The Official Journal of the American Academy of Cosmetic Dentistry®

JOURNAL of Cosmetic Dentistry

VOLUME 24 • NUMBER 4
WINTER 2009

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AMERICAN ACADEMY OF COSMETIC DENTISTRY

AACD MISSION STATEMENT

The American Academy of Cosmetic Dentistry is dedicated to advancing excellence in the Art and Science of Cosmetic Dentistry and encouraging the highest standards of ethical conduct and responsible patient care.

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Editor's Message

Abundance or Scarcity; What Is Your Point of View?

"When one door of happiness closes, another one opens; but often we look so long at the closed door that we do not see the one which has been opened for us…"
—Helen Keller

Motivational speeches always say to: Be confident, have a positive attitude, dream big, and visualize success! Our body and mind can achieve only what our mind can visualize. This sounds quite simple in theory, but how often do we practice it? Visualize an Olympic athlete with anything less on their mind. Could you imagine Michael Phelps breaking a world record if he began each race with the fear of losing? It would *never* happen. Well, the same can be applied to our daily lives and practices.

In booming economic times, we find ourselves with abundance and positive attitude flowing. And we start to see our surroundings with a more positive attitude; we can visualize success in many things, and we might even find ourselves dreaming of bigger and loftier goals! All of this is really an attitude that found its origin in an event that happened. Taking this just one step further, think about what actually came first. Was it the positive attitude, from some other event that spurred on imaginative goals, that days or weeks later brought on the new benchmark of success? How much control does our frame of mind dictate our course of success?

Going back to Michael Phelps, he obviously set goals for himself, devised a training plan to breed success, kept a positive attitude each and every day, visualized his goals, and finally achieved them during the Summer Olympics. The mind began this process, the attitude made it possible, his drive and physical abilities followed suit and success was his to have… but only as far as his mind took him. Consider the reverse order: Can one achieve the required physical strength and ability to break world records in swimming, and *then* set out to learn to swim and set goals after the fact? Drive—it is what our mind can do to achieve what we are talking about…mental drive.

So what happens during challenging economic times? Do we continue to spend like there is no tomorrow, buy the biggest boat we can afford, take that Tahitian vacation that we have always dreamed of? Or do we tighten our belts, save money, worry, and protect our nest egg? Of course we do. That protection mechanism is prudent and wise, but will it get us out of the downward spiral of a recession? Will it help our practices grow in these tough times? Or will it turn us into micro-managing myopic leaders of our practices, which in turn will lead to a negative attitude toward our teams, dentistry, our profession, and even our patients? It might, and it certainly will not allow us to break world records!

"Who Moved My Cheese?"

This popular book by Spencer Johnson is an easy read with an idea that needs to be revisited during these challenging times. Has the public's need for dentistry diminished with the fall of the NASDAQ? Of course not. However, the public's ability—or perceived ability—to afford quality dentistry has been altered or challenged. How do we as clinicians and business owners deal with this issue? It is not with an attitude of hunkering down, it is not with fear of disaster; rather, it is with realizing that opportunity still exists…just in different places. And the only way to find this is with an attitude that records can still be broken, from a place of abundance.

Take for example two doctors, Dr. Doom and his sister Dr. Bloom, presenting the same treatment plan to a patient. Dr. Doom has tightened his belt so much that all he sees are lean times ahead; he lives in scarcity. He is edgy with his team, and in a foul mood every morning as he watches the stock market like a hawk. He has lost sight of why he actually comes to work every day—to care for his patients. When the treatment plan is presented, he doesn't come across as confident; in the back of his mind, he's actually praying the patient says "yes," so that he can fill his schedule for tomorrow! There's nothing enthusiastic about his approach, nothing contagious or uplifting. Doom and gloom go together!

Now let's look at his sister, Dr. Bloom. She realizes that times are challenging. She has told her team to be smart about supplies spending. She has informed the team that bonuses might be lean for the next several months, but that if "we all pull together and work smarter" we can make it through this. Each day she begins her morning meeting searching the schedule for opportunities to fill it with patients already in the schedule; in fact, her entire team does this for her. She begins each day with a positive attitude of abundance: "Build it and they will come." So when Dr. Bloom sits down with the same treatment plan presentation as Dr. Gloom, she sees nothing but opportunities. It is the same plan, but with a much better, positive approach of abundance—the belief that life will provide for us if we simply work hard, look for doors to open, and never give up. She rallied her team for support, which in turn alleviated the weight upon her shoulders, and allowed her the mental freedom to turn great goals into reality. It is all about attitude!

In all things, may your expectations be forever exceeded, and may you realize your special ingredient: You!

Michael

Michael J. Koczarski, DDS, Editor

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President's Message

One Person at a Time

Artis, a minister for 25 years, had learned to deliver his sermons with closed lips and a down-turned face. Because of the enamel defects and the large spaces visible between most of his teeth, he was embarrassed to smile. His self-consciousness built an unfortunate wall between him and those he served in his congregation. Changing his teeth dramatically improved his life—and, subsequently, the lives of those to whom he provided guidance and comfort. Artis now stands before the congregation in full smile with full confidence each Sunday.

Heather, a 14-year-old actress and veteran of local theater, was headed to New York for a round of auditions. Sadly, hereditary enamel dysplasia had left her with small, brown teeth and little to no enamel. Her life and career were full of hope, but her smile was clearly an obstacle. Heat and pressure-cured full-mouth provisional restorations gave this now 19-year-old the opportunity to be competitive on the stage and confident throughout her critical teen years. Next on her agenda is a definitive reconstruction that will take her to college and on to a performance career that is sure to put her name and face in lights.

These are but two examples of people whose lives have been changed by what we in the American Academy of Cosmetic Dentistry (AACD) have to offer. I am sure that you have many such stories of your own about people whose lives have been changed dramatically with appearance- and health-enhancing care delivered by a superbly trained AACD member. Multiply our stories by our membership, and it is easy to see what an enormous impact we are having on the quality of peoples' lives around the world.

As we look forward to our 25th Anniversary AACD Scientific Session, we can simultaneously look back at our accomplishments with pride. Over the years the AACD has grown in numbers, stature, reputation, and accomplishment, gaining the admiration not only of our profession, but also of those we serve.

Numbers: We began with a small but determined band of members. Those pioneers who gathered in Las Vegas all those years ago have now grown to over 7,732 members in more than 70 countries. We now boast 47 Accredited Fellows, 286 Accredited Members, and 826 candidates eligible to submit cases for Accreditation. We are proud to have 22 AACD Affiliates in the United States and 11 AACD Affiliates in other countries, and we continue to grow steadily each year.

Stature: While there are many sources of appearance-enhancing continuing education, the single source of the most diverse and solid education is the AACD. Each year, our annual scientific session attracts some of the best educators in dentistry and our programs blend lectures, hands-on training, and experiential learning in a way that ensures our members get the best educational experience at any meeting in dentistry today.

Reputation: Mention the words "cosmetic dentistry" and the AACD immediately comes to mind, not only in the professional community, but also throughout the public at large. Our public relations and promotional efforts over the past several years have ensured that the Academy is seen as the rightful leader in esthetic dental care. In addition, our magnificent Give Back A Smile™ program has had a direct impact on the lives of survivors of domestic abuse and is steadily gaining attention in the media.

Accomplishment: Accreditation in the AACD has now become the gold standard for cosmetic excellence and is a much-sought credential in dentistry. Our Accreditation process has been honed and refined so that today it represents the most rigorous and rewarding credentialing process in the world of esthetic dentistry.

Twenty-five years ago, cosmetic dentistry focused almost exclusively on smile beautification. It took the AACD to broaden that perspective to include health-enhancement, functional considerations, comprehensive evaluation, treatment planning, and an interdisciplinary approach to blending beauty with science.

So much of what the Academy represents is only secondarily about the dentistry. First and foremost is our mission to change lives. Because the AACD has laid the foundation and done the hard work, we get the opportunity to do that on a daily basis. I salute our history and those who had the vision to set our Academy on the right path. I look forward with anticipation to our members and leaders to come, who will create an even stronger future for the Academy, our members, and those we serve.

Mickey Bernstein, DDS,
President, AACD Accredited Member,
GBAS Volunteer

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Message From The President

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– Dr. Bill Dorfman

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About the Cover

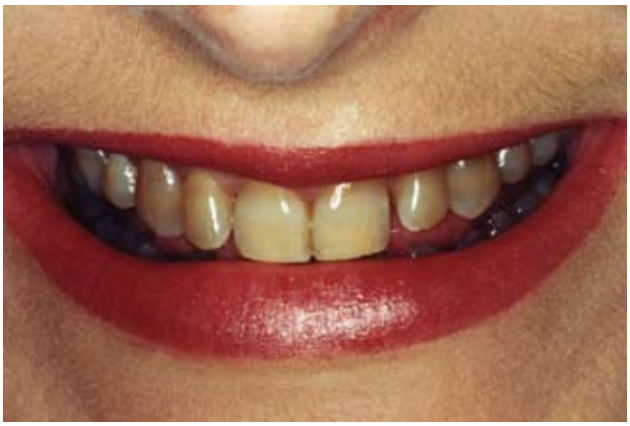
Tina, full face before.

Janette, full face before.

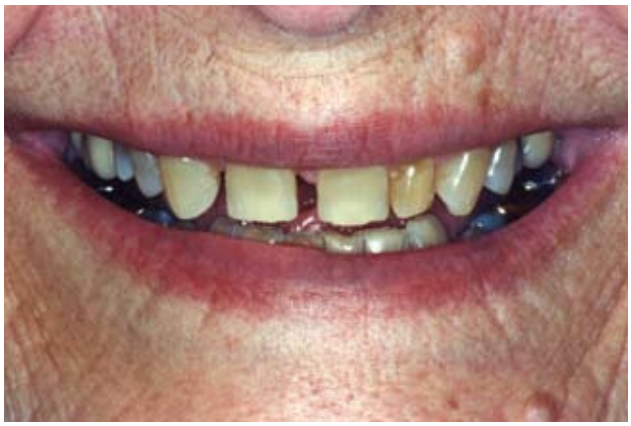
About the Cover

by Thomas E. Oppenheim, DMD, AFAACD

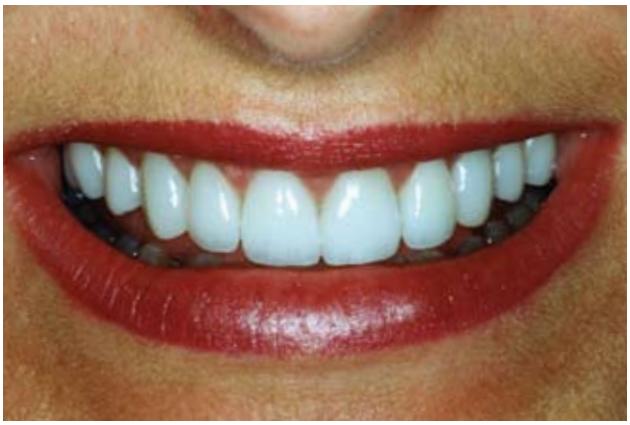
It is always an honor and privilege whenever a patient entrusts their oral and dental health care to me, especially when it involves altering their appearance for the rest of their life. When that patient later enthusiastically refers a friend, colleague, or relative for that same service—in this case, her own mother—it becomes even more meaningful and significant. In these two cases, I first restored the smile of Tina, a 37-year-old office manager, and then she referred her mother, Janette, to me and I was able to do the same for her. Please read the Cover Story on page 58 to find out more details regarding the patients' treatment, as well as comments from the patients.



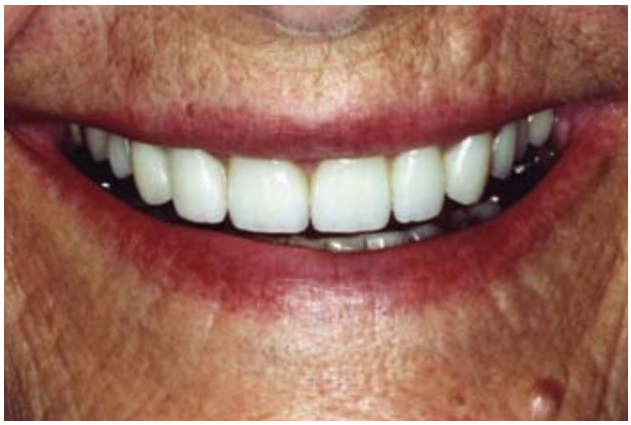
Tina: 1:2 view, before.



Janette: 1:2 view, before.



Tina: 1:2 view, after.



Janette: 1:2 view, after.

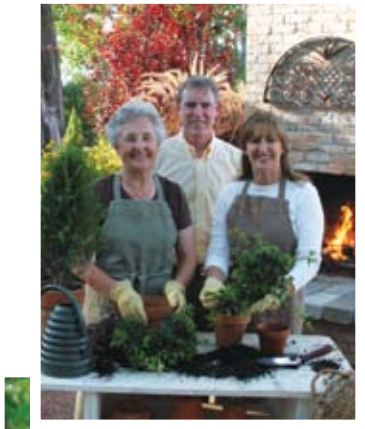
The Photo Shoot

Janette had been raised by her grandparents. Her grandmother, an avid gardener, taught her to love and respect the virtues and importance of gardening at a very young age. Naturally, these same values were imparted to Tina, and nowadays, Tina and her mother love gardening together whenever they have the opportunity. As a result, they both have wonderfully manicured lawns and potted plants galore. It was only natural to select their favorite hobby as the theme of our photo shoot for the *JCD*. Sincere appreciation goes to Dean Little and our friends at beautiful Gecko Gardens for their generosity and creative talent in making our photo shoot a successful and fun event. Located at the antebellum Wright House Greek Revival cottage in my hometown of Thomasville in Southwest Georgia, Gecko Gardens provided the perfect context for capturing Tina and Janette's passion for gardening.

Acknowledgment

The author thanks his wife, Kelly; and Margaret Titus for their tremendous and invaluable help in conceiving, managing, and directing the photo shoot.

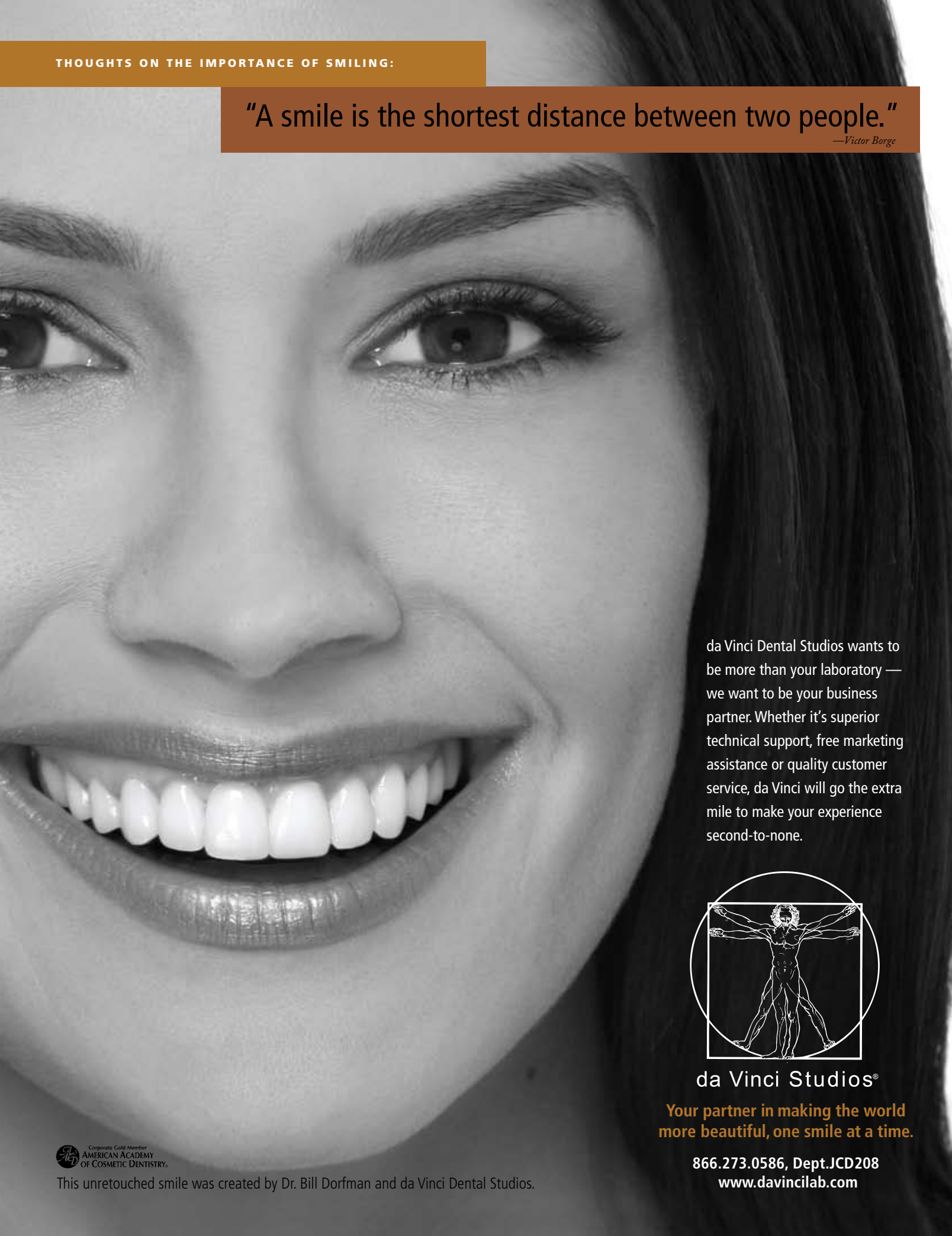
Cosmetic and restorative dentistry and clinical photography by Dr. Thomas E. Oppenheim, Thomasville, GA, smileart@rose.net. Tina's ceramics by Eric Newell, CDT, Newell Ceramic Art, South Jordan, UT. Janette's ceramics by Sandy McCafferty Cook, CDT, CMR Dental Laboratories, Idaho Falls, ID. Cover photograph by Todd Stone, Todd Stone Photography, Leesburg, GA.



Excellence in Cosmetic Dentistry
25th Anniversary AACD Scientific Session in Honolulu, Hawaii
Monday, April 27 - Friday, May 1

2009

In This Section:



THOUGHTS ON THE IMPORTANCE OF SMILING:

"A smile is the shortest distance between two people."
—Victor Borge

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This unretouched smile was created by Dr. Bill Dorfman and da Vinci Dental Studios.

Interview with Dr. Toru Matsuo

by Steven J. Hill, DMD, AAACD
Co-Chair, Professional Education Committee
Vancouver, BC
www.vancouvercosmeticdentistry.com

Toru Matsuo, DDS
Tokyo, Japan
www.matsmile.com

The goal of this section is to provide insight into the thoughts and perspectives of premier educators. In this issue, AACD Professional Education Committee Co-Chair Dr. Steven J. Hill (SH) interviews Dr. Toru Matsuo (TM) from Tokyo, Japan. Dr. Matsuo is scheduled to present at the 25th Anniversary AACD Scientific Session, *Excellence in Cosmetic Dentistry 2009*. For more information, log onto www.aacd.com.

SH: ***Dr. Matsuo, I am interested in how cosmetic dentistry began in Japan and how it has grown. Can you give us the history?***

TM: The concept of cosmetic dentistry in Japan goes back hundreds of years when, for example, the oldest wooden denture in the world was found. This added a perspective on how beautiful and natural dentures should be. Also "black teeth," an old and unique custom in Japan, had been popular among the upper class of society for more than a hundred years and was considered to be a kind of cosmetic dentistry at that time.

Modern cosmetic dentistry became popular in Japan in the 1980s, spurred by the development of adhesion and porcelain-fused-to-metal crown techniques. The Japan Academy of Esthetic Dentistry (JAED) was established in 1988. At the present time, JAED has more than 3,000 members and is active in various fields. The Asian Academy of Aesthetic Dentistry (AAAD) was also established under the leadership of JAED. I held the office of AAAD president from 2002 to 2004.

SH: ***I am curious about how general dentists, specialists, and the population at large have responded to the introduction of cosmetic dentistry.***

TM: "Cosmetic dentistry" is a well-known term among more than 80% of Japanese people. The term is frequently used throughout society and at academic meetings, as well. A training course for "whitening coordinator" is open to dental hygienists, of which there are more than 3,000 qualified. Dentistry is part of the richness of everyday life in Japan.

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SH: ***"Anti-aging dentistry" is a rather new concept for North Americans. I would like you to tell us how you see the concept.***

TM: Japan has one of the world's longest average life spans: 80 years for males and 85 for females. The so-called aging society is at hand and anti-aging dentistry is inevitably required in such a circumstance. The Japan Society for Anti-Aging Dentistry (JSAD) has three stated goals: Beauty management, lifestyle management, and longevity management. The JSAD maintains various activities under the slogan, "Everlasting Youth and Beauty."

SH: ***I know our readers would be interested in knowing what types of procedures you offer and what ancillary services you use. Can you give us an overview?***

TM: Dentists have a responsibility to manage not only teeth, but also occlusion, oral mucosa, and adjacent organs involved in oral functions. In this sense, anti-aging dentistry should maintain intimate collaboration and coordination with the medical science involved. JSAD has a training course for "beauty advisors," "supplement advisers," and "aroma coordinators," which is open to dentists and dental hygienists.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Steven Hill as an AACD Accredited Member.

❖

Give Back A Smile™

In This Section:

The Boomerang Effect[1]

by Randy R. Mitchmore, DDS
Houston, TX
www.lifesmiles.us

"The game of life is a game of boomerangs. Our thoughts, deeds, and words return to us sooner or later, with astounding accuracy." —Florence Shinn

Introduction

When I first became a member of the AACD, I felt that the Give Back A Smile™ (GBAS) program was a good humanitarian cause. I have always felt that it is my duty to give back to the community where I live in return for the goodness I have received. I decided to hold a "whitening day" at my office and donate the proceeds to the AACD Charitable Foundation (AACDCF) and become a GBAS volunteer dentist. The whitening day went well and I was soon assigned a case. Little did I know that this problem was already causing pain and destruction very close to home; as it turned out, my own sister was a victim of domestic violence. She was beautiful, smart, hard working, by every outward indication extremely successful, and the mother of three children. I had no idea how dreadful things were for her behind closed doors. Unfortunately, she was not a survivor of domestic violence in that it ultimately ended with her suicide. I now dedicate my work for GBAS in Laura's memory.

This case literally changed and saved this woman's life through the restoration of only one tooth.

The Case

This case shows how an entire smile can be broken with just one broken tooth. Previous articles in the *JCD* have illustrated beautiful and sometimes heroic dentistry for mouths that were decimated. That may have led to a perception that all GBAS cases involve a large number of teeth and procedures, and might require great time and financial sacrifice from the volunteer dentist

Figure 1: Full-face view, before.

and team. This case literally changed and saved this woman's life through the restoration of only one tooth.

Patient History

"Suzanne" (not her real name) (Fig 1) had been living with the outward signs of domestic violence for 12 years. The right upper central had been broken in one of the many scenes from an abusive marriage (Fig 2). Having to rebuild her life as a single mother with a broken smile was difficult. Suzanne did not have money for a dentist for herself, just for her sons. Trying to find a decent job and meet new people was very hard and was leading to a serious depression.

Clinical Findings

Suzanne had absolutely beautiful teeth! Her general health was very good and her oral hygiene was excellent. There was moderate periodontal disease from years of no professional dental care and the resultant subgingival calculus and inflammation. The teeth were yellowed. The upper right central had a broken and ragged mesio-incisal edge, and the left central was slightly chipped on the incisal edge (Fig 3). When we first met Suzanne she was very friendly, but nervous and somewhat skeptical that her dream of a restored smile really could come true.

Treatment

The first orders of business were to regain gingival health and brighten her smile. Scaling and root planing were performed by the hygienist under local anesthesia. We gave Suzanne a power toothbrush (Ultreo; Redmond, WA) to use at home with oral hygiene instructions, and CloSYS II mouthwash (Rowpar Pharmaceuticals; Scottsdale, AZ) for home use. Impressions were made for home whitening with 23% carbamide peroxide (Nite White, Discus Dental; Culver City, CA). At the follow-up periodontal care appointment, the teeth had whitened nicely from an A-3 to an A-1. The periodontal sulcus depths were 1 mm to 3 mm and there was no bleeding upon probing. We were ready to proceed with a conservative bonding procedure.

At the following appointment, the teeth were isolated, and an extremely conservative preparation was done only 1 mm to 3 mm beyond the broken edges of the teeth. The teeth were restored with layers of Vit-l-escence composite (Ultradent Products; South Jordan, UT), which followed the color map of shades and translucencies of the existing teeth (Figs 4 & 5). Suzanne was then rescheduled for a final polish and photographs appointment (Figs 6 & 7).

Suzanne's Words

Dr. Mitchmore truly changed and saved my life. When I first called Toni, Dr. Mitchmore's office manager, my spirits lifted. She was so kind. When I arrived, she made me and my son feel at home. She made me feel so special… and normal. She also made sure that my son was comfortable while I was busy with the dental staff. When I met

Figure 2: Preoperative 1:2 smile.

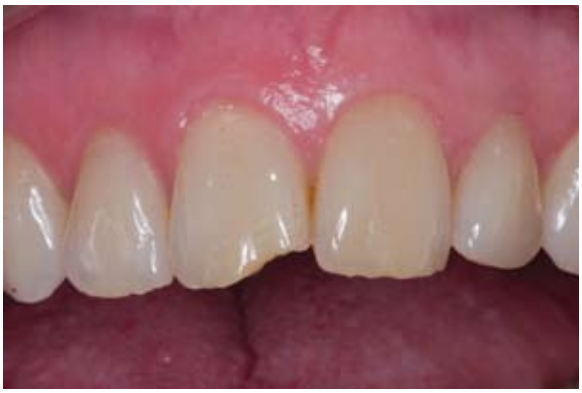

Figure 3: Preoperative 1:1 close-up of the smile.

Dr. Mitchmore and the rest of his staff, I realized that these people were all kind and caring. They work as a very cohesive unit, with consideration for each other; I wish I could film this and show it to other offices!

In two weeks, Dr. Mitchmore and his wonderful staff gave me the most beautiful smile! Antonio made me whitening trays to use for two weeks, and Cristina cleaned…and cleaned. The bonding procedure was done very subtly, with different shades and transparencies and took two hours of concentrated work by Dr. Mitchmore and both dental assistants. When his assistant, Silvia, first handed me the mirror after the bonding procedure, I cried, and she kindly told me that there had been many tears of happiness there. I had forgotten how it felt to really smile—this realization is so profound. My family is very thankful, as well, and is amazed by how natural it looks. I had forgotten that my youngest child had never seen me any other way, so you can imagine how wonderful all this is to me.

Dr. Mitchmore and his entire staff gave selflessly of their time, skills, and caring to help me again become the person I really am—happy, outgoing and productive.

I was shocked to learn that one in four women in this country will be a victim of abuse at some point in her life.

Reflections

Domestic violence is a "'dirty little secret" for many. The victim is stripped of self-esteem and often feels that she or he must be the only one in this situation, or that they somehow deserve the abuse, or that there is no way out. The problem cuts across all socio-economic lines. Part of the AACDCF's mission is to educate the public. I was shocked to learn that one in four women in this country will be a victim of abuse at some point in her life. In going through this process, my own staff slowly revealed that some of them had also been victims.

I was also amazed at the difference this restoration made for Suzanne. An impaired self-image may be more disabling from a developmental aspect than the patient's actual physical defect. The more attention is focused on a particular area, the more people tend to acquire a negative self-image relative to this area. In general, the clinician is not aware of the degree of the patient's perception of dentofacial disfigurements. The effect of such restorations may be underestimated in terms of their potential benefit to mental health.[2]

The "Boomerang"

The team building that this process creates is very powerful. My staff made contact with the local media, and stories were carried in local newspapers, magazines, and the Houston ABC television affiliate. No amount of money can buy all of the good will that was created and the lives that have been enhanced through this effort.

Call to Action

There currently are 272 survivors of domestic violence who are waiting for a GBAS volunteer dentist to help them. We do not have enough AACD volunteer members to meet

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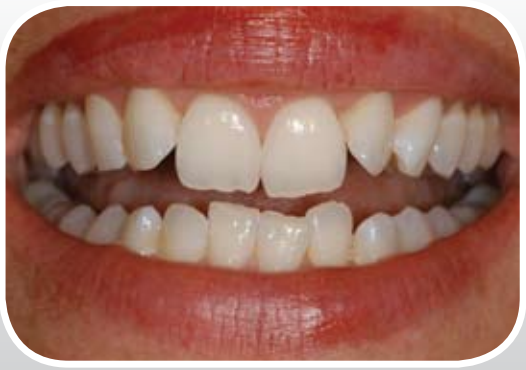

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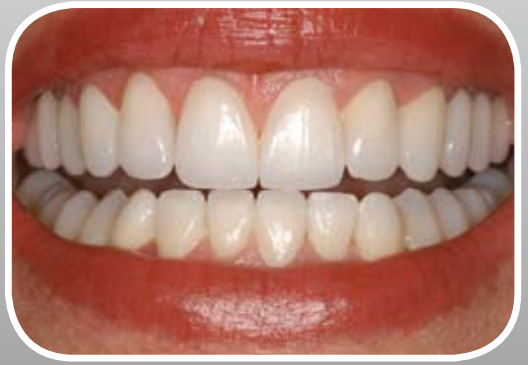
imaging with Envision a Smile



actual post-op

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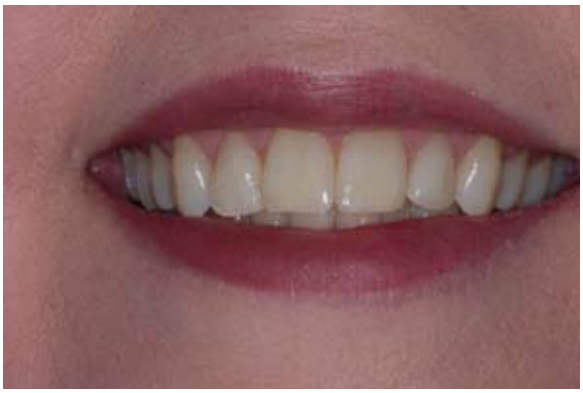

Figure 4: Postoperative 1:2 smile.

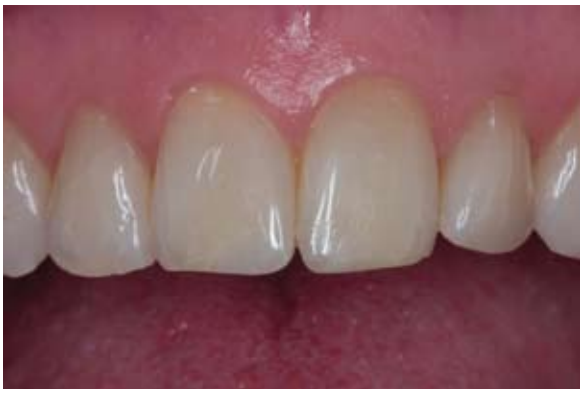

Figure 5: Postoperative 1:1 close-up of the smile.

