Multicentre study on the healing behaviour of a new implant system • prospective clinical and radiological results •

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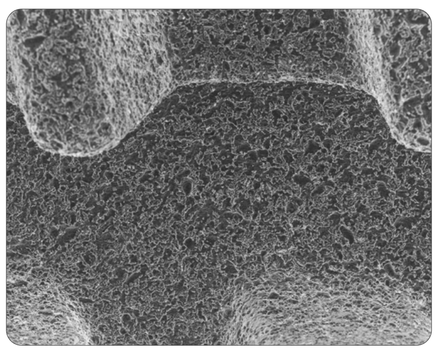
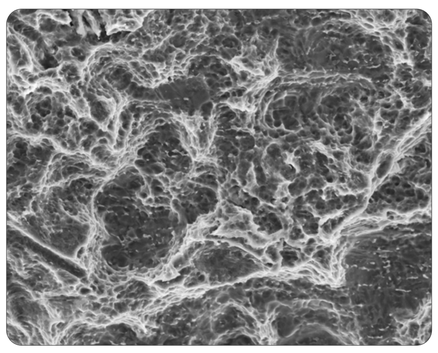
Task definition

This clinical trial is intended to demonstrate the use, suitability and reliability of the Ratioplant implant system under clinical conditions. The study was conducted and documented at 9 different dental clinics in Turkey. Special attention was paid to the osseointegration behavior and the herewith linked survival rate of the implants. The present evaluation was conducted over a period from December 2019 to August 2020. All examined surgeries where performed following a prior standardized implantation protocol using only original equipment by HumanTech Dental GmbH.

