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Clinical Case Report

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iTero Element Restorative Scanning

(Align Technologies, Inc.)

Introduction

iTero Element (Align Technology, Inc.) is an optical scanning system that can be used in conjunction with various orthodontic and restorative procedures. This mobile unit includes the scanning wand connected to an all-in-one PC with touch screen on a wheeled base. 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.

Clinical Case

The patient presented with a healthy dentition but was displeased with the appearance of an old porcelain-fused-to-metal crown on the lower right first molar (Figure 1). A treatment plan to replace the PFM crown with a full-contour zirconia crown was accepted. The ability to directly scan in the mouth allowed the accuracy and efficiency of a fully digital restoration.

Figure 1: Original PFM restoration,

Procedure

Anesthesia was administered, and while it took effect, the ***iTero Element*** was setup for the case by completing the laboratory prescription, and the opposing arch was scanned. The old restoration was sectioned and removed, and the preparation was refined to define the margin with a narrow chamfer design (Figure 2). Intraoral scanning requires management of the soft tissue to assure that the margin can be visualized circumferentially. ***Ginga-Plain*** (GINGI-PAK) dipped in ***Hemodent Liquid*** (Premier Dental) was gently tucked into the sulcus using a single-cord technique. After removal of the cord (Figure 3), the preparation was scanned, followed by the remainder of the mandibular segment and then the bite. A provisional restoration was fabricated and placed on the tooth. Total scanning time was just over two minutes. Once the scan was reviewed and approved it was sent to Apex Dental Milling (Figure 4).

Figure 2: Restoration removed and the prep is refined to define the margin.

Figure 3: Restoration after removal of retraction cord in preparation for scan.

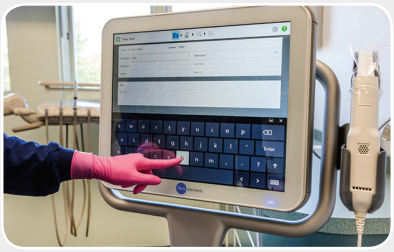

Figure 4: Touch screen allows for easy lab script completion.

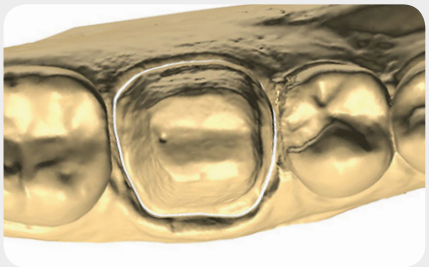

Figure 5: Imported scan

Laboratory: Apex Dental Milling

The case was electronically submitted and imported into CAD software (Fig. 5). There were noticeably fewer surface artifacts on the scan of the prepared tooth, especially at the margins, compared to typical scans from the original *iTero.* Less artifacts resulted in quicker processing time to create the internal crown surface. The prepared tooth was fully captured in the scan, as were the other important areas - adjacent teeth, occlusal surfaces and bite registration (Fig. 6). The quadrant scan up to the canine allowed proper development of occlusion. The crown was designed and milled by Apex Dental Milling from the prescribed zirconia, ***Lava Esthetic*** (3M). A reliable model solution is important with digital scans (Fig. 7), and in this case, a milled model (Fig. 8) was ordered from Align Technologies, Inc. After sintering, the crown was tried on the model (Fig. 9) and finished and glazed.

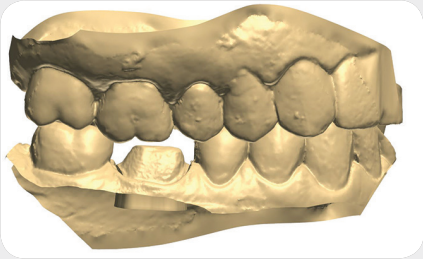

Figure 6: Upper and lower arch in design phase

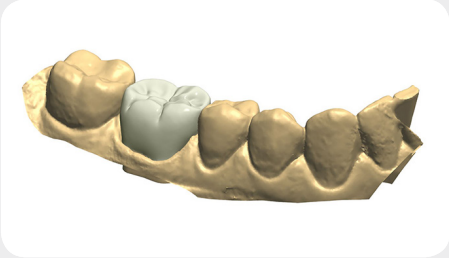

Figure 7: Final crown design prior to milling

Figure 8: Milled model ordered from Align Technologies.

Restoration seating

After removal of the provisional restoration, the crown was tried in and evaluated for fit to the tooth, interproximal contacts, margin integrity, and occlusion. The crown fit perfectly and required no occlusal adjustment; a slight adjustment was made to relieve a tight distal contact. The zirconia surface was primed with ***CLEARFIL CERAMIC PRIMER*** (Kuraray Noritake Dental Inc.) and the tooth was cleaned and dried. ***PANAVIA SA Cement Plus*** (Kuraray Noritake Dental Inc.) self-adhesive resin cement was applied, and the crown was held in place during tack curing. Final cementation was completed (Fig. 10), excess cement was removed, and occlusion was confirmed after final light curing.

Figure 9: Occlusal view of new restoration.

Figure 10: Final Zirconia restoration tooth

Conclusion

Immediate feedback during scanning, coupled with an intuitive workflow make the ***iTero Element*** an efficient tool in restorative procedures. The efficient nature of the digital impression is a pleasure for the patient, and the accuracy creates a predictable result at the crown seating appointment. The excellent fit of the restoration is a testament to the accuracy of the scan and the software of the ***iTero Element system.***