Figure 6: "After" portrait.

Figure 7: "Fun" portrait. Her dream come true, Suzanne now feels "normal," happy, outgoing, and productive.

the need. Won't you answer the call? Who knows what "boomerangs" you may throw! Please call the AACDCF office at 800.543.9220 and ask for Give Back A Smile, or visit the Web site at www.AACD.com.

References

1. Bynum M, Mowery A. *The Boomerang Effect.* Hakalau, HI: Hakalau Pub.; 2008.
2. Rufenacht CR. *Fundamentals of Esthetics* (chap. 3, p. 59). Hanover Park, IL: Quintessence Pub.; 1995.

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The American Academy of Cosmetic Dentistry recognizes Dr. Randy R. Mitchmore as a Give Back A Smile™ (GBAS) volunteer who has restored the smiles of three GBAS survivors. Dr. Mitchmore also serves on the Board of Trustees and is the GBAS Committee Chair.

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Students' Questions

In This Section:

Questions from Senior Dental Students

by Simona Cuevas, DDS
San Antonio, TX
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Question

What is the ideal connector zone between maxillary anterior teeth?

Answer

The ideal connector zone in the maxillary anterior region is defined by the 50/40/30 rule. The interdental contact is the area in which two adjacent maxillary anterior teeth touch one another. The most incisal aspect of the contact area is the contact point. As suggested by Morley, the 50/40/30 rule indicates the relationship between the anterior teeth in their ideal connector zone (Fig 1). This means the following:

- 50% of the length of the central incisors is the ideal connector zone between the two maxillary central incisors
- 40% of the length of the central incision is the ideal connector zone between a maxillary lateral and a central incisor
- 30% of the length of the lateral incisor is the ideal connector zone between a canine and a lateral incisor.

The zone where the two teeth are in contact is called the interdental contact area. The length of this area is not the same between the incisors. The longest contact area is between the maxillary central incisors; the shortest contact is between the maxillary lateral incisor and the canine, still following a pleasing pattern.

Sources

Morley J. A multidisciplinary approach to complex aesthetics restoration with diagnostic planning. *Pract Perio Aesthet Dent* 12:575-577, 2000.

Morley J. Smile design—Specific considerations. *CDAJ* 25:633-637, 1997.

Bichacho N. Cervical contouring concepts: Enhancing the dento-gingival complex. *Pract Perio Aesthet Dent* 8:241-254, 1996.

Gurel G. *Atlas of Porcelain Laminate Veneers (Smile Design)* (pp. 59-112). Quintessence Pub.; 2003.

Figure 1: 50-40-30.

Question

What are the indications for successful surgical coverage of root exposure?

Answer

Root exposure is caused by gingival recession, which is a result of the fragmentation and ulceration of the epithelium. It is a morphologic change rather than a pathologic condition. In other words, it is a morphological change in response to a pathological condition, in conjunction with congenital predispositions and contributing co-factors. Possible etiology includes, but is not limited to, parafunctional bruxing, congenital defects of bony fenestrations with resulting lack of periosteal blood supply, autoimmune diseases, diabetes, smoking, or habits like nail biting or eating lemons.

Dental hypersensitivity however, is primarily caused by the exposure of the dentinal tubules in the root cementum following root exposure, even though tooth flexure and possible abfraction with stress concentration at the cervical region can also contribute to cervical pain. In these cases, occlusal equilibration can often eliminate cervical tooth discomfort.

Generally, root exposure is understood as mainly an esthetic problem, yet it is very important for the clinician to conduct a thorough examination to determine the existence of underlying pathology(ies) and periodontal architecture specific to the case.

The first step is to eliminate the problem (e.g., bruxism, tooth malalignment, habits). Only after this step is addressed and restorative means fail to satisfy the esthetic concern (like abfraction restoration), is surgery to be considered.

The indications for root coverage by surgery are primarily esthetic and, secondarily, preventive (as added support to a compromised periodontal architecture, and as relief for potential chronic root surface thermal discomfort). Again, it is to be considered only after elimination of trauma and resolution of possible inflammation.

There are five conditions necessary for successful root coverage:

- appropriate case selection
  —no loss of interdental papillae and interdental alveolar bone adjacent to gingival recession area
  —sufficient interdental papillae adjacent to gingival recession area
- sufficient blood supply ensured to donor tissue
- root surface covered with thick donor tissue (flap and graft), which can potentially present an esthetic problem if the donor tissue does not match the recipient graft site
- donor tissue adapted closely to the recipient site and sutured (dead space between the donor tissue and recipient site will interfere with circulation and encourage possible sloughing or rejection of the graft)
- no severe decay or abrasion on exposed root.

There are also five ideal criteria to be satisfied for successful root coverage:

- the gingival margin is on the cemento-enamel junction in

Class I, Class II gingival recession

- the depth of gingival sulcus is within 2 mm
- there is no bleeding on probing
- there is no hypersensitivity
- the color match with adjacent tissue is esthetically harmonious.

There are five different procedural surgical methods for root coverage:

- pedicle gingival grafts

—laterally positioned flaps

—double papillae flaps

—transpositional flaps

—coronally positioned flaps

- free autogenous gingival grafts
- connective tissue grafts or subepithelial connective tissue grafts
- guided tissue regeneration (GTR)
- semilunar coronally positioned flaps.

Sources

Bahat O, M Handelsman M. Periodontal reconstructive flaps—Classification and surgical considerations. *Int J Perio Rest Dent* 11:481-487, 1991.

Grippo JO. Abfractions: A new classification of hard tissue lesions of teeth. *J Esthet Dent* 3(1):14-9, 1991.

Miller PD, Allen EP. The development of periodontal plastic surgery *Periodont 2000* 11:7-17, 1996.

Nordland WP, Tarnow DP. A classification system for loss of papillary height. *J Periodontol* 69:1124-1126, 1998.

Sato N. Periodontal plastic surgery. *Periodontal Surgery—A Clinical Atlas* (pp. 336-341). Haqnover Park, IL: Quintessence Pub.; 2000.

DP Tarnow: Semilunar coronally positioned flap. *J Clin Periodontol* 13:182-185, 1986.

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Accreditation Essentials

In This Section:

Introduction to Accreditation Essentials

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"Everyone has a purpose in life . . . a unique gift or special talent to give to others. And when we blend this unique talent with service to others, we experience the ecstasy and exultation of our own spirit, which is the ultimate goal of all goals. "

—Deepak Chopra

Each of us has our own journey to Accreditation, our own story. The process can be challenging, frustrating, and ultimately very rewarding. One of the greatest values of this journey is the experience of learning to perform your profession at its highest level. By challenging your skill, your creativity, and your patience, you will explore and consequently expand the boundaries of your talent. It is the opportunity to discover your true self.

Each Accreditation candidate follows a set of guidelines and a general formula for success. Beyond that, each candidate expresses his or her own unique talent in a way unlike anyone else. Many philosophers, psychologists, and spiritual leaders have talked about the experience that comes with expressing our human potential, our focus or intentionality. Buddhists call it "timeless awareness." Renowned psychologist Mihaly Csikszentmihalyi refers to it as "the flow" or the experience of the optimum self. Creating a new smile and executing that creation requires the focus that leads to our ultimate expression of self.

In this issue, Dr. Duane Beers and Dr. Jerome Cha discuss their diagnosis and treatment of Case Type I, Six or More Indirect Restorations. Both cases are excellent examples of rehabilitating the smile to radiant health and beauty. These are often the most rewarding cases because of the positive emotional

impact they have on the patient. When a person has lived with unsightly teeth due to noticeable stains, severe erosion, excessive wear, or a host of other possible pathologies and esthetic compromises, the biggest scars are found not on their teeth but rather on their hearts. Restoring someone's smile can restore his or her self-image and confidence, which in turn can bring increased joy to their lives. What greater gift can we give to another person and ultimately to ourselves?

Also in this issue, Mr. Nelson Rego, who received his Accreditation in New Orleans, shares the challenges and obstacles he overcame to achieve Accreditation success. I would like to take this opportunity to thank Dr. J. Fred Arnold, III, who is now our Accreditation Chairman, for sharing his insightful Examiners' Perspectives in previous issues; and I would like to welcome Dr. Rebecca K. Pitts, a gifted newcomer, who will now be sharing her Examiners' Perspectives.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Lynn Jones as an AACD Accredited Member and Give Back A Smile™ (GBAS) volunteer who has restored the smiles of three GBAS survivors.

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Accreditation Clinical Case Report, Case Type I: Six or More Indirect Restorations

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Introduction

The art of dentistry, coupled with advancements in ceramic technology, is now empowering skilled clinicians to create lifelike restorations that conserve tooth structure, are virtually invisible, and are long lasting. "The objective of dental science and dental practice should be to preserve the natural teeth and prolong their normal function in the same ratio as medical science has prolonged the average span of human life."[1] Perhaps the most useful restoration to achieve this objective is the porcelain laminate veneer. The porcelain veneer is the prosthetic replacement of the visible portion of the dental enamel with a ceramic substitute, intimately bonded to the tooth surface, yielding optical, mechanical, and biological properties closely resembling those of natural teeth. "This substitute enamel allows the clinician to achieve the prosthetic goal of replacing defective human enamel with bonded artificial enamel."[2] The human desire to have a beautiful smile transcends race, nationality, and age. The American media has been extremely effective conveying to the public the possibilities of smile makeovers. The gauntlet having been thrown down, it is up to the cosmetic dentist to master and deliver the principles of smile design.

This type of fluorosis has been classified as the most severe type.

Patient History

The patient was a 25-year-old Hispanic female in excellent health. She was pregnant and in her second trimester at the time of the examination. She had no known allergies. Her primary complaint was the unsightly white and brown spots covering all of her teeth, especially her upper front teeth. The patient

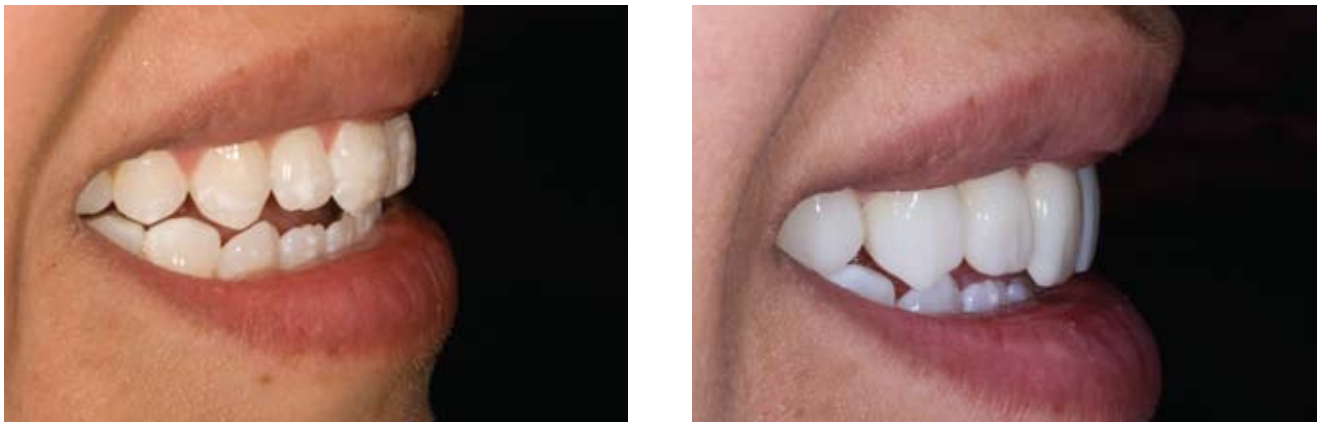


Figure 1: Before; right lateral smile, 1:2 view. After; right lateral smile, 1:2 view.

was born and raised in the city of Durango, which is in the Guadiana Valley in Northwestern Mexico; 80% of the inhabitants of this geographic area exhibit dental fluorosis and 35% of them suffer serious damage to their teeth. The fluoride levels in Durango range from 1.54 to 5.67 mg/L.[3] The fluorosis in this area is characterized by hypomineralization and increased porosity of the dental enamel. Calcium deficiency and malnutrition may increase the risk of developing DF mottling and disabling skeletal damage.[4] This type of fluorosis has been classified as the most severe type.[5] The patient freely admitted that she ground her teeth at night and had done so all of her adult life. Her restorative dental history was limited to Class I and II amalgam restorations placed in her molar teeth during her teen years. When the patient was questioned about her smile she complained of the "gap in front of her upper right eyetooth." She also said her front teeth were too short and her smile was "crooked."

Clinical Examination

Prior to beginning the examination, a complete digital set of the 12 AACD views was taken and downloaded to the operatory computer. Clinically all the hard and soft tissues were within normal limits. In fact, the oral hygiene and gingival health were exceptional and there was no pocketing and no bleeding upon probing. Her temporomandibular joint was asymptomatic and there were no audible or palpable joint noises. There was no pain upon palpation of the posterior joint spaces. The patient's facial profile was indicative of a skeletal Class III malocclusion. The molar and canine relationship was Angle's Class I. However, the maxillary and mandibular molars were in an edge-to-edge cusp tip relationship. There was a slight anterior open bite. The patient was not a tongue thruster. She said she had not sucked her thumb when she was young. There were numerous abfractions and excessive wear of the cusp tips of the maxillary and mandibular left canines. There was an absence of appropriate incisal guidance. There was no cuspid rise in right or left lateral excursions. The loss of canine rise on the left seemed to be due to wearing down of the canines. On the right, the cause seemed to be due to the distal-facial rotation of #6 (Fig 1) and the mesial-facial rotation of #27.

Once it was determined that the patient could be a good candidate for the AACD Type I veneer case, she was doubly draped with lead aprons and digital periapical radiographs were exposed of teeth ##4-13. The periapical radiographs revealed significant Class III caries on the mesial aspects of #8 and #9. No other caries was revealed. All of the patient's teeth, except #27 and #28, were affected by dental fluorosis. The maxillary incisors had multiple opaque areas that were porous. The mandibular incisors were affected to a lesser extent. The buccal surfaces of all the molars also were severely affected. The patient's smile was so full that the buccal surfaces of the upper and lower second molars were visible

Figure 2: Before; full-face, 1:10 view. After; full-face, 1:10 view.

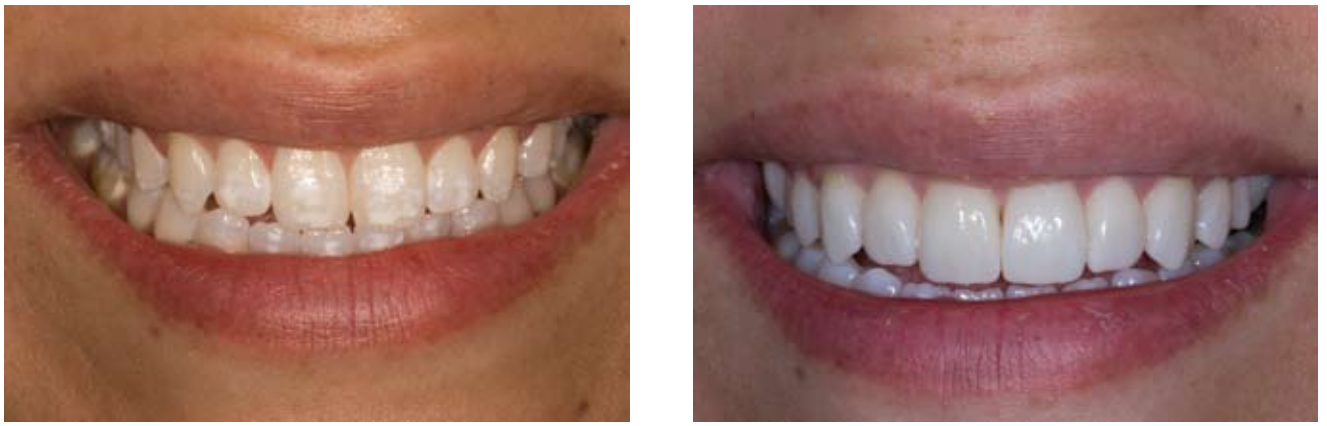


Figure 3: Before; smile, 1:2 view. After; smile, 1:2 view.

(Fig 2). The S.M.I.L.E. evaluation technique[6] was performed at chairside and would be repeated later on mounted diagnostic casts.

S (size and golden proportions)

M (midline and canting) (Fig 3)

I (axial inclination) (Fig 4)

L (lip line and incisal edge position) (Fig 5)

E (extra hard tissue guidelines)

S (soft tissue conditions) (Fig 6).

At the conclusion of the exam it was clear the patient was seeking an ideal smile makeover. The complexity of her case dictated that we collect more data before finalizing our diagnosis and treatment plan. Two sets of polyvinyl siloxane (PVS) impressions were made in order to fabricate two sets of casts: One to be used for a master diagnostic wax-up and one to be mounted on a Panadent articulator (Colton, CA) (with facebow transfer) for further occlusal analysis. Multiple sets of AACD digital photographs were taken. Additional views were exposed that might be useful in diagnosis, including the lateral profile (right and left) and retracted centric occlusion (right and left). Multiple shade tabs were photographed adjacent to teeth #27 and #28 since these teeth were unaffected by fluorosis (Figs 7 & 8). An appointment was made for the patient to meet the ceramist who would be doing her case.

Diagnosis

The patient presented with a chief complaint of unsightly white and brown discolorations of her teeth, and she requested that her smile be improved "just like her sister's." Her diagnosis was multifaceted, as would be her treatment.

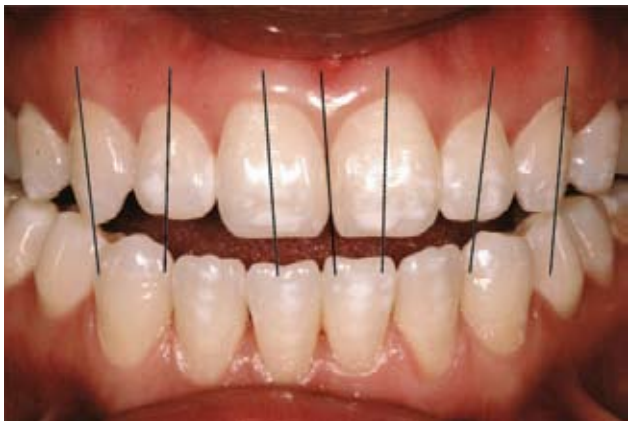


Figure 4: Axial inclination of maxillary anterior teeth.

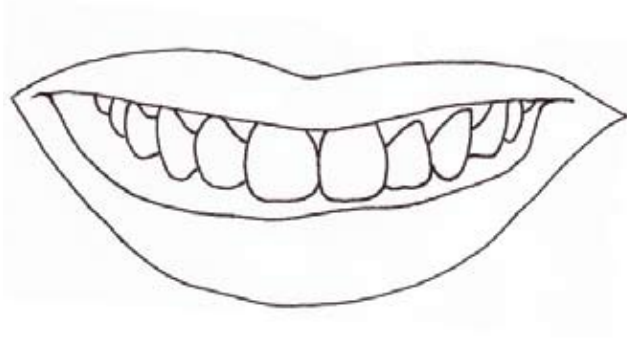


Figure 5: Lip opening tracing.

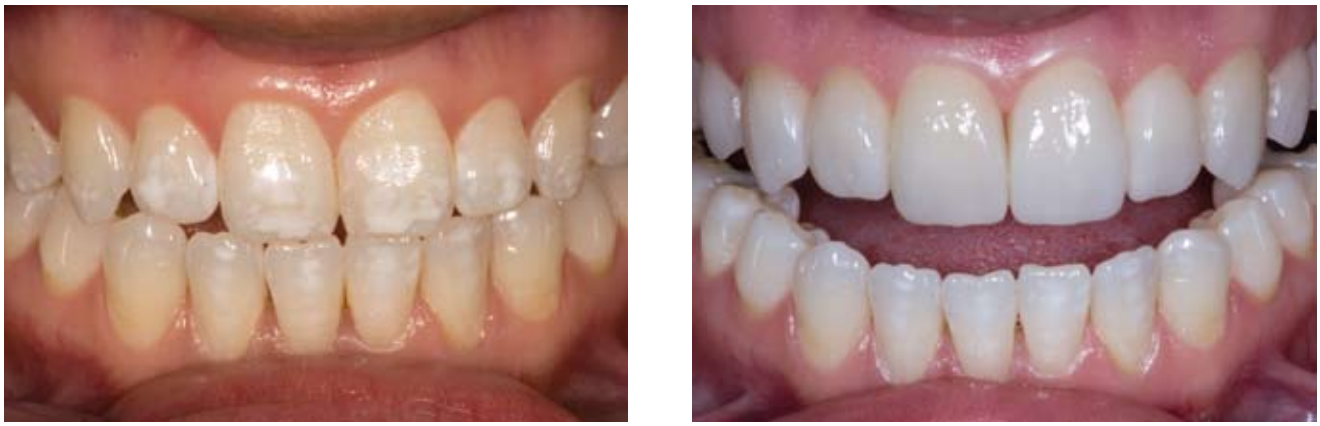


Figure 6: Before, retracted 1:2 view; the gingival height of the upper canines and central (excluding #8) was the same and was apical to the laterals. After; retracted 1:2 view.

- Severe fluorosis (mottling with porosity) of all maxillary anterior teeth and maxillary and mandibular molars. Simple fluorosis of the mandibular anterior teeth.
- Various Class II posterior amalgam restorations that were failing.
- Caries on the mesial surfaces of #8 and #9.
- Multiple Class V wear facets of the molar teeth.
- Excessive wear of the incisal surfaces of #22 and #27.
- Nocturnal bruxism habit.
- Skeletal Class III occlusion with a slight anterior open bite. Dental Class I with the upper and lower molars in a buccal-cusp-to-buccal-cusp relationship as opposed to a cusp-fossa relationship.
- Upward cant of incisal plane, normal upper posterior occlusal plane.
- Loss of incisal guidance and canine rise. Posterior group function occlusion.
- Short maxillary central incisors with a W/L ratio of 90% on #8 and 86% on #9. Violation of golden proportions and numerous principles of S.M.I.L.E. design, including canted midline, reverse smile, uneven gingival architecture #8, improper axial inclination of #7, inappropriate embrasure form #6. The disto-facial line angle of #9 was rotated facially about 1 mm

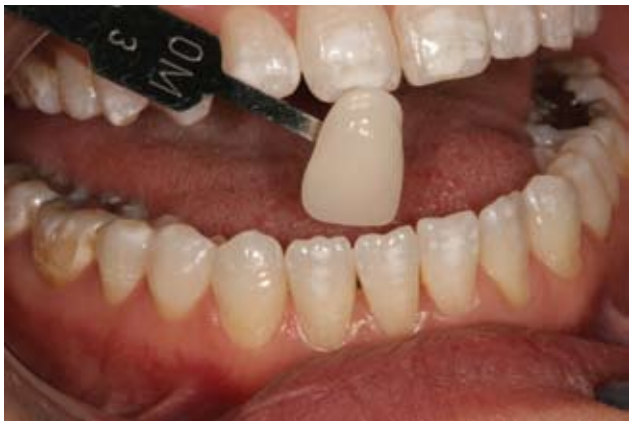


Figure 7: Shade tab OM3.

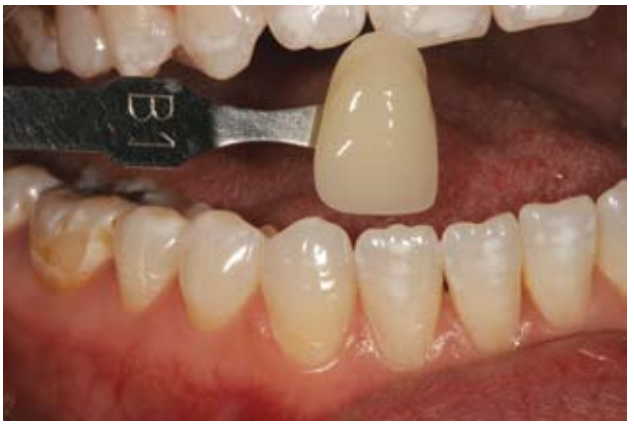


Figure 8: Shade tab B1.

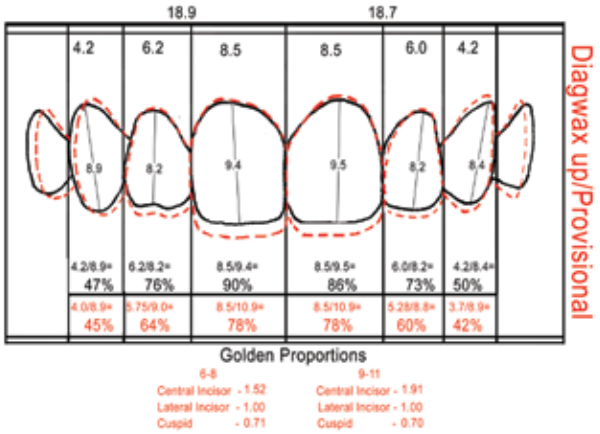


Figure 9: Preoperative tracing of anterior teeth with superimposed tracing of diagnostic wax-up.

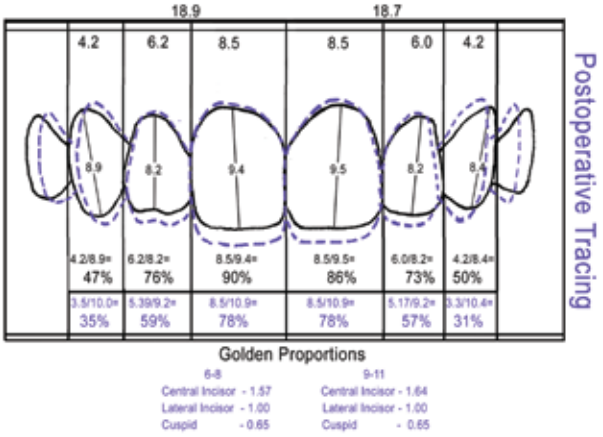


Figure 10: Postoperative tracing of veneers superimposed on preoperative teeth.

relative to #8. The mesial facial aspect of #6 was rotated facially. The disto-facial aspects of #22 and #27 were rotated facially.

- The patient displayed excellent gingival health, American Academy of Periodontology Type 0.

Treatment Plan

Although the patient's primary desire was to enhance her smile, it was important to address her parafunctional habits. We determined that the patient's functional and esthetic needs could be satisfied by restoring teeth ##5-12 with porcelain laminate veneers. We would mount diagnostic models on a Panadent articulator via a facebow transfer and equilibrate the cast to the most ideal occlusion. Then we would do a master diagnostic wax-up for teeth ##5-12. We would lengthen the incisors to recreate incisal guidance and satisfy smile design requirements. The canines would be lengthened slightly and reshaped to give a canine rise occlusion. It would be impossible to have the total length of the canines be the same as the central incisors since there was an upward cant of the premaxilla, causing the incisal plane and the posterior occlusal plane to differ. We would recontour the gingival architecture apical to #8 with a Luxar carbon dioxide (CO_2) laser (LuxarCare; Woodinville, WA). The carious lesions on the mesial aspects of #8 and #9 would be restored with composite resin, as would the buccal surfaces of all the upper and lower molars. Ultimately, after teeth ##5-12 were restored and incisal guidance and cuspid rise reestablished, the molars would be restored

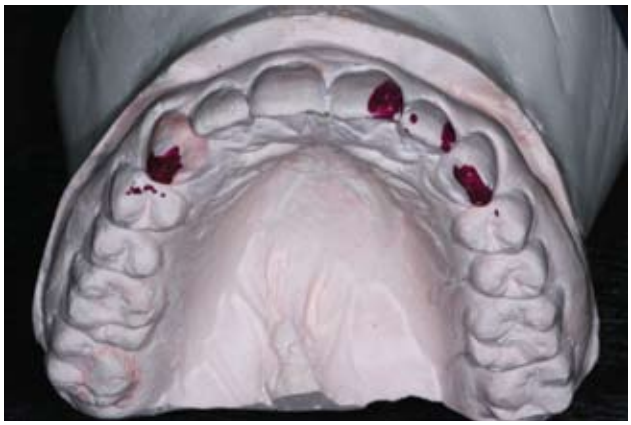


Figure 11: Preparation analysis of preoperative diagnostic cast.

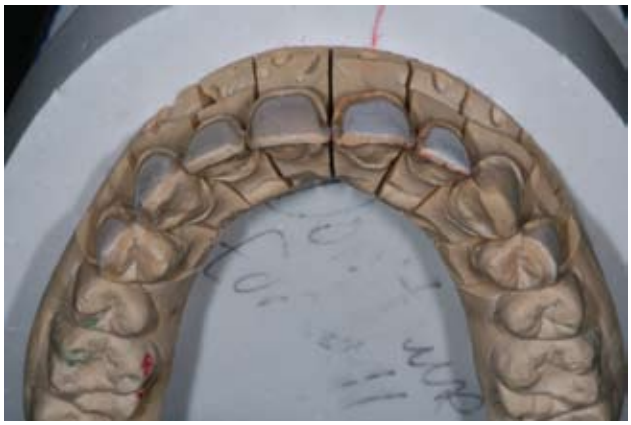


Figure 12: Master cast and final veneer preparation.

with crowns. It would be crucial that we fabricate a nightguard immediately after completing her anterior restorations.

Treatment

Preparation

Prior to the preparation appointment, diagnostic casts were transferred to a Panadent articulator with a facebow. The central incisors were measured with a caliper (Erskine Dental; Marina Del Rey, CA). Using these known values and a 1:2 photo of the anterior teeth, a tracing and digital evaluation of the apparent widths of teeth ##5-7 and ##10-12 was calculated. The W/L calculations of ##5-12 were completed. The hypothetical ideal proportions of these teeth were then calculated and superimposed over the first tracing. When tooth #9 was increased in length from 9.9 mm to 10.8 mm, the W/L ratio improved from 86% to 79% (Figs 9 & 10). These measurements and tracings were then sent to my laboratory for a master diagnostic wax-up. The laboratory technician was instructed to create incisal guidance and canine rise in the wax-up. This cast was duplicated and a vacuum-formed index was made over the cast. An impression of the wax-up was made from a PVS material. Both the index and the PVS impression would be used for provisional fabrication.

This is an exciting time to be in dentistry because people are so appreciative of a smile makeover.

"Analysis of the patient's arch form dictates the preparation requirements. Variables that interfere with a consistent arch form needed to be addressed."[7] These areas were marked on the preoperative diagnostic cast (Figs 11 & 12). One of the goals of preparation was to keep the preparations in enamel and be minimally invasive. It was mutually agreed by the ceramist that we would fabricate Authentic pressed glass veneers (Jensen Industries; North Haven, CT). He felt this system was the best in his hands and that he could keep the restorations less than 1 mm thick, with the exception of the incisal edge, where we would be increasing length.

