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A portrait of Dr. Arnold Weisgold
by Seattle artist Son Duong.


guest editorial


t at the end of it all, our lives are defined by the quality of the relationships we have created and maintained with others. Relationships have always been the heart of the Seattle Study Clubs. The success of each Member, each Director, each Club and the entire network of clubs can simply be attributed to the emphasis on building and maintaining strong, healthy and highly functional relationships.

But relationships have special rules that other forms of connection with human beings don’t have. Let’s take a look at the differences and their implications by comparing acquaintances, friendships and relationships.

Acquaintances

An acquaintance is someone you might have met once or perhaps run across on a few occasions, but only in a casual way. The circumstances of your meeting might be more accidental or circumstantial than meaningful. For example, if you regularly shop at a neighborhood grocery store, you might happen to see another shopper on more than one occasion. When you recognize that person’s face, you might share a cordial greeting and perhaps even comment on how good the mangoes look. If you find yourself regularly shopping at the same time as this person, the level of your recognition might expand to an acquaintance. You might also make the acquaintance of a bus rider who regularly chooses the route you take to work at the time you routinely catch the bus, or the parent whose son’s piano lesson follows your daughter’s every Tuesday. All of these examples involve recognition, which is the distinctive characteristic of an acquaintance.

Acquaintances are highly situational. That means if you were to see the bus rider in the grocery store or the other parent on the bus, you might not remember where you had seen him or her before. Were you to interact with this person in many different situations, the connection might grow beyond an acquaintance, but when the circumstances of your interactions remain singular, it is unlikely that the connection would develop into anything more meaningful.

Acquaintances are also superficial. Any conversation would be characterized as “chit chat” with focus on topics like the weather, traffic and other light subjects that put little pressure on either of the parties. Because you know little, if anything, about the person, you would likely avoid controversial topics and certainly would not give that person any advice or your opinion about something personal. Acquaintances are also characterized by no obligations short of common courtesy. That is because there is no actual purpose to the connection. Since the connection is, by definition, almost random, it would be improper for either party to hold any expectations of the other. An acquaintance might hold a door open if you were laden with packages yet not offer marital advice or co-sign for a loan.

One might have several thousand acquaintances each year. They come and they go and they have little impact on either party. A few might develop into something more significant, but most do not. There is room for lots of acquaintances in most people’s lives because the obligations are so low and the time and energy required is minimal. Most people find their lives positively impacted by these connections.

Friendships

Friendships sometimes grow out of acquaintances. When they do, they take on a very different set of dimensions. Two mothers who find themselves at the park with their toddlers might make an acquaintance. Initially, they might chat about their children’s birthdays, discuss what words each child is uttering or their favorite foods. Yet, with the passage of time and with repeated meetings, their acquaintance might develop into a friendship. They might agree to meet at the park again at a specific time so their children might play together. They might leave the park with one another and stop for ice cream or coffee at a neighborhood café. Thus, the friendship begins.

Friendships are social in nature, even when they are formed in nonsocial settings. One might easily form a friendship with a co-worker, for example, but the friendship itself is based on social and interpersonal issues, not on work-related issues. As a volunteer in a local service organization, two people might find themselves
working together on a series of projects. Any time spent together after the work is completed or in another setting would be a social friendship chosen by two people who enjoy one another's company. Obviously, one doesn't choose to socialize with everyone, so friendships are **selective, mutual and voluntary.** Friendships are important in our lives, for they serve a very important **purpose:** to contribute to the enjoyment of the time spent with one another.

Aside from that important purpose and common courtesy, it is inappropriate to expect any more from a friendship unless it is spelled out specifically. This is where many friendships derail — when one party has expectations that are either unspoken or to which the other party has not agreed. One might share a confidence with a friend and expect it to be honored, but unless that expectation is made explicit and an actual agreement is reached, it would be inappropriate to presume that the friendship itself carried this obligation.

Many friendships do not survive because one (or both) of the parties has overstepped a boundary or presumed permission that was not explicitly given. Unsolicited advice is a great example of overstepping a boundary. Often friends think they understand the complexities of each others' lives when what they see is only a snapshot rather than the entire movie. Thus, they offer unwanted advice to problems they incompletely understand, perhaps with inappropriate solutions.

Years ago, I knew a dentist who suffered from this problem. A friend or colleague would begin to talk about a problem or a concern, sketching out the basic facts of the situation. Without much thought, this dentist would jump in and offer suggestions and ideas about how to solve the problem. Because he understood only the superficial aspects of the problem, he would often either miss the mark or suggest an inappropriate fix. Before long, he and his friend or colleague were arguing over their different interpretations of the problem. Here is an example of how the dialogue would proceed:

**Colleague:** Boy, am I upset with my assistant. She is so unreliable lately. She's often late and rushes in at the last minute unprepared for the day. The rest of the staff and I expect her to show up for the morning huddle and we rely on her to be there on time. I'm really angry.

**Dentist:** I don't blame you for being mad. I'd be mad, too. You should give her a piece of your mind. Who does she think she is, anyway? Besides, I wonder what's really going on. I mean, what is she really trying to tell you with her passive aggressive behavior?

**Colleague:** Well, it's really not that bad. I mean, it doesn't happen every day. I think she just gets busy in the morning with her kids and loses track of time. I mean, she does show up on time most mornings. Actually, there's not a lot more to it than I've just said. It's more annoying than anything.

**Dentist:** Look, I had a friend once who thought lack of punctuality didn't mean anything until he found out his hygienist was interviewing elsewhere. Now, that's probably not what's going on with your assistant, but you can never be sure. You ought to check it out.

**Colleague:** Well, I certainly don't think it's anything like that. Besides, I really shouldn't have mentioned it to you. I guess I was just blowing off steam. Just forget I said anything.

**Dentist:** How can I forget it? I think you're just afraid to see the handwriting on the wall. I think you should ask a lot more questions and find out what's going on.

Perhaps you have experienced something like this with a friend or colleague. This illustration suggests how easily anyone can find him or herself in a similar situation when boundaries have not been made clear. Since it is inappropriate to make assumptions about expectations, friends must make sure to clarify the expectations they have of one another. The simple question, “Why are you telling me this?” should help one avoid overstepping a boundary. If your friend is asking your opinion, you can choose to offer your perspective or not, depending on how much of the situation you feel you know, but it would be inappropriate to offer an opinion with little foundation. If your friend is asking you to solve his or her problem, it would be wise to avoid agreeing to take on that role. You might instead choose to ask questions which support the problem-solving
process. The greatest act of friendship may be helping others probe their own thoughts and feelings to discover their own solutions.

Friendships require some work that acquaintances do not, and they have more significant obligations. Because friendships often involve promises, there is an obligation to fulfill those promises. An agreement to meet at Jak’s Grill for dinner must be honored unless it is specifically canceled with enough notice to avoid rudeness. When friends do not work on their friendship, it often melts away and when one friend works harder than the other the imbalance can cause resentment and mistrust.

**Relationships**

Relationships have a higher calling, for they serve significantly different purposes and have guidelines and rules that are specific to the nature of the relationship and which must be honored. There are three categories or types of relationships:

(A) Business relationships; (B) Organizational relationships; and (C) Personal relationships. The latter is not a matter for this journal, but the first two are very much an issue for dentists and their team members.

Each relationship, whether business, organizational or personal, has four essential ingredients that are not concerns for acquaintances and friendships, as follows:

**1. Purpose**

Successful relationships have clearly defined purposes that outline how each party will benefit from the connection. Thus, the purpose must be not only defined but also conveyed to ensure that each party is in agreement. In some cases the purpose is clear to all parties based on the nature of the relationship itself, but in others it is not obvious and thus, must be specifically defined.

