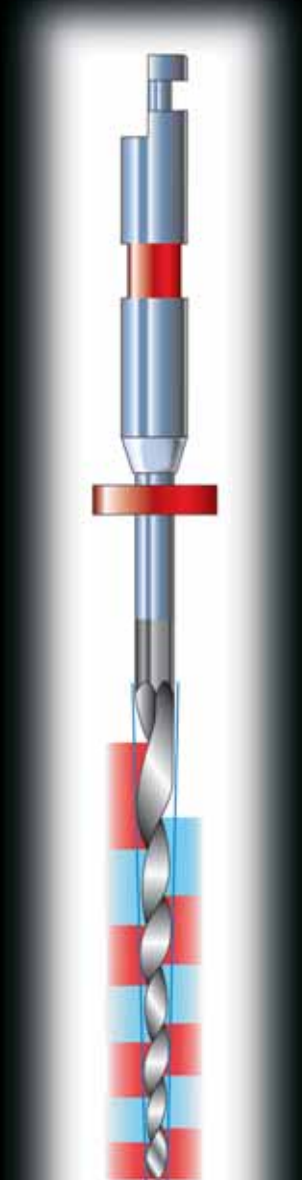




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PRESIDENT'S MESSAGE

NJAGD IS SPECIAL

Scott Dubowsky, DMD, MAGD

I can tell you that this past year has sped by very quickly, but in that time, the New Jersey Academy has gone through changes that will help set a path for the future. We have solidified our relationship with the New Jersey Dental Association and now we are holding our annual session with them in Atlantic City. We have a new website and a new publisher for our journal, **WISDOM**. We have also been holding down expenses by conducting executive board meetings online and our lecture series courses this year turned a profit for the first time in many years.

Under the able leadership of our national officers (Dr. Vincent Mayher, national vice president, Dr. Manuel Cordero, national trustee, and Dr. Elizabeth Clemente, regional director), we have seen the national organization take steps to reorganize and revitalize itself.

This will be my last president's message. On June 7th, Dr. Mel Pierson will take over as the next president of the NJAGD. I am sure that under his adroit leadership, there will be more and more growth and improvements within the organization. I would also like to take this opportunity to thank the many members and staff who have helped me through my term.

I would like to thank the board of trustees and the executive board for all of their tireless efforts and a special thanks to my consigliere, Dr. Luciano Ghisalberti for all of his advice. I would also like to extend a special thanks to Dr. Michael Conte and Dr. Charles Perle for all of the extra work that it took to complete the Mercedes Benz raffle.

A president in a volunteer-driven organization cannot function without great staff and we have been fortunate in being able to tap into the resources of the NJDA. I do understand that during this past year, we were still establishing the relationships needed for maximum productivity, but it is very evident to me that we have established a win-win situation. My special thanks go to executive director, Art Meisel, Patricia DeCotiis, Ricky Dibofsky, Stan Orenstein, Samantha D'Agosta, and Eric Elmore. These individuals have been invaluable to the organization and to me. The best advice I can give to my successors is to utilize this staff as much as possible.

My parting thought to you after a year at the helm of the NJAGD is that the future belongs to you. The culture of this organization is the culture of learning. In these days of hype, marketing, and fast dollars, it is a very noble and worthy culture to preserve, but it won't thrive without you. We need you to help us out and do more than collect transcripts for yourself. Come to our meetings. Help us make decisions. I believe that the NJAGD is special. Let's all pitch in to help keep it that way.



IN MY OPINION

CHAMPIONING PREVENTION

Evan Spivack, DDS, FAGD

I vividly remember my first meeting on coming to New Jersey almost ten years ago, as a dentist for St. Joseph's Hospital and Medical Center in Paterson. Sitting down with the department dentists and administrators, I laid out several ideas that I had for building up the special care component of the residency program and expanding services to what I knew to be a community in great need.

As we spoke, one of the administrators noted "the challenges here in Paterson are very different from the ones in New York City." Having been residency trained in the south Bronx and having practiced in a working-class neighborhood in the Bronx for several years, I felt that I was ready for whatever those "very different" challenges might be. I had no idea how mistaken I was.

While the demographics of the Paterson population were ethnically and financially very similar to that of the south Bronx, there was a tremendous difference in the dental needs of these two groups. Yes, the caries rate was high in the Bronx—but it was nothing compared to what I saw in Paterson. Routinely, children came through our clinic where there was no treatment choice other than extraction of all their primary (and sometimes some permanent) teeth. The same was true, also, for many adults who would lose their teeth at too young an age. The only difference in the two populations was the presence of fluoride in the New York drinking water.

As dentists living in the modern world, we have the opportunity to prevent oral and dental diseases in a way that dentists in the past never did. We should make it a priority to use and prescribe fluoride for our patients, and make preventive services a standard part of our treatment planning for children and adults. In some cases, this means spending more time on oral hygiene instruction, and following up at future visits. In other cases, it may mean spending time on targeted nutritional counseling and perhaps referral to a nutritionist or other appropriate medical specialist.

Our attempts at preserving the health of our patients through preventive measures need not stop with the oral cavity. Following the emerging paradigm of the dentist as a "physician of the mouth", we should be alert to possible medical concerns requiring intervention. You can save a life by guiding your patient into a smoking cessation program. You may prevent a stroke by alerting your patient to an abnormally high blood pressure reading. Perhaps your patient has sleep apnea, which if untreated may lead to serious health problems. Asking your diabetic patients about their daily testing results may identify someone in need of closer medical follow-up. Such examples are by no means all-inclusive of the many ways in which we can intervene to better the lives of our patients.

I have found that most patients respond positively to their dentist taking an active interest in them, and many come to better appreciate dentists as the health professionals we truly are. Rededicate yourself to championing prevention in the lives of your patients. You won't regret it.



Presentation by Dr. Jim Beck, Diplomate AACP, FIAO, FICCMO

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FUNCTIONAL FULL-MOUTH RESTORATION



Dr. Jim Beck taking neuromuscular bite registration using Tens stimulation and computerized jaw tracker.

