

Tomographic evaluation of the alveolar dimensional changes using the partial extraction therapy in the maxilla esthetic area: a case report with 3 years of follow up.

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INTRODUCTION

Tooth loss results in a collapse of the buccal bone and, if not treated, could lead to alveolar bone atrophy that could prevent implant placement and jeopardize the esthetic outcome.¹

Several techniques that aim to minimize the effects of this bone loss have been applied, such as the use of biomaterials,² root submersion techniques in pontic areas³, and the partial extraction therapy (PET), where a root fragment coincident with the buccal wall of the socket is maintained, supporting the periodontium, and, in this way,⁴ nourishing the bone plate, thus preventing its resorption.

This study presents a case of maxillary rehabilitation with immediate implants, using partial extraction therapy, with 3 years of clinical and tomographic follow-up, evaluating the dimensional changes of the alveolar bone in the buccal area.

PRE-TREATMENT



Initial condition, smile and occlusion

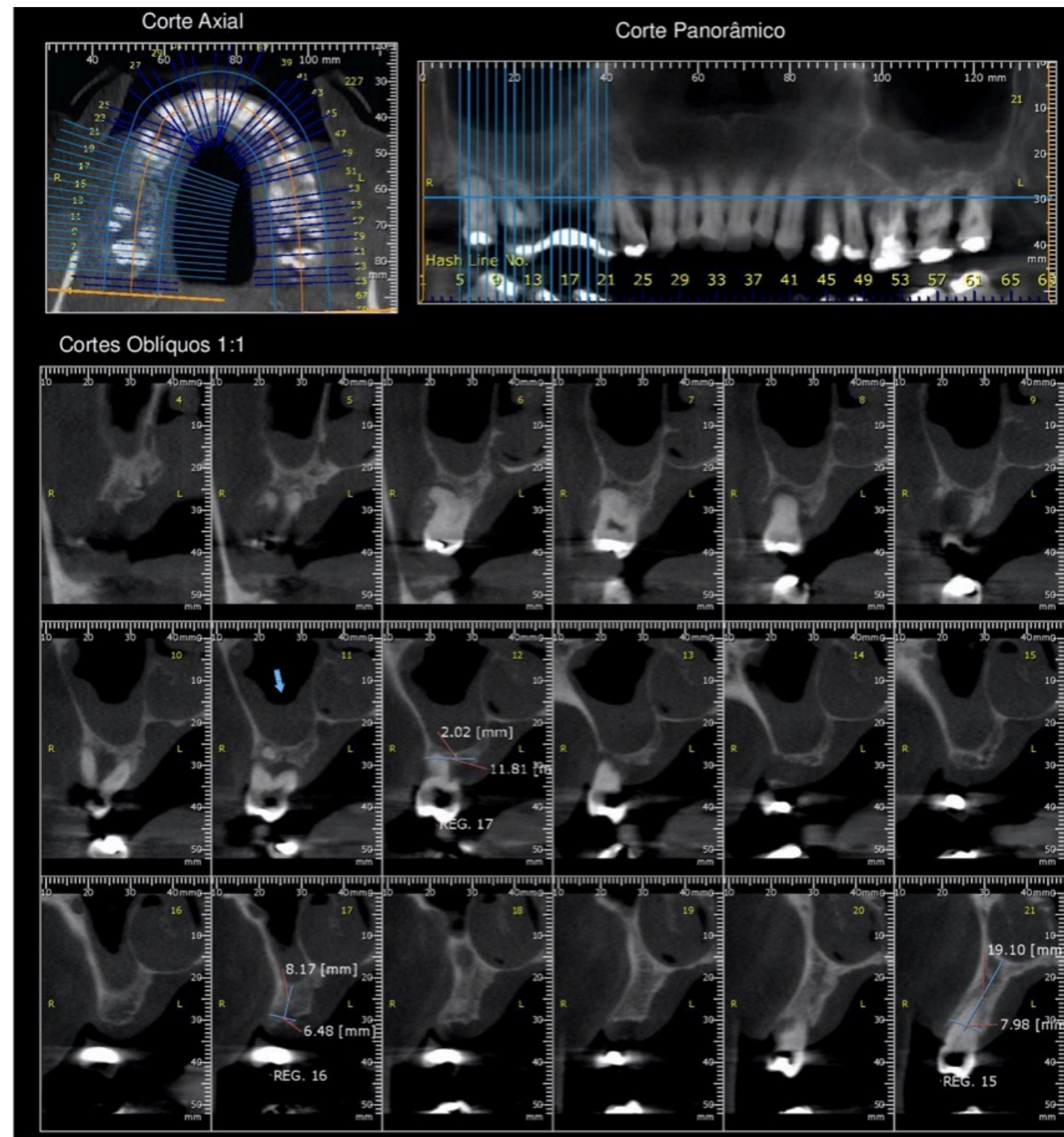
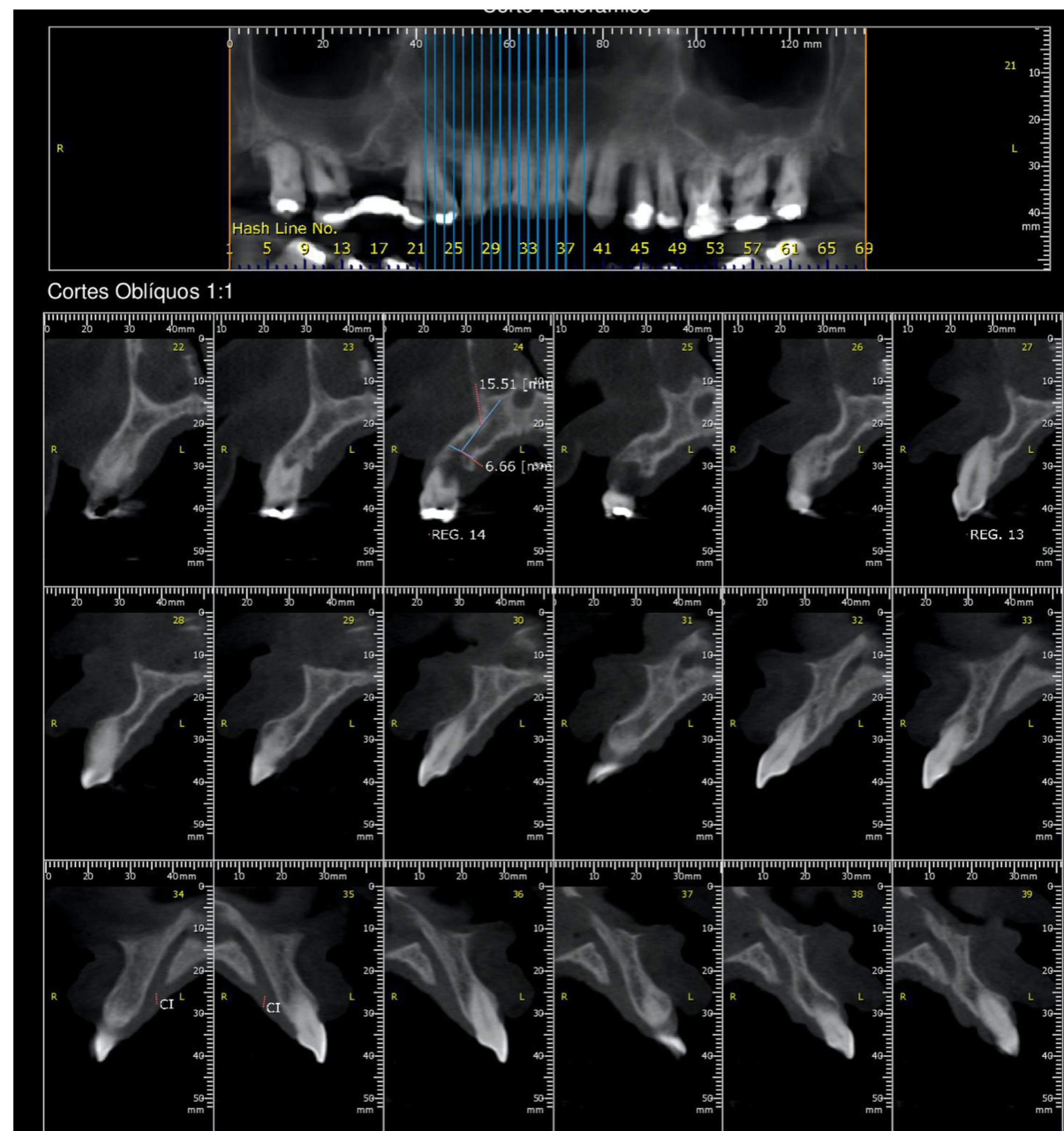
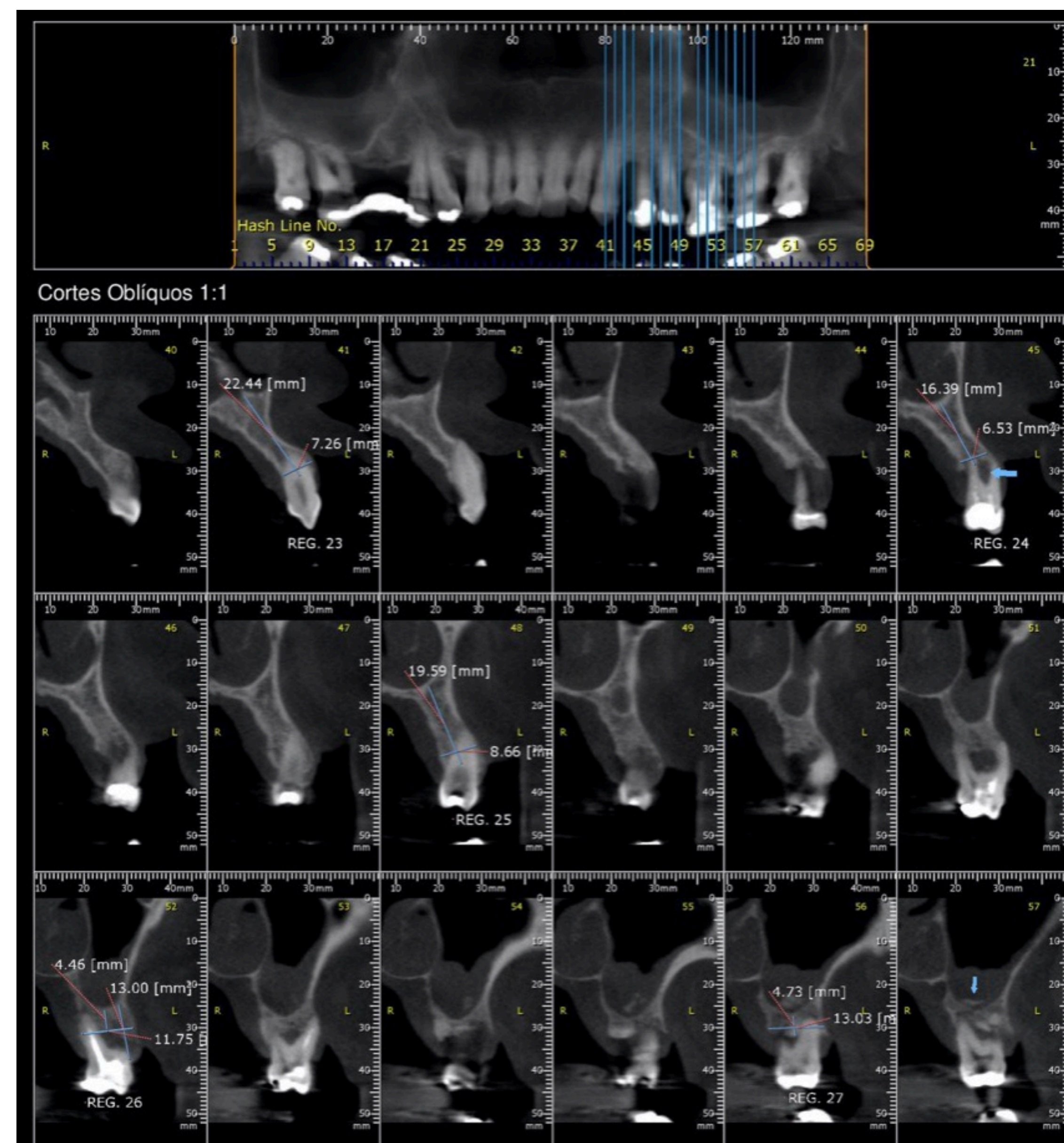
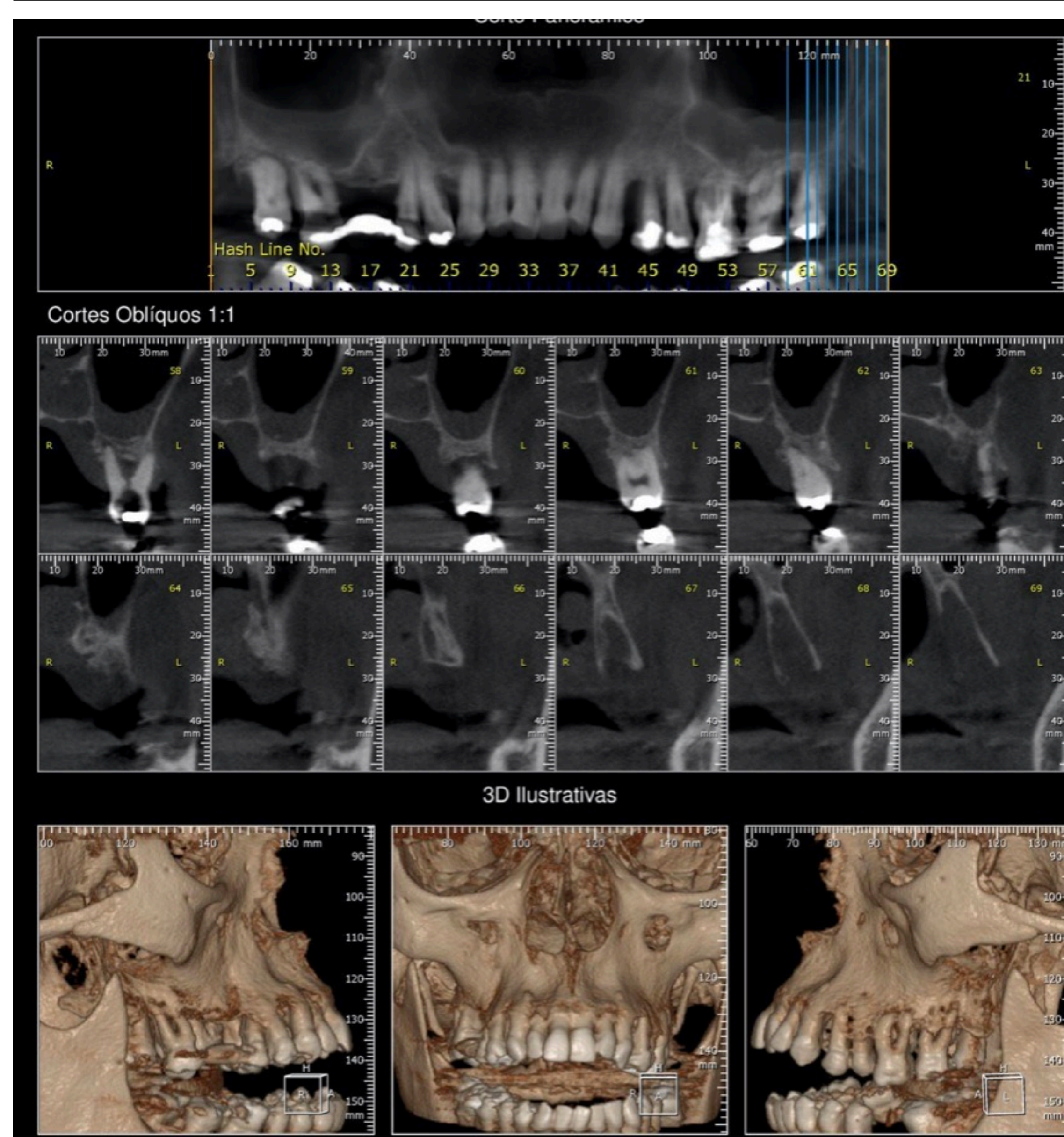


