COSMETIC DENTISTRY
BEAUTIFY & BALANCE BITES WITH T-SCAN™
The Mysteries of Occlusion Revealed in 3 Cosmetic Cases
INTRODUCTION

If you’re reading this, you probably have a keen sense for the mystery surrounding occlusion in your practice. Nancy Drew or the Hardy Boys would have a tough case on their hands if they were to try to solve the case of “what part of the occlusal scheme is damaging your dentistry.” Broken crowns, chipped veneers, TMD symptoms—at what point does one investigate the occlusion?

For many dentists, it’s after the damage is done.

Function and aesthetics rely on a balanced, harmonious occlusion. But unless you’re able to measure occlusion and identify it as the suspect behind cosmetic dental work failures, you may waste precious time and resources hunting for other clues. Luckily, T-Scan™ is here to help. T-Scan is a digital occlusal analysis system that removes the mystery, revealing the truth behind how teeth are coming together in the mouth. All the evidence is captured by T-Scan’s sensor and transferred to the software to show the force and timing of teeth as they occlude—like finding a fingerprint at the scene of a crime.

In this eBook, you’ll explore three cases showing occlusion’s role in full mouth rehabilitation, orthodontics, and veneers. Three different dentists will show you the ways T-Scan helped in the prevention, diagnosis, and treatment of these particular cases. You will gain insight into bite force dynamics, treatment protocol, and the different ways you can incorporate occlusal analysis into your practice.

Continuing education instructor and cosmetic dentist, Dr. Kevin Winters, DMD, relies on T-Scan to show him what he can’t see with the naked eye:

“T-Scan allows you to handle problems that you didn’t know existed, or see things that aren’t quite right from a symptom standpoint. It boils down to occlusion. When you have that information, you are able to handle these problems. Throughout my courses and in my daily practice, I’m able to use T-Scan to help finish cases and perfect bites.”

For anyone working in cosmetics, whether it’s general aesthetics or orthodontics, you don’t have to be Sherlock Holmes to develop a strategy that incorporates occlusion into the cosmetic treatment protocol. You need T-Scan and the principle understanding of occlusion’s role in your everyday dentistry.
If you’re new to T-Scan, you may be thinking about your stock of occlusal indicators back at your office. These are the “standards of care” you were taught to use in dental school:

- Articulating paper
- Shimstock foils
- Waxes
- Bite registration materials

These tools require your subjective “best guess” interpretation. T-Scan provides objective data: facts about the forces on each tooth, when they touch, for how long, and how hard. Using technology for occlusal analysis is one of the most highly underrated practices in dentistry today.

Take it from Dr. Terry Alford, DMD:

“If you place a piece of articulating paper into a patient’s mouth, it’s going to make some marks on the teeth. It tells you where the forces are, but it doesn’t show you how long or how much force is being applied—and it never will, because it isn’t technology. T-Scan, on the other hand, has pressure measurement sensors for occlusal evaluations—they are so accurate it’s incredible. I am adamant about this, because in my practice over the last several years, I’ve seen incredible improvement in my patients’ quality of life. At one point, I did believe I had articulating paper down to a science. I would use it on my patients and wonder why I still couldn’t fix certain issues. With my dental technology tools, however, I am able to accurately observe and treat malocclusion.”

While we can all accept that T-Scan does have the ability to solve occlusal mystery, read on in the preface to understand how this occlusal paradigm quietly lurks in the background of every dentist’s office...
Dogma – a principle or set of principles laid down by an authority believed to be incontrovertibly true.

Since graduating from dental school in 2005, I have been searching for the Occlusion guru. To say my dental school education in occlusion was less than satisfactory in preparation for clinical practice would be kind. Like many dentists, I have happily skipped down the yellow brick road, enthusiastic to reach the Emerald City and soak in the wisdom of the all-knowing Oz.

I thirst for knowledge because anything I can learn to bring better treatment to my patients is worth the investment. Too many times I have experienced the shock and disappointment like Dorothy did when she realized the guy behind the curtain was … just a guy. In occlusion, there are many gurus to choose from: centric relation, neuromuscular, biopsychosocial, joint-based occlusion, including a few gurus that state occlusion is not important to TMD. It is true that all the philosophies bring information forward and all can help patients some of the time, but none can help every patient, every time.