It is very common for patients who have been going to the dentist for long periods of time to arrive at a point where several of their teeth have been restored. Their restorative treatment normally has a common theme. They have over a long period of time had their mouths restored in several different isolated areas only. This evolves because of several different reasons unique to the patient and the treating dentist.

Common causes are the patient has situational isolated problems which have evolved with time. It may be decay originally treated with fillings; then you have fillings which get new decay which need more extensive restorations, e.g., root canal and crowns. They may get teeth extracted for various reasons. They may only treat to what their insurance benefits cover. It's possible they move to one dentist to another all who have different treatment philosophies.

Although the journey may be different for each patient, the reality is they have evolved to a point in their dental lives where their mouths are so extensively restored to their existing occlusion that their existing occlusion is now functioning to the detriment of their physiology. In other words in order to function with their existing dentition as it is, they now are damaging various areas of the stomatognathic system.

Common areas of breakdown are the existing teeth, periodontium, jaw joints and muscle. This physiologic

breakdown can lead to other areas of problems. This can manifest itself in various situations such as headaches, earaches, neck problems, balance problems and even numbness and tingling in the fingers.

The above mentioned scenario creates a possible paradigm shift for the treating dentist. Do you continue treating your patient in the manner they have previously been treated? In other words, do you only treat and/or repair to the existing potential pathologic occlusion or do you, when circumstances indicate, treat the whole mouth to a healthy functioning physiological occlusion? It is very exciting to me to treat a patient's full mouth to have totally healthy teeth and periodontal conditions which also satisfies and improves body physiology. It then becomes "icing on the cake" to get a very cosmetic pleasing result.

The starting point for extensive high end treatment must always start with a thorough record gathering, examination and diagnosis protocol. By adhering to this guideline the doctor and the patient can properly assess the "prognosis" of the proposed treatment plan.

In traditional dental situations treatment is dictated by patient's need, readiness, willingness and financial ability. Patients have direct control over the willingness and financial ability of the equation. The need and readiness becomes more of



Fig. 1: Preoperative view, full face with patient covering teeth with her smile.



Fig. 2: Preoperative unretracted smile.

the doctor's responsibility. To help with this area I divide my patients into 4 general categories. These categories are based on the examination protocols which assess patient dental signs and their physiologic symptoms. This simple protocol helps assess the patient's physiologic readiness for extensive prosthetic treatment. This is absolutely necessary because it will have great impact on the ultimate success and prognosis of treatment.

Patient Types

Type I — patients have healthy overall dentition with accompanying good occlusal function. There is no clinical breakdown of teeth, perio, etc. There are no signs of malfunction of the jaw joint muscle complex. The doctor can freely do restorative and/or cosmetic restorations to this patient type's existing habitual occlusion.

Type II — patients with dental, and/or TMD signs but are not complaining of subjective physiologic symptoms. There are a whole myriad of dental and TMD signs. Some of the more common dental signs are extensive anterior and posterior wear of teeth, deep overbites, depressed curve of spee, cervical abfractions, and broken failing restorations. TMD signs would be popping or clicking in jaw joint, uneven opening and closing patterns and limited opening. Subjective symptoms would be headaches, jaw joint pain, muscle pain, clenching, bruxing, earache and ringing in the ears. Patients who have some dental signs but have no subjective symptoms are good candidates for comprehensive care.

Type III — present with above-mentioned clinical signs and also have a history of physiologic symptoms. We now have to associate if the symptoms are caused by the clinical signs. Many times the pathologic occlusion contributes to a large extent to the physiologic symptoms. It is prudent to treat the patient to symptomatic relief before proceeding with any restorative care.

Type IV — patients are rare and present with no clinical signs but have extensive physiologic symptoms. This is the most difficult patient to deal with. It is recommended to refer and have various other health care providers evaluate. Again it is necessary to get symptomatic resolution but in this patient type the dentist will not primarily achieve this. Some of my common referrals for this patient type are chiropractors, acupuncture, neurologists, family doctors, orthopedists, and psychiatrists. This patient has a guarded prognosis and the general restorative dentist should be careful in selecting this patient as an extensive prosthetic patient.

In summary, by this typing of patients Type II and III patients are the best candidates for full mouth restoration. Type II patients present with clinical signs which include occlusal,



Fig. 3: Preoperative retracted view.

aesthetic problems and no TMD symptoms. Type III patients have above mentioned clinical signs along with physiological symptoms (e.g. headache, neck ache, jaw pain, muscle pain, etc.). Their treatment is more involved because it necessitates treatment of the symptoms to resolution prior to doing restorative care.

Case Report

This 48 year old female presented at my office with chief complaints that her upper right bridge was moving, #12 sensitive to biting pressure and she wanted to cosmetically enhance her smile. She was concerned that her front teeth were wearing excessively and she was not happy with the appearance. She was currently masking her teeth with an unnatural smile (Figures 1-5).

Dental History

The patient was missing teeth 1, 3, 14, 16, 17, 19, 29, and 32. The patient's dental history also consisted of traditional dentistry which included a 3 unit bridge from teeth 2-4; root canal, build up and crown tooth 12; a 3 unit bridge from teeth 13-15 which included a root canal on #15; a 3 unit bridge from teeth 18-20; a 3 unit bridge from teeth 28-30; and a porcelain to metal crown on 31. The dentistry was ten to fifteen years old and built to her habitual bite at separate isolated treatments. She had a very uneven occlusal plane, bilateral depressed curve of Spee, generalized gingival recession with excessive upper and lower incisal wear present. Her periodontal health was normal and healthy; it was evident that her periodontal status could support any planned restorative treatment.



Fig. 4: Preoperative retracted side view.



Fig. 5: Preoperative retracted side view.

