Use of Technology for Improved Implant Use in The OMS Practice

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Image Navigation Surgery For Implant Placement - A Comparison To Guided Stent Use

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Synopsis
This session will review the difference between dynamic and static image navigation surgery for dental implant placement.

Learning Objectives
At the conclusion of this presentation, participants should be able to:

Discuss the differences between dynamic and static image navigation surgery and what the literature states regarding their accuracy and clinical outcome;

Identify the treatment sequences required to utilize dynamic guidance, from obtaining the images for digital treatment planning to laboratory fabrication of components used for surgery; and

Describe the indications for using dynamic and static navigation surgery and the challenges to their use.

1. Definitions
   b. Static Guidance - Implant guide templates/stents that are fabricated prior to surgery.

2. Available Systems
   a. Dynamic Systems
      i. Image Guided Implantology (IGI)
      ii. RoboDent
      iii. MonaDent
      iv. VoNaviX
   b. Static Systems
      i. SimPlant
      ii. Anatomage
      iii. SICAT
      iv. EasyGuide
      v. Nobel Guide

3. Literature
   a. Manual implant placement vs. Image guided implant placement
   b. Accuracy
   c. Clinical Outcomes

4. Financial Considerations
5. Treatment Sequence
6. Challenges
   a. Intrinsic Errors
      i. Spatial resolution of CT
      ii. Image data processing
      iii. Planning software
      iv. Static Guide Fabrication
      v. Registration Errors
      vi. Tracking Errors
   b. Extrinsic Errors
      i. Impressions
      ii. Stone model fabrication
      iii. CT imaging protocol
      iv. Imaging guide fabrication
      v. Tracker fabrication
      vi. Provisional fabrication
      vii. Seating / movement of static guide
      viii. Seating / movement of patient tracker
   c. Limitations of the systems
      i. Visualization
         1. Seating guide
         2. Damage instruments or guide
         3. Array interference
      ii. Patient Related
         1. Maximal mouth opening - Instrument stack limitations
            a. Maximum Implant length limits
         2. Edentulous Patient
         3. Tooth Size / Tube Size Limitations
7. Unique Indications
   a. Patient related
      i. Minimal mouth opening - Dynamic
   b. Procedure related
      i. Remove foreign body - screws etc.
      ii. Sinus elevation
      iii. Remove difficult third molar
      iv. Apicoectomy
      v. Nerve lateralization
References


Nickenig HS et al., Evaluation of the difference in accuracy between implant placement by virtual planning data and surgical guide templates versus the conventional free-hand method. J of Cranio-Maxillo-Facial Surg 2010; 38, 488-493


Huy Trin Review of literature 2008 to present


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Nickenig HS et al., Evaluation of the difference in accuracy between implant placement by virtual planning data and surgical guide templates versus the conventional free-hand method. J of Cranio-Maxillo-Facial Surg 2010; 38, 488-493


Meloni SM et al., Implant treatment software planning and guided flapless surgery with immediate provisional prosthesis delivery in the fully edentulous maxilla. A retrospective analysis of 15 consecutively treated patients. uEr J Oral Implantol 2010;3(3):245-251

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