

Take a Lesson from Tulsa

The horrific story of the criminal practices of an oral surgeon from Oklahoma reinforces the continued need for mandatory infection-control practices and education.

Wow! Where do I begin? Really, in this day and age, how can such a thing happen? How can any dentist operate a clinic and not practice proper infection control? Did he not get the memo? Has he been living in a cave somewhere? I am referring, of course, to the Tulsa, OK, oral surgeon, W. Scott Harrington, who earlier this year had to close his two dental practices for grievous and possibly criminal disregard for standard infection-control practices.

How does this occur? Was he simply lazy? Did he not know he was responsible for protecting his patients from cross-contamination and possible infection? What was he thinking? Really, what was he thinking? I have a feeling he never thought any of this through. When asked about his infection-control procedures, his answer was, “They (his dental staff) take care of that. I don’t.” It seems he delegated infection control to his dental assistants and never thought to check on whether what they were doing was in agreement with what the ADA and the CDC said are the proper procedures to follow.

And it doesn’t end there. It seems he reinserted needles into medicine vials and then used that medicine on other patients. Had he never heard of cross-contamination? Apparently not. He used old and rusty instruments that cannot be sterilized

because they are porous. He delegated IV sedation to dental assistants, who, by law, cannot administer such sedation. He had vials of medicine that were expired, one dating back to 1993! I realize we, as dentists, tend not to throw things away, but that is a bit extreme.

Dr. Harrington voluntarily surrendered his license to practice when he was confronted with the charges. More than 7,000 patients were sent letters explaining what happened and recommending they get tested for Hepatitis C and HIV. Records on these 7,000 patients were the only ones investigators could locate, and they only went back to 2007. What about his previous patients and their records? Where are they?

I think Dr. Harrington made his first mistake when he delegated infection-control procedures to his dental staff and didn’t take a personal interest in setting up those procedures. As the owner of the practice, it was incumbent on him to know what was happening in his practice, particularly with regard to such an important aspect of that practice. After all, we, as dentists, take the Hippocratic Oath when we graduate. In that oath, it says, first, do no harm. It appears Dr. Harrington failed on this one right from the start.

Dr. Harrington also treated a “high population of known infectious disease carrier patients.” Did

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he forget about the AIDS scare in the '80s? Or the oral surgeon in Florida in 1991 who infected seven of his patients with HIV? Apparently he did.

Proper infection control has been ingrained in our thinking since the AIDS epidemic began. Here in New York State, we are obligated to take an infection-control course every four years as part of our licensure process. Now I can see the wisdom in mandating such a course. By legally requiring it, one would hope to avoid such an occurrence. Maybe such a course would have enlightened Dr. Harrington as to the importance of proper infection-control procedures and he could have avoided everything. Then, again, maybe not.

Someone who delegates important tasks to his staff and then doesn't check up on those procedures to determine if they are being carried out safely and correctly most likely has some kind of disconnect when it comes to the proper running of a practice. Any new system in my office is first vetted by me as the head of the practice before being integrated into the daily procedures in the office. As an orthodontist, I delegate many tasks to my assistants, but they are all prop-


erly licensed and they work under my direct supervision. And they only do those things a licensed dental assistant is allowed to do under the law. After all, they will not be the ones sued for malpractice if something goes wrong. It seems Dr. Harrington let his staff perform procedures only a licensed dentist can do.

I find it amazing it took this long for Dr. Harrington to be discovered. After all, he had been a practicing oral surgeon for 36 years. I understand each state has its own rules and regulations governing the practice of dentistry and deals with problems in its own ways. It is unfortunate he practiced the way he did.

Fortunately, the majority of dentists in this country practice ethically and with care for their patients. They employ correct infection-control techniques, ensuring that their patients are protected to the best of their abilities. We are professionals, after all, and should practice as such. We owe it to our patients and the public who trust us to treat them safely and properly every time they sit down in our operatories. We don't need any more horror stories coming out of dental offices. We fight daily to overcome the public's perception of dentistry as one of those

things in life you need but don't necessarily want. Stories such as the one coming out of Oklahoma only reinforce a negative stereotype of dentists as "being in it only for the money."

I am optimistic that here in New York State all our dentists are following proper infection-control procedures in their offices. We are continually updated through our mandatory infection-control courses. There is no shortcut to proper infection control. Let the situation in Tulsa be a reminder to never let our guard down. No one wants to have what happened there occur in their or anyone else's practice. It's not what we were taught and it's not the way to practice.

 D.D.S.





Dr. Stein and son, Adam.

The Perfect Imperfect Appointment

I spend my life in two worlds: one as a clinician with many years of involvement in organized dentistry, and the other as a parent within the special needs community. I draw on my personal perspective to engage others in the endeavor of special care dentistry.

Jeffrey I. Stein, D.D.S.

I have been blessed with two wonderful children: my daughter, Jessica, and son, Adam. As with all parents, the world begins anew with each birth. Each child is a miracle, the most precious gift. But Adam was no typical child. Adam has Down syndrome. With his arrival, my wife, Leslie, and I entered an unknown world. We were not at all prepared for this odyssey that is now in its 22nd year. For the first two years and beyond, we were overwhelmed with information—what we needed to do, how to do it, what we should have done—and with mixed emotions, not too dissimilar from what any dentist goes through when confronted with a special needs patient. At a certain point, you just do.

The Ninth District has been exceptional and is in the forefront with regard to special care dentistry. I sense an increasing awareness and favorable trend, but much remains to be done. My family lives in Somers, which has been a great school district for special education. When he was 7, Adam's first Somers teacher publicly stated objectives without any evaluation: for Adam to dress himself; learn personal hygiene; and be as socially appropriate as possible. You can imagine our despair. These were all skills Adam had mastered years previously. She wasn't an old teacher, just one with antiquated concepts. Working with the district we were able to get what all parents want: a teacher who can help their child reach his or her potential.

Adam subsequently had two phenomenal teachers who have taught him to read, write, do math (although this remains challenging) and job skills. The school district is important, but most important is the teacher in the classroom on a daily basis. Likewise, with regard to special needs patients, it is not what the Ninth District does that ultimately matters, it is what you, the dentist, does within the confines of your office.

A Welcoming Community

We have told Adam that in the same way that he has been a gift to us, he, too, has received a great gift—the gift of a community full of goodness and kindness. Loneliness is perhaps life's greatest affliction and when you are different, as he and our family became, alienation is not uncommon. We feared for his and our own solitude. But our community extended its arms wide, including helping us find a dental home. Adam has been the recipient of outstanding dental care. Many special needs patients, however, have trouble finding a dental home within their community. Quite possibly there may be a group home challenged to access care just down the block from your office.

When Adam was 9, he still could not stay upright on a bicycle and he was too big for standard training wheels to fit his bike. We went to countless bicycle stores. The staff at these stores felt bad, but did little to help. Our neighbor Joe, seeing all the boys riding and Adam just stand-

ing by staring despondently, took the time and effort to customize training wheels to fit his bike. I don't know who had the bigger smile, Adam or Joe.

As a parent of a special needs child, you regularly reach out for help for all sorts of problems and services. You quickly learn the difference between sympathy and empathy. Our community loves Adam for the way he resembles us and for the way he differs. Many of my colleagues have had the good fortune to meet Adam. He is an exceptionally warm, funny and social young man. Regardless of the disability, parents of a special needs child love their child. The bond may be even stronger in consideration of the dependency and responsibility that continues into adulthood and extends beyond our own lives.

I have had an incredible education, which included instruction from two Nobel Prize winners. But Adam has been my best teacher. I have learned we should be thankful for our loved ones, the plenty we all have and can do, and not be sorrowful for what we don't and can't do. Take nothing for granted—talking, walking, writing or even something as simple as working a microwave. Be truly appreciative of your family's health. Like most, I ask expectant parents if they want a boy or a girl. In reality, all I wish for them is a healthy child. Be grateful and show gratitude by helping others confronting challenges. Like all parents, we want to optimize our children's health and happiness. After repeated frustrating experiences seeking various services, special needs families may approach a dental setting with desperation, fear and panic. Will you provide relief and joy, or rejection? If the circumstances were reversed, what would you hope for with regard to dental care for your child or grandchild?

Everyone Has Special Needs

Many of you, like me, treat patients with Alzheimer's or Parkinson's disease. Those in practice a number of years have had ongoing patients develop these debilitating diseases. We all have had the extremely phobic patient or one with significant psychiatric illness. I recently had a patient with severe obsessive-compulsive disorder who had a seemingly endless list of questions and a need to count the threads on an implant prior to insertion. None of us are strangers to the crying or disruptive child. Just like patients with Down syndrome, autism, cerebral palsy and the litany of developmental and physical disabilities, all these patients require special care dentistry.

Even our "normal" patients have special needs, that is, the need for empathy and compassion. It requires a change in mindset and more of your attention, time and patience. Forget the labels; I have had many so-called "normal" and "typical" patients who require more of me than the true special needs patients. It goes back to what we all have heard countless times: don't make assumptions; assess and treat the individual.

Consultative appointments are enormously beneficial. This non-threatening relationship-building time is not wasted time.

A short, simple meet and greet will allow you and your staff, the parents or primary care provider, and the patient to prepare properly. You can determine which of your operatories is best to handle the physical disabilities or need for a wheelchair transfer. The parents or primary care provider can be extremely helpful (most of the time) in providing insight. Is there a better time of the day and day of the week? What toys, games, music, movies, sports, topics of conversation can be utilized to connect and distract during treatment? "Tell, Show and Do" is effective most of the time, even perhaps with older individuals, but not always. Along with a great assistant—and ideally the same assistant for future appointments—you can build trust, set the tone and build the foundation for a productive relationship, dentally and emotionally, for all parties. This evaluative, non-working appointment will facilitate treatment and shorten visits. It will allow you to reduce stress and the likelihood of wreaking havoc on your schedule by having a better idea how much time you will need.

Adjust and Adapt

Within the Ninth District there are a variety of practices and clinical settings. All have in common patients who are in need of special care. Regardless of the setting, time, patience and established routines for this population and, specifically, for the individual is paramount. Don't automatically pass on, refer out or under treat. Tertiary resources are overwhelmed with little hope for improvement in the current economic-government spending environment. Play the hand you're dealt. We all like to practice within our comfort zone, but this truly is the time and circumstance to extend yourself and give more, to go beyond your comfort and routine. The measure of an individual personally and professionally is taken at such crossroads.

Strive for ideal treatment, but don't dwell on trying to find and employ the perfect solution. Adjust and adapt. Have the confidence to persist and progress. As in many endeavors, perfection is the goal, but do not lose sight of the big picture. Pragmatism reigns supreme. What constitutes a good appointment? It could range from being no different from your typical prosthetic standards to just teaching proper brushing technique. It could be as simple as hygiene instruction and nutritional tips delivered in your office or to staff members at a group home. Your productivity and results may be atypical. Do not subject yourself to a guilt trip. What you would rate as an ordinary outcome in fact is extraordinary.

This is difficult for the typical dentist personality. We are obsessive, exacting and like to do things a certain way—our way. We embrace precise treatment and technical protocols. We are control freaks and in the special needs situation, control issues arise. Don't get overly frustrated. Your mindset and your treatment protocol need to be fluid. Under certain circumstances, accept compromise, but certainly only if it is above the necessary clinical threshold.

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We crave expert information and specialists who will take away all uncertainty. There are many within the Ninth District who can provide guidance, but I assure you, even for them not all goes smoothly. Do not attempt to rationalize excuses and justify why you shouldn't be treating; just execute the best you can. Learn to say "yes" to something new. This is how we all grow.

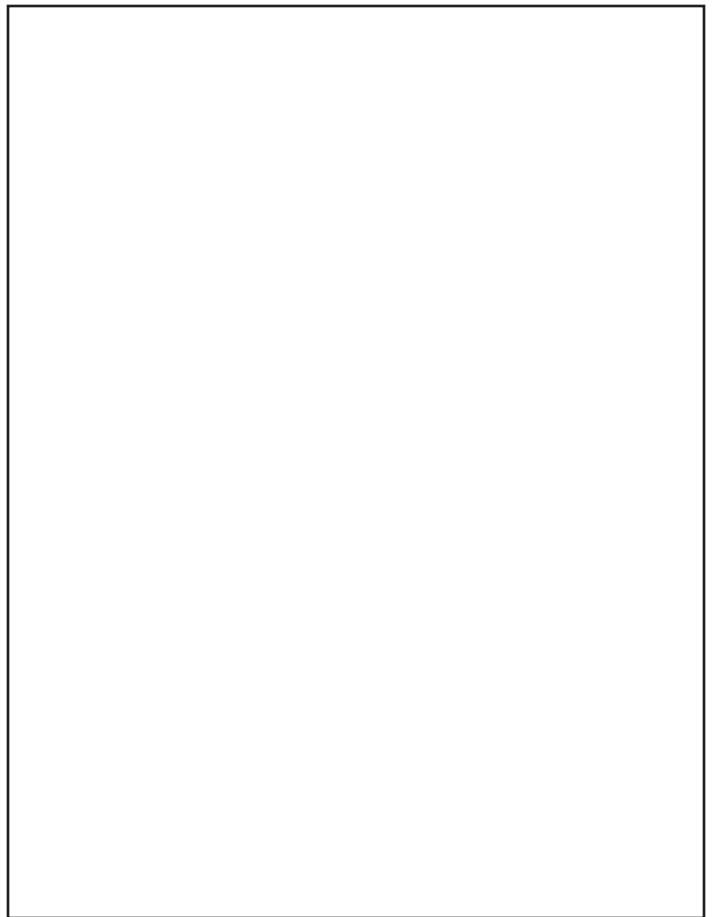
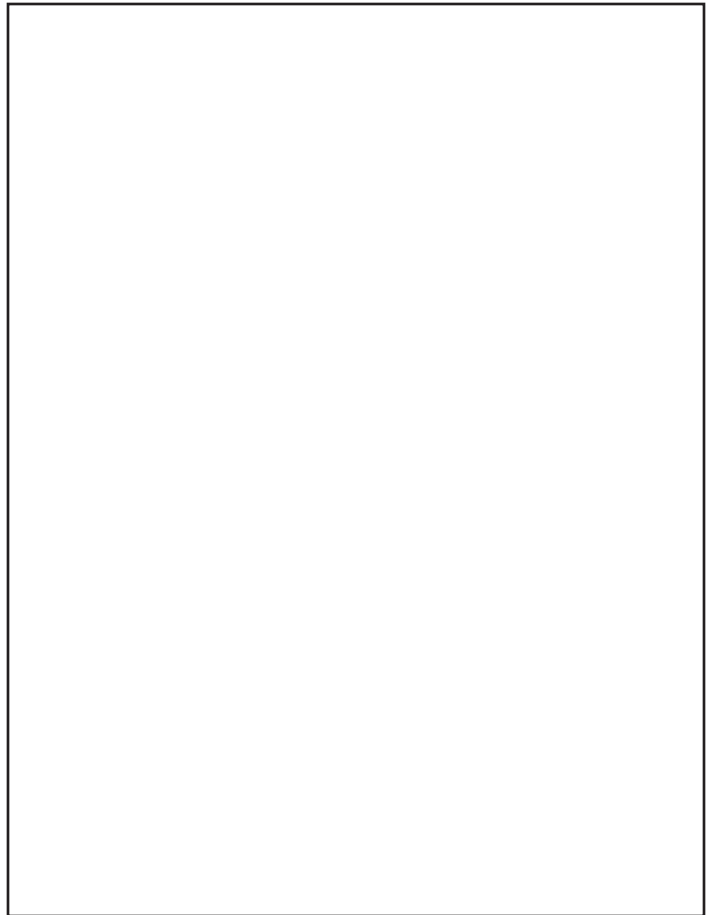
Be a Dental Caregiver

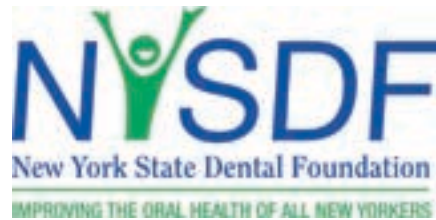
My advice to you is the same I have given Adam: "Try your hardest to be the best you can be. Don't dwell on the disappointments, but knowing when you truly have given your best, to be content in what you have accomplished." At the end of the day, you want to look at that individual with honesty and respect, with professional and personal integrity and let that person know, "I am here to take care of you and figure out a way to get it done." The insurance industry has relegated us to dental providers. This is your opportunity to be a dental caregiver. We can't change the entire marketplace, and we can't be all things to all people, but each of us can do our share within our communities.

There is no magic palace where all those with disabilities can go, the wand is waved and ideal care is rendered, but you can make the magic happen in your operatory with your compassion and stroke of an instrument. I cannot give you a compelling financial argument to do the work of special care dentistry. You will not be maximizing your income, but you will be rewarded by the great joy of giving. Live up to the person you aspire to be. Don't let a "third party" take the humanity out of your profession. We become good people by doing good deeds again and again.

Go forward despite your lingering doubts. There will be moments of adversity, setbacks and failure, but there will be much more success, happiness and fulfillment. Take heed of the Special Olympics Athletes' Oath: "Let me win, but if I cannot win let me be brave in the attempt." Open your heart, mind and door; something significant is expected from us as professionals and as a profession. We each determine our practice culture and what it can become in treating these vulnerable sons, daughters, brothers and sisters. We all have assets and deficits physically, emotionally and intellectually. In an imperfect world, Adam is a perfect Adam. One of his unique gifts is he accepts all of us for who we are, even when we are less than perfect. Can you do the same? //

Dr. Stein is a past president of the Ninth District Dental Association. He maintains a private practice limited to oral and maxillofacial surgery in White Plains, NY. His article originally appeared in the March 9th District Bulletin. Queries about this article can be sent to Dr. Stein at info@jawdoctors.com.





On hand for presentation of Give Kids a Smile Award to Ellis Medical Dental Clinic are, from left: Frederick Wetzel, director, Ellis Dental Health Center and Dental Residency Program; Cassie Andriano, executive director, Ellis Foundation; Laura Leon, NYSDF Executive Director; G. Kirk Gleason, chair, NYSDF Board of Trustees.

Two Organizations Receive NYSDF Give Kids a Smile Awards

The New York State Dental Foundation Board of Trustees this year is bestowing its prestigious Give Kids a Smile Award to two worthy organizations in recognition of their leadership, advocacy and innovation in providing oral health care to children.