Whether you are a general dentist, pedodontist, periodontist, endodontist, orthodontist, oral surgeon, or a prosthodontist, the forces and principles of occlusion are at work in your practice, regardless of the importance you place on them. In fact, the only dentists who do not have to concern themselves with occlusal forces are oral and maxillofacial radiologists and pathologists.

Although occlusion is passionately debated, it tends to be more defined by “this is what works in my hands,” rather than a common unifying concept that holds true across the profession. What do you believe to be true? Are you sure what you believe is the truth, or do you believe it to be so because you were taught it was true and never looked any further? The question is not meant to be judgmental, but rather to inspire in you a moment of professional reflection.

We have all experienced cases that, when completed, worked without a hitch, while others, when completed, we struggled to gain occlusal acceptance and comfort for the patient, wishing we could have a “do over.” Patients may have fractured porcelain, or developed symptoms after the restorations were delivered, where it was the “lab’s fault,” right? And all of these post-insertion complications arose despite using the same lab, occlusal materials, and clinical protocol.
Analog occlusal indicators like shim stock, articulating papers, waxes, and bite registration materials are used throughout all of dentistry. Articulating paper is, arguably, the most ubiquitous. It is considered the “standard of care” for how dentists gather data about the occlusion. I remember being taught in dental school how to “read the marks.” The bigger or darker the mark, the higher the bite force. And a bulls-eye shaped mark indicated even more force was present because some of the ink got wiped away. Unfortunately, there is nothing published to scientifically support what I was taught.

Importantly, one might be surprised to know there is a limited amount of published literature describing articulation paper’s use as a viable occlusal indicator. In fact, the literature does not support articulating paper as being accurate or reliable. Carey et al.\(^2\) using 600 paper marks, showed no direct relationship could be found between paper mark size and applied occlusal load. The authors concluded when clinicians select teeth to adjust, they should not assume the size of paper markings can reliably describe a contact’s force content\(^2\). Qadeer et al.\(^3\) showed that the largest paper mark in a quadrant was on the most forceful tooth in that quadrant only 38.3% of the time.

These findings indicate that the majority of the time, the largest paper mark in a quadrant is not the most forceful contact. Schelb et al.\(^4\) found that paper mark size is proportional to paper thickness, not to the applied occlusal load. Similarly, Saad et al.\(^5\) used articulated epoxy casts to crush articulating paper at three distinct loads (50 N, 100 N, and 150 N), where the resultant paper mark sizes did not appreciably increase, despite the load doubling and tripling. The authors found that as the load doubled and tripled, the paper mark sizes decreased, instead of going up in size. The study reported that paper thickness resulted in the different paper mark size differences, which is unrelated to the applied load. Confounding things further, articulating paper demonstrates a high degree of making false positive markings\(^6\).

Kerstein and Radke\(^7\) asked 295 dentists to look at the same paper markings, and found clinician interpretation of the paper marks varied widely. Their study revealed the 295 dentists chose correct contacts only 12.8% of the time when using the principles of mark size and color-depth as indicators of occlusal force levels. Importantly, 95% of all participants scored 3 or less correct out of a possible 12, where many of those participants scored 0 out of 12 correct.

No literature exists that supports the measurement of occlusal force or occlusal timing can be accomplished with analog occlusal indicators, including articulating paper. One might conclude that current belief systems surrounding paper mark interpretation have been a contributing factor in the widespread disagreement on occlusion.
Alternatively, the T-Scan™ system (T-Scan I–9; Tekscan, Inc. S. Boston, MA, USA) has demonstrated 95% force distribution reproducibility per subject from intercuspation to intercuspation. The T-Scan has a near-perfect linear correlation of 0.9995 when measuring and reporting on occlusal contact timing. This digital occlusal analyzer affords a clinician a more accurate dataset to base any occlusal adjustment process on, when compared to the use of analog occlusal indicators, which are subjectively interpreted.

Right now, some of you reading this might be wrestling with a little “cognitive dissonance.” This is the mental conflict that arises when belief systems are challenged or contradicted with new information. Instead of greeting new information with an open mind, we reject the information to rationalize our own beliefs instead of employing the new information and making it work for us. An example of cognitive dissonance would be something like, “I have not had a T-Scan thus far in my career, so what I am doing must be good enough.” It is this thought process that prompted Plato to write his “ Allegory of the Cave” some 2500 years ago. The lessons gleaned from the cave are as relevant now as they were then. Instead of embracing the light, and openness for new experiences and knowledge, we return to the darkness and familiarity of what we know.