The patient was anesthetized with mepivacaine with neo-cobefrin 1:20,000. First, the Luxar CO2 laser was used to move the zenith of gingival tissue apically by .5 mm. The carious lesions on #8 and #9 were then restored with microfill composite shade B1(Porcelize, Cosmedent; Chicago, IL). A #8801-014 round diamond (Brasseler USA; Savannah, GA) was used to make initial depth cuts and trace the margin placement on teeth ##5-12. The angle of the bur was varied to control the depth of the margin reduction to .5 mm. Next, a TFC2 depth-cutting bur was used to trace horizontal grooves in the labial surface in three planes. A KS1-012 was used to bulk reduce the remainder of the labial surfaces and shape the preparations. The Brasseler #8801-014 was angled to make a .5-mm depth cut on the incisors since they would be lengthened by 1 mm. The same bur was turned vertically to give a 1.5-mm incisal reduction in the indicated area of the canines and buccal cusps of the bicuspids. The finish line of the preparations was a flat shoulder on the lingual aspect. The incisal depth cuts of the bicuspids and canines were completed with a TFC-5 egg-shaped dia-

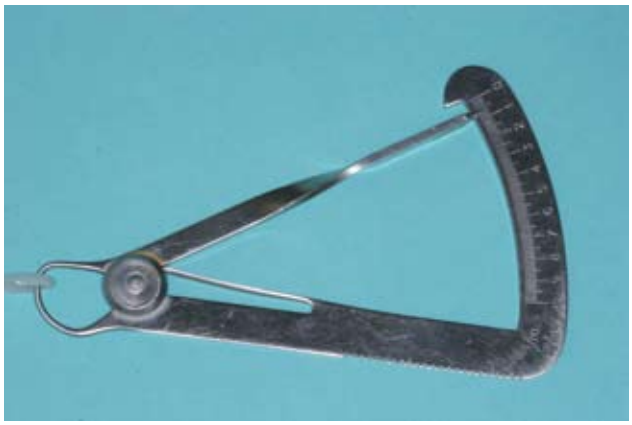


Figure 13: Tooth #8, .6-mm veneer.

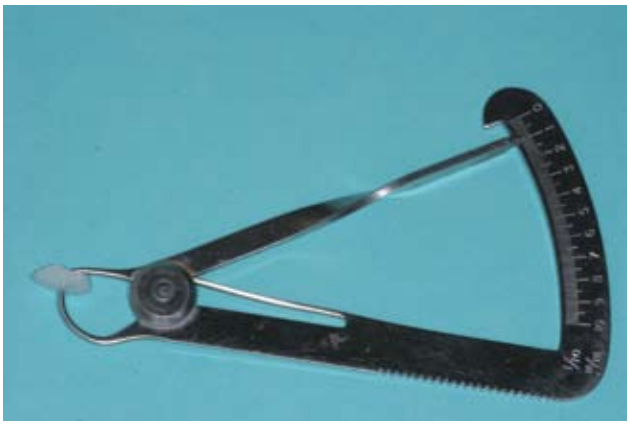


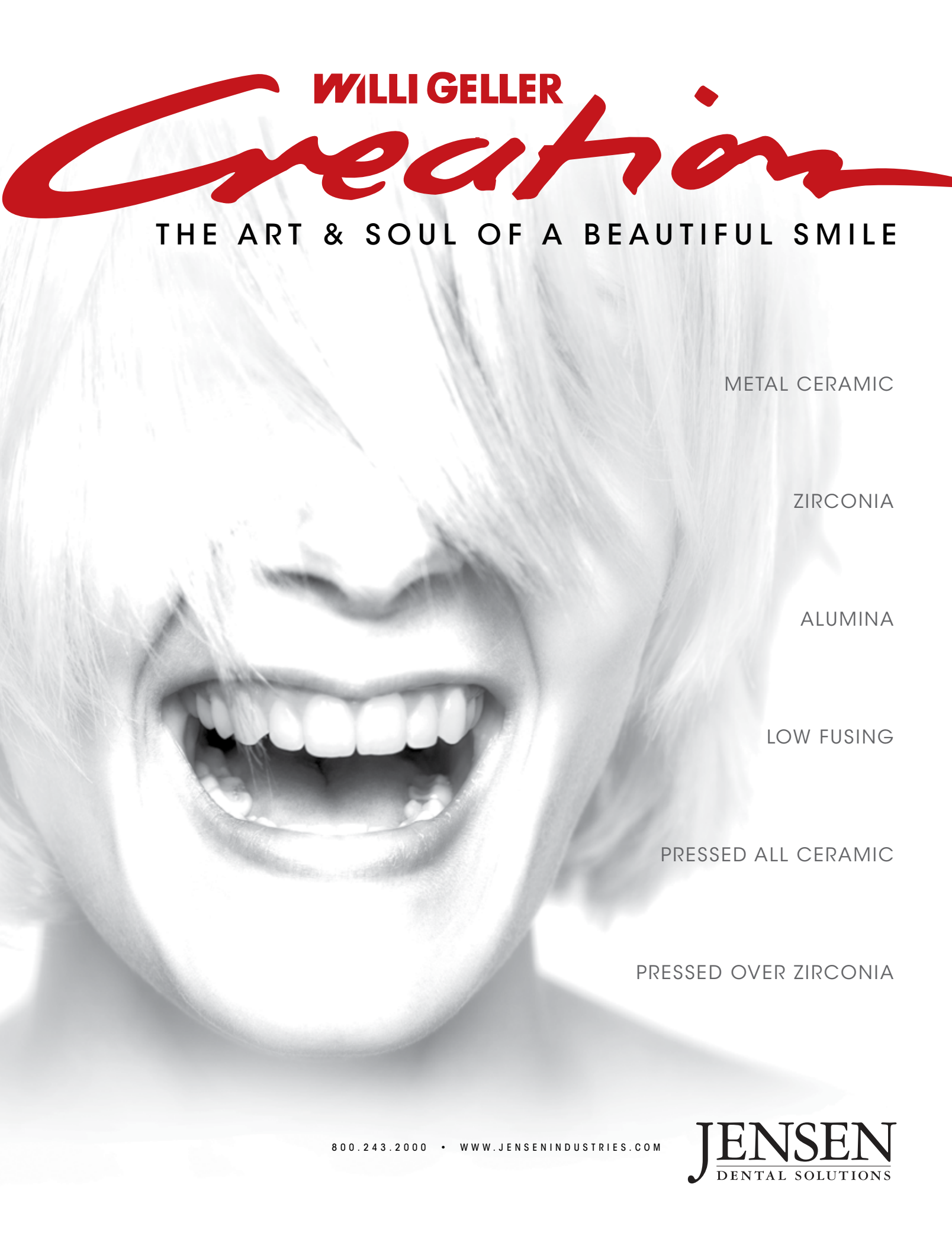
Figure 14: Tooth #9, .8-mm veneer.

mond. A Brasseler #8856L-016 was used to increase the proximals of each tooth and round internal line angles. A Brasseler #10839-012 was used to smooth the proximal surfaces and finalize margin placement at a juxta-gingival level. A white ceramiste point was used to smooth the preparations and round all the line angles.

The preparations were irrigated with .12% chlorhexidine and the stump shade (st9) was photographed next to the preparations. A #1 retraction cord (Ultradent; South Jordan, UT) was placed around the preparations and a full-arch Impregum polyether impression (3M ESPE; St Paul, MN) was made. A centric bite and facebow transfer were made. The preparations were once again rinsed with chlorhexidine and spot-etched in the midfacial with 35% phosphoric acid. A minimal trace of Clearfil SE bond (Kuraray; Kurashiki, Japan) was added to the etched areas and light-cured. The PVS putty matrix made from the ideal diagnostic wax-up was filled with shade B1 Integrity provisional resin (Dentsply International; York, PA) and placed over the preparations and held in place for two minutes. The putty was removed and the splinted provisionals were trimmed and polished. An impression and photographs of the provisionals were made and sent to the laboratory. A second facebow transfer was made with the provisionals in place. A temporary nightguard was fabricated from 00 Tru-Tain (Rochester, MN) material. The occlusion was carefully adjusted, postoperative instructions were given, and the patient was scheduled to be seen the next day. The ceramist was given the ideal wax-up and the impression of the provisionals. He was also given a detailed prescription for the design of each tooth. A compact disc of all the AACD views was also provided, with 8 x 11 glossy photographs of the key pictures.

Seating Appointment

Three weeks after the preparation appointment, the patient was seen to seat the veneers. She was anesthetized and the temporaries were removed. The preparations were cleaned with chlorhexidine and each veneer checked individually for fit. Next, all veneers were checked together and a few binding contact areas were adjusted. The veneers were tried in with three Variolink (Ivoclar Vivadent; Amherst, NY) try-in pastes: Veneer -1, 0, and +1. The +1 shade was deemed the best by all. The laminate for #8 measured .6 mm thick and the veneer for #9 measured .8 mm, respectively (Figs 13 & 14). The teeth were etched with 35% phosphoric individually for 15 seconds. The preparations were rinsed and painted with Excite (Ivoclar Vivadent) resin and cured for 10 seconds. The veneers were also etched with phosphoric acid for 30 seconds, rinsed, dried, and painted with silane. The veneers were then painted with Excite and air-thinned, and Variolink II Veneer +1 resin was placed in the veneers. The first veneer seated and finished was #5 to verify color. The order of seating was #5, #12, #6, #11, #7, #10, #8, and #9. To avoid an oxygen-inhibited layer, an oxygen barrier, glycerin, was applied to all the veneer margins and then each tooth was light-cured for an additional 60 seconds on the buccal and the lingual. The margins were polished with Brasseler gray and pink cups, then with 3 µ Porcelize, followed by 1 µ Porcelize. The occlusion was adjusted and the patient felt good with her new incisal guidance (Fig 15). A nightguard was fab-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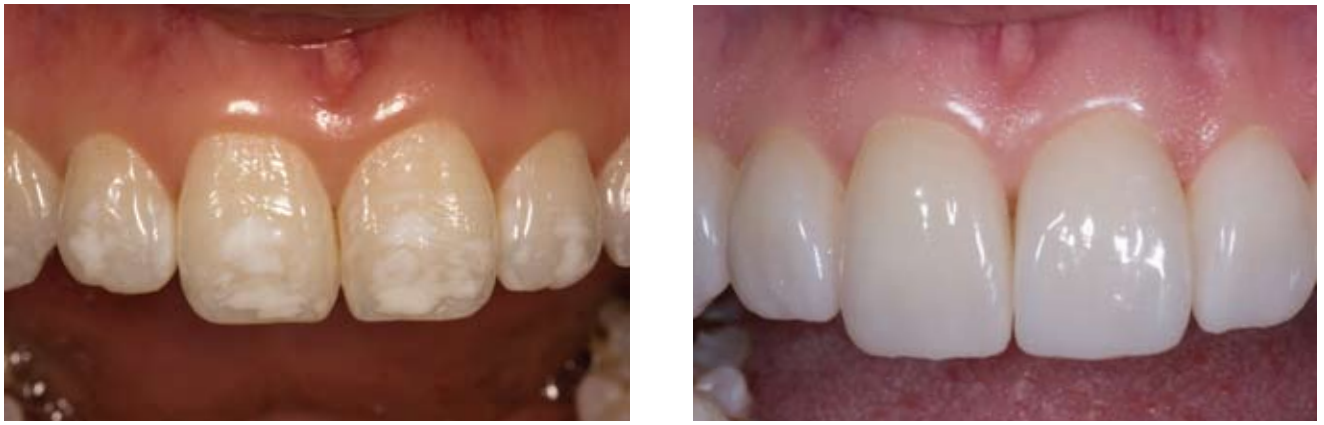

Figure 15: Before; frontal 1:1 view. After; frontal 1:1 view.

ricated at the seating appointment. A set of AACD photos was exposed. Finally, the patient had the beautiful smile she desired.

Conclusion

People are hired or fired, accepted or rejected based on the appearance of their smile. We all want a beautiful smile. This is an exciting time to be in dentistry because people are so appreciative of a smile makeover. The art, science, and now, mentorship of our profession, especially by the AACD, are empowering more clinicians to successfully complete such cases.

References

1. D'Amico A. The canine teeth: Normal functional relation of the natural teeth of man. *J So Calif Dent Assoc* 26:6-23, 49-60, 127-142, 175-182, 194-208.
2. Tovati B, Miara P, Nathanson D. *Esthetic Dentistry & Ceramic Restorations* (p. 163). London: Martin Dunitz, Ltd.; 1999.
3. Alarcon-Herrea MT, Martin-Cominguez IR, Trejo-Vazquez R, Rodriguez-Dozal S. Well water fluoride, dental fluorosis, and bone fractures in the Guadiana Valley of Mexico. *Fluoride* 34(2):139-149, 2001.
4. Dorzal RS, Herrera MTA, Cifuentes E, Barraza A, Fodriquez LJP, Sanin LH. Dental fluorosis in rural communities of Chihuahua, Mexico. *Fluoride* 38(2):143-150, 2005.
5. Feinman RA, Goldstein RE, Garber DA. *Bleaching Teeth*. Hanover Park, IL: Quintessence Pub.; 1987.
6. Bynum M. Anterior indirect laminates and veneers: Procedures for complicated cases; The New Face of Aesthetics. *AACD Monograph* (pp. 173-176), 2004.
7. Eubank J. *All Ceramic Restorations—Preparation Guide for Seven Different Situations*. Plano, TX: J. Eubank; 2003.

Sources

Accreditation Essentials. *Journal of Cosmetic Dentistry* 23(1):52-78, 2007.

Accreditation Essentials. *Journal of Cosmetic Dentistry* 21(3):64-108, 2005.

Accreditation Essentials. *Journal of Cosmetic Dentistry* 19(1):63-88, 2003.

Adar P. Magic of illusion: Step-by-step applications of the Authentic system. *Dent Dialogue* 3(2):92-104, 2003.

Blitz N, Steel C, Willhite C. *Diagnosis and Treatment Evaluation in Cosmetic Dentistry: A Guide to Accreditation Criteria*. Madison, WI: AACD; 2001.

Chiche GJ, Pinault A. *Esthetics of Anterior Fixed Prosthodontics*. Hanover Park, IL: Quintessence Pub.; 1994.

Picture Perfect Aesthetics: *AACD Monograph*, 2005.

Ritter R, Culp L. Ingot selection for aesthetic restorations using contemporary pressed ceramics. *Pract Proced Aesth Dent* 14(6):473-478, 2002.

Rolly HG, Gmund S, Dietrich J. The secret of natural appearance: Veneers. *Dent Dialogue* 2(2):140-152, 2000.

Sesemann MR. Utilizing diagnostic tracing analysis for Smile design; The New Face of Aesthetics: *AACD Monograph* (pp. 177-179), 2004.

Spear F. Diagnosis and treatment planning to optimize the periodontal restorative interrelationship. *Advanced Esthet Interdiscip Dent* 1(1):6-11, 2005.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Duane H. Beers as an AACD Accredited Member.

Examiners' Perspective for Dr. Duane H. Beers

by Rebecca K. Pitts, DMD, AFAACD
Lake Mary, FL
www.drrebeccapitts.com

Accreditation Case Type I involves treatment of six indirect restorations on the maxillary anterior teeth or more. It requires the candidate to use his or her knowledge to properly diagnose and create an appropriate treatment plan. It also demands excellent skills and collaboration by the dentist and the laboratory technician. In addition, the candidate must master the clinical aspects of the treatment.

The emphasis of the evaluation of Case Type I is on smile design elements. Dr. Duane Beers applied principles of proportions very nicely. In the overall picture, the patient's smile balanced well with her face and lips. Dr. Beers also managed to harmonize the smile line with the lip line despite the challenge of the patient's asymmetric smile. The decision to include placement of veneers on the first bicuspids and direct restorations on other posterior teeth, instead of stopping short at the cuspids, resulted in congruency from the anteriors to the posteriors. It also improved the appearance at the buccal corridor. Since the patient had a broad smile that revealed back to her first molars, improving the long axis of the second bicuspids and the first molars could have further enhanced this area. This was noted, but did not result in any score deductions.

Regarding individual restorations, the elements of dental anatomy including the line angles, the emergence profile, and the labial anatomy were well developed. There was a concern about the lack of translucency at the incisal third of the restorations. The cervical two-thirds were more opaque than normal, but they matched appropriately with the patient's unrestored dentition.

In general, examiners agree that soft tissue health is crucial in all case types. In this case, the examiners appreciated the good tissue tone and the absence of inflammation. However, the interdental papillae at the midline was blunted, creating a visible dark triangle. Most examiners gave a minor score deduction for this fault. The candidate did address this issue in his report, where he attributed the deficiency to insufficient healing time. However, the examiners are obliged to score the case based on what they actually see in the images.

As in most cases submitted for Accreditation, some faults were observed. However, examiners felt this case was very well executed, with most giving a +1 point for the overall appearance. Dr. Beers and his ceramist can be very proud of their achievement.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Rebecca K. Pitts as an AACD Accredited Fellow and Accreditation Examiner.

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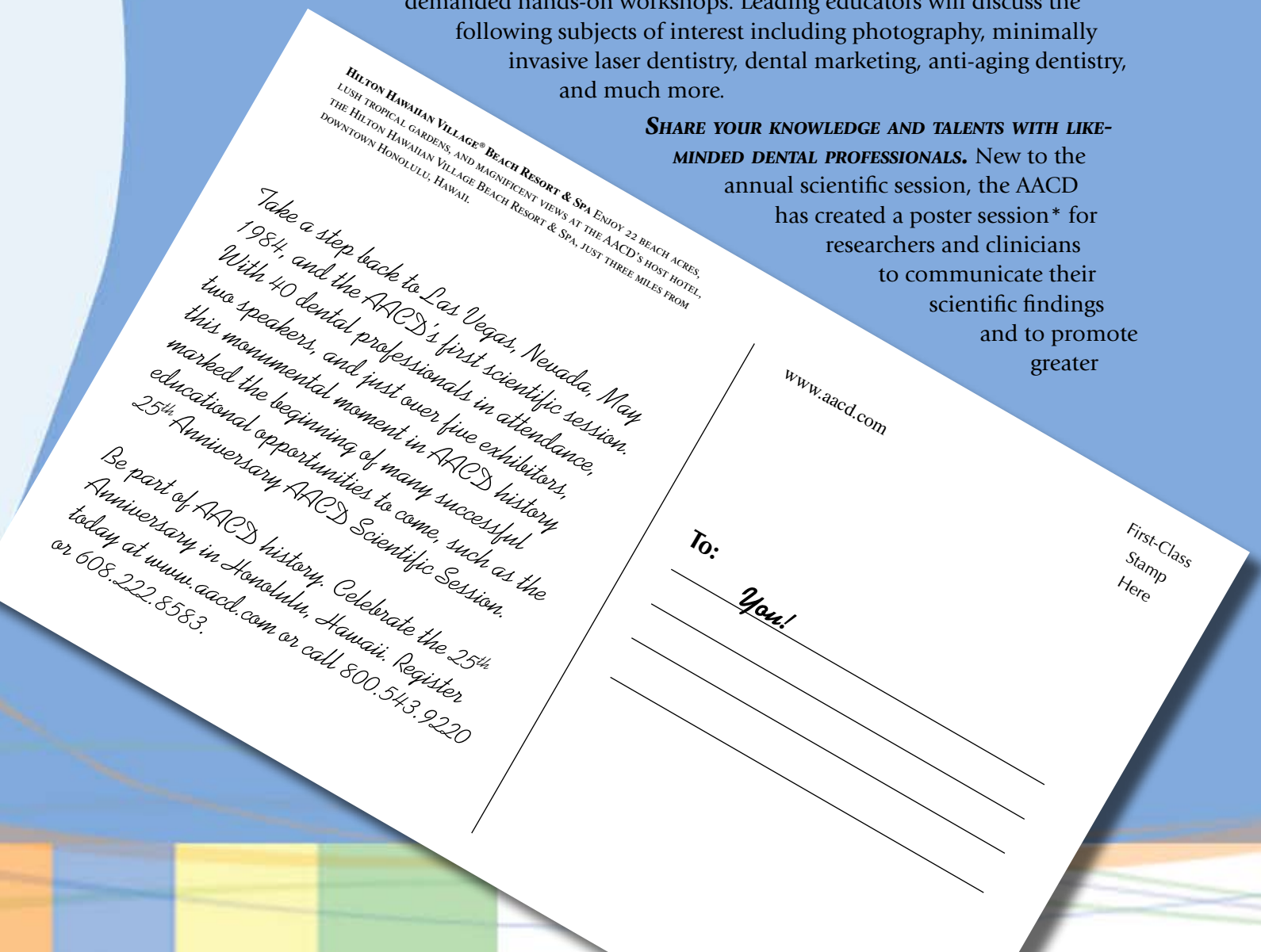

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interaction within the dental community. You are also encouraged to show your artistic skills in both dentistry and presentation through the 2nd Annual Smile Showcase.** Cosmetic dentistry is about positive transformations and this showcase allows you to present your patients' transformations in a variety of categories.

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Accreditation Clinical Case Report, Case Type I: Six or More Indirect Restorations

by Jerome Y. Cha, DDS
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www.tulsacosmeticdentalcenter.com

Introduction

"Your teeth are as white as sheep, recently shorn and freshly washed, your smile is flawless, each tooth matched with its twins."[1] In the Old Testament, King Solomon thus described his lovely bride. A beautiful smile is a vital component of overall beauty. The most rewarding part of being a cosmetic dentist is seeing a patient transform into a more confident and better version of their previous self. The amazing transformation of personality and confidence truly testifies to the power of having a beautiful smile. It is our privilege and gift that we can provide such an amazing healing service to our patients. In the case of severely worn dentition, reestablishing lost vertical dimension can not only change facial profile and esthetics, but it also provides a harmonious, efficient functioning oral-facial-masticatory system.

The most rewarding part of being a cosmetic dentist is seeing a patient transform into a more confident and better version of their previous self.

Patient History

The patient was a 37-year-old female in excellent health. She decided to seek cosmetic dental care because she wanted her teeth to look like they had when she was in her twenties. She explained that due to her past acid

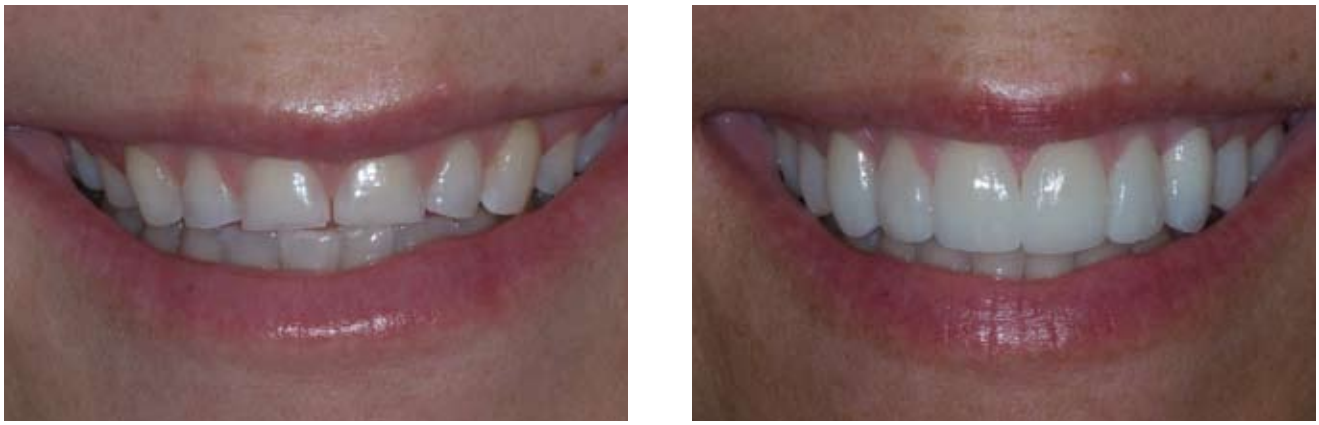


Figure 1: Before; severely worn upper anterior teeth. After; completed treatment with corrected buccal corridor and incisal width-to-length ratio of 80%.

reflux disease, the backs of her front teeth had become very sensitive (Fig 1). The patient's past dental care included orthodontic treatment, routine examinations, yearly bitewing radiographs, and basic oral hygiene therapy.

Clinical Evaluation and Diagnosis

The patient's periodontal examination was within normal range, except for tooth #11, which had a Miller Class I recession defect with a 2-mm recession (Fig 2).[2] The hard tissue examination showed teeth ##6-11 with complete lingual enamel erosion (Fig 3). Teeth #3, #14, #15, and #30 had previous restorations that were failing. Unlike the maxillary arch, the mandibular arch showed very minimal wear. Tooth #19 showed a fractured composite restoration with recurrent caries.

The gingival heights on #8 and #9 were approximately 2 mm coronal from the ideal position (Fig 4).[3] The gingival height on #11 was approximately 3 mm apical from the ideal esthetic position (Fig 5). The patient did not report a problem with her temporomandibular joints. However, she did report occasional headaches, which were usually relieved with over-the-counter medications.

Treatment Plan

The patient was presented with a treatment plan of restoring the complete maxillary arch with all-porcelain restorations to restore lost vertical dimension and to provide coverage for the lingual surfaces of the anterior teeth with minimal preparation. Laser gingival contouring on #8 and #9 and gingival grafting of #11 by a periodontist were proposed to the patient.

Once the diagnostic casts were mounted on an articulator (Denar, Waterpik Technologies; Fort Collins, CO) using a facebow transfer (Hanau Spring Bow, Teledyne Hanau; Buffalo, NY) and a bite registration, it became very clear that, in order to achieve an ideal width-length ratio of 67% to 80%,[4] I needed to increase the posterior occlusion by approximately 2 mm. An addition diagnostic wax-up was finished.

Treatment

Preparation

The first step was the use of an Odyssey diode laser (Ivoclar Vivadent; Amherst, NY) for recontouring of #8 and #9 to set the gingival margin. Next, all of the maxillary teeth were prepared for porcelain. The maxillary arch was restored with Access temporary crown material (Centrix; Hofheim, Germany) that was formed from a Sil-Tech silicone putty index (Ivoclar Vivadent) of the initial diagnostic wax-ups. The gingival margin of the temporary crown on #11 clearly indicated to the periodontist where the height of the gingival graft should be placed. In order to allow time for occlusion and periodontium to stabilize and heal, no impressions were taken at this time.

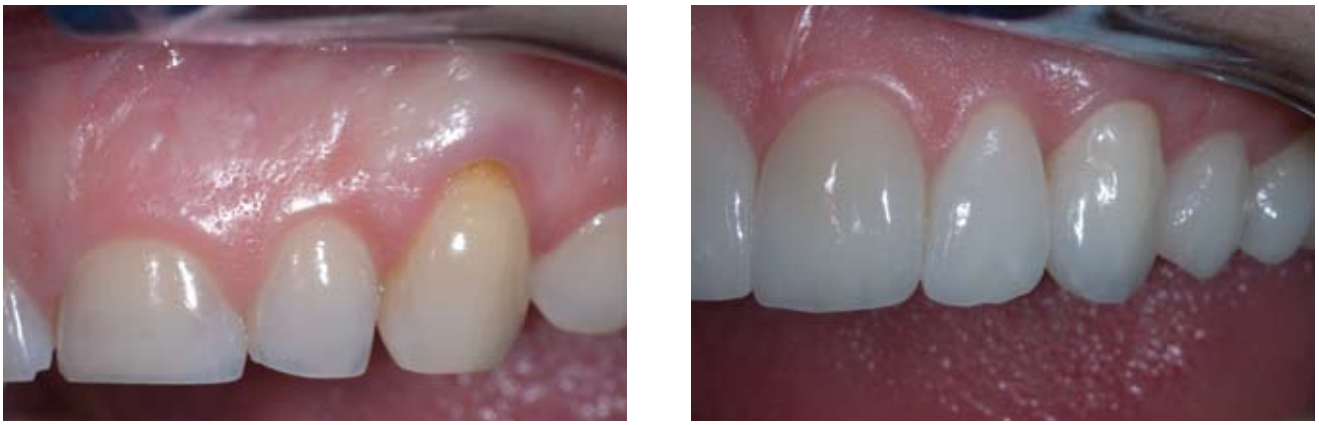


Figure 2: Before; apical recession of gingival on #11. After; successful gingival graft on #11.

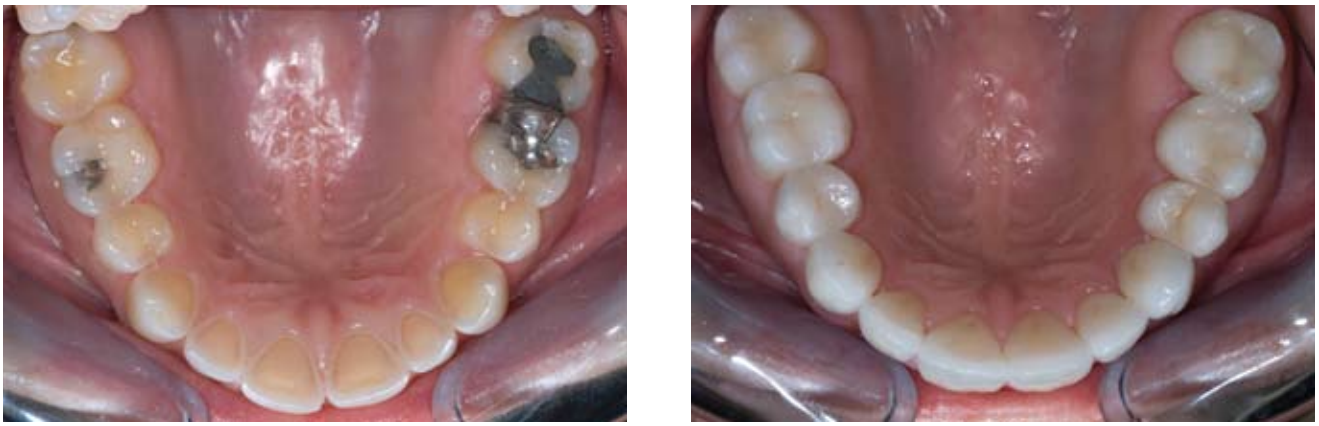


Figure 3: Before; complete erosion of enamel layer on lingual surfaces of anterior teeth. After; the restoration of maxilla.

The patient was seen the next day for an occlusal adjustment and then referred to a periodontist for the gingival graft procedure.

Post-graft period

During the eight weeks of the post-graft waiting period, the patient was carefully monitored to make sure that the vertical dimension was comfortable.

Once the vertical dimension proved to be comfortable for the patient and the graft had matured, the impression of the maxillary arch with the temporary crowns was taken. From the impression, casts were made and the second silicone index was made.

The previous temporary crowns were removed, the final impression (Impregum Penta Soft, 3M-ESPE; St Paul, MN) was taken, and the maxilla was temporized again with a new set of temporary crowns.

I have always done some of my own laboratory work, as I did in this case.

In the early years of my practice I had wanted to take continuing dental education but did not have a lot of money. I noticed that the tuition for laboratory courses cost less, so I started taking laboratory classes and enjoyed them. As a result, I have always done some of my own laboratory work, as I did in this case.