While it may be clear and obvious to everyone that a record store is in the business of selling music in recorded form it is not necessarily clear what an attorney or even a dentist is in the business of providing. When the “customer” — in your case the patient — is likely to have any misunderstanding about the purpose of the business, it is incumbent on the business owner — in this case you and your staff — to anticipate this and address it in advance. As your practice becomes more distinctive and defined, it will be more important that you make a point of conveying the distinctive nature of your services to patients and clients.

In organizational relationships, the purpose of the organization must be clearly conveyed so that each party knows how he or she is being asked to contribute to the outcome. Your team is a group of people who are in an organizational relationship with one another. This is an important distinction because teams often talk about themselves as being a family. While they most often mean that they spend a lot of time together and mostly like one another, teams are far from families. Most families are not voluntary; yet teams are. Most families do not have people who come and go at the will of an employer; yet teams do. Families are often highly dysfunctional and while teams can be, there are many things to be done with teams that would not be attempted with families.

**2. Defined roles**

In a healthy relationship, each role is outlined and agreed upon. Who is in service to whom? Sometimes roles can be blurred as when a friend is also your patient as well as your banker. In this case, there may be two relationships (dentist/patient, banker/customer) and a friendship (golfing buddies); so the parties must be careful to acknowledge when they are in one situation rather than another.

A car salesman would be advised against telling a customer that he needed a sports car when the father of five is wanting a vehicle to transport a large family. If someone treated you that way, you would balk and likely go elsewhere. Often dentist/patient relationships are strained when doctors fail to assume the role of clinical advisor and shy away from conveying truthful messages about the patient’s condition. Likewise when dentists or team members presume to know what is in the patient’s best interest rather than relying on the patient to be in charge of his or her own decisions, it can destroy a relationship. Consider this admonition: **while you are the expert on clinical dentistry, your patient is the expert on his or her own life.** Do not get this distinction confused.

When you consider that a team is a group of people who come together to accomplish a job or mission that none could have accomplished on his or her own, you understand that each person has a clear part to play — a role. Each person hired to be a part of the team has a
role to play and that role is intended to have an impact on the overall performance of the organization. Each member of the team must understand both his or her own role as well as the role of each other member. People must know what they can count on others to do, and organizational relationships are strengthened with this clarity.

3. Expectations

There must also be both clarity and agreement about the expectations and obligations each party has to the other. This is often the source of relationship breakdown when anyone assumes the other understands and has agreed to certain conditions. While a sign on the wall stating “Payment is expected at the time of service unless other arrangements are made” may convey an expectation, it is clearly not meaningful to many patients. In healthy relationships, all expectations are reviewed specifically in advance and both parties leave little, if anything, to chance. Specific financial arrangements must be made. Clarity about cancellations and their implications must be discussed. A patient's description of what “beautiful” or “white” means to him must be heard.

Likewise, in organizational relationships, peers have a right to make their expectations known to one another and hear the expectations others have from them. Issues like job performance, punctuality, attitude, cooperation, approach to conflict, and the like are part of these organizational expectations. Organizational relationships are highly at risk when expectations are unspoken. When there is ongoing discussion, however, even disappointments and disagreements take on a different flavor and are more easily resolved.

4. Boundaries

And finally, there must be clarity about any boundaries that must be honored. In a business relationship, the boundary is drawn around issues that impact the nature of the product or service being offered. Thus, it is appropriate to discuss mouth odor in a dental practice, yet not foot odor. To address the appearance of, or care given to, one’s teeth yet not the appearance of, or care given to, one’s car. Many dental team members can easily become embroiled in a patient’s personal life dynamics — divorce, job issues, child-rearing problems and the like — when this is not part of the business relationship, and should be avoided. Simultaneously, they may shy away from addressing issues that are very relevant to the reason the patient has come to the practice — health, appearance, wear, function and the like.

In organizational relationships, it is not unusual to find team members almost meddling in each others’ affairs. When friendships are strong, team members may bring personal issues to the practice in a way that interferes with their working relationships and obligations to one another and their employer. When there is animosity between members of the team, personal information can be used in a harmful way thus putting the organization or practice in jeopardy because the boundaries have been violated.

Conclusion

Clearly there are major differences between acquaintances, friendships and relationships. When we get these three types of interpersonal dynamics confused, it can put all parties at risk. Perhaps this is a good time to assess your connections with others and determine what issues should now be addressed, what roles must be defined, what expectations must be clarified and what boundaries must be honored.

Sandy Roth has been working closely with Seattle Study Clubs at the national and individual club level for over 12 years. Her understanding of the purpose and structure of the clubs makes her uniquely able to create programs which benefit both new and mature clubs. Sandy’s focus on communication, leadership, hiring, team development and patient relations offers clubs a balance to their clinical programming and events. She may be reached by email (sandy@prosynergy.com) or by calling 1 (877) 491-8326.
How to Keep Patients from Falling Through the Cracks

You wouldn’t want to drop anything important off the side of your boat while traveling over the Marianas Trench in the Pacific Ocean, located just east of the Philippines. The water in this part of the Pacific is almost seven miles deep. The ocean floor bubbles with volcanic activity as fissures open to release energy from deep within the earth and swallow anything that might be swept inside by the currents. This is a largely uncharted world where sunlight does not penetrate, geological features change constantly, and sunken ships, crushed by the extreme pressure of the deep, are lost forever.

As you work in your dental office far from the Marianas Trench, you may feel that you are safe from this black hole that leads to the center of the earth. However, in many dental offices, there are unseen fissures in the delicate practice ecosystem that can cause patients to fall through the cracks, never to reappear. Indeed, one of the refrains often heard in dental practices is, “Whatever happened to Mrs. Hickenlooper? She was supposed to schedule, but we haven’t seen her.” Alas, Mrs. Hickenlooper has gone missing from the practice and she is unlikely to surface.

The time to start tracking patients is not after you notice their absence, but at the outset of the case presentation process. The following steps are recommended to keep patients from falling through the cracks. They should not be used with every patient, but for those who have somewhat extensive treatment plans that merit a formal follow-up protocol:

1. Set the stage for follow-up at the consultation appointment.
2. Send a post-consultation letter (immediately following the consultation appointment).
3. Make a follow-up phone call (between one and two weeks later).
4. Make a second phone call (two months after the consultation appointment).

Set the Stage at the Consultation Appointment

If the patient does not accept treatment at the time of the consultation appointment, use these three strategies.

1. Instead of saying, “Please call us if you have any questions,” use this verbal skill instead: “Please call us when you have questions.” Virtually every patient will have questions. They may not think of their questions until they are driving home from your office, that evening when they are discussing your recommendations with their spouse, or the next day when they are trying to decide whether to accept treatment. Reassure the patient that you welcome all questions and that you will be happy to repeat information as necessary, because it is difficult for patients to remember everything that you say to them in the office. The more you give patients the “green light” to contact your office and continue the dialogue about their treatment needs, the more likely it is that the patient will accept at least some treatment.

2. Ask this open-ended question, “How do you think this treatment will benefit you?” When patients say that they want to “think about” your treatment recommendations, they mean that they want to think about the fee with respect to the benefits they will receive from treatment. While patients have every right to make this calculation, they may focus more on the cost than the benefits. By asking patients to think about the benefits, you are focusing their attention on the value of the treatment, not its cost.