The entire dental marketplace is changing from analog systems to digital. One example of this transition is dentistry moving away from 2D film-based x-rays towards 3D digital cone beam radiographs. This allows computer guided implant surgery using milled stents for greater control. This change has occurred because those placing implants wanted a better result for their patients by embracing the advantages of technology.

If I were to advocate a common unifying concept, it would be to measure occlusion as much and as often as you can, regardless of your occlusal paradigm. Once you do this, you will be left with the uncomfortable realization that some of what we were taught is not correct.

“When Kepler found his long-cherished belief did not agree with the most precise observation, he accepted the uncomfortable fact. He preferred the hard truth to his dearest illusions. That is the heart of science.” - Carl Sagan

As you venture into this eBook, prepare to unlock the mysteries of occlusion as it relates to cosmetic dentistry. Throw on your hygienic spy gloves and don your Holmes-esque cap, because today you’re an occlusion super sleuth!
Case 1: Full-Mouth Fury
Perfecting the Bite Throughout a Full-Mouth Reconstruction Case

Dr. Ben Sutter DMD, FAGD, FICCMO, LVIF

Dr. Sutter graduated Rutgers School of Dental Medicine in 2005 and currently has a private practice in Eugene, OR. Since then, he has extensively studied occlusion by completing coursework at the prestigious Las Vegas Institute for Advanced Dental Studies, the Piper Education and Research Center and is a certified Perfect Bite Doctor. He has spent the last 7 years devoting himself to the treatment of occlusion and TMJ Dysfunction.
In this case, we’ll follow a 61-year-old male patient who’s an executive with a high-stress job. He came into my office for a regular cleaning and my hygienist, who is very aware of occlusal disease, notes that his four front teeth were loose—they wiggle a lot. There’s no sign of inflammation or decay, and while he does have a few fillings here and there, nothing stands out as an obvious tooth issue.

But as you can see in this first image, he has abfractions on tooth #7, a bit on #8 and #6 has been repaired. He has some bone loss on #19, and additional abfractions on teeth #20, and #21.

On #30, he has a huge abfraction that’s been patched. The patch is still good, however, occlusal factors are clearly taking a toll. At least that’s what the signs and symptoms tell me.

In the second photo, you can see the teeth opposing the loose front four have some pretty serious wear and tear. Tooth #8 is so thin here that you can actually see right through it.

I feel it is important to obtain a complete set of radiographs to see everything. Here are his x-rays:
There’s a faint black line around the root of the tooth called the periodontal ligament—it holds the tooth into the bone. When you compare it to the bottom opposing teeth, there is no widening of the periodontal space. These teeth are not mobile; they’re solid as a rock. The spaces around the front four teeth are filled with elastic tissue, so these teeth do move. In fact, when the patient bites his teeth together, those upper teeth push outward. This indicates there is fremitus.

Teeth #7-10 demonstrated Class 3 mobility which means they’re depressible in the socket. If you pushed his front teeth upwards, you could actually push them into his skull. That’s how mobile these four teeth are! Obviously, there is a problem.

On his upper cast, there is definite ledging present on the lingual aspect of teeth #7-10. These teeth are weak. The patient must choose a treatment course: undergo either orthodontics to create an ideal occlusion, or a full mouth reconstruction. He could also live in an orthotic to take pressure off the four upper anterior teeth, or choose to do nothing, and risk eventually losing these teeth due to repetitive occlusal trauma.

Eighteen to twenty-four months in braces isn’t going to work; he’s a frequent traveler and involved in numerous public speaking events. Ultimately, he decided on having a full mouth reconstruction, which would provide a lasting correction (because I have complete control over the whole occlusal design) and require less time than undergoing orthodontics.

At the start of the reconstruction, I used T-Scan to obtain a Multi-bite scan of his habitual intercuspation. He exhibited a left-sided bite force discrepancy that was consistent across all three intercuspations. Typically, the first time a patient occludes onto a T-Scan sensor, the patient can be hesitant, as they feel they might break it, so they don’t bite down completely during the intercuspation. However, the next two closures were definitely symmetrical, showing the same occlusal data.
Note the anterior portion of the T-Scan force data, where the patient is occluding directly on the lingual cervical ledges, which is why his front teeth are mobile. Also, note that the left side receives 76% of his overall bite force, which is definitely problematic.

First, I built him a removable appliance that kept his upper front teeth out of contact with the opposing teeth, so they could start to heal. We transferred his bite force to the posterior teeth, where it would be more evenly distributed from right to left. Over time, his teeth began to heal and tighten up. This improvement helped the patient to move ahead with definitive restorative treatment.

