

A Unique Guidance System For Implant Placement

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ABSTRACT

We will address a unique implant guidance system that can be used in preplanning to guide implant spacing for fabrication of prefabricated stents or at chairside without a prefabricated stent.

Key words : Implant Guidance, Implant Planning, Adjacent Implants

Ideally, implant placement is accomplished with a prefabricated surgical stent. But, this may not be possible due to time constraints or the surgeon may choose in the case of either a single missing tooth or two adjacent missing teeth to use other guidance methods. We will address a unique implant guidance system that can be used in preplanning to guide implant spacing for fabrication of prefabricated stents or at chairside without a prefabricated stent.

INNOVATIVE IMPLANT TECHNOLOGY (IIT) GUIDANCE SYSTEM

The IIT guidance system was developed to ensure correct implant location in both the buccal/lingual and mesial/distal orientation. The system consists of;

- **Titanium Blades** – to accurately determine appropriate implant spacing and position for single or 2 adjacent implants. A handle is provided to allow safe maneuvering and positioning of the blades intraorally during surgery. (figure 1)
- **Titanium Measuring Pins with extensions** – to guide the position and spacing of implants in edentulous posterior segments of the arch. (Figure 2)
- **Titanium Parallel Pins** – used to assure parallel placement of implants and verify positioning. (figure 3) The IIT Guidance System is not specific for any particular implant system and can be used with any implant on the market. Provided in a sterilizable cassette it can be used in either the dental operator or operating room during the surgical phase. (Figure 4)

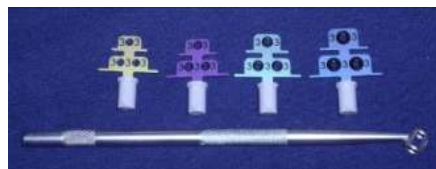


Figure 1: IIT titanium blades and handle.



Figure 2: IIT measuring pins with extensions.

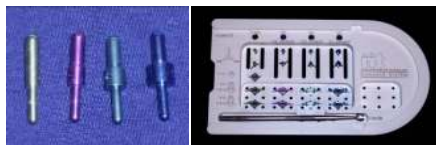


Figure 3: IIT paralleling pins.

Figure 4: The IIT Guidance System kit containing titanium blades, measuring pins and paralleling pins.

Guidance for implant placement can occur during two distinct points in the treatment. First during preplanning when the location of the fixtures is determined and a surgical stent is fabricated. Secondly, during the surgical appointment when the implants are placed. We will review how the IIT Guidance System can be utilized during both of these treatment points.

USE OF THE IIT GUIDANCE SYSTEM AS A PREPLANNING TOOL:

Preplanning in implant treatment helps in the communication process between the restoring dentist and the surgeon. The decisions as to spacing from natural teeth or between implant fixtures can be time consuming and can require the need for use of an outside laboratory. Typically, denture teeth are set on the cast to place the fixtures too close to the natural tooth or the other fixture.

The IIT Guidance system can be utilized in the preplanning phase to properly space the fixtures and aid in the fabrication of the surgical stent, bypassing the need to set denture teeth. It is accepted philosophy that implants should be placed no closer than 2mm from a natural tooth and spacing between fixtures should be a minimum of 3mm.

A cast is fabricated from an impression of the patients arch. The restoring dentist decides what diameter fixture will be placed at the site and selects the appropriate titanium blade. The blade is placed against the natural tooth to provide 2mm of spacing from that root. (Figure 5). A pencil is placed through the hole in the blade marking the cast. (Figure 6) A 3/32 inch twist drill in a slow speed handpiece is paralleled to the long axis of the natural tooth and a pilot hole is created in the cast. Maintaining parallelism with the adjacent natural tooth will limit the possibility of accidental damage to the natural tooth during osteotomy preparation.



Figure 5: The IIT titanium guidance blade being used on the cast to space the first implant 2mm from the natural root.



Figure 6: A pencil is used to mark the site through the IIT titanium guidance blade for a regular diameter fixture.