Staten Island University Hospital Department of Dentistry will receive \$4,875 to provide treatment to pediatric patients for conditions that can be corrected or significantly improved by early intervention for the guidance of eruption, space supervision and interceptive orthodontic treatment. The 15 patients who will benefit from the GKAS Award are those whose insurance plans, such as Medicaid and Child Health Plus, do not cover orthodontic treatment.

Nancy R. Vomero, president and CEO of the Seaman's Society for Children & Families, a foster care agency that contracts with New York City Children's Services, has commended the Department of Dentistry for the expert care provided by a team of committed professionals to the society's entire foster care population of 200 to 250 children. The Department of Dentistry focuses

on community service, assuring that the targeted population receives quality, efficient and compassionate dental care regardless of their ability to pay and without regard to race, creed, sex, age, disability or national origin.

The Ellis Medical Dental Clinic in Schenectady will receive \$5,000 to purchase a RVG 6100-size 0 (for children) dental digital radiography sensor to enhance patient comfort and expedite the clinical patient experience. The Ellis Clinic, which provides care to nearly 3,800 children under the age of 17 each year, has partnered with several community organizations to deliver a comprehensive healthcare program called the Medical Home. It includes dental and primary care, child and adolescent mental health, and a wide range of outpatient services, including imaging, laboratory and emergency. Ellis Medicine offers a one-year residency in general dentistry through the Dental Health Center, which serves as both a productive training program and a valuable community resource. //

The Practice Management Curriculum in New York State Dental Schools

Joseph McManus, D.M.D., M.S., M.H.A., M.B.A., M.S.

ABSTRACT

The practice management curricula of the four dental schools in New York State were examined and were found to be limited. Although it was acknowledged that it is challenging to expand the hours devoted to teaching this discipline, steps should be taken to address the issue. The author suggests two initiatives that can help address this deficiency.

The education a dental student receives at each of the four dental schools in New York State is among the best in the nation. However, all dental schools in the United States are faced with a perplexing problem. There is a finite amount of time in the four-year curriculum and the schools must decide what and how much time will be allocated to the basic sciences, the clinical sciences and to the behavioral sciences that comprise the curriculum of a predoctoral dental education.

There has been an explosion of knowledge over the last three decades, yet the dental school curriculum is still four years. New York State has recognized this dilemma and has instituted the mandatory PGY-1 year for licensure. Although I firmly support the mandatory PGY-1 year, this does not solve the deficiency in practice management education. Other solutions should and must be sought.

Students graduating from dental schools across the country have a significant amount of debt (Figure 1).¹ Therefore, in order

for us to address this economic reality, there should be adequate time in the dental school curriculum to provide students with the skill set they need to practice efficiently and to provide them with the fundamental business skills that will allow them to be successful practitioners.

FIGURE 1

Educational Debt
88.8% had student loan debt
\$180,557 mean debt indebted graduates
\$157,525 (graduates of public school)
\$218,695 (graduates of private schools)
29.4% had debt of \$250,000 or higher

FIGURE 2

Institution	Clock Hours of Instruction in Practice Management
University of Tennessee	341
University of the Pacific	323
Southern Illinois University	246
University of Maryland	12
University of Connecticut	12
Louisiana State University	2

If we examine the allocation of curriculum time devoted to teaching practice management in the schools across the United States, we see an extremely wide variation (Figure 2).² In the aggregate, according to the 2008-2009 Survey of Dental Education, the median number of curriculum hours devoted to teaching practice management for all dental schools was 61.5 hours.³

When we look at recent information from New York State dental schools⁴ (Figure 3) and compare it to the national statistics, all but one of the schools fall well below the national mean. This is not an indictment of the curriculum in the schools; I fully appreciate the fact that there is a finite amount of time in the dental school curriculum. Therefore, we must look elsewhere to provide quality education in this vital discipline.

The American Dental Education Association 2011 Survey of Dental Schools Seniors revealed interesting results. The survey asked the students to rate the time devoted to 22 areas of instruction in their curriculum. Not surprisingly, the time devoted to the teaching of practice management was rated the third most inadequate in the curriculum, behind orthodontics and implant dentistry⁵ (Figure 4).

At a national level, the need for quality practice management information has been recognized by the American Dental Association. In 2011, the ADA formed an interagency work group called the Practice Management Initiative Advisory Group. This advisory group recommended that the Board of Trustees support two new initiatives to provide practice management resources and education to ADA members. Information will be disseminated through the newly formed Center for Professional Success, scheduled to be launched this year.

The ADA is not alone in this effort. At the state level, the California Dental Society provides practice management information to its members on its Compass website through a

Practice Support Center. This center provides support in four primary areas: practice management; employment practices; dental benefit plans; and regulatory compliance.⁶

The need to provide this type of education has been acknowledged by the University of Florida College of Dentistry. To fill the

FIGURE 3

Institution	Total Hours of Instruction in the 4-year Curriculum as of 9/12	Total Hours of Instruction in Practice Management as of 9/12	% of Curriculum Devoted to Practice Management as of 9/12
New York University	4,973 hours	46 hours	.9%
Columbia University	3,872 hours	26 hours	.6%
Stony Brook	5,762 hours	26 hours	.4%
Buffalo	4,980 hours	85.5 hours	1.7%

FIGURE 4

Seniors' Perceptions of Time Devoted to Selected Areas of Education and Training, by Percentage of total 2011 Respondents for Each Area					
	Inadequate	Appropriate	Excessive	Neutral	Not Applicable
Basic Sciences	1.6%	70.9%	18.0%	7.2%	2.2%
Behavioral and Social Determinants of Health	4.6%	69.0%	12.8%	11.6%	1.9%
Pharmacology	12.6%	70.2%	9.2%	7.0%	0.9%
Patient Evaluation and Diagnosis	8.5%	79.0%	6.1%	5.9%	0.5%
Occlusion / Temporomandibular Disorder	21.3%	65.3%	4.9%	8.0%	0.6%
Preventative Practices and Patient Education	3.6%	78.0%	11.8%	6.1%	0.5%
Restorative Dentistry	2.3%	87.4%	5.6%	4.2%	0.5%
Prosthodontics – Fixed	5.9%	84.2%	4.8%	4.6%	0.5%
Prosthodontics – Removable	11.8%	77.0%	5.6%	5.0%	0.6%
Endodontics	15.6%	76.1%	3.1%	4.7%	0.6%
Periodontics	5.2%	74.3%	15.4%	4.7%	0.4%
Orthodontics	40.8%	47.4%	4.4%	6.9%	0.6%
Pediatric Dentistry	12.9%	76.8%	4.6%	5.2%	0.5%
Oral Surgery	9.4%	81.9%	3.9%	4.6%	0.5%
Oral Pathology	4.9%	82.2%	7.4%	4.9%	0.5%
Dental Health Policy	21.4%	58.8%	5.5%	11.5%	2.8%
Organization and Financing of Health Services	34.1%	48.6%	3.2%	11.0%	3.1%
Implant Dentistry	37.0%	54.3%	1.9%	6.0%	0.8%
Dental Materials	10.8%	73.6%	8.2%	6.6%	0.7%
Anesthesiology / Pain Control	7.3%	85.0%	2.1%	5.1%	0.5%
Ethics	3.1%	75.8%	15.2%	5.3%	0.6%
Practice Administration	36.5%	52.3%	2.8%	7.5%	

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void, the college has developed an Executive Practice Management Certificate Program for Dentists. This 13-module program, which participants attend one weekend a month for 13 months, “is designed to prepare Dentists to become business owners and executive managers within their dental practices.”⁷

Conclusions

The problem is clearly defined and the need has been unmistakably established. Now, what can the New York State Dental Association and the dental schools do to address this pressing problem? I propose the following two initiatives.

New York State Education Law requires dentists to complete 60 contact hours of continuing education in each three-year registration period. However, any coursework in practice management is not acceptable. Why? It is my recommendation that the leadership of NYSDA and the deans of the dental schools in New York State petition for a change in the New York State Education Law. I urge that the law be amended to allow dentists during their first three-year registration period to take a maximum of 20 credits in practice management and that these credits be acceptable to partially fulfilling the continuing education requirement.

There is an obvious need for establishment of formal educational programs in the state where New York dentists can take courses that will provide them with a solid foundation in accounting, finance, human resource management and leadership skills. The skill sets that these courses will provide will allow our dentists to successfully manage their dental practices. The time to act is now. //

REFERENCES

1. ADEA Survey of Dental School Seniors, 2011 Graduating Class. American Dental Education Association. Retrieved on 28 Nov 2012 from <http://www.adea.org/publications/library/ADEAsurveyreports/Pages/ADEASurveyofDentalSchoolSeniors2011GraduatingClass.aspx>.
2. American Dental Association, 2008-2009 Survey of Dental Education, Volume 4, Table 11.
3. American Dental Association, 2008-2009 Survey of Dental Education, Volume 4, Figure 10.
4. Data provided by the offices of the academic deans of the respective institutions.
5. ADEA Survey of Dental School Seniors, 2011 Graduating Class. American Dental Education Association. Retrieved on 28 Nov. 2012 from <http://www.adea.org/publications/library/ADEAsurveyreports/Pages/ADEASurveyofDentalSchoolSeniors2011GraduatingClass.aspx>.
6. Dental Practice Management, Dental Practice Marketing. California Dental Association Retrieved on 28 Nov 2012 from <http://www.cdacompass.com/Practice-Management/Overview.aspx>.
7. Executive Practice Management Certificate Program for Dentists. University of Florida Distance Learning. Retrieved on 28 Nov 2012. <http://www.distance.ufl.edu/executive-practice-management-certificate-program-for-dentists>.



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What You Need to Know About the Affordable Care Act in New York

Implementation of the federal Affordable Care Act (ACA) will affect dentists in their roles as employers and healthcare providers—and even as patients themselves. Most significantly, dentists are likely to face increases in the number of patients presenting with dental benefits through Medicaid and private insurance companies.

Judith L. Shub, Ph.D.; Richard P. Herman, D.D.S.

When the Affordable Care Act (ACA) goes into effect in 2014, it is expected that more than a million additional people in New York State alone will be covered by health insurance, including dental coverage. Plans offered through a Health Benefit Exchange must offer a “pediatric standard product,” that is, the benefit package now available through the Children’s Health Insurance program (CHIP).

What is a Health Benefit Exchange?

Later this year, New Yorkers will begin to see changes in how dental benefits are provided in conjunction with the ACA. Individuals with incomes that are too high to qualify for public programs—Medicaid—and employers with fewer than 50 employees will be able to shop for insurance products on New York’s Health Benefit Exchange. The exchange, which will offer dental benefit plans, will begin accepting insurance coverage applications on Oct. 1, with coverage becoming effective on Jan. 1.

The New York Health Benefit Exchange website defines an exchange as an organized marketplace designed to help people shop for and enroll in health insurance coverage. Individuals, families and small businesses will be able to use the exchange to help them compare commercial insurance options, calculate costs and select coverage online, in person, over the phone or by mail. They can access the exchange to determine their eligibility for financial assistance to help them pay for health insurance purchased through the exchange and to check their eligibility for healthcare programs like Medicaid and to sign up for these programs if they are eligible.

Health Plan Offerings in the Exchange

The ACA requires that qualified health plans (QHPs) sold through the exchange, and most health plans sold outside of the exchange in the individual and small group markets, provide benefits in 10 different coverage areas. The required areas are:

1. Ambulatory patient services.
2. Emergency services.
3. Hospitalization.

4. Maternity and newborn care.
5. Mental health and substance use disorder services.
6. Prescription drugs.
7. Rehabilitative and habilitative services and devices.
8. Laboratory services.
9. Preventive and wellness services and chronic disease management.
10. Pediatric services, including dental and vision care.

The benchmark plan chosen by a state may include additional benefits.

Health plans on the exchange will be offered in a tiered format, with at least two plans in each tier to choose from. Plan tiers will be based on metal levels that match the approximate percentage of costs covered and premium charges. The designated levels are:

- Bronze 60 percent
- Silver 70 percent
- Gold 80 percent
- Platinum 90 percent

Plans at the Bronze level would pay approximately 60% of the healthcare cost, and the enrollee would be responsible for the remaining 40%. Platinum plans would pay 90% of the cost, and the insured would pay 10%.

Employer Mandates

The ACA impacts dentists as healthcare professionals, but dentists who provide healthcare coverage for their employees might be affected as consumers as well. The act includes an employer mandate, requiring for the first time that employers with 50 or more full-time employees offer coverage to their employees and their dependents or pay tax penalties.

Through the end of this year, employers who have up to 25 employees, provide health insurance and pay an average annual wage of less than \$50,000 may qualify for a Small Business Health Care Tax Credit of up to 35% (up to 25% for nonprofits). Starting in 2014, the Small Business Health Care Tax Credit will increase to 50% (35% for nonprofits) and will be available only through the exchange.



The Health Benefit Exchange will operate a Small Business Health Options Program (SHOP) that offers small businesses (most dental offices) and their employees new choices. Through the SHOP, employers can offer their employees a variety of QHPs; and their employees can choose the plan that fits their needs and their budget.

Both individual stand-alone plans and those offered through the SHOP can offer two optional dental products selected from a non-standard dental pediatric product, a non-standard dental adult product and a non-standard family dental plan.

Starting in 2014, if their employers do not offer insurance, employees will be able to buy coverage directly in the Health Insurance Marketplace. The marketplace will offer a choice of health plans that meet certain benefits and cost standards. Small businesses with 50 or fewer employees may purchase health insurance coverage through the New York Health Benefit Exchange. The exchange will make it easier for employers to compare the benefits, premiums and quality of different health plans. The exchange will also give small employers the flexibility of choosing a health plan for their employees or setting the amount they will contribute toward coverage and allowing their employees to select the plan that best meets their needs, with employees paying the remainder of the premium.

Dental Plans in the Exchange

Last January, New York State issued a call for applications from benefit companies seeking to be included in the exchange. The dental benefit companies that applied needed to increase or make changes to their dental provider networks and assure that these networks could deliver dental services in the new environment. It is expected that the formation of the exchange and the expansion in coverage will result in an increase in patients with managed care dental plans that will require networks of participating contracted dentists.

In evaluating their own business plans, dentists should determine whether they want to contract with companies whose dental plans will be marketed through the exchange. Providers who have already contracted with participating provider organizations (PPOs) should determine whether their existing contracts reflect their practice goals with respect to their obligations to treat the anticipated expanded patient pool.

A contract establishes the rights and obligations of all parties to the contract.

In this regard, dentists are advised to take this opportunity to become familiar with the contractual requirements that apply to any PPO contracts in which they are currently participating. If they are evaluating new contract offers, they should consider many of these same factors:

- First, do you have a copy of all participating provider agreements so that you know what is required of all parties to your contract?
- Does your contract allow the insurance company or PPO to sell or assign your agreement to other provider networks or insurance plans?
- Are you aware of any options the plan has to increase or decrease reimbursement or change the form of reimbursement (i.e., from fee-for-service to capitation)? Is there a requirement that the plan notify you in advance of any changes?
- If you began participation in a provider network because of one particular employer plan, does the contract require you to participate in any and all other plans offered by the provider network or insurance company?
- If you wish to terminate your contract, what are the steps required and how long will it take to become effective?

If a company with which you have already contracted as a participating provider contacts you with changes to your contract, it is advisable to review the proposed changes with your own attorney. A contract establishes the rights and obligations of all parties to the contract. More than ever, in the current insurance environment, it is important to have a complete understanding of your provider agreements so that you can make informed decisions about how they affect your practice and may affect it in the future.

Your participation in any contract is an individual decision. For dentists considering joining a new provider network, NYSDA can provide assistance through the ADA Contract Analysis Service. NYSDA can also help members locate an attorney with expertise in professional contracting. Participants in NYSDA's Legal Services Panel offer Association members a free consultation and discounts on any additional legal counsel provided. //

Dr. Shub is NYSDA Assistant Executive Director for Health Affairs. Dr. Herman, Bronx County, is a member of the NYSDA Board of Trustees and sits on the Association's Council on Peer Review & Quality Assurance.



Hospital/Family photos by Jason Green, 16 Photo

Joel and Marian Friedman with grandchildren Arielle and Jesse on occasion of Jesse's Bar Mitzvah last September at Congregation B'nai Jeshurun in New York City.



Dr. Friedman values time working with residents at Weill Cornell Medical College, where he is associate professor of clinical surgery.

A Conversation with NYSDA President Joel M. Friedman, D.D.S.

What constitutes an ideal/perfect day for Dr. Joel Friedman?

I have two types of ideal days: the business perfect day and the personal perfect day. On the business or professional side, I regard time spent meeting with my residents, going over cases and having them go well; seeing patients or having a conference; and, as trite as it sounds, attending a dental meeting in the evening as time well spent. My personal perfect day involves my family. I truly enjoy spending time alone with my wife, Marian, but when my grandchildren Jesse and Arielle are there too, that is a truly special day. Most of our time together is spent at our house in the Berkshires (Massachusetts) doing chores, hiking and watching sports on TV. When we're in the city, I enjoy going to the gym with grandson, Jesse, and doing basketball drills. He was on his middle school all-star team.

What do you do to relax/unwind?

I read mindless novels, escapist reading. But I also have decent biographies and historical works on my reading list. I recite poetry. It comes to me from out of nowhere, lines of poetry I learned and memorized when in grade school. Yates, Shakespeare...whatever is appropriate for the moment. And then there's my home in South Egremont, MA. I love it there. It's a chance to get away and look out on things that are green and quiet. A welcome retreat from the cacophony and movement of the city. I try to get there every weekend.

Can you tell us something about yourself?

Where did you grow up?

The Bronx. But I was born in Boston.

Your parents? Siblings?

My father was Abraham Friedman, a dentist in the Bronx. My mother was Theda Friedman. My mother worked in my father's dental office. I helped out as well, including developing X-rays. My father's desire to be an oral surgeon was passed on to me. To this day, there is no specialty I'd rather be in.

I have a younger brother, Harvey. He lives in New York City and is a semi-retired limousine driver. The rest of the family consists of two nephews and two great nephews.

Where did you meet your wife, Marian?

At the 92nd Street Y in New York City. We were both attending a Bible course. I must have been feeling bold and she seemed nice. I just walked up to her and started talking to her. Turned out we shared a lot of common interests. We've been married 18 years. Marian recently retired as the human resources director at Random House.

Children?

I have just one daughter, Alison Davis, wife of Glen Davis. They met when they were in high school and live in Manhattan with their two children: Jesse, 13, and Arielle, 11. Alison has a Master of Social Work degree and a master's degree in early childhood education and teaches preschool in the city. Glen is a stock analyst and trader.

What book (s) are you currently reading?