Waxing

The final full-contour restorations were waxed using Ivory Inlay casting wax (Kerr Corp.; Orange, CA) and a Belle de St. Claire Ultrawaxer (Kerr

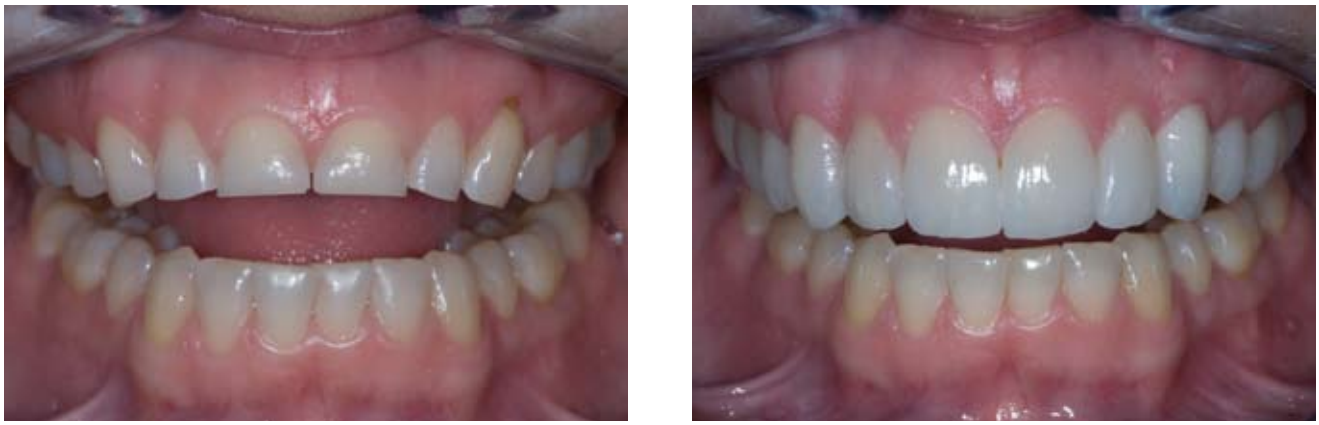


Figure 4: Before; gingival zeniths on #8 and #9 are 2 mm coronal from the ideal height. After; gingival zenith corrected.

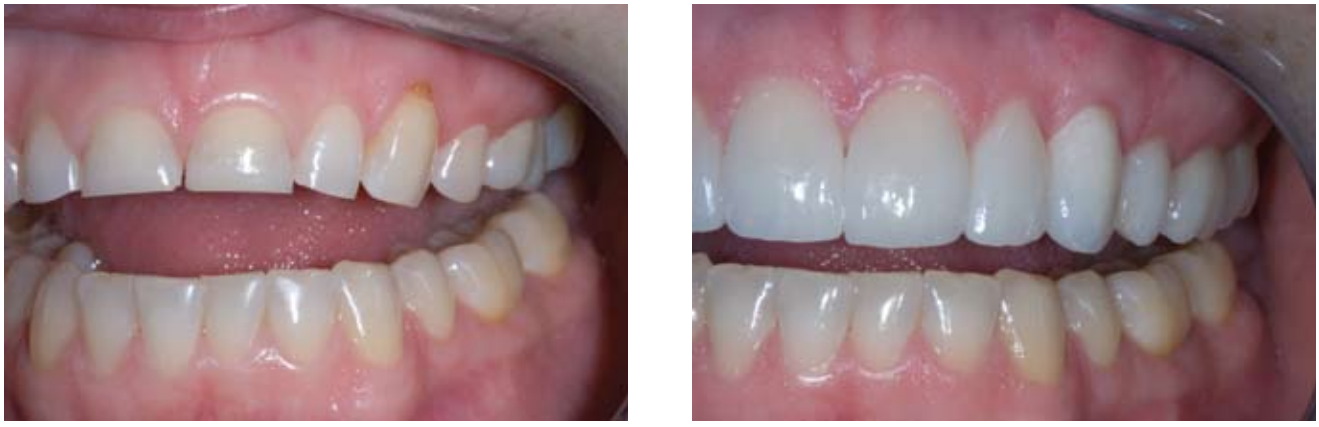


Figure 5: Before; note gingival recession and abrasion/abfraction on #11. After; successful gingival graft performed by a periodontist.

Corp.) guided by a second silicone index from the new temporary impression. The waxed crowns were then marginated, sprued, and invested into investment rings. Semi-translucent porcelain ingots (Empress pressable porcelain esthetic EO1, Ivoclar Vivadent) were selected and placed into a burn-out oven with the investment rings.

Staining

After the specified burn-out cycle, the ingots were pressed into the investment rings. Once the full-contour crowns had been devested and cleaned, the incisal thirds of the crowns were cut back. The internal porcelain stains (Empress Esthetic Stain Kit) were applied. Next, the Empress esthetic porcelain powders were stacked and baked. The porcelain stains—incisal blue and gingival yellow—were applied and baked. Then translucent porcelain was stacked at the gingival margin, then semi-translucent porcelain at the incisal one-third to show slight show-through of blue stain. Finally, incisal white porcelain was applied at the incisal edges of the crowns. The crowns were then baked according to the manufacturer's recommendation.[5]

Glazing and Polishing

The final fit and contours were checked, and then two layers of porcelain glaze were applied. The final polish was accomplished using Pink Polisher rubber wheel polishers (Axis Dental; Coppell, TX), followed with Diashine diamond paste polisher (VH Technologies; Bellevue, WA) and Robinson wheels. The insides of the crowns were sand blasted using a glass bead blaster (Bead/Sand Blaster, Integral Systems; Culver City,

Figure 6: Before; collapsed midface, brachycephalic facial profile. After; the treatment has corrected the collapsed midface and provided a more harmonious facial profile.

CA) at two bar pressure, then etched with 9.6% hydrofluoric acid for 15 seconds (Pulpdent; Watertown, MA) for final cementation.

Trying In and Placement

The crowns were tried in the patient's mouth to check for accurate fit, then etched with Etch Rite 38% phosphoric acid (Pulpdent) for 15 seconds to remove residue. The crowns were then dried and silaned with Monobond-S silane (Ivoclar Vivadent) for 60 seconds. The crowns were dried again, and then coated with Heliobond unfilled bonding resin (Ivoclar Vivadent). RelyX Unicem dual-cure resin cement (3M ESPE; St Paul, MN) was mixed and loaded into the crowns.[6] The crowns were placed in the following sequence: #8, #9, #7, #10, #6, #11, #2, #3, #4, then #15, #14, and #13. The crowns were spot-cured, then flossed and cleaned of excess cement. When all the crowns were placed, they were then final-cured for six seconds on all surfaces with a Sapphire plasma arc curing light (DentMat; Santa Maria, CA).

The treatment also gave the patient a more stable masticatory system by providing balanced occlusion and anterior guidance.

Discussion

Valuable information was gathered from the diagnostic wax-up process. The patient's vertical dimension, gingival height, contours/shapes of the teeth, and occlusion were derived from the wax-up process. From the wax-up, provisional restorations were fabricated and used to prove the patient's phonetics, function, and esthetics. The provisional restoration also served as a vital tool for communicating to the periodontist where the final restorative margins would be located, allowing the periodontist to properly correct the gingival recession to the desired level.

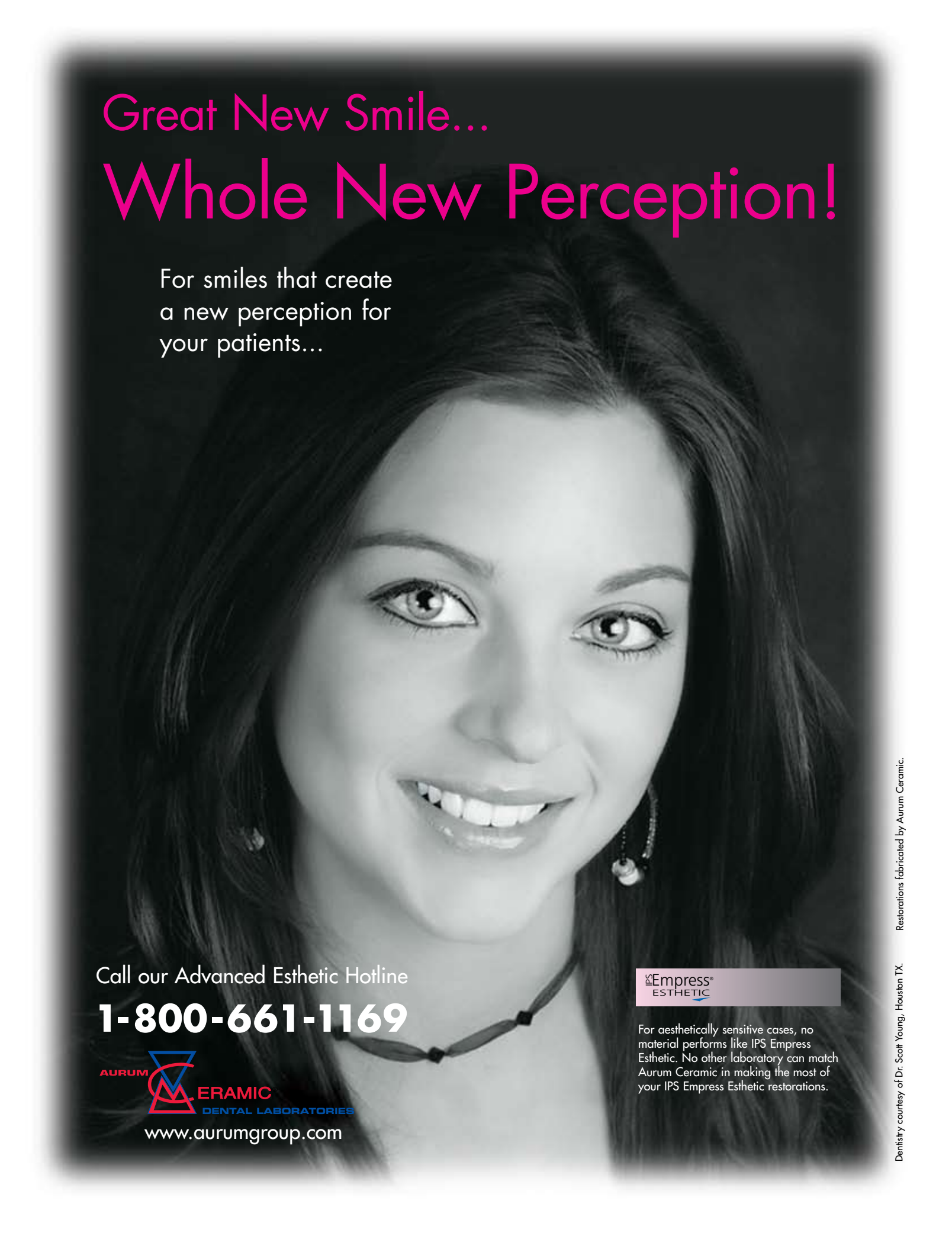
The treatment changed the patient's facial profile from a short, brachycephalic facial profile to an elongated harmonious facial profile (Fig 6). The treatment also gave the patient a more stable masticatory system by providing balanced occlusion and anterior guidance.

References

1. Holy Bible. *New Living Translation: Song of Soloman 4:2*. Wheaton, IL: Crossway Bible, a division of Good News Publisher; 1996.
2. Miller PD Jr. A classification of marginal tissue recession. *Int J Periodontics Restor Dent* 5:8-13, 1985.
3. Blitz N, Steel C, Willhite, C. *Diagnosis and Treatment Evaluation in Cosmetic Dentistry: A Guide to Accreditation Criteria*. Madison, WI: AACD; 2005.
4. Kokich VO, Kokich VG, Kiyak HA. Perceptions of dental professionals and laypersons to altered dental esthetics: Asymmetric and symmetric situations. *Am J Orthod Dentofacial Orthop* 130:141-151, 2006.
5. IPS Empress Esthetic. I*nstructions for Use*. Amherst, NY: Ivoclar Vivadent; 2004.
6. RelyX Unicem. *Self-Adhesive Universal Resin Cement. Technical Product Profile*. St. Paul, MN: 3M ESPE.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Jerome Cha as a Give Back A Smile™ (GBAS) volunteer who has restored the smiles of two GBAS survivors.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Dentistry courtesy of Dr. Scott Young, Houston TX.

Examiners' Perspective for Dr. Jerome Y. Cha

by Rebecca K. Pitts, DMD, AFAACD
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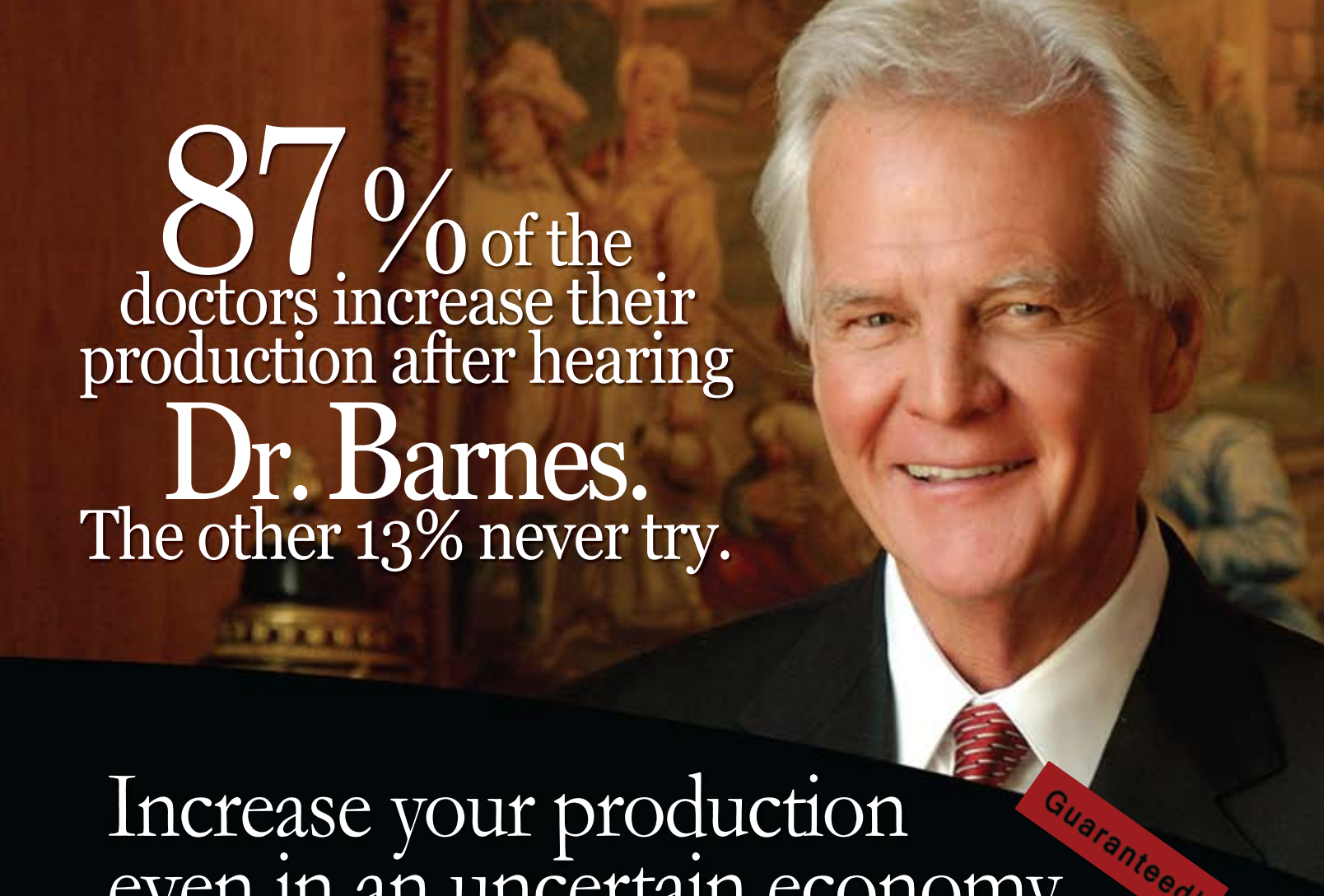
Examiners judge Accreditation cases by using a score deduction system whereby -2, -4 and -8 points are applied for minor, major, and catastrophic flaws, respectively. A total score of -8 or worse indicates a failed case. In general, candidates are encouraged to select cases that have potential for an excellent result without the need for complicated or extensive treatments. This is because there are no extra points awarded for difficulty. Furthermore, the added treatments will also be judged with the same high standard, leading to more areas for potential point deductions.

Cases involving worn dentition are more complex than normal because they usually have underlying problems that have to be properly diagnosed and managed. Moreover, to achieve optimum results, they typically require additional treatments such as periodontal surgery, orthodontic treatment, and restoration of posterior teeth to increase the vertical dimension. Dr. Jerome Cha took on a case with worn anterior teeth and managed to deliver a dramatic outcome for the patient. The examiners passed the case unanimously.

By applying smile design concepts, such as correcting the reversed smile line, Dr. Cha produced a very nice result. The majority of the examiners gave a +1 point for overall appearance of the case. However, a few flaws were observed. Most examiners noted the discrepancy in the length of the two central incisors at the mesio-incisal angle. The anterior restorations appeared to be rather long and contours somewhat convex. Some of the examiners found the crowns slightly opaque and lacking incisal translucency. Blunted papillae were also observed. These flaws did not in any way add up to a high score deduction.

In summary, Dr. Jerome Cha was able to manage a challenging case and presented us with a beautiful result. He is to be congratulated on such achievement.

(The issue of occlusion is especially crucial in comprehensive treatments. The Accreditation Committee, the American Board of Cosmetic Dentistry, and the examiners have no alliance with any particular philosophy of occlusion. However, the matter has to be addressed in the report and in treatment.)



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Accreditation Success Story: It Finally Happened!

by Nelson A. Rego, CDT, AAACD
Santa Fe Springs, CA
www.regosmiles.com

One moment in my career that really stands out was a beautiful winter day in 2001. That day, I received upper and lower impressions of a three-unit fixed partial denture from my friend and client, Dr. Ed Lowe. Included in the package were 12 color slides and a detailed laboratory slip that stated, "This is my AACD Accreditation bridge case!"

It became obvious to me that I needed to belong to this elite and like-minded group of individuals.

At the time, I was heavily involved in teaching live patient programs at the Pacific Aesthetic Continuum in San Francisco. I had quite a bit of experience in esthetic dentistry and really thought that every case we did was world class. I had of course heard of the AACD but had never really delved into what Accreditation meant. I phoned Dr. Lowe to discuss his case and he talked about how there were very few dentists and even fewer technicians who had achieved Accredited status in the AACD. He said that it was a serious commitment of time and that it was very challenging. Between running a very busy lab, teaching esthetic dentistry 20+ weekends per year, and lecturing, time was a scarce commodity for me and another challenge wasn't exactly what I was looking for.

However, I decided to attend the next annual AACD scientific session to see what it was all about. The quality of the meeting was exceptional, from the location to the events, to the world-class education. It became obvious to me that I needed to belong to this elite and like-minded group of individu-

als. I immediately joined the AACD and started on the path of fulfilling the prerequisites for Accreditation.

During this period, I was also looking for cases that might pass the process. I already had a bridge in the works for Dr. Lowe and was certain that case would pass. After all, I was an esthetic "expert"!

Imagine my surprise and indignation when I learned that the bridge didn't pass due to soft tissue and connector problems. Dr. Lowe insisted on trying again; two years and three different bridges later, I came to the conclusion that Accreditation was not for me and that there was nothing wrong with not attaining Accredited status.

Our bridges did not pass for numerous reasons. Our first patient had missing laterals and was very young. As this was the pre-zirconium era, we had to design porcelain-fused-to-metal restorations with porcelain margins. Adequate tooth reduction was our limiting factor due to the larger pulp chambers in the abutment teeth. The restorations were nice, but not exceptional enough to pass the rigorous Accreditation standards.

Our second attempt was a fiber-reinforced resin bonded bridge with a ceramic laminate veneer. We had numerous try ins, which included my flying up to Dr. Lowe's office in Vancouver, British Columbia, for a custom shade appointment. The soft tissue was perfectly developed over a six-month period and everything looked favorable.

Unfortunately at this time, Dr. Lowe was in the middle of a very chaotic office remodel. I shipped the finished case to him and, through fate or happenstance, it actually was lost during shipping! At this point, the idea of starting over led to the end of this particular patient's cooperation.

Our third bridge was by far our best attempt. This patient continually traveled all over the country so we had a lot of time to let his soft tissue mature during the temporization phase. We planned to seat the bridge six months after the first bisque bake try in. Imagine our horror when our patient showed up after six months, having developed a smoking and chewing tobacco habit that destroyed both our tissue graft and our hopes.

What Accreditation taught me is how to look at the overall cosmetic canvas that is the patient.

At this point many people would have given up, but I had become determined to get this right and prove that I could pass this case! Dr. Lowe finally found a great patient with a great attitude; over 18 months, two connective tissue grafts, and two three-unit fixed partial dentures later, we had our first truly undetectable restorations.

This bridge case passed. As it was his fifth and final case, Dr. Lowe received his award at the Atlanta annual scientific session and invited me to accompany him for his big night. I was very proud of him, and his achievement also helped to further motivate me to complete the process myself.

My "dirty little secret" was that I had submitted only my bridge case; the thought of starting two other cases was something that I had not wanted to contemplate. I had taken the Accreditation Written Examination almost five years earlier and time was rapidly running out. Luckily I had several dentists/clients who were also trying to achieve Accreditation...

The hardest time of all in the Accreditation process is the time between submitting the cases and then checking the mail every day to see if you have received anything from the Academy. It is especially trying if you submit your cases at the November 1 deadline, as the anxiety can really ruin the holidays. When I finally received the two separate envelopes I was happy and terrified at the same time: What if I didn't pass? What if I did?

Fortunately I passed both cases! I was extremely happy, but then realized that I also had to pass my oral examination in Chicago at the Mid-Winter Meeting. What would they ask me? Did they notice something that I missed? Could I still fail? My fears were unwarranted as the oral examination in Chicago was more of a clarification and presentation of my case submissions rather than the Spanish Inquisition.

The best thing about achieving Accreditation is not the plaque that is proudly hanging in my waiting room. Rather, the best thing about the entire process was how I learned to look at things with a different perspective. Ceramists are usually concerned with incisal layering, using several different porcelains to achieve a level of ceramic artistry that in its purist form is undetectable. What Accreditation taught me is how to look at the overall cosmetic canvas that is the patient. We can achieve beautiful ceramics, but if a

case exhibits long connectors or if the tissue is not optimal or blunted by over-contoured ceramics, then we have failed.

I urge everyone to take on the challenge of Accreditation. It may not increase your business or create any tangible material advantage over your competition, but you will meet some great people along the way and you will be re-energized! I was lucky to have so many mentors during the process; terrific individuals like Drs. Ed Lowe, David Hornbrook, Rod Gore, Mike Koczarski, Mike Sesemann, and Betsy Bakeman, as well as many others who gave their time so generously.

Coincidentally, I recently received a new case from Dr. Ed Lowe. Included were upper and lower impressions with a compact disc of photographs and a big note that said, "This is one of my Fellowship cases!"

Here we go again…

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Nelson Rego, CDT, as an AACD Accredited Member who has helped restore the smiles of two Give Back a Smile™ survivors.

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Clinical Science and Art

In This Section:

Cover Story

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Introduction

I am honored to have my patients Tina and Janette on the front cover of this issue of the *Journal of Cosmetic Dentistry*. I always feel privileged when patients trust me with their oral and dental health care, particularly when it involves significantly changing their appearance. I was especially honored that Tina referred her own mother to me. The following is the story behind the smiles featured on this issue's cover.

The discoloration, along with the crooked appearance of her lateral incisors, was a constant source of embarrassment.

Tina

In March 2001, 37-year-old Tina, the office manager for a tractor dealership in a nearby town, initially came to me hoping to find a solution to a lifelong problem of living with dingy, tetracycline-stained teeth. The discoloration, along with the crooked appearance of her lateral incisors, was a constant source of embarrassment. It was not surprising that she felt so self-conscious that she hardly ever wanted to smile.

Treatment Goals

After a detailed discussion and review of my treatment archives, a thorough examination and smile analysis was completed. Diagnostic records, including several photographs, were gathered. During the interview and photographic session it was apparent that Tina barely displayed her lower teeth when speaking or even smiling broadly (Fig 1). My preliminary diagnosis was that restoring 10 upper teeth and achieving whitening on the incisal third of the lowers would give us a great solution (Fig 2). After viewing a wax "blueprint" of my proposed smile design, Tina agreed to restore teeth ##3-14 (the first biscuspids were missing). Among my goals for Tina's smile, besides the obvious elimina-

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Dentistry courtesy of Dr. Nasser Barghi.

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Figure 1: Tina; before, full-face smile view.

tion of the discoloration, were to do the following:

- correct the flared appearance of the lateral incisors
- de-rotate the cuspids
- eliminate spacing
- restore wear
- reduce negative space in the buccal corridors
- improve anterior/posterior gradation
- optimize the occlusion
- idealize the smileline
- develop a more pleasing proportion and arrangement to the anterior sextant.

When striving for excellence and lifelike results, advanced levels of cosmetic dentistry can sometimes be difficult and very challenging; and severe tetracycline cases rank near the top of the list for many of us. As we hear from many of our patients, Tina had longed for a bright white smile her entire life, but had delayed treatment due to her valid fear of having teeth that looked "capped and artificial." Because I am Accredited by the AACD, Tina felt that she could rely on me to provide her with an excellent result. I have always believed that I am only as good as my latest effort, so I wanted to surpass Tina's expectations and make it truly dazzling for her!

Treatment

A pressed ceramic was definitely going to be my first choice as a restorative material. Tina's new smile design would involve modifying the maxillary arch form by making changes to the width, angulation, shape, and contours of the teeth. Moderate recontouring of the lower teeth, especially the anteriors, was necessary to facilitate my additional goal of incorporating occlusal rehabilitation (sufficient cuspid rise, no excursive interferences, etc.) into my treatment plan. In order to overcome the handicap of the dark underlying tooth structure and still produce brilliance and translucency in the final restorations, I knew that my preparations would reach deep into the dentin. Considering the potential problems associated with ceramic veneers placed primarily on dentin (debonding, sensitivity, etc.), combined with my intent to optimize the occlusion, I felt that full-coverage restorations would provide more strength, longevity, better retention, and a superior esthetic outcome. Today, zirconium cores have the ability to mask stained dentitions and some expert ceramists can even fabricate porcelain-fused-to-metal (PFM) restorations that may provide esthetic alternatives in these situations. However, in my opinion, there is still no restoration that rivals the unparalleled beauty of a pressed ceramic that is cut back and meticulously colored and layered by today's world-class ceramic artists. Its fluorescence, vitality, and natural depth of color can absolutely defy detection from the natural dentition. A pressed ceramic also permits the transmission of light throughout the entire tooth. This "fiberoptic" effect allows maximum illumination of the root structure and overlying gingiva, which imparts a more natu-

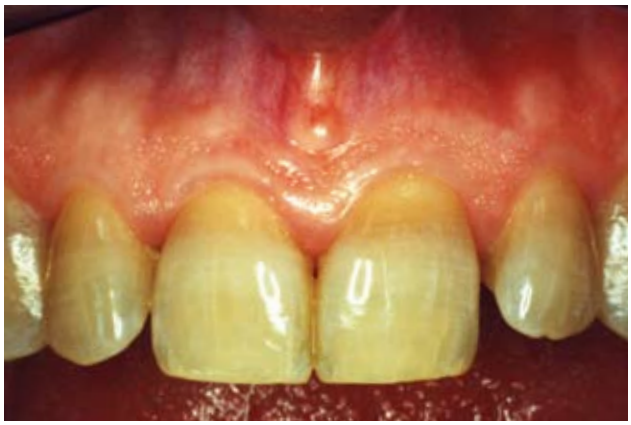

Figure 2: Tina; before, 1:1 retracted view.

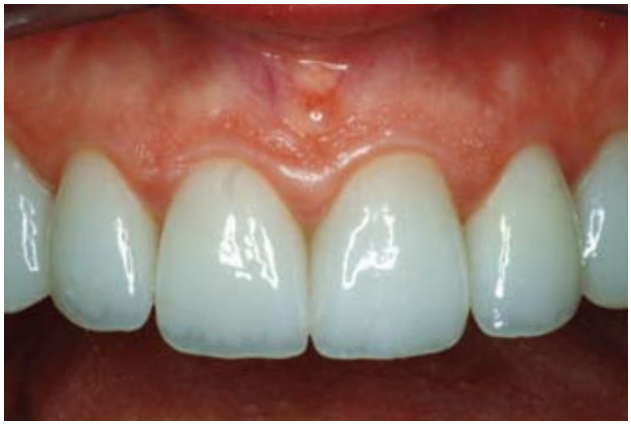

Figure 3: Tina; after 1:1 retracted view.

Figure 4: Tina; after, full-face view.

ral appearance to the discriminating eye.

For Tina, I chose an Empress O2 ceramic ingot (Ivoclar Vivadent; Amherst, NY). As there was severe staining in the middle and cervical thirds of the teeth, selection of another ingot or improper management of the selected ingot in the laboratory may have required the tedious, time-consuming subopaquing of the prepared teeth with a microhybrid composite. However, a combination of preparation design allowing for at least 1 mm of porcelain in critical areas, with margins tucked ¼ to ½ mm beneath the gingival crest; and the careful cutback and artistic layering of the ingot, eliminated any need for subopaquing the teeth and gave us a highly luminous restoration with just enough opacity to not appear overly white. Adhering to contemporary standards, a purely light-curing adhesive luting composite (Variolink shade white, Ivoclar Vivadent) was utilized, combined with a self-etching primer (Prompt L-Pop [3M ESPE; St. Paul, MN]), and a light-curing single-component adhesive (Excite, Ivoclar Vivadent) to fuse each restoration into place. Tina now feels that her smile is one of her best assets, and seven years later it continues to maintain its strikingly natural appearance and lasting beauty (Figs 3 & 4).

Janette

Tina recently referred her 75-year-old mother, Janette, to me. The first thing Janette said to me was music to every dentist's ears: *"I've waited a long time to fix my smile and now I am able to do it. I saw what you did for my daughter and I hope you can do the same for me. I trust you—everything is in your hands. When can we get started?"*

Janette presented to my office with a combination of wear, erosion, discoloration, spacing, generalized

Figure 5: Janette; before, full-face smile.

malalignment, and shifting of teeth, as well as old amalgams and obsolete PFMs. Even if orthodontics had been a considered option, there were numerous concerns that orthodontics could not address. Tooth #7 was congenitally missing, allowing tooth #8 to drift distally; while tooth #6 had drifted mesially almost into the position of tooth #7. Tooth #10 was undersized, as were the central incisors. There was a thick band of connective tissue mesially adjacent to tooth #9 that seemed to serve as a "retainer," preventing any shifting from occurring in the upper left quadrant. Although there was a diastema between #6 and #8, the large diastema between #8 and #9 was a huge distraction, while three of the four bicuspids (#4, #5, and #13) were "dished in," which further highlighted and directed even more attention to the esthetic discrepancies in the anterior region. There were also some minor asymmetrical gingival contours that would need to be addressed. Eleven upper teeth were visible during a broad smile, including the unsightly PFMs on the first molars. After a complete examination including a photographic survey (Figs 5 & 6) and review of the diagnostic models, a restorative and esthetic treatment plan was developed involving 11 teeth. The details of the specific treatment goals were incorporated into a preliminary wax blueprint and reviewed with Janette.

