

Robot-assisted Surgery Combined with Photogrammetry Impression In Immediate Implant with Fixed Full-arch Prosthesis: A Case Report



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BACKGROUND

Dental industry has been deeply digitized, the application of data computing and AI have greatly improved accuracy and efficiency of implant surgical and prosthetic process.

AIM

Applied digitalization in full-process of implantation will improve efficiency and precision, and with AI robot assistance could reduce error from dentist's muscle fatigue.

MATERIALS&METHODS

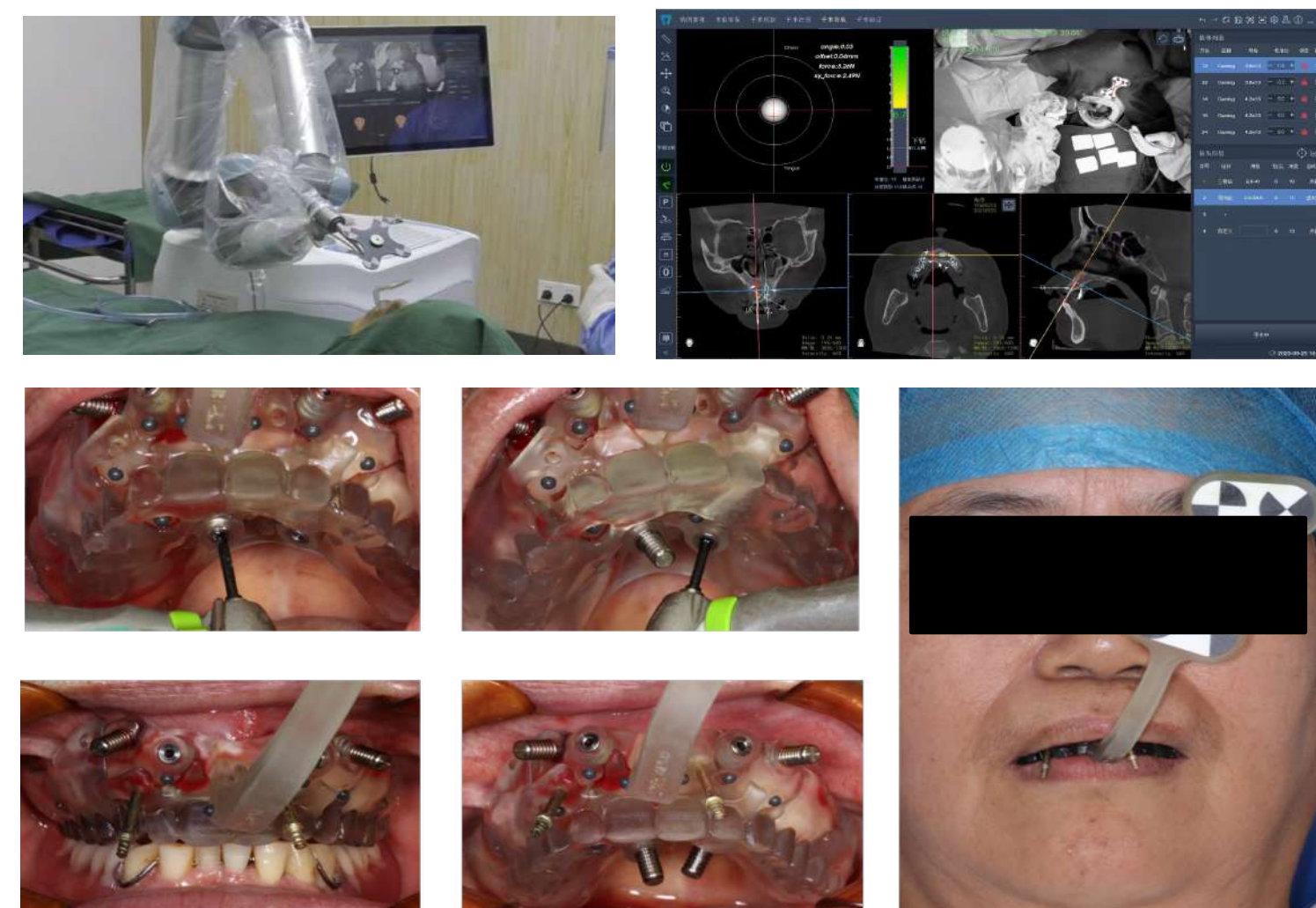
This case highlights the digital technology application in full process immediate implant and restoration of edentulous, includes preoperative plan, use robotic arm to limit handpiece's movement in surgical site (Ruijibo Robot) to accurately positioned implant, and use Icam4D extraoral scanner for impression. Before surgery, the digital software was used to evaluate occlusal space and status for diagnostic purpose, then made the radiation guide plate. After double scanning, 3D printed an edentulous jaw marker for robot arm registration. In surgery, the robot (Ruijibo Robot) assisted in flap osteotomy and 3D navigation, then inserted six Camlog implants.

