Data Confirms What a Patient Feels:

A Case Report

An Implant Case Summary Provided by
Dr. Scott Keith, DDS, MS

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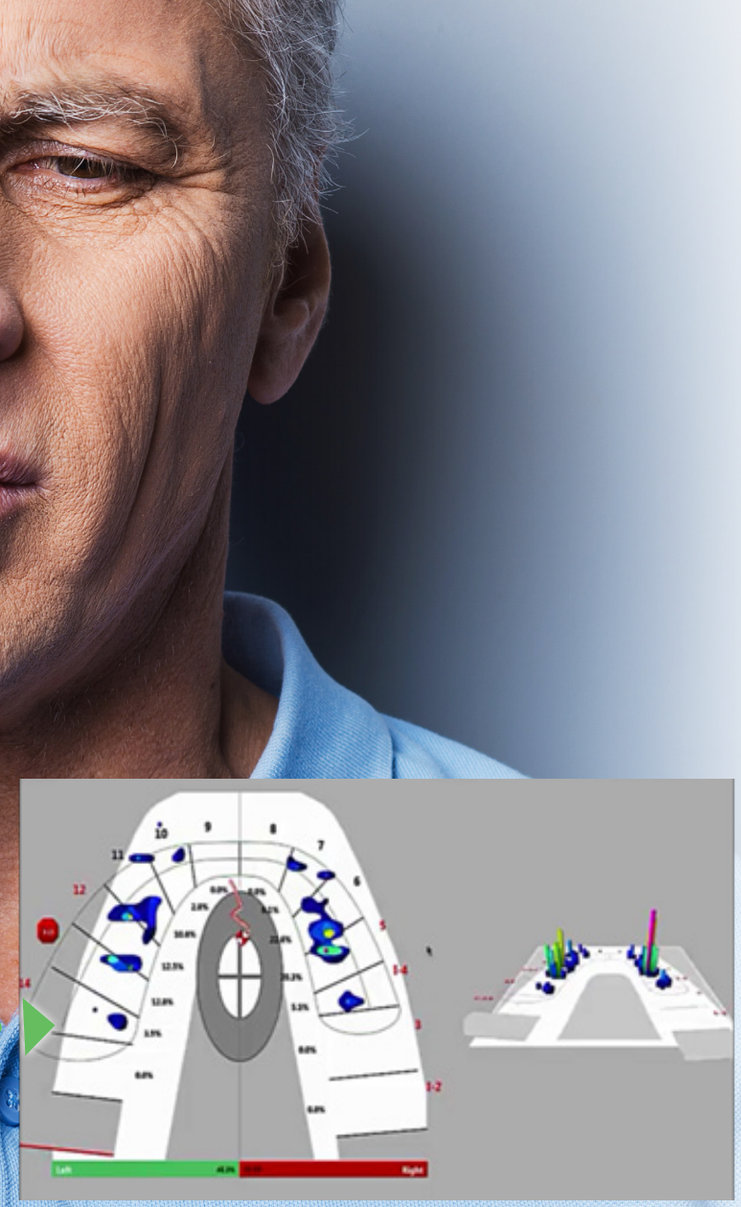

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Patient Overview

The patient is an interior designer in her early 60s, with very high aesthetic demands. She was in the middle of treatment when she presented for a second opinion with Dr. Keith. During this initial visit, there was no sign of active infection, and while her occlusal discomfort annoyed her, treatment at the time was not an emergent situation.

- **Had implants placed, but had concerns her teeth did not fit correctly.**
- **Reported constant headaches.** In fact, she removed the provisional bridge on her right side in order to sleep at night, but would wear it during the day.

After a little more than three years, the patient contacted Dr. Keith once again.

The patient reported she had completed treatment, which involved the **removal of two implants in the posterior maxilla and placement of four additional implants.** Once the final prostheses were delivered, she had returned to the office multiple times for repeated adjustment of her bite. Unfortunately, she reported that she still had a feeling that her face was crooked, her smile was off, and it was interfering with her quality of life.

The patient reported that she's very self-conscious and thinks people look at her funny because her bite is off. We completed a new clinical examination and made a new Panoramic Radiograph. In addition to the bilateral Maxillary posterior implant-supported fixed dental prostheses, the patient had a tooth supported FDP from 18 x x 21 and was now missing first and second molars on the lower right as well.

