



Digital Technology for Good Clinical Practice in Implant and Prosthetic Dentistry



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MINIMALLY INVASIVE TECHNIQUES IN THE RESOLUTION OF MAXILLARY DISTAL EDENTULISM, WITH SEVERE BONE RESORPTION : TILTED IMPLANTS AND CANTILEVER EXTENSION WITH COMPUTER GUIDED FLAPLESS SURGERY. 3-YEARS FOLLOW UP.

ESPOSITO U.* – SIRIGNANO M.*/**

*A.Cardarelli Hospital (Naples,Italy)- Operating Complex Unit of Dentistry – Chief: Dr. U.Esposito
**University Federico II (Naples, Italy) – Post Doctoral School in Oral Surgery – Chief: Prof.L.Ramaglia

OBJECTIVE

Resolution of distal edentulism with severe bone resorption using minimally invasive techniques and prosthetically guided implants positioning.

CASE PRESENTATION

In April 2010 an healthy 64 years old female patient came to our observation. She presented compromised natural teeth supporting fixed prosthesis in region 2.3-2.6.

Three months after extractions the patient underwent CT Dentscan. For a proper assessment of the case a scan prosthesis was realized: it was a barium sulphate duplicate of patient dental set-up in order to perform a correct CT Dentscan for a computer case planning, and we observed a reduced bone availability in the distal edentulous region.

We analyzed the CT images using SimPlant software (Materialise Dental – Leuven, Belgium) in order to discuss with the patient about the use of alternative techniques to the sinus lift outlining the advantages and disadvantages of different approaches.

By means a computer and prosthetically driven surgery we planned to insert 2 implants, an axial implant in region 2.3 and a tilted implant in region 2.5 to cross the sinus, foreseeing the use of distal cantilever.

In this case, using SimPlant software, we realized a teeth and mucosa supported surgiguide and we preferred to perform a flapless surgery to minimize the surgical trauma.

We inserted two implants 3,6mm in diameter, with a length of 14mm in region 2.3 and a length of 12mm in region 2.5 (Dentium Implant System–Seoul, Korea). The prosthetic loading was performed 90 days after the surgery.

