camlogfoundation

Luzern, Switzerland 03. - 05. Mai 2012
4. International Camlog Congress

CHARITÉ
UNIVERSITÄTSMEDIZIN BERLIN

Pre-Diagnostics Using Cone Beam CT Prior To Sinus Floor Elevation - Case Report

MEISSNER S[1*], STRIETZEL FP[1]

[1]Charité Centre 3, Department of Oral Medicine, Dental Radiology and Oral Surgery, Berlin, Germany (Head: Univ.-Prof. Dr. A.M. Schmidt-Westhausen)

Introduction

The dental Cone Beam CT (CBCT) with a prefabricated surgical splint is nowadays established as one of the required diagnostic tools prior to sinus floor elevation and augmentation (SFEA) and implantation. This case report describes a metal-dense opacity as an incidental finding in CBCT, which was not detected and diagnosed in panoramic radiograph before.

Case Report

The patient underwent a staged SFEA utilizing deproteinised bovine bone mineral and a porcine collagen membrane before implantation of a Camlog rootline implant. The CBCT revealed a metal-act dense opacity of 1 cm in length below the junction of the maxilla in the right posterior zygomatico-alveolar arch, and vertical and transversal bone volume in region 16-17 insufficient for a single-stage approach. Intraoperatively, a metallic *corpus alienum* was removed after elevating a vestibular mucosal-periostal flap. Location and removal of the opacity, SFEA via lateral access window and implantation were successfully performed in maxillary right first molar region (16) after diagnostics and treatment planning with CBCT in combination with a radiographical / surgical template (Fig.1-7).

Radiological Diagnostics (Sirona GALILEOS DVT HC)

Fig.1 panoramic radiograph Sirona Orthophos XG

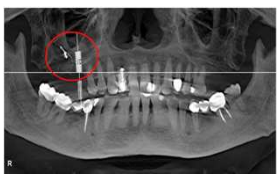

Fig.2 panoramic view window CBCT Sidexis XG Galileos

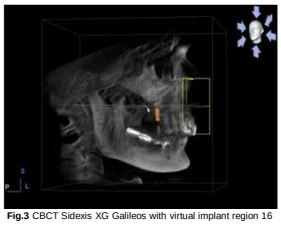

Fig.3 CBCT Sidexis XG Galileos with virtual implant region 16

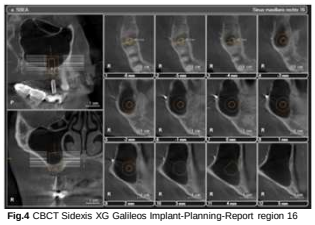

Fig.4 CBCT Sidexis XG Galileos Implant-Planning-Report region 16

The CBCT was performed with the prefabricated radiological and surgical splint, to control the requested prosthodontic position of the implant in region 16. In region 17, the CBCT revealed a metal-act dense opacity in comparison to the panoramic radiograph, which exhibited not such a clear diagnostic finding (Fig. 1-5). Using the Sicat software, a virtual implant was placed according to the position of the splinted drill sleeve. Length (10mm) and diameter (2mm) of the drill sleeve fits to pilot drills of various implant-manufacturers (Fig.2-6). 5 months following SFEA and prior to implantation, a panoramic radiograph was performed with the splint to control the residual augmented height. A second panoramic radiograph showed the correct position of the implant postoperatively (Fig.6-8).

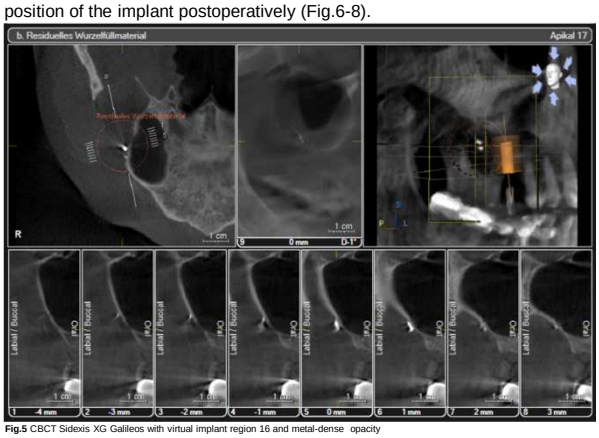

Fig.5 CBCT Sidexis XG Galileos with virtual implant region 16 and metal-dense opacity

Fig.6 post SFEA panoramic radiograph with surgical splint

Fig.7 panoramic radiograph with Camlog Rootline implant 16

Prosthodontic Procedures

4 month after implant placement, the second stage surgery and installation of a healing abutment was accomplished. Then the healing abutment was customized with a composite to enhance the diameter for the following 4 weeks before impressions were taken. The individualized abutment and the metal ceramic crown were cemented 10 months after SFEA. For control of abutment fitting and preventing peri-implantitis associated with residual cement in the peri-implant sulcus, finally a single-tooth radiograph in region 16 was made (Fig. 9-16).

Fig.8 surgical template

Fig.9 healing abutment following surgery

Fig.10 healing abutment two weeks later

Fig.11 formed peri-implant sulcus

Fig.12 individual abutment on model

Fig.13 intraoral abutment position

Fig.14 metal-ceramic crown

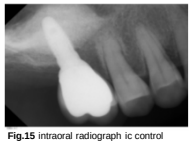

Fig.15 intraoral radiograph ic control

Fig.16 intra-oral incorporated crown

We acknowledge Dr. T. Dillschneider (Charité,CC3,Prosthodontic department) for prosthetic treatment and related photographs.

Discussion

In implantology, especially combined with SFEA, implants, abutments, augmentation, incisions, dental restorations can be simulated and evaluated based on CBCT and software as described and evaluated by the CBCT guideline, recommended by the German Society for Oral and Maxillofacial Medicine. These guidelines and clinical experiences can be used for treatment planning and virtual exact positioning of the prosthetically required implant positions based on best possible utilization of bone quantity. In addition, tissue deficiencies can be detected and identified. The exact location of the mandibular nerve in the mandible, the existence of *Underwood* septae or mucous cysts in the maxillary sinus, foreign materials, the patency of maxillary sinus ostium and an entitative artery anonyma, which is an anastomosis of the superior alveolar artery with the infraorbital artery, located in the lateral maxillary bone. Therefore, a CBCT is always recommended to be performed prior to SFEA.
The need for augmentation, distractions, type of implant site preparation are proactively planned. The transfer of spatial information from the planning system into the surgical reality can be produced by computer assistance, transmission by drilling template or by direct navigation tools.

Conclusion

The described diagnostic approach utilising a CBCT should be considered a standard for planning SFEA, supports the surgical procedure and the diagnosis of pathological findings.

Conflict of interest: The author was invited by CAMLOG Biotechnologies AG for Camlog 4th International Congress registration fee.

Address: Mr. Simon Meissner DDS, Universitätsmedizin Berlin CC 3, Arbeitsbereich Oralmedizin, zahnärztliche Röntgenologie und- Chirurgie
Aßmannshauser Str. 4-6, 14197 Berlin, Germany
Phone: 030 - 450 662 627, Fax 030 - 450 562 922, e-mail: simon.meissner@charite.de