periodontal outcomes after removal of mandibular M3s.[4] The results of their review suggest that in most cases (>90 percent), when there is evidence of preexisting periodontal disease—i.e., PDs >4 mm—the periodontal health on the distal of the adjacent M2 is stable or improves, as evidenced by PDs improving at least 2 mm. Conversely, in the setting of PDs <4 mm, PDs deteriorated in 48 percent of the cases after M3 extraction.

Clinical Situation 3:

M3s erupted to the occlusal plane. Asymptomatic M3s are at risk for caries. Shugars et al. reported on the incidence of occlusal dental caries in M3s based on the study sample described above.[5] The sample was composed of 211 subjects with more than one M3 erupted to the occlusal plane and followed for at least 24 months. At the baseline examination, 29 percent

Subjects with caries on the first or second molar at baseline were also more likely to develop occlusal caries on the M3 at follow-up.

of subjects had at least one M3 with occlusal caries. At the end of follow-up, 33 percent of the subjects had evidence of caries in the M3s. Mandibular teeth were affected more than maxillary teeth. Younger subjects (less than 25 years of age) were more likely to develop caries at follow-up. Subjects with caries on the first or second molar at baseline were also more likely to develop occlusal caries on the M3 at follow-up.

Conclusion

The overall purpose of this article was to answer the question "For patients with asymptomatic M3s, when is it prudent to extract the M3s or monitor the M3s?" Based on the evidence summarized in this article, my current recommendations to clinicians and patients regarding the management of asymptomatic M3s are summarized below.

Always use a periodontal probe when evaluating patients with M3s to measure PDs in the M3 region, including the distal of the adjacent M2. If PDs are >4 mm in the M3 region or the M3 can be probed through the gingival sulcus, it is generally better to remove the tooth. If the tooth is erupted and there are caries on the first or second molar, M3 removal is again advised.

If the tooth is impacted and cannot be probed, offer patients the choice of monitoring or elective M3 removal to prevent future problems. If patients opt for the former, have them return on an annual basis to review their history and complete a physical and radiographic examination to assess symptoms and determine if the M3 can be probed or has PDs >4 mm. ■

References

1. Blakey GH, Marciani RD, Haug RH, Phillips C, Offenbacher S, Pabla T, White RP Jr. Periodontal pathology associated with asymptomatic third molars. J Oral Maxillofac Surg 2002;60(11):1227-33.
2. White RP Jr, Offenbacher S, Blakey GH, Haug RH, Jacks MT, Nance PE, Phillips C. Chronic oral inflammation and the progression of periodontal pathology in the third molar region. J Oral Maxillofac Surg 2006;64(6):880-5.
3. Phillips C, Norman J, Jaskolka M, Blakey GH, Haug RH, Offenbacher S, White RP, Jr. Changes over time in position and periodontal probing status of retained third molars. J Oral Maxillofac Surg (submitted for publication 2006 Sept).
4. Richardson DT, Dodson TB. Risk of periodontal defects after third molar surgery: an exercise in evidence-based clinical decision-making. Oral Surg Oral Med Oral Pathol 2005;100(2):133.
5. Shugars DA, Elter JR, Jacks MT, White RP Jr, Phillips C, Haug RH, Blakey GH. Incidence of occlusal dental caries in asymptomatic third molars. J Oral Maxillofac Surg 2005;63(3):341-6.

What Every Dentist Should Know About Malignant Hyperthermia

AMIR NAIMI, DDS
KALPAKAM SHASTRI, DMD
MORT ROSENBERG, DMD
Dr. Naimi is a resident in oral and maxillofacial surgery and Dr. Shastri is an assistant professor of oral and maxillofacial surgery at Tufts University School of Dental Medicine. Dr. Rosenberg is a professor of oral and maxillofacial surgery at Tufts University School of Dental Medicine and an associate professor of anesthesia at Tufts University School of Medicine.

Malignant hyperthermia (MH) is a rare but potentially lethal hypermetabolic disorder of skeletal muscle that was first described in 1960 by Denborough.[1] Susceptibility to this trait is triggered by exposure to inhalation anesthetics and succinylcholine, a depolarizing skeletal muscle relaxant, used during surgery. Since its initial identification, MH has been studied extensively, resulting in identification of its triggering agents, preventive measures, and treatment. A brief overview of the pathophysiology of MH and a discussion regarding the safe use of local anesthetics in MH-susceptible individuals for dental procedures are discussed here.

Case Report

A 54-year-old female presented for evaluation regarding the extraction of an erupted tooth, #30, with significant periapical pathology and intermittent pain in the area. In 1984, during a routine surgery under general anesthesia, the patient's son had an episode of MH. Subsequently, the patient and her four children were tested with positive results for MH susceptibility. The recommendations from her physician at that time read: "The results are positive . . . that you are susceptible to malignant hyperthermia . . . The only time this would present a problem would be in the dentist's office with general or local anesthesia of the amide type. Should you require local anesthesia, you may receive drugs of the ester type [Pontocain or Novocain]."

Preoperative vital signs were recorded, 3% mepivicaine was administered for an inferior alveolar nerve block and infiltration, and tooth #30 was extracted. The patient tolerated the procedure well, was discharged in stable condition, and has had an uneventful recovery.

Pathophysiology

MH is recognized as an autosomal-dominant disorder affecting the regulatory proteins of skeletal muscles on ryanodine receptors.[2] When exposed to triggering agents, these mutations cause a massive influx of calcium from the sarcoplasmic reticulum into the myoplasm, resulting in sustained muscle contractions.[1-3] This, in turn, results in manifestation of a hypermetabolic state evidenced by tachycardia, tachypnea, hypercapnia, and generalized muscle rigidity. The ultimate sequelae of MH, if untreated, are progressive changes secondary to accumulation of cell death products, electrolyte abnormalities, and coagulopathies leading to death.

Even with recognition and treatment, a mortality rate of 5–10 percent has been reported.[3] This point emphasizes the importance of prevention by a thorough knowledge of triggering agents and effective screening methods. With the advent of new molecular genetic testing, it has been estimated that one in 2,000 of the population may be genetically predisposed to MH. Clinically, however, the incidence appears to be one in 15,000 children and one in 60,000 adults receiving triggering agents.[3]

Over the years, diseases have been identified that seem to have an association with MH, especially those of neuromuscular origin (see Table 1).

Table 1: Diseases with Association with Malignant Hyperthermia

- Central core disease
- Duchenne Muscular Dystrophy
- King-Denborough Syndrome
- Other myopathies
- Becker Muscular Dystrophy
- Periodic paralysis
- Myotonic Congenita

Triggering Agents

Potent inhalation anesthetic agents such as halothane, sevoflurane, desflurane, isoflurane, and succinylcholine are known to cause MH in susceptible individuals. Triggering anesthetic agents and those that are recognized to be safe are listed in Table 2.

Table 2: Agents Identified as Triggering Agents for MH and Safe Agents Without Any Additional Risks in MH-Susceptible Individuals

Triggering Agents	Safe Agents
• Succinylcholine	• Local anesthetics
• Halothane	• Propofol
• Isoflurane	• Ketamine
• Desflurane	• Benzodiazepines
• Sevoflurane	• Nitrous oxide
	• Barbiturates
	• Non-depolarizing muscle relaxants
	• Narcotics

Differential Diagnosis

Although many health care professionals mistakenly believe that the earliest sign of MH is a rapid and sustained rise in body temperature, it actually is a relatively late symptom. This hyperthermia is usually preceded by unexplained tachyarrhythmias and unexplained hypercarbia and tachypnea.[2,4] Pheochromocytoma, thyrotoxocosis, and hyperkalemia associated with some varieties of muscular dystrophy could also resemble MH. Another condition that mimics MH clinically is neuroleptic malignant syndrome that is encountered rarely in individuals on seizure and antipsychotic medications.[4] Signs and symptoms of MH are listed in Table 3.