3. Ask for permission to follow up. Here is a great question to ask at the time of the consultation appointment if patients are undecided: “Would it
be o.k. if our treatment coordinator calls you to follow up?” In the United States, over 60 million people have asked that their names be placed on a “Do Not Call List” to stop annoying calls by telemarketers. While you have every right to call a patient of record, there are many patients who do not welcome unsolicited calls, even when the caller is your treatment coordinator who is brimming with courtesy. A better alternative is to ask the patient for permission to follow up.

Sample Post Consultation Letter

These are not exactly form letters, but they are format letters. The difference is that format letters have some degree of customization. The customized parts are seamlessly integrated into the boilerplate of the letter so that the entire letter looks personalized. You should create format letters for certain procedures you do routinely in your office. The following sample format letter is for dental implants. Note that information in square brackets [like this] is personalized for the particular patient.

Dear Mrs. Hickenlooper:

It was a pleasure to see you in my office recently regarding your dental implant treatment. [It was also a pleasure to meet your husband, Harvey.] Dental implants offer many benefits, such as:

- Natural appearance.
- Natural chewing function.
- Never develop decay.
- Never require root canals.
- Preserve bone to prevent the appearance of premature aging.
- Scientifically proven track record.

Dental implants are a scientific marvel that function much like natural teeth and enable patients to eat, chew, laugh and smile naturally and with great confidence.

[You mentioned that your parents lost their teeth at an early age. I know from our conversation that you do not want to wear conventional dentures. Fortunately, there is now a much better alternative to tooth loss than old-fashioned dentures.]

Please call our office with any questions or to schedule your treatment.

Sincerely,
John Smile, DDS

Scripts for First Follow-Up Phone Call

Call the undecided patient one to two weeks after the consultation appointment. Note that if you wait for the patient’s name to appear on a computer-generated “pending” report the month after the consultation appointment, you have waited too long. At that point, the train has left the station for an unknown destination and the patient may not have a round-trip ticket to return to your office.

If you call the patient and get an answering machine, leave a message with your number. If there is no response within one week, call again. If you get the machine a second time, leave another message. If there is no response after two messages, do not call again. It is obvious that this patient does not wish to have a telephone conversation with you, so the follow-up protocol for this patient is concluded. If, however, the patient returns to the office at some point in the future (for a hygiene appointment, for example), you can then revisit the issue of the treatment that needs to be completed.

If staff is successful in speaking to the patient by phone, the script should be as follows. (Scripted dialogue appears in italics.)

Hello, Mrs. Smith. This is ____ from Dr. Smile’s office. I am calling like we promised. (Because you asked for and obtained permission to call, you are exhibiting great customer service by keeping a promise.) I know that Dr. Smile reviewed some treatment options with you when you were here. I am calling to follow up. What questions do you have that I may be able to answer for you?

Even if the staff has answered all questions, it is a good idea in some cases for the doctor to call the patient. (Note, this does not apply to questions about financial arrangements. Staff should answer these questions and the doctor should not need to call the patient to discuss finances.)
Mrs. Smith, I’m also going to ask Dr. Smile to speak to you personally to answer that question. He’s with a patient right now, but he could call you back at about _____ o’clock. Would that time be convenient for you?

When the doctor calls the patient, he or she will give the patient the same answer/information as the staff in order to reinforce the message. Then, the doctor finishes the phone call as follows:

(This is the doctor speaking.) Do you have any other questions, Mrs. Smith? (If there are no other questions, then the doctor continues as follows.) When you were speaking to Marsha earlier today, did she schedule your treatment? (The answer will be no.) Would you like me to put her on the line now so you can schedule?

Note that if the patient is definitely not interested, then there is no need for the doctor to call and there is no more follow up. If the patient is still interested but not ready to schedule, then ask for permission to call again.

It was a pleasure speaking with you, Mrs. Hickenlooper. Would it be o.k. if we followed up with you again at some point in the future?

If the patient says yes, then call again in two months.

Scripts for Second Follow-Up Phone Call

If you are at this point, it has been two months since the consultation appointment. You have sent the patient a format letter and you have successfully contacted the patient by phone on one previous occasion. The patient has given you permission to call again. This is your last formal follow-up strategy in terms of outreach. If the patient does not schedule at this time, you will need to wait until the patient returns to the office for whatever reason to continue the discussion about needed treatment.

Although you have kept a tickler file and you are calling the patient according to a schedule (two months after the consultation appointment), you want the timing to appear to be more casual when you speak to the patient.

Hello, Mrs. Hickenlooper, this is Marsha from Dr. Smile’s office. How are you today? I was going over our records and I noticed that you were here about two months ago. When we spoke on the phone about six weeks ago, you said it would be o.k. for me to contact you again, so I am just following up as promised. What questions do you have about your treatment?

Just as with the first follow-up call, you should offer to get the doctor involved as appropriate to reinforce the answer to a question.

Depending on how the conversation goes, you can also ask, Would you like to schedule treatment? If the patient is not interested in scheduling, end the conversation gracefully. It was a pleasure speaking to you, Mrs. Hickenlooper. Please call us at any time if we can be of help or answer any questions for you.

Footnote

You should suspend this protocol when the patient does one of the following: a) schedules treatment, b) decides not to pursue treatment in your office, or c) indicates that a follow-up phone call would not be welcome. However, as long as the patient is interested and you are relating to the patient in a low-key manner with the utmost respect and courtesy, the protocol should be followed.

Don’t let Mrs. Hickenlooper fall through the cracks in your system and become lost in a sea of patients. Follow this protocol consistently and keep your patients on board.

David Schwab, Ph.D., provides lively and entertaining practice management seminars and he offers in-office consultations to help practices reach the next level. He has an audio series available for doctors and team members. Dr. Schwab works extensively with the Seattle Study Club and its affiliates. He may be contacted at (888) 324-1933 or via e-mail at dschwabphd@cfl.rr.com. His web site is www.davidschwab.com.
On The Cover

A Tribute to Dr. Arnold Weisgold

It is my great pleasure to tell the readers of the Seattle Study Club Journal a little bit about the gentleman on the cover, my friend and colleague Dr. Arnold Weisgold.

I first met Arnold when he was an undergraduate student at Temple Dental School. Not only was he an excellent student, but he was also willing and able to accept the many challenges thrust upon him. After graduating from dental school he served in the Army Dental Corps...during the Cuban Missile Crisis! This was his most trying time while in the Army, other than when he went AWOL to have his interview with me when he was accepted into the U Penn Graduate Program in Periodontal Prosthesis. As a post-graduate student he continued to excel, and in his enthusiasm, dedication and desire to learn, he made every hour count for two. I have known very few students who accomplished what Arnold did in the same (or more) time. After completion of his post-graduate training, he received his Certification in both Periodontics and Prosthodontics. In fact, he demonstrated such breadth and depth of understanding in so many areas of both basic and applied clinical dentistry, that I suggested he be asked to direct and expand the core course in occlusion that I had initiated at Temple University. He did so with such distinction that he was ultimately asked to join the University of Pennsylvania School of Dental Medicine to direct a program on the Form and Function of the Masticatory System. Despite many limitations and obstacles posed by both budgetary and manpower considerations, he managed to install and develop a program that greatly enhanced the curriculum at Penn, and also served as a model for dental schools all over the world.