To start, we took impressions and a bite registration in order to thoroughly track his occlusion throughout the process. I replaced his top teeth with porcelain. I wasn’t convinced he was completely healed yet, so we held off on his lower teeth.

We fixed a tooth shaped orthotic onto his lower teeth, which would not dislodge during chewing. This prosthesis allowed the whole system to heal.

A fixed orthotic ensures the occlusion will align properly. A removable appliance is only therapeutic when a patient is wearing it—take it off and the patient would once again be occluding on his weakened front teeth.

After further healing, the lower arch was reconstructed and restored with porcelain. The patient stated this felt good. The mobility was gone, such that the anterior teeth firmed up because they were not taking the brunt of his occlusal force. There was quite a noticeable difference from pretreatment to post treatment, where even his gum tissue had improved. This is a really nice end result.
Now, let’s evaluate the T-Scan measurements made following this reconstruction. Scan #1 is from the day that I inserted the lower porcelain restorations. At this point, the patient believed he was occluding more to the left (which is what you would expect). However, he was actually favoring the right side that concentrated 69% of his bite force.

Nineteen minutes later, we took Scan #2, which showed that the Center of Force was fairly even bilaterally. I couldn’t believe it. I actually called up Dr. Robert Kerstein and was elated to report that I had just inserted a whole lower arch and completed the occlusal case finishing in 19 minutes.
I had one more follow-up appointment with him, when he reported that his bite felt great, and he asked me not to touch it. I told him I’d like to see him again in six months. His scan from November looked good, but when we met again in April we discovered he had reverted back to favoring his right side [Scan #3]. He reported that he could feel the discrepancy, but that he hadn’t broken anything and wasn’t experiencing any symptoms.

Once again, following further T-Scan refinements, within 20 minutes his occlusion was right back to where it was left after our initial treatment [Scan #4]. In general, I prefer to keep the left-to-right arch half-force distribution within a range of about five percentage points.
Not only is this an aesthetic improvement, but it’s also a functional improvement. It is often stated that form follows function, and that is true. Function takes priority. Teeth can look beautiful, but if they don’t work properly, all of the replacements will likely pop off.

Occlusion isn’t sexy. Cosmetic dentistry is, however, because you can blatantly see the results. Occlusion can’t really be seen with one’s eyes, but it can be visualized with the aid of occlusal measurement technology. Occlusion gets sexy fast when Disclusion Time Reduction (DTR) rids patients of pain and provides immediate results.

Honestly, I sleep at night because I know I have taken care of my patients’ bites. In fact, most of my patients will never need to wear an orthotic again because they don’t clench and grind. The point is this: the bite is fixed.

**Dr. Ben Sutter - Q&A:**

**Did you use articulating paper in conjunction with T-Scan to measure the bite?**

Of course I use paper marks as well. I have to know where on the tooth these points are touching and where exactly to adjust them in the mouth. I definitely use articulating paper, I just don’t rely on it solely.

**Is there a specific brand of porcelain you’d recommend for tooth replacements?**

It doesn’t really matter what you use. If the bite is right, you could essentially build this in empress (which is glass). I used Emax on my patients—these replacements are a more yellow/warm golden color at the gum line, and then as you move toward the incisal edge, it lightens up. Then when you get right at the edge it has a bit of translucency to it. These aren’t block-like monochromatic replacements. I personally like things to look more natural. For me, as a cosmetic dentist, that doesn’t look natural, and that’s not a true representation of what I try to build.
Case 2: Ortho Ordeal

Orthodontics & Occlusion: T-Scan as Part of Top-Notch Toolkit

Dr. Hoon Kim DDS, MSD, Diplomate, ABO

With an extensive background in orthodontics, Dr. Hoon Kim has designed a treatment philosophy all his own: HOON. Not only is this his first name, but it also stands for Harmony Of Orofacial Nature. Harmony of Orofacial Nature is the driving force behind Dr. Kim’s practice through which he helps individuals achieve an excellent, harmonious occlusion via orthodontic treatment. This fuels his ultimate goal of ensuring every patient leaves with a beautiful smile and improved quality of life.
A 23-year-old male came to my dental office with an unrelenting issue—he was referred by his mother who knew of my reputation through other TMD patients I had successfully treated. Upon examination, I identified several problematic factors: facial asymmetry, clicking of the right condyle, bilateral pain to palpation in the masseter and internal pterygoid muscles, a mandibular shift during opening and closing, a limited mouth opening of 35 mm, and bruxism.