RESULTS

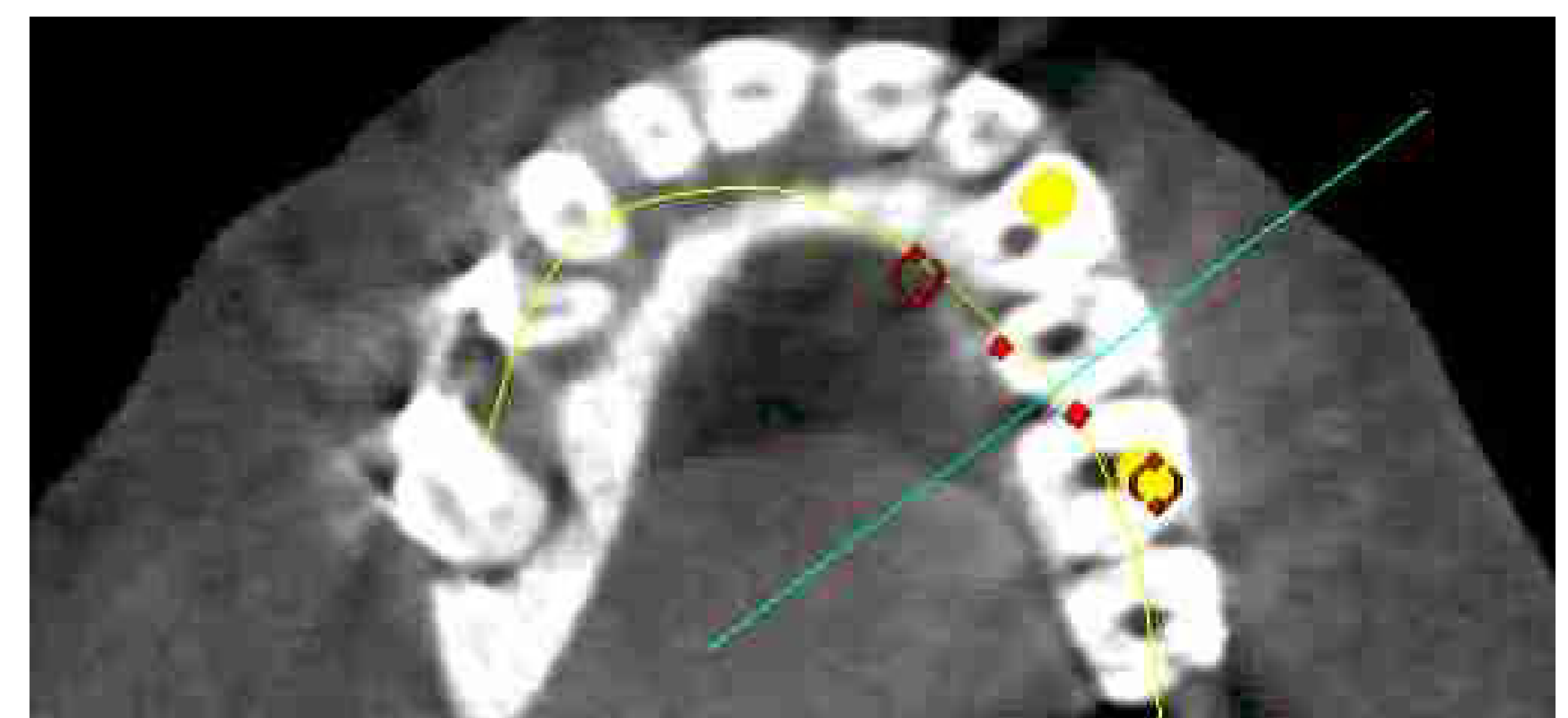
After a clinical and radiographic 3-years follow up, the patient presented the soft tissues in perfect conditions and an excellent maintenance of marginal bone.