Planning by Digital Smile Design (DSD)



Impression and occlusion register

INITIAL TOMOGRAPHIC IMAGES



SURGICAL GUIDE



METHODS

A total maxillary rehabilitation with implants, using partial extraction therapy in teeth # 6, 8, 9, 10, and 11 was performed. In addition, immediate implants were placed in regions # 8 and 9. An interim immediate total implant-supported restoration was placed on the same day. Five months later, the definitive restoration was placed and adjusted. In each of the five regions where PET was performed, the changes in the alveolar dimension in its cervical, middle, and apical portions were measured using CBCT scan and DTX software, at baseline, 1 and 3 years after loading.

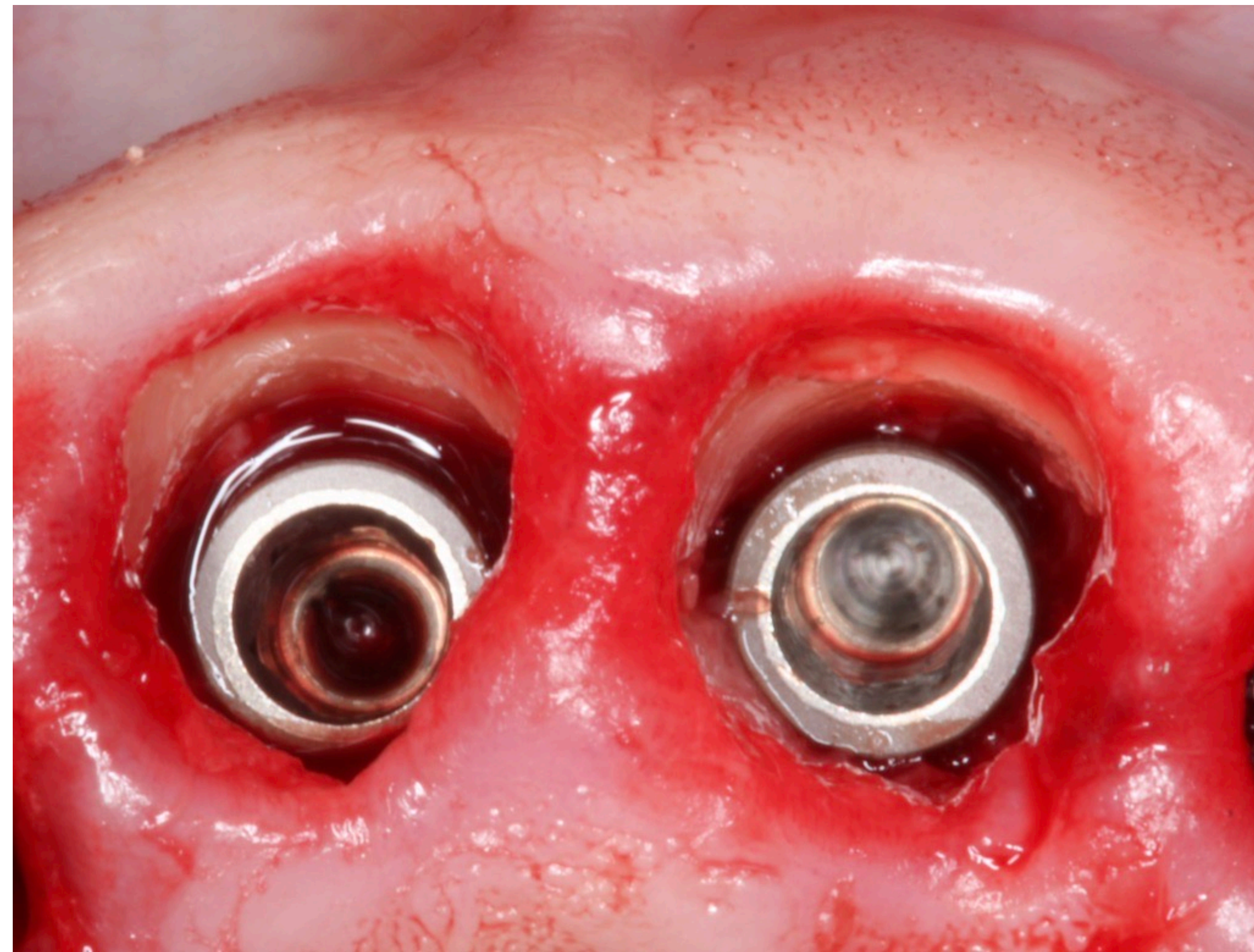
SURGERY



Partial extraction therapy



Surgical guide in position



Socket shield



Implants positioning



Immediate provisionalization



8-day follow up

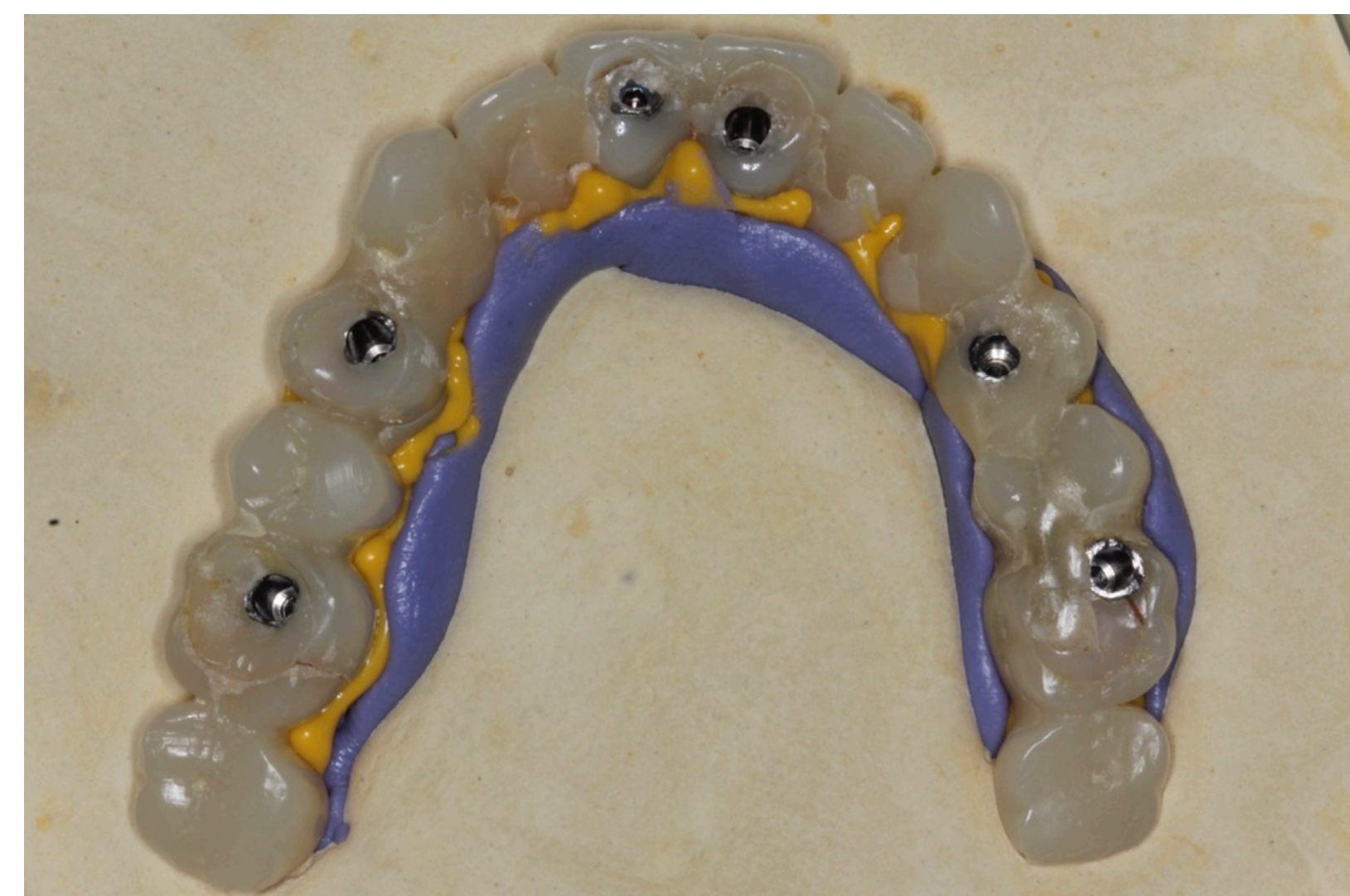
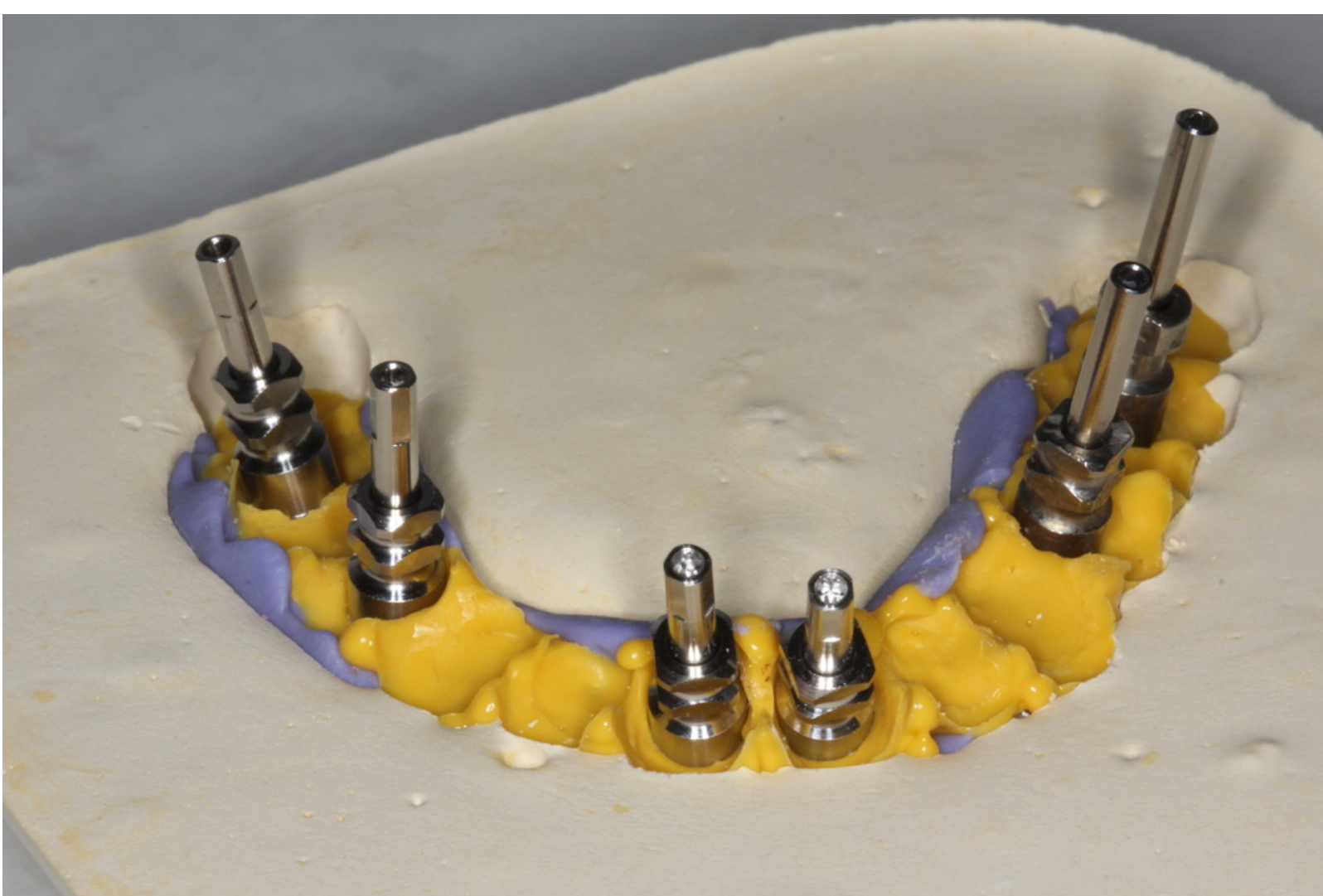