When adjacent fixtures are to be placed the titanium blade is placed on the cast and a titanium parallel pin is placed through the blade into the first pilot hole in the cast. (Figure 7) A pencil is again used to mark the site of the cast ensuring spacing of 3mm between fixtures. (Figure 8).

The pin is removed from the cast and the guidance blade is set aside and the pin reinserted into the cast. Again a 3/32 inch twist drill is introduced into the cast at the mark made on the cast, paralleling the pin in the mesial site. This process is repeated should a third fixture be planned distal to the second site. It is important that when a regular diameter (RD) fixture is planned for the mesial most site that the green guidance blade is used to properly place the final width of the osteotomy 2mm from the natural tooth.

When a wide diameter (WD) implant is planned for the subsequent site, the practitioner should switch to the blue guidance blade for the second site.



Figure 9: An alternative to use of the IIT titanium guidance blade for location of the second site is cast using the IIT guidance use of the titanium measuring pin using the 3mm extension arm.

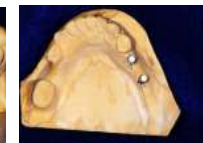


Figure 10: Pins placed into the two sites created in the cast using the IIT guidance system demonstrating proper spacing and parallelism. A RD implant will be placed into the mesial site and a WD into the distal site.

USE OF THE IIT GUIDANCE SYSTEM AT THE SURGICAL PHASE

At times fabrication of a surgical stent may not be practical due to timing. Patients may present for various reasons needing immediate implant placement which precludes fabrication of a surgical stent. The IIT Guidance System will assist in these situations in creating the osteotomy properly spaced from the natural teeth. When a single fixture is planned the smaller portion of the blade is used and when two adjacent fixtures are to be placed the wider portion of the blade is utilized. (Figure 11)

Following flapping of the site the guidance blade corresponding to the diameter of the intended fixture is placed in the site contacting the adjacent teeth. (Figure 12)

A pilot drill appropriate to the implant system being used is introduced through the crestal hole on the guidance blade. (Figure 13) The angulation is determined to create an osteotomy that will be within the buccal and lingual osseous plates. Site development is continued using larger osteotomy drills or osseous expansion tools. (Figure 14)



Figure 11: IIT titanium guidance blade on the handle for use in placing a single or two adjacent implants with 2mm of spacing from the natural tooth and 3mm spacing between fixtures.



Figure 12: IIT titanium guidance blade shown intraorally to provide 2mm of spacing from the roots of the natural roots.



Figure 13: Pilot drill being introduced through the IIT titanium guidance blade intraorally.



Figure 14: Rotary osseous expander being introduced into the pilot hole created with guidance from the IIT guidance blade.

When adjacent fixtures are planned, the first site is initiated as described above using the narrower portion of the appropriate blade. (Figure 15) The wider portion of the guidance blade is then placed with contact to the natural tooth and a pilot drill is used to initiate the second site. (Figure 16) Standard osteotomy preparation techniques are then followed using the pilot holes within the bone to finalize the sites and the implants are placed. (Figure 17)



Figure 15: Pilot drill being introduced through the IIT titanium guidance blade to prepare the first site of two adjacent sites.



Figure 16: Pilot drill being introduced into the more posterior site of the two adjacent sites using the IIT guidance system to guide the spacing.



Figure 17: Final implant placement of two adjacent implants guided by the IIT guidance system with 2mm of spacing to the natural tooth and 3mm spacing between fixtures.

CONCLUSION

Implant planning is key to providing esthetic results that can mimic the natural dentition. Proper spacing of the fixtures from the natural teeth is critical in this pursuit. Additionally, placement of fixtures too close to natural teeth can compromise the health of the tooth. When adjacent implant fixtures are placed too close together, periodontal issues can be compromised and chronic hygiene issues arise. The IIT Guidance System allows the restoring dentist to preplan implant placement using ideal spacing or be used by the surgeon at the placement visit in lieu of a prefabricated surgical stent.

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