I recently finished "The Spanish Civil War: Reaction, Revolution and Revenge," by British historian Paul Preston, who is also a



NYSDA President is also a basketball fan. Seen here with grandson Jesse cheering on University of Michigan Wolverines last April in their bid to capture NCAA Tournament championship.



Friedmans relaxing at home in Manhattan. From left: son-in-law Glen Davis; daughter, Alison; grandchildren Jesse and Arielle; Marian and Joel.

specialist in Spanish history. I belong to a history book club, so I read one book every six weeks. We're currently reading the "The Last Mughal," by William Dalrymple, which chronicles the British takeover of Delhi, India. The club is a group of people I know: four golf buddies and four common friends.

What is the last movie you saw?

"The Gatekeepers," a well-done documentary that came out last year and features interviews with six former heads of the Israel's internal security service, talking about the roles they played from the Six-Day War to the present. It was nominated for an Academy Award.

What are your goals for the coming year?

For one, I intend to have an absolutely transparent administration. Also high on my list is developing ways to bolster the membership of the Association, followed closely by changes in the PGY-1 model for achieving dental licensure. I'd like to see the addition of a portfolio-based examination and was gratified that the House of Delegates adopted a resolution to allow the PGY-1 Task Force and the Council on Dental Education and Licensure to explore the possibility of developing such an examination.

I'd also like to see a movement toward empowering the membership, to opening members' eyes to the value of giving and receiving from the Associa-



Working with students/residents keeps you fresh, according to Dr. Friedman, seen here with resident Liza Rogol.



Dr. Friedman and New York State colleagues, in San Diego last year for meeting of American Association of Oral and Maxillofacial Surgeons, take night off to watch Padres at home in Petco Park. Dr. Friedman was joined by Steve Snyder of Suffolk County, left, and Steve Tunick, New York County.



Dr. Friedman consults with Weill Cornell colleague David A Behrman, chief, Division of Dentistry, Oral and Maxillofacial Surgery.

If you work at something you love, you never have to work in your life.

tion. I've been living the tripartite my whole career and never encountered anyone in organized dentistry who didn't come from a good place. I've met some of the finest, most active and selfless people, who give without any thought of personal aggrandizement.

Did you ever imagine you would be president of the New York State Dental Association?

I did not, though I have been president of several other dental groups. I believe I am well-prepared for the job.

Who has inspired you the most in entering and/or continuing your dental career?

My father and his colleagues were an inspiration. I looked at their lifestyle and the satisfaction they got from dentistry. I knew this was something that would fulfill me personally. If you work at something you love, you never have to work in your life. You take someone out of pain and restore form and function in one visit. Contemplating this was an epiphany for me. I was thinking, if you were writing your obituary, what part of your life would you want to stress? For me, that would be the profound effect you have had on the people you teach and the effect they have on you. Working with students/residents as I do, keeps you fresh. //

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National Dental Board of Anesthesiology

Professional Offices

Past President, Bronx County Dental Society

Past President, New York Society of Dental Anesthesiology

Past President, New York State Society Oral and Maxillofacial Surgeons



Child Abuse

Concerns for Oral Health Practitioners

Salim Rayman, R.D.H., M.P.A.; Elvir Dincer, D.D.S.; Khalid Almas, B.D.S., M.Sc., FDSRCS

ABSTRACT

Child abuse and neglect are prevalent issues that permeate all ethnic, cultural and socioeconomic segments of society. Parents of abused children frequently change physicians in order to prevent detection, but they are more likely to continue to visit the child's dentist. Most states recognize four major types of maltreatment: neglect; physical abuse; psychological maltreatment; and sexual abuse. The American Academy of Pediatric Dentistry defines dental neglect as "the willful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection." The oral health practitioner must uphold his or her legal and ethical responsibility if there is suspicion, record and report the incidence. It may help save a child from further abuse.

Child abuse and neglect are prevalent issues that permeate all ethnic, cultural and socioeconomic segments of society. In 2009, the Department of Health and Human Services (USDHHS) re-

ported that more than 3.6 million children were victims of abuse and neglect or were at risk of abuse and neglect.¹ The Child Welfare League of America categorizes child abuse as an epidemic.² Oral health practitioners are distinctly placed to identify and report abuse because approximately 65% of all physical manifestations of abuse are found around the head and neck area.³ But oral health practitioners account for only 1% of reported abuse.⁴ This low level reporting of child abuse by dental professionals exposes two main concerns. One is the lack of education and knowledge in recognizing signs of child abuse, and the other is the lack of information about requirements and procedures in individual states for reporting child abuse.

In addition, oral health practitioners may tend to resist admitting to themselves that it is really happening or that it is serious enough to report.⁵ Thomas et al. reported that parents of abused children frequently change physicians in order to prevent detection, but they are more likely to continue to visit the child's dentist.³

Child Abuse Defined

The Child Abuse Prevention and Treatment Act (CAPTA), as amended by the Keeping Children and Families Safe Act of 2003, defines child abuse and neglect as, at a minimum: "Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent

risk of serious harm.”¹ Note, that each state defines child abuse and neglect and its various types of maltreatment in state statute and policy. State statutes also establish the level of evidence needed to make specific findings or disposition as a result of the state’s inquiry into the allegation of maltreatment. This definition also includes sexual abuse, sexual exploitation, physical or emotional abuse, and willful cruelty or unjustifiable punishment of a child.

Most states recognize four major types of maltreatment: neglect; physical abuse; psychological maltreatment; and sexual abuse. Although any of the forms of child maltreatment may be found separately, they can also occur in combination.

Neglect

While child abuse refers to acts of commission by a parent or other legally responsible caregiver, child neglect usually refers to acts of omission, that is, the failure to provide for the child’s basic needs. In 2009, CAPTA reported that four-fifths, or 78.3%, of victims of reported cases of child abuse suffered from neglect.¹ CAPTA defines neglect as the deprivation of adequate food, clothing, shelter and medical care to a child under the age of 18.

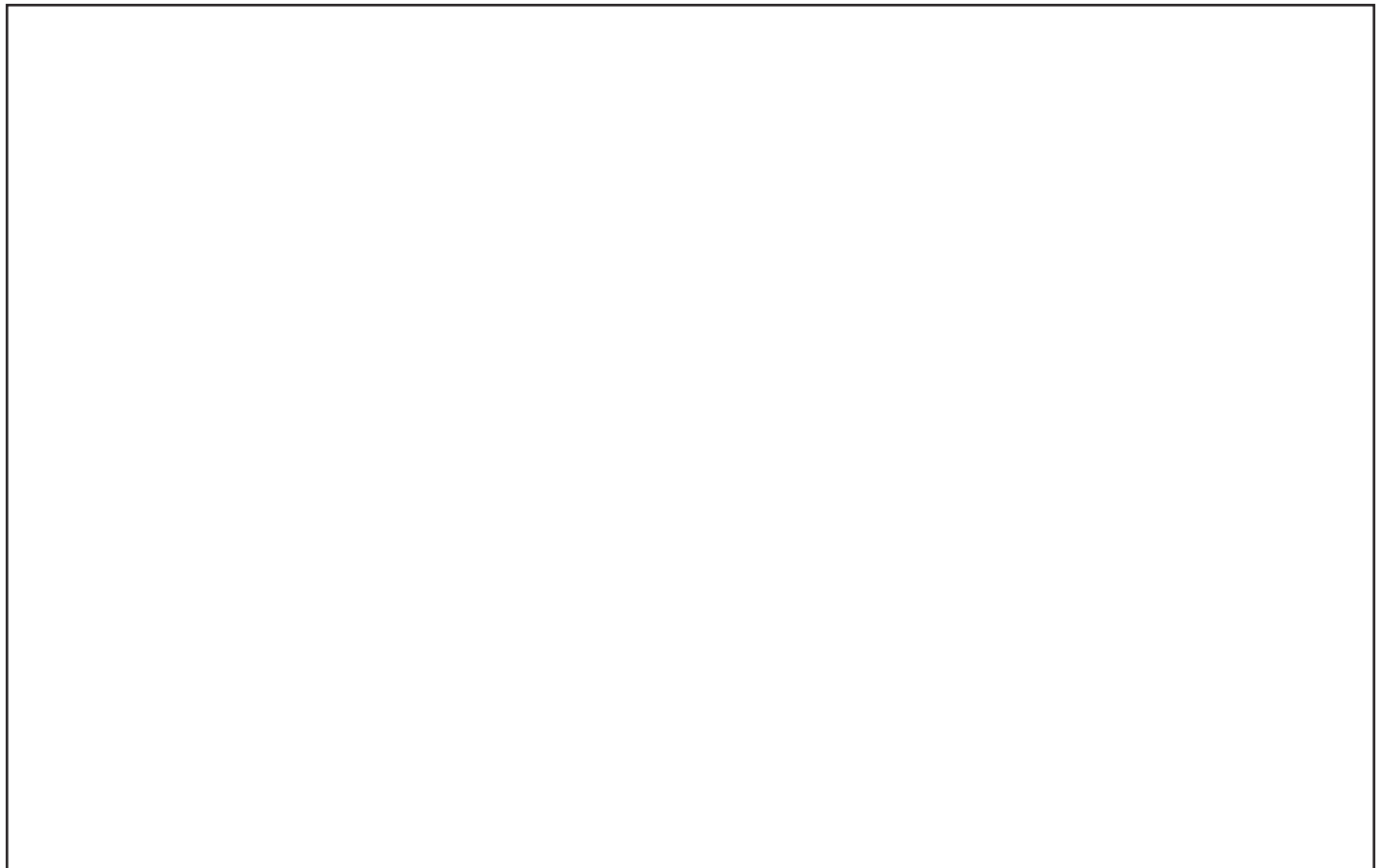
Neglect is among the most misunderstood and misdiagnosed forms of maltreatment. Physical and behavioral indicators can be categorized by general neglect and dental neglect. General neglect can



Figure 1. Extensive primary tooth decay. (Photo courtesy Neal G. Herman, DDS, clinical professor, Department Pediatric Dentistry, NYU College of Dentistry.)

include but is not limited to constant hunger, lack of supervision, chronic fatigue, unattended/lack of medical needs, inappropriate dress for the season, poor personal hygiene or inadequate supervision.⁹

The American Academy of Pediatric Dentistry defines dental neglect as “the willful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection.” It can include poor oral hygiene, untreated rampant caries that can easily be detected by a lay person (Figure 1),



untreated pain, infection or trauma to the orofacial region, or a history of lack of continuity of dental care.¹⁰ The oral health practitioner must distinguish between a caregiver who has adequate knowledge and willfully fails to seek care from a caregiver without knowledge or awareness of his or her child's need for dental care. This determines the need to report such cases to child protective services.

The point at which to consider a parent negligent and to begin intervention occurs after the parent has been properly alerted by the oral health practitioner to the nature and extent of the child's condition, the specific treatment needed and the mechanism for accessing that treatment.¹¹ The dental practitioner should consider that many families face challenges in their attempts to access dental care or insurance for their children when considering whether negligence has occurred.¹²

Physical Abuse

The Family Court Act defines the abused child as a person under 18 years of age whose parent or legal guardian, or custodian responsible for his or her care, does any of the following: inflicts or allows to be inflicted upon the child injury that is nonaccidental; creates or allows to be created substantial risk of injury to the child by other than accidental means; and commits or allows to be committed a sexual offense against the child as defined in the penal law.⁶ In other words, abuse is actual or potential harm to a child that is directly or indirectly caused by a parent or caregiver.

With approximately 65% of physical manifestations of abuse occurring around the head and neck region, it is imperative that dental practitioners become aware of and knowledgeable about recognizing and identifying these injuries. In the head area, manifestations may include subdural hematomas, which cause more serious injuries and deaths than any other form of abuse; traumatic alopecia; and subgaleal hematomas. Eyes may have retinal hemorrhage, ptosis and periorbital bruising, while the ears and nose may have bruising of the auricle, tympanic membrane damage and nasal fractures, or injury resulting in clotted nostrils, respectively.

Some authorities believe that the oral cavity may be a central focus for physical abuse because of its significance in communication and nutrition.⁷ Naidoo reported that the most common site for inflicted oral injuries were the lips (54%), followed by the oral mucosa, teeth, gingiva and tongue.¹⁵ These injuries to the orofacial region usually are inflicted with instruments such as eating utensils or a bottle during forced feedings; hands; fingers; scalding liquids or caustic substances.⁹ The abuse may result in contusions, burns or lacerations of the tongue, lips, buccal mucosa, palate (soft and hard), gingiva, alveolar mucosa or frenum; fractured, displaced or avulsed teeth; or facial bone and jaw fractures.⁹

Unintentional or accidental injuries to the mouth are common and must be distinguished from abuse by judging whether the history, including the timing and mechanism of injury, is

consistent with the characteristics of the injury and the child's developmental capabilities.⁹ Multiple injuries, injuries in different stages of healing, or a discrepant history should arouse a suspicion of abuse.⁹

Any serious injuries caused by the caregiver must be reported by the oral health practitioner for investigation and, if needed, consultation with or referral to a knowledgeable oral health practitioner should be considered.

Bite Marks

Bite marks are typical injuries associated with physical or sexual abuse.¹¹ They are suspected when ecchymoses, abrasions or lacerations are found in an elliptical or ovoid pattern. They are caused by two possible phenomena: positive pressure from the closing of the teeth, with disruption of small vessels; and negative pressure caused by suction and tongue thrusting.⁹ Animal bites are distinctly different from human bites in that animals tend to tear flesh,²² while humans bites compress flesh and can cause abrasions, contusions and lacerations.⁹ An interaction distance, which is the linear distance between the central point of the cuspid tips, measuring more than 3 cm is suspicious for an adult human bite.²⁴ The oral health practitioner should refer any suspected case to a forensic pathologist or a dentist trained as a forensic odontologist for further evaluation.²⁵

Sexual Abuse

Sexual abuse is any sexual behavior or activity with a minor or the exploitation of a minor by an adult for the sexual pleasure of someone else.²⁶ The American Academy of Pediatrics further states that sexual abuse occurs when a child is engaged in sexual activities that he or she cannot comprehend, for which he or she is developmentally unprepared and cannot give consent, and/or violates the law or social taboos of society.²⁷ CAPTA reported that approximately 10% of maltreatment cases were sexual abuse.¹ The majority of child sexual abuse cases are not characterized by physical violence or obvious injury. In contrast to adult victimization, child molestation typically involves no penetration, partial penetration or penetration with a small object (e.g., a finger) of the vagina or anus, simulated intercourse, fondling or oral-genital contact. These forms of abuse may result in temporary redness, swelling and infection, but may leave little scar tissue. Most sexual abuse occurs within the family; evidence of abuse is higher among girls than boys, but boys may be less likely to report it.

In the absence of physical findings, the dental practitioner may find it challenging to detect and confirm child sexual abuse. The oral cavity is a frequent site of sexual abuse in children; however, visible oral injuries or infections are rare.¹² The American Academy of Pediatrics recommends that the dental practitioner refer to a specialized clinical setting equipped to conduct comprehensive examination if oral-genital contact is suspected.⁹

Oral and perioral gonorrhea in prepubertal children is the most common sexually transmitted disease in sexually abused children. Eruptions may appear symptomatically on lips, tongue, palate, face and pharynx in forms ranging from erythema to ulcerations and from vesiculopustular to pseudomembranous lesions. Syphilis can manifest as a papule on the lip or dermis at the site of inoculation; and herpes simplex virus (type 2, HSV-2) presents as an oral or perioral painful, reddened area with a grape-like cluster of vesicles. In addition, the human papillomavirus infection may result in oral or perioral warts; however, the mode of transmission remains uncertain and debatable.⁹ Papillomavirus infections can be transmitted sexually through oral-genital contact, vertically from mother to infant during birth or horizontally through nonsexual contact from child or caregiver's hand to the genitals or mouth.³² Other physical signs of sexual abuse that can indicate forced oral sex are unexplained injury that manifests as erythema and petichia at the junction of the hard and soft palate.³³

Psychological Maltreatment

The circumstances that constitute impairment of mental or emotional health are commonly referred to as psychological maltreatment that can result in a state of substantially diminished

psychological or intellectual functioning by the child. These circumstances include failure to thrive, which is a condition associated with inadequate parental interaction with the infant or child and the lack of skills or knowledge to feed and care for the child properly. Examples of harmful behavior include intimidation with gestures, yelling, smashing things or destroying the victim's property; threats to harm the child; and isolating the child from family and friends. The child may also exhibit lack of self-esteem, stemming from verbal abuse, excessive demands on the child's performance, and withholding love and affection. Most child victims of psychological maltreatment will exhibit pronounced nervousness, often manifested in habit disorders such as sucking and rocking. They may also self-inflict injuries, such as lip and cheek biting.

Oral Healthcare Professional's Responsibility

The American Dental Association outlines the legal responsibility of the dental practitioner in responding to a suspected case of child maltreatment. The ADA states that the dental practitioner's role is to observe and examine any suspicious evidence that can be ascertained in the office. They should record, per legal and court rules, evidence that may be helpful in the case, including physical

evidence and any comments from questioning or interviews. The dental practitioner must treat dental or orofacial injuries within the treatment expertise of the dentist, referring more extensive treatment needs to a hospital or dental/medical specialist. The dental practitioner should also establish/maintain a professional therapeutic relationship with the family and become familiar with the perioral signs of child abuse and neglect and report suspected cases to the proper authorities, consistent with state law.

The key diagnostic feature of abuse or neglect is a discrepancy between the clinical findings and the history given for the problem by the parent or caregiver.¹⁵ The oral health practitioner needs to be vigilant during interactions with parents in a suspected case of child maltreatment. Most abusive adults usually have no questions and may appear withdrawn or unconcerned.³⁵

Because most parents accompany their injured child to the dental office, it is important in a suspected case to first question both the child and caregiver separately as to what happened and record their responses per verbatim.⁵ In all cases of suspected abuse, complete documentation in the client's records, co-signed by a witness present at the examination, is essential.⁵ The client's records should include the time and date of the examination; description of the injury or injuries, including location, color and size; verbatim responses of the child and caregiver; and any other information the practitioner feels is important. If possible, photographs, X-rays and diagrams should be included.⁵ Children may want to disclose their abuse so it can be stopped, but often they are afraid no one will believe or help them.³⁹

It is the duty of oral healthcare professionals to report their suspicions of child abuse and/or neglect to the appropriate authorities and document their observations in the client's records. They are not to gather evidence to build an abuse or neglect case because, as a legal instrument, the treatment record must document objectively all findings and disclosures made by the client. While the law provides protection for mandated reporters who make their report in good faith, there are also harsh penalties for not reporting abuse, including fines and prison time. Failure by a mandated reporter to report suspected abuse is a misdemeanor in most states.