After an initial clinical examination and patient interview, I collected precise, objective data through several measurement methods, including facial photos (frontal, smiling, and profile), intraoral teeth photos, and four radiographic series (both lateral and frontal cephalograms, a panoramic, and a TMJ series). In addition, stone dental casts and a Brux Checker were obtained. (Figures 1, 2, 3, 4).

This patient demonstrated an internal disk displacement with reduction, which informed my decision to establish orthopedic stability before initiating orthodontic treatment. He underwent three months of splint therapy, which successfully achieved orthopedic stability, eliminating the clicking sounds and pain upon muscle palpation. He could open and close his mandible without deviation, and the maximum opening increased to greater than 50 mm.

After he completed splint therapy, we took another set of measurements and determined comprehensive orthodontic treatment was necessary.
The patient exhibited a high-angle class III malocclusion, with facial asymmetry, and a skeletal transverse discrepancy. Dentally, he had both upper and lower mild crowding, a lower dental midline shift to the right, a posterior crossbite on the right side (with Class I canine and molar relationships), and Class III canine and molar relationship on the left side (along with a constricted maxillary arch).

To ensure both occlusal form and function, this patient required orthognathic surgery to address his facial asymmetry, the imbalances in his mandibular body length, and the deviation of the lower dental midline.

**Treatment**

I applied Metal self-ligation brackets (Smart Clips: 3M Unitek) with .018 slot and MARPE (Micro-implant Assisted Rapid Palatal Expander) to correct his posterior crossbite (Figure 5).

After aligning and leveling the upper arch teeth, I placed an anterior bite plate and two microimplants between the second premolars and first molars, which were used to align and level the teeth on his lower arch (Figures 6, 7, 8, 9).
I placed lower power chains from his lower canines to the microimplants along the upright canines, and finally to the lower second molars (Figures 10, 11, 12, 13, 14).
We went ahead and performed Orthognathic surgery with posterior impaction of the upper arch, combined with a mandibular set-back, a genioplasty, and reshaping of the mandibular angles (Figure 15).

MEAWs (Multiloop Edgewise Arch Wires) were used to establish excellent occlusion (Figure 16).

Fixed retainers were placed on his upper four incisors and the lower six incisors (Figures 17 - 21).
After three months, I performed occlusal adjustments with T-Scan. With this digital occlusal analysis tool, I measured the patient’s occlusal force balance, Occlusion Time, and Disclusion Time.

The black line in the Force vs. Time graph (to the right) should hover around 100% of Max Movie Force (MMF). This line should generally be horizontal at full occlusal force. If it undulates, the masticatory muscles are most likely exhibiting hyperactivity or hypoactivity.

At this time in the patient’s treatment course, occlusal examination with T-Scan, performed under physiologic conditions, did not detect any interfering tooth contact pattern from the patient’s potential parafunctional habit. Thus, a Brux Checker was employed to identify bruxism during sleep, and to verify the presence of posterior interferences from grinding (Figure 27).
Patients who have canine-protected occlusion during the day can exhibit a parafunctional habit at night. Patients with bruxism can have powerful muscle force, so following orthodontic treatment, the four incisors and canines should protect the molars during lateral excursions (or grinding), and the molars should protect anterior teeth during clenching.

The initial Brux Checker, taken before orthodontic treatment, showed there was a grinding pattern with posterior interferences occurring during sleep. Although post orthodontic occlusal adjustments accomplished with the T-Scan achieved a canine-protected occlusion (with a DT=0.21 seconds), a final Brux Checker taken after the occlusal adjustments still indicated there were posterior interferences present during the patient’s parafunctional habit. I marked this interference on the maxillary arch, and then adjusted the corresponding tooth surfaces (Figure 28).

After the occlusal adjustments, wraparound retainers were fabricated to remove this interference. These auxiliary tools maintained the well-balanced occlusion (Figure 29).

**Occlusal Measurements with T-Scan**

Following debanding, I used the T-Scan to measure the patient’s occlusion until the force balance, the Occlusion Time, and the Disclusion Time were within normal ranges. Often, orthodontic patients will come in for follow-up appointments to achieve optimal occlusal schemes.