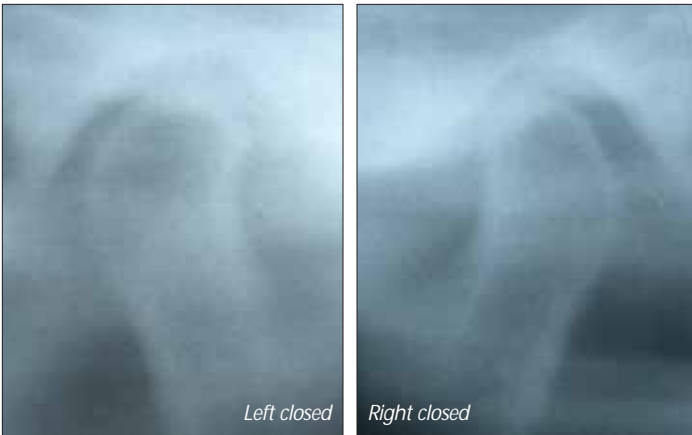



Fig. 6: Before treatment Left and Right tomographic TMJ views in the closed position.



Fig. 7: Pre-treatment maxillary model mounted on Accu-Liner articulator.



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Comprehensive Evaluation

The patient filled out a symptoms screening form and presented with no symptoms in her history of head/face pain, ear, throat, jaw, nasal, eyes, neck or mouth problems. I was concerned with problems in her TMJ complex due to clinical observations of occlusal wear, anterior chipping, mandibular tori and generalized gingival recession. In my practice various radiographs, mounted models (on Accu-Liner Articulator, www.acculiner.com) and electrodiagnostics (BioPak by BioResearch, www.biojva.com) are utilized to aid with my diagnosis protocol. Corrected angle, bilateral, multi-positioned, para-sagittal tomograms were taken. (Figures 6-11) The information from these diagnostic tests along with patient's subjective history illustrated a patient with resistance to systemic physiological breakdown and favorable prognosis for treatment. I made the clinical decision that this patient did not need treatment for symptoms (TMJ complex) prior to extensive prosthetic restorative treatment. My main objective would be to target her existing occlusal disease and create a more desirable occlusal environment with restorations that would function in harmony. In summary, she was classified as an ideal Type II patient.

Case Planning

The first step was to improve the upper gingival contouring by doing laser-assisted tissue recontouring. This contouring was done to place the gingival zeniths in the appropriate position for each tooth independently as well as in relation to one another. This is essential to ultimately enhance the final cosmetic results of the anterior veneers. (Figures 12-14)

It was next evident that the patient needed lengthening on the anterior teeth to compensate for incisal wear and to achieve ideal proportions. To facilitate this, the three dimensional relationship of the mandible to the maxilla had to be modified. Besides the obvious incisal wear, this step was deemed necessary because of the asymmetrical improper postural relationships which the tomography of the condyles revealed. (Figure 6)

The best vertical, antero-posterior, and lateral position of the mandible were determined by finding true physiologic rest through neuromuscular bite registration techniques. From physiologic rest position, isotonic closure through freeway space was recorded using computer-enhanced jaw tracking. Closure along the physiologic trajectory was noted and the centric occlusal position on that trajectory with a freeway space of 1mm was recorded and captured with a bite registration taken with tens and jaw tracker from BioResearch.

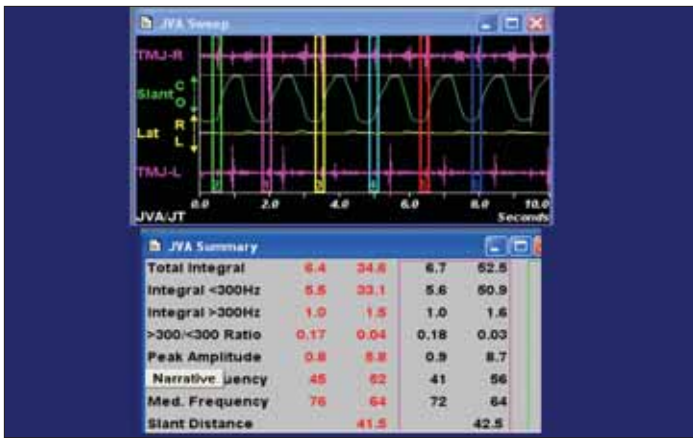


Fig. 9: Joint Vibration Analysis demonstrates left side ligament laxity.

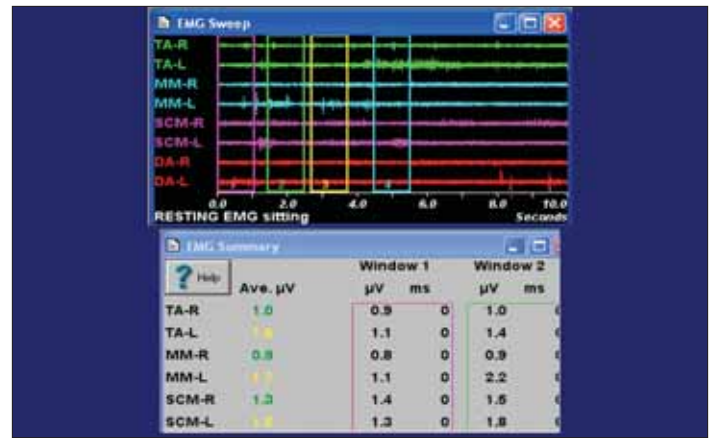


Fig. 10: Electromyography illustrates healthy, normal resting muscles of mastication.

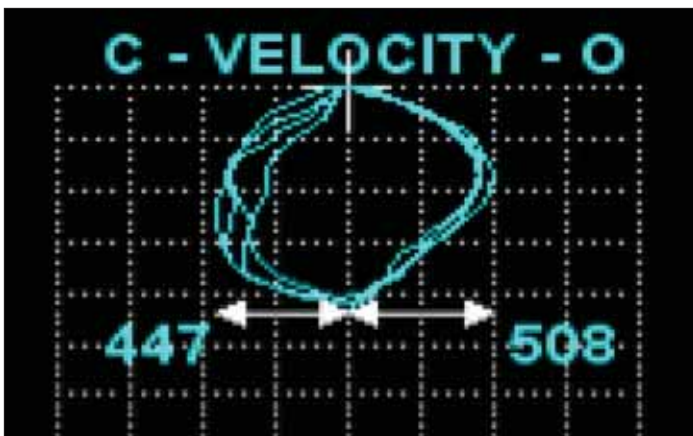


Fig. 11: Jaw tracker illustrates normal jaw opening and closing velocity.