All oral healthcare professionals should visit their state's Child Protective Services website and/or contact the state bar association for specific information about child abuse and neglect. For a complete list of definitions and reporting requirements, go to the website of the Children's Bureau, Administration for Children and Families, U.S. Department of Health and Human Services, at www.childwelfare.gov.

Conclusion

Approximately 36% of dentists reported they suspected child abuse in one or more of their patients. Astonishingly, 73% of dentists and 69% of dental hygienists did not know where to

report suspected child abuse; 6% of dentists and 17% of dental hygienists could not define child abuse correctly.³ With these alarming numbers, oral health practitioners must be aware of reporting requirements; and they must be competent in history taking, recognizing and maintaining a reporting policy, and implementing procedures in their practices for child abuse and neglect suspicions.

The evaluation and recording of child abuse and neglect is part of the oral healthcare practice, as well as part of a multidisciplinary approach to prevention, investigation and treatment. A serious consequence of non-reporting is that the child would still be at risk and the abuse can continue. The oral health practitioner must uphold his or her legal and ethical responsibility. If there is suspicion, record and report. It may help save a child from further abuse. *///*

Queries about this article can be sent to Dr. Dincer at edincer@hostos.cuny.edu.

REFERENCES

1. U.S. Department of Health and Human Services, Administration of Children, Youth and Families: Child Maltreatment 2009, Washington, DC, 2011, U.S. Government Printing Office.
2. Thomas P. Rise in child abuse called national "epidemic": states in crisis as abuse cases increase in middle class. ABC News, World News Tonight, April 25, 2005.
3. Thomas JE, Straffon L, Inglehart MR. Knowledge and professional experiences concerning child abuse: an analysis of provider and student responses. *Pediatr Dent* 2006; 28:438.
4. Thomas JE, Straffon L, Inglehart MR, Habil P. Milieu in dental school and practice. *J Dent Educ* 2006;70:558.
5. American Dental Hygienist Association: Child abuse: a private family matter? No! ADHA Intouch Oct 2003:4.
6. New York State Legislature, Laws of New York. Article 10 of the Family Court Act. <http://public.leginfo.state.ny.us/menuf.cgi>.
7. Gargiulo RM. Children at Risk: An Interdisciplinary Approach to Child Abuse and Neglect. Goldman RL, Gargiulo RM eds. Austin, TX: Pro-Ed, 1990:21.
8. Vadiakas G, Roberts MW, Dille DCH. Child abuse and neglect: ethical and legal issues for dentistry. *J Mass Dent Soc* 1991; 40:13-15.
9. California Society of Pediatric Dentists. Dental neglect: when to report. *Calif Pediatrician* 1989; fall:31-32.
10. Kellogg N and Committee on Child Abuse and Neglect. Oral and Dental Aspects of Child Abuse and Neglect. *Pediatrics* 2005;116(6):1565.
11. Naidoo S. A profile of the oro-facial injuries in child physical abuse at a children's hospital. *Child Abuse Negl.* 2000;24:521-534.
12. Holowaty R, Stechey FM. Dentistry's Responsibility to Child Abuse. *Paediatrics* Jan 2002;15-25.
13. Wagner GN. Bitemark identification in child abuse cases. *Pediatric dentistry* 1986;8:96-100.
14. Stechey F. Bite marks and cans - child abuse and neglect syndrome. *Ont Dent* 1991;68:19-20.
15. Jessee, SA. Child abuse and neglect: Implications for the dental professional. Continuing Education Course, www.dentalcare.com; revised Dec 2009.
16. Kellogg N, American Academy of Pediatrics, Committee on Child Abuse and Neglect. The evaluation of sexual abuse in children. *Pediatrics* 2005;116:506-512.
17. Stevens-Simon C, Nelligan D, Breese P, Jenny C, Douglas JM Jr. The prevalence of genital human papillomavirus infections in abused and nonabused preadolescent girls. *Pediatrics* 2000;106:645-649.
18. Schlesinger SL, Borbotsina J, O'Neill L. Petechial hemorrhages of the soft palate secondary to fellatio. *Oral Surg Oral Med Oral Pathol* 1975; 40:376-378.
19. Fontana VJ. A physician's view of responsibility in reporting child abuse. *Spec Care Dentist* 1986;6:55-7.
20. Dental hygiene's role as mandated reporters of child abuse. Ontario Dental Hygienist Association: Focus Newsletter; January 2003.

Single Tooth Odontodysplasia

Case Report

Jessica A. Zilo, B.A.; Doron Ringler, D.D.S., M.D.; Louis Mandel, D.D.S.

ABSTRACT

Odontodysplasia (ghost tooth) is an uncommon, nonhereditary developmental condition of unknown origin, affecting both mesodermal and ectodermal elements of the dental organ. To our knowledge, this case is unique in that it is only the second reported case of odontodysplasia affecting a single tooth. Based on clinical, radiographic and histologic findings, we diagnosed this tooth as a ghost tooth.

Regional odontodysplasia (RO) was first reported by Hitchin in 1934.¹ Originally called “shell teeth” by Rushton,² the term “odontodysplasia” was formulated in 1963 by Zegarelli et al.³ Odontodysplasia is an uncommon, nonhereditary developmental condition of unknown origin, affecting both mesodermal and ectodermal elements of the dental organ. It results in an unusual clinical and radiographic hypomineralized appearance of the affected teeth. Abnormalities in dental follicle, pulp, dentin and enamel are evident. Both permanent and deciduous teeth may be affected, and the degree and number of teeth involved can vary from patient to patient.⁴ Affected teeth, which are delayed in eruption, have an irregular shape and are hypomineralized. The ghostly appearance depicted on radiographs is due to this hypomineralization and to a loss in definition between enamel and dentin.⁴

Other conditions that may show similar findings include amelogenesis imperfecta, dentinogenesis imperfecta, dentinal dysplasia and hypophosphatemia.⁵ Odontodysplasia can be differentiated from these other dental conditions in that all layers of the dental organ are affected—enamel, dentin and pulp. Cases of odontodysplasia have been reported as arrested tooth development, unerupted deciduous teeth, localized arrested tooth development, odontogenesis imperfecta, unilateral dental malformation and ghost teeth. The designation “regional” was given to the condition by Pindborg in 1970,⁶ because, typically, the condition affects regional portions of the dentition.

RO does not show any racial predilection, and it affects females more often than males.⁴ The age of presentation may vary, with cases reported in patients as young as 12 months or as old as 26 years.⁵ Generally, the abnormality is localized to the quadrant of one arch; the maxilla is involved twice as frequently as the mandible; and, at times, only a region of a quadrant is affected.^{4,7,8} Odontodysplasia has a predilection for anterior teeth.^{4,9} Some cases of generalized odontodysplasia have been reported in which the entire dentition is involved. In those cases where the deciduous dentition was affected, the succedaneous permanent teeth were also changed.¹⁰ In rare cases of odontodysplasia, a single tooth has been affected.^{4,11}

The most commonly reported complaints related to odontodysplasia are swelling at the site, pain, dental infections, enamel defects, and delayed development and tooth eruption.¹² Diagno-



Figure 1. Panoramic radiograph demonstrates developing mandibular right third molar “ghost tooth” (arrow).

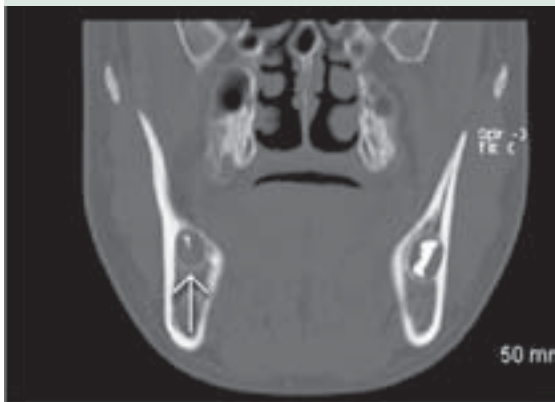


Figure 2. CT scan (no contrast, coronal view). Hypomineralized follicle of mandibular right third molar (arrow).

The most commonly reported complaints related to odontodysplasia are swelling at the site, pain, dental infections, enamel defects, and delayed development and tooth eruption.¹²

sis is typically made on the basis of clinical and radiologic findings and supported by histological findings. Clinically, the teeth appear abnormally pitted and have unusual morphologies. They tend to appear discolored, hypocalcified and misshapen. If teeth are erupted, explorer probing reveals that the hypomineralized enamel is soft and very susceptible to trauma.¹³

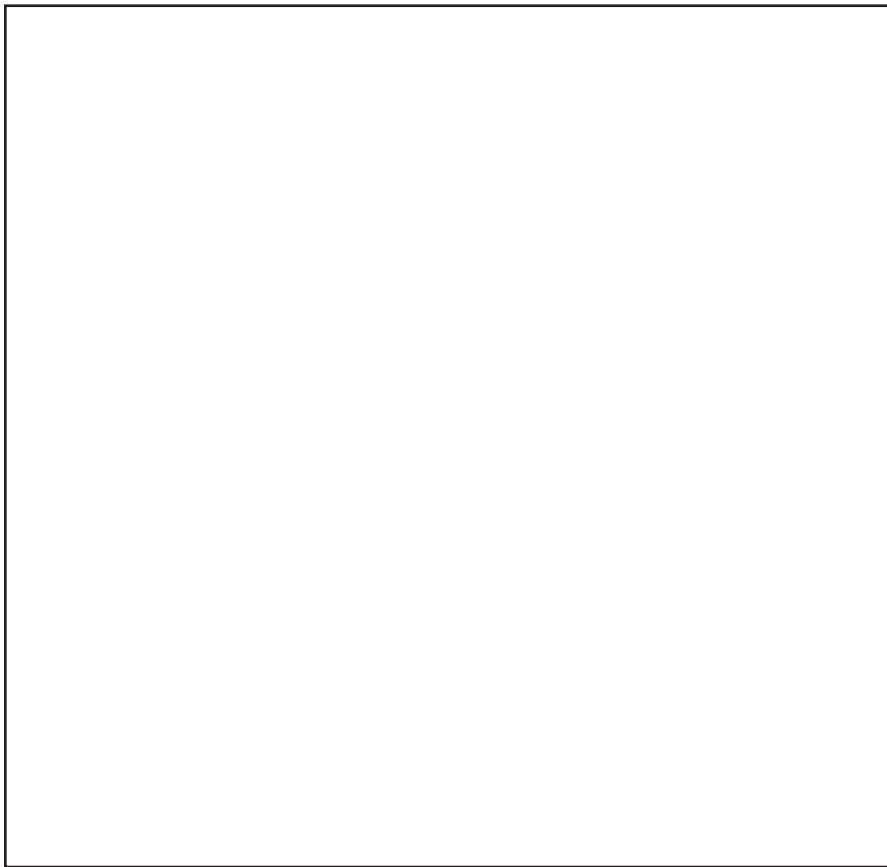
Histologically, all structures of the dental organ are affected. The enamel will display varying degrees of thickness and is hypocalcified with irregular enamel prisms. Areas of cementum-like material have been found to lay on the surface of the enamel.⁵ The dentin is thinner than normal and tends to have large areas of poorly mineralized interglobular dentin.⁴ Clefts within mantle dentin cause bending of adjacent tubules and facilitate bacterial invasion into the pulp.¹² Calcified pulp stones and denticles are frequently found in an enlarged pulp tissue, and a wider apex is usually present. Both free and embedded pulp stones may be found. An enlarged gingiva around the affected teeth may show a parakeratinized surface epithelium with hyperplastic rete pegs.¹³

Universal treatment for odontodysplasia has not been determined. Some clinicians believe that early extraction of the affected teeth is necessary. This therapeutic approach is based on the belief that when odontodysplastic teeth remain in the mouth, there is a greater risk for pathology and infection. Other clinicians argue that removing the teeth at a young age may affect the growth of the alveolar ridge and/or create psychological problems in young patients.⁵

Case Report

A 16-year-old African-American male was referred to Columbia University’s Department of Oral and Maxillofacial Surgery because of an unusual painless dental radiographic finding. The patient was in good medical health, was not currently taking medications and had no known allergies. There was no history of tooth or genetic anomalies in the family. The patient exhibited no facial asymmetries or extraoral abnormalities. The intraoral examination was also within normal limits.

Radiographs taken during a routine dental examination showed an abnormal lucency with some faint opacities in place of the right mandibular third molar (Figure 1). The abnormal



configuration was originally diagnosed as a cyst and a CT scan, without contrast, was requested. A normal-sized but lucent follicle in place of a developing and well-calcified, unerupted right mandibular third molar was seen (Figure 2). A diminished density from hypomineralization of the developing bud was apparent when compared to the normal calcifying process visible in the mandible left third molar. The adjacent trabecular bone was normal. No other abnormalities in the maxillary and mandibular arches were noted.

Based on the image study, a diagnosis of odontodysplasia was suggested. Surgical removal of the dysplastic tooth was performed. A minimal amount of hard tissue was present, but no distinguishable cusp or roots were apparent. The histologic report indicated that the submitted tissue represented a poorly formed, hypomineralized tooth bud and was consistent with a diagnosis of odontodysplasia (ghost tooth).

Summary

To our knowledge, this case is the second reported case of odontodysplasia affecting a single tooth. Based on clinical and radiographic findings, we diagnosed this tooth as a ghost tooth. ✍

Queries about this article can be sent to Dr. Mandel at lm7@columbia.edu.

REFERENCES

1. Hitchin AD. Unerupted deciduous tooth in a youthful 15 1/2. *Br Dent J* 1934; 56: 631-3.
2. Rushton MA. A new form of dental dysplasia. *Oral Surg* 1954;7:543-9.
3. Zegarelli EV, Kutscher AH, Applebaum E, Archard HO. Odontodysplasia. *Oral Surg* 1963;16:187-93.
4. Hamdan MA, Sawair FA, Rajab LD, Hamdan AM, Al-Omari IK. Regional odontodysplasia: a review of the literature and report of a case. *Int J Paediatr Dent* 2004; 14: 363-70.
5. Crawford P, Aldred M. Regional odontodysplasia: a bibliography. *J Oral Pathol Med* 1989;18:251-63.
6. Pindborg JJ. Pathology of the dental hard tissues. Copenhagen: Munksgaard, 1970:120-3.
7. Lustmann J, Klein H, Ulmansky M. Odontodysplasia. Report of two cases and review of the literature. *Oral Surg Oral Med Oral Pathol* 1975;39.5:781-93.
8. Gibbard PD, Lee KW, Winter GB. Odontodysplasia. *Br Dent J* 1973;135:525-32.
9. Fujiwara T, Nakano K, Sobue S, Ooshima T. Simultaneous occurrence of unusual odontodysplasia and oligodontia in the permanent dentition: report of a case. *Int J Paediatr Dent* 2000; 10.4: 341-7.
10. Walton JL, Wiktop CJ, Walker PO. Odontodysplasia. A report of three cases with vascular nevi overlying the adjacent skin of the face. *Oral Surg Oral Med Oral Pathol* 1978;46:676-84.
11. Pullon PA, Miller AS. Ghostlike tooth. *Gen Dent* 1984;32:526.
12. Lowry L, Welbury RR, Soames JV. An unusual case of regional odontodysplasia. *Int J Paediatr Dent* 1992;2:171-6.
13. Mehta DN, Bailoor D, Patel B. Regional odontodysplasia. *J Indian Soc Pedod Prev Dent* 2011; 29.4:323-6.

Titanium Hypersensitivity

A Hidden Threat for Dental Implant Patients?

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ABSTRACT

Titanium and its alloys have been widely used for dental prosthetic devices because of their superior mechanical properties and biocompatibility. However, the incidence of titanium hypersensitivity or allergy is still unknown and the discussion about its existence is ongoing. Unexplained implant failures have also forced dental clinicians to investigate the possibility of titanium hypersensitivity or allergy. This review focuses on the potential of dental implant-related titanium hypersensitivity or allergic reactions. It includes an examination of the existing scientific literature and current knowledge. Evidence-based data and studies related to titanium hypersensitivity in dental implant patients are also discussed.

Titanium (Ti) and Ti alloys have been widely used in several fields of clinical medicine and dentistry during the last three decades. There are also Ti-Aluminum (Al)-vanadium (V) alloys (Ti-Al-V), Ti-Cobalt (TiCo) and other alloys under an assortment of trade names on the market today. Also “pure Ti” may be used in implant materials and spectacle frames.¹ Ti and Ti alloys have an intraosseous use in the medical field.²⁻⁵ In dentistry, Ti and Ti alloy

dental implants have been used with success as root forms that are left under mucosa for several months before they are used to support a prosthesis. Ti alloys also have a wide range of uses in cast denture frameworks or orthodontic brackets.⁶

Ti is a highly reactive metal and a thin, stable protective oxide film layer is formed spontaneously on its surface. It has been claimed that this oxide layer provides a high corrosion resistance and excellent biocompatibility.^{6,7} In a recent in vitro corrosion study, it was shown that a pure Ti surface is instantly passivated in contact with salivary proteins and exhibits a highly stable behavior.⁸ Because of these favorable properties, it has been previously stated that as a biologically and chemically inert material, Ti does not cause reactions in the body, with specific emphasis on allergic reactions.^{6,9-11} The low dissolution rate and near chemical inertness of Ti dissolution products allow bone to thrive and, therefore, osseointegrate with Ti.⁶ Therefore, Ti is generally considered the material of choice for both dental and orthopedic implantation.

Contrary to the belief that Ti and Ti alloys are non-allergenic, many questions have been raised about its biocompatibility. Ti hypersensitivity has been described in deodorant and cosmetics users,^{9,12} after local reactions to pacemakers,^{11,13-18} in patients with bronchopulmonary pathology through exposure to Ti powder,¹⁹⁻²³ in monitored hip prosthesis patients,²⁴ in failed hip and knee prostheses^{25,26} and in patients with Ti plate osteosynthesis.^{27,28} Although Ti and Ti alloy implants have corrosion

rates that are markedly less than other metallic implants, they do release Ti into the body.⁶ Degradation products of metallic biomaterials, including Ti, may mediate metal hypersensitivity or allergic reactions in the body. Many clinical reports of incompatibility reactions regarding contact dermatitis or granulomatous reactions to Ti materials, including dental implants, have been published.^{9,13,17-20,26,27,30-33} Discussion about the existence of Ti allergy is ongoing.

This article describes the potential mechanism of possible hypersensitivity reactions caused by dental implant-related Ti and Ti alloys in the human body and examines current scientific knowledge about Ti hypersensitivity.

