

iTero Element Clinical Integration (Align Technologies, Inc.)



Figure 1: Previous *iTero*



Figure 2: *iTero Element*

Introduction

The *iTero Element* (Align Technologies, Inc.) is an evolution of earlier versions of *iTero* (Fig. 1), an optical scanning system that can be used in conjunction with various orthodontic and restorative procedures. The clinical use of digital impressions has been gaining traction in replacing traditional impressions in nearly all phases of dentistry. The unit evaluated included the scanning wand connected to an all-in-one PC with touch screen on a wheeled base. Most of the functions are accessed on the touch screen, and some functions can also be controlled from the wand itself. Evaluators included dentists and dental assistants experienced with CAD/CAM workflows and digital impression systems, including the original *iTero*.

Set-up and Training

The *iTero Element* (Fig. 2) arrived in two boxes and was assembled and set up by dental assistants in less than an hour. The instructions were clear and concise and included the process for transferring the office's *iTero* account to the new system. Online training was easy to access from the home screen for users to review at any time. Additional modules are added as the software is updated with new features.

Scanning and capturing data

The advances in the *iTero Element* have resulted in a tool that is easy to use with a very short learning curve. Functionally, the *iTero Element* scanner emits white LED and red laser light as it captures image data intraorally of hard and soft tissue without the use of powder. The scanner operates through continuous data collection, and the user can freely scan any number of teeth in the arch, from a quadrant to a full mouth. For posterior single-unit crowns, a quadrant scan is adequate, extending from the second molar through the canine. Scanning the opposing quadrant takes 20-30 seconds; scanning the operative arch, including the prepared tooth, usually takes one and one half to two minutes. Full-mouth orthodontic scans were consistently accomplished in under five minutes. The ability to preserve the scan data for future retrieval provides flexibility. Multiple scans on the same patient can be compared to track changes such as tooth position, wear or recession over time.

iTero Element:

What Has Changed?

- All-in-one cart offers a compact footprint.
- Scanner wand is smaller and lighter.
- The touch screen eliminates keyboard and mouse.
- Scanner wand has built-in controls for case review.
- Scan time is faster than original *iTero*.
- Historical scans can be compared to current scans to track changes in dentition.



Figure 3: *iTero* wand (pictured left) is significantly heavier and larger than *iTero Element* wand.



Figure 4: *iTero Element* (pictured right) requires less space in the operatory.



iTero updates



Figure 5: *iTero Element* handpiece (pictured right) is now lighter and more ergonomic than previous wand.



Figure 6: Integrated gyro technology (pictured right) allows rotation of models on the touch screen as well as the wand.

Entering a case

This design has eliminated a keyboard and mouse, (Fig. 7) simplifying infection control. Disinfectant wipes can be used on the touch screen and on the handle of the scanning wand. The wand tip that is placed intraorally has single-use, disposable covers (Fig. 8). Unlike the original *iTero*, the *iTero Element* does not have a battery backup and must be powered down when moving it around the office.



Figure 7: *iTero Element* touch screen eliminates the need for a keyboard and mouse.



Figure 8: Single-use disposable tip

Patient Acceptance

From a patient's perspective, the overwhelming majority of patients have preferred digital impressions to traditional methods. The consistent request from patients over the years has been for the scanner wand to be smaller and the process to be quicker; the *iTero Element* accomplishes both (Fig 9). There is no noisy fan or audible feedback during data capture. The scan tip cover is a pliable material with rounded corners for patient comfort. Patients always appreciate procedures being completed quickly; scanning with the *iTero Element* is quick and surprisingly quiet.

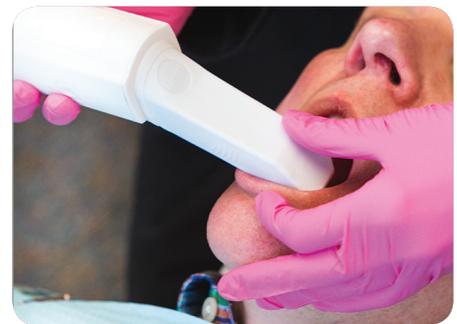


Figure 9: *iTero Element* wand is smaller with rounded corners maximizing patient comfort.

Laboratory Feedback from Apex Dental Milling

Every restorative scan received passed initial inspection by technicians for acceptability and was subsequently used to design a restoration with 3Shape (3Shape A/S) or Exocad (exocad gmbh). Long processing times due to artifacts on the prepared tooth were often experienced with scans from the original *iTero*. Surface artifacts (imperfect surface data) have been reduced with *iTero Element*, especially on the margins (Fig. 10). From a lab standpoint, the *iTero Element* scanner is an improvement over the previous *iTero* scanner in terms of surface quality and ease of use. This occasionally leads to slightly better margin integrity during milling due to smoother polygon transitions on the margin in the resulting design file.

Over 40 crown and bridge cases were completed utilizing scans from the *iTero Element*. Implant cases were also scanned intraorally utilizing Straumann (Institut Straumann AG) scan bodies, and custom zirconia and titanium implant abutments; subsequent full-contour zirconia crowns were successfully completed.

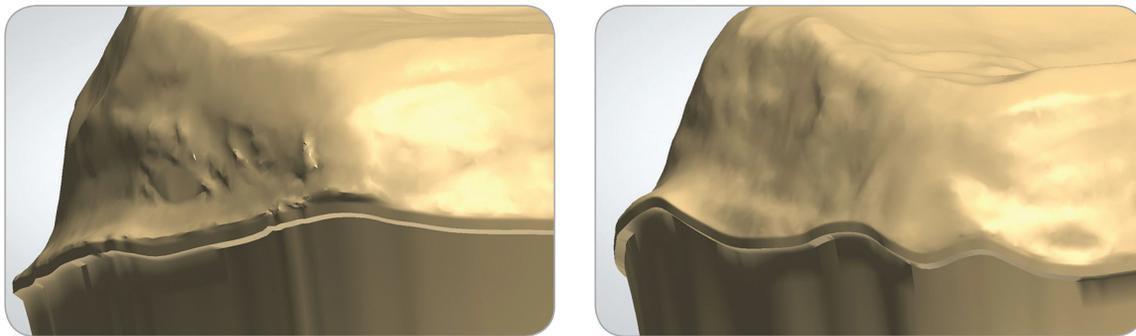


Figure 10: *iTero Element* scan (pictured right) in CAD software offers improved clarity and detail. Note the improved cleaner margin and surface area.

Conclusion

iTero Element is a versatile tool for the restorative dentist and orthodontist. Scans are quick and easy to accomplish, and scanning does not require extra time in the schedule. The ability to freely scan without powder has great advantages in efficiency and clinical practicality. Overall, the *iTero Element* scanner is versatile and consistently provides quality scan data.