Fig. 12: Preoperative view showing need to correct uneven gumline.



Fig. 13: Gingival contouring completed using diode laser.



Fig. 14: Gingival contouring post operative 2 days later.

The position was recorded using Blue Sapphire (Bosworth). I could now identify the best max anterior incisal length by utilizing the Shimbashi formula and verifying it's correctness while observing patient counting through "sixty" numbers and also making "V" sounds. From the established "f" and "v" points, upper and lower models, and the bite registration, the lab could now mount the models and construct an ideal full mouth wax-up. (Figures 15 and 16)

The lab I work with exclusively now is Ocean Ceramics from Vancouver. They work with the Accu-Liner articulator (Accu-Liner Products) and start by mounting the upper model using the HIP (hamular notch-incisal papilla).

Dr. Harry Cooperman introduced the HIP plane in 1960. This boney plane is a very important anatomical horizontal reference plane. It acts like a transit and allows the clinician and lab

technician to observe how the existing (diseased) occlusal plan relates to the true horizontal landmark. This is very diagnostic and a key part of treating the pathologic occlusion.

Once the maxillary model is mounted, the mandibular model can now be mounted to it utilizing the occlusal registration provided. Once the relationship has been mounted on the Accu-Liner the lower model is removed and the stage is inserted in the articulator. From here using the central incisor length which was previously established, the stone models are prepared and the wax-up for the upper arch is completed to an ideal plane against the stage. Once the maxillary arch is completed the lower model is re-inserted in the articulator, prepared and waxed up to the now established ideal upper maxillary arch at the bite registration previously established. (Figure 16)

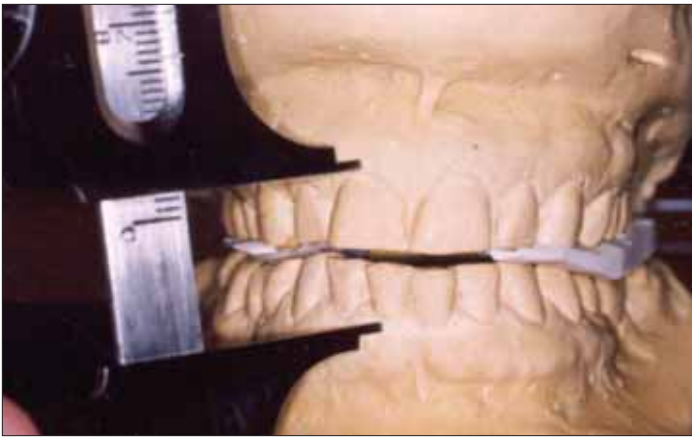


Fig. 15: Mounted models to final bite registration with Shimbash Measurement of 16mm.



Fig. 16: Wax-up to final bite registration at 16mm Shimbash.



Fig. 17: Full mouth temporaries complete on day of full mouth prep.



Fig. 18: Full mouth temporaries complete on day of full mouth prep.

Preparations

When the final full mouth wax-up completed to the bite registration previously taken, the patient is now ready for preparation. Prior to full mouth preparation, I always remove all old dentistry including old crowns, etc, and place healthy composite restorations and replace old crown and bridge with new temporary crowns fabricated from a stent made directly from the mouth. This step is important because it is unpredictable what lies under the old restorations and crowns. (This is done on crown and bridge and large restorations only.)

Often times, these old crowns have advanced decay which necessitates endodontic. It is imperative that all of this is complete prior to the final preparation date. The case is now ready for preparation.

This patient was treated by preparing her entire mouth in one session. I started with the upper arch. The temporary bridge on the upper right was sectioned leaving the temporary on #2 in place. Then, all teeth were prepared with the exception of tooth #8. On the upper left side the temporary bridge was sectioned, leaving #15 in place and everything on the upper left arch was prepared with the exception of tooth #9.

The original Blue Sapphire bite was now reused again. I placed a luxabite wash (Zenith/DMG) over all of the prepared teeth in the Blue Sapphire bite and inserted this into patient's mouth on the upper arch. The patient was then instructed to close into the bite. Shimbash measurements verified that full closure into Blue Sapphire bite occurred.

The remaining teeth on the upper arch were now prepared. The teeth were prepared with shoulder margins. The final impression of the upper arch was made using Impregum (3M ESPE) and the Schreinemaker trays (Accu-Liner products).

The mandibular teeth were now prepared again leaving the temps on teeth 18 and 31 in place and teeth 24 and 25 unprepared. A bite registration wash using Luxabite was now introduced to the mandibular side of the Blue Sapphire and the patient again closed into the bite registration. The Shimbash measurement again verified that patient fully closed into bite registration.

The remaining teeth were now prepared and a final lower impression was made. Now that upper and lower teeth were prepared, bite registration created, final impressions taken; I then took upper and lower stump shades. I also took photos of the prepared teeth to guide the lab.

Provisionals were fabricated by loading shade B1 Luxatemp into the triple tray Silk-Tech stent (Ivoclar Vivadent) made from the upper and lower wax-ups mounted on the Accu-Liner. The patient closed into the upper and lower stents and Shimbash measurement was again verified after the temporary set. The teeth previously had Vaseline applied to them so the temporary stents were removed from the patient's mouth with the Luxabite still in tact in the stent. The Siltech was bent backward and the final full arch temporaries were teased out of the stent. They were now accurately trimmed to precise margin fitting and tried back into mouth. They were closely inspected for marginal fit and in particular verification of quality gingival embrasure space for proper provisional cleansing. It is ideal to have embrasure areas allow for Super-floss (Oral B) to be used daily. I also give my patients a complimentary Water Pik (Water Pik) so they can irrigate the gingival tissues while in the temporary stage. I recommend a solution of water, Listerine, and a few drops of antibacterial hand soap as a mixture to reduce bacteria and eliminate seepage on my bonding visit. (Figures 17 and 18)



Fig. 19: Full mouth reconstruction completed to corrected occlusal plane.