Treatment Goals

Treatment goals discussed with my ceramist were as follows:

- create the illusion of an anterior sextant by converting the first bicuspid (#5) to a canine and the canine (#6) to a lateral incisor
- expand the right buccal corridor and also build out tooth #13 to create a more harmonious panoramic view of the entire esthetic landscape
- lengthen, strengthen, and restore wear
- soften (feminize) the smile to some degree by maintaining open incisal embrasures graduated properly, etc.
- correct the reverse smileline
- eliminate the obvious spacing
- idealize the anterior/posterior gradation.

The worn, uneven lower anteriors would be whitened and recontoured not only to improve their appearance and complete the new smile, but also to optimize the occlusion, helping to impart healthy longevity to the teeth and restorations.

Treatment

A subtle but vital key to the overall success of this case was one that is often downplayed or sometimes omitted altogether; that important key was the establishment of an esthetically pleasing horizontal plane to the lower anterior sextant. Recontouring a jumbled mandibular incisal plane not only improves appearance, but also facilitates the creation of balanced protrusive contacts and removal of detrimental laterotrusive interferences, which can compromise the integrity of the porcelain in

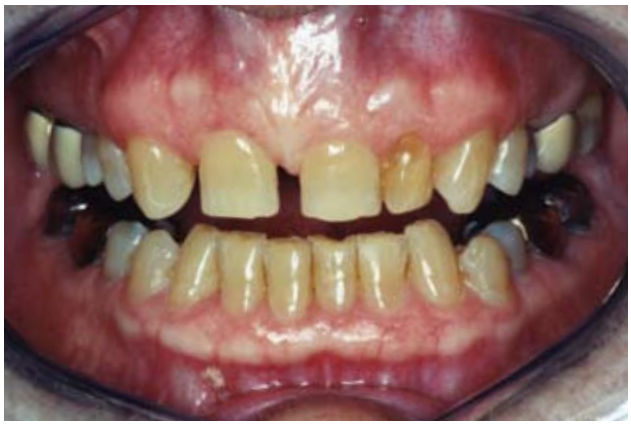

Figure 6: Janette; before, 1:2 retracted view.

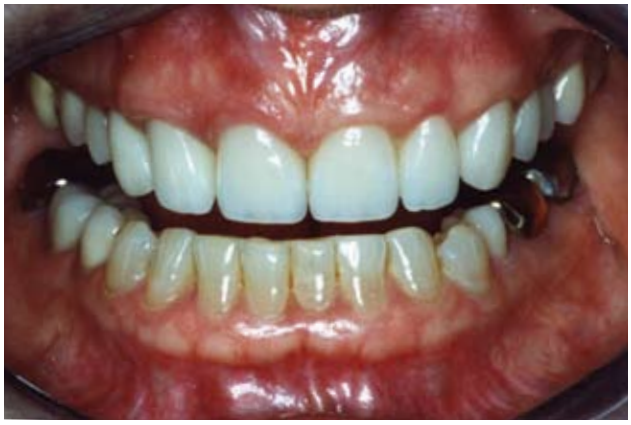

Figure 7: Janette; after, 1:2 retracted view.

Figure 8: Janette; after, full-face smile view.

the maxillary anterior region. For a smile makeover to be truly complete and comprehensive, additional consideration must be given to irregular, uneven mandibular teeth, even if they can be whitened to complement the color of the upper restorations. Cosmetic dental patients are obviously dynamic individuals that do not go around with static smiles on their faces, displaying primarily their upper teeth all the time; rather, they reveal their lower teeth continually as they laugh and talk. As cosmetic dentists, it can be frustrating to observe nightly news anchors reporting the latest happenings with nicely restored upper teeth which, as they continue to speak, merely draw more attention to the contrasting, unsightly lower anteriors.

At this stage of her life, Janette was not interested in orthodontic therapy, but was not opposed to the extensive recontouring of teeth ##22-27 to help achieve our goals of optimizing the esthetics and occlusion. The recontouring was performed at a separate appointment, with Janette sitting upright and level with her teeth slightly parted so I could have the proper visual perspective. I stood directly in front of her, constantly rechecking the horizontal plane of her face. A stick-bite, stick-bite photograph, and a model of the recontoured lower teeth were made to be used to develop the smile line and establish the vertical position of the midline in the definitive wax blueprint.

Exposure of dentin, postoperative sensitivity, and removal of important contours and centric stops are always critical concerns associated with less-than-conservative recontouring of virgin teeth for any purpose (and it certainly was not my intention to incorporate anything iatrogenic into Janette's treatment plan). Therefore, anterior bitewing radiographs were initially taken to

verify significant shrinkage and retraction of the pulp chamber in every lower anterior tooth. I would be the most aggressive on tooth #22, so I began there using no anesthetic and copious amounts of water, with Janette continuously affirming that she felt zero discomfort from either the handpiece or the air and water, until the entire procedure was completed on all of the involved teeth. As we all know, exposed dentin can not only be or become sensitive, but it also wears at an accelerated rate compared to enamel, which is another reason why in this case I selected a leucite-reinforced pressed ceramic that is much kinder to the opposing dentition. Composite was added to the lingual surfaces of the upper anteriors to remain until the provisionals and, ultimately, the final restorations could permanently reestablish the centric stops that were either compromised or removed by the lower recontouring and polishing.

I wanted to lighten Janette's smile in order to create a healthy, vibrant appearance. To ensure that it would be "age appropriate" I selected a shade of A-1 with a higher value (as opposed to Chromoscop 020 for Tina). I improved the gingival symmetry in the anterior region using an electrosurge, and was somewhat more aggressive above #5 in order to help convert it to a "cuspid."

During the preparation phase, I was careful in the interproximal areas adjacent to the diastemas to place the margins as far below the gingivae as reasonably possible without violating the biologic width. These margin positions allowed my ceramist to create a gradual sloping transition of the porcelain into the interproximal contact areas, which enabled maximum displacement/compression of tissue by each restoration, helping form the most optimal "papillae" between ##6-9. In addition, relatively normal outline forms could be developed with interproximal emergence profiles that not only would be more hygienic, but also would not have irregular contours that might annoy the tongue.

To accomplish the magnitude of changes involved in Janette's treatment, I elected to utilize Authentic (A1+ ingot) (Jensen Industries; North Haven, CT) pressed, colored/layered, bonded restorations on teeth ##4-13. After applying a coat of G-Bond (GC America; Alsip, IL) to each preparation, I light-cured the restorations into place using Single Bond (3M ESPE) and RelyX shade A3 (3M ESPE) veneer cement. Teeth #3 and #14 received Procera Z crowns (Nobel Biocare; Yorba Linda, CA) placed with Fuji Plus resin-reinforced glass ionomer luting cement (GC America). Janette finally had a smile that was bright, healthy, and completely whole (Figs 7 & 8).

Patients' Comments

Tina

"All my life I have had dark, yellow, discolored teeth due to tetracycline staining. I smile a lot and am generally a very happy person, but I was never comfortable with my smile because of the unnatural, ugly color. This led me to look into ways to change my smile so that I would be happier when I looked in the mirror. Bleaching had no effect and I started reading about other methods to alleviate the problem. My aunt told me that a friend of hers had used Dr. Oppenheim and that the results were outstanding.

I can honestly say that the money I spent having my smile done is the best money I have ever spent. It has made all the difference in the world. Most people think I am a lot younger than I really am because my smile brightens up my face so much. I no longer try to hide my mouth when I smile and laugh. It's a joy to like the smile I see in the mirror, especially after all the years I had to live with the smile I had.

I only wish I hadn't waited so long. I guess it really didn't occur to me until a few years ago that I might actually be able to do something about the one thing that bothered me so much."

Janette

"All of my adult life I was ashamed of my teeth. I had large spaces between my front teeth and when I smiled, I was embarrassed. One dentist told me there was nothing that could be done. But I wasn't satisfied with that answer. My daughter had her smile done by Dr. Oppenheim and both of us were so pleased that I decided to see him to find out what he could do for me. He performed miracles. Today I am very satisfied and smile all the time."

Summary

Each of these cases presented its own challenges. I am very grateful, however, that I was able to help both Tina and Janette feel proud of their smiles. I am happy to have been able to share both of these cases with you, and encourage all *JCD* readers to share their stories on how they changed someone's life by restoring their smile.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Thomas E. Oppenheim as an AACD Accredited Fellow, an Accreditation Examiner, and a Give Back A Smile™ (GBAS) volunteer who is presently restoring the smile of a GBAS survivor.

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Creation and Preservation of Natural Soft Tissue Emergence Profiles Around Dental Implants in the Esthetic Zone

by Paul S. Petrungaro, DDS, MS, FICD, FACD, DICOI
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Abstract

The integration of restorative and cosmetic dentistry principles into the discipline of implant dentistry has allowed for esthetic implant restorations to be achieved on a more predictable basis. Incorporation of these principles into the surgical phase of implant treatment, along with adoption of more minimally invasive surgical placement and bone grafting protocols, in addition to placing an immediate provisional restoration, can simplify the implant treatment process, and increase the probability for preservation of natural soft tissue emergence profiles around implants in the esthetic zone. This article presents a conservative treatment approach to the replacement of the natural tooth system in the esthetic zone, allowing for natural soft tissue emergence profiles to be maintained and/or sculpted from the initial surgical visit, throughout the healing phase, and into the post-treatment phase of the implant process.

This article presents a conservative treatment approach to the replacement of the natural tooth system in the esthetic zone.

Introduction

Clinical Significance

Esthetics in implantology are becoming increasingly important in the contemporary reconstructive and surgical dental practice. Preservation and/or creation of natural soft tissue emergence profiles lead to the foundations for esthetics in the final implant-supported restoration. Provisionalization at implant placement supports the preservation of these natural tissue emergence profiles.

The use of dental implants for the replacement of the natural tooth system has become widely accepted as a viable treatment option in the contemporary restorative, cosmetic, and surgical dental practice.[1-3] Implants' use for tooth replacement have been well documented in the dental literature, and

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they have allowed many patients to enjoy a more comfortable and fulfilling lifestyle.[1-3] The conventional, multistage approach to implant reconstruction has accounted for the bulk of implant placement and restorative protocols that have amassed the success rates that are routinely referred to when discussing the use of dental implants, and their long-term success. While the multistage protocol is predictable and reliable for long-term success, due to the multiple surgical procedures they usually require, soft tissue contours are often compromised and the esthetics of the final restoration can be put in jeopardy. This is a complicating factor in the esthetic zone, where the balance and symmetry of the gingival margin and emergence profile of the restoration are imperative for the esthetic result of the case.[4] Additionally, conventional surgical protocols usually require extended healing phases and removable provisional appliances, and do not allow for parameters of the final restoration to be worked out in the provisional phase.

To address some of the concerns that exist with the conventional multistage implant approach, advancements in surgical protocols were developed that have allowed the implant surgeon to provide the patient and restorative/cosmetic dentist with an immediate provisional restoration at the surgical visit.[5-9] The insertion of a fixed provisional at implant placement has been shown to contribute to the formation of natural soft tissue emergence profiles and contours throughout the healing phase and into the final treatment phase of the implant process.[5-9]

The foundation for these procedures must start in the treatment-planning phase. In addition to maxillary and mandibular study models being obtained, a facebow transfer is recommended to correctly align the models. Once this has been accomplished, the dental laboratory creates a diagnostic waxing of both the hard and soft tissue contours that need to be replaced/altered.[10-11] This allows for the implant team to properly plan for the dimensions of the final restoration, and its translation to a surgical visit. A surgical guide can be constructed from the waxing obtained—converted into a provisional restoration—and possess all the parameters of a surgical guide and its use in implant placement. This guide should be a duplicate of the diagnostic wax-up, and can be converted at the surgical visit into an esthetic provisional restoration.[10-11]

The foundation for these procedures must start in the treatment-planning phase.

Clinical examination should include a full periodontal analysis and radiographic examination (periapical/panoramic radiographs), and a cone beam image of the planned treatment site is also recommended. Evaluation of papillary height contours,[12] interproximal heights of bone,[13-14] and risk factors for periimplant esthetics[15] are contributing pieces of information that allow the implant team to properly understand, interpret, and formulate a treatment sequence that allows for the predictable management of the extraction/edentulous site.[12-15]

Assessment of the aforementioned information allows for the implant team to determine whether adequate amounts of alveolar structure exist to proceed with the implant placement procedure; or whether a separate bone replacement, and/or soft tissue procedure will be necessary prior to implant placement.[12-15] With proper alveolar structure present to stabilize the implant fixture, and allow for the proper angulation of the implant for correct emergence profile formation to be obtained, minimally invasive surgical protocols for implant placement and bone grafting are recommended.[9] These protocols allow for the maintenance of existing soft tissue contours, contained areas for graft placement, and less traumatic postoperative healing phases.[9]

After implant placement, selection of an appropriate provisional abutment is made. The provisional abutment should help support the pre-existing soft tissue contours, or help to sculpt and create those contours in the edentulous site, which usually has lost papillary contours and interproximal heights of bone. Retro-fitting of the surgical guide/provisional restoration completes the immediate restoration procedure. This can be done by the implant surgeon, or in conjunction with the restorative/cosmetic dentist. The provisional restoration must be properly contoured; the line angles of the provisional should allow for passive support to the facial/mesial and distal-free gingival margins. The facial emergence profile of the restoration should be balanced and symmetrical to that of the contralateral tooth to be replaced, and should be free of contact in the protrusive, centric, and lateral excursive move-

	Implant Sites	Implants, non-integrated prior to final loading	Initial rate of success
Immediate Extraction/ Implant Placement	1,636	15	99%
Edentulous Ridges	1,053	5	99.5%

Table 1: Immediate restoration procedure success rates (eight-year period).

ments (immediate non-functional load). The provisional restoration should remain in place for a three-month healing phase, at which time the provisional and abutment are removed and a fixture-level impression is obtained. Fabrication of a ceramic or zirconia abutment and final esthetic restoration complete the streamlined implant treatment process.

Table 1 shows the success rates I have observed over an eight-year period utilizing an immediate restoration protocol previously published in the dental literature.[7-9]

The following case studies demonstrate the immediate restoration procedure outlined above in an immediate extraction site and an edentulous site. Minimally invasive protocols for implant placement, bone grafting, and emergence profile formation are described, while demonstrating the blending of the surgical and restorative/cosmetic disciplines of the implant treatment process.

Case 1

A 34-year-old, non-smoking female presented for replacement of an externally resorbing left central incisor (Figs 1 & 2). The patient's chief concern was to preserve the natural appearance of the gingival complex, and for the final restoration to duplicate the existing left central. Due to the patient's esthetic concerns and high lip line, a fixed provisional was desirable.

After gathering the necessary preoperative information (which consisted of digital periapical radiographs, a digital panoramic radiograph, periodontal analysis with bone-sounding measurements of the right and left maxillary central incisors, and study models mounted on an articulator), a diagnostic waxing of the maxillary left central incisor was obtained. Utilizing the wax-up, a surgical guide was fabricated that would also serve as an esthetic provisional restoration, should the natural tooth shell be damaged in the removal of the tooth.

Due to the patient's esthetic requirements, it was decided to utilize the existing natural tooth shell (which had had a facial bonding procedure at some time in the past) as the esthetic provisional restoration, and retro-fit that back to the provisional abutment at the initial surgical visit. After review of all the preoperative information, the decision was made to proceed with a minimally invasive surgical protocol to replace the left central incisor, preserving the pre-existing gingival architecture present.

After administration of an appropriate local anesthetic, an incisal edge registration was obtained across the maxillary anterior sextant with bite registration material. This registration served to index the contact points, buccal-palatal spacial alignment, incisal edge, and facial emergence profiles of the preoperative site, and would aid in the retro-fitting of the tooth shell for the esthetic provisional restoration. Following the incisal edge restoration, sounding measurements were reconfirmed prior to tooth removal. The sounding measurement was important as the depth of the collar of the implant was placed at a line drawn from the facial height of contour of bone of the contralateral tooth to be replaced.[16] Therefore, the sounding measurement of 4 mm at the facial height of contour of bone at the right central incisor dictated the implant collar being placed approximately 4 mm above the facial

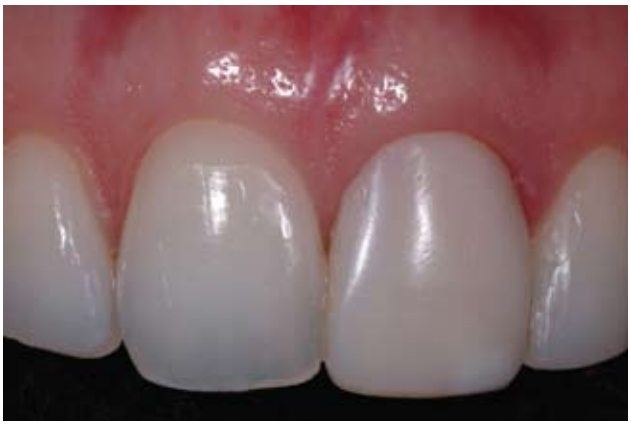

Figure 1: Preoperative clinical view.

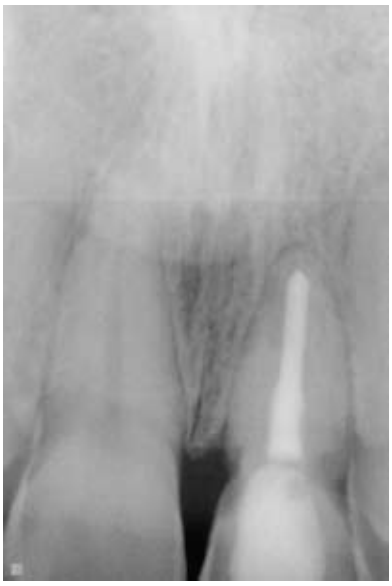

Figure 2: Preoperative digital periapical radiograph.

of the free gingival margin of the left central incisor. Following confirmation of the sounding measurements, the tooth was removed by atraumatic means (Fig 3), preserving the natural soft tissue contours present. Once the tooth had been removed, debridement of the extraction socket was accomplished by mechanical (curette) and rotary instruments (coarse diamond with water irrigation) means, removing all remnants of the periodontal ligament, granulation, or infected tissues.

Evaluation of the buccal plate's integrity was accomplished utilizing a petro 1 or petro 2 elevator (Salvin Dental; Charlotte, NC). This elevator was inserted underneath the facial gingival tissue, and a full-thickness "pouch" was created over the buccal plate, or an existing dehiscence and/or fenestration. In the minimally invasive protocol, evaluation of the buccal plate must be accomplished in these means by tactile sensation, as the buccal tissues are not elevated aggressively in this technique. The pouch is carried to the mucogingival junction, or in the case of a fenestration and/or dehiscence, 2 to 3 mm past the margin of the defect noted.

Once the dimensions of the buccal plate of bone were established, the surgical guide was placed, and initial site development was accomplished. Widening the site to receive a 3.7-mm implant preceded the placement of a 3.7 mm x 13 mm length tapered screw vent implant (Zimmer Dental; Carlsbad, CA). The implant was placed to the appropriate depth predetermined by the sounding measurements (Fig 4). Under-sizing the final drill prior to implant seating allowed for the implant to seat by self-tapping means when it was inserted, and to register a torque measurement of 30 Ncm.

Removal of the implant carrier preceded the placement of the cover screw to aid in the minimally invasive grafting procedure. Figure 5 shows the occlusal view of the implant placed into the extraction socket. Note the optimal position of the implant placement in relationship to the outline of where the natural tooth root was positioned. Fabrication of the graft complex—a mineralized bone graft and cancellous chips (1- to 2-mm particle size)—was rehydrated with an activated platelet-rich plasma (PRP) solution harvested presurgically from the patient. The PRP/graft complex was then heavily condensed into the peri-implant defect from the implant surface to the mesial-buccal and distal aspects of the extraction socket (the buccal plate was intact) (Fig 6). The graft was condensed to the collar of the implant (Fig 6). The larger particle cancellous chips and heavy condensation added support to maintain the buccal dimension of the emergence profile that was to be obtained.

Removal of the cover screw preceded the insertion of a contoured abutment (Zimmer Dental) that was placed into the implant and hand-tightened, allowing for the friction-

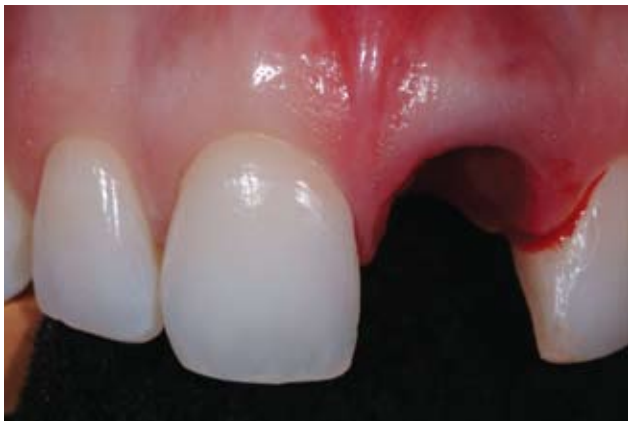

Figure 3: Atraumatic extraction, left central incisor.

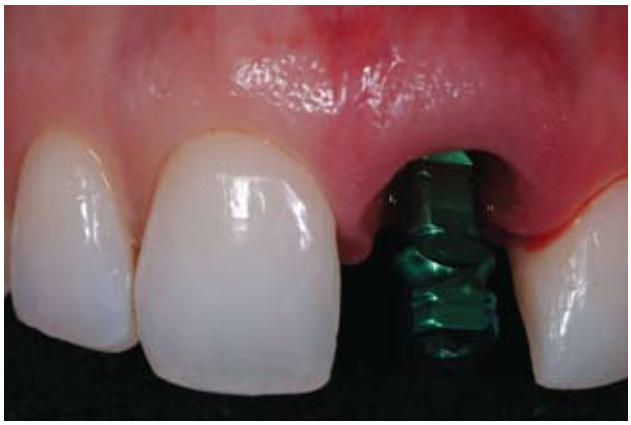

Figure 4: Minimally invasive implant placement.

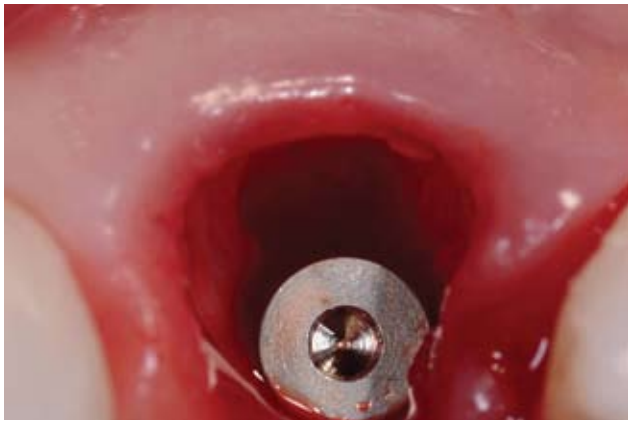

Figure 5: Pregrafted peri-implant defect.

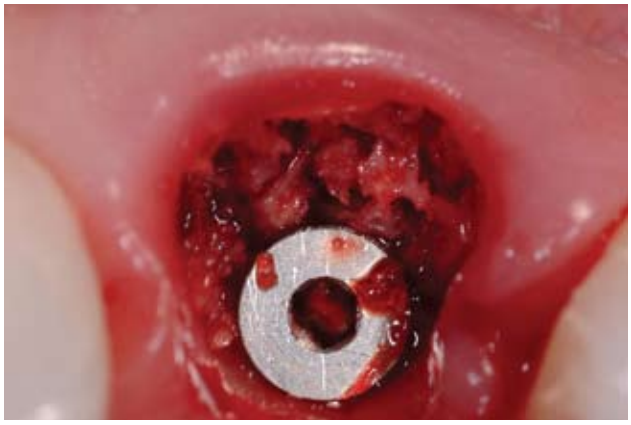

Figure 6: Minimally invasive peri-implant grafting.

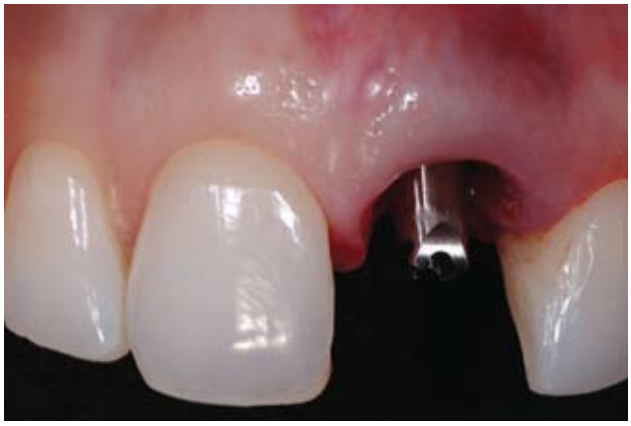

Figure 7: Contour abutment placement.

Figure 8: Final contouring of the emergence profile on the immediate provisional.

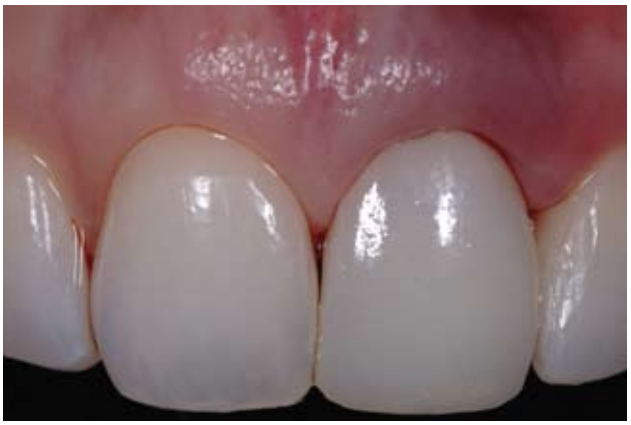

Figure 9: Immediate postoperative clinical view, left central incisor.

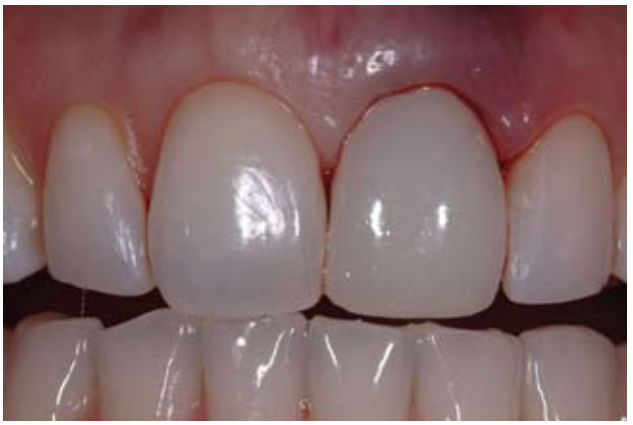

Figure 10: Immediate postoperative protrusive management.

fit internal connection to provide for initial stability of the abutment (Fig 7). Altering a provisional coping and applying bonding agent to the acrylic coping aided in the retro-fitting process by registering the margins of the abutment.

After removing the root of the tooth from the clinical crown at the cemento-enamel junction (CEJ) and hollowing out the natural tooth shell, bonding agent was applied to the internal aspect of the crown. The crown was then filled with composite (Filtek, 3M ESPE; St. Paul, MN) and placed into the incisal edge index obtained presurgically. The crown was then placed over the coping/abutment complex, and the complex cured with a curing light. The initial alignment of the natural tooth was transferred to the implant site in this process.

The provisional complex was then removed from the abutment, placed on a lab analog, and the margins of the provisional contoured with Filtex Flow and discs (Shofu Dental; San Marcos, CA) (Fig 8). Note the facial emergence profile of the provisional, which would help to place passive pressure on the facial gingival margin and support the emergence profile in the tissue. The provisional restoration was then cemented with a strong temporary cement.

The immediate postoperative view can be seen in Figure 9. Note how the provisional restoration possesses the correct contact point relationships, and the facial emergence profile mimics that of the preoperative view in Figure 1.

Figure 10 shows the protrusive relationship. The provisional restoration is free from occlusion in the centric relation, protrusive, and right/left excursive movements.

The seven-day postoperative clinical view can be seen in Figure 11. Note the appearance of the papillary contours, and how they fill the embrasure spaces of the provisional restoration. A two-month postoperative view is shown in Figure 12. Note the natural appearance of the soft tissue emergence profile.

After a three-month healing and observation phase, the patient was referred back to the restorative clinician for construction of a zirconia abutment and all-ceramic restorations. After routine fixture-level impressioning techniques were performed, a CAD-CAM zirconia abutment (Atlantis; Cambridge, MA) was created, followed by the laboratory fabrication of an all-ceramic restoration for the left central incisor.

Figure 13 shows the one-year post-treatment cone-beam image. Note the alveolar structures present on the facial aspect of the implant. Figure 14 shows the one-year post-treatment clinical view; and Figure 15, the one-year post-treatment periapical radiograph view. Compare Figure 14 to Figure 1, and how preservation of the interdental tissues, the facial emergence profile, and the mesial and distal line angles have allowed for an esthetic implant restoration to be obtained.

Case 2

A 32-year-old, non-smoking female presented for treatment of an edentulous maxillary left central incisor (Figs 16 & 17). The patient had an existing resin bonded bridge that failed, and the pontic tooth temporary bonded into place at the initial consultation visit. Esthetics were of primary concern to the patient, and

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Figure 11: Seven-day postoperative clinical view.

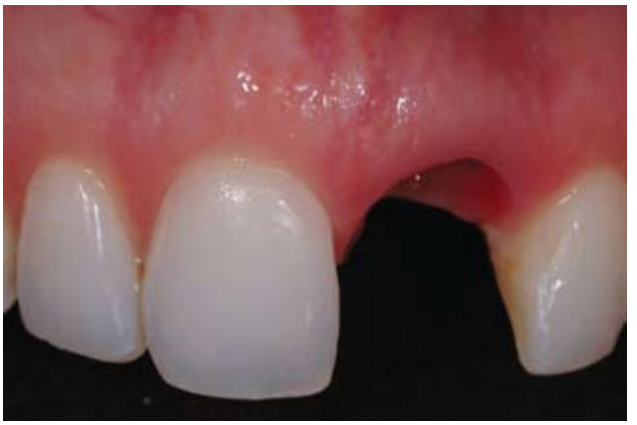

Figure 12: Two-month post-implant placement tissue emergence profile.