Table 3: Signs and Symptoms Associated with MH

- Tachycardia
- Hypercarbia
- Muscle rigidity (especially masseter muscle)
- Hypertension
- Hyperthermia
- Hyperkalemia
- Hypocalcemia
- Rhabdomyolysis

Treatment

The best outcomes in MH are achieved by determining a thorough preoperative medical history, including familial problems associated with anesthesia. Proper intraoperative monitoring when using potential triggering agents, early diagnosis, and immediate treatment are essential in the care of the anesthetized patient. The immediate availability and administration of sodium dantrolene, a mild skeletal muscle relaxant, is life saving in the treatment of a suspected MH episode.[2,5] Table 4 provides an overview of treatment of an acute MH episode.

Table 4: Treatment Overview

1. Recognize an impending MH episode.
2. Stop procedure and administration of triggering agents, and call 911.
3. Ventilate with 100% oxygen at high flows >8 L/minute.
4. Establish definitive airway by endotracheal intubation.
5. Administer an initial intravenous dose of dantrolene at 2.5 mg/kg.
6. Monitor and treat metabolic acidosis, electrolyte abnormalities, and potential dysrythmias.

Screening for Susceptible Individuals

A thorough history obtained from all patients regarding adverse reactions to anesthesia personally or in their family is invaluable in identifying some susceptible individuals. Of the few testing methods available to screen for MH susceptibility, the gold standard is the in vitro contracture test (IVCT) with sensitivity and specificity of 99 percent and 90 percent, respectively.[6] This involves a minor surgical procedure for harvesting muscle—usually from the thigh—and exposing this muscle to caffeine and halothane while measuring the contractions. There are less invasive and more reliable molecular genetic tests being developed that may further improve MH screening efforts.[4,6]

Treating MH-Susceptible Patients in the Dental Office

In the past, MH-susceptible patients were often refused dental care under local anesthesia in the dental office.[7] This was due to lack of familiarity with the condition and adherence to the old warnings that amide local anesthetics could potentially trigger an MH episode. Both the medical and the dental literature have concluded that there is no evidence linking MH and the administering of commonly used amide local anesthetics.[8-10] Therefore, it is generally accepted to routinely administer amide local anesthetic in MH-susceptible individuals, as we did in the case presented here. We decided not to use epinephrine to avoid the possibility of an increase in the heart rate. If the need for general anesthesia is indicated and the use of inhalational agents is contemplated, the immediate availability of sodium dantrolene and proper monitoring must be employed.

One other source of concern is the fact that stress may also trigger an MH-type response in susceptible individuals. There have been a few reports of individuals presenting with signs and symptoms

It is imperative for dental practitioners to understand the pathophysiology behind malignant hyperthermia and its clinical presentation.

of MH following intense physical activity.[11] Further testing on these individuals has demonstrated that they do in fact have the MH mutation. To date, however, there are no reports of emotional stress and anxiety seen in patients undergoing minor surgical procedures and dental work causing an MH crisis. Therefore, there are no specific recommendations regarding stress reduction in individuals at risk for MH as compared to the normal population.

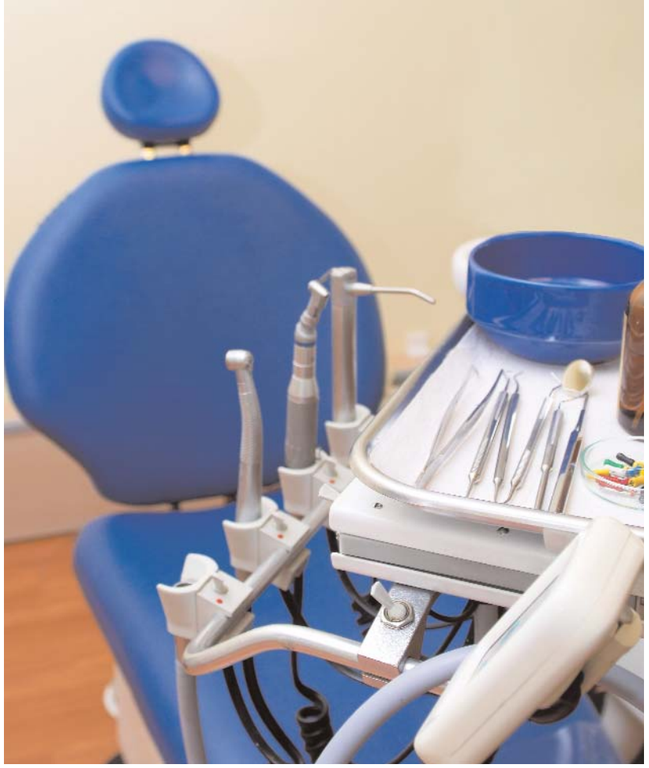
Conclusion

Malignant hyperthermia is a genetically inherited, potentially lethal clinical syndrome. Therefore, it is imperative for dental practitioners to understand the pathophysiology behind the disease and its clinical presentation. It is also very important to have a thorough knowledge of the drugs to be avoided as triggering agents and those that can be safely administered to susceptible individuals.

There is a wealth of information regarding MH on the Malignant Hyperthermia Association of the United States Web site, ***www.mhaus.com***. In addition, there is a hotline—(800) 644-9737—that is always available to guide clinicians during any suspected MH episode.[12] ■

References

1. Denborough MA, Lovell RR. Anesthetic deaths in a family. Lancet 1960;2:45.
2. Stoeling RK, Miller RD. Basics of anesthesia. 4th ed. New York: Churchill Livingstone; 2000. p 89-105.
3. Rosenberg H. Malignant hyperthermia syndrome. Available from www.mhaus.com. Accessed 2006 Nov.
4. Blauch A, Kaye AD. Preanesthetic assessment of the patient with malignant hyperthermia. Anesthesiol News 2005 Dec;11:49-53.
5. Collins CP, Beirne R. Concepts in the prevention and management of malignant hyperthermia. J Oral Maxillofac Surg 2003;61:1340-5.
6. Rosenberg H, Antognini JF, Muldon S. Testing for malignant hyperthermia. Anesthesiol 2002;96:232-7.
7. Minasian A, Yagiela JA. The use of amide local anesthetics in patients susceptible to malignant hyperthermia. Oral Surg Oral Med Oral Path 1988 Oct;66(4):405-15.
8. Chang CY, Scher RL. Malignant hyperthermia and the otolaryngologist. Ear Nose Throat 2003 Jun;82(6):433-6.
9. Muray C, Sasaki SS, Berg D. Local anesthesia and malignant hyperthermia: review of the literature and recommendations for the dermatologic surgeon. Dermatologic Surg 1999 Aug;25(8):626-30.
10. Dershwitz M, Ryan JF, Guralnick W. Safety of amide local anesthetics in patients susceptible to malignant hyperthermia. JADA 1989 Mar;118(3):276-80.
11. Wappler F, Fiege M, Steinfath M, Agrawal K, Scholz J, Singh S. Evidence for susceptibility to malignant hyperthermia in patients with exercise-induced rhabdomyolysis. Anesthesiol 2001 Jan;94(1):95-100.
12. Malignant Hyperthermia Association of the United States. Available from www.mhaus.com. Accessed 2006 Nov.