4-month follow up

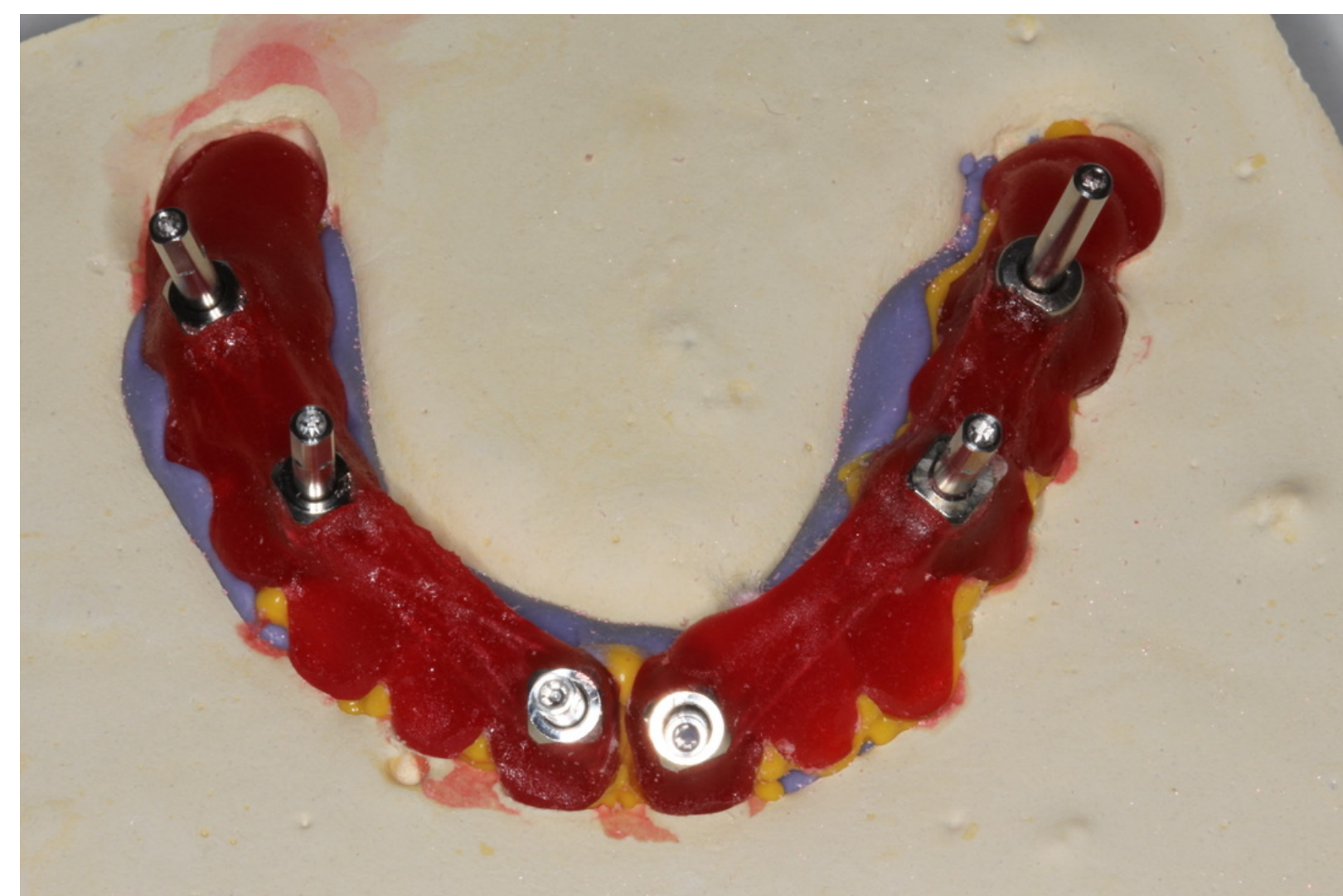
RESTORATIVE



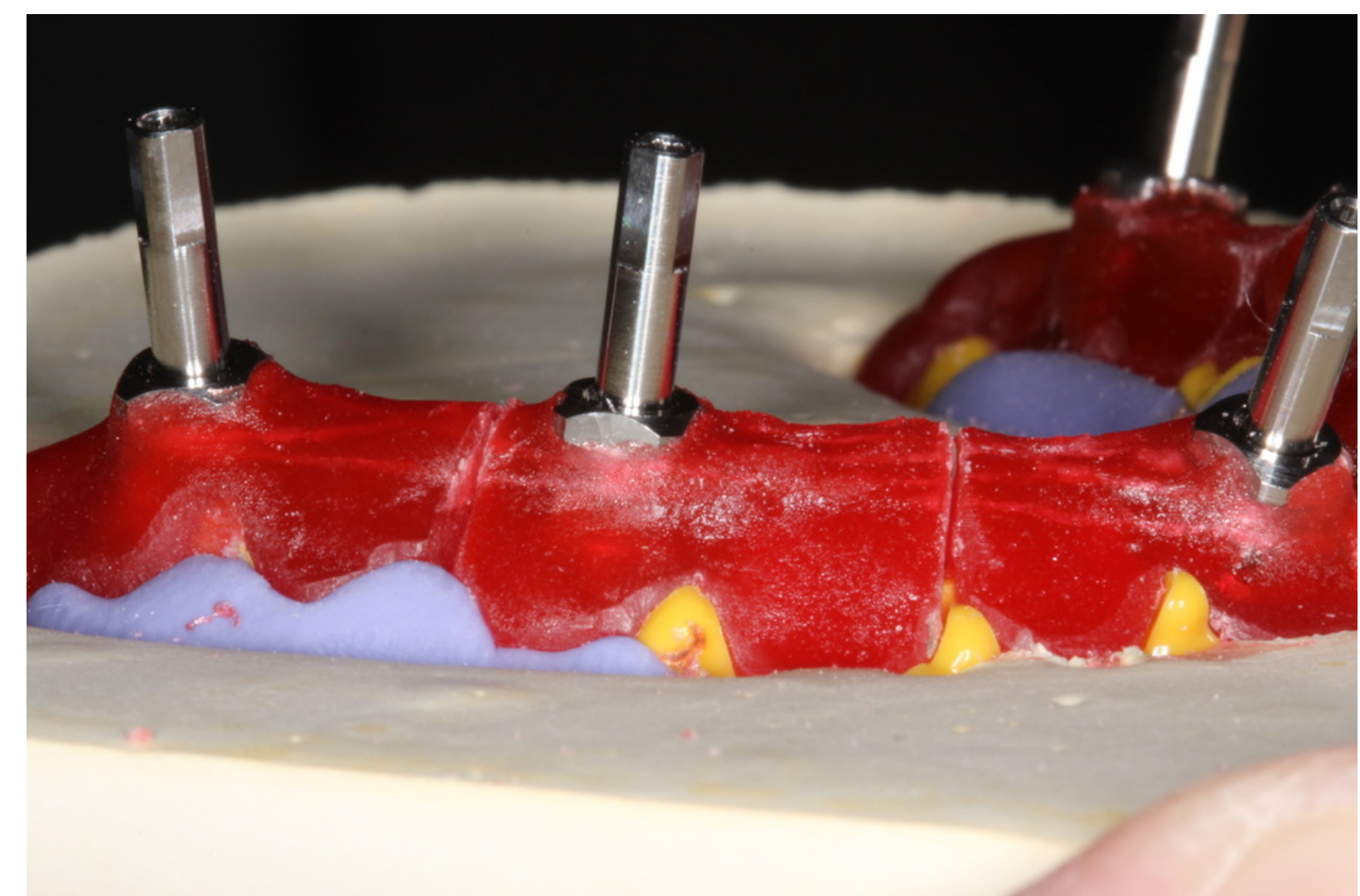
Copy of the emergency profile of the provisionalization with silicone