CONCLUSIONS

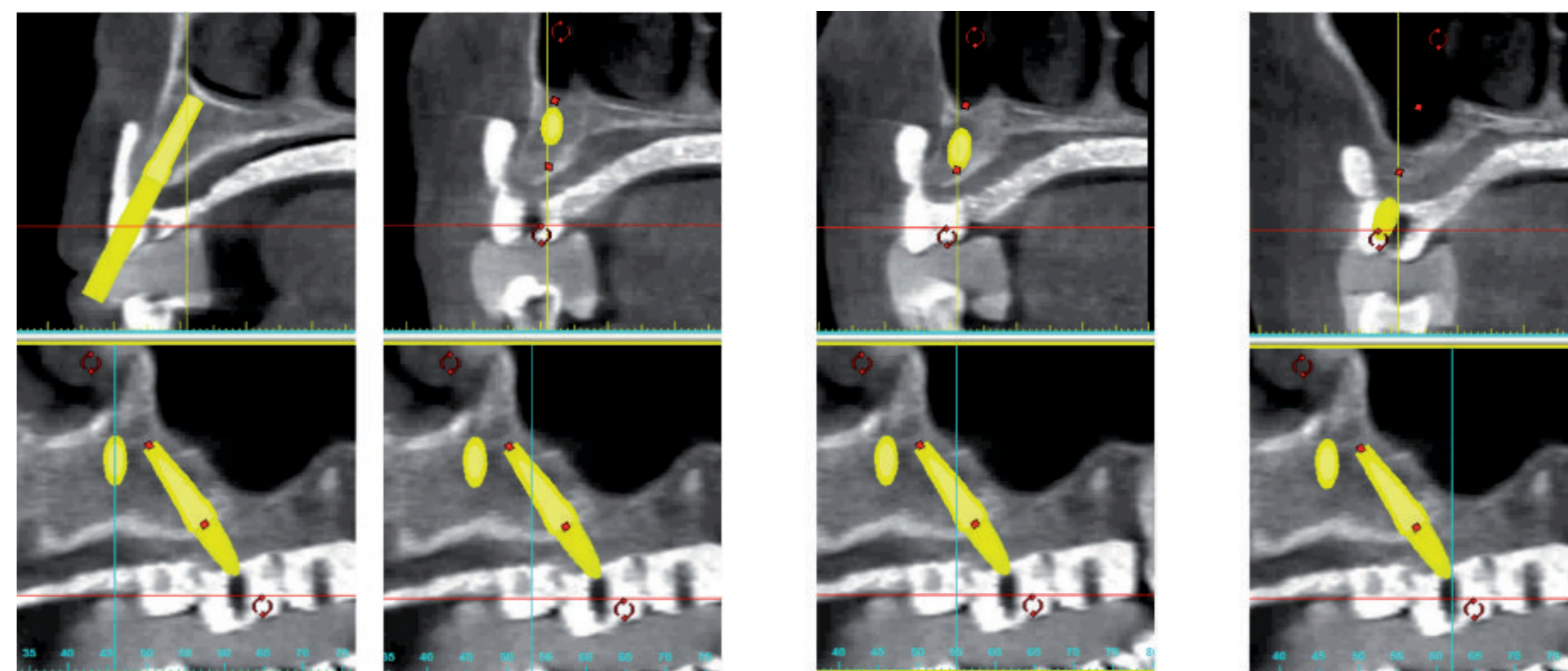
With the utilization of cad/cam technology, tilted implant and cantilever extension, a complex clinical case from the surgical and prosthetic points of view was treated performing a minimally invasive flapless surgery with a satisfactory functional and esthetic result.