Dental Observations: 2006

MAURICE H. MARTEL, DDS
Dr. Martel is a retired general dentist residing in Holden, MA. He is a clinical professor in the department of graduate prosthodontics at Tufts University School of Dental Medicine.

The goals of dentistry have undergone subtle changes over the years. We can perform certain procedures today that were earlier unavailable to the profession. However, availability is not necessarily indication. The following are areas of consideration:

Conservation of Hard Tooth Structure

The wisdom of tooth conservation is likely the same today as it has been for the last century. Natural tooth enamel is ideal from the standpoint of strength of the entire tooth. A restorative material might be nearly as good as tooth enamel, but to use a restorative material, it is necessary to reduce tooth structure, thus reducing the overall strength. It follows that the less tooth structure removed to accommodate the restorative material, the stronger the tooth.

Comment

Since the advent of the need for esthetic dentistry, there has been a tendency to remove significant tooth structure to attain the desired cosmetic results. This has resulted in a number of endodontic procedures, frequently followed by placement of a post and core. This is a reasonable plan for a tooth that has been severely compromised by decay. Is it equally reasonable to follow the same path for an uncompromised tooth? Is the patient made to understand the potential risks of significant tooth reduction, endodontics, and post and cores? Conservation of healthy, natural tooth structure continues to be a wise choice.

Gingival Crevice Health

Little has changed over the years with regard to this subject. Keeping dentin and enamel in intimate contact with soft tissue provides the most favorable environment for optimum periodontal health. Exquisitely accurate and fine dentistry can be placed in the crevice with minimal alteration of soft tissue health. However, this is accomplished in a minority of restorations. Supragingival margins are considered less insulting to the soft tissues than subgingival margins.

Comment

Currently, there is a strong tendency to use the full crown as the restoration of choice. In the more posterior teeth, although an esthetic compromise, cast gold has been shown to be ideal from the standpoint of strength, longevity, and tooth conservation.[1] The need for posterior esthetics can also be attained with partial-coverage bonded porcelain and possibly a satisfactory resin. It is understood that subgingival margins are required in those cases where the patient demands esthetics. The patient should be informed of the available choices and risks of various modes of treatment.

Conservation of Periodontal Structures

The height of the soft tissue on the tooth with a sufficient band of attached gingiva is optimum. Loss of alveolar bone from periodontal inflammation is considered pathologic.

Comment

Is removing healthy alveolar bone to facilitate restoration resistance and retention a restorative necessity or an information void on the part of the restorative dentist? The use of slots, grooves, and pins to gain resistance and retention is well documented in the literature and can prevent elective surgical bone loss.[2,3] Crown extension procedures may be reasonable and appropriate to attain esthetics and resolve loss of biologic zone problems. Again, the patient should be informed of the risk-reward of the proposed procedure.

Crown-Root Ratio

The more tooth structure in the bone and the less tooth structure out of bone results in the most ideal ratio. In optimum health, the anterior teeth radiographically have approximately a 50 percent crown-root ratio, with greater root structure within the bone in posterior teeth. This is a remarkable natural physiological phenomenon to compensate for the significantly greater forces that are applied to the posterior teeth.

Comment

The prudence of altering this naturally occurring physiological ratio needs to be constantly evaluated.

Splinting

In the past, full-arch splinting was the treatment of choice for restoring a periodontally compromised dentition. Prior to the availability of root-form osseointegrated implants, there was a greater need to save the maximum number of periodontally compromised and mobile teeth. Philosophically this was a sound premise, but unfortunately multiple-unit splinted full-arch restorations lacked longevity and presented other complications.

Comment

The longest-lasting cemented restoration is the single unit. Cementing rigid fixed restorations on teeth of varying mobility and compressibility frequently results in the loss of cement seal on the more mobile abutments, thus shortening the longevity of the restoration.[4] Single units and shorter fixed spans are preferred from the standpoint of longevity and repairability of the restoration. The root-form osseointegrated implant is the most significant beneficial change in dental treatment in the recent decades.

Dentistry has progressed significantly over the past 40 years. Some procedures have increased our ability to restore and esthetically improve our patients' oral condition. There is a tendency to increase the number of procedures to attain certain preferred goals, sometimes at the expense of healthy hard and soft oral tissues. The patients deserve to be advised of alternative therapies to accomplish their goals with minimal alteration of their healthy oral tissues. Would you have the same procedures done on your teeth that you are recommending to your patient? ■

References

1. Donovan T, Simonsen RJ, Guertin G, Tucker RV. Retrospective clinical evaluation of 1,314 cast gold restorations in service from 1 to 52 years. J Esthet Restor Dent 2004;16:194-204.
2. Goodacre CJ, Compagni WV, Aquilino SA. Tooth preparation for complete crowns: an art form based on scientific principles. J Prosthet Dent 2001;85(4):363-77.
3. Pameijer JRN. Periodontal and occlusal factors in crown and bridge procedures. Amsterdam: Dental Center for Post Grad Courses; 1985. p 194, 205.
4. Sornkul E, Martel MH, Stannard JG. In vitro study of cementation of cast splints on nonmobile and mobile teeth. Int J Prosth 1990;3(5):449-56.

A Clinico-Pathologic Correlation

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Bisphosphonates (BPs) have been in clinical use for performing bone imaging, treating different metabolic bone diseases, and managing osteolysis and the hypercalcemia associated with some cancers since the late 1960s.[8] Although these agents are extremely effective at treating these conditions, recent publications have noted a possible sequela of treatment with BPs is bisphosphonate-related osteonecrosis (BRON) of the jaws. In the past few years, a great deal of attention has been paid to recognition and management of different issues surrounding patients being treated with bisphosphonates by many health care providers, including dentists and dental specialists. This article will review some of the basic principles behind bisphosphonate therapy and its side effects, and summarize the management guidelines used in BP therapy. We will also report one of the 11 cases that we have identified and managed in our clinic in the past five years.

Background

BPs are chemically similar to the endogenous mineralization regulator pyrophosphate (PPi), but they have a more stable internal structure and are even more calcium-avid than PPi.[8,13] This great affinity of BPs for calcium is what delivers them, with great efficiency, to sites of active bone remodeling where bone minerals are exposed.[13] After delivery to the bone, BPs are sequestered in the hydroxyapatite crystals of the bone and, over time, are released back into the plasma.[4] Due to this slow release, the elimination half-life of BPs is significantly extended, ranging from hundreds of hours to years.[4] Based on their chemical structure, BPs have different antiresorptive potencies and are used in different clinical settings. (See Table 1.) Specifically, the presence of a nitrogen atom in one of the side chains of the BP molecule greatly increases its potency by up to a thousandfold.