About the Author:
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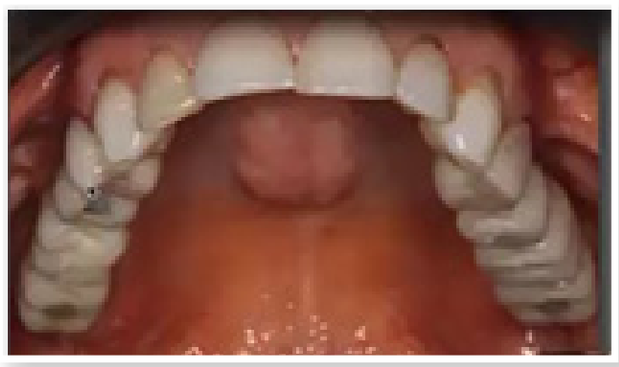
- Dr. Scott Keith received his DDS with valedictorian honors from the University of California, San Francisco in 1995. He then completed specialty training in Prosthodontics at the Baylor College of Dentistry and also earned a Master of Science degree in Oral Biology.
- Dr. Keith has published several articles and has presented his research into dental implants internationally.
- In June of 1998, Dr. Keith's work won the International Team for Implantology (ITI) Research Competition for his presentation at the ITI World Symposium in Boston. Dr. Keith was awarded a prestigious surgical implant fellowship by the ITI to further his training at the Harvard School of Dental Medicine, where he also maintained a faculty appointment teaching at the pre-doctoral and graduate levels.
- A board-certified fellow of the American College of Prosthodontists, Dr. Keith is also a fellow of the ITI, and a member of the Academy of Osseointegration, and Omicron Kappa Upsilon. Currently, Dr. Keith maintains a private practice in the **Dental Implant Center @ Walnut Creek**

“The Patient was Found to be Occlusally Sensitized.”

When asked to indicate which area of her bite is off, she immediately points to her upper right 1st premolar and says, **“This tooth is not right! I’m hitting harder. My jaw has to slide to close, and it’s making my jaw crooked.”** In this situation, it would not be advisable to start grinding down areas on this patient’s teeth without firm evidence to support those irreversible modifications to her bite. Once the first adjustment is made, you become the owner of those occlusal problems.

As the treating clinician, it would be unwise to say, based on subjective information, “In my opinion, here’s what’s going on and let me grind on your teeth until it starts to feel better to you.” **We simply bring out the T-Scan and show the patient the source of her occlusal discrepancy. We can then educate the patient along the lines,** “It’s not my opinion. It’s the computer sensor’s objective data that shows us where you’re hitting harder and where your bite might be coming together before the other teeth touch!”

Figure 1: Intraoral view and panoramic radiograph



Figures 2 & 3: Upper and lower dentition

“When We Reviewed the Data, We Found the Patient to be Absolutely Correct.”

We use the T-Scan Novus. The single red button on the handle allows the operator to open a new scan, as well as start and stop a recording. In addition, based upon what is observed on the bite force reading on-screen, one is able to adjust the bite sensitivity of the sensor right on the handpiece.

After explaining to the patient how the T-Scan bite sensor works, we were able to record her first bite force movie. When we then reviewed the data that was captured with the patient, we find that the patient was absolutely correct in identifying her prematurity contact on tooth #5 (**Figure 4**).

The software also shows implant warnings, telling us the implants are taking on stronger force, or earlier force than the surrounding teeth.

At this point, **the patient now recognizes the value of the technology being used to validate her concerns about the area of her bite that didn’t feel right to her**. A look of relief washed over the patient’s face as she was now finally being understood and she was confident her concerns would be addressed and corrected.