Mechanism of Hypersensitization

An allergic reaction, or hypersensitization, is defined as an excessive immune reaction that occurs when coming into contact with a known antigen.³⁴

A hypersensitivity reaction to a metal depends upon the presence of released ions following ingestion, skin or mucosal contact, or from implant corrosion processes.^{35,36} Identification of the exact process responsible for released metal ion levels and their clinical effects are difficult to assess, depending on such factors as the material, the environment or clinical symptoms.³⁶⁻³⁹

Metal ions are released from prostheses by numerous mechanisms, including corrosion, wear and mechanically assisted electrochemical processes, such as fretting corrosion, stress corrosion and corrosion fatigue. Released ions or the implant metal degradation products bind with native proteins,³⁶ acting as haptenic antigens (allergens) and cause hypersensitivity reactions by activating the immune system.^{36,40}

Placing permanent metal dental implants might provoke such hypersensitivity reactions. Hypersensitivity might be either an immediate (within minutes) humoral response (initiated by an antibody or antibody-antigen complexes of Type I, II and III reactions) or a delayed (within hours to days) T cell-mediated response (Type IV reaction) after exposure to the immunogen.¹⁰ Implant-related metal hypersensitivity reactions are reported to be generally of Type IV delayed hypersensitivity.^{36,40} In cases indicating hypersensitivity reactions susceptible to Ti implants, delayed Type IV hypersensitivity reactions have previously been reported.^{28,31,41} Type IV hypersensitivity reactions, with Ti particles inside the macrophage lysosomes have been shown in previous reports.^{3,27,29,30,42-44}

In cases of Ti hypersensitivity or allergy, the medical literature has described cases showing symptoms of urticaria, eczema, edema, redness and pruritus of the skin or mucosa, either local-



ized, at distant sites or generalized.^{10,12,16,28,45-48} In special cases, allergic reactions have been associated with more serious problems, such as atopic dermatitis,¹² impaired healing of fractures,²⁸ pain, necrosis and weakening of orthopedic implants⁴⁵ and tolerance phenomena.⁴⁷ Facial erythema^{19,27,43} and non-keratinized, edematous, proliferative hyperplastic tissue³⁰ have been also reported in dental implant patients.

Animal studies have also shown that after placing dental implants, an increased presence of Ti ions both in peri-implant tissues^{49,50} and in the regional lymph nodes and in the lungs have been found.^{3,49,51,52} In one of the studies where two implants had failed without any infection, the related patients revealed a 2.2- to 3.8-times higher presence of Ti in the lungs, and 7- to 9.4-times higher in the lymph nodes, which were enlarged.³

Due to its poor solubility,^{29,53} a significant rise of Ti levels in blood was not detected when three dental implants were placed in humans.⁴ On the other hand, a significant rise of Ti levels in blood has been shown in patients with failed, loose Ti hip prosthesis, compared with controls.³⁹

In mucosa, the number of Langerhans' cells, which act as antigen-presenting cells, is much smaller;^{40,47,54} thus, oral mucosa must be exposed to allergen concentrations 5- to 12-times greater than the skin in order to cause tissue reactions. Concentrations of between 100 ppm and 300 ppm have been discovered in peri-implant tissues, often accompanied by discolorations, which can be well tolerated.^{13,27,36,55-57} Moreover, contact between the metal and the host is not continuous, as the implant and prosthetic structures in the oral cavity are coated with a layer of salivary glycoproteins, which act as a protective barrier.^{8,54}

Diagnosis of Ti Allergy

The diagnosis of metal allergy is typically based on the patient's medical record, clinical findings and results from epicutaneous patch tests.^{54,58} It has been suggested that the susceptibility to metal is probably genetic.⁴⁷

Metal sensitivity is conventionally diagnosed using a patch-test where an allergen is applied to the skin for a few days. A positive response is considered when an erythematous reaction is observed. However, this test is unreliable, as it may give false-positive or false-negative results because of the exceptional protective and sealing qualities of the skin against direct contact.⁵⁹ From an immunological point of view, oral mucosa and the skin behave very differently due to the influence of specific immune systems for each, such as skin-associated lymphoid tissue and mucosa-associated lymphoid tissue. A practical application is that the number of Langerhans' cells, acting as antigen-presenting cells, is much smaller in mucosa.^{40,47,54}

Epicutaneous tests, which are considered standard procedures,⁴⁷ are widely used to assess Type IV hypersensitivity reactions to Ti.^{18,19,28,29,32,34,35,40,46,58} These tests are acceptable as

proof of sensitivity to a specific allergen⁵⁴ and can also be used in combination with the intra-dermal inoculation of the antigen¹⁸ to assess Type I hypersensitivity reaction.

Blood tests have also been used, the most common being the lymphocyte transformation test (LTT),^{18,25,28,36,37,48,57,60} the memory lymphocyte immunostimulation assay (MELISA)⁴⁸ and the lymphocyte migration inhibition test (LMI or LIF).^{24,25,36}

Dentists should consider that most of their patients can suffer from multiple allergies and individuals with previous reactions to metals or jewelry have a greater risk of developing a hypersensitivity reaction to a metal implant.³⁶

Discussion

The discussion about the existence of Ti allergy or hypersensitivity is a popular one in dental implantology, because there are few clinical reports of dental implant failures arising from susceptibility to Ti.^{19,27,30,41,43,61} These reports were only suggestions, not confirmed by skin or blood tests. A recent clinical study⁶² reported a positive hypersensitivity reaction to Ti in 9 patients out of 1,500 with a prevalence of 0.6% in the post-implant insertion period, by the use of epicutaneous tests.

Scientific evidence of the clinical features of metal allergy should be based on cohort studies, case series and isolated clinical cases. It is estimated that cutaneous hypersensitivity to metals ranges between 10% and 15%.^{36,37} Studies that have used epicutaneous tests have indicated that the percentage of individuals with Ti hypersensitivity was 1% to 3%.^{34,46} Another study that used LMI blood test reported a finding of 4%,²⁴ while those performed with the MELISA test fluctuated between 1.5% and 28%, indicating that an increase in sensitization was observed in the majority of the recent studies.⁴⁸ An *in vitro* study reported no significant differences between MELISA and conventional LTT in terms of sensitivity and specificity and suggested that these tests are not useful in the diagnosis of metal-related contact allergy because of the high number of false-positive results.⁶³ However, in this study, no direct comparison in a single patient was given to directly compare these two tests. The only thing shown was the mean for the whole group, which we think is not a precise way to present such data. Direct comparison between MELISA and LTT has been described in a more recent study,⁴⁸ which showed data on the effect of the lymphocyte concentration in LTT tests. MELISA uses one million cells per well, while conventional LTT uses 200,000 cells per well. Thus, the sensitivity in MELISA was found to be much higher. Although MELISA is the only standardized and widely published LTT test, it is not yet approved as routine for testing Ti hypersensitivity.⁶³

Many of the investigations on the Ti hypersensitivity topic have been carried out with Ti orthopedic implants; therefore, it is not certain to what extent the findings should be extrapolated to the oral cavity and dental implants. Since reports of

Ti hypersensitivity or related pathology after dental implant insertion are scarce, the percentage for the possibility of a dental implant-related hypersensitivity reaction is suspected to be low.²⁹ Although there are various case reports with symptoms reminiscent of Ti hypersensitivity after insertion of orthopedic metal implants, the number of reported cases for dental implant patients is limited. This situation might depend upon the differences between dental or orthopedic implants. The intraosseous contact surface is much smaller in dental implants than in orthopedic implants,^{2,64} which may be particularly important when considering that bone has a very low reactivity potential.⁴⁰ Besides, the mechanisms that lead to degradation or release of Ti ions from orthopedic implants, such as wear or fretting corrosion, is not valid for dental implants.

The failure of dental implants has been widely studied,⁶⁵⁻⁶⁷ as has their use in compromised patients,^{68,69} with the primary causes being infection, impaired healing and overloading.⁶⁷ However, not all failures can be explained by these three factors; some are more difficult to explain, such as implant spontaneous rapid exfoliation⁷⁰ and other situations in which the effect of a possible hypersensitivity reaction to Ti should be taken into consideration. It was reported that unexplained pain, troublesome skin rashes,

eczema or dermatitis, impaired wound healing and sterile osteomyelitis can be observed^{28,36} and that Ti hypersensitivity could be responsible for unexplained successive failure cases of dental implants in some patients (named “cluster patients”).⁷¹ Considering the large numbers of dental implants inserted each year in the world, the extremely low number of clinical reports seems to suggest a negligible threat. As a routine practice, a failed dental implant is substituted with a new one either immediately or after a certain waiting period. Although there are numerous clinical studies reporting implant failures, probable causes of failures and percentages of implant success, there are no studies reporting symptoms of a hypersensitivity reaction after the replacement of a dental implant. On the other hand, there are no reported cases where all inserted implants somehow failed. In a case having true Ti hypersensitivity, it can be expected that all inserted dental implants would fail.

Considering the clinical experience in our university clinic, reevaluating the roughly 1,500 implants placed in the last decade, no exact hypersensitivity case has been identified. All failed implants have been replaced by new implants; they have shown a noteworthy 100% success rate. In a hypersensitivity condition, those and also other implants in the same patient would have

failed a second time. However, the probability that Ti can elicit a hypersensitivity reaction in patients still cannot be neglected. It is advisable that clinicians carry out allergy tests for such patients before placing Ti and Ti alloyed dental implants. It should be pointed out that there is a need for long-term clinical and radiographic follow-up of all dental implant patients with a history of metal allergy.

There are no epidemiological studies on the prevalence rate of Ti hypersensitivity in the general population, although the fact that external exposure to Ti is so important. Immune sensitivity may manifest at some distance from the implant, and may even demonstrate a systemic reaction that remains unnoticed or may be incorrectly interpreted.^{24,72} A hypersensitization reaction may take months or even years to develop⁴⁵ and, along with the infrequency and uncertainty of the symptomatic expression, it might be hard to recognize.^{36,37} This situation creates difficulty in performing studies about Ti allergy. Unless there are reports or case series indicating such hypersensitivity reactions, the topic will remain controversial. Further clinical studies are suggested for this purpose.

Conclusion

Since evidence-based data or studies related to Ti hypersensitivity in dental implant patients is lacking, Ti as a dental implant material cannot currently be considered a clinical threat. However, the probability that Ti or Ti alloy dental implants can elicit a hypersensitivity reaction should always be kept in mind. When unexplained successive failures of dental implants are encountered, the patient should also be medically consulted for a hypersensitivity reaction to Ti. ❖

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REFERENCES

1. Forte G, Petrucci F, Bocca B. Metal allergens of growing significance: epidemiology, immunotoxicology, strategies for testing and prevention. *Inflamm Allergy Drug Targets* 2008;7:145-162.
2. Akagawa Y, Abe Y. Titanium: the ultimate solution or an evolutionary step? *Int J Prosthodont* 2003;16:28-29.
3. Frisken KW, Dandie GW, Lugowski S, Jordan G. A study of titanium release into body organs following the insertion of single threaded screw implants into the mandibles of sheep. *Aust Dent J* 2002;47:214-217.
4. Smith DC, Lugowski S, McHugh A, Deporter D, Watson PA, Chipman M. Systemic metal ion levels in dental implant patients. *Int J Oral Maxillofac Implants* 1997;12:828-834.
5. Sykaras N, Iacopino AM, Marker VA, Triplett RG, Woody RD. Implant materials, designs, and surface topographies: their effect on osseointegration. A literature review. *Int J Oral Maxillofac Implants* 2000;15:675-690.
6. Powers JM, Sakaguchi RL. Dental Implants. In Powers JM, Sakaguchi RL eds. *Craig's Restorative Dental Materials*. 12th ed. pp 555-569. Philadelphia: C.V. Mosby Co. 2006
7. Sarmiento-González A, Encinar JR, Marchante-Gayón JM, Sanz-Medel A. Titanium levels in the organs and blood of rats with a titanium implant, in the absence of wear, as determined by double-focusing ICP-MS. *Anal Bioanal Chem* 2009;393:335-343.
8. Bilhan H, Bilgin T, Cakir AF, Yuksel B, Von Fraunhofer JA. The effect of mucine, IgA, urea, and lysozyme on the corrosion behavior of various non-precious dental alloys and pure titanium in artificial saliva. *J Biomater Appl* 2007;22:197-221.
9. Basketter DA, Whittle E, Monk B. Possible allergy to complex titanium salt. *Contact Dermatitis* 2000; 42:310-311.

10. Hensten-Petersen A. Casting alloys: side effects. *Adv Dent Res* 1992;6:38-43.
11. Syburra T, Schurr U, Rahn M, Graves K, Genoni M. Gold-coated pacemaker implantation after allergic reactions to pacemaker compounds. *Europace* 2010;12:749-750.
12. Tamai K, Mitsumori M, Fujishiro S, et al. A case of allergic reaction to surgical metal clips inserted for postoperative boost irradiation in a patient undergoing breast conserving therapy. *Breast Cancer* 2001;8:90-92.
13. Abdallah HI, Balsara RK, O'Riordan AC. Pacemaker contact sensitivity: clinical recognition and management. *Ann Thorac Surg* 1994;57:1017-1018.
14. Akaki T, Dekio S. Pacemaker dermatitis: report of a case. *Environ Dermatol* 2002;9:153-157.
15. Buchet S, Blanc D, Humbert P, et al. Pacemaker dermatitis. *Contact Dermatitis* 1992; 26: 46-47.
16. Peters MS, Schroeter AL, van Hale HM, Broadbent JC. Pacemaker contact sensitivity. *Contact Dermatitis* 1984;11:214-218.
17. Verbov J. Pacemaker contact sensitivity. *Contact Dermatitis* 1985;12:173.
18. Yamauchi R, Morita A, Tsuji T. Pacemaker dermatitis from titanium. *Contact Dermatitis* 2000; 42:52-53.
19. Bircher AJ, Stern WB. Allergic contact dermatitis from "titanium" spectacle frames. *Contact Dermatitis* 45: 2001; 244-245.
20. Breton JL, Louis JM, Garnier G. Asthma caused by hard metals: responsibility of titanium. *Presse Med* 1992;21:997.
21. Nemery B. Metal toxicity and the respiratory tract. *Eur Respir J* 1990;3:202-219.
22. Redline S, Barna BP, Tomaszewski JF Jr, Abraham JL. Granulomatous disease associated with pulmonary deposition of titanium. *Br J Ind Med* 1986;43:652-656.
23. Shirakawa T, Kusaka Y, Fujimura N et al. Occupational asthma from cobalt sensitivity in workers exposed to hard metal dust. *Chest* 1989;95:29-37.
24. Merritt K, Rodrigo JJ. Immune response to synthetic materials. Sensitization of patients receiving orthopaedic implants. *Clin Orthop Relat Res* 1996;326:71-79.
25. Cook SD, McCluskey LC, Martin PC, Haddad RJ Jr. Inflammatory response in retrieved noncemented porous-coated implants. *Clin Orthop Relat Res* 1991;264:209-222.
26. Lalor PA, Gray AB, Wright S, Railton GT, Freeman MA, Revell PA. Contact sensitivity to titanium in a hip prosthesis? *Contact Dermatitis* 1990;23: 193-194.
27. Matthew I, Frame JW. Ultrastructural analysis of metal particles released from stainless steel and titanium miniplate components in an animal model. *J Oral Maxillofac Surg* 1998;56:45-50.
28. Thomas P, Bandl WD, Maier S, Summer B, Przybilla B. Hypersensitivity to titanium osteosynthesis with impaired fracture healing, eczema, and T-cell hyperresponsiveness in vitro: case report and review of the literature. *Contact Dermatitis* 2006;55:199-202.
29. Lalor PA, Revell PA, Gray AB, Wright S, Railton GT, Freeman MA. Sensitivity to titanium. A cause of implant failure? *J Bone Joint Surg Br* 1991;73:25-28.
30. Mitchell DL, Synnot SA, VanDecreek JA. Tissue reaction involving an intraoral skin graft and CP titanium abutments: a clinical report. *Int J Oral Maxillofac Implants* 1990; 5:79-84.
31. Müller K, Valentine-Thon E. Hypersensitivity to titanium: clinical and laboratory evidence. *Neuro Endocrinol Lett* 2006;27:31-35.
32. Suhonen R, Kanerva L. Allergic contact dermatitis caused by palladium on titanium spectacle frames. *Contact Dermatitis* 2001;44:257-258.
33. Viraben R, Boulinguez S, Alba C. Granulomatous dermatitis after implantation of a titanium-containing pacemaker. *Contact Dermatitis* 1995;33:437.
34. Okamura T, Morimoto M, Fukushima D, Yamane G. A Skin Patch Test for the Diagnosis of Titanium Allergy. *J Dent Res* 1999;78:1135.
35. Ahnlied I, Bjorkner B, Bruze M, Moller H. Exposure to metallic gold in patients with contact allergy to gold sodium thiosulfate. *Contact Dermatitis* 2000;43:344-350.
36. Hallab N, Merritt K, Jacobs JJ. Metal sensitivity in patients with orthopaedic implants. *J Bone Joint Surg Am* 2001;83:428-436.
37. Hallab NJ, Mikecz K, Vermes C, Skipor A, Jacobs JJ. Differential lymphocyte reactivity to serum-derived metal-protein complexes produced from cobalt-based and titanium-based implant alloy degradation. *J Biomed Mater Res* 2001; 56:427-436.
38. Iavicoli I, Falcone G, Alessandrelli M et al. The release of metals from metal-on-metal surface arthroplasty of the hip. *J Trace Elem Med Biol* 2006;20:25-31.
39. Jacobs JJ, Skipor AK, Patterson LM et al. Metal release in patients who have had a primary total hip arthroplasty. A prospective, controlled, longitudinal study. *J Bone Joint Surg Am* 1998;80:1447-1458.
40. Schramm M and Pitto RP. Clinical relevance of allergological tests in total hip joint replacement. In Willmann G, Zweymüller K, eds. *Bioceramics in Hip Joint Replacement*. New York: Thieme, 2000. pp 101-106
41. Egusa H, Ko N, Shimazu T, Yatani H. Suspected association of an allergic reaction with titanium dental implants: a clinical report. *J Prosthet Dent* 2008;100:344-347.
42. Katou F, Andoh N, Motegi K, Nagura H. Immuno-inflammatory responses in the tissue adjacent to titanium miniplates used in the treatment of mandibular fractures. *J Craniomaxillofac Surg* 1996;24:155-162.
43. Matthew I, Frame JW. Allergic responses to titanium. *J Oral Maxillofac Surg* 1998;56: 1466-1467.