Fig. 20: Patient smiling with complete full mouth reconstruction.

One day after the preparation visit the patient returns. We adjusted the occlusion and smoothed rough spots on temporaries. The final decision as to the tooth shade and length keys off the temporaries. In other words, do we want teeth same shade, lighter or darker? Same length, longer or shorter? We confirm length and shape of temporaries with the patient and note this. I then prepare a color map, make tooth selection from smile design catalog, and include stump shade. An impression is taken of upper and lower temporaries and photos of patient relaxed and smiling from the front and side. Finally I tell the lab (Ocean Ceramics www.oceanceramics.com) what occlusal scheme I want for final design. This determination is made from the steepness of the eminence of the jaw joint fossa and the prediction of how the condyle will translate upon opening. All of this info is essential for the lab to make a great final restoration case for your patient.

Cementation

On this case my posterior bridges were authentic porcelain pressed to a high noble gold framework. All of the other restorations were layered authentic porcelain using the W+ ingot. The temporaries were sectioned and removed. The preparations were all cleansed with consepsis scrub (Ultradent) followed by consepsis liquid. The upper bridges were tried in first. Then each individual unit was tried in independently and then as a group to check contacts.

The anteriors were now placed with try-in paste to allow for patient viewing and acceptance. Upon patient acceptance, the restorations were thoroughly rinsed and etched for 45 seconds with 37% phosphoric acid. They were then coated with Silane Primer (Kerr) and then loaded with the transparent shade Variolink (Kerr) bonding resin. They were then placed in the

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crown and bridge organizer (C&B Organizer) to maintain a light free environment prior to bonding on the teeth.

The upper right and left bridges were cemented in place using Fuji II (GC) cement. Rubber dam was placed using the trough format and the palate was sealed with bite registration material to control bonding field and eliminate any oral saliva or vapor contamination. Bonding followed standard 12 second etching, Ultracid wetting agent (Ultradent) and application of Optibond Solo Plus (Kerr). I like to start bonding by placing the 2 central incisors first. I spot tack them with my laser and remove excess bonding resin. The remainder of the arch is now bonded 2 units at a time, e.g., lateral, cuspid one side, then bicuspid, bicuspid. Final curing was now performed using 2 lights simultaneously (one buccal, one lingual). The mandibular arch was now placed in similar fashion. At this time only minor obvious occlusal adjustments were performed. (Figure 19)

Final Adjustments

The next day patient returned to my office for final cleanup of excess residual bonding resin. At this time we started occlusal balancing utilizing the T-Scan II system (TekScan).

This computerized system records the timing of occlusal contacts and the forces and their location that are generated. I used this Tscan system to analyze my patient's occlusion and make adjustments based on timing and forces generated.

With this system I can verify objectively the accuracy of my occlusal adjustments versus what feels good to the patient. When my patient reached optimum occlusal balance and timing she was dismissed. In my practice we reassess the occlusion and the TMJ complex 1 month, 6 months, 1 year post insertion of the restorations. The assessment is done with the Tscan II system and

the electro diagnostic equipment (BioResearch). These modalities are indispensable in my diagnostic and treatment protocols.

Conclusion

This patient was initially diagnosed as a Type II dental signs and no symptoms category. She had several occlusal signs of dysfunction as well as aesthetic concerns. Her subjective history along with radiographs, electrodiagnostics and clinical exam confirmed no existing symptoms present with her TMJ complex. The patient went through a comprehensive evaluation from which a diagnosis, treatment plan and prognosis were established. This is necessary prior to embarking on comprehensive restorative care. This patient's stomatognathic system as predicted before treatment has been verified objectively 6 years following treatment. The patient's full mouth reconstruction is occlusally balanced and functioning great. Her overall TMJ complex and whole body physiology is symptom free. (Figure 20)

About the Author

Dr. Jim Beck is an international speaker/teacher on the subjects of diagnosis and treatment of TMD, occlusion, and full mouth reconstruction. He has shared his knowledge on PC-enhanced diagnostics, full mouth reconstruction, TMD and Tscan computerized occlusal treatment with many professionals through international lectures and in-house seminars. Having successfully treated numerous full mouth reconstruction patients, he is an expert in diagnosis and treatment modalities to achieve optimal cosmetic and functional results. Dr. Beck is a Diplomate with the American Academy of Craniofacial Pain, a Fellow with the International College of Craniomandibular Orthopedics, a Fellow with the International Association of Orthodontics, and a Mastership in Electrodiagnostics. Dr. Beck's focus continues to be improving his knowledge and sharing this knowledge training doctors and their staff on the advanced treatment modalities you've seen here. Dr. Jim Beck can be reached at 719-543-9797 or drjbeck@comcast.net.

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PRECISION BASED

Kenneth Koch, D.M.D.

Everyday restorative dentists are creating precision in their practices. Precision in their restorations, precision in their prosthodontics. So why is it that we have not been able to develop predictable precision in our endodontics? Well, the fact is we are now able to develop precision in our endodontics through the concept of synchronicity. Synchronicity is the precise matching of a gutta percha cone to the shape created by rotary instrumentation. This concept is additionally applied to the absorbent paper points used in the procedure. However, to fully appreciate this concept we must review the types of shapes created by rotary files.

There are currently two popular methods available to prepare (shape) a root canal. The first is to use a series of files that employ a common tip size, but have varying tapers. For example, a 20/.10 file followed successively by a 20/.08, .20/.06, and eventually a 20/.04 file. The ProSystem GT employs a variable taper sequence as do a number of other file systems such as the Quantec and RaCe.