After five years as a fully affiliated teacher, Dr. Weisgold made a critical and unselfish decision. He firmly believed that in order to continue to develop and become a “master clinician” in the true sense of those words, he would have to increase his time in clinical practice. I say this was a critical decision because all too often, our clinical teachers and researchers lack the expertise necessary in performing and evaluating health care. I say this was an unselfish decision because it meant that he relinquished all of the advantages of full affiliation, but retained all of the responsibilities. Subsequently, Dr. Weisgold continued to Chair the Department of FFMS and in addition, succeeded me as Director of Periodontal Prosthesis.

Needless to say, Dr. Arnold Weisgold has long since reached his goal of becoming a true “master clinician” but he continues to teach and to learn. His body of work has contributed much to our understanding of the “emergence profile” of both the natural tooth as well as the implant restoration. In all of his endeavors, he has had the support and encouragement of his wife Marci and the Weisgold family. I am so happy to see Dr. Weisgold now being honored on the cover of the Seattle Study Club Journal.

— Dr. Morton Amsterdam
Senior Journal Advisor
Clinical Treatment Planning • Case 40

Treating Clinicians: Drs. Tal Morr and Stephen Rimer

Initial facial view
Age at Initial Presentation: 40
Initial Presentation: November 1995

Introduction and Background
The patient has had extensive dental work including at least five attempts at full mouth rehabilitation. Every tooth has been treated endodontically, with many failed root canals and extractions. She has spent a fortune on her teeth only to have the rehabilitations quickly fail. She is tired of “living at the dentist’s office” and fed up with her teeth “falling out all the time.” She presents with yet another failing rehabilitation.

Medical History
• Claims long history of obsessive compulsive disorder; says she is a workaholic and a recovered anorexic.
• Taking Prozac for depression.

Diagnostic Findings
Extraoral/Facial:
• Flat facial profile with insufficient support.
• Irregular lips — upper lip higher on right and longer on left, bottom lip lower on right and longer on left.
• Long upper lip hides maxillary gingival levels.
• Occlusal planes are skewed relative to the eyes and the floor.

TMJ/Mandibular Range of Motion:
• Within normal limits.

Intraoral:
Dental:
• Both occlusal planes canted downward on the left.
• Missing teeth #’s 1-7, 12, 13, 15-16, 17-26, 29-32.
• Implants #’s 4, 5, 21, 23, 25, 26.
• Failing upper bridge and loose posts with decay down the canals.
• Lack of adequate ferrule on teeth #’s 9 & 10 — broken down to gumline.
• Upper right arch form severely deficient due to prior extractions and removal of buccal plate.
• Poor placement of implants #’s 4, 5, 21, 22, 24 & 26.
• Ill-fitting lower denture.

Periodontal:
• Within normal limits — with previous crown lengthening procedures.

Initial profile
Initial smile
Probings

Mobilities

FACIAL

RIGHT

LINGUAL

FACIAL

LEFT

LINGUAL
**Occlusal Notes**
- Existing Class II skeletal and prosthetic relationships exacerbated at proper vertical by unfavorable implant placement.

**Radiographic Review**
- Pneumatized sinuses.
- Atrophy of posterior maxilla and mandible.
- Calcified mass lower right mandible.
- Blunted root tips — previous orthodontic therapy.
- Generalized poor endodontic healing at apices.
- Decay.

**Diagnosis and Prognosis**
- Flat facial profile.
- Skeletal Class II & Prosthetic Class II.
- Irregular lip form and inadequate lip support.
- Canted occlusal plane.
- Failing rehabilitation with ill-fitting prostheses.
- Decay.
- Multiple missing teeth and severe bony atrophy maxilla and mandible.
- Calcified mass on lower right mandible.
- Improper previous implant placement mesiodistally and buccolingually.
- Fracture of implant # 4 and root proximity and malposition of #’s 4-5 implants.
Bruxism.

AAP type II.

A fixed implant rehabilitation was optimistically achievable based on proper prosthetic design and a favorable surgical outcome.

Hopeless: #'s 9,10: leakage down the post space with decay. Implants #'s 4, 5: improper positioning, root proximity, and fracture # 4.

#'s 11,14: hopeless overall for treatment plan.

Good: integration good for implants #'s 22, 23, 24 & 25.

Guarded: # 8.

Fair: #'s 27 & 28 fair prognosis but hopeless overall for treatment plan.

Summary of Concerns

- The patient is a gagger and cannot tolerate full palatal coverage. She is adamant about having a fixed prosthesis with no palatal coverage. Although she is willing to undergo any procedure to achieve her goals, what if a grafting procedure does not take and implants cannot be placed on the upper right posterior segment?

- What if it does take and the amount of lateral augmentation is not enough for proper placement of implants for a fixed prosthesis? If the prosthesis necessitates a flange for proper lip support will the patient go along?

- How is the patient going to be maintained in the provisional phase to minimize the forces on the grafts and the implants?

- The patient has a Class II skeletal relationship. Compounding this problem is improper placement of the lower anterior implants in a mesiodistal and buccolingual relationship, creating an even more unfavorable Class II relationship. Another concern is the transverse discrepancy on the right side due to the severe bony defect on the upper right. How is the occlusion relationship going to be managed? How will the jaw relationship and the future prosthesis affect lip posture and aesthetics? Do the lower implants need to be removed and new implants placed in the proper positions even though they are well integrated? Does the patient need to undergo mandibular advancement procedures to create a more favorable jaw relationship?

- The patient has an irregular lip form. How is the occlusal plane going to be determined and the lip posture controlled?
Proposed Treatment Plan • Case 40

Phase I: Initial Therapy
1. Upper and lower wax up to correct occlusal planes and create a more harmonious occlusion and aesthetic situation.
2. Scaling and root planing.
3. Removal of decay and fabrication of gold posts for teeth #’s 9 & 10.

Phase II: Provisionalization Phase I
4. Cementation of posts #’s 9 & 10.
5. Upper provisionals with interim partial.
6. Lower overdenture retained on implants.

Phase III: Surgical Phase - Bone Grafting from the Iliac Crest
7. Removal of implants #’s 4 & 5 and extraction of # 10.
8. Upper bilateral sinus lifts with onlay grafting in area of #’s 3-6, 10 & 12.
10. Lower onlay grafting for posterior mandible.

Phase IV: Implant Placement Phase I
11. Implant placement in the areas of #’s 3-6, 10 & 12.
12. Implant placement in the areas of #’s 19, 20, 27, 28, 29 & 30.

Phase V: Provisionalization Phase II
13. Provisionalization of implants #’s 3-12.

Phase VI: Preparation for Implant Placement Phase II

Phase VII: Implant Placement Phase II

Phase VIII: Provisionalization Phase III
17. Wax up and provisionalization of implants #’s 3-14 & 19-30 with extraction of #’s 8 & 9.

Phase VIII: Definitive Restorative Therapy
18. Upper implant bridges #’s 3-5, 6-11, 12-14.

Stephen Rimer is in the private practice of oral and maxillofacial surgery, Boca Raton, FL and is the Director of the D.E.A.L. Study Club.

Tal Morr maintains a private prosthodontic practice in Aventura, FL.
Active Clinical Treatment • Case 39

Treating Clinicians: Drs. George Duello, Thomas Matthes and Harvey Lehrer

Pre-treatment facial view

Post-treatment facial view

Age at Initial Presentation: 43
Initial Presentation: January 2002
Active Treatment Completed: August 2004

Review of Treatment Goals

This patient had maxillary anterior crowns placed over varying periods of time with different all-ceramic crown systems. The patient was unhappy with the appearance of the gum tissue and the front teeth after the last insertion of new crowns. She stated that “the front two crowns are too wide, not long enough, and they look too triangular.” Her original teeth were nicely shaped and she wanted to achieve improved cosmetics and better gum health. The course of treatment was as follows:

• Cosmetic evaluation, wax-up, patient co-diagnosis.
• Endodontic re-treatment prn and preparation analysis of existing abutment teeth.
• Crown lengthening to achieve symmetrical gingival profiles, provide adequate ferrule, and establish biologic width following provisional fixed prosthetics to allow soft tissue response.
• Final fixed prosthetics to achieve long-term periodontal/gingival health and improve cosmetics of all-ceramic crowns.