Regardless of potency, all BPs more or less exert their antiresorptive effects by direct and indirect effects on the cellular vehicles of bone resorption, osteoclasts, via many different mechanisms.[2,13] These mechanisms include inhibition of formation of osteoclasts from precursor cells, leaving the mature ones nonfunctional and causing apoptotic death of osteoclasts. In addition, BPs seem to trigger a negative feedback mechanism from osteoblast on osteoclasts to further suppress the bone resorption process.[2,13,15]

Aside from the described direct effects of BPs on osteoclasts, they also may produce many other systemic and local concomitant effects. Among well-documented outcomes of the BPs are antiangiogenic and antivasculogenic effects leading to overall hypovascular tissues that are prone to necrosis and infection.[5,6,14] Other cell types besides osteoclasts could be affected by BPs, including macrophages and different connective tissue cells such as fibroblasts and chondrocytes.[8] There is also evidence that BPs may actually inhibit the growth of malignancies such as myelomas or prevent the bony metastasis of certain cancers, which could widen the spectrum of their use even further.[9,10]

Decreased vascularity along with direct cellular effects of BPs completely inhibits the body's natural bone turnover process. The sequel of this pathophysiology in an area of active micro- and macrotrauma, such as the oral cavity, is hypoxia, lack of local repair, and immune factors with a final result of necrosis of the bone. The incident, severity, and prognosis of lesions is multifactorial and depends on the potency of BP used and either current use or a history of use of antiangiogenic drugs such as steroids, thalidomide, or other antineoplastic agents.[14] Systemic immunosuppression, diabetes, and advanced neoplastic states will certainly provide for more refractory lesions and a worse prognosis. A complete list of risk factors that could predispose one to develop BRON is provided in Table 2.

Table 1: Antiresorptive Potencies and Clinical Uses of Various Bisphosphonates

Agent	Potency	Route of administration	Therapeutic use
Etidronate	1	PO, IV	PD, HAN
Tiludronate	10	PO	PD
Pamidronate	100	IV	PD, HAN, O
Aldronate	100-1,000	PO	PD, O, MO
Risedronate	1,000-10,000	PO	PD, O
Ibandronate	1,000-10,000	PO	O
Zoledronic acid	>10,000	IV	HAN

PD: Paget's disease; HAN: hypercalcemia associated with neoplasm; O: osteoporosis; MO: male osteoporosis.[18]

Table 2: Conditions and Risk Factors with Bisphosphonate-Associated ONJ

- Trauma
- Female sex
- Anemia
- Coagulopathy
- Surgical dental procedures
- Alcohol use
- Tobacco use
- Prior infection
- Advanced age
- Edentulous region
- Combination chemo
- Blood dyscrasia
- Metastatic disease

Case Report

We are reporting the case of a 67-year-old male who was referred to our clinic in April 2003 for evaluation of exposed bone in the posterior left mandible. The only symptom he complained of was minor discomfort upon palpation of the exposed area. This patient was diagnosed with multiple myeloma in 1998 and had been treated with an autologous stem cell transplant in 1999 along with chemotherapy. He did not have any other significant medical problems or any other contributory history. At the time of our initial evaluation, he was receiving intravenous zoledronic acid for treatment of osteolytic lesions associated with multiple myeloma. For the previous four and a half years, he had been on pamidronate for the same condition. Additionally, the patient was receiving thalidomide and prophylactic penicillin. He had also been treated with oral dexamethasone in the past but was not receiving any glucocorticoids at the time of our evaluation.

On exam the patient had a 3x5 cm lesion with the appearance of dense sclerotic bone on the lingual aspect of the left mandible. There were minor inflammatory changes in the surrounding soft tissues without any evidence of mucosal or cutaneous fistula formation. There was also no gross swelling of the face, restriction of jaw movement, or depression of the mandible.

At this time, it was decided to take the patient to the operating room for debridement of the exposed area and attempt primary closure of the overlying soft tissues. Despite the lack of evidence in the literature at the time, the patient was taken off of the IV zoledronate by his oncologist about a month before the operation. In May 2003, under general anesthesia, the area of exposed bone was thoroughly debrided until bleeding vascular bone was encountered. Tooth #20 was removed due to 3-plus mobility, and the surrounding soft tissues were undermined and primary closure was achieved. For the first two weeks following the surgery, there was no evidence of soft tissue breakdown or hard tissue exposure. At three weeks post-op, however, the patient presented complaining of pain associated with tooth #21. The tooth had 3-plus mobility, and a small 2x2 mm area of bony exposure on the lingual aspect of the mandible in the area was noted. At this time, tooth #21 was removed and the sharp bony exposure was smoothed, and the patient was placed on oral antibiotics for 10 days.

For the next two years, the patient received multiple conservative recontouring procedures for the sharp bony edges under local anesthesia and was placed on systemic antibiotics and oral antimicrobial rinses.

In February 2005, another attempt was made to debride the area more thoroughly under general anesthesia and close the soft tissues primarily. Once again, initially the defect appeared to be healing well, but eventually there was a recurrence of the exposed necrotic bone. Most of the remaining few anterior teeth on the right side exfoliated over the course of this case, creating another area of exposed necrotic hard tissue. On his last follow-up, in addition to the two areas of exposed bone, the patient also had evidence of a cutaneous fistula along the left body of the mandible with no active discharge. Our plan for the patient at this point is to continue providing conservative palliative recontourings and treating active infections with systemic antibiotics.

Discussion

There are several articles, case reports, and literature reviews in the dental, medical oncology, and pharmaceutical databases regarding bisphosphonate-related osteonecrosis of the jaws. The consensus is that there is no best way to manage some of these BP therapy-related jaw lesions.[7] The American Association of Oral and Maxillofacial Surgeons recently published a position paper setting forth some guidelines for management and a staging protocol for BRON.[21] These recommendations are based on limited available clinical data, and long-term prospective data on definitive management of BRON is lacking.

Prevention

If time permits, the institution of BPs (particularly those administered intravenously) should be delayed until a full clinical and radiographic evaluation of hard and soft tissues of the maxillofacial region, including the dentition, is performed.[7] This could reduce the chance of some of the more common complications of BP therapy. Simple dental prophylaxis, removal of hopeless and excessively mobile teeth, and restorative procedures focusing on eradicating caries are invaluable in preventing BRON.[7,21] The fact that the majority of ONJ lesions present after dental extraction further emphasizes this point.[1,12,17] Another integral part of this initial evaluation should be focused on optimizing the prosthetics to minimize the trauma exerted to the tissues. Patient education, including hygiene instruction, the necessity for keeping close three- to four-month follow-ups, and smoking cessation, should also be instituted.[7]

Similarly, once BP therapy has started, the current recommendations are targeted to prevent BRON. This includes routine hygiene visits with prophylaxis and atraumatic scaling, along with conservative restorative treatments. Attempts should be made to avoid the need for extractions by applying preventive measures and root canal treatments when feasible.[7,11,12,16] If extractions are necessary or BRON lesions are suspected, early referral to an oral and maxillofacial surgeon is warranted.

There may be a slight reduction in development of BRON in patients treated with oral BPs if a three-month period of

drug-free interval precedes elective oral surgical procedures.[21] This observation is based on a small patient population and future findings may change the recommendations. Discontinuing IV BPs seems to have no short-term benefits; however, if systemic conditions allow it, the discontinuation may prevent new areas of BRON from developing.[21] Any modification in the BP therapy should be consulted with the treating physician, taking into account coexisting risk factors and the overall systemic status of the patient.

Treatment of BRON

The management of already-existing ONJ should be on a case-by-case basis, focusing on initial aggressive treatment of infections, then palliative measures, and finally attempts to optimize healing. Most of the aggressive surgical treatments, such as large resections in order to expose seemingly vascular bone and subsequent primary closure of the soft tissues, have not been successful.[1,3] Conservative debridement with a palliative goal, systemic antibiotics in the face of active infection, and antimicrobial rinses for optimizing oral hygiene seem to be the most effective treatment modalities. A staging system and treatment modality for each stage of clinical disease as developed by the AAOMS's task force is presented in Table 3.