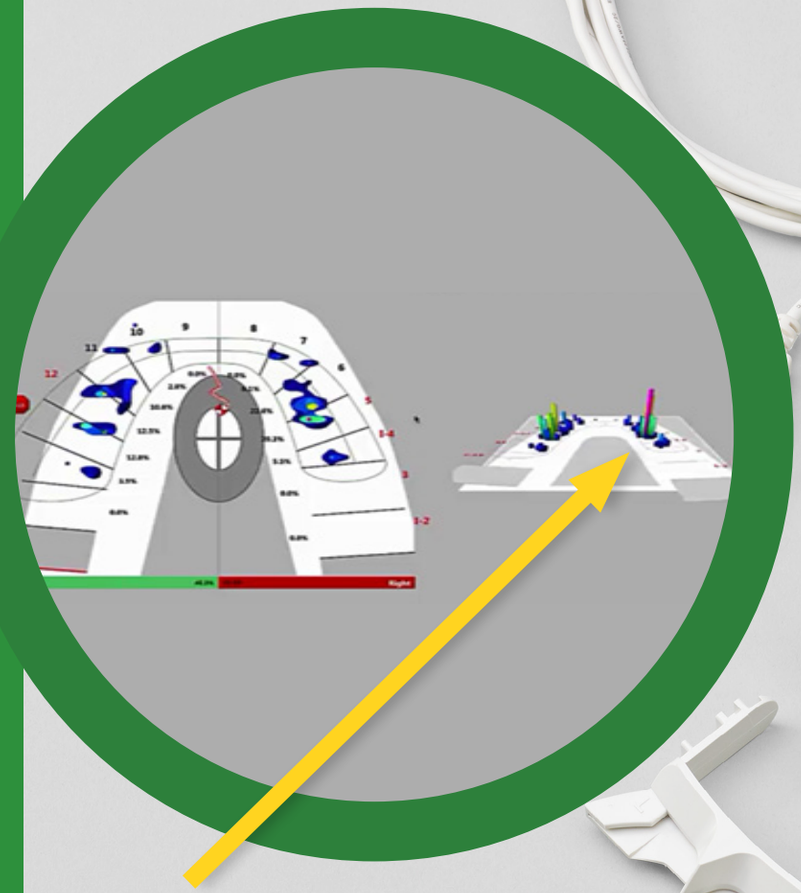


Figure 4: Premature contact identified on tooth #5

“This is a Big Leap Forward in Occlusal Evaluation, and is Exciting to See.”

Another feature of T-Scan is the ability to import digital impressions and overlay the force data. This is a Digital Intraoral Scanner (**Figure 5**) that we can use to scan the patient’s teeth instead of making traditional impressions. After scanning this patient’s teeth, the digital models are created in an STL file. We can take that STL file and import it into the patient chart with a feature in the T-Scan software.

Now, instead of looking at just a generic arch form, one can overlay the data force contacts or movie recordings on a replica of the patient’s actual teeth. The feature is very new and is something we’re still learning to use on a routine basis. This is a big leap forward in occlusal evaluation, and is exciting to see. **To be able to identify the exact contact points and cusp inclines in a patient’s dentition, and relate it to clinical force data, is truly a revolution in understanding occlusion.** Using digital information that is available to us, and correlating that to the intraoral situation, allows us to provide patients with the best possible outcome.

Figure 5: Intraoral scan takes a digital impression

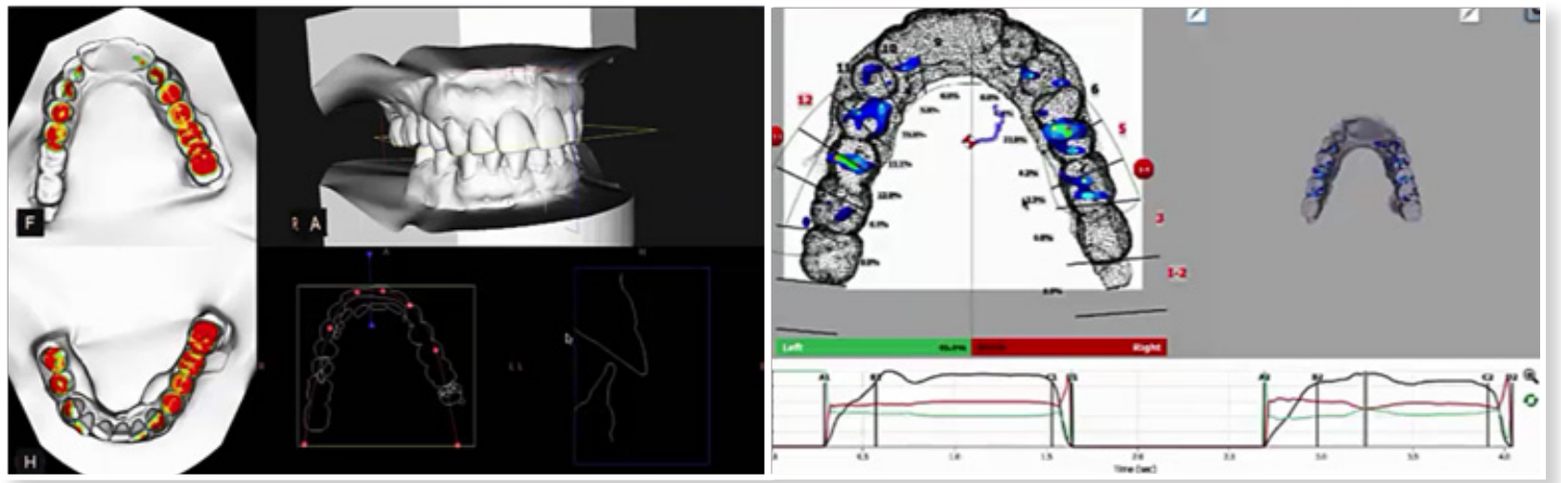


Figure 6: Digital impression and digital impression overlay in T-Scan

“We Will Not Adjust Anything Until the T-Scan Tells Us Where We Need to Go.”

