CASE REPORT

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Optimum Esthetics and Retention with Cast-to Abutments

Progress and technological evolution is something we should all embrace since such attributes allow us to provide patients with improved care. But when is it appropriate to consider proven materials and techniques outdated and when should one move forward with the promise of better product(s) along with superior outcomes?

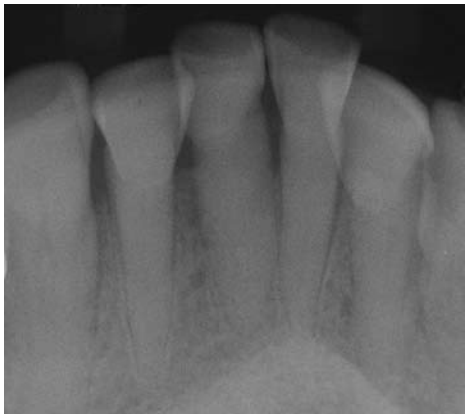
When reflecting on giving up a comfort zone of predictability and long-term success, is the risk at hand worthwhile? It is then when proven research and reliable development is needed to jump the hurdle and to take action for clinical implementation with the confidence that the given laboratory results will support such a decision.

When considering essential aspects of the implant traits such as improved bone preservation, enhanced occlusal loading of the crown-abutment-implant unit and faster integration could be compromised by achieving earlier and improved esthetics; one might argue if such compromise is worth the risk. However, this is not the case when utilizing the Astra Tech OsseoSpeed™ Implant with the MicroThread™ and Conical Seal Design™, which offers the combination of marginal bone preservation with its soft tissue response and no screw loosening, thus setting higher standards and expectations for dental professionals, patients and manufacturers.

Case Presentation 1: Cement-retained

The need to extract fractured, untreated teeth (1a) is not an unusual occurrence and replacing them with implants is a more conservative approach than creating a three-unit bridge. The options to place an implant immediately after the tooth has been extracted or implement a delayed technique vary depending on each case being treatment planned. A benefit of immediate implant placement is bone preservation as well as avoiding a second surgical procedure. Once the implant is integrated and an impression is taken, using a Cast-to Abutment allows for customization, thus providing a crown with the best possible retention (1b).

The final crown can be permanently or temporarily cemented, depending on the patient's overall dental health and dentist's preference[1,2] (1c, 1d, 1e).

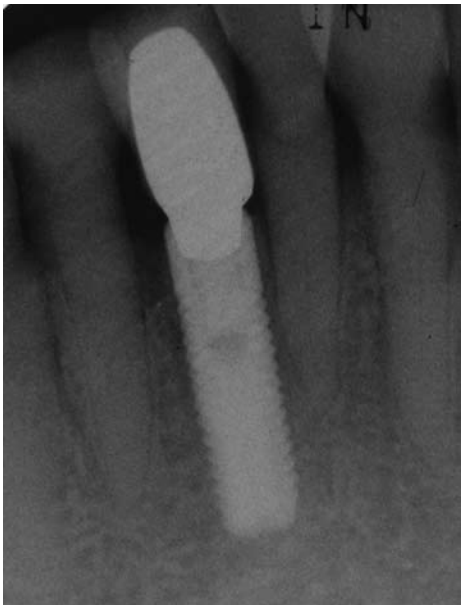


1a. Lower anterior teeth with moderate bone loss. Right central incisor was lost due to horizontal fracture and failing root canal.

1b. Cast-to Abutment customized with grooves to prevent rotation of the cementable crown.

1c. Lower right central incisor with cemented implant supported crown.

1d. Incisal view of cemented implant supported crown.
Dentistry by Sergio Rubinstein DDS
Laboratory work by Fujiki Toshi RDT



1e. Radiograph showing implant with final crown cemented.
Implant placed by David Barack DDS, Periodontist.

Case Presentation 2: Screw-retained

Teeth with existing restorations and, in some instances, with root canal treatment, are weaker than untreated teeth and therefore more susceptible to fracture (2a). The reasons for a tooth (or teeth) requiring extraction are numerous[1] but with careful diagnosis, treatment planning and meticulous implementation, the ability to regenerate the lost bone and sustain it with an implant is no longer a miracle but a clinical reality[2,3] (2b).