Ceasing administration of oral BPs for six to 12 months seems to improve the clinical symptoms, and has been reported to result in spontaneous recovery of some BRON cases. Similar clinical improvement and a stabilizing effect on active lesions has been reported with cessation of IV BP therapy; however, systemic conditions don't always allow it.[21] Hyperbaric oxygen therapy similarly is not effective, although there are isolated reports of success with this mode of treatment for managing BRON lesions.[1,17,18]

The effect of BP therapy on healing following placement of endosteal implants is not well documented in the literature. Animal studies have shown that implant placement in BP-treated osteoporotic subjects is possible and, in fact, superior in initial retention to that of nontreated osteoporotic subjects.[19] Reliable long-term human data, however, are currently not available.

Table 3: Staging and Treatment Strategies[21]

BRON Staging	Treatment Strategies
At-risk category	
No apparent exposed/necrotic bone in patients who have been treated with either oral or IV bisphosphonates	• No treatment indicated • Patient education
Stage 1	
Exposed/necrotic bone in patients who are asymptomatic and have no evidence of infection	• Antibacterial mouth rinse • Clinical follow-up on a quarterly basis • Patient education and review of indications for continued bisphosphonate therapy
Stage 2	
Exposed/necrotic bone associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without drainage	• Symptomatic treatment with broad-spectrum oral antibiotics—e.g., penicillin, cephalexin, clindamycin, or first-generation fluoroquinolone • Oral antibacterial mouth rinse • Pain control • Only superficial debridements to relieve soft tissue irritation
Stage 3	
Exposed/necrotic bone in patients with pain, infection, and one or more of the following: pathologic fracture, extraoral fistula, or osteolysis extending to the inferior border	• Antibacterial mouth rinse • Antibiotic therapy and pain control • Surgical debridement/resection for longer-term palliation of infection and pain

Source: American Association of Oral and Maxillofacial Surgeons (Reprinted with permission)

Conclusion

Bisphosphonates are potent antiresorptive medications that are used widely these days to treat a variety of metabolic and neoplastic bone diseases. Osteonecrosis of the jaws is a rather recent clinical entity that has been identified as being possibly linked to the use of BPs.

The exact incidence of BRON is hard to establish due to limited prospective data. Based on current clinical data, BRON associated with IV BPs occurs at a much higher frequency with a range of 0.8 percent to 12 percent.[21] A manufacturer of alendronate has estimated the frequency of BRON linked to this drug to be 0.7/100,000 person years of exposure. Based on the prescription data from Australia, the incidence of BRON associated with a weekly regimen of alendronate is estimated to be 0.01 percent to 0.04 percent, and 0.09 percent to 0.34 percent after extractions.[21]

Since the dental professional may be the first provider to note the presence of BRON or the potential for its development, it is imperative to have a thorough and up-to-date knowledge of the subject. Every effort should be made by medical and dental providers to prevent BRON lesions. In addition, close follow-up and early referral are also vital to the ultimate prognosis.

The Future

Some authorities believe that BP-associated ONJ is only beginning to show its potential as a serious pathological entity. What is even more disconcerting is the fact that other areas of the body could be affected by similar processes. There is one case reported in the literature of BP-associated osteonecrosis of the auditory canal after treatment with zoledronate.[20] Further research efforts and more clinical data are needed to formulate universal treatment guidelines that ensure positive long-term outcomes for patients with BP-associated ONJ. ■

References

1. Ruggiero SL, Mehrotra B, Rosenberg TJ, Engroff SL. Osteonecrosis of the jaws associated with the use of bisphosphonates: a review of 63 cases. J Oral Maxillofac Surg 2004;62:527-34.
2. Teronen O, Laitinen M, Salo T, et al. Inhibition of matrix metalloproteinases by bisphosphonates may in part explain their effects in the treatment of multiple myeloma. Blood 2000;96:4006-7.
3. Migliorati CA, Schubert MM, Peterson DE, Seneda LM. Bisphosphonate-associated osteonecrosis of mandibular and maxillary bone: an emerging oral complication of supportive cancer therapy. Cancer 2005; 104(1):83-93.
4. Licata AA. Discovery, clinical development, and therapeutic uses of bisphosphonates. Ann Pharmacother 2005;39:668-77.
5. Wood J, Bonjean K, Ruetz S, et al. Novel antiangiogenic effects of the bisphosphonate compound zoledronic acid. J Phamacol Exp Ther 2002;302(3):1055-61.
6. Fournier P, Boissier S, Filleur S, et al. Bisphosphonates inhibit angiogenesis in vitro and testosterone-stimulated vascular regrowth in the ventral prostate in castrated rats. Cancer Res 2002;62:6538-44.
7. Novartis Pharmaceutical Company. Expert panel recommendations for the prevention, diagnosis, and treatment of osteonecrosis of the jaws. Professional education material. East Hanover, NJ. June 2004.
8. Rogers M, Watts D, Graham R, Russell G, et al. Overview of bisphosphonates. Supp to Cancer 1997;1652-60.
9. Shipman CM, Rogers MJ, Apperley JF, Russell RGG, Croucher PI. Bisphosphonates induce apoptosis in human myeloma cells; a novel antitumor activity. Br J Haematol 1997;98:665-72.
10. Van der Pluijm G, Vloedgraven H, Van Beek E, Van Der WeePlas L, Lowik C, Papapoulos S. Bisphosphonates inhibit the adhesion of breast cancer cells to bone matrices in vitro. J Clin Invest 1996;98:698-705.
11. Marx RE, Stern D. Oral and maxillofacial pathology: a rationale for diagnosis and treatment. Hanover Park, IL: Quintessence; 2003. p. 36-8.
12. Marx RE. Pamidronate (Aredia) and zoledronate (Zometa) induced avascular necrosis of the jaws: a growing epidemic. J Oral Maxillofac Surg 2003;61:1115-7.
13. Rogers M, Gordon S, Benford HL, Coxon FP, et al. Cellular and molecular mechanisms of action of bisphosphonates. Supp to Cancer 2000;2961-78.
14. D'Amato R, Loughnan MS, Flynn E, Folkman J. Thalidomide is an inhibitor of angiogenesis. Proc Natl Acad Sci 1994;91:4082-85.
15. Vitte C, Fleisch H, Guenther HL. Bisphosphonates induce osteoblasts to secrete an inhibitor of osteoclast mediated resorption. Endocrinology 1996;137:2324-33.
16. Bagan JV, Murillo J, Jimenez Y, et al. Avascular jaw osteonecrosis in association with cancer chemotherapy: series of 10 cases. J Oral Pathol Med 2005;34(2):120-3.
17. Vannucchi AM, Ficarra G, Antonioli E, Bosi A. Osteonecrosis of the jaw associated with zoledronate therapy in a patient with multiple myeloma. Br J Haematol 2005;128:738.
18. Lugassy G, Shaham R, Nemets A, Ben-Dor D, Nahlieli O. Severe osteomyelitis of the jaw in long-term survivors of multiple myeloma: a new clinical entity. Am J Med 2004;117:440-1.
19. Narai S, Nagahata S. Effects of Alendronate on the removal torque of implants in rats induced osteoporosis. Int J OMF Implants 2003;18:218-23.
20. Polizzotto M, Couins V, Schwarer A. Bisphosphonate-associated osteonecrosis of the auditory canal. Br J Haematol 2005;132:114-17.
21. American Association of Oral and Maxillofacial Surgeons. Position statement on bisphosphonate-related osteonecrosis of the jaws. 2006 September 25. Available at http://www.aaoms.org/docs/position_papers/osteonecrosis.pdf. Accessed 2006 Dec.