Phase I: Initial Therapy

Cosmetic analysis was performed by following Dr. Chiche’s methods, using the incisal plane, incisal profile, incisal length, smile line, tooth proportion, gingival outline, tooth shades, and intrinsic characteristics. Mounted study casts were taken and heat processed temporaries were fabricated using the existing tooth anatomies. Laboratory processed temporaries were modified based on the goal of improving cosmetics to meet the patient’s needs and wants. After removal of the prior crowns, it was apparent that the biologic width was violated on crowns #’s 6, 7, 8, but the previous buildups appeared to be stable. The patient was pleased with the initial cosmetic appearance of the provisional restorations. The patient was referred for endodontic re-treatment of # 7. Histological examination of the soft tissue curetted from the apical radiolucency was diagnosed as a radicular cyst. The previous root canal was re-treated and a reverse apical seal was performed with Super EBA. The patient was allowed to heal from the initial therapies and was referred to the periodontist for gingival and crown lengthening analysis. A delay of three months was recommended for tissue response and to assess the long-term prognosis of # 7 from endodontic therapy.

Phase II: Surgical Phase

The tissue response to the new heat processed provisionals was favorable but crown lengthening was necessary to facilitate gingival and tooth symmetries. Based on the previous cosmetic analysis and the final incisal edge position, it was determined that 1 mm of additional clinical crown length was necessary on #’s 6 & 7, and 1.5 mm on # 8. Internal beveled incisions were performed after sounding of the attachment apparatus to provide...
surgical guidelines for the gingival resection portion of the osseous crown lengthening procedures. The previous preparation margins were irregular and inconsistent with the biologic width in the facial and proximal surfaces. Final apical repositioning of the tissue was accomplished through preparation modification, root reshaping, osteoplasty, ostectomy, and vertical mattress suturing. Post-surgical procedures were uneventful and the tissues were allowed to heal for three months before re-evaluation of Phase I and II results.

**Phase III: Prosthetic Phase**

After three months of healing, new impressions were obtained and mounted study casts were prepared for a second set of heated processed temporaries to finalize the cosmetic treatment goals. The final margins were prepared and the new provisionals were placed for analysis and trial cosmetic evaluations by the therapists and the patient. During this phase it was determined that endodontic therapy on #7 was successful and a pre-fabricated stainless steel post was inserted and glass-ionomer
buildup was performed. Three months of healing occurred after the placement of the final temporaries and evaluations by patient and therapist were favorable for progressing to the final restorations. Refinement of preparations was performed and vinyl polysiloxane wash/putty system impression was taken along with appropriate shade/occlusal records. Reference study casts were taken for fabrication of the permanent crowns from the final temporaries. Cross mountings and a silicone putty index were used for the contours of the final ceramic fabrication in the laboratory phase. Custom shading and tooth characteristics were a collaboration between the patient, prosthodontist and the laboratory technologist for all-ceramic crowns butt margins on #'s 6-11. Upon completion of the laboratory procedures, the all-ceramic crowns were trial cemented with a non-eugenol zinc oxide temporary cement for evaluations prior to final cementation. Following successful trial cementation and final acceptance of cosmetics by the patient, the all-ceramic crowns were individually cemented with a hybrid glass ionomer permanent cement.

Commentary
1. The major treatment planning dilemma for this case was the decision to retain tooth # 7. This patient was presented to our Gateway Study Club members for a treatment planning session. It was determined by consensus that the members would recommend endodontic re-treatment of # 7 as opposed to strategic extraction, guided bone regeneration, and placement of an endosseous root form implant prosthesis. The possibility of strategic extraction, socket/soft tissue augmentation, and an ovate pontic in the # 7 site as part of a fixed bridge prosthesis was explored. This however was ruled out by the patient’s desire to have single units for oral hygiene accessibility and maximum aesthetics. Fortunately, the endodontist’s skill and the patient’s favorable healing response to date has met the initial treatment goals of the patient and the club’s treatment plan. During the trial cementation period, the patient swallowed the all-ceramic crown # 10, and was unable to retrieve the definitive prosthesis. Fabrication of a new all-ceramic crown was achieved through
the expert skill of the laboratory technician to match the previous all-ceramic crowns. The post-crown swallowing course was uneventful for the patient.

3. Gingival tissues were allowed to heal over prolonged periods of time due to the fabrication of well fitting processed provisionals. This facilitated the healing of the tissues to create emergence profiles consistent with ideal biologic relationships to the provisionals and ultimately the permanent prosthesis. The use of two sets of provisionals over a one year period allowed the clinicians and the patient to collaborate on the smile design characteristics of the final prosthesis. The durability of these temporaries was invaluable to minimize “between” appointment emergencies and inconvenience to the patient due to the distance of travel from home to the providers.

4. The patient was very pleased with the final prosthetic result and we were happy to submit this case to the Seattle Study Club Journal for sharing with the Seattle Study Club network. This is the 5 year anniversary of our Gateway Study Club and it has been through the collaborative efforts of our members and guest speakers (“A University without Walls”) that we can offer this type of care to our patient in the Midwest.

George Duello is in the private practice of Periodontics, St. Louis, MO and is the Director of the Gateway Study Club.

Thomas Matthes is in the private practice of Prosthodontics, St. Louis, MO and is a Restorative Advisor of Gateway Study Club.

Harvey Lehrer is in the private practice of Endodontics, St. Louis, MO and is the Endodontic Advisor for Gateway Study Club.

The clinicians would like to thank the Laboratory Technician, Mr. Gerry Jacobi of Jacobi Dental Lab, Inc, St. Louis, MO for his contribution to this case.
**Achieving Excellence with Composites in Anterior Teeth**

**Introduction**

One of the more challenging, yet rewarding aspects of contemporary aesthetic dentistry is freehand composite restorations in anterior teeth. Composite allows dentists to close diastemas or build-up teeth with minimal invasiveness. The beauty and strength of today’s composites allows clinicians to do things that just a few years ago could only be done with porcelain.

Although there are numerous restorative materials one can choose, there are also many “secrets” to achieving the finest possible aesthetic result. Dr. Luiz Baratieri made it his goal to share these secrets with the audience. It wasn’t his goal to teach those in attendance how to do composites, but rather to help all of the clinicians achieve a better result with some well defined procedural modifications.

Is it really possible to create restorations with a light to composite interaction that is similar to that of light to natural dentition interaction? Textbooks and scientific literature would certainly say yes, however in clinical practice, this is certainly much more difficult to achieve. It is, however, possible, if certain rules are followed. There are a number of prerequisites for obtaining an ideal result. Within each prerequisite are the hidden secrets to obtain the desired outcome.

**Prerequisite 1**

The first prerequisite is that the clinician must have a way of reading the “chromatic map” of the tooth to be restored. In other words, one must have the ability to clearly identify the “basic hue” of the dentin body and the regions of translucency, in order to define and plan the “chromatic composition” of the anticipated restoration. This is vital, as the hand can only do what the eye can see.