After three years, the patient returned and we took another T-Scan measurement. As you can see, his bite force and timing have remained within acceptable ranges. With T-Scan, I’m able to validate and ensure the long-term success of my cases.
Case 3: Veneer Vexation
Balancing the Bite to Protect Veneers & Ensure a Long-Lasting Solution

Dr. Robert Kerstein DMD

Dr. Kerstein received his D.M.D. degree in 1983, and his Prosthodontic certificate in 1985, both from Tufts University School of Dental Medicine. From 1985 – 1998, he maintained an active appointment at Tufts as a clinical professor teaching fixed and removable prosthodontics in the Department of Restorative Dentistry. In 1984, Dr. Kerstein began studying the original T-Scan technology.

Dr. Kerstein has conducted original research regarding the role that occlusion and lengthy disclusion time plays in the etiology of Chronic Occlusal-Muscle Dysfunction. Recognized as a leading author and researcher in the field of Computerized Occlusal Analysis, Dr. Kerstein has published forty-five peer reviewed publications. Dr. Kerstein has authored four textbook chapters that highlighted the T-Scan computerized occlusal analysis technology. Dr. Kerstein maintains a successful private practice in Boston, Massachusetts, that is limited to prosthodontics, computerized occlusal analysis, and occlusal-muscle dysfunction.
This case details a 25-year-old female patient, who, three years prior to these photographs, had six maxillary anterior veneers placed. Unfortunately, over the three years of intraoral service, she experienced mid-facial cracking on two of the original six veneers.

This patient was obviously unhappy with the quality degradation of her original veneers and wanted to replace all six. Subsequent to the consultation visit, they were removed, new provisional veneers were fabricated, and then six final new veneers were seated after they were returned from the lab. As the coloring and esthetic shape were both correct, the six new veneers were bonded into place. The excess cement was removed, and the veneers were highly polished lingually where they met the tooth structure, and facially at the gingival margin.

Following veneer placement, it is essential to assess the occlusal function with the T-Scan, especially in protrusion. Veneers often require prosthetic force control, as their incisal edges are brittle, and too much occlusal pressure applied to the incisal edges can lead to both incisal edge failure and mid-veneer cracking, as was the case for this patient.
Using T-Scan data in tandem with articulating paper marks, the closure forces were analyzed, as was the protrusive interference timing sequence. These were the first measurements obtained after replacing her veneers.

The first T-Scan examination shows that excessively early closure forces occurred on the lingual aspect of veneers #8 and #9 at 1.389 seconds. Then, just before the “B line,” the forces worsen at 1.750 seconds. The incisal contact on #8 was the most problematic, demonstrating moderately high occlusal force. As such, teeth #8 and #9 required the first insertion corrections.

The second set of measurements were made of the protrusive excursion, which showed that early in protrusion there was low force uniformity spread across all of the veneers (at 3.646 seconds). However, later in the movement, the distal of tooth #9 became moderately forceful (see the light green/blue column), demonstrating more force than the other veneers at 3.260 seconds, just before the “D line.” This region of the #9 veneer required adjustment to reduce the comparatively higher distal force.
A third set of measurements was obtained after adjusting tooth #9 distal. This scan showed too much force being applied during the early protrusive movement on the distal incisal edges of #6 and #7, when the opposing lower teeth grazed across them. This protrusive force profile showed that #7 became forceful early in the movement at 2.580 seconds, which then later worsened when #6 began to take on more force compared to the other veneers at 2.676 seconds.

In the photograph, the paper marks at the distal incisal edges of #6 and #7 denote the problematic contacts. However, the paper marks do not illustrate that #6 and #7 are high force contacts, nor do they describe the sequence of overload present on the new veneer incisal edges. This is why T-Scan’s occlusal force and timing data are so important.
These final measurements were taken after correcting the occlusal forces on teeth #6 and #7 incisal. This T-Scan recording showed there were shared low forces on teeth #s 9, 10, 8, 7 and 6, all throughout the anterior segment during the protrusive movement. Although #9 had slightly more low-force present than was detected on the other anterior teeth, the intensity of all the protrusive forces was similar. This shared low-force occlusal profile will help to prevent the new veneers’ incisal edges from fracture, during both incising and shearing of food.

Ultimately, collecting occlusal force and timing data with the T-Scan during this veneer insertion helped identify potentially damaging uneven force rises on the new veneers at different points in the protrusive movement. When these problematic forces were moderated in sequence, the new veneer incisal edges were subjected to far less stress throughout the entire protrusive movement.
REFERENCES


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