A Clinico-Pathologic Correlation

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History

A 37-year-old male was referred to the oral and maxillofacial surgery department at Tufts University School of Dental Medicine with a firm swelling in the right preauricular region. The swelling was first noted over 10 years prior to his presentation, with no reported history of facial trauma. The patient complained of periodic discomfort in this area exacerbated by cold weather, but no functional limitations were present. His condition had been previously addressed overseas in both 1996 and in 2005 with computed tomography (CT) and a needle biopsy. Separate CT scans obtained in 1996 and 2005 revealed multiple opacifications in and around his right temporomandibular joint (TMJ), and in 1996 a preauricular biopsy was consistent with parotid gland tissue, a finding not uncommon with biopsy of some TMJ pathologies.[1] The patient's past medical history was without significance; he reported taking no medications and had no known drug allergies. His social history was positive for light recreational use of alcohol and tobacco.

Clinical examination revealed a palpable, nontender fullness in the right preauricular area. The patient exhibited an adequate 42 mm of jaw opening with slight deviation to the right. Good right and left lateral excursions were noted, a stable occlusion was exhibited, and there appeared to be no tenderness or spasm of the muscles of mastication. Neurological findings were within normal limits with no report of cranial nerve (CN) 7 deficit, hearing loss, or tinnitus on his affected side. Computed tomography revealed multiple radiopaque areas in the right TMJ (see Figure 1). A comparison review of the CTs obtained in 1996 evidenced a similar entity but to a lesser degree.

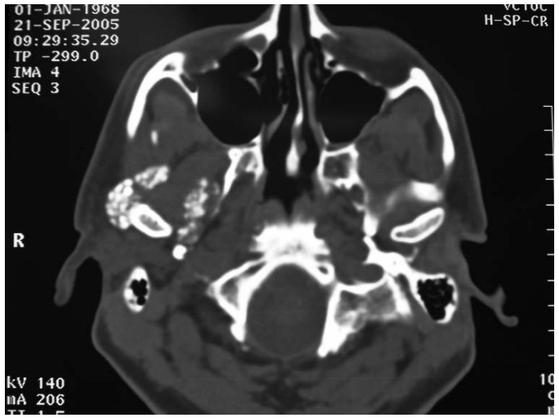

Figure 1. Axial computed tomography with radiopaque masses appreciated proximal to right temporomandibular joint medially and laterally.

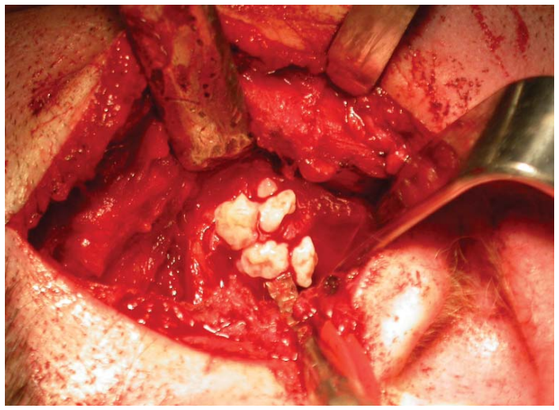

Figure 2. Intraoperative digital photograph of calcifications exposed through preauricular incision approach to temporomandibular joint.

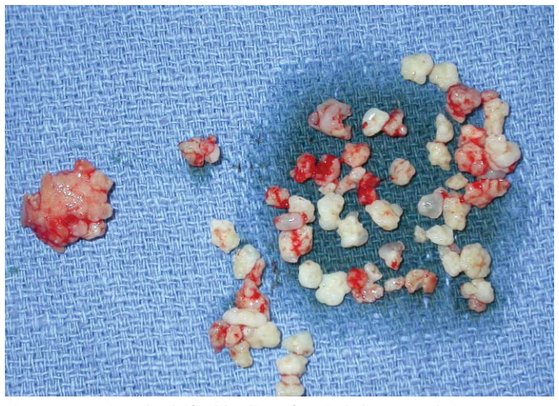

Figure 3. Retrieved calcified bodies of varied shapes and sizes.

The treatment recommended was a right open joint surgical procedure with exploration of the right TMJ and biopsy of representative areas, performed under general anesthesia. Intraoperatively, free-floating calcified lesions were noted but limited to the superior joint space in anterior, lateral, posterior, and medial locations (see Figure 2). All accessible calcifications were removed (see Figure 3) along with the synovial lining of the joint. The meniscus appeared normal and was left in place. The inferior joint space was not violated. The patient tolerated the procedure well and had an uneventful postoperative course.

Differential Diagnosis

Synovial chondromatosis
Chondrocalcinosis (pseudogout)
Synovial chondrosarcoma
Degenerative joint disease

Histological Findings

Histological examination of specimens submitted from the right TMJ revealed fragments of metaplastic cartilage in apposition with mature lamellar vital bone. The cartilage exhibited chondrocytes located in groups and surrounded by an acellular matrix of hyaline cartilage with no free chondroid fragments (see Figure 4).

Diagnosis

Synovial chondromatosis

Discussion

Synovial chondromatosis (chondrometaplasia) is a benign progressive joint disorder of unknown origin. It is marked by the proliferation of cartilaginous nodules within the connective tissue of a joint's synovial membrane.[2] According to Koyama, the disorder was first described by Auhausen in 1933 and is exceedingly rare in the temporomandibular joint.[3] Ishii's 20-year review of the English literature documented only 51 cases of TMJ-affected chondromatosis.[4]

With regard to this disease's incidence, this patient is particular. Synovial chondromatosis of the TMJ is a disorder with an age and gender predilection that favors middle-aged females.[2] At a ratio of 4:1, this statistic specific to synovial chondromatosis of the TMJ deviates from disease incidence with other joints that carry a 2:1 male predilection.[2,5]

Synovial chondromatosis can be asymptomatic but can often present with preauricular swelling, facial asymmetry, pain, crepitus, and limited joint function.[2,5] Traditionally, there is no reported history of trauma or rheumatoid arthritis in cases of synovial chondromatosis.[3]

The progression of this disorder develops and is characterized in three histologically numbered stages. The first stage shows histological evidence of metaplasia in the synovial membrane with no distinguishable detached cartilaginous particles.[3] The second stage reveals a histological picture that includes metaplasia with freestanding or detached cartilaginous entities.[3] The third and late stage is evidenced by only free particles, and manifests clinically with particle size ranging from 1 mm to 10 mm in diameter.[2,3]

These particles are foci of metaplastic cartilage known as "loose bodies." Although the absence of these particles does not preclude the diagnosis of synovial chondromatosis, the fragments are a dramatic radiographic and intraoperative feature of this disorder. (Figures 2 and 3 clinically illustrate loose bodies extirpated from the patient.)

Loose bodies are appreciated radiographically as round, irregularly sized radiopacities often visualized in and proximal to the joint (see Figure 1).[2] Again, these radiopacities are cartilaginous nodules that form and detach from the synovial membrane and often exist freely in the synovial fluid, where they are nourished and gain in size.[2] But Koyama reminds us that many other types of loose bodies or fragments in the joint space can result from disorders including, but not limited to, intracapsular fracture, avascular necrosis, and degenerative joint diseases such as osteoarthritis and rheumatoid arthritis.[3] None of these entities were representative of the patient.