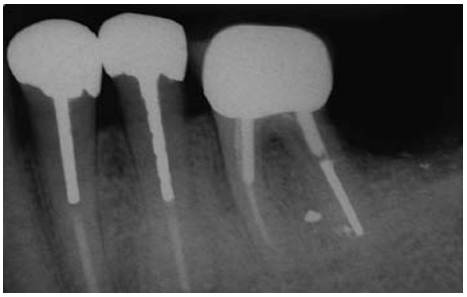
Furthermore, with Astra Tech implants, bone preservation at the most coronal thread of the implant is not a process that occurs only seldom but routinely. In order to provide for optimum recreation of the anatomical crown, the implant must be properly positioned in sound bone while respecting the surrounding anatomical boundaries (2c). The bone preservation influences the soft tissue health and contours and it is critical to have the implant with adequate depth to allow the crown to emerge from the implant with the correct profile (2d).

While on multiple implants it is preferred to take an impression with an open-tray for greater accuracy; when a single implant impression is taken, a closed-tray technique is also acceptable. Once the impression is taken, there are multiple prosthetic options but they can be broken down into two main categories: cemented or screw-retained. If the restoration is a single crown, often a cement-retained technique is preferred because of its similarity to traditional crown and bridge. In some situations however, cement removal and possible damage of the crown when loosening may dictate a screw-retained restoration. Screw-retained restoration offer the advantages of: (i) retrievability; (ii) no need for cement removal; and (iii) accuracy. The occlusal anatomy is preserved with a lingual screw-retained crown, but may be compromised when screw-retained occlusally.

While the Cast-to Abutment is more commonly used for cement-retained restorations, in cases where a cement-retained restoration is not ideal, the Cast-to Abutment can also be used to provide the capability to design and customize the optimum shape, including lingual tapping, to accommodate for a screw-retained crown (2e). The tapping is preferably done on the mesial lingual area to facilitate its placement and removal (2f). Any slight ledge between the crown and the lingual screw should be smoothed down in the mouth with a #4 round bur followed by a brownie rubber point (2g). The previously described advantages of the screw-retained crown are very important with the key benefit being the ability to recreate the ideal occlusal anatomy without concern for the location of the abutment screw (2h). Of all the previously described concepts, most important is the need to preserve the coronal bone around the implant for long-term support, stability and peri-implant soft tissue health (2i).

Implants can also act as excellent anchorage for orthodontic movement, especially if the patient desires to proceed with the orthodontic treatment after the implant-supported crown has been completed. If the crown is screw-retained, one has the ability simply to unscrew it and utilize a provisional with the implant in order to avoid damage to the crown. In situations where a treatment option such as Invisalign™ orthodontics is utilized and no buttons are placed on the crown, the crown does not need to be removed (2j, 2k).

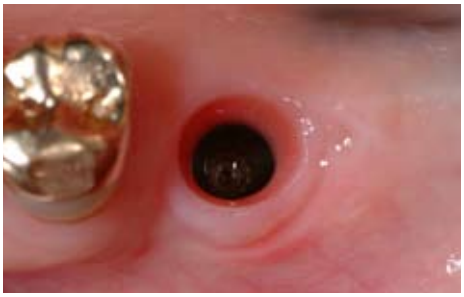
1. Rubinstein S, Nidetz A, Heffez L, Fujiki T. Prosthetic Management of Implants with Different Osseous Levels. QDT 2006; 147-156.
2. Rubinstein S, Nidetz A, Hoshi M: A Multidisciplinary Approach to Single-Tooth Replacement. QDT 2004; 157-175.
3. Boyne PJ, James RA. Grafting of the Maxillary Sinus Floor with Autogenous Marrow and Bone. J Oral Surg 1980;38:613-616.



2a. Lower left molar with fractured roots.

2b. Occlusal view of implant-healing cap replacing a lower left molar.

2c. Buccal view of implant replacing the roots on the lower left molar.



2d. Occlusal view showing the soft tissue emergence profile created by the healing cap.

2e. Lingual view of custom abutment tapped to accomodate a lingual screw and prevent displacement of the crown.

2f. Insertion of lingual screw through the crown onto the abutment to prevent its displacement.

2g. Lingual view of the crown with the retaining screw in place. Sharp edges to be smoothed down with a #4 round carbide bur and brownie polishing point.

2h. Buccal view of a screw retained crown preserving and recreating the occlusal anatomy.
Laboratory work by Fujiki Toshi, RDT

2i. Radiograph of the implant supported crown showing excellent bone preservation.
Implant placed by Ken Peskin DDS, Oral Surgeon.

2j. Occlusal view showing final implant supported crown on lower left molar. Note the existing crowding on the lower anterior teeth.

2k. Lower anterior teeth straightened with Invisalign™ having used the final implant supported crown as additional anchorage.
Dentistry by Sergio Rubinstein DDS