Digital-guided implant surgery with immediate loading : a case of full mouth rehabilitation

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Introduction

Recently, the development of computerized tomography (CT) and implant planning software has increased interest in guided surgery, leading to various attempts to install implants at ideal angles and locations. In addition, prefabricated temporary prosthesis which can be designed and fabricated through the digital work-flow makes immediate loading easier. In this case, through the example of a 66-year-old edentulous patient, we would like to share an experience of full mouth implant placement through a digital-guided surgery with immediate loading and discuss the possibility and limitations.

Purpose

This case report aims to share an experience of full mouth implant placement through a digital-guided surgery with immediate loading and point out the possibility and limitations.

Materials & Methods

Age/Sex : 66 / M
Past Medical History : had hypertension, CVA and was taking antithrombotic drug(clopidogrel)

The digitally pre-planned and pre-made surgical guide (One-guide, Osstem, Korea) utilizing computed tomographic data and digitally scanned model were used to place eight upper and eight lower implants without incision. After mounting the pre-made abutments through CAD/CAM operations, the pre-built temporary bridges were delivered on the day of operation and immediate loading was initiated.

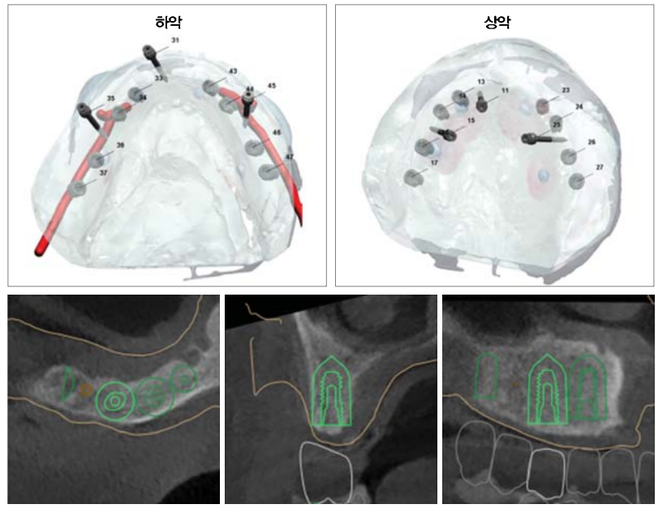
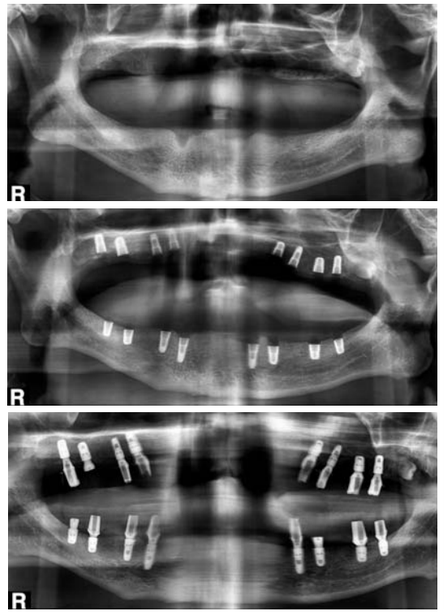


Fig. 5. Pre-operative report of surgical planning
This report shows three dimensional location and orientation of each implant and anatomical structures that need attention.



▶ Clinical values of inserted Implants

Implant type : TS3 SA (Osstem, Korea)

All implants except #34i(20Ncm) showed insertion torque over 55Ncm

Position / implant size / RFA value at op.				
#71i / 5.0 ×8.5(mm)	/ 79	85	85	85
#16i / 5.0 ×8.5(mm)	/ 67	67	67	67
#14i / 4.0 ×10.0(mm)	/ 80	80	80	80
#13i / 4.0 ×10.0(mm)	/ 86	86	86	86
#23i / 4.0 ×7.0(mm)	/ 78	78	78	78
#24i / 4.0 ×10.0(mm)	/ 79	79	79	79
#26i / 5.0 ×7.0(mm)	/ 84	84	85	85
#27i / 5.0 ×8.5(mm)	/ 85	85	85	85
#37i / 5.0 ×7.0(mm)	/ 67	82	82	82
#36i / 5.0 ×7.0(mm)	/ 62	61	62	62
#34i / 4.5 ×8.5(mm)	/ 84	84	84	84
#33i / 4.0 ×11.5(mm)	/ 80	80	82	82
#43i / 4.0 ×11.5(mm)	/ 78	78	79	79
#44i / 4.5 ×10.0(mm)	/ 85	85	80	85
#46i / 5.0 ×7.0(mm)	/ 67	83	84	84
#46i / 5.0 ×7.0(mm)	/ 84	75	75	75

