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CASE STUDY

TRACING SOFT TISSUE OUTLINES ON CBCT USING GLASS BEADS: A NEW CONCEPT

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ABSTRACT

Dental implants have become a treatment option for the replacement of missing teeth. The ideology of osseointegration has rapidly led to the use of dental implants over the years. New technologies are emerging and have been readily accepted into dentistry. There is a need for high accuracy in treatment planning and surgical procedures to obtain a high success rate in implant treatment as implant complications mainly occur due to improper diagnosis, treatment planning and execution of surgical procedures. This can be achieved by the use of CAD-CAM technology, 3D planning software, image guided surgical template and computer aided surgery. The surgical template is a guide used to assist in proper surgical placement and angulation of dental implants. The main objective of the surgical template is to direct the implant drilling system and to provide an accurate placement of the implant according to the virtual plan. In patients where a sufficient number of teeth are present surgical stent can be reoriented with the help of the teeth. CBCT tracing of soft tissue on mandibular ridges seems difficult due to the overlap of adjacent structures. This problem is addressed by using glass bead markings which are well visible on the CBCT.

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INTRODUCTION

Dental implant placement is a skill based procedure. Thorough patient evaluation, good treatment planning, presurgical planning, operator skill and sound knowledge of the surrounding anatomical structures are the cornerstones of a successful implant procedure and a good clinical outcome for partially and completely edentulous patients. Since the oral cavity is a relatively restricted space, a high degree of accuracy in placement of an implant in posterior region is very important. Therefore, accurate placement and orientation of dental implants are necessary for optimum function and esthetics of the definitive restoration. To achieve this, diagnostic radiographic templates, C.T scans, and surgical templates can be used. The conventional method of surgical guide fabrication has long been used but the outcome is often unpredictable especially where longer spans have to be replaced. The major advantage of CAD CAM over conventional sequential drilling is the exact transfer of virtual planning to the surgical entity. Guided surgery will buffer the surgical skills of the operating dentist. At the time of surgery, stability of the surgical guide over the remaining dentition or on to the edentulous span is very important to ensure exact placement of implants as planned virtually. One of the major challenges in making surgical template for edentulous and long span edentulous cases is the orientation of scanned soft tissue images of the dental models to the CBCT images, since there are no well-defined anatomic landmarks. This can result in the improper placement of the implants, which makes the final restoration difficult to fabricate. Therefore, the goal of this paper is to highlight a situation in which implant treatment planning and placement were carried out with the use of computer-aided surgical template utilizing glass bead technique.

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Case report

A 58-year-old male patient reported to the department of prosthodontics, with a chief complaint of missing teeth in both upper and lower regions of the mouth and complained of difficulty in eating food and wanted a replacement of the lower teeth. Case history was recorded, non-contributory medical history was given, relevant laboratory tests, dental and oral examination was performed. Clinical intraoral examination revealed a mandibular class I edentulous arch. In the mandibular arch, only the anterior teeth were present. Diagnostic impressions were made and casts were prepared. A thorough examination was done and all the treatment options were explained to the patient and the patient was willing for a fixed prosthesis supported by implants.

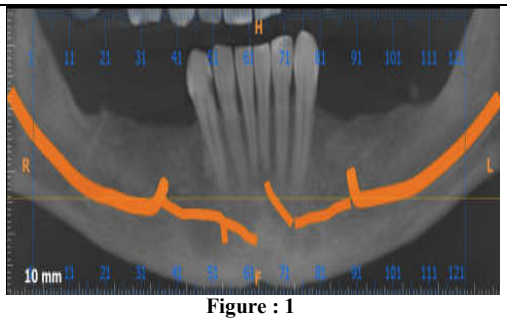
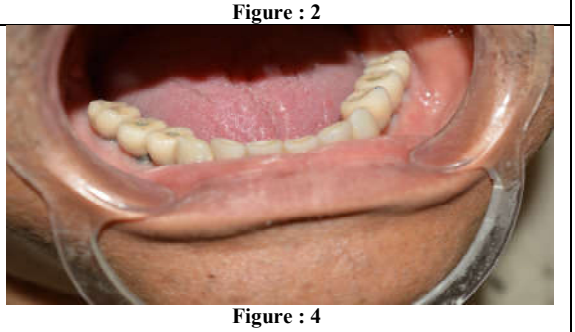