A second option is to use a constant taper file, with variable tip sizes. For example, a 35/.06 followed by a 30/.06, 25/.06, and finally a 20/.06. Two currently popular file systems that employ a constant taper are the Profile and the EndoSequence file.

Both of these techniques do a great job in cleaning and shaping the root canal system. However, one methodology is strongly preferred by endodontists. This is the constant taper preparation. What is it about a constant tapered preparation that makes it the choice of specialists?

When you think about it, a variable taper sequence is nothing more than a step-back preparation from the opposite end of the tooth. As the result of better manufacturing, we now have the ability, with constant taper files, to create predictable, reproducible shapes. A variable taper sequence, on the other hand, results in a different shape each time you do a root canal. The result? A lack of reproducibility that will make obturation more challenging. This lack of shape reproducibility is why most variable taper preparations are filled with a thermoplastic technique.

The first key to creating endodontic synchronicity is to shape canals with a constant taper preparation. The second key is to use an efficient rotary instrument that has the ability to actually machine (or mill) a preparation. The EndoSequence file by Brasseler USA fulfills both of these criteria.

The fact that the EndoSequence file allows us to “mill” a preparation is important because what comes along with the idea of milling anything, is the concept of precision. Actually, the key to the success of the EndoSequence file lies in its manufacturing and design. Let's take a look at some of its features.

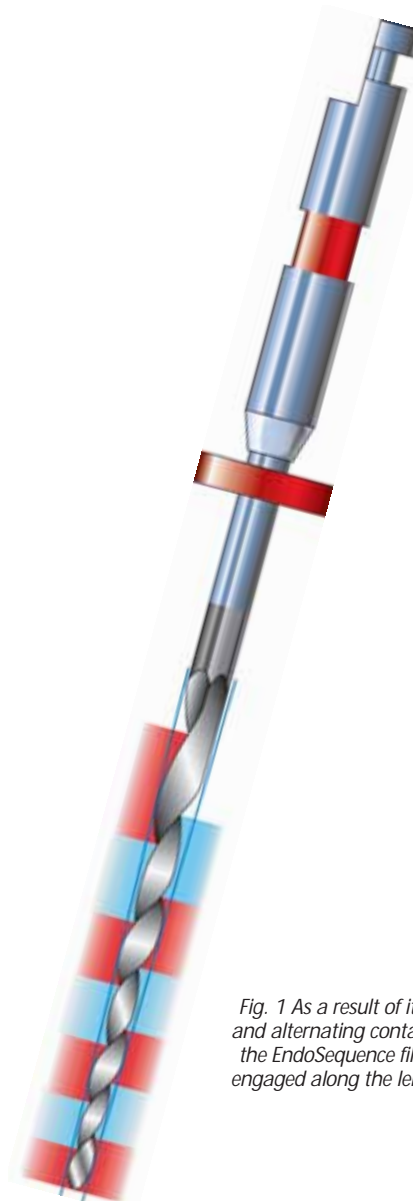


Fig. 1 As a result of its reamer design and alternating contact points (ACPs), the EndoSequence file is never totally engaged along the length of its shank.



Fig. 2 The tip of an EndoSequence file after electropolishing.



Fig. 3 EndoSequence gutta percha organizer.

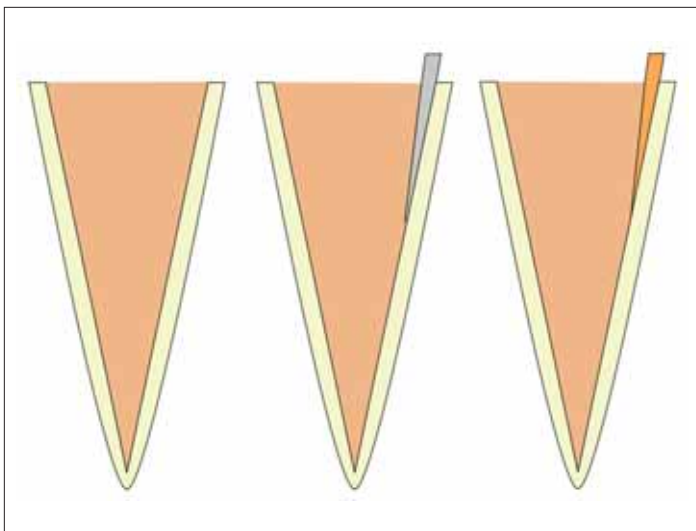


Fig. 4 Demonstration of a confirmation cone alongside the primary cone.



Fig. 5 An example of a mono bloc achieved with Activ GP.

Blank Design

The blank design of this file is a departure from previous generations of rotary files. This is because the EndoSequence file is not a file. It's a reamer. The blank design (triangular) is that of a true reamer, not a file.

Furthermore, the instrument has been designed in such a way that there are alternate contact points (ACP's) along the cutting surface of the instrument. This design not only keeps the file centered in the canal, but the alternate contact points limit engagement and thereby reduce the torque requirements of the file. Consequently, as a result of its reamer blank design and alternating contact points, this file is never fully engaged along its entire length. In a sense, alternate contact points (ACP) combine the most significant benefit of a variable taper method (reduced engagement) and provide it on a constant tapered instrument. The result is getting the best of both worlds, reduced engagement and a reproducible constant taper preparation.

There are additional benefits to the ACP design. Because the alternate contact points, in combination with a non cutting (precision) tip, keep the file centered in the canal, there is no need for radial lands. This is important because the lack of radial lands allows the instrument to be sharper and consequently more efficient. Also, the lack of radial lands, means an increase in instrument flexibility.