44. Revell PA, Lalor PA. Massive exposition to titanium, but without sensitization. *Acta Orthop Scand* 1995;66:484.
45. Haug RH. Retention of asymptomatic bone plates used for orthognathic surgery and facial fractures. *J Oral Maxillofac Surg* 1996;54:611-617.
46. Lhotka CG, Szekeres T, Fritzer-Szekeres M et al. Are allergic reactions to skin clips associated with delayed wound healing? *Am J Surg* 1998; 176:320-323.
47. Thomas P. Allergological aspects of implant biocompatibility. In Willmann G, Zweymüller K, eds. *Bioceramics in Hip Joint Replacement*. New York: Thieme, 2000. pp 117-121.
48. Valentine-Thon E, Schiwara HW. Validity of MELISA for metal sensitivity testing. *Neuro Endocrinol Lett* 2003; 24:57-64.
49. Brune D. Metal release from dental biomaterials. *Biomaterials* 1986;7:163-175.
50. Wennerberg A, Ide-Ektesabi A, Hatkamata S et al. Titanium release from implants prepared with different surface roughness. *Clin Oral Implants Res* 2004;15:505-512.
51. Schliephake H, Reiss G, Urban R, Neukam FW, Guckel S. Metal release from titanium fixtures during placement in the mandible: an experimental study. *Int J Oral Maxillofac Implants* 1993;8:502-511.
52. Weingart D, Steinemann S, Schilli W et al. Titanium deposition in regional lymph nodes after insertion of titanium screw implants in maxillofacial region. *Int J Oral Maxillofac Surg* 1994;23:450-452.
53. Bianco PD, Ducheyne P, Cuckler JM. Local accumulation of titanium released from a titanium implant in the absence of wear. *J Biomed Mater Res* 1996;31:227-234.
54. Bass JK, Fine H, Cisneros GJ. Nickel hypersensitivity in the orthodontic patient. *Am J Orthod Dentofacial Orthop* 1993;103:280-285.
55. Parr GR, Gardner LK, Toth RW. Titanium: the mystery metal of implant dentistry. Dental materials aspects. *J Prosthet Dent* 1985;54:410-414.
56. Torgersen S, Gilhuus-Moe OT, Gjerdet NR. Immune response to nickel and some clinical observations after stainless steel mini plate osteosynthesis. *Int J Oral Maxillofac Surg* 1993;22:246-250.
57. Torgersen S, Gjerdet NR, Erichsen ES, Bang G. Metal particles and tissue changes adjacent to miniplates. A retrieval study. *Acta Odontol Scand* 1995;53:65-71.
58. Kusy RP. Clinical response to allergies in patients. *Am J Orthod Dentofacial Orthop* 2004;125:544-547.
59. Nasser S. Orthopedic metal immune hypersensitivity. *Orthopedics* 2007;30:89-91.
60. Carando S, Cannas M, Rossi P, Portigliatti-Barbos M. The lymphocytic transformation test (L.T.T.) in the evaluation of intolerance in prosthetic implants. *Ital J Orthop Traumatol* 1985;11:475-481.
61. Preez LA, Bütow KW, Swart TJ. Implant failure due to titanium hypersensitivity/allergy? Report of a case. *SADJ* 2007; 62: 22, 24-25.
62. Sicilia A, Cuesta S, Coma G et al. A. Titanium allergy in dental implant patients: a clinical study on 1500 consecutive patients. *Clin Oral Implants Res* 2008;19:823-835.
63. Cederbrant K, Hultman P, Marcusson JA, Tibbling L. In vitro lymphocyte proliferation as compared to patch test using gold, palladium and nickel. *Int Arch Allergy Immunol* 1997; 112: 212-217.
64. Brunski JB, Puleo DA, Nanci A. Biomaterials and biomechanics of oral and maxillofacial implants: current status and future developments. *Int J Oral Maxillofac Implants* 2000;15: 15-46.
65. Esposito M, Hirsch J, Lekholm U, Thomsen P. Differential diagnosis and treatment strategies for biologic complications and failing oral implants: a review of the literature. *Int J Oral Maxillofac Implants* 1999;14:473-490.
66. Esposito M, Lausmaa J, Hirsch JM, Thomsen P. Surface analysis of failed oral titanium implants. *J Biomed Mater Res* 1999;48:559-568.
67. Esposito M, Thomsen P, Ericson LE, Lekholm U. Histopathologic observations on early oral implant failures. *Int J Oral Maxillofac Implants* 1999;14:798-810.
68. van Steenberghe D. The use of oral implants in compromised patients. *Periodontol* 2000 2003; 33:9-11.
69. van Steenberghe D, Quirynen M, Molly L, Jacobs R. Impact of systemic diseases and medication on osseointegration. *Periodontol* 2000 2003; 33:163-171.
70. Deas DE, Mikotowicz JJ, Mackey SA, Moritz AJ. Implant failure with spontaneous rapid exfoliation: case reports. *Implant Dent* 2002;11:235-242.
71. Evrard L, Waroquier D, Parent D. Allergies to dental metals. Titanium: a new allergen. *Rev Med Brux* 2010;31:44-49.
72. Merritt K, Brown SA. Distribution of cobalt chromium wear and corrosion products and biologic reactions. *Clin Orthop Relat Res* 1996;329:233-243.

Pleomorphic Adenoma of the Palate in a Child

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ABSTRACT:

Presented is a pleomorphic adenoma of the palate in a 12-year-old boy. Pleomorphic adenoma is usually found in adults and is rarely found in patients under 20 years of age. We present initial exam, diagnosis, treatment and a review of literature.

Pleomorphic adenoma (mixed tumor) is a benign, epithelial-derived tumor composed of cells that demonstrate both epithelial and mesenchymal differentiation. It is the most common neoplasm of salivary gland origin. It occurs in both the major and minor salivary glands. The most common minor salivary gland (intraoral) site for the pleomorphic adenoma is the palate, with equal incidence in both the hard and soft palate. Other locations of intraoral pleomorphic adenoma include the upper lip and buccal mucosa. Mixed tumors are usually solitary, but, occasionally, a second tumor is present. Pleomorphic adenoma is usually found in adults and rarely found in patients under the age of 20.

Case Report

A 12-year-old male was seen initially by his general dentist. He had a two-month history of a slowly growing, painless mass in the right hard palate. The patient was referred to our oral and maxillofacial surgery department for further evaluation and treatment.

Physical exam revealed a 2.5 cm x 2.5 cm smooth, firm mass in the right hard palate extending from the maxillary right canine

to the distal of the maxillary right first molar (Figure 1). The patient denied tenderness, discomfort, sensory disturbance or fever. All teeth were vital, with no mobility. There were no signs of infection, inflammation or ulceration.

A panoramic radiograph showed a hint of a radiolucency of the right palate. No clear bony defect was noted on the panorex. A computed tomography (CT) scan of the maxilla was obtained. Axial, coronal and sagittal cuts, showed a tumor of the right hard palate (Figure 2). There was bony erosion of the palate extending to the floor of the nose, with no violation of the nasal cavity. Incisional biopsy was performed in the middle of the lesion and a specimen was sent for histopathologic evaluation. The biopsy yielded a diagnosis consistent with pleomorphic adenoma.

Preoperative workup included complete blood count and coagulation studies. No other studies were performed.

The lesion was excised under general anesthesia with nasotracheal intubation. The incision was made with a clear, one-half centimeter margin around the tumor, down through periosteum to bone. The entire neoplasm was removed, including the periosteum and overlying palatal mucosa (Figure 3). Peripheral ostectomy was performed within the bony cavity and the greater palatine foramen due to extension of the tumor into the canal. There was no communication between the oral cavity and the nose. Good hemostasis was obtained. The surgical site was packed with Nu Gauze, and a prefabricated, soft omnivac surgical stent was inserted for two weeks postoperatively for patient comfort.



Figure 1. Initial presentation. 2.5 x 2.5 posterior right palatal mass.



Figures 2A. and B. Axial and coronal CT cuts showing right palatal mass with bony erosion and no communication with nose or maxillary sinus.



Figure 3A. Excision of PA with .5-1 cm margins and resulting bony crypt.

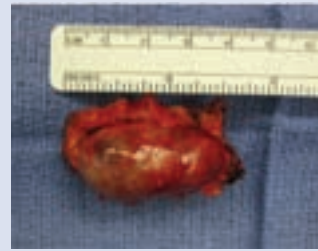


Figure 3B. Surgical specimen.

Macroscopically, the excised tumor consisted of a red-gray mass measuring 3.0 cm x 2.5 cm x 1.5 cm and covered by palatal mucosa on one side. Dissection showed a tan-gray cut surface with areas of myxoid degeneration.

The pathology report noted an encapsulated neoplasm showing variably cellular areas with epithelial and myoepithelial cells and chondromyxoid cells. The overall features are consistent with a cellular pleomorphic adenoma (Figures 4A,B).

The patient's last follow-up visit was six months postoperatively. The surgical site was well healed with bone and soft tissue fill at the surgical site. There was no evidence of recurrence (Figure 5).

Discussion

Pleomorphic adenoma is a mixed salivary gland tumor originating from the epithelial and mesenchymal cell components. It is usually found in adults and rarely found in patients under the age of 20. It is the most common neoplasm of salivary gland origin, constituting about 90% of all salivary gland sites: 61% of major gland tumors and 54% of minor gland tumors. The most common intraoral site of pleomorphic adenoma is the palate, with nearly equal incidence between hard and soft palates.

In a review of current English literature, Daniels et al., found 16 cases of juvenile palatal pleomorphic adenoma involving patients age 18 years and younger. These 16 patients included 9 females and 7 males, with the age range of 5 to 17 years. Of the 16 cases, 7 cases of the juvenile palatal pleomor-

phic adenoma occurred in patients 10 years of age and younger. In Japanese literature, Yamamoto et al. found 8 cases (7 female and 1 male) of juvenile palatal pleomorphic adenoma in patients age 18 years and younger. Of these 8 cases, 4 were females ages 10 years and younger and 4 (1 male and 3 female) were ages 11 years to 18 years.

Pleomorphic adenomas are usually painless, slow-growing tumors. However, cases where tumors exhibit rapid growth have been reported.¹⁻³ Lopez-Cedrum et al.² reported a case of palatal pleomorphic adenoma in a 16-year-old male patient that was noted only two weeks before his presentation. De Courten et al.¹ reported a case in a 10-year-old female who gave a history of five to six weeks of palatal swelling. Our patient, reported in this case, had a two-month history of palatal swelling before seeking treatment. During that time period there was a gradual increase in the size of the tumor.

PAs are usually asymptomatic, although a few cases have exhibited ulceration and bleeding, usually as a result of trauma.^{1,3,4} At times, the tumor can cause an erosion of the palatal bone.^{1,5} CT scans of our case showed the pleomorphic adenoma embedded in a deep cavity in the palate due to pressure erosion of the growing tumor. Galich⁴ reported a case of a 12-year-old girl complaining of pain and bleeding from an ulcerated pleomorphic adenoma that she had tolerated for 18 months. Shabaan et al. reported a case of palatal pleomorphic adenoma with ulcerated surface in a 9-year-old boy.

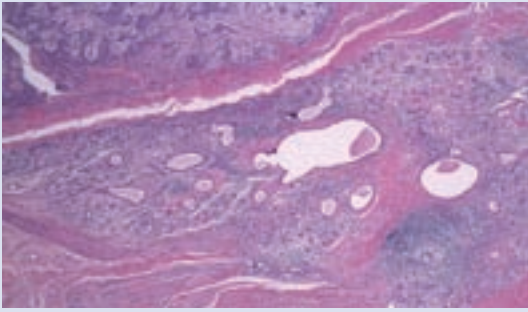


Figure 4A. Low-power photomicrograph demonstrating portion of encapsulated tumor composed of islands of epithelial cells set in loose myxoid stroma. Degenerating regional mucous gland lobules are noted adjacent to tumor.

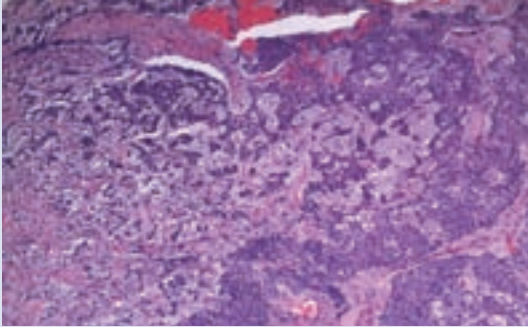


Figure 4B. Medium-power view demonstrating ductal structures of various sizes and small islands and sheets of epithelial cells set in background of myxoid stroma. Fibrous septa are noted within stroma.



Figure 5. Healing at 6 weeks postop.

The diagnostic studies for salivary gland tumors include ultrasound, CT and magnetic resonance imaging (MRI). These are useful methods in determining the size of the lesion and verifying involvement of surrounding anatomic structures.^{1,6-8} Plain film X-rays and hematologic study show no benefit in the diagnosis of salivary gland tumor of the palate.¹

Ishii et al.,⁸ in a study of ultrasonography in the diagnosis of palatal tumors, considered it to be the best initial diagnostic technique for evaluating palatal masses due to its simple, rapid and non-invasive technique. It is a useful technique for preoperatively evaluating patients with small tumors (<3 cm in diameter). However, they recommend that when a palatal tumor is large (>3 cm) or is suspected to be malignant, comparative evaluation by CT or MRI be performed. CT and MRI can both provide important information on the location, size and extension of the tumor into the surrounding superficial and deep hard and soft tissues. CT is superior when evaluating bone, especially in diagnosing erosion and perforation of the bony palate and possible involvement of the nasal cavity or maxillary sinus.^{4,9} MRI, with its high resolution for soft tissue, provides better definition of extension through the tumor-muscle interface and indicates the degree of encapsulation. As in our case, the CT scans showed the extent of the lesions, including the degree of encapsulation and deep erosion of the palatal bone up through the greater palatine foramen. Panoramic radiograph was not helpful in our case.

Our definitive diagnosis of this palatal swelling was obtained by incisional biopsy. Biopsy of salivary gland tumors

has been controversial because of the tendency for incisional biopsies to seed surrounding tissues with affected cells, leading to local recurrence. For this reason, excisional biopsy is recommended, particularly in the major salivary glands.⁹ Because of the possibility of seeding cells during biopsy, it is recommended that incisional biopsy, if required, be performed at the center of the lesion rather than at the margins. Another option for salivary lesions in the major salivary glands, lips and buccal mucosa is fine needle aspiration (FNA). Although not completely reliable, up to 80% accuracy has been claimed. Surgical treatment performed for palatal tumors can vary greatly depending on the diagnosis; thus, a histologic diagnosis is considered essential to management of these lesions.⁹

Treatment of palatal pleomorphic adenoma in children is the same as in adults. Surgical treatment includes wide local excision and careful dissection of the encapsulated mass, including periosteum and palatal mucosa, away from the bony crypt. Care must be taken to prevent any incomplete excision or rupture of the capsule that would leave residual tumor cells. Even though PAs do not perforate the periosteum, curettage or peripheral ostectomy of the surrounding bone is useful if residual tissue is suspected.^{1,2,7,9} A prefabricated surgical splint can provide comfort postoperatively during the granulation phase of healing. Our patient was treated with complete excision of the encapsulated tumor and palatal tissue, followed by peripheral ostectomy of the bony crypt, including the greater palatine fora-

men. A prefabricated, soft omnivac splint was worn to protect the surgical site and diminish postop pain.

There is limited data, but recurrence after surgical treatment of palatal pleomorphic adenoma in children and adolescents has rarely been reported. There was no information on follow-up and recurrence rates in studies by Fonseca et al.⁶ and Yamamoto et al.¹⁰ Of the 16 cases of PA of the palate in children and adolescents reviewed in the English literature, only two recurring cases were reported, both within five years of treatment. The most likely reasons for recurrence are seeding, incomplete excision, rupture of the capsule and cutting through the microscopic extracapsular projections, all of which can leave tumor cells behind.

Overall, the prognosis for pleomorphic adenomas of minor salivary glands such as the palate is considered to be better than the outlook for those arising in the parotid gland. The parotid gland is intimately involved with multiple vital structures, making adequate surgical excision of the tumor more difficult. Also, the texture of the parotid gland makes excision of the encapsulated tumor more complicated. The tumor in the palate arising from the minor salivary gland is usually managed more easily by surgery. Because of the location and lack of vital structures in the palate, wide local excision is less technique-sensitive. However, recurrences in the palate can be

serious because of the greater palatine foramen and proximity to the cranial base.⁹

Recurrences usually manifest about five years postoperatively. Therefore, these patients should have lengthy follow-up appointments to detect any recurrence, which may occur more than five years after primary excision. ✍

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REFERENCES

1. De Courten A, Lombardi T, Samson J. Pleomorphic adenoma in a child: 9-year follow-up. *Int J Oral Surg* 1996;25:293.
2. Lopez-Cedrum JL, Gonzalez-Landa G, Birichinaga B. Pleomorphic adenoma of the palate in children: report of a case. *Int J Oral Surg* 1996;25:206.
3. Shabaan H, Bruce J, Davenport PJ. Recurrent pleomorphic adenoma of the palate in a child. *Br J Plast Surg* 2001;54:245.
4. Galich R. Salivary gland neoplasms in childhood. *Arch Otolaryngol* 1969;89:100.
5. Crawford WH, Guernsey LH. Pleomorphic adenoma of the palate: report of a case. *Oral Surg Oral Med Oral Pathol* 1967;23:116.
6. Fonseca I, Martins AG, Soares J. Epithelial salivary gland tumor of children and adolescents in southern Portugal: a clinicopathologic study of twenty-four cases. *Oral Surg Oral Med Oral Pathol* 1991;72:696.
7. Noghreyan A, Gatot A, Maor E, et al. Palatal pleomorphic adenoma in a child. *J Laryngol Otol* 1995;109:343.
8. Ishii J, Nagasawa H, Wadamori T, et al. Ultrasonography in the diagnosis of palatal tumors. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1999;87:39.
9. Pogrel MA. The management of salivary gland tumors of the palate. *J Oral Surg* 52:454, 1994.
10. Yamamoto H, Fukumoto M, Yamaguchi F, et al. Pleomorphic adenoma of the buccal gland in a child. *Int J Oral Surg* 1986;15:474.

Even Small Interventions Can Improve Oral Health

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ABSTRACT

When resources are scarce, authors of articles appearing in health publications have questioned the effectiveness of traditional interventions as a means of improving oral health. The experience in Delicias, Honduras, indicates that the principles of BPOC (Basic Package of Oral Care) may provide quicker and better results.