Figure : 1

Figure : 2

Figure : 3



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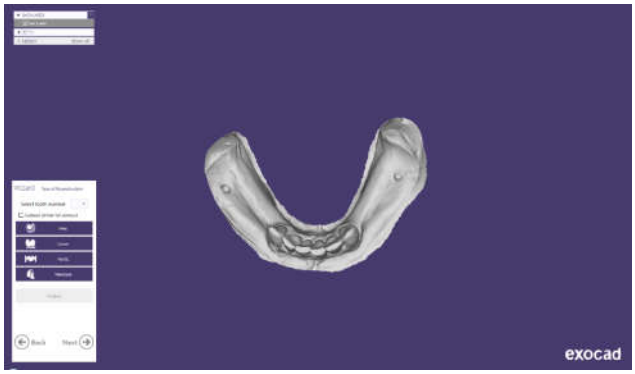
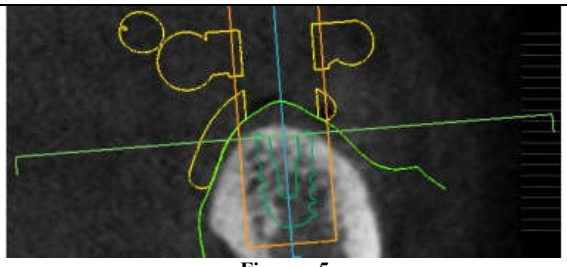


Scanned model with glass beads in position



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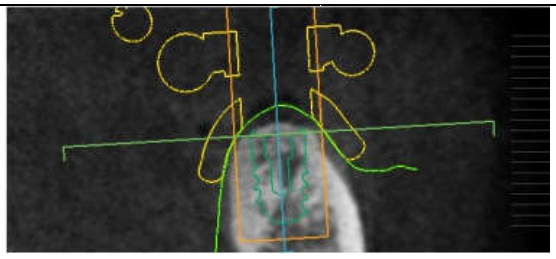

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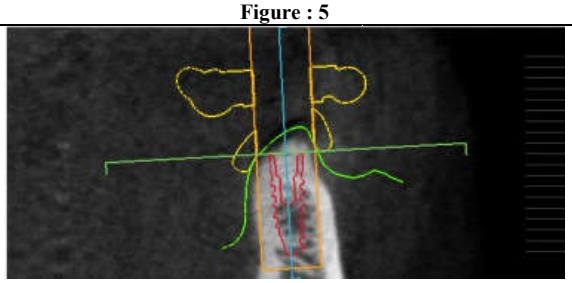

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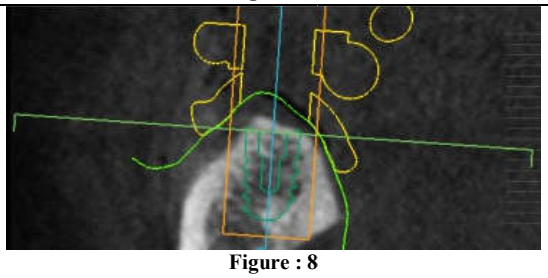

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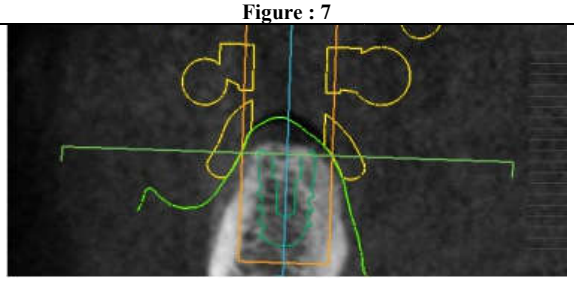

Figure : 9

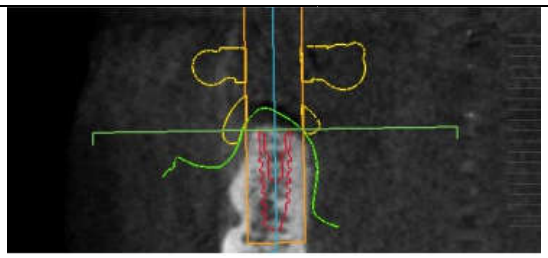

Figure : 10

CROSS SECTION OF PLANNED M GUIDE STENT IN
Figure 5,6,8 and 9- molar region, Figure 7 and 10- Premolar region