**Prerequisites 2 & 3**

The next requirement is that special composites must be used to replace the “artificial dentin.” They must be low translucency, high fluorescence dentin materials that are saturated with hue and chroma. 3M Filtek™ is a great choice. In addition, special composites to replace the “artificial enamel” must also be employed. These composites must be high translucency, low fluorescence enamel materials that are low in hue and chroma. This increased translucency allows the clinician to obtain the desired opalescence.

Regardless of which composite is used, it is important that the same material be used for an extended amount of time. The longer a material is employed, the more is learned about it by the operator. This allows greater consistency in manipulation and handling of the composite over time.

**Prerequisite 4**

The clinician must have the ability to perform a build up that allows the reproduction of the thickness of dentin and enamel similar to those found in natural anatomy. It is during this build up phase that one should keep in mind the fact that art and quickness do not necessarily go hand in hand. It is alright if the restoration isn’t finished in only one session. Sometimes, it may take longer.

**Shape and Color**

It is very important that the primary factors of restorations be added to the aforementioned prerequisites if an ideal outcome is to be achieved. These include proper shape and color. The surface macro and micro-morphology is as important as color attributes such as hue, value, chroma and translucency.

**To Bevel or Not To Bevel?**

Is it possible to build “invisible” composite restorations in anterior teeth without a bevel? Most dentists believe that to mask the tooth-composite interface, a bevel is necessary. In addition, better aesthetics and increasing the surface area of enamel for etching have been mentioned as other reasons to bevel. Some dentists feel that bevels help achieve a better marginal seal or facilitate finish and polishing. Avoidance of excessive over-contouring and better retention have even been mentioned as reasons to bevel.

It appears that the better question to ask is “why should we not bevel?” There are clearly
some strong arguments against beveling a tooth when performing a direct composite restoration. Not beveling preserves tooth structure and can avoid damage to adjacent teeth as well as reduce the need for anesthesia. Most importantly, there is no scientific evidence that shows the necessity of bevels. Today’s “total etch technique” allows clinicians the ability to do beautiful direct composite restorations without beveling.

**Protocol**

When dealing with fractured teeth, it is important to observe and pay attention to the characteristics of the neighboring teeth. In addition, there is a protocol that must be followed if a successful outcome is to be produced. The steps must be followed in this order: Diagnose the case, clean the teeth, select a shade, select a resin, build a diagnostic restoration, fabricate a silicone mold, moisture management, preparation (if necessary), total etch and hybridization, layering technique, finish and polish the restoration.

**Counter Opalescence**

The concept of counter opalescence is one of the most important concepts to understand. It describes that an orange shade occurs at the incisal portion of teeth in normal circumstances. When the lingual side of the crown lies in water, the orange is diminished by half. When the entire tooth is submerged, the orange almost disappears and the tooth becomes transparent. Counter opalescence also causes orange and orange-pink shades in the mamelons of natural teeth. It follows that the orange shading of the incisal portion of teeth can be explained as an optical event.

Most dentists think that one needs to put orange in a tooth, however, once the enamel is removed, it becomes evident that there is no orange in the dentinal portion of a tooth. It is whiter in shade and adding yellow or orange to rebuild the dentin will only skew the final aesthetic result of the case.

**Shade**

The Mirus ™ shade guide only uses a range of “A” shades, but includes 7 chromas. It also allows a way to measure incisal translucency. After selecting the dentinal shade, the enamel tint and translucency can be determined. One can combine the dentinal shade and translucency to see how the final outcome will look.

Remembering that there is a palatal layer of enamel will ensure that the underlying dentin will have the proper brightness when sandwiched between the facial and palatal enamel planes. The more enamel thickness, the higher the value and lower the translucency.

**Build up a Diagnostic Restoration**

In some cases, by choosing the appropriate shades and actually building up a diagnostic restoration on the tooth, the patient has the opportunity to leave the office with a preliminary example of the proposed final outcome.

**Composite Selection**

Perhaps the most important phase is to correlate the chosen color with the restorative materials and to select the composite to be used as the artificial dentin and artificial enamel. Since color in natural teeth comes from the relationship between the enamel and dentin with light and not only from the dentin, one should replace dentin with a more opaque dentin composite and enamel with a more translucent composite.

**Building a Silicone Mold**

After a wax up of the missing tooth structure is complete, a silicone mold of the wax up can be fabricated. The facial surface is cut back so that the well fitting mold is visible around the tooth when tried into the mouth. One can experiment with several different shapes of wax ups and molds and try them in to see which looks best. After selecting the desired mold, an ultraviolet light will allow the dentist to better see the dentin through the tooth and draw it for a more predictable dentin build up.

The tooth should be isolated and a total etch technique employed for 15 seconds, after which, bonding agent is applied and the first layer of palatal and incisal enamel is built up in the mold using a plastic instrument and spread with a fine brush. This layer should be no more than .5 in thickness. Next, the incisal edge is further built up as a scaffold for future additions. The first layer of dentin comes next, and the build up continues until the desired shape and size is achieved. It should come to within approximately 1-2 mm from the incisal edge when done.

It is important to remember that, in general, after polymerization, the micro-hybrid composites become darker and more translucent, and the microfill composites become lighter and less
translucent than their uncured counterparts. One should also recall that the more thickness of material, the more chroma. That means that when building up the dentinal layers, separate colors aren’t necessarily needed, but thicker layers of existing colors can change the appearance by affecting the chroma.

When the palatal layer of dentin build up is done, blue, gray or violet can be added for characterization, however, blue is almost always the color of choice. The facial layers of dentin follow. Next, the same level of enamel translucency as the tooth is created, hues of white are placed in the material to customize the restoration and finally, reproduction of internal and external opalescence with the application of higher translucent materials occurs. DuraFill VS™ is a wonderful material for creating the final enamel translucency and it is applied using a brush. The tooth is then polished to a final luster.

By paying attention to the surface of the adjacent teeth, the shape and surface texture of the outer surface of the tooth can be reproduced. It is here that one can appreciate the fact that the interaction of light with the most superficial layer of the restoration is responsible for making restorations blend with the natural dentition. It is also important to remember that the surface micro-texture design varies in different areas of the tooth.

**Conclusion**

Creating exceptional direct composite restorations is clearly no easy task. It requires that the clinician take the time to build the tooth from the inside out in a fashion that mimics natural enamel and dentin patterns. By choosing the proper artificial dentin and enamel composites and producing the appropriate facial micro and macro-anatomy, a realistic, conservative restoration can be fabricated.

**Figure Captions**

Fig. 1) The patient presented with fractured, failing composites on the two maxillary central incisors.

Fig. 2) The existing restorations were removed to show the extent of repair necessary.

Fig. 3) Composite mock ups of the proposed restorative outcome were produced and a matrix fabricated.

Fig. 4) The matrix was cut back and the mock up removed, once again showing the extent of the missing tooth structure.

Figs. 5-6) Using the matrix, the incisal lingual enamel is the first area to be rebuilt.

Fig. 7) The dentinal layer is built up incrementally.

Fig. 8) A close up view of the completed restorations.

Luiz Baratieri is Dean of the Operative Dentistry Department at The University of Santa Catarina, Florianopolis SC, Brazil.
Tooth Discoloration and Whitening Options

Introduction

Whitening is one of the most commonly requested procedures in today’s dental office. Whether due to staining or genetic factors, it seems that most of our patients are looking for a way to brighten their smiles. Dentists must be able to answer the myriad questions posed to them by patients, as well as understand which whitening option best serves each clinical situation.