***RFA values(ISQ) were tested at buccal(labial)-mesial-distal sides of implants by Osstell ISQ**

Fig. 2. Panoramic views of pre-operative, post-operative phase 1(post-surgery) and post-operative phase 2(after delivery of immediate temporary restorations)

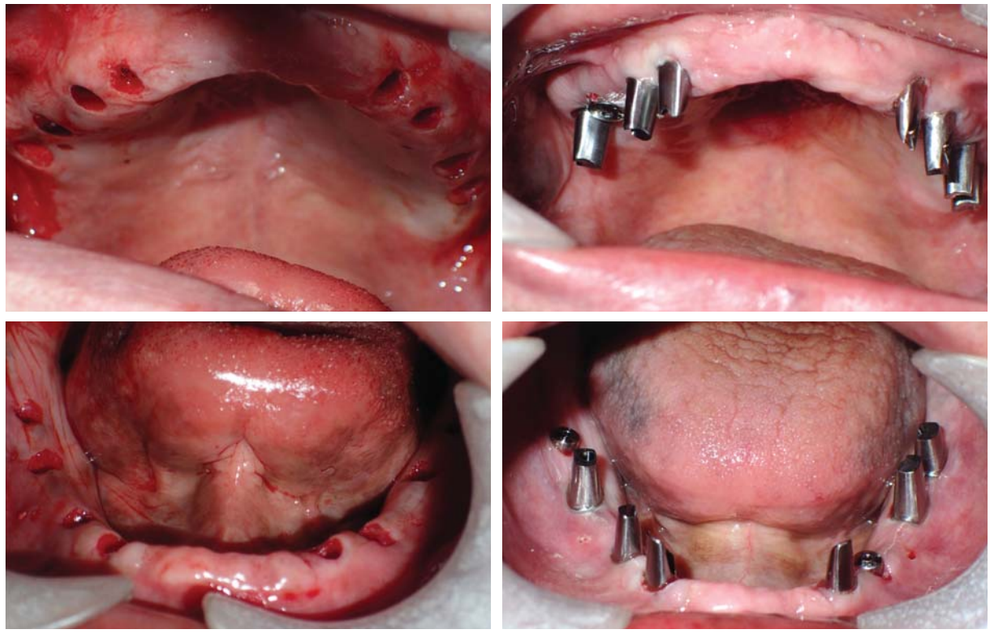


Fig. 3. Mounting pre-made abutments after Implant surgery

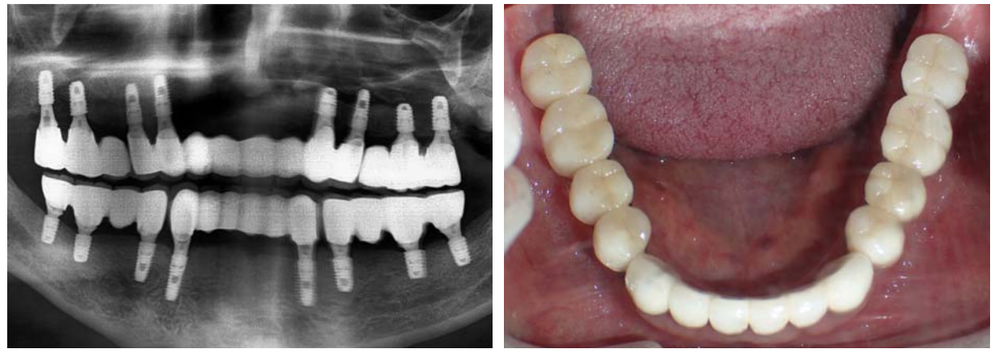


Fig. 4. Clinical and panoramic view after final rehabilitation

Results

No specific symptoms or complications occurred after the surgery and no problems were detected due to the immediate loading. No special side effects were observed after the final rehabilitation.

Conclusion

This case, using a surgical guide to the edentulous patient with the pre-operative prosthetic plans, improving the patient's function immediately through immediate loading were possible. It showed satisfactory esthetic and functional results.

Guided surgery brings both patients and clinician with convenience and satisfaction. The diffusion of digital surgical guides, which enable implantation at pre-planned locations and angles in computers, allows clinician to practice more freely.

But it is still not a simple treatment to design and install restorations to immediately restore the masticatory function of a fully edentulous patient while placing a number of implants.

This difficulty can be reduced by the collaboration between clinicians and digital technicians. The development of digital technology also decreases the errors in applying design to actual surgery.