Oral health is an important component of general health and an indicator for quality of life. Despite the recognition of oral health as a human right, individuals throughout the world, particularly the poor and socially disadvantaged, suffer greatly from oral disease. There are vast differences between economic brackets in oral health status and the availability, access and affordability of oral health service.

A number of articles have been published in FDI World Dental Federation, World Health Organization and other global health publications¹⁻⁷ examining the activities of groups working in economically disadvantaged communities. The articles point out that those activities are provided with the best of intentions and with high motivation. “Regrettably, the impact of this engagement on oral health remains rather low. This is mainly due to the choice of inappropriate (Western and clinically oriented) approaches, the failure to integrate their projects with existing health care systems and the lack of sustainability (Helderman).”⁸

Those same publications advocate the concept of the Basic Package of Oral Care (BPOC) to improve the oral health of underserved dental populations. BPOC concepts increase the level of preventive and pharmacologic curative oral treatments and are feasible and affordable for communities with minimal resources. The main components are:

- Oral Urgent Treatment (OUT)—relief of pain, initial treatment of oral infections (mainly extractions) and dento-alveolar trauma, and referral of complicated cases to existing health care.
- Affordable sources of fluoride products in various concentrations (AFT), facilitating remineralization and suppression of *mutans Strep*. While the World Health Organization states that fluoride toothpaste is an important delivery system for fluoride,^{9,10} experience has taught these authors that better results can be obtained using the higher concentrations often provided more affordably by fluoride rinse. (*NaF; Medical Products Labs*).¹¹⁻¹⁵
- Atraumatic Restorative Treatment (ART)—This restorative approach requires no dental drill, no plumbed water or electricity. Cavities can be remineralized and/or cleaned with hand instruments, then filled with an adhesive fluoride-releasing restorative material (usually auto-cured glass ionomer cement). Previous articles have documented that not only are glass ionomer materials less technique sensitive than conventional amalgam or composite, they also outperform the



General practice resident Catalina Morales with patients in Delicias.



Dr. Vega's dental clinic in San Jose.

more conventional materials.¹⁶⁻²⁶ It should be mentioned that ART is not a top priority in the BPOC program and is only employed after the fluoride program is established. To date, ART has not been part of the University of Rochester program in Delicias.

During 2006, the Global Health Initiative of the Department of Family Medicine of the University of Rochester started an oral health project as part of its outreach project in Honduras. The clinic currently consists of a community building and a front porch in San Jose Centro, San Marcos de la Sierra, Departamento de Intibucá, Honduras. For the 4,000 descendants from the Lenca tribe who live within a three-hour walk from the clinic, it is a primary source of medical and dental care. It is operated by the Department of Family Medicine in conjunction with Shoulder to Shoulder, a binational, non-governmental organization.⁽¹⁾

In addition to providing medical services in Honduras, the clinic serves as a medical and dental resident training site in the Global Health programs of both the Department of Family Medicine and the Department of Dentistry at UR. The program provides quality medical and dental care in an area that not only has limited professional services but is also lacking electricity or potable water (electricity arrived in December 2007). Such programs have been shown to have a positive impact on the willingness of recent graduates to serve in resource poor areas.²⁷⁻³¹

The core values of the Shoulder to Shoulder Program stress improved health outcomes for the poor by working with communities and their leaders to provide programs with a sustain-

able impact. Thus, not only do the participants work in primary medical and dental health care roles, public health initiatives are central to the work as well.

In this small Honduran community, we find the same problems that are present the world over. We see the tremendous impact that malnutrition, low literacy, limited economic opportunities and lack of potable water have on the population's overall health. The problems caused by few dentists, gross tooth decay and periodontal disease, reactive not proactive seeking of care, early childhood caries and premature loss of both primary and permanent teeth are readily observed. During 2009, the residents of the nearby community of Delicias approached the clinic administrators in San Jose requesting that clinic health care programs be extended to include the people who live in their village.

Evaluation of Needs

Delicias is similar in size to San Jose. Like San Jose, it consists of a central village, Delicias Centro, and is surrounded by six smaller villages (Las Mesitas, Coyolar, Los Almendros, Sumursa, Pilas and Samulsan), but it is far more remotely located. San Jose is accessible by road. Access to Delicias requires a five-hour hike over mountainous trails.

Prior to accepting the challenge posed by accepting the responsibility of a large group of new patients, the requirements of those patients had to be appraised. A rapid assessment team was formed and visited Delicias in May of 2010. The review by the medical team revealed that the solutions, or at least partial solutions, for many of the public health problems (gutters for water collection, fogones or improved cook stoves, latrines and ceramic filtration of water) were already present in the community. It became clear that the quality of life in Delicias would be improved by public health work projects aimed at expanding access to the existing technology. That fact was pointed out to the

(1) Shoulder to Shoulder is based at the University of Cincinnati and operates a system of five outreach clinics in rural Honduras. Four of the clinics are located in Intibuca, an extremely poor, arid and mountainous area near the southwest border with El Salvador. The clinics are owned and/or are staffed by various departments of a number of U.S. medical schools, among them, Baylor, Brown, University of Dayton, John Hopkins, University of North Carolina at Chapel Hill, University of Pittsburgh, University of Pennsylvania, University of Rochester, Thundermist and Virginia Commonwealth.

residents. It also was made clear that collaboration with the clinic would involve not just guiding and carrying materials for the U.S. volunteers, but actual work on the projects by residents of the community.

Oral Health Evaluation

The dental assessment provided a very different picture. This was the first experience with a dentist for 97% of the children. Actually, for 97% of the children it was their first experience with people, other than their neighbors and teachers. Most of the children were under the age of 9 and did not understand simple dental terminology, such as toothbrush and toothpaste (*cepillo de dientes, crema de dientes*). Only 21% of the children were free of dental disease. Traditional medical remedies were also common. Of interest was that 57% of the children cleaned their mouths with salt, salt water or a paste made from the bark of the Quina tree.

The village had no access to regular dental care. When the radio broadcast the location of a brigade, a makeshift, temporary clinic, few residents had had emergency extractions. A few of the adults had received extractions or appliances when they had traveled. The need for greater access to dental care was of major concern for the community.

Since the most effective first effort in establishing a dental program is fluoride rinse, part of the initial assessment in 2010 was to establish a baseline in preparation for that rinse program by performing 141 exams using the WHO format for recording the presence of dental disease. Even though the decision had not been made concerning accepting Delicias into the clinic's area of responsibility, the assessment team encouraged the teachers in Delicias to visit the clinic in San Jose, receive training in dispensing fluoride rinse and start a program. A few days after the assessment team left Delicias, two teachers and a community leader from Coyolar arrived at the clinic to receive the training and the supplies for a fluoride program.

Results

In 2011, five people—two medical residents, two dentists and a translator—returned to Las Delicias to evaluate the progress in that community, discuss perceived needs and talk about potential future projects. The group made seven home visits in Centro and Coyolar. The medical projects are heavily dependent upon outside donations and/or micro-loans, but they did find one completed latrine and 12 in progress, four in-home water filters and five fogones (cook stoves). Unfortunately, the process that had been created for educational meetings to learn how to build the fogones was not followed; two of the stoves were not built to specifications.

Time limitations permitted dental reexaminations in only one school. The teachers reported that the fluoride rinse was going well at the school in Coyolar, so that school was selected. All

29 of the children, ages 5 to 8, who attended school that day were examined using the WHO format for recording dental disease. Those exams documented a 35% reduction in active decay in the primary teeth (15.7% dfs to 10.2% dfs); 31% of the children were now disease free as opposed to 21%, and the DMFS had decreased from 1.09 to 0.07.

Discussion

This experience documents that even small public health interventions—oral health education at the school and the introduction of a fluoride rinse program as a part of the BPOC model—can quickly make a difference in the oral disease of a population. The experience in Delicias emphasizes the importance of utilizing existing structures and personnel and provides an awareness of what is possible.

The problems encountered in bringing oral care to a remote area such as Delicias are not much different from those encountered in bringing oral care to any population where access is a problem. The rapid improvement in the dental health obtained in Delicias using the BPOC principles would suggest that when resources are scarce, what resources are available should be directed toward programs that can be provided in an informal setting, such as a school classroom, rather than to programs that require the traditional clinic-oriented setting. Such informal settings are also compatible with the BPOC principle of involving community leaders, teachers, nurses and others as part of the effort to improve the oral health of the community.

Relief of pain and appropriate fluoride ion access can be provided in a classroom or schoolyard. The strategy of such a program is to relieve pain, arrest the disease and protect the erupting permanent teeth until more permanent clinic programs (sealant and restoration) can be provided. In the experience of these authors, the higher dosage provided by a 0.2% rinse can be more effective and provide more remineralization than the 0.05% pastes suggested by other authors. At a cost of 10 cents per child per year for the materials, the rinse also can be very cost-effective. Experience has also taught that the results can be improved by holding the rinse in the mouth longer than the one minute recommended on package instructions and using the rinse twice a week.

It is important to remember that fluorides are most effective on the smooth enamel surfaces of the teeth. The more conventional clinic-oriented services (sealant and restoration) will be required for the protection of many of the occlusal surfaces.

As demonstrated in this and other projects, there are many reasons why patients are not receiving oral care. Cost, availability, fear, and cultural and social concerns are just a few of the issues. Dentists can and must provide supervision of efforts to provide oral care; but they cannot do so if they remain in their clinics and offices. Mobile clinics may be part of the solution, but they have their limitations and are expensive. There are numerous situa-

tions where a dentist is available only for sporadic periods. Perhaps the techniques of BPOC and community involvement used in Delicias can be employed in other situations. *✍*

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REFERENCES

1. World Health Organization. The World Health Report 2002. Reducing Risks. Promoting Healthy Life. Geneva: WHO, 2002.
2. Petersen PE. The World Oral Health Report 2003: Continuous Improvement of Oral Health in the 21st Century - The Approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2003 31(suppl. 1):3-24.
3. Bratthall D, Petersen PE, Stjernsward JR, et al. Oral and Craniofacial Diseases and Disorders. In: Jamison DT, Breman JG, Measham AR, et al., eds. *Disease Control Priorities in Developing Countries*. New York: World Bank Health and Oxford University Press, 2006, pp 723-736.
4. Petersen PE. Challenges to improvement of oral health in the 21st century - the approach of the WHO Global Oral Health Programme. *Int Dent J* 2004;54:329-343.
5. Petersen PE, Bourgeois D, Ogawa H et al. The global burden of oral diseases and risks to oral health. *Bull World Health Org* 2005;83:661-669.
6. Petersen PE, Ogawa H. Strengthening the prevention of periodontal disease: the WHO approach. *J Periodontol* 2005;76:2187-2193.
7. Frecken, JE, et al. *Basic Package of Oral Care*; Dental Health International; WHO Collaborating Center, Nijmegen; 2002.
8. Helderma WP, et al. Implementation of a Basic Package of Oral Care; towards a reorientation of dental NGOs and their volunteers. *Int Dent J* (2006);56:44-48.
9. Ministry of Health. Oral health project. Trainer's handbook. Kathmandu, Nepal, 1996.
10. Ntabaye MK, Scheutz F, Poulsen S. Job satisfaction amongst rural medical aids providing emergency oral health care in rural Tanzania. *Community Dent Health* 1999;16:40-44.
11. Van Palenstein Helderma W, Mikx F, Begum A, Adyatmaka A, Bajracharya M, Kikwilu E, Rugarabamu P. Integrating oral health into primary health care—experiences in Bangladesh, Indonesia, Nepal and Tanzania. *Int Dent J* 1999;49:240-248.
12. Carberry FJ. School based fluoride rinse programme in Antigua-Barbuda 1989-1998. Oral Health Data Base: Malmö University. <http://www.mah.se/CAPP/Country-Oral-Health-Profiles/AMRO/Antigua--Barbuda/Information-Relevant-to-Oral-Health-and-Care/Special-Projects-of-Interest/Fluoride-rinse-programme/>
13. Carberry FJ. Fluoride rinse. An alternative to restoration in Barbuda, West Indies. *NY State Dent J*. 1999;65:34-8.
14. Carberry FJ. A public health programme for Navajo Indians in Pine Hill, New Mexico. <http://www.mah.se/CAPP/Country-Oral-Health-Profiles/AMRO/United-States-of-America-USA/Information-Relevant-to-Oral-Health-and-Care/Special-project-of-interest-/A-public-health-programme-for-Navajo-Indians-in-Pine-Hill-New-Mexico-/>
15. Carberry FJ, Cloud B, Finster C. Dental disease control in Pine Hill, New Mexico. *NY State Dent J*. Feb. 2004;70-2:30-33.
16. More than 40 additional studies concerning efficacy and cost effectiveness of fluoride rinse. Located at: http://search.mah.se/search?q=fluoride+rins&site=mah&ie=utf-8&oe=utf-8&hl=en&client=default_frontend&output=xml_no_dtd&ud=1&proxystylesheet=default_frontend&filter=filter&mahl
17. Frencken JE, Makoni F, Sithole WD, Hackenitz E. Three year survival of one-surface ART restorations and glass-ionomer sealants in a school oral health programme in Zimbabwe. *Caries Res* 1998;32:119-126.
18. Frencken JE, Makoni F, Sithole WD. ART restorations and glass-ionomer sealants in Zimbabwe: survival after 3 years. *Community Dent Oral Epidemiol* 1998;26:372-381.
19. Holmgren CJ, Lo ECM, Hu DY, Wan HC. ART restorations and sealants placed in Chinese school children—results after three years. *Community Dent Oral Epidemiol* 2000;28:314-320.
20. Mallow PK, Klaipo M, Durward CS. Dental nurse training in Cambodia—a new approach. *Int Dent J* 1997;47:148-156.
21. Mallow PK, Durward CS, Klaipo M. Restoration of permanent teeth in young rural children in Cambodia using atraumatic restorative treatment (ART) technique and Fuji II glass ionomer cement. *Int J Paediat Dent* 1998;8:35-40.
22. Mandari GJ, Truin GJ, van 't Hof MA, Frencken JE. Effectiveness of three minimal intervention approaches for managing dental caries: Survival of restorations after 2 years. *Caries Res* 2001;35:90-94.
23. Phantumvanit P, Songpaisan Y, Pilot T, Frencken JE. Atraumatic Restorative Treatment (ART): a three-year community field trial in Thailand—survival of one-surface restorations in the permanent dentition. *J Publ Health Dent* 1996;56:141-145.
24. Rahimtoola S, van Amerongen WE. Comparison of two tooth saving preparation techniques for one surface cavities. *J Dent Child* 2002; in print.
25. Taifour D, Frencken JE, Beiruti N, van 't Hof MA, Truin GJ, van Palenstein Helderma WH. Comparison between restorations in the permanent dentition produced by hand and rotary instrumentation—survival after 3 years. *Community Dent Oral Epidemiol* 2002; in print.
26. van Palenstein Helderma WH, Mikx F, Truin GJ, Hung HT, Luc PH. Workforce requirements for a primary oral health care system. *Int Dent J* 2000;50:371-377.
27. Taifour D, Frencken JE, Beiruti N, van 't Hof MA, Truin GJ. Effectiveness of glass-ionomer (ART) and amalgam restorations in the deciduous dentition—results after 3 years. *Caries Res* 2002; accepted.
28. Godkin M, Savageau J. The effect of global multiculturalism on cultural competence of pre-clinical medical students: *Fam Med* 2001; 33 (3):178-86.
29. Gupta A, Well C, Bia F, Barry M. The international program: the fifteen year experience with Yale University's Internal Medicine Residency Program. *Am J Trop Med Hyg* 1999;61(6):1019-23.
30. Stapleton FB, Wahl PW, Norris TE, Ramsey PG. Addressing global health through the marriage of public health and medicine; developing the University of Washington Department of Global Health. *Academic Medicine* 2006;81(10):897-901.
31. Haq C, Rothenberg D, Gjerde C, Bobula J, Wilson C, Bickley I, Cardelle A, Joseph A. New world views; preparing physicians in training for global health work. *Fam Med* 2000;32(8):566-72.
32. Ramchandani SR. The impact of international health and humanitarian medicine on US graduate medical education; American Medical Association-Resident and Fellow Section; October 2007; 53-9 available at http://www.residentandstaff.com/issues/articles/2007-10_12.asp

Carcinoma ex Pleomorphic Adenoma

Case Report

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ABSTRACT

Carcinoma ex pleomorphic adenoma (CXPA) is a rare and aggressive malignancy that usually develops in primary or recurrent pleomorphic adenoma. It occurs in 6% of all pleomorphic adenomas, of which only 7% of cases occur in minor salivary gland tumors. The rate of occurrence and malignant change increases with time if a case is left untreated. Intraorally, it is mostly seen in the palate, followed by the upper lip and buccal mucosa. CXPA of the hard palate typically presents as a painless, slow-growing swelling that frequently involves the periosteum and underlying palatal bone. Imaging of CXPA is usually noncontributory, leading to frequent misdiagnosis. Longstanding cases may extend up to the parapharyngeal space and cavernous sinus. We describe a rare case of CXPA of the palate with non-significant clinical and radiological findings. Early diagnosis for better prognosis is stressed.

Pleomorphic adenoma (PA) is the most common tumor of the salivary glands. It accounts for about 60% of all salivary gland

tumors.¹ About 85% of these tumors are found in the parotid glands; 8% are found in the submandibular glands; and the remaining tumors are found in the sublingual and minor salivary glands.¹ Different patterns of malignant change occur in PA, of which carcinoma ex pleomorphic adenoma (CXPA) is one form.² CXPA constitutes 6% of all pleomorphic adenomas.

The exact etiologic factors associated with malignant transformation are largely ill-defined.³ The rate of occurrence seems to increase with time if the PA is left untreated.⁴ According to some investigators, the rate of malignant change is 1.5% in the first year in which the adenoma goes untreated; it increases to 9.5% after 15 years.²

The CXPA of the hard palate typically presents as a painless, slow-growing swelling⁵ that frequently involves the periosteum and the underlying palatal bone.⁶ Intraorally, the mixed tumor most often occurs on the palate, followed by the upper lip and buccal mucosa.⁸⁻⁹ On clinical examination, these tumors appear as painless, firm, mobile masses that rarely ulcerate the overlying mucosa.

The gross appearance of PA is that of a firm, smooth mass within a pseudocapsule. Histologically, the lesion demonstrates epithelial tumor cells arranged in a form of sheets and duct-like pattern.¹⁰ The treatment of this lesion consists of surgical removal with adequate margins.