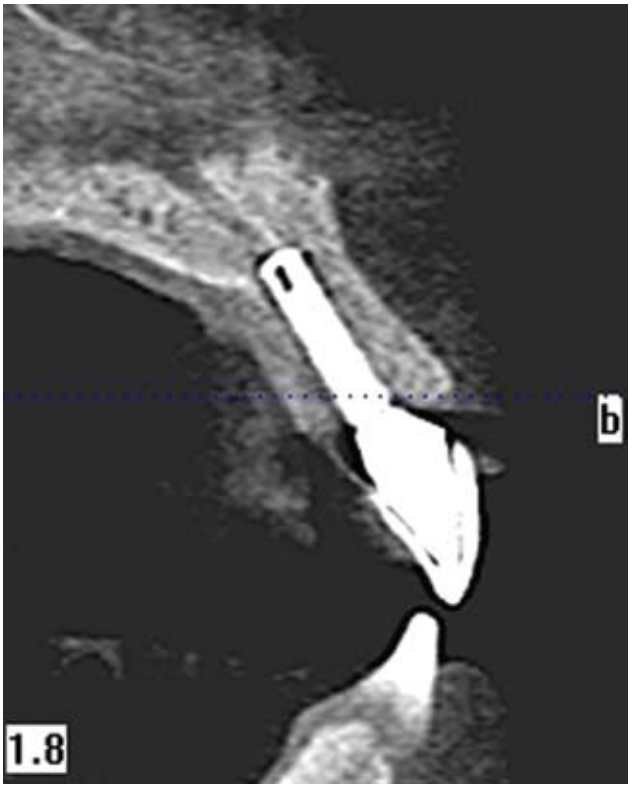

Figure 13: One-year postoperative cone beam image.

Figure 14: One-year postoperative clinical view.

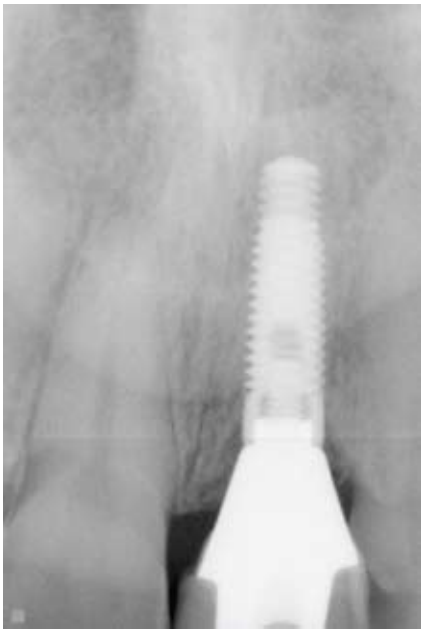

Figure 15: One-year postoperative digital periapical radiograph.

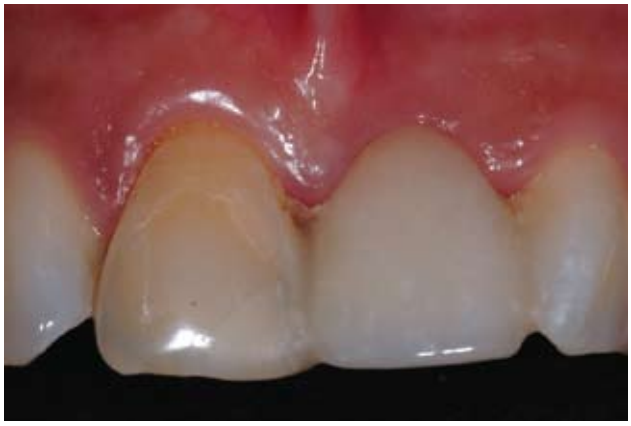

Figure 16: Preoperative clinical view, left central incisor.

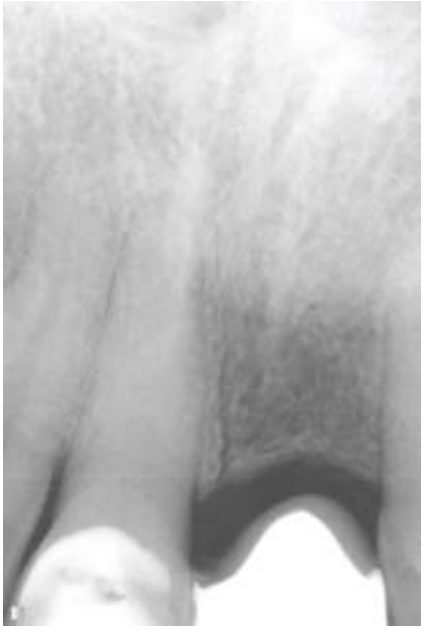

Figure 17: Preoperative digital periapical radiograph, edentulous site, left central incisor.

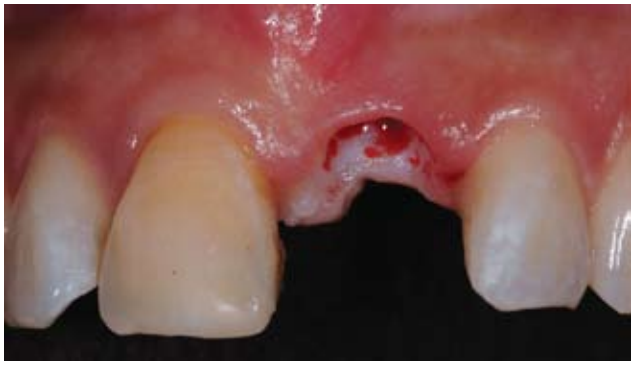

Figure 18: Creation of the planned soft tissue esthetic emergence profile.

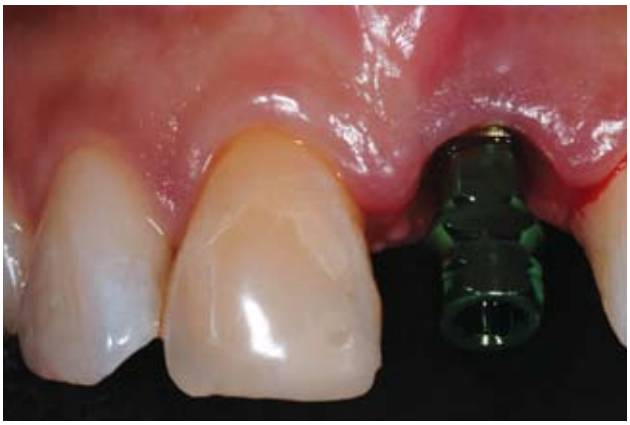

Figure 19: Minimally invasive implant placement, left central incisor.

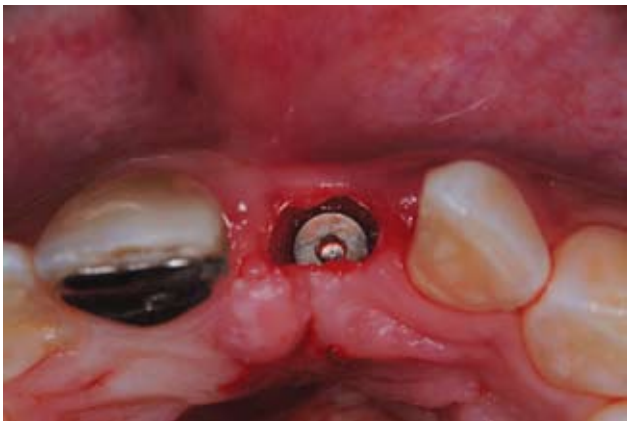

Figure 20: Minimally invasive peri-implant grafting, pregrafted view.

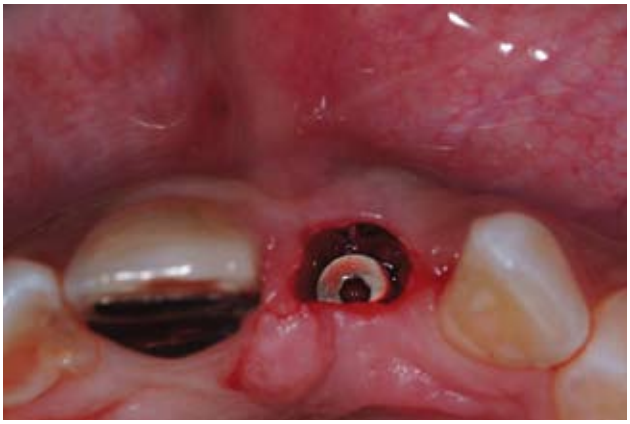

Figure 21: Minimally invasive peri-implant grafting, allogenic graft/prp complex into "pouch" created.

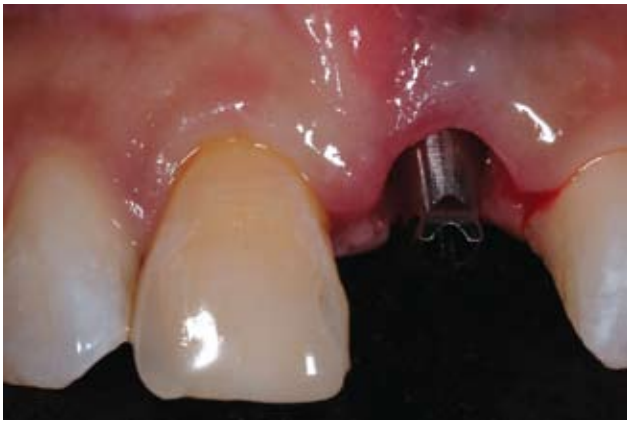

Figure 22: Contour abutment placement.

the cosmetic/reconstructive dentist had planned for esthetic enhancement of the adjacent teeth, as well as an esthetic implant-supported restoration at the edentulous site. After gathering the necessary preoperative information (as previously described), a diagnostic waxing was obtained for the teeth to be altered, and of the edentulous site. The diagnostic waxing, in addition to the radiographic analysis, dictated that a bone replacement procedure would be necessary at the facial of the left central incisor, in addition to implant placement, in order to allow for the natural emergence profile of the restoration and soft tissues to be obtained.

The treatment protocol decided upon by the implant team was to treat the edentulous central incisor site by minimally invasive means, and utilize the "pouch" grafting procedure previously described to reconstruct the natural soft tissue emergence profile that had been lost from the previous tooth removal procedure. Additionally, the immediate provisionalization of the implant would allow not only for a fixed provisional option, but also help to sculpt and maintain the desired emergence profiles.

After administration of an appropriate local anesthetic, the pontic was removed. The surgical guide/provisional system utilized by the author was then inserted, and an initial site marked in the pontic site. Following this marking, the natural emergence profile was created in the soft tissue utilizing a football-shaped diamond, mimicking the appearance as if the tooth were just removed (Fig 18). This reshaping of the gingivae aids in the reconstruction of the emergence profile of the planned

Figure 23: Provisional coping analog appearance.

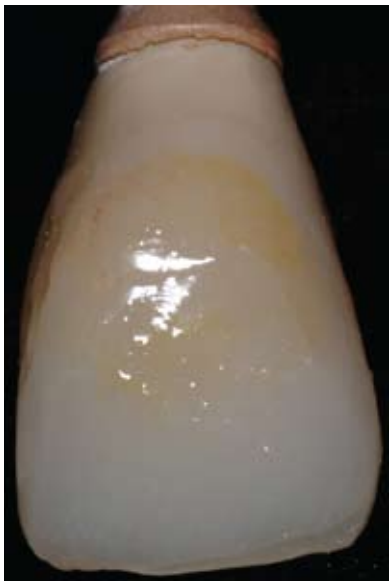

Figure 24: Provisional complex after final contouring, custom staining, and marginal correction.

restoration. Additionally, by reshaping the tissue, the depth of the pontic site now has access to the crest of the ridge, allowing for evaluation of the buccal plate, and for implant placement by minimally invasive means. Utilizing a petro 2 elevator, a full-thickness elevation of the facial tissue was accomplished past the muco-gingival junction, thereby creating the "pouch" in which the graft complex would be placed. The concavity noted presurgically in the facial tissue was accentuated at this point, and would be reconstructed after implant placement.

Reinsertion of the surgical guide/provisional system allowed for appropriate site development, which was followed by the placement of a 3.7 mm by 13 mm in length tapered screw vent (Zimmer Dental) implant (Fig 19). Following the procedure previously mentioned, the collar of the implant was placed at the level of the crest of bone at the facial height of contour of the contralateral tooth. After removal of the carrier mechanism, reconstruction of the facial defect was accomplished. Figure 20 shows the position of the implant in relationship to the concavity of the buccal tissues. Insertion of the graft complex (as previously described) was performed into the full-thickness "pouch" created prior to implant placement (Fig 21). Note how the distal contour of the facial aspect of the grafted site resembles that of the distal aspect of the right central incisor (Fig 21).

Once the grafting was completed, removal of the cover screw preceded placement of a 341s contour abutment (Zimmer Dental), which was hand-tightened (Fig 22). A provisional coping was then roughened, bonding agent applied, and the internal aspect of the initial surgical guide/provisional restoration also roughened and bonding agent applied. This was followed by Filtek composite being placed into the provisional, and the provisional restoration being placed over the coping, which had previously been placed over the abutment. Once the provisional complex was cured, it was removed and placed on an analog to achieve marginal integrity, and the proper management of the facial emergence profile and line angles (Fig 23). Figure 24 shows the final appearance of the custom-stained, properly contoured provisional restoration. The immediate postoperative view can be seen in Figure 25. Note the proper contact point relationships, and the management of the mesial and distal line angles. The 11-day postoperative view can be seen in Figure 26. Note how the papillary tissues have migrated to fill the interproximal spaces at this short time frame postoperatively.

After a three-month healing and observation phase, the patient was referred back to the restorative dentist for final restorations. The restorative clinician utilized a contour zirconia abutment for the final abutment, and completed full-coverage ceramic restorations on teeth ##4-13. Figures 27 and 28 show the con-

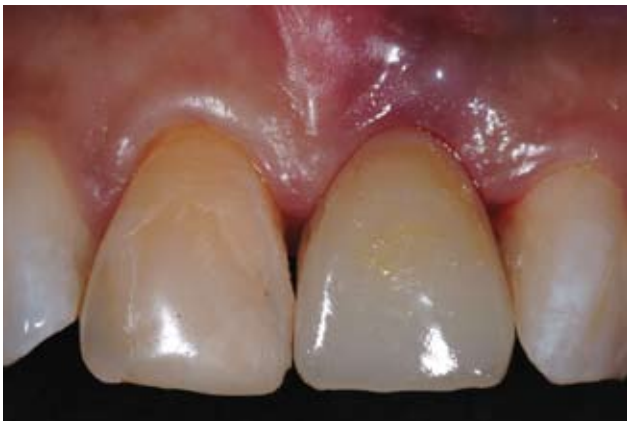

Figure 25: Immediate postoperative view, left central incisor.

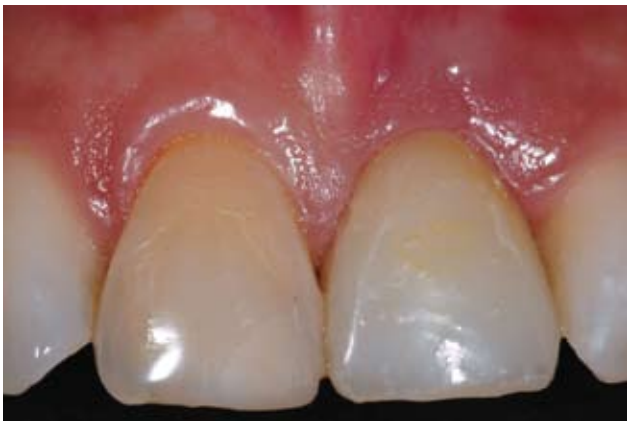

Figure 26: Eleven-day postoperative view.

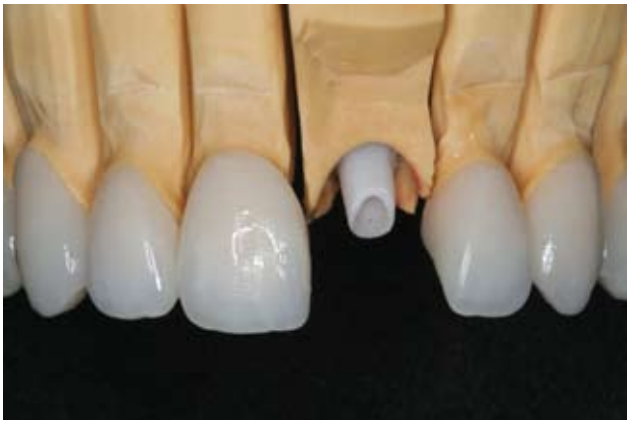

Figure 27: Contour zirconia abutment, laboratory casts, adjacent restorations.

Figure 28: Final all-ceramic restoration on the laboratory casts.

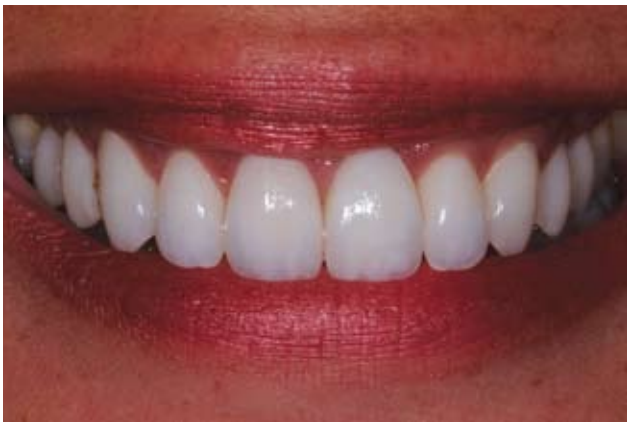

Figure 29: Completed case, smile view.

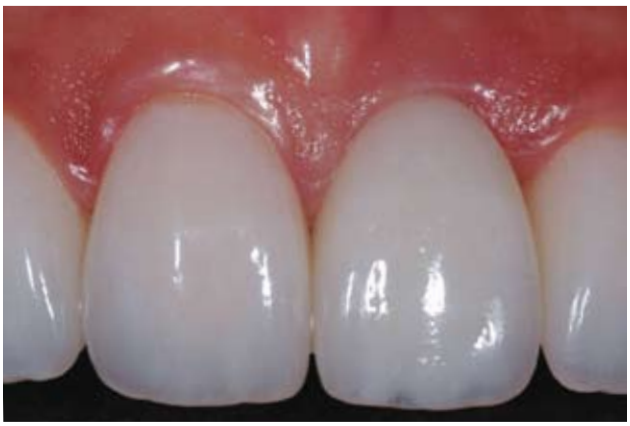

Figure 30: Completed case, clinical view.

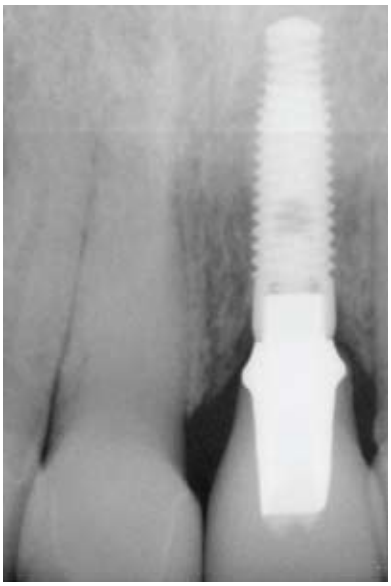

Figure 31: Complete case, digital periapical radiograph.

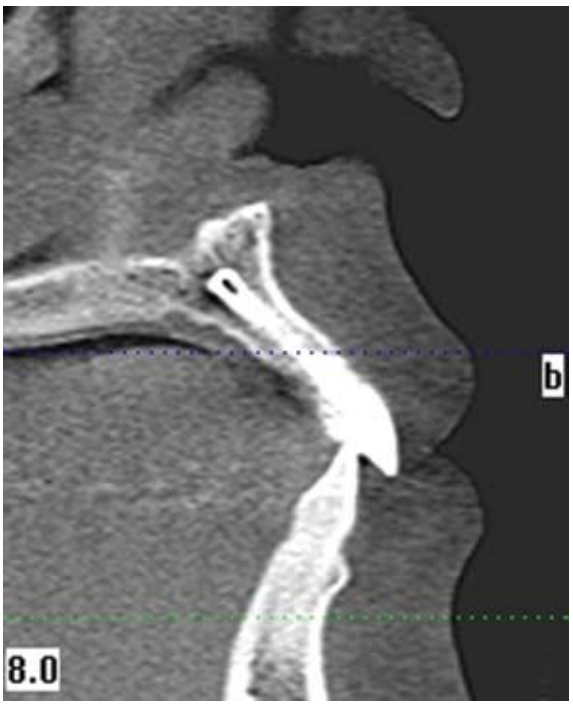

Figure 32: Completed case, cone-beam image, left central incisor.

tour zirconia abutment and adjacent restorations on the laboratory casts. The completed case clinical view of the patient's smile can be seen in Figure 29, and a close-up view of the full-coverage, all-ceramic restoration on the implant at the left central incisor can be seen in Figure 30. Figure 31 shows the completed case digital periapical view, and Figure 32 the completed case cone-beam image. The one-year postoperative view can be seen in Figure 33. Compare Figure 30 to Figure 33 and observe how the soft tissue contours have been maintained in the healing phase.

Conclusion

The presence of natural tissue emergence profiles around teeth and dental implants in the esthetic zone is paramount to the overall clinical success of the esthetic enhancement of the natural dentition, as well as to tooth replacement procedures. Minimally invasive surgical protocols have been demonstrated clinically to decrease surgical trauma to both hard and soft tissue, and to allow for a more rapid healing phase to occur.

Incorporation of restorative principles into the surgical phase of implant dentistry has allowed for immediate provisionalization of dental implants to become a more simplified procedure for the implant team to accomplish, allowing the patient to have an esthetic, fixed provisional throughout the healing phase. The additional benefits of a properly contoured immediate implant provisional are as follows:

- proper contouring of the facial gingival emergence profile
- proper contact point relationships, which can lead to the formation and maintenance of interproximal tissues
- proper contouring of the line angles of the provisional, which leads to a natural soft tissue emergence profile result.

Maintaining the soft tissue emergence profile and, subsequently, the alveolar contours, allows for a mature dento-implant-gingival complex to be established prior to the final implant restoration being seated; this is a common procedure for the alteration of the natural tooth prior to partial and full-coverage procedures.[9] This allows for the dental laboratory to be more predictable when creating the contact points, line angles, and emergence profiles of the final restoration, as these parameters have already been worked through in the healing phase.

I have performed the procedure described above on more than 2,600

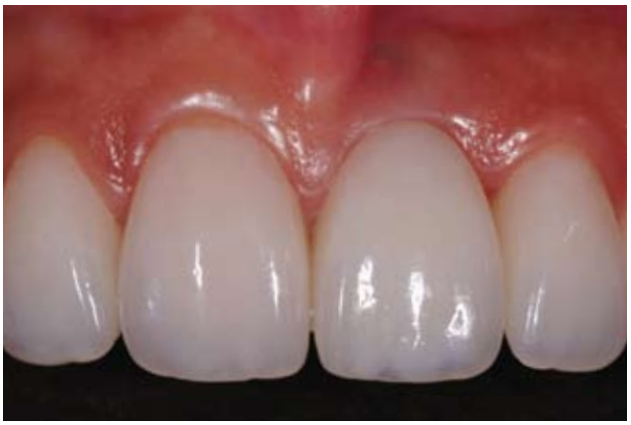

Figure 33: One-year postoperative clinical view.

sites over a period of eight years. Additional clinical studies are necessary to document and substantiate the long-term success of the procedure outlined in this article.

Acknowledgment

The author thanks Edgar Jimenez, CDT (North Oaks, MN), for his excellence in the laboratory aspect of these cases; and Dr. Steven Gorman (North Oaks, MN) and Dr. Steven Lorentzen (Golden Valley, MN) for their clinical excellence.

References

1. Adell R, Lekholm U, Rockler B, et al. A 15-year study of osseointegrated implants in the treatment of the edentulous jaw. *Int J Oral Surg* 10(6):387-416, 1981.
2. Adell R, Eriksson B, Lekholm U, et al. Long-term follow-up study of osseointegrated implants in the treatment of totally edentulous jaws. *Int J Oral Maxillofac Implants* 5(4):347-359, 1990.
3. Babbush CA. *Dental Implants: The Art and Science* (pp. 201-216). Philadelphia, PA: W.B. Saunders; 2001.
4. Kois JC. Altering gingival levels: The restorative connections. Part 1: Biological variables. *J Esthet Dent* 6:3-9, 1994.
5. Worhle PS. Single-tooth replacement in the aesthetic zone with immediate provisionalization: Fourteen consecutive case reports. *Pract Perio Aesthet Dent* 10(9):1107-1114, 1998.
6. Saadoun AP, Le Gall MG. Periodontal implications in implant treatment planning for aesthetic results. *Pract Perio Aesthet Dent* 10:655-664, 1998.
7. Petrungaro PS. Immediate implant placement and provisionalization in edentulous, extraction, and sinus grafted sites. *Compend Contin Educ Dent* 24(2):95-113, 2003.
8. Petrungaro PS. Implant placement and provisionalization in extraction, edentulous, and sinus grafted sites: A clinical report on 1500 sites. *Compend Contin Educ Dent* 26(12):879-890, 2005.
9. Petrungaro PS. An update on implant placement and provisionalization in extraction, edentulous and sinus grafted sites: A clinical report on 3200 sites over 8 years. *Compend Contin Educ Dent* 29(5): 288-300, 2008.
10. Petrungaro PS. Using the TempStent technique to simplify surgical stent and esthetic temporary fabrication in immediately restored implants in the aesthetic zone. *Contemp Esthet Rest Pract* 6(5)84-90, 2002.
11. Petrungaro PS, Maragos C, Matheson O. Using the Master Diagnostic Model® to enhance restorative success in implant treatment. *Compend Contin Educ Dent* 21:33-42, 2000.
12. Tarnow DP, Magne AW, Fletcher P. The effect from the distance from the contact point to the crest of one on the presence or absence of interproximal dental papillae. *J Periodontol* 53(12):995-996, 1992.
13. Tarnow DP, Cho SC, Wallace S. The effect of inter-implant distance on the height of the inter-implant bone crest. *J Periodontol* 71(4):546-549, 2000.
14. Salama H, Salama MA, Garber D, et al. The interproximal height of bone: The guidepost to predictable aesthetic strategies and soft tissue contours in anterior tooth replacement. *Pract Perio Aesthet Dent* 10(9):1131-1141, 1998.
15. Kois JC. Predictable single-tooth peri-implant esthetics: Five diagnostic keys. *Compend Contin Educ Dent* 25(11), 895-905, 2004.
16. Petrungaro PS. Immediate restoration of implants utilizing a flapless approach to preserve interdental tissue contours. *Pract Proced Aesthet Dent* 17(2)A-H, 2005.

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Dental Injuries from Sports Trauma: Review and Case Study

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Ann Arbor, MI
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Prevalence of Sports-Related Dental Injuries

As a growing number of individuals become involved in athletics and recreational activities, the prevalence of sports-related dental injuries continues to rise.[1] This trend is perhaps most evident in adolescents, for whom it is estimated that trauma as a result of sports accounts for 36% of all injuries annually in the U.S.[2] The prevalence of sports injuries has been analyzed in terms of age, gender, type of sport, cause and type of injury, and yearly and monthly distribution by a number of sources.

Studies reveal that 13% to 39% of dental trauma is sports-related.

Data

Although the absence of a central data-gathering center has been the basis for significant variance amongst injury rates, the results of such studies have been beneficial in the treatment and prevention of orofacial sports injuries.[3] Data concerning sports-related trauma can vary depending on geographical location, as the popularity and predominance of different sports varies by region. Statistics also depend upon method of data collection, sample size and age group, and varying levels of competition. These figures are often obtained from insurance companies, representing only a portion of the actual accidents that can be attributed to sports.[4] In the pediatric population, injuries occur frequently during informal sporting activities and are often considered play-related accidents instead of sports-related accidents, contributing another possible source of inaccuracy and underestimation.[5]

A 10-year study of sport-related injuries in Austria found the 10- to 19-year-old age group demonstrated the greatest incidence of sports

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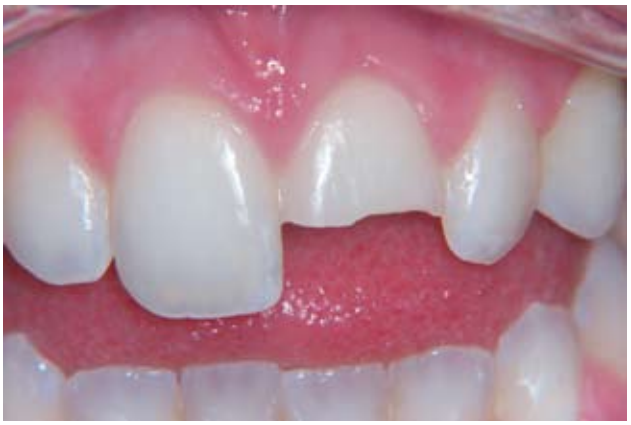

Figure 1: Fractured upper left central incisor.

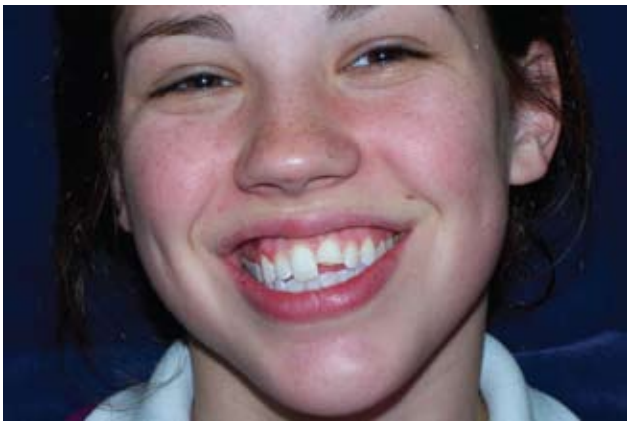

Figure 2: Full face; fractured upper left central incisor.

injuries.[6] Men and boys accounted for 68% of the injuries, more than twice the proportion of injuries sustained by women and girls (32%).[6] The most common sources of trauma were falls and collisions with other players; other causes included being struck by one's own equipment, collisions with obstacles, and traffic collisions.[6] Sports-related injuries have been found to account for 31.3% of all cases of facial trauma, behind only household and play accidents.[6]

Studies

Studies reveal that 13% to 39% of dental trauma is sports-related.[6] Dental injuries occur most commonly in collision and contact sports.[3] The National Youth Sports Foundation for Prevention of Athletic Injuries, Inc., has estimated a one in 10 risk of orofacial injury for sports participants in a single athletic session.[7] Orofacial injuries include soft tissue lacerations, chipped or avulsed teeth, and mandibular/maxillary fractures.[3] A number of studies have shown the maxillary central incisors to be the most frequently injured teeth.[3,4]

Dental trauma in the young athlete is especially serious, as injury can result in long-term complications: Retardation of growth, ankylosis of the teeth, fractures, endodontic necrosis, and partial or complete tooth avulsion.[4] Athletes undergoing orthodontic treatment may be at even greater risk of sports-related injuries, as lip entrapment, lip laceration, tooth avulsion, and other complications have been reported as outcomes in the past.[8,9]

Dental trauma in the young athlete is especially serious, as injury can result in long-term complications.