Using the T-Scan data as a verified and archival medico-legal document in the patient record, one can proceed with accurate and predictable occlusal adjustments. You still need to get patient consent to do adjustments, as this is an irreversible procedure. In fact, the T-Scan data is so precise, that the number of required adjustments is usually fewer than that required with use of traditional means alone.

As the occlusal modifications are confirmed with each subsequent T-Scan recording, **the patient reports, “Oh, that’s feeling better. That’s a little more even. My jaw doesn’t feel crooked anymore!”** As we proceed through the process and really fine-tune her bite, we also demonstrate to the patient, via the computer monitor, how the contacts improve overall. Often times, patients are quite interested at seeing their bite force data on the screen. We show the patient how the teeth begin to touch more evenly with even distribution of those forces over time. We can observe with each adjustment that we have begun to eliminate those real “high-peak” colliding forces and prematurities. Once we reach a point of patient comfort and consistent bilateral equal intensity contacts, we advise the patient that we would like for her to test it out for a little while, before coming back to re-evaluate the results.

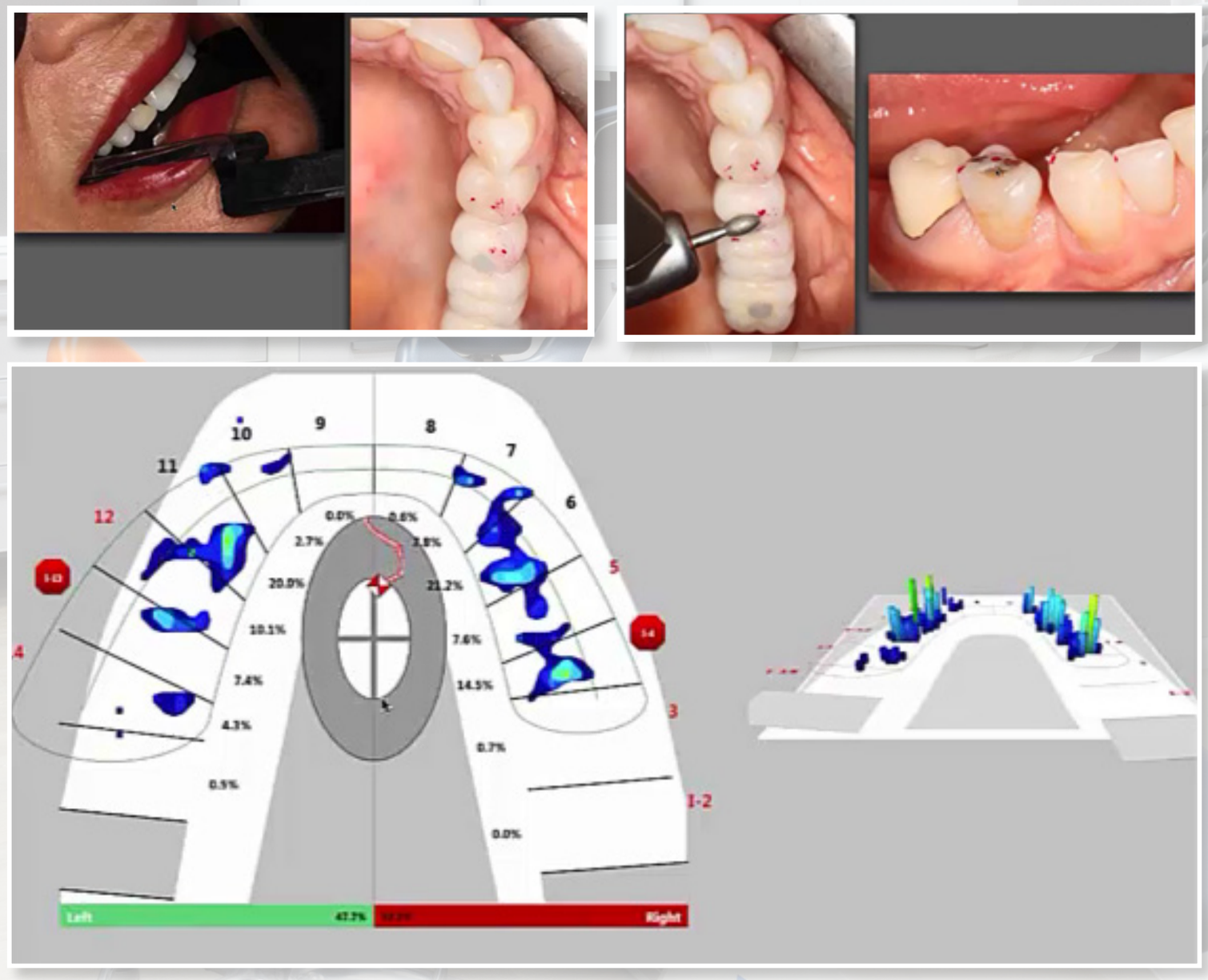


Figure 6: Articulating marks correlate to the T-Scan data points

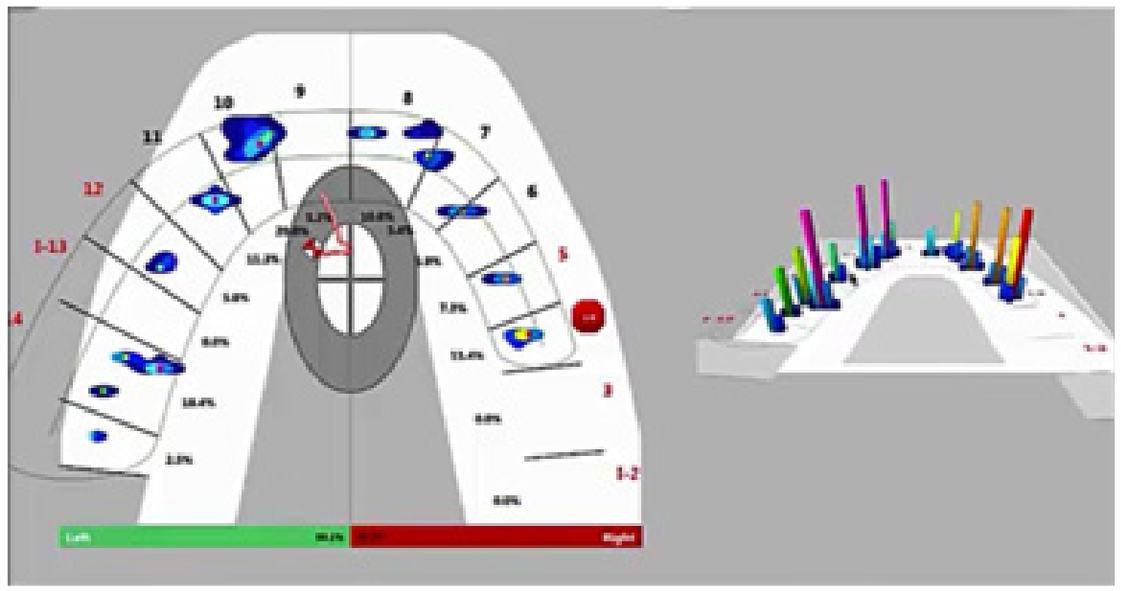


Figure 7: T-Scan can be used to make adjustments in splint therapy

"There is a Night-and-Day Difference."