Osteoarthritis of the TMJ accounts for 10 percent of TMJ-associated pain. Osteoarthritis is a chronic degenerative and destructive inflammatory joint disorder marked by progressive aching, pain, crepitus, and joint stiffness, which is often most severe in the morning. The disorder can present with pain in the muscles of mastication. Radiographically, osteoarthritis of the TMJ presents in a variety of ways that can include a diminishing joint space, exostoses, osteolysis, subchondral cyst, synovial membrane thickening, and/or multiple chondral bodies appreciated in the joint space.[2]

Rheumatoid arthritis (RA) is also a chronic degenerative inflammatory joint disorder. However, rheumatoid arthritis is thought to be an autoimmune disorder. RA affects women significantly more than men, at a ratio of 3:1. Signs and symptoms indicative of RA are progressive and are relapsing and remitting. The joint is affected by swelling, stiffness, pain, ankylosis, and deformity. TMJ appears in 40 percent of patients with RA, is bilateral, and can result in malocclusion and micrognathia from severe destruction of the condylar heads. Approximately 80 percent of patients with RA demonstrate diagnostic markers for the autoantibody rheumatic factor and 50 percent manifest antinuclear body.[2]

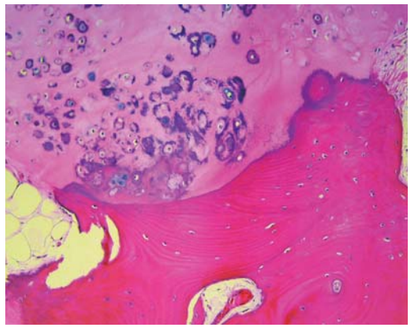

Figure 4. Hematoxalin- and eosin-stained slide. Low-power photomicrograph of fragments of metaplastic cartilage in intimate apposition with mature lamellar vital bone. Chondrocytes localized in groups and surrounded by an acellular matrix of hyaline cartilage are appreciated.

Synovial chondromatosis is similar in its physical appearance to chondrocalcinosis (pseudogout). Chondrocalcinosis is characterized by the precipitation of calcium pyrophosphate dehydrate crystals into the joint space.[5] These crystals appear similar to the cartilaginous foci appreciated in synovial chondromatosis. TMJ involvement in this entity is similarly rare, but this diagnosis is distinguished

from synovial chondromatosis histologically and by its particle composition.

The histological appearance of synovial chondromatosis is characterized by cartilaginous nodules included within the synovium and sometimes freestanding in the joint space. Calcification and ossification are not uncommon features. In addition, the cartilage can sometimes assume areas of cellular atypia and hyperchromatic features suggestive of chondrosarcoma. It is important to note that synovial chondromatosis does not exhibit malignant behavior; malignant transformation has never been reported with this disorder.[2]

However, chondrosarcoma is a critical inclusion in the differential diagnosis. Koyama states that "multiple and short interval recurrences" might present a possibility of a synovial chondrosarcoma (as opposed to chondrometaplasia) that should be carefully investigated.[3]

Chondrosarcoma is a malignant tumor of cartilaginous origin. Chondrosarcoma has no gender predilection and commonly is first diagnosed in patients during the fourth to fifth decade of life. Chondrosarcoma rarely occurs in the jaws, but when present, it most commonly affects the maxilla.[2] The presentation of this malignancy rarely involves a complaint of pain. Signs and symptoms can include nasal and sinus congestion, epitaxis, and visual disturbance, with loosening of the teeth another common finding.[4]

The signature radiographic features of chondrosarcoma often manifest a mixed radiopaque-radiolucent entity with ill-defined borders. Chondrosarcoma is distinguished from chondrometaplasia clinically and radiographically, where chondrosarcoma is characteristically accompanied by severe bone destruction, trismus, and abnormal joint function.[2] However, this is not to suggest that synovial chondromatosis can not also exhibit locally destructive behavior. Mupparapu reports a case of glenoid fossa perforation with extension of chondrometaplasia into the middle cranial fossa.[1] Cranial extension is a rare but serious development. Careful diagnostics with computed tomography and magnetic resonance imaging, combined with close long-term follow-up, is useful to rule out this occurrence.

Conclusion

Surgery to remove loose bodies in synovial chondromatosis is the treatment of choice and delivers a good prognosis with low recurrence rates. Synovectomy and meniscectomy may be indicated if recurrence occurs and/or if the disk can not be fully repaired.[2]

The patient has recovered well during his postoperative course. He has resumed over 40 mm of jaw opening and exhibits good lateral excursion of his mandible. Continued clinical and radiographic assessment has been recommended for this patient. ■

References

1. Mupparapu M. Synovial chondromatosis of the temporomandibular joint. J Postgrad Med 2005;51(2):122-9.
2. Neville B, Damm D. Oral and maxillofacial pathology. 2nd ed. Philadelphia: WB Saunders; 2002.
3. Koyama J, Ito J. Synovial chondromatosis in the temporomandibular joint complicated by displacement and calcification of the articular disk: a report of two cases. Amer J Neuroradiol 2001 Aug;22:1203-6.
4. Ishii J, Koji K. Synovial chondromatosis of the temporomandibular joint: long-term postoperative follow-up of the residual calcification. J Med Dent Soc 2003;50:33-7.
5. White S, Pharroh M. Oral radiology, principles and interpretation. 4th ed. St. Louis: Mosby; 2000.

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MANDIBULAR CERAMIC LAMINATE VENEER

CERAMIC LAMINATE VENEERS PROVIDE A CONSERVATIVE, PREdictable, and durable option when mandibular incisal edges need to be restored.

The patient is a 42-year-old female who presented for restoration of fractured teeth #24 and 25. The teeth had been previously restored with limited success using composite resin bonding (see Figure 1).

The teeth were prepared for ceramic laminate veneers allowing a minimum of 1.0 mm clearance in centric occlusion and lateral excursions while preserving as much enamel as possible. The labial cervical reduction was less than 0.3 mm (see Figure 2). Feldspathic porcelain veneers were fabricated using the platinum foil technique. This technique allows veneers of 0.2 mm to 0.3 mm labial thickness. The restorations were etched and bonded with a dual-cure low-viscosity cement (see Figure 3). ■

Figure 1. Teeth #24 and 25 had previously been restored using composite resin bonding.

Figure 2. A labial cervical reduction of less than 0.3 mm was prepared.

Figure 3. The ceramic laminate restorations were etched and bonded with a dual-cure low-viscosity cement.

About Clinical Case Study

A clinical case study is defined as a written and visual assessment of a clinical case wherein the author presents before-and-after radiographs and/or photographs as a means to discuss the diagnosis, treatment plan, and actual treatment of a particular situation. The purpose of this study is to encourage JOURNAL readers to contribute a clinical response to the cases presented. It is our hope that many practitioners will contribute their ideas and treatment approaches, with the end result being a means for communication and learning.

Please address your correspondence to Clinical Case Study, JOURNAL OF THE MASSACHUSETTS DENTAL SOCIETY, Two Willow Street, Suite 200, Southborough, MA 01745. Responses may be published in a future issue of the JOURNAL.