MATERIALS&METHODS

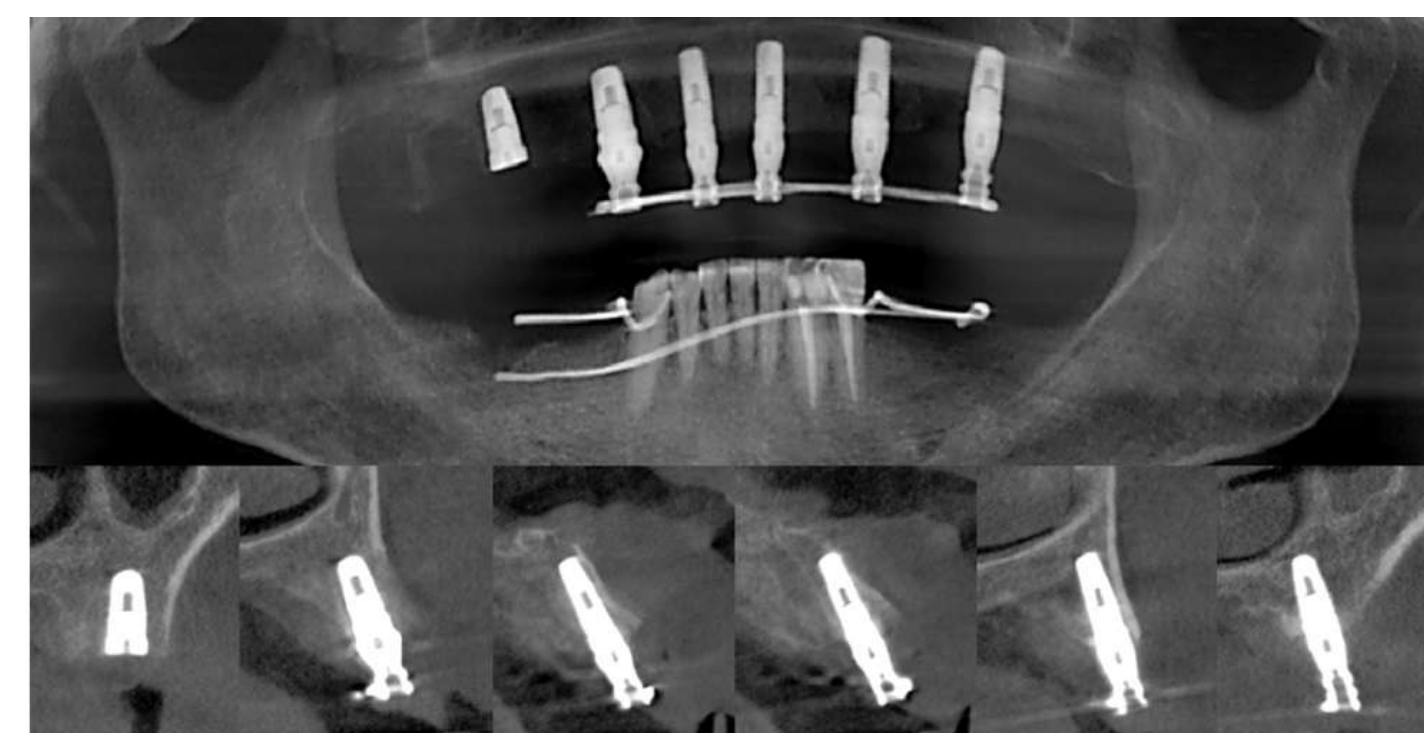
Provisional prosthesis was made chairside based on preoperative design and installed immediately. After 3 months, the impression was taken by Icam4D scanner, CAD/CAM titanium bridge with zirconia all-porcelain crown was finally made and installed.