Initial X-Ray



Virtual planning in occlusal view



Virtual planning in lateral and frontal view



Virtual implants inclination



The teeth and mucosa surgiguide



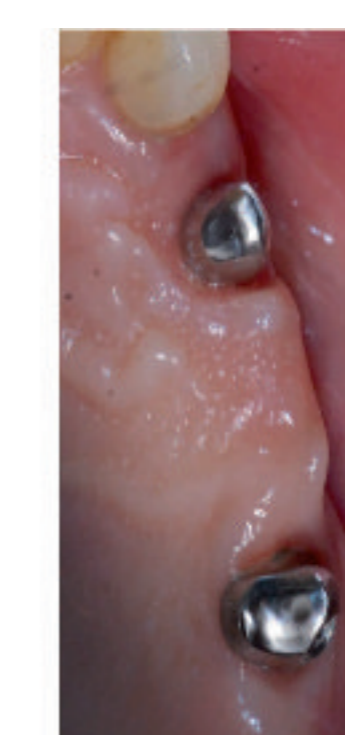
Some steps of surgery



X-Ray just after implants insertion



Prosthetic abutments in lateral and occlusal view



X-Ray to control the prosthetic abutments



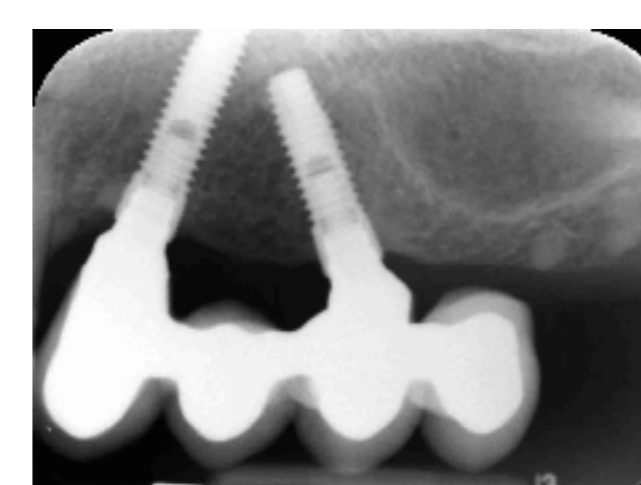
Final cemented restorations



Final result in frontal view



3-years clinical follow-up



3-years radiological follow-up



Clinical and radiological follow-up: superimposed images

REFERENCES

- 1) Aglietta M., Siciliano V., Zwaalen M., Bragger U., Pjetursson BE, Lang NP, Salvi GE A systematic review of the survival and complication rates of implant supported fixed dental prostheses with cantilever extensions after an observation period of at least 5 years. Clin. Oral Implants Res. 2009;20:441-451
- 2) Aparicio C, Arevalo X, Ouzzani W, Granados C. A retrospective clinical and radiographic evaluation of tilted implants used in the treatment of severely resorbed edentulous maxilla. Appl Osseointegration Res 2002;3:17-21
- 3) Barbier L, Schepers E. Adaptive bone remodeling around oral implants under axial and nonaxial loading conditions in the dog mandible. Inter. Journal of Oral and Maxil. Implants 1997; 12: 215-223
- 4) Calandriello R, Tomatis M. Simplified treatment of the atrophic posterior maxilla via immediate early function and tilted implants: A prospective 1-year clinical study. Clin Implant Dent Relat Res 2005;7 Suppl 1:51-12
- 5) Heitz-Mayfield LJ, Schmid B, Weigel C, Gerber S, Bosshardt DD, Jansson J, Lang NP, Jansson J Does excessive occlusal load affect osseointegration? An experimental study in the dog. Clin Oral Implants Res. 2004 Jun;15(3):259-68
- 6) Koutouzis T., Wennström J. Bone level changes at axial and non axial positioned implants supporting Fixed partial dentures. A 5-year retrospective longitudinal study. Clin. Oral Impl. Res. 2007 Oct 18(5):585-90
- 7) Romeo E., Lops D., Margutti E., Chisoffi M., Chiapasco M., Vogel G. Implant-supported fixed cantilever prostheses in partially edentulous arches. A seven-year prospective study Clin. Oral Impl. Res. 2003; 14: 303-311
- 8) Romeo E, Storelli S. Systematic review of the survival rate and the biological, technical, and aesthetic complications of fixed dental prostheses with cantilevers on implants reported in longitudinal studies with a mean of 5 years follow-up. Clin Oral Implants Res. 2012 Oct;23 Suppl 6:39-49.
- 9) Romeo E, Tomasi C, Finini I, Casentini P, Lops D. Implant-supported fixed cantilever prosthesis in partially edentulous jaws: a cohort prospective study. Clin Oral Implants Res. 2009 Nov;20(11):1278-85.
- 10) Sertgöz A, Güvenser S. Finite element analysis of the effect of cantilever and implant length on stress distribution in an implant-supported fixed prosthesis J.Prosthet. Dent. 1996 Aug; 76(2):165-9
- 11) Stegaroliu R, Sato T, Kusakari H, Miyakawa O. Influence of restoration type on stress distribution in bone around implant: a three-dimensional finite element analysis. Int J Oral Maxillofac Implants. 1998 Jan-Feb; 13(1):82-90
- 12) Wennström J., Zurdo J., Karlsson S., Ekestubbe A., Grondahl K., Lindhe J. : Bone level change at implant-supported fixed partial dentures with and without cantilever extension after 5 years in function. J. Clin. Periodontol. 2004 ; 31 : 1077-1083
- 13) White S.N., Caputo A.A., Anderkvist T. Effect of cantilever length on stress transfer by implant-supported prostheses J.Prosthet.Dent. 1994 May;71(5):493-9
- 14) Zurdo J., Romao C., Wennström J.L Survival and complication rates of implant-supported fixed partial dentures with cantilevers: a systematic review. Clin Oral Implants Res 2009;20(suppl.4):59-66