Having been a pioneer in the earliest days of whitening, Dr. Van Haywood is considered one of the foremost experts on the topic. With over 25 years of experience, Dr. Haywood offers valuable insights into all aspects of whitening, as well as information on managing cases from beginning to end.

Today’s whitening options include home, in-office, vital and non-vital. Each option has its own particular use, advantages and disadvantages.

Home Whitening

10% carbamide peroxide is still the easiest, most cost effective choice for home whitening. Currently, an ADA 10% carbamide peroxide solution, administered at home, in a non-scalloped, non-reservoir, horseshoe shaped tray is the most predictable way of whitening. Patients are advised that they may wear the tray either overnight or 2-4 hrs/day. The typical duration of treatment using this method is 2-6 weeks, however, some cases can take up to 6 months.

One of the major advantages of take home trays is that in addition to whitening the entire arch, one can also whiten only selected teeth. This is particularly useful in order to gain whiter cuspids to blend in to the rest of an arch or to eliminate darker brown stains from fluorosis on individual teeth. Related to removing stains from teeth, it is important to remember that one can completely eradicate brown only approximately 8% of the time.

Many patients choose to not whiten the lower arch. In Dr. Haywood’s practice, almost 50% of patients choose to whiten only the maxillary arch, even when there is no cost difference involved. By doing only one arch, one can get better compliance and less overall sensitivity, so it makes sense for practices to have a single arch fee.

If micro-abrasion is part of the proposed treatment plan, it should always be performed prior to whitening. Once again, it is important to keep in mind the fact that brown should only be removed through whitening. Never attempt to use micro-abrasion to remove brown.

Dental Office Supervised Whitening

The main advantage and rationale for dental office supervised whitening, as opposed to over the counter systems, is that there must be a proper diagnosis for the cause of discoloration. One needs to rule out causes that are not solved by whitening.

In addition, radiographs are necessary before beginning a whitening case. One must verify that there are no reasons not to perform whitening. Another valid reason for pre-treatment radiographs is that teeth with small pulp chambers take longer to whiten due to the presence of more dentin which, in turn, makes the tooth darker.

Figure captions are on page 32
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When dealing with a single discolored anterior tooth, one should always whiten first, before considering indirect restorations. Clinicians should always look for teeth that may not whiten as well. For instance, grey teeth can whiten, but translucent teeth may look worse after whitening. It’s important to differentiate between the two. A simple test to differentiate between grayness and translucency is to place a finger behind the back of the tooth and see if the “grayness” disappears. If it does, then it is translucency, and a proper clinical decision can be made.

Whitening before veneers may not eliminate the need for veneers, but it will definitely reduce the masking needs for a successful aesthetic result. So, what if one whiten, places veneers and the color of the teeth rebounds? It is possible to successfully whiten from the lingual and still make the veneers appear whiter. Although not always 100% successful, this is certainly a much better first option than simply cutting off an otherwise acceptable veneer.

**Whitening and Verbal Skills**

So, how does one market bleaching without insulting the patient? One excellent way is to bring up the subject of whitening prior to performing any restorations. Let the patient know that it’s a good time to whiten because the restorations, once placed, will not change color. Whitening also gives a vision of what a patient could look like with cosmetic changes. A great guideline to illustrate the comparative whiteness of the teeth is to point out that the whites of the eyes should match the whiteness of the teeth.

It is also important to remember that roots will never whiten because the cementum tubules react differently than enamel when exposed to carbamide peroxide. Patients need to be informed of this as well as the fact that restorations will not match. Cervical discoloration cases are the tougher, while those with a uniform discoloration are the easier. Moderate to severe tetracycline staining, dark blue or grey teeth and those teeth with white spots are the toughest to treat. It is also important to be aware of the fact that Minocycline is capable of staining teeth even in adult patients.

Patients should be informed that 2-4 weeks is the normal course of whitening for most patients, but they may continue to “bleach” until they are white. Nicotine stains take, on average, 1-3
months of 10% carbamide peroxide to disappear. For Tetracycline stained teeth, patients should be advised to wear their whitening trays for 6 hrs/night for 6 months. Due to this extended period of treatment, determining an appropriate fee can be difficult. A reasonable approach is to charge a per month fee after the first month.

Of interest is the fact that all teeth will eventually reach a maximum whiteness. It is impossible to predict this whiteness prior to beginning the process. There is also no way to go beyond this pre-determined threshold. Different materials or higher concentrations will have no greater effect on the level of whiteness and will only introduce other variables such as increased sensitivity. Once a patient has gone two weeks without any color change, it can be assumed that there will be no further whitening. Additionally, after the completion of a whitening process, one must wait at least two weeks for shades to stabilize before performing bonding. Not waiting this specified amount of time will also cause a 25% decrease in bond strength.

Choosing the Right Product

ADA approved products are always preferable due to safety reasons. As of this lecture, for 10% carbamide peroxide, only 3 whitening products bear the ADA seal of approval. They are Rembrandt Classic, Opalescence and Colgate Platinum. Having an ADA seal means that the company must be truthful in all advertising and that there has been significant scientific research to back up all claims.

The scientific literature supports the assertion that there is no increased endodontic risk, no increased resorption risk and minimal rebound. In addition, 9 out of 10 whitening cases will be successful, with an average duration of 1-3 years. Studies indicated that 43% of patients who whitened were still happy with the color of their teeth 10 years after whitening.

Whitening and Sensitivity

Tooth sensitivity occurs mostly during the first two weeks, then becomes more sporadic. Predictors for sensitivity are inherent sensitivity prior to whitening or application more than once a day. Contrary to public opinion, age, sex, exposed dentin or cementum, cracks, pulp size, allergies and decay play little role in sensitivity.

It is also important to recognize that 25-75% of patients who whiten will have some form of sensitivity. Of note, however, is that in some studies, 20-30% of placebo groups have experienced discomfort and 15-20% of subjects using just a tray alone, without any whitening material, have experienced sensitivity. So, one can conclude that no such thing as a zero sensitivity whitening process exists.

Easy passage of peroxide to the pulp is the primary reason for sensitivity. As a matter of fact, it travels in so well, that the rate of color change in the dentin is the same as enamel. In terms of reducing sensitivity, fluoride is a tubular blocker and affects transmission into the tooth, however, potassium nitrate actually gets into the tooth. Potassium nitrate in trays for 10-30 minutes/day helps considerably with decreasing sensitivity and has no negative side effect on whitening.

10% Carbamide Peroxide — The Standard

So, why use 10% carbamide peroxide as opposed to all of the other options that are out there? Hydrogen peroxide whitens much faster but the slower delivery of 10% carbamide peroxide can actually be preferable. Higher concentrations of carbamide or hydrogen peroxide lead to greater sensitivity, and the teeth don’t whiten to a greater degree, they only whiten faster. These faster results lead to greater rebound and there may be legal issues related to the smaller body of scientific literature for the higher concentration and hydrogen peroxide materials. There is more research underway, but 10% carbamide peroxide is the most studied and time tested material available.

Conclusion

Tooth whitening is much more complex than the typical patient has been led to believe. With all of the current options available, it is the dentist’s responsibility to understand all of the variables that need to be managed for a desired outcome. With all of the information presented by Dr. Haywood, clinicians can now approach tooth whitening with a true understanding of the probable outcomes and provide realistic expectations and sound advice to every patient.

Figure Captions

Figs. 1-14) Multiple before and after examples of the capabilities of modern whitening procedures.