Basketball

Basketball accounts for a significant number of sports injuries, surpassing trauma rates for popular contact sports such as football and ice hockey.[3] Even at the amateur level, football players are required to wear helmets with face shields and mouth guards; basketball players currently have no such rule.[3] Dental injury rates among basketball players wearing mouthguards were significantly lower than in athletes without protection.[10] Younger basketball players, as is the case in many sports, tend to suffer more dental trauma while playing than do older athletes.[3]

Hockey

Ball sports and stick-and-ball sports are considered most dangerous, accounting for 59% of orofacial injuries caused by athletics.[11] Fortunately, ice hockey, field hockey, and lacrosse have all adopted policies requiring the use of mouthguards in order to protect players from such trauma.[3] Although to a lesser extent, despite these precautions, orofacial trauma still prevails.[3] Dental injuries among ice hockey players were significantly higher than those among football players in a series of studies conducted between 1988 and 1995.[3] It was also found that players wearing half-face shields alone were 10 times more likely to experience a dental injury than those equipped with full-face shields.[12] Of all injuries sustained in hockey, 11.5% are dental trauma.[13]

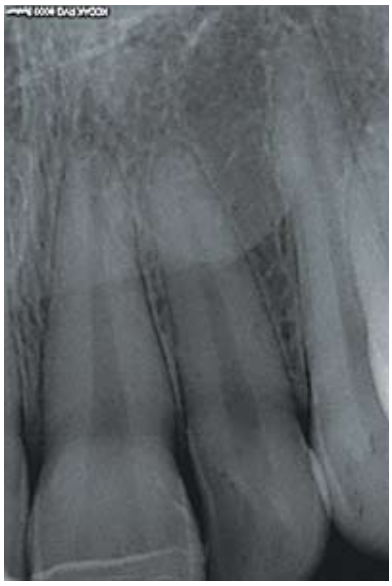

Figure 3: Radiograph of fractured upper left central incisor after provisionalization.

Baseball

Possibilities for injury are abundant in baseball and softball, as players face the risk of being hit with either a bat or ball, in addition to collision with other athletes.[3] Pitchers are perhaps at the greatest risk, positioned in close proximity to the batter and hard-hit balls.[14] A 1998 study found that 75% of baseball coaches reported at least one dental injury among players.[15] Currently, studies indicate much lower incidence rates of orofacial trauma in softball than in baseball.[3]

Football

Prior to mouthguard use in the 1950s, 54% of all football injuries were of the orofacial class.[16] Since mandating the use of protective facemasks and mouthguards in the U.S., the rate of dental injuries in the sport have been reduced significantly.[3] A low 2.8% dental trauma rate among football players at the college level can likely be credited to the use of this preventive gear.[17,18]

Other Sports

Other sports, including gymnastics, martial arts, boxing, wrestling, and even swimming also contribute to the number of dentofacial injuries suffered by athletes each year.[3] Although gymnasts do not come into physical contact with one another, they may suffer dental injuries from falls and facial contact with the equipment. Because martial arts, boxing, and wrestling involve much physical contact with an opponent, they pose a significant risk for orofacial damage. In one study, more than 50% of wrestlers interviewed had suffered some type of dental trauma.[19] Extreme sports such as skateboarding and snowboarding contribute to rates of dental injury as well, as protection for the mouth and dentition is rarely utilized.

Prevention

Prevention of sports-related orofacial trauma is contingent upon further research and the acquisition of reliable data pertaining to the causes and outcomes of different types of sports injuries.[20] Increasing public awareness of the risks involved in sports participation and the importance of preventive measures may result in the decline of sports accidents. Fortunately, dental trauma as a result of athletic activity can often be minimized or prevented with the use of protective mouthguards.

Mouthguards

Mouth protection for athletes was introduced over 100 years ago, but has yet to be mandated in most sports.[3] The mouthguard is a simple, economical, and effective method of preventing injury to the mouth and dentition during sport. The mouthguard's proficiency has been best illustrated through the significant reduction of dental injuries in con-

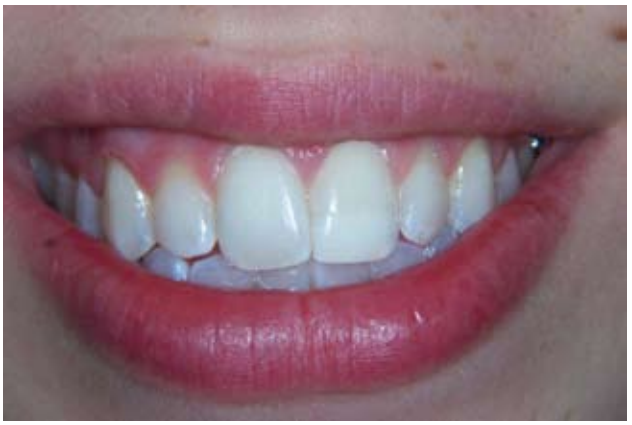

Figure 4: Provisionalization with reattached fragment, upper left central incisor.

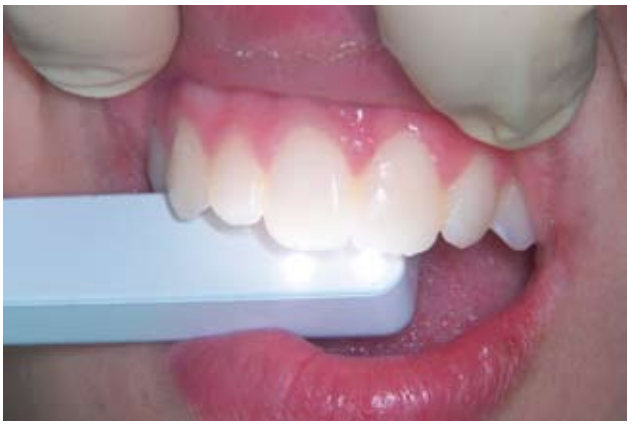

Figure 5: Trans-illumination of upper central incisors for ceramist.

tact sports such as hockey and football, where their use has become obligatory.[4] The strength required to cause dental injury and damage to the alveolar structure is significantly greater under the protection of a mouthguard.[21]

The notion that mouthguard wear is unnecessary in children prior to the loss of primary teeth is a common misconception. In fact, trauma to the primary teeth can cause serious defects in the permanent dentition.[22] Studies reveal low mouthguard use among adolescents in sports when compared to adults.[4] Children are also more likely to utilize "boil and bite"-style guards in contrast to adults, who report using a greater proportion of the custom-fitted type.[23]

Mouthguards are often associated with discomfort, bulkiness, complications in speaking, and difficulty breathing. Through a better fit, the custom-made mouthguard provides the athlete with greater comfort and ability to converse.[24]

The regular replacement of mouthguards with aging is important in children, as changes in dentition can occur rather rapidly.[4] For this reason, it is recommended that mouthguard fit be assessed by a dentist with each sports season and in conjunction with routine dental exams.[4]

Dental trauma as a result of athletic activity can often be minimized or prevented with the use of protective mouthguards.

Mouthguards are required in the U.S. for athletes participating in football, boxing, ice hockey, field hockey, and lacrosse.[3] Outside of these sports, mouthguard use is limited, and therefore dental injury is of greater prevalence.[3] Mouthguards have consistently been shown to reduce the number and severity of dental injuries.[4] They may also be effective in preventing concussion in athletes sustaining sports injuries.[25] The importance of utilizing this protective measure should be stressed by dental professionals. Equally as important, the regulatory bodies that govern organized youth sports should be encouraged to mandate mouthguard wear in order to provide athletes with greater protection.

Case Study

The patient was a 16-year-old healthy female who had completed orthodontic treatment and whitening. She was an accomplished student athlete who played varsity girls' basketball and competed at Judo on a national level. She had sustained an injury when she fell on a gym floor, hitting her face and teeth. The upper left central incisor fractured (Figs 1 & 2). The fractured tooth was asymptomatic with no pulp exposure.

Provisionalization

The tooth was provisionalized two hours after the accident. The fractured segment of the tooth had been recovered at the accident site. The tooth was anesthetized and the fractured segment and the tooth were both then cleaned with pumice and disinfectant. The fractured segment was then reattached with a highly filled bonding resin, following manufacturer's recommendations (PQ1, Ultradent Products;

Figure 6A: Try in of upper left central incisor, view one for shade refinement.

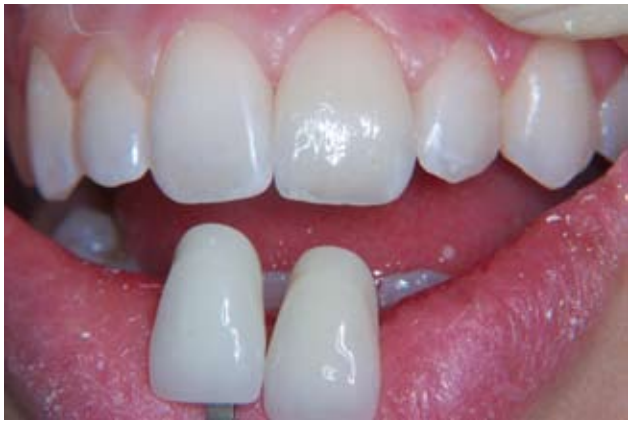

Figure 6B: Try in of upper left central incisor, view two for shade refinement.

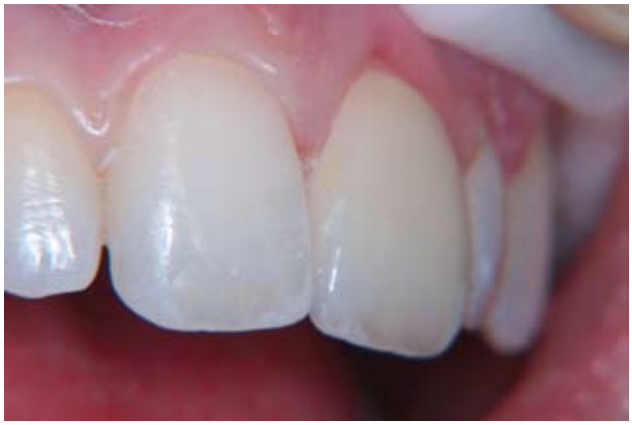

Figure 6C: Try in of upper left central incisor, view three for shade refinement.

South Jordan, UT). The enamel and dentin were etched for 15 seconds with 35% phosphoric acid. The tooth was rinsed and lightly dried, leaving the surface moist. PQI was applied to the enamel and dentin. The bonding agent was air-thinned, then cured for 20 seconds. The fractured segment was etched in the same manner. PQ1 was then applied to the fractured segment and air-thinned; the segment was then positioned back on the tooth and the tooth was cured for 20 seconds on the facial and 20 seconds on the lingual (Figs 3 & 4).

Restoration

The final treatment was to be a porcelain veneer. Restoring a single central incisor can be one of the most challenging esthetic dental procedures. Great care in the selection of the restorative material, preparation, and information conveyed to the fabricating ceramist must be taken. The material selected was IPS Empress Esthetic (Ivoclar Vivadent; Amherst, NY), due to its enamel-like light-scattering properties and translucency. To ensure an optimum shade, the patient underwent a touch-up whitening treatment prior to a final restoration (the patient had undergone in-office whitening a year prior to the accident). After provisionalizing the traumatized tooth, an in-office touch-up whitening session was performed using Opalescence Xtra (Ultradent), a 35% hydrogen peroxide gel. After isolation, the gel was applied for three consecutive 15-minute sessions. The patient then used TresWhite Supreme (Ultradent), a 10% hydrogen peroxide disposable tray product, for three days at one hour per day. The shade was allowed to stabilize for 14 days after the touch-up whitening.

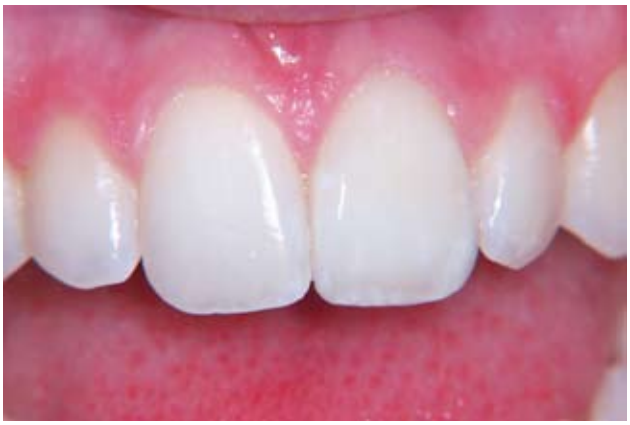

Figure 7: Final restoration, upper left central incisor.

Figure 8: Restored smile.

Preparation Appointment

At the preparation appointment, local anesthesia was achieved. A complex shade mapping was drawn and trans-illumination was done on the upper right central incisor in order to view the dentin formation (Fig 5). The custom shade diagram, photographs of the shade tabs next to the teeth, and the photographs of the trans-illumination were sent to the ceramist. The tooth was prepared for a conservative porcelain veneer. The facial surface was reduced .75 mm. The facial preparation extended interproximally without breaking the remaining contacts. The enamel along the fracture was beveled to the lingual surface. The shade of the preparation was noted and photographed with a shade tab for the ceramist. Tissue retraction was accomplished with Expasyl (Kerr; Orange, CA). A full arch impression was taken with Impregum (3M ESPE; St. Paul, MN). A bite registration in centric relation was recorded and opposing impression was taken. Provisionalization was accomplished utilizing an RSVP (Cosmedent; Chicago, IL) stent as a custom matrix, in a "shrink wrap" technique. A thin layer of bonding resin, Permaquik (Ultradent), was initially placed on the prepared and unetched tooth, and the bulk of the provisional was RSVP.

Try-In Appointment

Several weeks later the provisional was removed under local anesthetic. The porcelain veneer was tried in for shade and fit. At the try-in appointment, the restoration was determined to need a slightly brighter hue and to require additional superficial enamel characteristics to attain a closer likeness to the right central incisor. Multiple photographs from all angles were taken with the restoration seated on the preparation (Figs 6A-6C). The photographs and restoration were returned to the ceramist for the refinement of the shading. One week later, the patient was again anesthetized and the restoration was evaluated. Deemed an excellent match, the restoration was seated with Variolink II (Ivoclar Vivadent). Translucent base was used for cementation, which maximized the "chameleon" effect, allowing the healthy underlaying tooth structure's color to come forth.

The restoration was cleaned with alcohol, etched with 9% hydrofluoric acid for 15 seconds, treated with silane, and then treated with bond resin according to the manufacturer's directions. The prepared tooth was cleaned with Consepsis (Ultradent), a 2% chlorhexidine gluconate solution; etched with 35% phosphoric acid for 15 seconds; rinsed completely; and lightly air-dried but left moist. Then Excite (Ivoclar Vivadent) bond resin was applied, air-thinned, and cured for 20 seconds. A thin bond resin such as Excite provides good bond strength with very little thickness, which is desirable for the light transmission through the Empress restoration. The restoration was loaded with the translucent luting cement and seated in place. The excess material was removed with a brush. The restoration was then tacked into place with a 5-mm curing tip for 10 seconds. Any additional excess material was removed, then the restoration was fully cured into place with a full-size curing tip. The occlusion was checked. The layering, shading, and superficial characteristics of the restoration combined to make an excellent match to the patient's existing dentition (Figs 7 & 8).

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Summary

Dental trauma from sports injuries is a common occurrence that seems to be increasing in frequency as a growing number of individuals participate in sporting activities. Many injuries are being prevented by the use of mouthguards; sports that mandate mouthguard use report lower rates of injury than sports that do not mandate such use. Athletes seem to comply better with wearing custom-fitted mouth guards than they do with alternative types. Dental traumas also occur during recreational activities and are harder to prevent, as mouthguards are rarely if ever worn at those times. The cosmetic dentist's role in the treatment of sports-related dental trauma is becoming more important than ever before, because as the prevalence of these injuries continues to rise with the ever-growing popularity of sports and recreational activities, the esthetic expectations of the athletes suffering trauma rise as well.

Acknowledgment

The authors thank Charles Moreno, CDT (Excel Dental Studios, Encino, CA), for the ceramic restoration in the case discussed in this article.

References

1. Guyette RF. Facial injuries in basketball players. *Clin Sports Med* 12:247-264, 1993.
2. Bijur PE, Trumble A, Harel Y, Overpeck MD, et al. Sports and recreation injuries in U.S. children and adolescents. *Arch Pediatr Adolesc Med* 149:1009-1016, 1995.
3. Kumamoto D, Yoshinobu M. A literature review of sports-related orofacial trauma. *Gen Dent* 52(3):281, 2004.
4. Cornwell H. Dental trauma due to sport in the pediatric patient. *J Calif Dent Assoc* 33(6):457-461, 2005.
5. Banky J, McCrory PR. Mouthguard use in Australian football. *J Sci Med Sport* 1999;2:20-29.
6. Tuli T, Hächl O, Hohlrieder M, Grubwieser G, et al. Dentofacial trauma in sports accidents. *Gen Dent* 50(3):274-279, 2002.
7. Woodmansey K. Athletic mouthguards prevent orofacial injuries: A review. *Gen Dent* 47:64-69, 1999.
8. Croll TP, Castaldi CR. Customized protective mouthguards for orthodontic patients. *J Clin Dent* 15-19, 1996.
9. Ngeow WC, Kon L. Entrapped lip following sport injury. *Dent Update* 24(7):285-286, 1997.
10. Labella CR, Smith BW, Sigurdsson A. Effect of mouthguards on dental injuries and concussions in college basketball. *Med Sci Sports Exer* 34:41-44, 2002.
11. Skaare AB, Jacobsen I. Etiological factors related to dental injuries in Norwegians aged 7-18 years. *Dent Traumatol* 19:304-308, 2003.
12. Benson BW, Mohtadi NG, Rose MS, Meeuwisse WH. Head and neck injuries among ice hockey players wearing full face shields vs. half face shields. *JAMA* 282:2328-2332, 1999.
13. Lahti H, Sane J, Ylipaavainiemi P. Dental injuries in ice hockey games and training. *Med Sci Sports Exerc* 34:400-402, 2002.
14. Sakamoto B. In high school play, a livelier softball may be adding insult to injury. *Chicago Tribune* May 13, 1999.
15. Berg R, Berkey DB, Tang JM, Altman DS, et al. Knowledge and attitudes of Arizona high-school coaches regarding oral-facial injuries and mouthguard use among athletes. *JADA* 129:1425-1435, 1998.
16. Cathcart JF. Essential in contact sports. Mouth protection-A must for football players. *Dent Survey* 28:195-199, 1952.
17. Bhat M, Li SH. Consumer product-related tooth injuries treated in hospital emergency rooms: United States, 1979-1987. *Comm Dent Oral Epidmiol* 18:133-138, 1987.
18. Morrow RM, Seals RR, Barnwell GM, Day EA, et al. Report of a survey of oral injuries in male college and university athletes. *J Natl Athletic Trainers Assoc* 26:339-342, 1991.
19. Persson LG, Kiliaridis S. Dental injuries, temporomandibular disorders, and caries in wrestlers. *Scan J Dent Res* 102:367-371, 1994.
20. Gassner R, Bosch R, Tuli T, Emshoff R. Prevalence of dental trauma in 6,000 patients with facial injuries: Implications for prevention. *Oral Surg Oral Med Oral Path* 87:27-33, 1999.
21. Johnston T, Messer LB. An in vitro study of the efficacy of mouth guard protection for dentoalveolar injuries in deciduous and mixed dentitions. *Endod Dent Traumatol* 12:227-285, 1996.
22. von Arx T. Developmental disturbances of permanent teeth following trauma to the primary dentition. *Aust Dent J* 38(1):1-10, 1993.
23. Cornwell HL, Messer LB, Speed H. Use of mouthguards by basketball players in Victoria Australia. *Dent Traumatol* 19:193-203, 2003.
24. Maestrello-deMoya MG, Primosch RE. Orafacial trauma and mouth protector wear among high school varsity players. *ASDC J Dent Child* 56(1):36-39, 1989.
25. Knapik JJ, Marshall SW, Lee RB, Darakjy SS, et al. Mouth guards in sport activities: History, physical properties and injury prevention effectiveness. *Sports Med* 37(2):117-144 2007.

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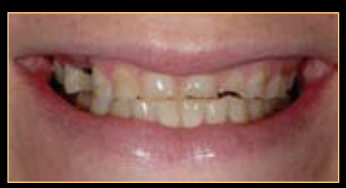

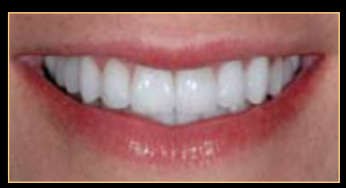

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Understanding Zirconia Backgrounds for Custom Shade Matching

by Luke S. Kahng, CDT
Naperville, IL
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Introduction

Before beginning a case requiring the fabrication of a zirconia restoration, the technician must first understand zirconia background color and the way the porcelain powder shades will appear together.[1] Additionally, in order to assign a final color to the restoration, the patient's modified or base shade must be obvious to the technician in order to best match the custom color. One question that must be answered is, "Is there less dentin or more dentin?" That is the key to shading.

If the technician cuts the dentin porcelain back too much, the value of the restoration will be low. The result will not look natural, and no one will be satisfied. If the technician cuts less, there will be insufficient room for enamel placement and creation of translucency; the color will be wrong and the value will be too high.

A technician can obtain a great deal of information about a patient from a preoperative photograph.

Given the particular clinical situation, the technician must decide where to begin based upon what he or she knows about zirconia copings and porcelain powder, as well as the information received about the patient. This article illustrates my general approach to color matching and fabricating zirconia copings based upon my personal philosophy. A specific case study is used to demonstrate the technique.

Case Study

The female patient was a public speaker who presented with two 15-year-old porcelain-fused-to-metal (PFM) crowns on teeth #7 and #8 that she no longer liked. In-office radiographs revealed recurrent caries; however, the patient had healthy gingival tissue. She sought "natural-looking crowns with no black lines." Her dentist prepared the teeth, and an impression was taken (Flex-Time Impression Material, 3M ESPE; St. Paul, MN). Provisional restorations were then fabricated (Protemp, 3M ESPE) and stained for better color matching.

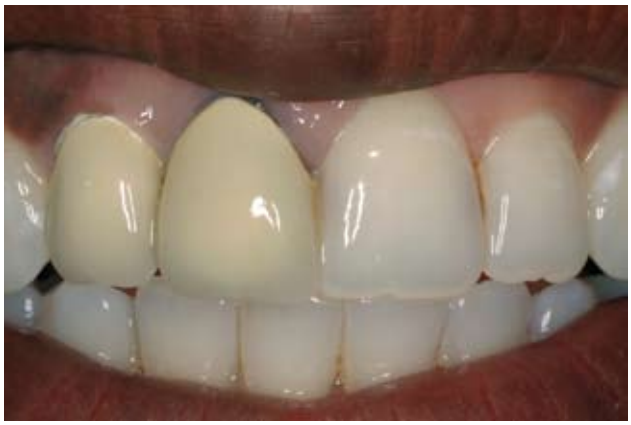


Figure 1: Two 15-year-old PFM crowns that the patient wanted replaced were photographed preoperatively for "before-and-after" viewing.

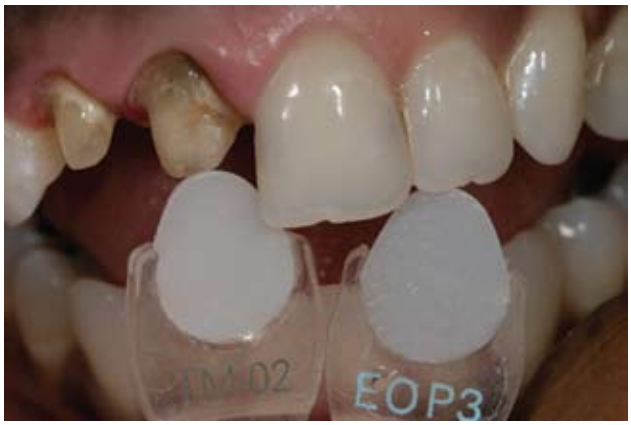


Figure 2: A shade tab check using light blue and white transparent modifier verified the natural teeth's shades, in order to achieve a color match with tooth #9 and the finished restorations.

A technician can obtain a great deal of information about a patient from a preoperative photograph (Fig 1), such as the opacity of the teeth, gingival color, discoloration of soft tissue, and differences between the natural teeth's color and value compared to existing crown restorations. EOP3 and TM02 shade tabs (GC Initial, GC America; Alsip, IL) were used to verify the patient's recommended amount of translucency and opalescence (Fig 2). A stump color check (Fig 3) was compared with brown-orange, and the gingival color was found to be very dark. The adjacent central incisor was a strong key to the color-matching process. The in-office whitening she completed lent a blue tone to the overall color of her teeth.

Experimenting With Zirconia Backgrounds

Success with the custom-shading process for zirconia restorations begins with an understanding of the zirconia coping background, from porcelain to the finished product. While each case is different, I have found that for multilayering porcelain techniques, a general formula can be followed based upon experimentation and case study. After the modifier is applied, the following powders can be placed, in this order:

- first layer—a thin but deep, dark chroma
- second layer—dentin
- third layer—translucency
- fourth layer—mammelon and enamel (the color is chosen according to the individual patient, but will include shade possibilities of orange, brown, yellow, red, etc.).

By applying the layers in this sequence, the custom shade is systematically broken down and the color direction and strategy will unfold naturally. Eight zirconia test copings (CAD/CAM facility copings, GC America) I fabricated are shown in Figure 4. Four copings demonstrate a white background and four demonstrate a color tone.[2] The colors to be applied were D2, A3.5, B4, and C1, as these are the most common starting points for custom color matching.

First, the color modifiers light tan, orange, yellow, and pink were applied[3] (Fig 5). A category background color check was then performed (Fig 6) by applying D2, A3.5, B4, and C1 to the body of the copings, after which the porcelain buildup was cut back slightly to allow application of translucency enamel and color modifier to the copings. This was an important step, as the amount of porcelain cut back would determine the final color appearance. Cervical color, translucency modifier (Fig 7), and enamel opal were applied for color range; mammelon was then applied and checked. The variations in color ranged from translucent, to brown, to orange-toned, to chalky white.

The final shades were achieved through the layering technique. In fact, the amount of porcelain powder applied versus the manner in which it was layered was very different. Before the technician can decide what he or she wants the outcome to be, they must first understand the powder and how it can be used to their advantage. There are distinct differences in appearance during the stages of the porcelain layering process and the final texture application.

The difference between the segmented teeth can be observed in Figure 8. Half of each crown was

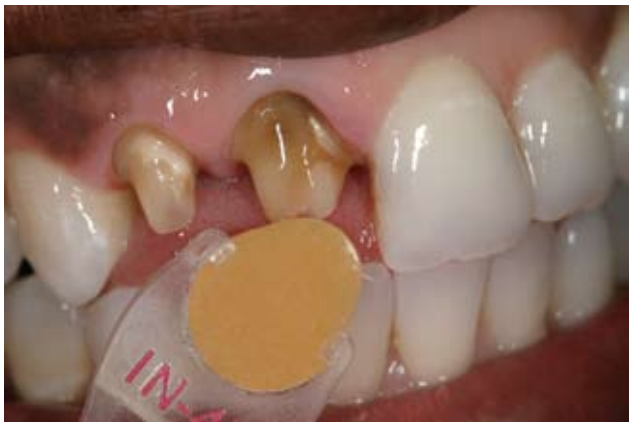


Figure 3: A stump shade check revealed that the overall color had a brown-orange tone and that the gingival shade was fairly dark.

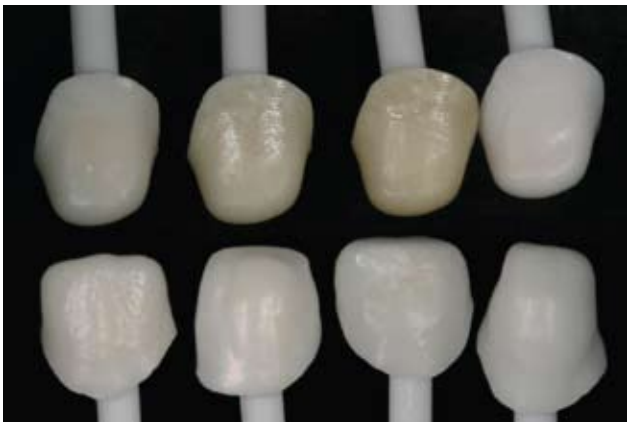


Figure 4: Eight zirconia copings were fabricated and displayed for shade-testing purposes.

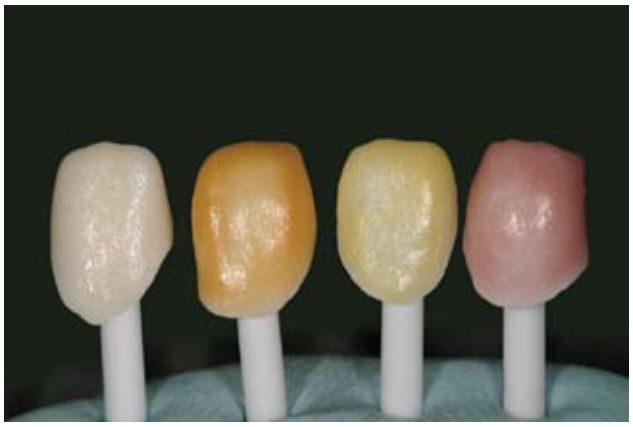


Figure 5: Four body colors (D2, A3.5, B4, and C1) were tested with color modifiers (left to right: light tan, orange, yellow, and pink) to achieve the proper internal color.

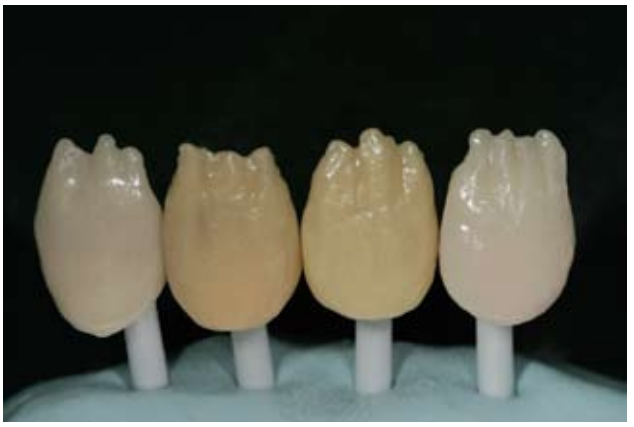


Figure 6: The body colors were tested and the dentin porcelain was cut back for color matching.