We present a case of CXPA where the clinical findings were in contrast to the histopathological diagnosis. It is likely that the dental professional may misdiagnose in such an instance, yet the importance of early diagnosis in these cases is well recognized.



Figure 1. Intraoral photograph of lesion.



Figure 2. Panoramic radiograph of patient.

Case History

A 40-year-old woman with noncontributory social and medical history was referred to the Oral Medicine Department for the evaluation of a pink-to-slightly red swelling located on the midline of the junction of the hard and soft palate (Figure 1). The patient reported that the swelling had been present for the last two years. The swelling, measuring 36 mm x 26 mm, appeared to be well-circumscribed and sessile. It was nontender on palpation, and was firm in consistency. The swelling was negative to diascopy. No cervical lymphnodes were palpable.

Clinical examination of the maxillary dentition revealed no abnormal findings. The patient was subjected to radiographical investigations. A digital panoramic radiograph (*Orthophos XG5, Sirona, Bensheim, Germany*) (Figure 2) and an occlusal radiograph revealed no abnormalities. Fine-needle aspiration was performed and was negative for any liquid or viscous content.

Differential Diagnosis

In accordance with the observation that this was a small, slow-growing lesion on the palate with no osseous erosion, it was thought most likely to represent a benign lesion. Our clinical differential diagnosis included benign minor salivary gland neoplasm, a reactive process, benign mesenchymal neoplasm and low-grade malignant tumor of minor salivary gland or mesen-

chymal origin. Although less common, PA was considered to be the most likely possibility, while other benign salivary gland neoplasms, including papillary cystadenoma, ductal cystadenoma and sialadenoma papilliferum, had to be considered.

PA has a definite predilection for the hard palate in cases of intraoral occurrence.¹¹ PA can occur at any age, but is most commonly discovered in 40- to 50-year-olds and is slightly more common in women.¹² The age, sex, location and clinical appearance of the lesion in our patient were compatible with PA.

Diagnosis and Management

Patients with CXPA do not give any contributory history, nor do they show any significant changes intraorally. Radiographically, these cases do not show any bony erosion or saucerization. Both these findings were absent in our case. In such cases, the dental professional must correlate the clinical findings to the histopathological findings to achieve a correct diagnosis and treatment for the patient. Surgical excision with a wide margin is the treatment of choice to avoid recurrence. The soft tissue was surgically removed (Figure 3) and sent for histopathological evaluation. Hematoxylin and Eosin-stained sections of the tissue revealed epithelial tumor cells arranged in the form of sheets and duct-like pattern. The tumor cells show features of malignancy, like cellular and nuclear pleomorphism and vesicular nuclei (Figure 4).



Figure 3. Surgical removal of lesion.

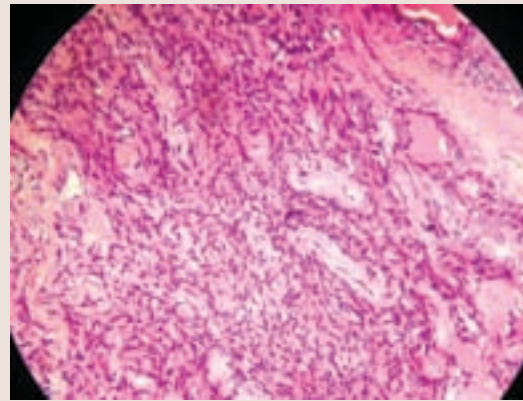


Figure 4. H and E-stained section of tissue revealing epithelial tumor cells arranged in form of sheets and duct-like pattern. Tumor cells show features of malignancy like cellular and nuclear pleomorphism and vesicular nuclei.

Malignant cells were seen infiltrating the capsule in one area. Areas of hemorrhage and mature adipocytes were seen interspersed within the connective tissue stroma.

The patient was kept on a regular follow-up for the next three months to rule out any metastasis or secondary lesion. On subsequent follow-up, the patient did not present with any recurrence.

Discussion

According to the World Health Organization histological classification, published in 2005, CXPA is the most common malignant change in PA and accounts for 11.7% of salivary malignancies.^{13,14} Most of the malignant changes in CXPA occur in the parotid gland; they are extremely rare in minor salivary gland. Fewer than 7% of CXPA are found in the minor salivary glands.¹³ Moreover, only 1.6% of malignant transformation occurs in tumors in less than five years.¹⁴ However, in the case presented here, there was malignant transformation in the lesion within two years of onset. The typical clinical presentation of CXPA may be similar to that of PAs, and the most common symptom is an asymptomatic mass, as in our case. At times there is a longstanding history of PA.

In contrast to our case, the parotid gland, followed by the submandibular gland, is the most common site of origin. CXPA is seen in patients in the sixth to seventh decades of life.¹⁵ They occur most often in patients over 50 years of age and are four-times more common in males.¹⁶ Typical symptoms include recent onset and rapid growth of a mass that may be painful and fluctuate in size.¹⁶

Clinically, the patient usually presents with a history of a slow-growing, painless mass¹⁷ that suddenly or over a short period enlarges rapidly. Patients usually present with symptoms and signs suggesting malignancy (e.g., fixation to surrounding structures,⁴ occasional pain, skin infiltration, trismus, facial nerve weakness or palsy). Facial nerve weakness or palsy has been detected in approximately 23% to 40% of cases.¹⁸

The tumor in the soft palate can readily spread by way of the greater palatine nerve toward the pterygopalatine fossa (PPF).

Once the tumor lodges in the PPF, the tumor can further spread: 1. anterosuperiorly to the inferior orbital fissure to the extraconal space; 2. posterosuperiorly to the foramen rotundum (V2) to the Cavernous sinus (CS); 3. laterally to the masticator space—then the trigeminal nerve gets invaded and exploited as a route to the foramen ovale, dural layer and CS; and 4. medially via the sphenopalatine foramen to the nasal cavity.⁷ Hence, advanced imaging modalities play a significant role in ruling out further spread of the tumor. In our case, the patient was kept under a long follow-up to rule out any advanced spread. As seen during surgery, perhaps due to early detection, this complication was avoided.

Unlike our case, most of the patients with CXPA have a history of multiple previous surgeries for PA.¹⁷ Such a history might suggest the possibility of malignant transformation.² This is relevant, considering the fact that some cases of very well-differentiated epithelial malignancy (e.g., myoepithelial CXPA) are sometimes not fully appreciated. Careful observation of the resected tumor may reveal malignancy. Most of these findings were negative in our case and can be attributed to early detection of the lesion. ✎

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REFERENCES

1. Crisius MM. Salivary Gland Diseases. *Burket's Oral Medicine Diagnosis & Treatment*, 10th Ed. Spain: BC Decker Inc., 2003, 235-270.
2. Kane WJ, McCaffrey TV, Olsen KD, Lewis JE. Primary parotid malignancies. A clinical and pathologic review. *Arch Otolaryngol Head Neck Surg* 1991;117(3):307-15.
3. Eneroth CM, Zetterberg A. Malignancy in pleomorphic adenoma. A clinical and microspectrophotometric study. *Acta Otolaryngol* June 1974;77(6): 426-32.
4. Spiro RH, Huvos Ag, Strong EW. Malignant mixed tumor of salivary origin; a clinicopathological study of 146 cases. *Cancer* Feb 1977;39(2):388-396.
5. World Health Organization. *Classification of Tumors: Pathology and Genetics of Head & Neck Tumors*. Lyon. IARC Press; 2005.
6. Clauser L, Mandrioli S, Dallera V, Sarti E, Galie M, Cavizzini L. Pleomorphic adenoma of the palate. *J Craniofac Surg* 2004;15:1026-9.
7. Hsuan-Ho Chen, Li-Yu Lee, Shy-Chyi Chin, I-How Chen, Chun-Ta Liao, Shiang-Fu Huang. Carcinoma ex pleomorphic adenoma of soft palate with cavernous sinus invasion. *World Jour Surg Oncol* 2010;8:24.
8. Aver-De-Araujo LM, Chaves-Tarquinio SB, Neuzling-Gomes AP, Etges A. Intraosseous pleomorphic adenoma: case report and review of the literature. *Med Oral* 2002;7:164-70.
9. Jansisyanont P, Blanchaert RH Jr, Ord RA. Intraoral minor salivary gland neoplasm: a single institution experience of 80 cases. *Int J Oral Maxillofac Surg* 2002;31:257-61.
10. Soames JV, Southam JC. *Diseases of Salivary Glands*. Oral Pathology, 4th Ed. United States: Oxford University Press Inc., 2005, 203-218.
11. Silverman S. *American Cancer Society. Oral Cancer*, 4th Ed. Spain: BC Decker Inc., 2002.
12. Jabber MA. Intraoral minor salivary gland tumors: a review of 75 cases in a Libyan population. *Int J Oral Maxillofac Surg* 2006;35:150-4.
13. Grossmann Sde M, Johann AC, Castro WH, Friedman H, Gomez RS, Mesquita RA. Anterior midline nodule of the hard palate. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009 Dec;108(6):808-11.
14. Furukawa M, Suzuki H, Matsuura K, Takahashi E, Suzuki H, Tezuka F. Carcinoma ex pleomorphic adenoma of the palatal minor salivary gland with extension into the nasopharynx. *Auris Nasus Larynx* 2001;28:279-81.
15. Behars OH, Woolner LB, Kirklind JW, Devine KD. Carcinomatous transformation of mixed tumors of the parotid gland. *ALH. AMA Arch Surg* Oct 1957;75(4):605-13; discussion 613-4.
16. Barnes L, Rao U, Krause J, Contis L, Schwartz A, Scalapogna P. Salivary duct carcinoma. Part I. A clinicopathologic evaluation and DNA image analysis of 13 cases with review of the literature. *Oral Surg Oral Med Oral Pathol* 1994;78:64-73.
17. LiVolsi VA, Perzin KH. Malignant mixed tumors arising in salivary glands. I. Carcinomas arising in benign mixed tumors: a clinicopathologic study. *Cancer* May 1977;39(5):2209-30.
18. Luers JC, Wittekindt C, Streppel M, Guntinas-Lichius O. Carcinoma ex pleomorphic adenoma of the parotid gland. Study and implications for diagnostics and therapy. *Acta Oncol* 2009;48(1):132-6.

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Management of Oral Pyogenic Granuloma with Sodium Tetra Decyl Sulphate

A Case Series

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ABSTRACT

Pyogenic granuloma, or granuloma pyogenicum, is a common, tumor-like growth of the oral cavity or skin that is considered to be an exaggerated, localized connective tissue reaction to a minor injury or irritation. A total of five clinical cases of oral pyogenic granuloma were randomly selected in the age group between 26 and 41 years. All these cases were treated with sodium tetra decyl sulphate and examined for regression and recurrence of the lesion for six months. Various treatment modalities consist of conservative surgical excision, cryosurgery, laser surgery and sclerotherapy. Sclerotherapy with sodium tetra decyl sulphate is a relatively simple and effective method for treating oral pyogenic granuloma.

Pyogenic granuloma, or granuloma pyogenicum, is a common, tumor-like growth of the oral cavity or skin that is

considered to be non-neoplastic in nature. It is a type of “inflammatory hyperplasia” that histologically represents inflamed fibrous and granulation tissue overgrowth in reaction to mild irritation.¹ The name pyogenic granuloma is a misnomer since the condition is not associated with pus and does not represent a granuloma histologically.

Pyogenic granuloma of the oral cavity is known to primarily involve the gingiva. It is presumably caused by local irritating factors, including calculus, overhanging dental restoration margins or foreign material within the gingival crevice. Extragingivally, it

TABLE 1.
Demographic, Clinical and Therapeutic Findings of Pyogenic Granuloma Patients

Patient	Sex	Age	Lesion Site	Size (cm)	Number of Injections	Total Volume (ml)	Final Outcome
1	35	F	Maxillary anterior gingiva	0.5x0.7	1	0.5	Resolution
2	32	F	Maxillary left posterior gingiva	0.4x0.5	1	0.6	Resolution
3	26	F	Maxillary right posterior gingiva	2x3	4	2	Resolution
4	38	F	Maxillary anterior gingiva	2.5x2	4	2	Resolution
5	41	F	Maxillary right posterior gingiva	1x1.2	2	2	Fibrosis



Figure 1. Sodium tetradecyl sulphate injection.



Figure 2. Case One Before.



Figure 2. Case One After.



Figure 3. Case Two Before.



Figure 3. Case Two After.

can occur on the lips, tongue, buccal mucosa and palate. A history of trauma is common in such sites.^{2,3}

Clinically, it is an asymptomatic reddish papule or nodule that is usually smooth but shows at least part of its surface to be rough or ulcerated.⁴ Treatment of pyogenic granulomas consists of conservative surgical excision, cryosurgery or laser surgery. These are usually adequate but often result in scars and recurrence.¹ Although many treatment techniques have been described, when the pyogenic granuloma is large or occurs in a surgically difficult area, choosing an appropriate treatment modality can be difficult. Therefore, to find treatment alternatives, we speculated that sclerotherapy could be an effective treatment for pyogenic granuloma, which consists of highly vascularized connective tissue. We are reporting five cases of pyogenic granuloma treated using sodium tetra decyl sulfate (STS) as a sclerosing agent.

Materials and Methods

The study included five oral pyogenic granuloma patients diagnosed based on history and clinical examination. They were treated with sodium tetra decyl sulphate solution after providing informed consent. All were in good systemic health. A patch test was done to rule out hypersensitivity reactions to the drug.

Sodium tetra decyl sulphate solution (*Setrol, Samarth Life Sciences Pvt. Ltd., Mumbai, India*) was injected slowly into the base of the lesion using a 23-gauge needle until it leaked out from the surface of the lesion. Local anesthesia was not used, and no compressive dress-

ing was applied. The patients were followed regularly at weekly intervals until the lesions became dry, necrotic and fell off spontaneously. Changes in lesions and adverse reactions were recorded; injections were repeated if needed. The treatment effect was determined according to physical examination. Follow-up evaluation was performed one and three months after treatment.

Results

In four patients, the procedure resulted in complete resolution of the lesions, with inconspicuous scars. The procedure was well-tolerated by the patients and there was no recurrence. One-to-four treatment sessions were needed, with total volume injection ranging from 0.5 ml to 2 ml. In the fifth patient, after two treatment sessions, the lesion became fibrosed. It measured 0.3 mm x 0.4 mm in size. The sclerosing solution leaked out when further injections were attempted. Complete excision was done for this patient.

Discussion

Pyogenic granuloma is an exaggerated localized connective tissue reaction to a minor injury or irritation.⁵ Hormonal changes of puberty and pregnancy may modify the gingival reparative response to injury, producing what was once called a “pregnancy tumor.”² The incidence of pyogenic granuloma has been described as between 26.8% to 32% of all reactive lesions. Its peak incidence is in the third decade, with the age ranging from between 11 years and 40 years. Females are more frequently affected with a predilection



Figure 4. Case Three.



Figure 4. Case Three after first injection.



Figure 4. Case Three after second injection.



Figure 4. Case Three after third injection.



Figure 5. Case Four. Pyogenic granuloma on palate.



Figure 5. Case Four after first injection.



Figure 5. Case Four after second injection.



Figure 5. Case Four after third injection.

of 3:2 over males.⁵ In the study presented here, all the patients were females, with an average age of 34 years.

Conservative surgical excision and removal of causative irritants (plaque, calculus and local trauma) is the usual treatment, but it is associated with risk of recurrence and can leave a visible scar.⁶

Nd:YAG, CO₂ and flashlamp-pulsed dye lasers have also been used for the treatment of pyogenic granulomas. However, they require several treatment sessions, specialized training, expensive equipment and are inappropriate for larger lesions, due to the penetration depth of the laser wavelength.^{7,5}

Cryotherapy with liquid nitrogen or nitrous oxide is another treatment modality. It requires more visits and infection may develop in the lesion, requiring systemic antibiotics.⁸

Sclerotherapy with sodium tetra decyl sulphate, monoethanolamine oleate and polidocanol has been described as a conservative method with effective results. It has the advantage of no repeated recurrence and no scar formation. Possible adverse effects with these agents include burning sensation during injection and allergic reactions.^{6,7}

Sclerotherapy has been used with success in chronic venous disease, esophageal varices and hemangiomas, and other vascular malformations. It acts by injuring the endothelium of the vessels, leading to the formation of thrombus. In pyogenic granuloma, the agent injures the endothelial cells comprising the major part of the lesion and induces necrosis of the entire lesion.⁹ In our study, sodium tetra decyl sulphate was used. A 100% response rate was achieved. No major complications were encountered in our patients, except for pain and swelling in one patient. This was managed by administration of nonsteroidal anti-inflammatory drugs.

The clinical diagnosis of pyogenic granuloma was based on history and clinical examination. Biopsy was not performed, but histopathological confirmation for any persistent or recurrent lesion is recommended.



Figure 6. Case Five Before.



Figure 6. Case Five after injection.

Conclusion

Sclerotherapy is a valuable alternative therapy because of its simplicity and lack of scarring. The benefits also include a better safety profile, repeatability and low cost of treatment even when multiple sessions are needed. ✎

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References

1. Jafarzadeh H, Sanatkhani M, Mohtasham N. Oral pyogenic granuloma: a review. *J Oral Science* 2006;48(4):167-75.
2. Regezi, Sciubba, Jordan. *Oral Pathology. Clinical Pathologic Correlations*. 4th Ed. Saunders, Elsevier 2003:111-12.
3. Bhavna D, Vasudha S, Harsh GS, Rachana B. Extraj gingival pyogenic granuloma – a case report. *J Advanced Dent Research* 2010;1(1):78-80.
4. Wood NK, Goaz PW. *Differential Diagnosis of Oral and Maxillofacial Lesions*. 5th Ed. Mosby, Elsevier 1997:138-39.
5. Shenoy SS, Dinakar AD. Pyogenic granuloma associated with bone loss in an eight year old child: a case report. *J Indian Soc Pedod Prev Dent* 2006; 24:201-3.
6. Gilmore A, Kelsberg G, Safranek S. What's the best treatment for pyogenic granuloma? *J Fam Pract* 2010;59(1):40-2.
7. Arau R, Carvalho J, Neto V. Poidocanol sclerotherapy for the treatment of pyogenic granuloma. *Dermatol Surg* 2010;36:1068-70.
8. Gupta R, Gupta S. Cryotherapy in granuloma pyogenicum. *Indian J Dermatol, Venereol and Lleprol* 2007;73(2):141-2.
9. Matsumoto K, Nakanishi H, Seike T, Koizumi Y, Mihara K, Kubo Y. Treatment of pyogenic granuloma with a sclerosing agent. *Dermatol Surg* 2001;27:521-3.