

Masterclass in Clinical Practice

Dental Implants

with

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The single posterior dental implant for beginners: A step by step guide from placement to restoration

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Introduction

This Master Class is indicated for the novice or newly qualified clinician who is interested to know more about single implant treatments, be it for the placement or restoration of the posterior single implant. Placing and restoring implants in the aesthetic zones require more experience and should not be attempted by the novice.

Implant dentistry in 2025 is an integral part of the normal dental practice and gone are the days of dentists who do not wish to become involved with implant dentistry. It has become as routine as placing a porcelain crown.

There are however differences in that the treatment involves both a surgical phase and a restorative phase. As with all dental surgical procedures, a thorough knowledge of anatomy is required. In addition, if you wish to perform the surgical phase yourself, surgical training is required and training in the specifics of the implant system to be used. Although most dental implant systems have a common design and instrumentation, each system has specific specifications for placement protocol, abutment selection and restoration details.

Below are some of the most important aspects for the posterior single dental implant placement. The video highlights the procedures involved with the aim of familiarizing the newly qualified clinician with the terminology, phases of treatment and instrumentation. It will cover the process from placement to restoration.

Important aspects of the posterior maxilla:

Bone Density:

- The posterior maxilla may have a soft type of bone which can be a complicating factor due to lack of primary stability of the implant when placed. In severe cases the implant may have no real stability and would then have to be closed under the gingiva to allow a longer undisturbed healing period of 3-6 months. This is known as a 2-phase surgical protocol and after the healing period the implant can be re-opened and tested for bone integration. If however the stability reaches at least 20Ncm stability during placement, it can be done in a 1-phase surgical protocol with attachment of a healing abutment which will keep the gingival opening for the future tooth. (Figs. 1-2).

- In addition to density issues in the posterior maxilla, the maxillary

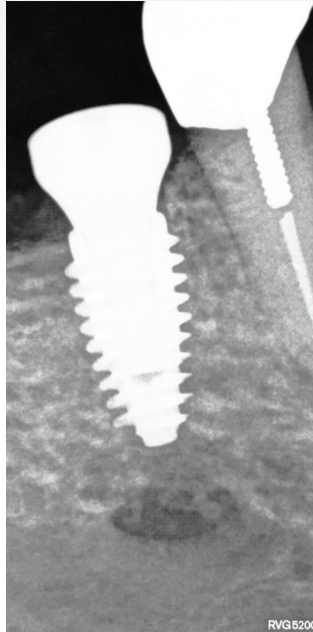


Figure 1: Implant placed with a healing abutment attached. The healing abutment keeps the gap open in the gingiva for the future tooth so dimensions should be selected for the size of the future tooth.

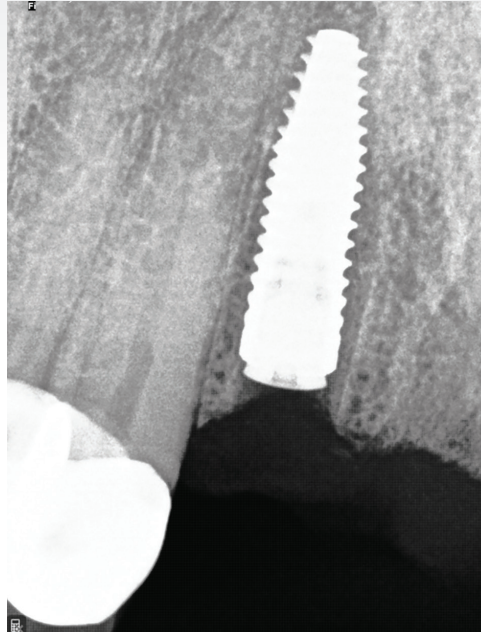


Figure 2: The implant stability was 15Ncm at time of placement and the implant is closed with a cover screw and left to heal submerged. It will be exposed in a second surgical procedure after 6 months.

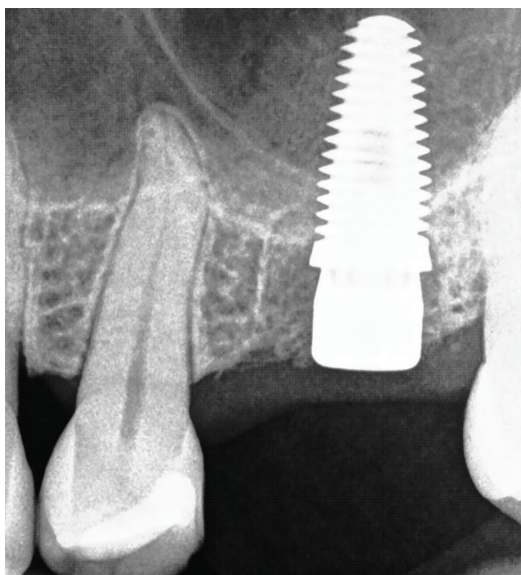


Figure 3: Implant placed into the sinus as the sinus pneumatization was not checked before surgery.

sinus may limit vertical bone availability by pneumatization resulting in a lower sinus floor. Some implant manufacturers have specific implant designs to maximize the stability and implant surface for more stability and better integration. The

sinus pneumatization should be evaluated on a 3D CBCT as a 2D radiographic assessment may not reveal the sinus floor accurately and the width of the alveolar ridge should also be assessed on the CBCT. (Fig. 3).