Implant : **CAMLOG Biotech GmbH**

Photo: robot assisted surgery



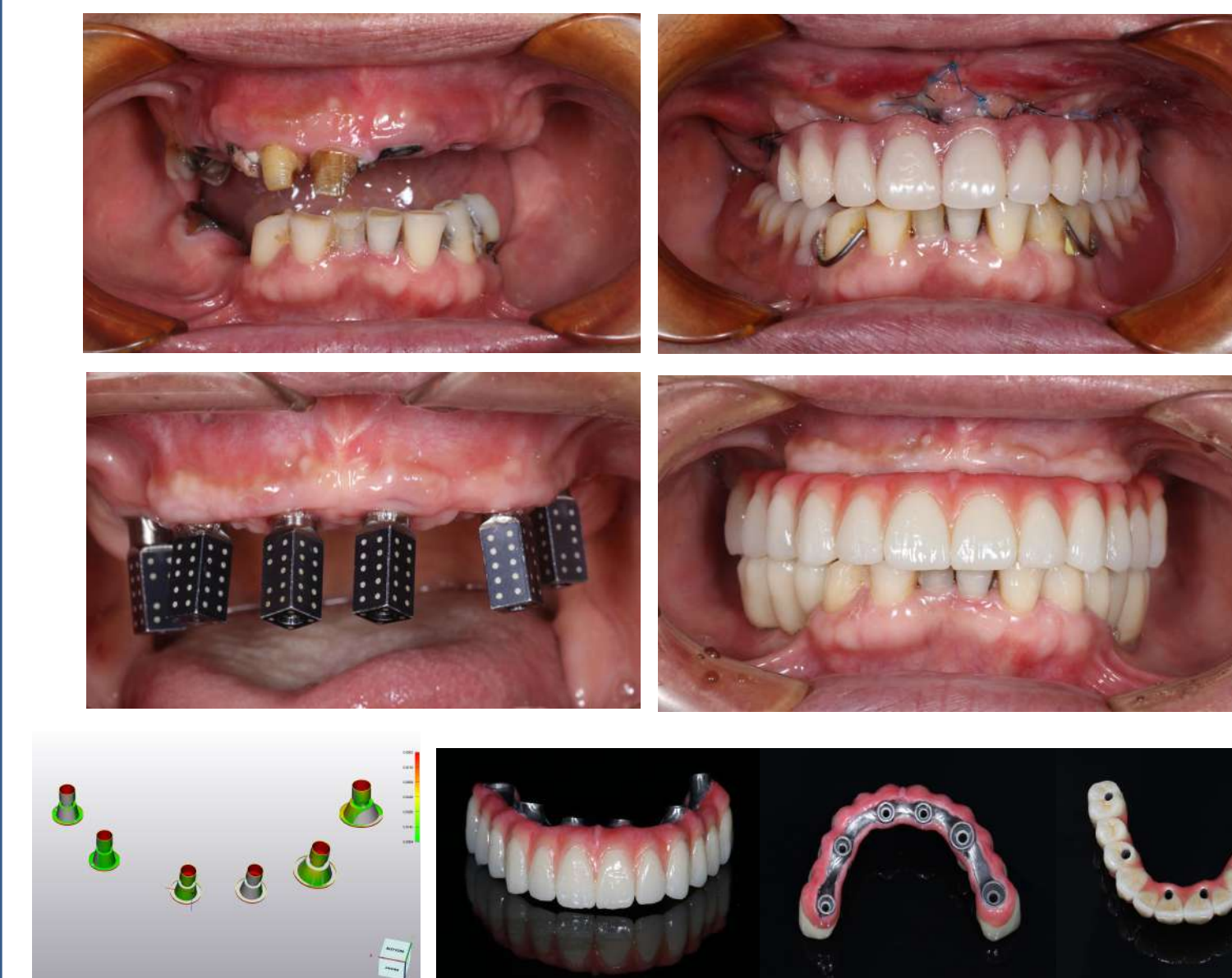
Xray after surgery with pick-up



RESULTS

Robot arm replicated implant position as preoperative design. Osseointegration is still good after 3 months. Patient satisfied with final restoration.

Photo: after conventional hybrid restoration, contrast with initial status, ICam4D impression



Patient look: Initial vs day surgery vs after 3 months



CONCLUSIONS

When free-hand operation, the surgery quality may vary with dentist's physical status, muscles and experience. There are 4 surgical navigation robot systems in China approved by CFDA, based on AI which can real-time 3D navigate surgery, accurate handpiece constraint movement and obstacle avoidance strategies in implant site, etc., clinical feedback positive. Icam 4D also could greatly shorten prosthetics process. The whole process digitalized can improve consistency precision between preoperative plan and result, reduce dentist work intensity and error, improve patient's experience and trust.

Scan QR code to watch video of its surgical procedure



DISCLOSURE OF INTEREST

The author reports no conflicts of interest. Written informed consent for post of their clinical details and clinical images was obtained from the patient.