Impression posts



Pattern resin



Copy of emergency profile

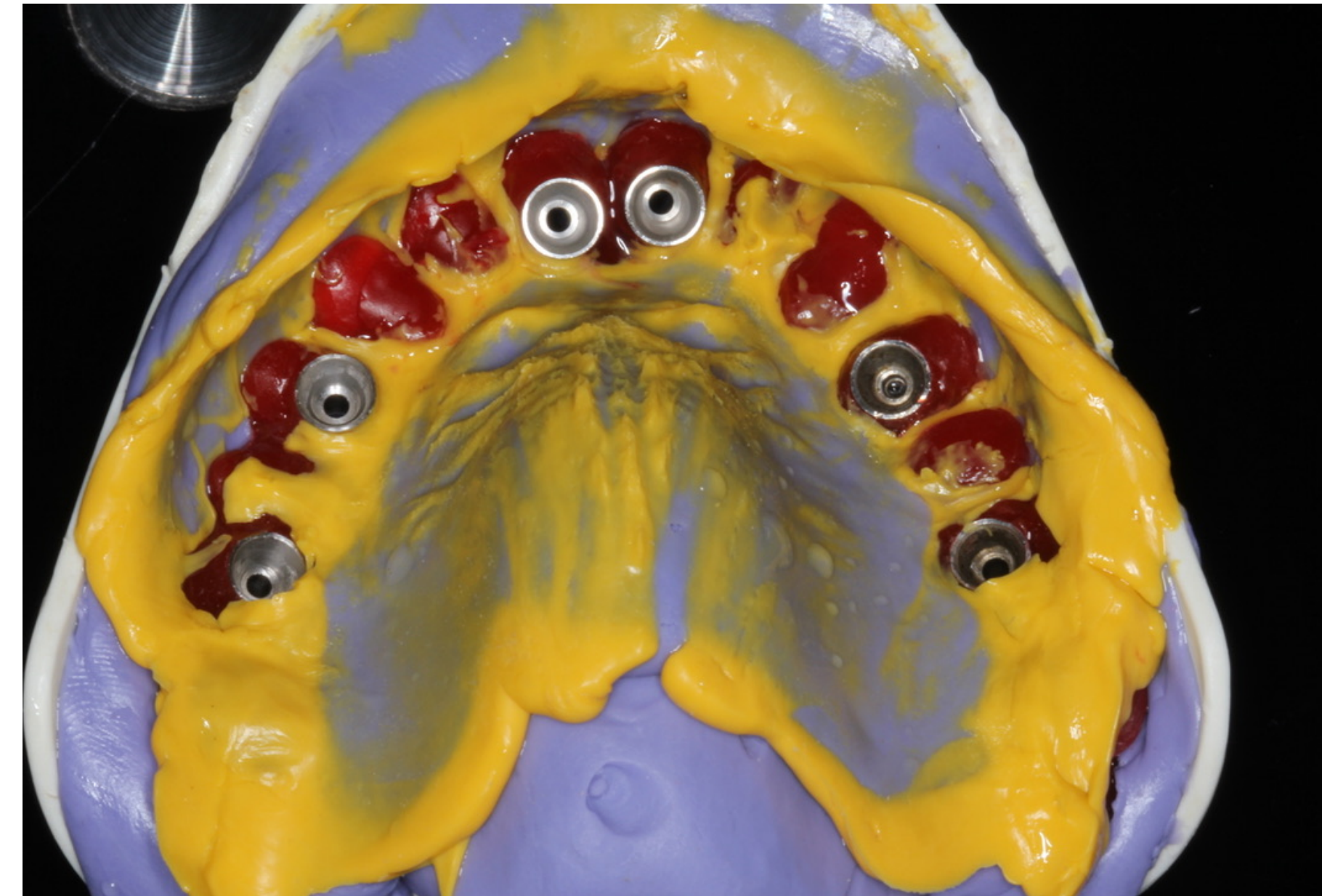
RESTORATIVE



Separate impression posts



Installed in the mouth and bonded with pattern resin. Occlusal registration.



Implant impression



Obtaining plaster models



Occlusal view of emergency profiles and tissue volume



Zirconia infrastructure



Ceramic prosthesis



Final condition

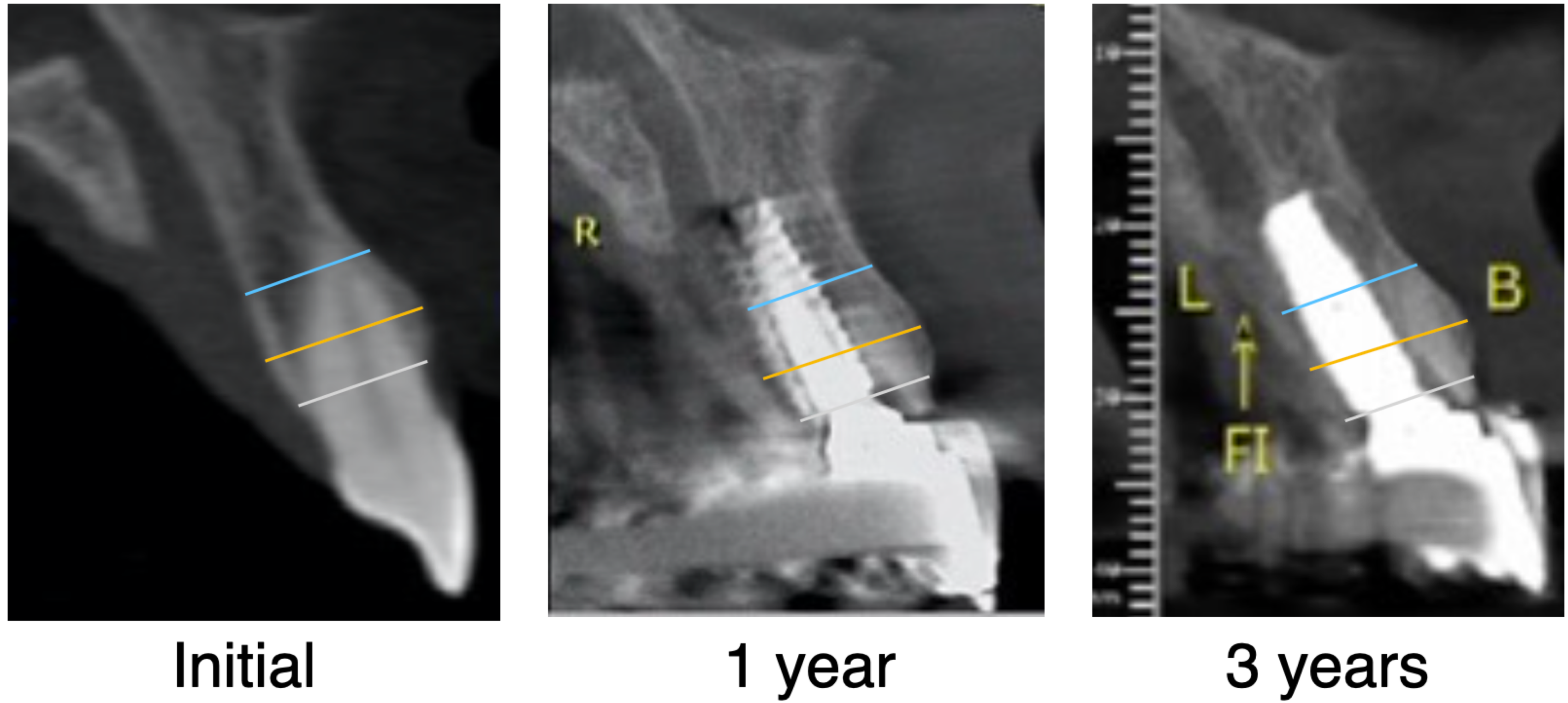


3-year follow up

RESULTS

The mean values (mm) in the five regions evaluated at baseline, 1 and 3-year periods were respectively: cervical = 7.92 ± 0.46 ; 8.38 ± 0.61 and 8.28 ± 0.51 . Middle = 7.84 ± 0.99 ; 8.18 ± 1.05 and 7.22 ± 0.69 . Apical = 6.84 ± 0.91 ; 6.88 ± 0.74 and 6.40 ± 0.70 . No statistically significant difference was observed in each region between the periods measured ($p > 0.05$).