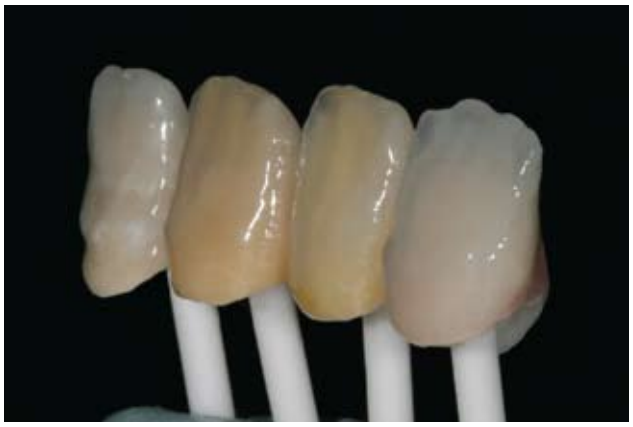


Figure 7: To give a better transparency viewing, the copings were first fired at a temperature 10˚ higher than normal. Note the variation achieved through porcelain layering techniques.

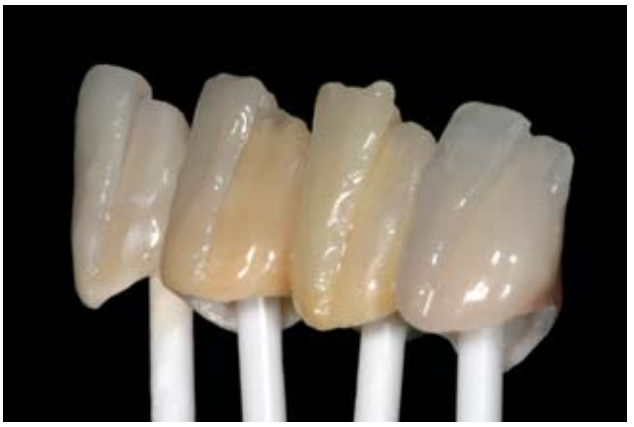


Figure 8: On each crown there is a thin layer of enamel, covered by one-half of a porcelain buildup. This aids the technician in deciding the final enamel color and texture application for the best possible match.

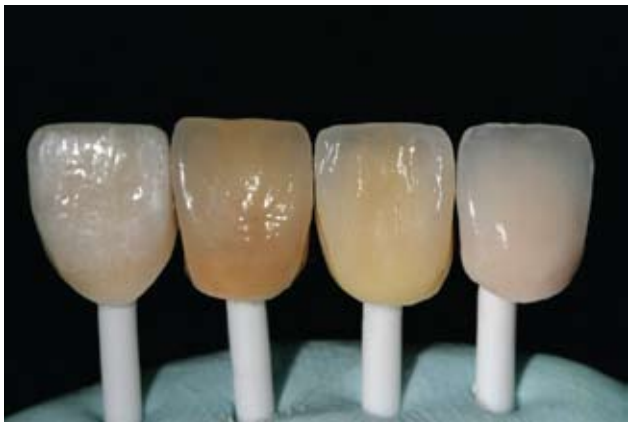


Figure 9: A final modifier color is applied to the zirconia copings. Each coping is given a specific recipe and texture.

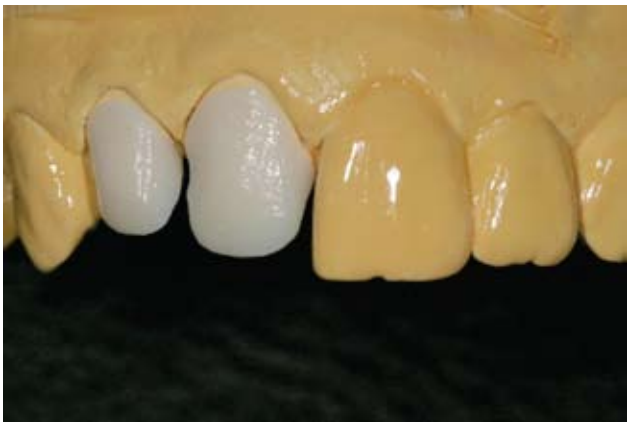
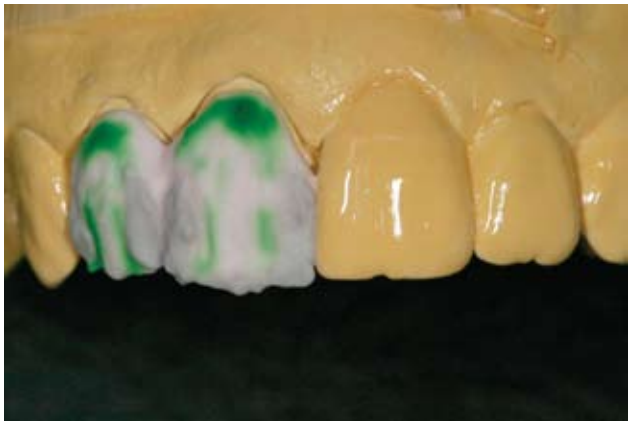
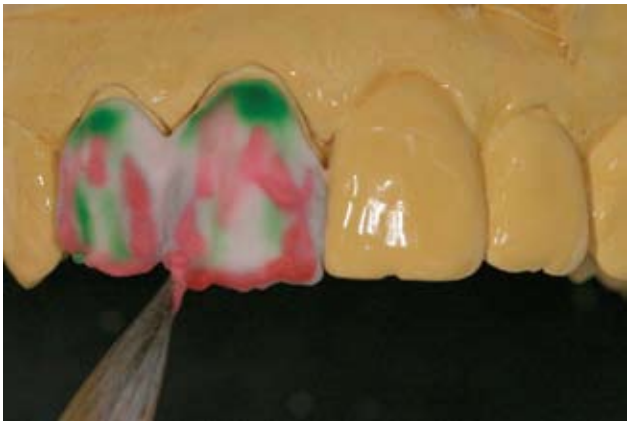


Figure 10: The contours of the zirconia coping were checked, after which frame modifier color was applied.





Figures 11 and 12: Enamel, translucency modifier, and enamel opal were applied.

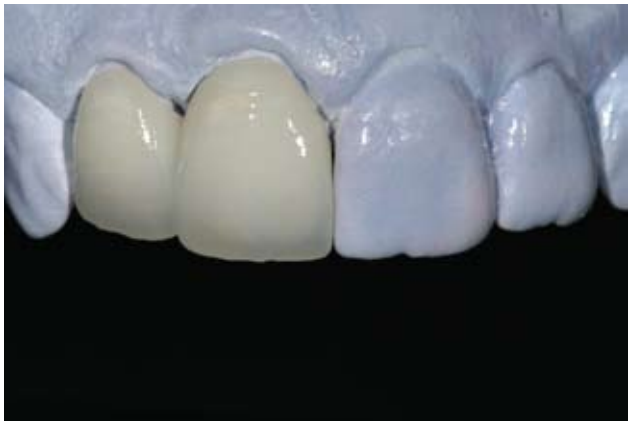


Figure 13: The final restorations were verified on the master cast.

Figure 14: The final restorations, dramatically displayed on a black background, exhibit beautiful and natural-looking color variations.

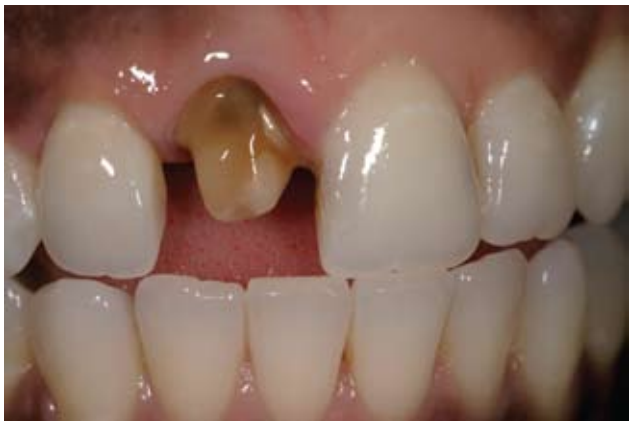


Figure 15: Upon insertion of the restoration for tooth #7, I performed a width check. The restorations had to be flat in order to avoid the "black triangle" effect.

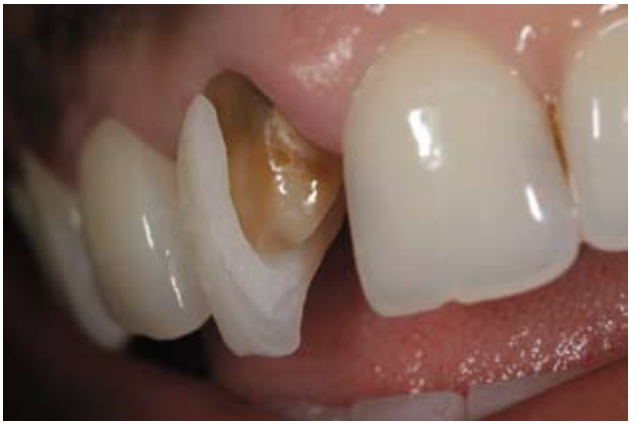


Figure 16: The internal difference in shades between the coping and the layered porcelain color can be seen from this view.

covered in porcelain buildup, while the other half received a thin layer of enamel. The left-hand side illustrates the final color with enamel; the right-hand side shows the dentin and modifier color without enamel. This demonstrates the basic-to-final build-up process that I apply to my experimental restorations, in the following order:

- inside modifiers
- color (D2, A3.5, B4, or C1)
- enamel opal or clear fluorescence (depending upon color)
- white stain (D2 only)
- translucency modifier
- cervical translucency.

These various coping colors can be categorized by the general age groups of the patients, as follows:

- The D2 zone will usually fit into a very young person's category—white modification; less translucency; high value; and rough, frosty texture.
- The A3.5 coping appears shiny, clear, and transparent—the way a slightly older person's teeth appear.
- The B4 coping is usually associated with a middle-aged person's color, with more dentin, transparency, and translucency, less enamel, and more enamel opal color.
- The transparent grayish tone of C1 is brought out after the pink undertone is applied. This represents the approximate shade of an elderly person's tooth color that results from the enamel wearing away over time. This color is very hard to mimic and requires Vita 3M1, 3R1.5, and 5M1 (Vident; Brea, CA), an essential range of colors that brings out the pink undertone. In order to achieve a Vita 3D Master Shade color, the pink tone from classic Vita color is crucial.[4]

The outcome of this experiment with zirconia backgrounds is that the first coping appears to be rough, similar to the tooth surface of a very young person. The second, third, and fourth copings have more translucency, or what can be categorized as a "shiny" appearance. This almost always applies to older patients. Color differences can also be noted. With this information, technicians can begin their work by using each illustrated zone for a large range of possible colors. The experiments will recall for them each of their patient's individual cases and their own unique coloring (Fig 9).

Revisiting the Case

The patient's base range of color was 030 after in-office bleaching (BriteSmile, Discus Dental; Culver City, CA), with a B1 base shade and translucency. Tooth whitening caused a blue-gray enamel color and translucency, indicating that this patient's color belonged within the third experimental coping color range. Her crowns therefore required more dentin, transparency and translucency, and more enamel opal color.

This was the starting point for the patient's case. I would have to utilize a manufacturer's porcelain containing more enamel and translucency in order to match her color. Her case would require only a slight change of color from the test coping experiment (B4 versus B1 base shading). The value of the time spent studying zirconia copings was evident because the patient's case plan was "blueprinted" before it had ever been received from the dentist and reviewed by the laboratory.

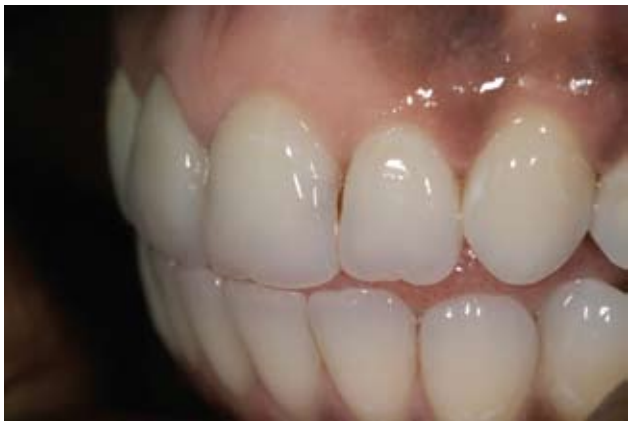


Figure 17: An emergence profile view illustrates a perfect match with the patient's adjacent teeth.

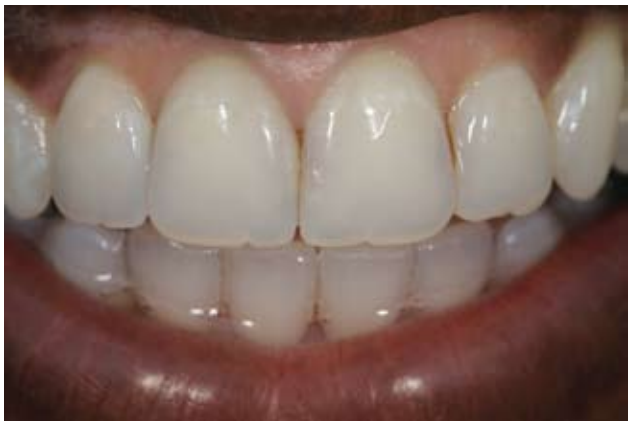


Figure 18: An alignment check of teeth ##7-10 shows an incisal halo match and perfect contouring, texture, and translucency opal.

Cervical porcelain and regular dentin (GC Initial) were applied (Fig 10). The next step in the process was to create enamel and apply translucency modifier and enamel opal (Figs 11 & 12). The final restorations were then viewed on a master cast (Fig 13). The final restorations were revealed on a black background in order to accentuate their multiple color variations (Fig 14). One or two porcelain colors will not match with natural teeth; in my opinion, there must be at least five or more shades for true harmony. This color differentiation will normally show well in the mouth because natural teeth are multicolored, not one-dimensional.[5]

Immediately after the insertion of the restoration for tooth #7, the restoration for tooth #8 could be checked for size and width from the gingival to the incisal level (Fig 15). The interproximal contact for tooth #8 had to be flat in order to avoid the "black triangle" effect and still provide proper fit.

Even though the patient's stump shade was dark, it could be masked with a zirconia crown (Fig 16).[6] By fabricating a zirconia crown, slicing it in half, and placing it over the patient's remaining tooth #8, it could be seen that the stump shade was well masked. Does it blend with stump color? How well can the dark color be masked with the coping? Material selection plays a role in verifying the final appearance because the patient sought a "no metal, no black line" look after her experience with the two previous PFM crowns. From a technical viewpoint, by presenting this experiment with the crown, I ensured that the clinician and patient would be satisfied with the final restoration because the color would match better. The image (Fig 16) was taken to serve as verification of the testing.

A side emergence profile view illustrates two perfectly matched restorations (Fig 17). The flawless alignment among teeth ##7-10, with matching incisal halo, contouring, texture, and translucency opal (Fig 18), is also apparent. After cementation, the patient was relaxed and at ease about her appearance (Fig 19).

Conclusion

This patient was seen twice for custom shade matching in the laboratory. The first time was unsuccessful because her appointment was scheduled at 4:00 p.m. My visual acuity is not at its best in the afternoon; I endeavored to match her color but was not pleased with the outcome. I asked her to return for a morning appointment, when my eyes would not be fatigued and my perception would be clearer. During this second visit, the shade was matched successfully.

This example is a reminder to recognize the potential for fatigue when scheduling a patient for custom color matching. In the interest of saving time for everyone, if the technician has a preference for time of day, it is certainly acceptable to inform the clinician and patient of this before getting started.

As mentioned earlier, in my experience, it is important to determine where to start and how to proceed with each individual patient's case. This coping experiment and case study benefited everyone involved: The patient, clinician, and technician. The patient has been very pleased with her final restorations. She no longer hides her smile and is

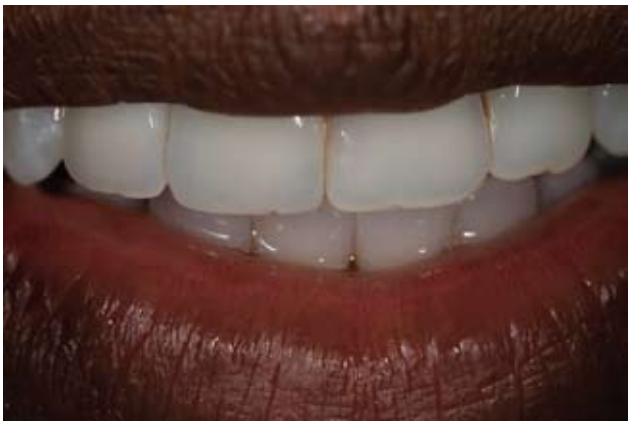


Figure 19: Final postoperative view of the patient in a rest position, no longer hiding her smile.

much more comfortable in front of large audiences during her speaking engagements.

Acknowledgment

The author thanks Dr. Cary Goldberg, from the Center for Dental Excellence (Flossmoor, IL), for performing the dentistry featured in this article.

References

1. Pashley EL, Tao L, Mackert JR, Pashley DH. Comparison of in vivo vs. in vitro bonding of composite resin to the dentin of canine teeth. *J Dent Res* 67:467-470, 1988.
2. Dell'Acqua P, Broseghini C, Broseghini M. *Oral Harmony: 30 Cases from the Practice of Aesthetic Treatment and Periodontal Prostheses* (pp. 118-123). Fuchstal, Germany: Teamwork Media GmbH; 2002.
3. Touati B. Improving aesthetics of implant-supported restorations. *Pract Periodont Aesthet Dent* 7:81-92, 1995.
4. Kahng LS. Initial porcelain 3D conversion chart. Leuven, Belgium: GC Europe; 2006.
5. Davidson DF, Jordan RE, Suzuki M. Esthetic conservative incisal restoration of anterior teeth—Part I. *J Can Dent Assoc* 60:301-304, 1994.
6. McLaren EA. All-ceramic alternatives to conventional metal-ceramic restorations. *Compend Contin Educ Dent* 19:307-325, 1998.

Practice Development

In This Section:

Value Creation and the Cosmetic Practice

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Introduction

The future of cosmetic dentistry could not be brighter. Consumer demand for cosmetic services continues to increase, thanks to several developments, including the following:

- media attention (makeover shows and celebrity culture emphasize the power of a beautiful smile)
- demographics (aging baby boomers want to look younger and more attractive)
- at-home products (individuals can whiten and brighten their smiles at home).

Given these factors, success in cosmetic dentistry seems assured… or is it?

While many dentists very successfully incorporate cosmetic services into their practices, others are still significantly challenged by this. Of course, the slow economy has not helped matters either. Can these practices overcome obstacles and increase their cosmetic production? The answer is a resounding "Yes!"

What is "Value Creation?"

How do you unleash your cosmetic potential? A concept called value creation can help you achieve your esthetic vision, even in today's economy. Value creation is taking a task's basic purpose and enhancing it. For example, the functional aspects of a new patient phone call include the following: Answering questions, gathering information, creating the appointment, and ending the call. Applying value creation principles, the new patient phone call could also include information about practice services, the doctor's background, and the practice's use of leading-edge technologies.

Cosmetic dentistry itself is a form of value creation. Traditional dentistry is concerned with the proper and healthy functioning of the oral cavity, whereas cosmetic dentistry focuses on adding value to the patient's smile and

quality of life. To increase cosmetic production, practices should review all systems and apply the concept of value creation everywhere possible. In today's economy, it is critical that practices maximize all of their resources. Value creation can help you do exactly that.

Value creation should become part of every patient interaction. In most conversations, you either add value to the relationship or you deplete it; rarely does it come out as a neutral exchange. For example, if you go to a store and ask a clerk for help, will you receive assistance that exceeds expectations, meets expectations, or fails to meet expectations? If the clerk exceeds expectations, then value is added. If the worker meets expectations, then the value added is slightly above neutral. If the clerk fails to meet expectations, then value is depleted.

Translating this to the dental practice means that every conversation with a patient is an opportunity for a "moment of truth." Each contact creates an opportunity to add value to the relationship. Bear in mind that the interaction is rarely neutral. Therefore, the conversations and activities in the practice should be geared to adding value rather than simply performing a function. Value is added when the patient's experience exceeds expectations.

Every area in your practice has the potential to be transformed by the concept of value creation. Dentists can achieve value creation by focusing on the following practice areas:

- customer service
- office appearance
- training
- case presentation.

Customer Service

Cosmetic patients need to be "WOWed"; they need to be motivated and excited. Nobody purchases discretionary items like jewelry or sports cars without being motivated and excited. Too many dental practices focus more on logic-based explanations during esthetic case presentations than on generating excitement about cosmetic treatment.

Customer service encompasses how practices treat every patient—every hour, every day. In fact, what Levin Group calls Stage III Customer Service™ is based on "WOWing" the patient and creating additional value during every interaction. Patients must feel special from the moment they walk into the office, whether it is the first time or the 50th time. Exceeding patient expectations requires "WOW" customer service. This occurs when every interaction has been exceptional, causing patients to be amazed at the level of customer service, making them think "WOW!" as they leave the office.

Unlike traditional need-based dentistry, cosmetic procedures are viewed as an "extra" by patients. Because esthetic services usually do not correct or treat an oral healthcare problem, superior customer service is even more important to ensure that patients will initiate and follow through on elective procedures.

Enthusiasm is a critical component of excellent customer service. It is not enough for staff members to thank patients for selecting the practice. The dental team must do it the right way—sincerely and enthusiastically. Simply going through the motions reflects poorly on the practice.

Improving customer service requires a systemized approach that is repeated for every patient—every hour, every day. The practice should provide training on customer service so that all team members know the best ways to interact with patients. Here are a few ways to exceed patient expectations, create value, and provide Stage III Customer Service.

- **Do not make patients wait.** When your practice fails to keep appointment times, patients will think you provide poor customer service.
- **Greet patients by name.** Everyone loves hearing the sound of his or her name. It shows that the practice cares for the patient as a person, not as a revenue stream.
- **Provide refreshments.** Cosmetic procedures go beyond those of traditional need-based dentistry. Offering extras—juice, coffee, and more—for guests in a refreshment area is a way to provide excellent customer service while "branding" your practice at the same time.
- **Provide your staff members with clear job descriptions.** Knowing exactly what is required of them will make staff members less stressed and, therefore, friendlier to patients.
- **Give patients something by which to remember your office.** Pens, key chains, and notepads are just a few items you can give your patients to keep your practice on their minds.

Office Appearance

Improving your office's appearance is a surefire way to add value to your practice. Patients must feel that they are in an esthetically pleasing environment, which reflects the

ability of the doctor and team to provide excellent cosmetic dentistry.

Where do you start? First, do a complete walk-through of the office, starting outside. Check the front desk area to see if it looks organized. Walk through the entire office as if you were a patient and make notes about areas that need to be addressed. Second, consider hiring an interior designer. Too many dentists attempt to decorate their own office or have their spouses do it. The dollars spent on an interior designer are minor compared to the benefit gained by creating an attractive office.

Remember, cosmetic dentistry is about improving appearances, so your office's appearance must reflect the type and quality of dentistry you provide to patients.

If your office does not look sufficiently "esthetic," many of your patients may seek out other practices for cosmetic enhancement. Many dentists have had the unfortunate experience of seeing patients return to their practice with a smile that was cosmetically enhanced…at another practice. When queried as to why these patients went elsewhere, these patients invariably state that they did not realize that their current dental office provided these esthetic procedures.

Even if these patients had realized that their current dental office provided a range of cosmetic dental procedures, they still might have elected to go somewhere else because the current practice's environment and atmosphere were not perceived as being sufficiently "cosmetic" or "upscale." A practice that needs an office makeover will have difficulty persuading patients to undergo a cosmetic makeover. Unfairly or not, patients will judge the level of your cosmetic skills based on the appearance of your office. An attractive, contemporary office sends the right message to patients and creates additional value for your services.

Training

Every team member plays a vital part in the success of the practice. For dentists to successfully incorporate cosmetic treatment into their practices, the dental team must be trained on every esthetic procedure the practice offers. If staff members are uneducated about the practice's array of services, how can they properly inform patients about cosmetic dentistry?

While there is growing awareness among the public about cosmetic dentistry, most patients still do not know about the different types of esthetic treatment available. It is up to the dentist and dental team to educate patients about the value of cosmetic dentistry. Every patient interaction is an opportunity to create value by educating patients about whitening, veneers, composites, implants, and other elective services.

One of the biggest mistakes dentists make is trying to handle cosmetic case presentation entirely by themselves. Team-based case presentation is the key to creating value for cosmetic services and increasing esthetic production. When hygienists, assistants, and front desk personnel all support and promote the practice's cosmetic services, patients have more opportunities to learn about esthetic procedures… and to say "Yes" to recommended treatment.

One problem is that many offices do not sufficiently educate their staff about cosmetic dentistry. If added value for cosmetic services has not been created for the team, how can it be transferred to patients? For example, one Levin Group client recently told the story of taking an experienced dental assistant with him to a cosmetic course. "*What did you learn?*" he asked at the end of the class. "*I'd like to have my own teeth cosmetically enhanced,*" she said. Imagine a team member with almost 20 years in dentistry who never had a chance to become personally excited about cosmetic dentistry. The client explained that it was an incredible wake-up call for him to realize that his own staff was not knowledgeable or excited enough about cosmetic dentistry before the seminar to want such treatment for themselves. Training enhances the skills of your team members, creating additional value for your staff, your patients, and your practice.

Case Presentation

Cosmetic dentistry has the power to transform not only smiles, but also lives. That is something that most patients will be excited about, if it is presented in the right way. Most cosmetic patients are primarily interested in the emotional benefits of esthetic services. How will the treatment improve the patient's smile? How will it make the patient feel more attractive and look younger? Clinical descriptions can play an important role during case presentation, but they should take a backseat to the emotional benefits. Of course, dentists must make adjustments based on the personality of each patient.

Exceeding patient expectations will help practices create value for cosmetic treatment. The following factors can help make case presentation a win-win for both patients and practices.

Educate and Motivate Your Staff (and Yourself)

Members of your staff are only as skilled as you empower them to be. Train your staff to promote treatment by using scripts for training and role-playing.

Educate and Motivate Your Patients

Patient education is critical to growing a cosmetic dental practice. You cannot wait for patients to ask you about treatment.

Build Relationships

Learn at least one new personal item about patients during every visit. Inquire about family, hobbies, vacations, and other activities. Use these as conversation starters. People like to come to an office with an easygoing, friendly staff. Building trust makes it easier for patients to say "Yes" to recommended treatment.

Raise Awareness, Present the Options

Stimulate patients' thought process by asking questions. This will heighten their awareness of their present condition. Identify their available choices. Encourage patients to actively participate in the consultation and gain adequate information to make knowledgeable decisions. Provide every patient with a comprehensive cosmetic evaluation.

Employ Effective Case Presentation Tools

The use of visual aids such as software, photographs, and physical models is important during case presentation. Showing patients before-and-after photographs of successful cosmetic cases is powerfully persuasive.

Actively Listen to Patients

By listening to patients, you can answer any concerns that may have previously been stumbling blocks to case acceptance. Smile as you present and be aware of your body language.

Know Your Support Statements

Saying things like, *"You'll look younger"* or *"Your teeth will be whiter and brighter"* can make an enormous difference. These statements carry weight if you have established trust with patients.

Conclusion

Exceeding patients' expectations is the heart of value creation. Patients expect more from practices that provide cosmetic dentistry. Look at your practice through the eyes of patients. What could be perceived as basic or just okay? Be honest. Every practice has room for improvement. Find those areas and apply the principles of value creation. You will end up with a better team, happier patients, and a more successful cosmetic practice.

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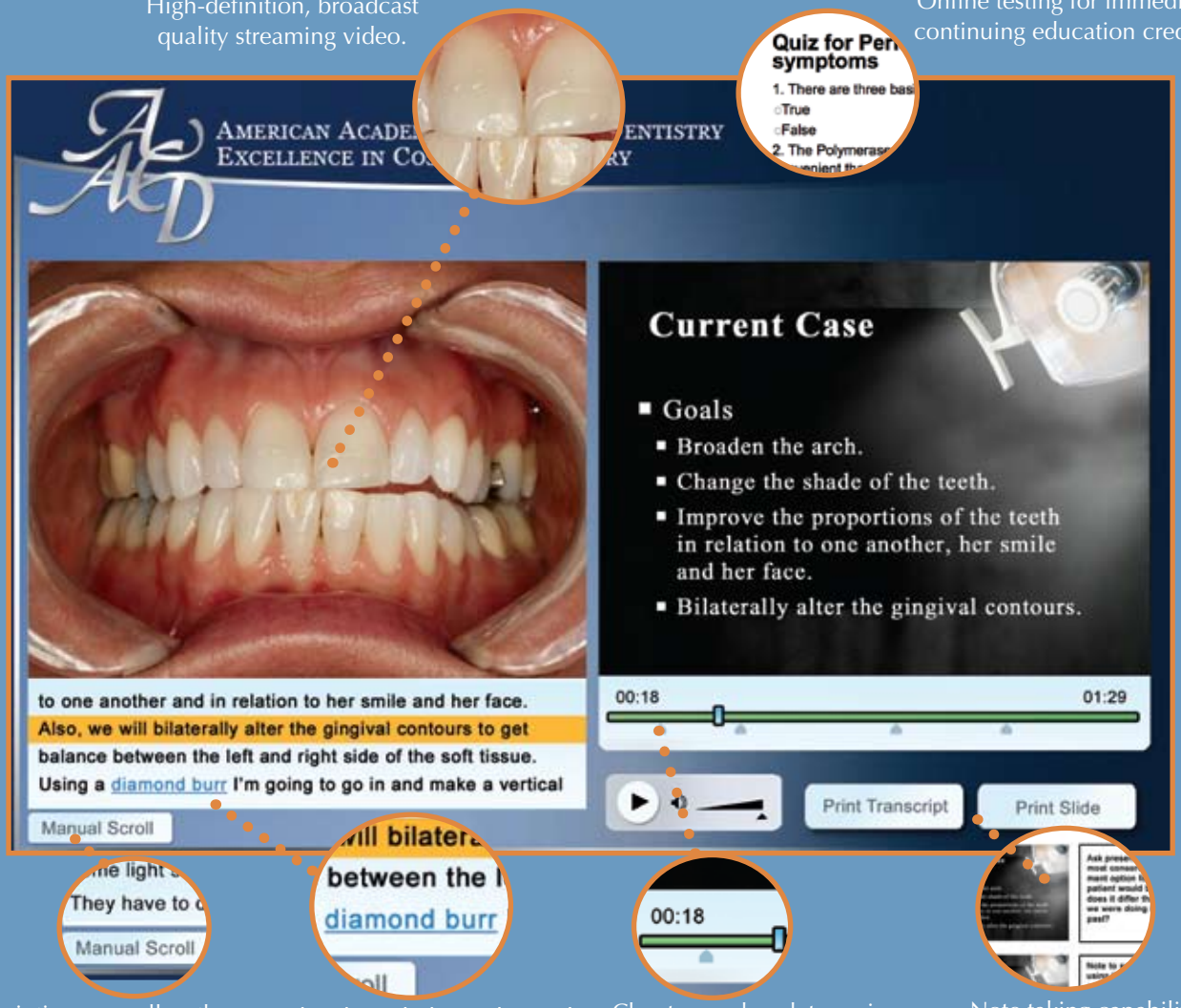

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