Planning was done to rehabilitate the mandibular arch first with six implants. Initially, a printed C.A.D guide for the placement of six implants was planned but as it was a class 1 situation and desirable amount of soft tissue was present in the distal part, glass beads were planned on the dental models of the patient. Two glass beads were placed and stabilized in the posterior region. This was scanned using an exocad software. On this auto polymerizing acrylic resin template was prepared, which was given to the patient. On this acrylic, an opening was incorporated in the anterior region for C.T orientation pin attachments, therefore, when patient closes in occlusion, template will be in position The patient was instructed to wear the template during CBCT imaging. Glass bead marker, which was visible in C.B.C.T, is overlapped on an exocad image of model. Both were transferred and overlapped on M-Guide software. Using this surgery was executed. Post op C.T was compared with virtual planning. Here the implant platform was compared to virtual planning i.e. distance from crest to the platform was measured.

DISCUSSION

Dental implants are prosthetically driven surgical procedures. The main objective of the glass bead technique is to attain maximum surgical precision by transferring the virtual plan to the surgical site. Computer aided surgery minimizes the risk of iatrogenic injuries to the vital structures by direct virtual three-dimensional visualization, avoiding the uncertainties during the actual surgery. This glass bead technique aids in getting an accurate surgical template in cases where long edentulous span has to be replaced. Furthermore, the amount of soft tissue can be assessed which will aid in the accurate extension of the lingual flange of the surgical template that will indirectly affect the retention of the template, especially in edentulous conditions. Preoperative implant placement and treatment planning can be done on software. This, in turn, enables the dentist to understand the size, length, and angulation of implant and the type of prosthesis. Parallel placement of implants can be achieved when needed. Moreover, a minimally invasive surgery can be performed without flap reflection preventing trauma.

Conclusion

The guided surgery technique represents an advance in the field of implantology. It is indicated for several cases in oral rehabilitation with dental implants, allowing for minimally invasive surgery, decreased errors, and increased prosthesis predictability, showing more accuracy compared to the conventional surgery, despite the need of new technologies and advanced planning.

REFERENCES

Aalam AA, Reshad M, Chee WW, Nowzari H. 2005. Surgical template stabilization with transitional implants in the treatment of the edentulous mandible: a technical note. *International Journal of Oral & Maxillofacial Implants*, May 1;20(3).

Dattatreya S, Vaishali K, Vibha Shetty S. 2016. Imaging modalities in implant dentistry. *Journal of Dental & Oro-facial Research*, Jan; 12(1):22-29.

Jayadevappa BS, Kodhandarama GS, Santosh SV, Rashid WT. 2010. Imaging of dental implants. *Journal of Oral Health Research*, Apr 1;1(2).

Koshy E, Surathu N, Philip SR. 2009. Computer Guided Implant Surgery:A Clinical Report. *International Journal of Clinical Implant Dentistry*, May-August, 1(2):23-29.

Lingeshwar D, Dhanasekar B, Aparna IN. 2010. Diagnostic imaging in implant dentistry. *International Journal of Oral Implantology & Clinical Research*, Dec 25;1(3):147-53.

Mascarenhas VI. 2014. The use of Computer Guided Implant Surgery in Oral Rehabilitation: A Literature Review. World, Jan;5(1):60-3.

Moslehifard E. 2011. Computer aided techniques developed for diagnosis and treatment planning in implantology. INTECH Open Access Publisher.

Purtaji B, Panjnoush M, Shamshiri A, Purtaji M. 2016. Difference in implant measurements made on cone beam computed tomography scans taken with and without radiographic stent. *International Journal of Medical Research & Health Sciences*, 5(12):84-91.

Shankar MS, Bhupinder P, Nitesh R, Digvijaya PP. 2013. CBCT as an Emerging Gold Standard for Presurgical Planning in Implant Restorations. *J. Indian Acad. Oral Med. Radiol*., Jan;25:66-70.

Yeshwante B, Choudhary N, Baig N. 2014. Surgical stent for implant placement. *International Journal of Clinical Dental Science*, Nov 23;5(2).

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