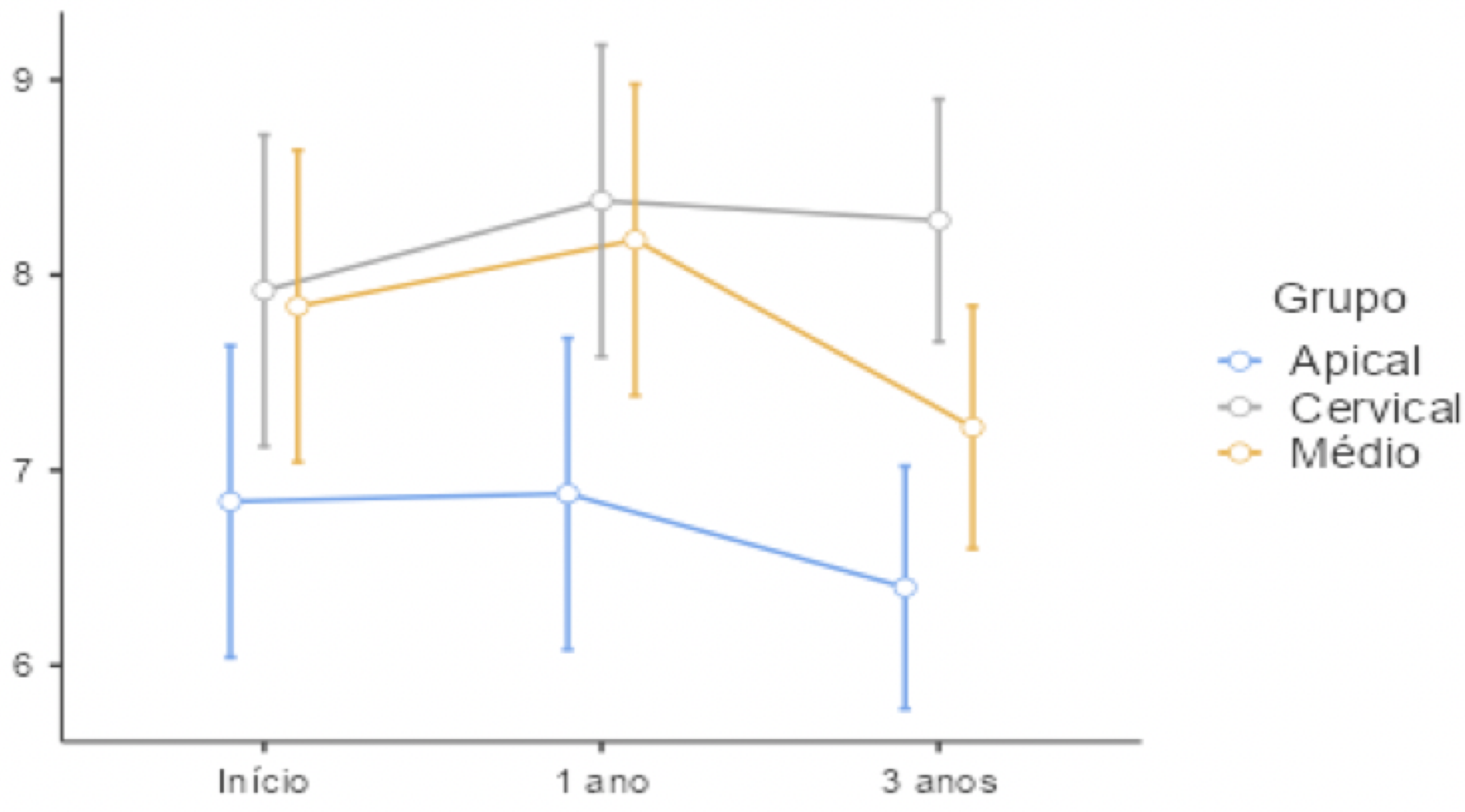
STATISTICAL ANALYSIS



Measurements obtained by DTX Software

Group	Time	N	Average	Median	Standard deviation	Minimum	Maximum	Shapiro-Wilk
								p
Cervical	Baseline	5	7,92	8,00	0,46	7,2	8,3	0,293
	1 year	5	8,38	8,10	0,61	7,7	9,2	0,569
	3 years	5	8,28	8,10	0,51	7,8	9,1	0,397
Middle	Baseline	5	7,84	8,00	0,99	6,8	9,1	0,520
	1 year	5	8,18	8,20	1,05	7,1	9,5	0,508
	3 years	5	7,22	7,10	0,69	6,4	8,3	0,627
Apical	Baseline	5	6,84	6,60	0,91	5,8	8,1	0,850
	1 year	5	6,88	6,90	0,74	6,1	7,8	0,536
	3 years	5	6,40	6,00	0,70	5,8	7,3	0,120

Shapiro-Wilk test on the cervical, middle and apical regions of the teeth # 6, 8, 9, 10 and 11.



CONCLUSION

Partial extraction therapy allowed the maintenance of the alveolar dimension, in pontic and implant sites in the anterior maxilla, during the 3-year follow-up period.



References: 1- Araújo, M. G. & Lindhe, J. Dimensional ridge alterations following tooth extraction. An experimental study in the dog. Journal of Clinical Periodontology 2005.
2- Araújo MG, Lindhe J Ridge preservation with the use of Bio-Oss collagen: A 6-month study in the dog. Clin Oral Implants Res. 2009
3- Salama, M. et al. Advantages of the root submergence technique for pontic site development in esthetic implant therapy. Int J Periodontics Restorative Dent. 2007
4- Hurzeler, M. B. et al. The socket shield technique: a proof-of-principle report. J Clin Periodontol. 2010.