- The degree of opening can be a critical factor to gain access in the posterior maxilla for implant placement. This should be checked before the surgery is scheduled and the most reliable way is to use a contra-angle handpiece with a short dental implant drill and check if it fits. If not, a complication may be that the implant is placed using a buccal approach and getting an incorrectly angled implant. In severe cases the implant may be angled to the point of missing the alveolar ridge and exiting through the bone on the palatal side (Fig.4a-b).

- The Greater Palatine artery and nerve lies in a groove between alveolar bone and palatal bone- and this may be damaged by an implant angled from buccal if it exits the bone in the apical area. The greater palatine artery may also have an ascending branch in the premolar area which can cause bleeding complications (Fig.4b).

Important aspects of the posterior mandible:

- The inferior alveolar neurovascular bundle is one of the most important landmarks in oral surgery. If it is not identified

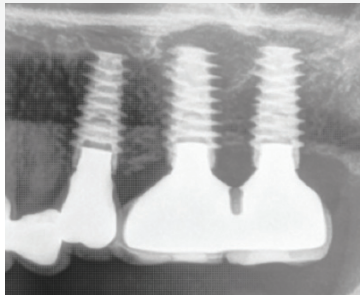


Figure 4a: Implants placed in the posterior maxilla appear to be placed in an ideal orientation.

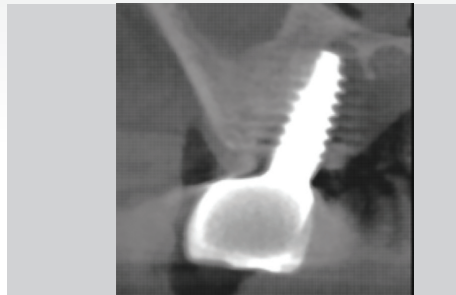


Figure 4b: Implant 27 seen in a cross section on CBCT showing that implant has missed the alveolar ridge due to severely restricted mouth opening and surgeon drilling at an angle from buccal. The implant tip is in contact with the neuro-vascular Greater palatine bundle.



Figure 5: The 36 implant was placed through the inferior alveolar nerve with permanent damage to the nerve. CT assessment would have prevented this.

accurately on 3D CBCT, it may lead to damage to the nerve with severe consequences for patient and clinician. (Fig. 5)

- The only potentially fatal complication from surgery in the posterior mandible is perforation of the lingual plate into the submandibular/lingual fossa during implant drilling. This fossa is easily missed on a 2D radiograph and must be examined using 3D technology (Fig 6a-b).

Conclusion

Implant dentistry can be one of the most rewarding aspects

of dental treatment. It broadens the scope of conventional dentistry and straightforward single posterior implants should be within the domain of most if not all dentists.

It does however require background knowledge of anatomy, surgical principals and should always be driven from the restorative side. The question is therefore not how many implants can be screwed into the jaws, but what are the requirements to restore the occlusal function of the patient. If implants are needed for the occlusal rehabilitation, then and then only should it become part of the final solution.

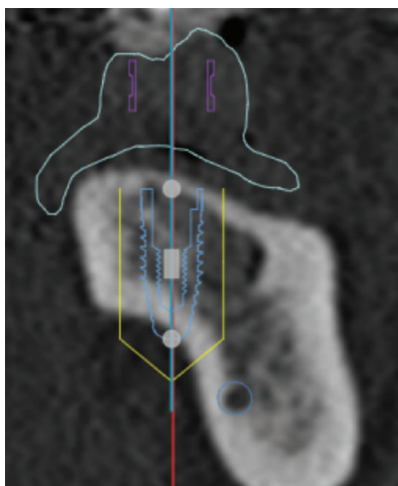


Figure 6a: A pronounced submandibular fossa which may be perforated if not identified. This will rupture blood vessels that may cause a life-threatening bleeding (fig 6b)



Figure 6b: A near-fatal bleeding after routine single implant surgery perforated through the lingual cortex, rupturing the arteries in the floor of the mouth, and causing blockage of airway requiring an emergency tracheostomy. (Photo courtesy of Joe Niamtu III)



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A comprehensive
step-by-step guide
from placement to
restoration