Electropolishing

Historically, most nickel titanium files have been polished in a drum. However, the EndoSequence file is not finished in a drum. It is, in fact, electropolished. Electropolishing is an anode-cathode process that electrolytically removes grinding imperfections, by removing a microscopic amount of material. The result is that electro polishing removes many of the imperfections in the nickel titanium instrument that can lead to unexplained separation. Additionally, the creation of a superior finish will keep the edge of the instrument sharper, cleaner, and more durable. The result is a rotary file with more cutting efficiency and increased resistance to wear.

Due to the multiple advantages of this process, it is our hope that other manufacturers follow our lead and begin to electropolish their files. Everyone benefits from this technology, including the patient.

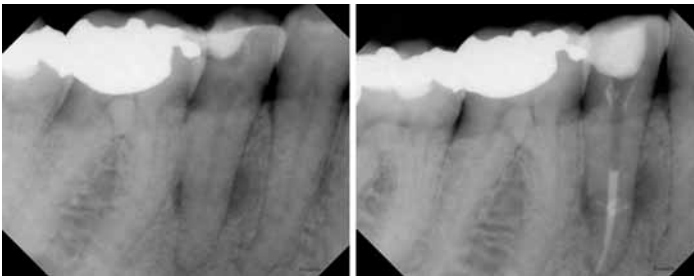
Tip Design

One of the key components in performing safe endodontic procedures is to use a file with a non cutting tip. Consequently, the EndoSequence file utilizes a precision tip. A precision tip is, by definition, a non cutting tip that becomes fully engaged at D-1. The result is safety (non perforating) combined with efficiency.

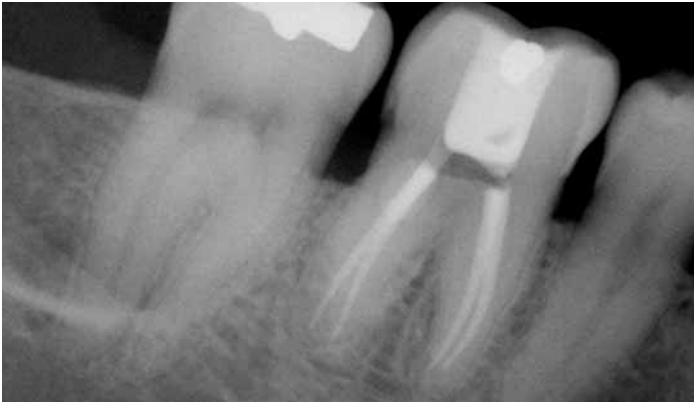
Having discussed some of its design features, let us now look at its performance.

The EndoSequence file has superb cutting efficiency. What gives this file increased efficiency is its reamer design (lack of radial lands) combined with electropolishing that results in its extremely sharp edges. This file cuts so well that the clinician must be aware to clean the file after three engagements. Each file should work in the canal for no more than 2-3 seconds before cleaning or moving to the next sequential instrument.

Additionally, this instrument has been shown repeatedly through test cases (both clinically and bench top) to work best in a range of 500 - 600 RPM. The ideal speed may vary a little according to personal preference and engine. Every engine seems to have an optimal RPM for specific files.



Case IA mandibular premolar demonstrating the precision of synchronicity.
Dr. Ali Nasseh, Boston, Ma.



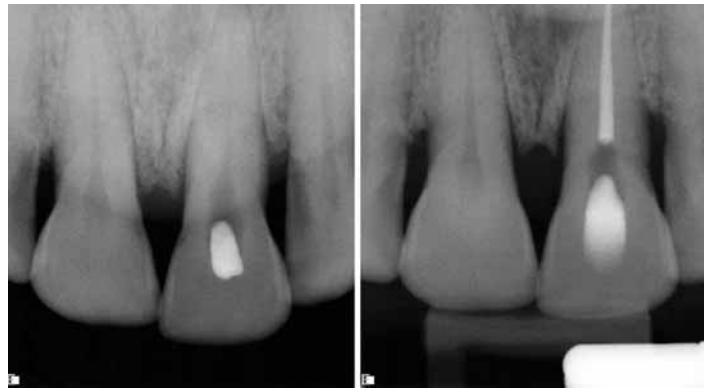
Case II Precision milling of the canals utilizing the .06 taper EndoSequence rotary files.

Some clinicians may be hesitant to run these files at an increased rate of speed. In this case, the following formula may be helpful. $E = T \times S$. This means that the energy required to remove dentin (E) is a function of both torque (T) and speed (S). Consequently, if the torque requirements are reduced, the file can be run at a higher RPM. The rationale to go to a higher RPM (whenever possible) is that the increased rate of speed allows for more tactile awareness and consequently, greater precision. This combination of efficiency, tactile feel, and a constant taper preparation gives us the ability to produce predictable shapes. This is a giant leap forward in creating endodontic synchronicity. The next challenge is to create paper points and gutta percha cones that will precisely match the shapes created during the instrumentation procedure.

Historically, gutta percha cones have varied significantly from one manufacturer to the next. They not only differ in proprietary composition, they can differ in true finished size (one to the other). This variation can be a serious impediment when fitting master cones to machined, tapered preparations.

Another limitation has been the historical lack of stiffness in gutta percha cones. Too often, gutta percha either collapsed at the end (especially in small sizes) or doubled back on itself. The EndoSequence system addressed these challenges by making the gutta percha cones stiffer. In fact, these cones can be pre curved by the clinician.

History has shown that there has been significant variation in size among ISO gutta percha cones. However, this has now been solved because all EndoSequence cones are laser verified to confirm their size and taper. The laser verification process is, very significant because it gives us the ability (for the first time) to have tapered gutta percha cones consistently match the shape of the preparation. It gives us the precision we have been looking for in our endodontic procedures.