Implant RatioPlant® ConeCept



SEM 500µm

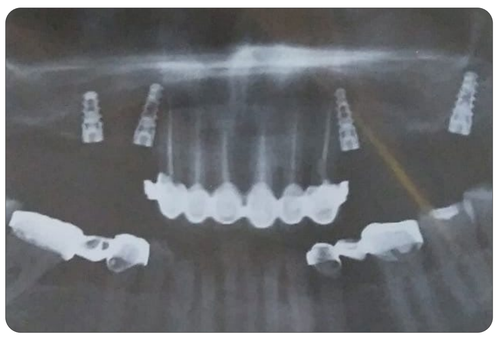


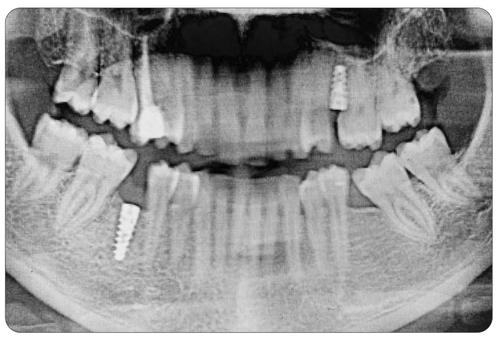
SEM 20µm

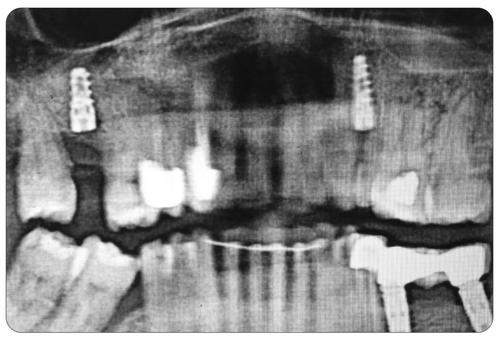
Implant RatioPlant® Avantgarde

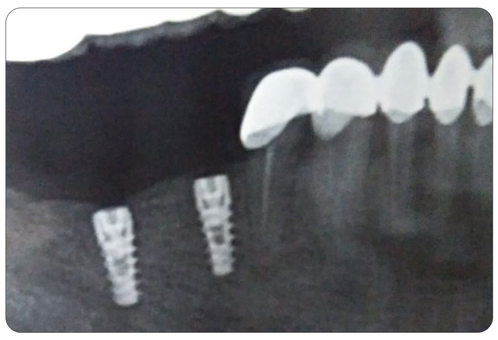
Implementation

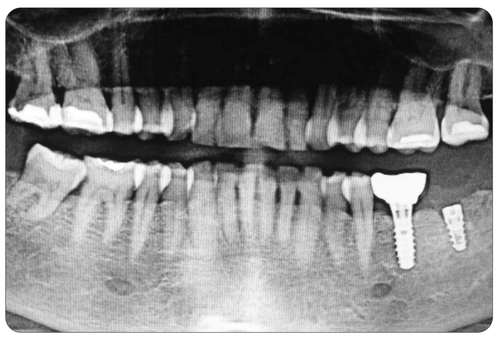
example cases

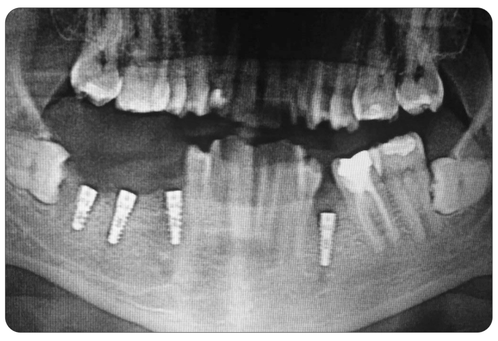


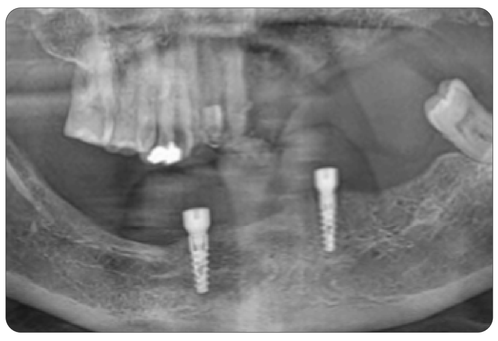










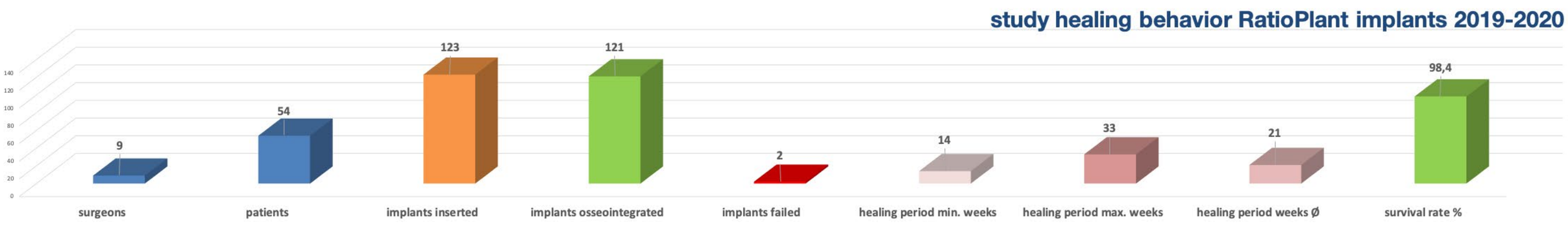


The cases for the present study were documented in 9 different dental clinics with 54 patients in Turkey. All patients were selected by the clinics and informed regarding the study participation in advance. The above presented figure shows exemplary x-rays of the clinical trial. Each surgeon was instructed in advance regarding the preparation, execution and goal of this study. All surgeries were performed using the same instruments and following a standardized drilling protocol. Herewith a uniform implantation procedure could be guaranteed.
Different indications, such as direct implantation after extraction, late implantation and aesthetic oral rehabilitation, as well as direct or previous augmentation procedures were considered within the patient selection. The implants were surgically placed in partially edentulous or edentulous jaws of the patients. Healing after surgery was performed by surgeons choice either with an open or closed approach. Non-invasive methods like x-ray, reverse-torque or percussion testing were used during healing period to control the osseointegration behavior of the implants. Soft tissue forming was carried out with healing caps in different shapes according to the given indication. Subsequently, the prosthetic restoration with single crowns, bridges, partial or total dentures was carried out. All cases of the study were documented and will be monitored the following months for generating long-term results. More cases with the same procedure will be included to this study for increase statistical significance and confirm the quality of its results.

Results and Discussion

The evaluation of 54 implantations in the period from December 2019 to August 2020 showed the following results:
The present cases exhibit an average healing period of 22 weeks with a minimum of 14 weeks and a maximum of 33 weeks. Overall, the resulted healing periods in this study were extended due to clinical lockdowns during to Covid-19 pandemic. The survival rate of all 123 inserted Ratioplant Implants, within a time period of 11 months presents a value of 98,4 % which corresponds to a number of 2 failed implants in total. This given survival rate represents a better result than those stated in an early stage data analysis, carried out by Lambert et al.[1] (97,0%); Chrcanovic et al.[2] (93,6%) and Mohajerani et al.[3] (93,3%). However comparable survival rate of 98% ± 1% could be observed in various studies[4] but most focusing on a different timeframes and higher quantity of placed implants.

[1] Lambert, France E., et al. „Descriptive analysis of implant and prosthodontic survival rates with fixed implant–supported rehabilitations in the edentulous maxilla." Journal of periodontology 80.8 (2009): 1220-1230.
[2] Chrcanovic, B. R., et al. „Factors influencing early dental implant failures." Journal of dental research 95.9 (2016): 995-1002
[3] Mohajerani, Hassan, et al. „The risk factors in early failure of dental implants: a retrospective study." Journal of Dentistry 18.4 (2017): 298.
[4] Smeets, Ralf, et al. „Impact of dental implant surface modifications on osseointegration." BioMed Research International 2016 (2016).



Conclusion and Outlook

On basis of documentation and subsequent evaluation the present study demonstrates an above-average survival rate of the Ratioplant Avantgarde and ConeCept implants. The results indicate a high quality surface treatment and an excellent reliability of the implant system. Furthermore, all evaluated patients could receive an optimal indication-related treatment due to various available implant sizes and prosthetic components of the system.

This study will be continued by monitoring the documented cases and with further treated patients. Herewith the statistical significance and the quality of its stated results shall be confirmed. Furthermore the effect of early loading (< 12 weeks) shall be evaluated, which was not possible in the present study due to clinical lockdowns during to Covid-19 pandemic.

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