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GEOGRAPHIC STOMATITIS

GEOGRAPHIC STOMATITIS, A BENIGN CONDITION SIMILAR TO geographic tongue, most frequently presents on the buccal and labial mucosa and the soft palate. Clinically, geographic stomatitis is characterized by a central area of erythema surrounded by a yellow-white circuitous border, characteristics very similar to those seen in geographic tongue. In patients with geographic stomatitis, the tongue may also be affected. These lesions "migrate" by healing in one area, only to reappear in a different location.

Like geographic tongue, geographic stomatitis is typically asymptomatic; however, occasionally patients may describe a burning sensation of the affected areas, particularly when consuming spicy foods. Very rarely, discomfort may be significant enough to require management with topical steroids such as 0.05% Lidex gel for two to three days.

Geographic stomatitis may bear a superficial resemblance to lichen planus, erythematous candidiasis, and erythroplakia and is therefore often considered in the differential diagnosis. While the features of geographic stomatitis are generally sufficiently distinctive for clinical diagnosis, when in doubt it is reasonable to err on the side of caution and biopsy the lesion with submission for histopathologic analysis. Once identified, geographic stomatitis does not require any treatment. ■

Figure 1. Lesions of the buccal mucosa and mandibular vestibule show well-demarcated erythematous lesions surrounded by a yellow-white border.

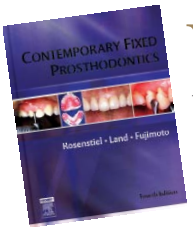
Figure 2. Lateral tongue of the same patient shows a solitary discrete lesion with features of geographic tongue.

NORMAN BECKER, DDS, EDITOR EMERITUS

Contemporary Fixed Prosthetics, Fourth Edition

STEPHEN F. ROSENSTIEL, MARTIN F. LAND, JUNHEI FUJIMOTO

Mosby Elsevier



When the publishers suggested that the fourth edition of this textbook be in color, the editors relied on feedback from many contributors—practitioners, teachers, students of all levels, researchers, and manufacturers—to evolve and expand the text. According to the editors, "the 'baby-boomer generation' is confronted with increasingly complex treatment needs in a society that now demands more and more aesthetic treatment options, one of the many areas in which content continues to evolve and expand."

The editors—while still retaining the logical segmentation with sections devoted to planning and preparation, clinical procedures, and laboratory procedures—use expanded color and improved readability to update the contents and references. For example, the sections devoted to clinical procedures have been updated to include the most recent findings, showing step-by-step examples of various techniques. They have greatly expanded the section on dental aesthetics, focusing specifically on how to achieve the optimal cosmetic result for the patient. Updates include new illustrations depicting the effects of long-term follow-up.

The result is a textbook that is well suited for the preclinical, clinical, and postdoctoral student. Each chapter contains key terms, a glossary, and study questions to accomplish their goals, as well as text boxes that present quick facts and tips.

QuintEssentials 19: Aesthetic Dentistry

DAVID BARTLETT, PAUL A. BRUNTON

Quintessence Publishing

The editor in chief Nairn Wilson has once again chosen an outstanding-yet-practical team to address a complex subject: aesthetic dentistry. As with the other titles in the QuintEssentials series, the authors focus on the essence of the subject matter. Using high-quality illustrations and clear text that highlights principles, key points, and critical techniques—as well as common pitfalls—Bartlett and Brunton meet the demands of presenting this difficult aspect of dental care.

Subjects covered include shade and color, bleaching and microabrasion, laminate resin composite techniques, porcelain laminate techniques, laboratory considerations, and aesthetic compromises and dilemmas.

Although this title is not a definitive text on the rapidly evolving field of aesthetic dentistry, the volume successfully provides tips and hints toward improving everyday practice. With an emphasis on the fact that a good clinical outcome often comes down to trust and understanding between dentist and patient, the book presents many hints to achieve this goal.

QuintEssentials 22: Fixed Prosthodontics in Dental Practice

MICHAEL O'SULLIVAN

Quintessence Publishing

The practice of fixed prosthodontics has undergone many changes in recent years, with significant developments in dental materials and principles of adhesion, but tooth preparation is still guided by the need to preserve tooth tissue, generate space for restorative material, and reshape the tooth to a cylindrical form with a defined finish line.

From patient assessment through completed restorations, the book uses precise text and clear illustrations, as well as up-to-date knowledge of current techniques and materials, to achieve this goal.

In a few short hours, the reader will be able to complete a course in the current thinking on fixed prosthodontics in dental practice. ■

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PIRATE TEETH

Leanne Potts, pop culture columnist for the *Albuquerque Journal*, called me. "I've been noticing that these days everyone wants straight, white teeth," she said. "In fact, I understand that more than 130 products for whitening teeth alone have come to market in the last five years. How is it that a perfect smile has become such a social imperative?"

"Hmm," I said. "Lots of people ask me to make their smiles prettier, but no one has ever asked me where the urge comes from."

"Smiles must be some kind of social signal, right?" Potts continued. "Here's what I mean. In *Pirates of the Caribbean*, I noticed right away that the good guys have good teeth, the bad guys have bad teeth, and the ambiguous guys have, well, interesting, ambiguous teeth. What's that all about?"

I told her it starts with this: In America, we want beautiful teeth because they are possible. (The rest of the world believes all Americans have beautiful teeth.) Supply creates demand. Dentists have the technology and materials to make mouths look better than ever. Also, corporate strategists are busy saturating the market with ads for bleaching.

But the dental industry depends on deeper impulses, as well. We want nice teeth because they create psychological meaning. We have a strong cultural bias toward good teeth. For one thing, there's the primeval, biological thing. Assertive, influential animals show their teeth. A healthy dentition suggests vigor, virility, and youth.

What's more, we like to think teeth reflect personality. So, in *Pirates of the Caribbean*, evil pirate Captain Barbossa (played by Geoffrey Rush) snarls his lines through a thicket of rotting stumps. Good-guy pirate Will Turner (Orlando Bloom) smiles blinding flashes of arctic white. Charmingly ambiguous Captain Jack Sparrow (Johnny Depp), who could go either way, shows off a campy mouthful of gold that Depp's own dentist reportedly designed.

Will Turner's strong, straight teeth, moviegoers immediately intuit, are an outward sign of his noble character. The notion of such physical markers revealing psychic conditions runs deep in literature. James Joyce lamented, "My mouth is full of decayed teeth and my soul of decayed ambitions." Graham Greene's dissolute protagonist in *The Power and the Glory* possesses teeth that crumble with his fortunes. Writers often invoke false teeth to reflect deceitful personalities, as in Evelyn Waugh's description of the "grinning dentures" of a traveling salesman in *Brideshead Revisited*.

Great teeth, of course, connote success. Until relatively recently, for instance, only the rich could afford dental care. "Teeth were clearly, or apparently, connected to rank—which was bad news for the lower classes," observed Martin Amis in *Experience*. So movie audiences immediately expect plucky, upwardly mobile Will Turner to rise into high society and marry the governor's daughter.

Since the beginning of the film industry, when the early movie studio honchos routinely sent their contract actors out for a dental makeover, the envious, emulating masses have not failed to notice movie stars' enchanting choppers. Thus, Will Turner has great teeth, finally, because Orlando Bloom has great teeth.

Who knew? Each veneer, each composite a dentist bonds into place burnishes not only a tooth but an image, a personality, if you will.

Every person, the saying goes, has in him or her a continent of undiscovered character, and "blessed are they who act as the Columbus to their own souls." Clearly, more and more such inner explorers—as well as a few pirates—are sailing straight to the dentist. ■