Van Haywood is a Professor in the Department of Oral Rehabilitation, School of Dentistry, Medical College of Georgia.
Symposium 2004: Dr. Roberto Spreafico

Composite Resin Restorations on Posterior Teeth: Keys to Success

Introduction

Today’s dentist has a wide choice of restorative materials available when replacing missing or damaged tooth structure. Direct or indirect? Composite or ceramic? These are just a few of the decisions that need to be made before definitively restoring a tooth.

Dr. Roberto Spreafico is a master of the composite restoration. His clinical expertise illustrates what can be achieved using composite restorations and where they fit in to the restorative gamut. The primary focus of his presentation was to allow dentists a better understanding of the factors that influence successful outcomes when using composite resins, and the pitfalls that plague many clinicians.

Current Restorative Choices

When a part of a tooth is missing due to fracture or caries it needs to be replaced with an artificial material such as gold, amalgam, porcelain or composite. For years, posterior teeth were restored with metal restorations. Today, tooth colored restorative materials such as composite or porcelain are options that weren’t available years ago. While gold and amalgam rely on macro-retention such as undercuts to stabilize the restoration, adhesive dentistry relies primarily on micro-retention through etching and bonding. This results in the sacrifice of less sound tissue for retention.

In addition, amalgam releases oxides at the tooth/filling interface, generating a darker tooth which creates an unpleasant aesthetic outcome for patients. When used as an intra-coro-

nal restoration, metallic materials do not protect the tooth from mechanical stress, so horizontal and vertical cracks occur more frequently.

Scientific research suggests that there is no difference in restoration longevity between amalgam and composite restorations when the restoration is performed by an efficient provider. The key to understanding this statement is that the dentist plays a huge role in the long-term survival of a composite restoration.

Failures

When analyzing the main reasons for failures of different types of restorations, one can see that the principle cause of direct composite failure is secondary caries, while indirect restorations usually fail due to mechanical reasons.

With direct restorations, failures can be classified as either immediate failures or medium to long-term failures. Immediate failures show post operative sensitivity, microfractures around the restoration, poor interproximal contacts and anatomy as well as poor aesthetics. Medium to long-term issues can include secondary caries, bulk fractures, marginal fractures and poor anatomic form.

Luted restorations can show post operative sensitivity and poor aesthetics as the main reasons for failure, while restoration fractures, secondary caries and marginal fractures are more indicative of medium to long term-failure.

The choice of restorative technique, adhesive procedures, placement of the material and adhesive cementation are all vital techniques that can play large roles in the long-term success of a direct restoration.

Figure 1

Figure captions are on page 37

Figure 2
**Restorative Techniques**

The three main types of restorative techniques are classified as direct, semi-direct (chairside) and indirect.

Composite inlays and onlays were first introduced in the 1980s to counteract the stresses during setting due to shrinkage, and to better control the anatomy.

The advantages of luted indirect composite restorations are less stress and better anatomy control while the disadvantages include invasiveness, cost, multiple visits and the technical skill required. Although several studies have shown indirect restorations to be advantageous over direct restorations for fit and longevity, other studies have shown that in regard to composite inlays, there is no advantage when compared to well placed, direct composite restorations.

When deciding whether to treat using direct versus indirect restorations, there are three parameters that the treating clinician must take into consideration. They are cavity size, wall thickness of the remaining tooth structure and enamel at the cervical margin.

**Post Operative Sensitivity**

A major problem that occurs with composites, in both direct and indirect restorations, is post operative sensitivity. This problem is most probably due to fluid movements which occur within the dentinal tubules, if voids are formed between the restoration and dentin. It is also known that the dentist’s technique plays a significant role in the bond strength to dentin. For minimal post operative sensitivity, certain steps can be taken during the bonding process.

After etching the enamel for 30 seconds and the dentin for 15 seconds, the operator should apply adhesive agents rigorously. The cavity should be lined with an elastic material such as flowable composite and of course, the composite for the remaining portion of the restoration should be built up using an incremental layering technique.

This concept of placing an elastic layer between the dentin and composite has been well documented in the literature. When doing this, there are two approaches that can be taken. They are filled bonding and flowable composite. There are conflicts in the literature as to whether flowable composite is preferable, but Dr. Spreafico has chosen this model for his practice.

Composite shrinkage is the main problem with direct restorations. Presently, composite shrinkage is approximately 2% which is considerably less than the traditional 4-5% seen with older composites. This shrinkage can lead to marginal openings, internal de-bondings, cuspal flexures and cuspal microfractures. This can, in turn, lead to microleakage, recurrent caries, post operative sensitivity, pulpal pathology and marginal discoloration.

**Incremental Layering Technique**

Layering the material not only minimizes polymerization stresses, but it also increases the polymerization depth and allows for the best aesthetic result by allowing the clinician the ability to achieve good anatomic contours. Not following a layering technique will lead to marginal openings, internal de-bondings, cuspal flexures and cuspal microfractures. This has been well documented in the scientific literature.

Post operative sensitivity can be seen in both direct and luted restorations. To avoid this, a dual bonding technique can be utilized. The best way to do this for an indirect restoration is to etch, prime and bond the preparation, followed by a lining of flowable composite. The cavity is then re-prepared and an impression procured and temporary restoration fabricated.

**Tricks for Avoiding Problems**

Achieving an appropriate proximal contact is difficult with direct composite restorations. Sectional matrix bands with metallic retainers are essential. The tines separate the teeth to compensate for the thickness of the matrix. This allows for a rounded, appropriately shaped interproximal contact.

A great way to practice the artistry associated with composites is to make entire teeth out of composite and experiment with dentin and enamel layering. By doing this, one can gain a better understanding of the properties of composites in a non clinical setting and apply this knowledge to clinical situations.
Conclusion

Composite restorations, both direct and indirect, are one of the greatest tools available to a dentist when replacing missing or damaged tooth structure. However, it is vital that the treating clinician have a thorough understanding of the principles that lead to a successful outcome. Dr. Roberto Spreafico showed how a naturally appearing and problem free outcome can be achieved if certain rules are followed by a conscientious operator.

Figure Captions

Fig. 1) This lower molar presents a large class I cavity. In such situations, a careful oblique layering may minimize the detrimental effects of the polymerization shrinkage.
Fig. 2) The cavity floor is lined with a thin layer of flowable composite.
Fig. 3) An opaque composite mass is layered obliquely on the mesio lingual cusp.
Fig. 4) The dentin layering is accomplished with some increments anticipating the final occlusal anatomy.
Fig. 5) Final view of the composite restoration after finishing and polishing.
Fig. 6) Preoperative view of composite restoration to be removed because of marginal ridge fractures and poor anatomy.

Fig. 7) The tooth after the restoration and caries removal. In order to achieve a correct anatomy an indirect composite restoration was scheduled.
Fig. 8) A composite base was done in order to seal the dentin and to reduce the onlay thickness.
Figs. 9-10) The composite onlay.
Figs. 11-12) Occlusal views 1 month later.
Fig. 13) The amalgam on this first premolar has to be removed.
Fig. 14) An MOD cavity is prepared and ready to be restored with a direct composite restoration.
Figs. 15-16) The first composite increment is placed against the metallic band in order to transform the Class II into Class I. After the polymerization the band and the retainer are removed.
Fig. 17) The cavity is lined with flowable composite and a “dentin” mass is anatomically stratified and light cured.
Fig. 18) The same tooth 2 months later.

Dr. Roberto Spreafico maintains a private practice in Busto Arsizio, Italy.