This patient then returned a few weeks later and exclaimed, "You know what? There is a night-and-day difference. I don't have headaches, my bite isn't crooked, my jaw has shifted back!" While it is not likely we actually altered anatomically the position of the jaw, the patient reports what she is feeling and it is a significant improvement to the occlusal situation that has dominated her life for the last several years. In addition, it is often prudent to consider the fabrication of an Occlusal Guard to be worn at night. For this specific case, a thermoplastic Impact guard was fabricated in the lab and delivered at the follow-up appointment. It is also possible and advisable to use T-Scan to adjust the night guard as well (**Figure 7**).

T-Scan is not just for teeth. It is certainly possible to take a bite scan with the night guard in the patient's mouth to evaluate the forces and loading. The patient is able to clench down on that guard, because it's a braced position. We make a final adjustment on the guard, and we part with the advice, "We want you to protect your dental investment. This guard is like an insurance policy for you now." We don't want the prospect of renewing or replacing the work in her mouth anytime soon.

Today, we're doing things with implants that we haven't done in the past, and it becomes imperative to use a computerized approach beyond 100-plus-year-old carbon paper, to mark occlusal forces. Steve Jobs told us, "Be a yardstick of quality. Some people are not used to an environment where excellence is expected!" Expect it in your office. Expect it from your team. Expect it for your patient care.

For More Information on T-Scan in Implant Dentistry, Download our Free eBook!

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