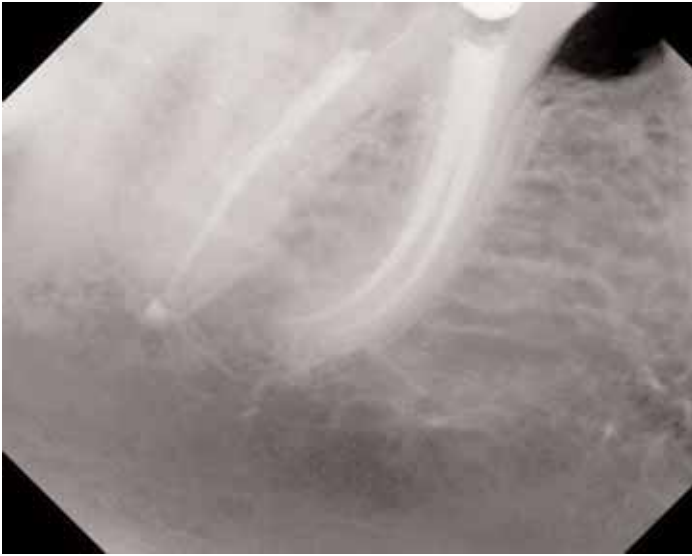
Case III Excellent synchronicity in a central incisor. Activ GP

Clinically, the concept of "synchronicity" is straight forward. After the preparation has been completed and fully dried, obturate the canal with the matching (laser verified) EndoSequence master cone and the technique of your choice. When one becomes familiar with this technique, you may find that some smaller canals may, in fact, be filled with a single cone. However, even in these cases it is recommended to try and place an additional cone next to the main one. This is a modified single cone technique. Simply insert a D-11 spreader alongside the primary cone and generally it only goes down about 4 or 5 millimeters. Place an additional cone (fine or # 15) into the channel that was just created. This is known as a confirmation cone. To complete the case, burn off the gutta percha at the orifice and apply some vertical condensation.

For those clinicians interested in a true mono cone obturation technique, there is the Activ GP system. This system utilizes improved material science and glass ionomer technology to develop an obturation technique that delivers a mono bloc result. A mono bloc is necessary if we are ever going to get a true hermetic seal to the root canal system. The Activ GP system uses gutta percha cones that are coated with glass ionomer at a thickness of two microns. The coated cones are also laser verified to ensure synchronicity with a constant taper preparation. The Activ GP sealer (glass ionomer) bonds to the canal wall as well as to the coated gutta percha. The result is a mono bloc from wall to primary cone.

This article has discussed the concept of endodontic synchronicity and how to achieve it through precision based procedures. Synchronicity is attainable for the greatest majority of practitioners and is the absolute key to developing precision in endodontic procedures. The following cases illustrate both concepts.

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Case IV Mandibular molar filled with Activ GP.
Dr. Ali Nasseh, Boston, Ma.

About the author

Dr. Ken Koch received both his D.M.D. and Certificate in Endodontics from the University of Pennsylvania School of Dental Medicine. He is the founder and past Director of the New Program in Postdoctoral Endodontics at the Harvard School of Dental Medicine. Prior to his Endodontic career, Dr. Koch spent ten years in the Air Force and held, among various positions, that of Chief of Prosthodontics at Osan AFB and Chief of Prosthodontics at McGuire AFB. In addition to having maintained a private practice, limited to Endodontics, Dr. Koch has lectured



Case V Endodontic synchronicity achieved utilizing the .04 taper EndoSequence rotary system.
Dr. Alex Fleury, Dallas, Tx.

extensively in both the United States and abroad. The author of numerous articles on Endodontics, Dr. Koch maintains a faculty position at Harvard. Dr. Koch is a co-founder of Real World Endo.

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ARCH-WIRE RETAINED PONTICS

An Esthetic Solution During Orthodontic Therapy



Joseph Sandberg, DMD, MAGD

As restorative dentists, we often treat patients with missing anterior teeth who are undergoing fixed orthodontic therapy. Although trauma, caries, or periodontal disease can result in the loss of any tooth, it is not uncommon to find congenitally missing maxillary lateral incisors. This article will address an esthetic and patient-friendly interim means of replacing missing maxillary lateral incisors. The technique is both easy and cost effective.

Required armamentarium:

- Orthodontic bracket and elastic ligature tie
- Hybrid composite
- Clear plastic crown formers
- Self-cure or dual-cure bracket or composite cement

Procedure:

1. Make alginate impressions and pour stone models. It is advisable to remove the archwires prior to taking the impression. This will allow easy removal of the alginate with out disturbing the brackets (See Figure 1).
2. Select a clear plastic crown former as a laboratory procedure using the stone models. Trim gingival areas as required. Leave at least 3-4 mm facially and apical to the alveolar ridge and align gingival margin with adjacent teeth. You can also create a slight ridge lap buccally and palatally. This will prevent rotation of the pontic when secured to a round archwire (See Figure 2).
3. Clinically, try the crown former in the mouth and check for interocclusal clearance. Select an appropriate shade of a hybrid composite. Fill the crown former with selected composite, place in the mouth to contour the undersurface against the alveolar ridge and light cure (See Figure 3).
4. Remove from the mouth and peel off the crown former after slicing with a scalpel or sharp blade. Shape, trim and polish the pontic as desired.
5. Reposition the pontic in the mouth and mark the location of the archwire on the pontic with a lead pencil. This will index where the bracket should be placed inciso-gingivally.



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6

6. Remove from the mouth and place a bondable bracket in the correct position to align the bracket slot with the scribed pencil line and centered mesio-distally. Mark the periphery of the bracket pad with a pencil on the pontic. (See Figure 4)
7. Use a high-speed handpiece to prepare a 1 mm deep well that the bracket will seat into for retention. This will allow securing of the bracket to the pontic using any self-cure or dual-cure bracket or composite cement. (See Figures 5 and 6)
8. Once the bracket is secured, attach it to the archwire using a matching elastic ligature and check occlusal contacts. Eliminate all occlusal contacts where feasible. (See Figure 7)



Fig. 7

Replacing missing teeth during orthodontic treatment can be challenging to do with fixed appliances. This technique offers an easily fabricated, low-cost, and convenient alternative.



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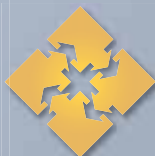
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