

COMPARISON OF THE ACCURACY OF DIFFERENT STATIC GUIDED SURGERY SYSTEMS IN THE PLACEMENT OF DENTAL IMPLANTS: AN IN VITRO EXPERIMENTAL STUDY

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INTRODUCTION

Digital planning using static guides (sCAIS) allows to place the implant in the ideal position as it limits the possible deviation in its placement compared with freehand surgery.

There is limited information about the accuracy of these guides; for this, it's important to know if the design of the guide influences in 3D position. The aim of this poster is to compare the accuracy of different guided surgery systems.



METHODS

Our experimental design consists of 3 simulated surgery with different types of guides. An operator and one typodont with an edentulous posterior lower area for each surgery guide were included.



A STL file of the scanned model and a cone beam computed tomography (CBCT) were taken, and both were sent to each implant company to obtain the planning of 2 standard platform implants for each model. The surgical guides were printed and the implants were placed following the drilling protocol as indicated by the company.



The comparison between the pre-surgical CBCT and the post-surgical CBCT was made to calculate the deviations obtained in the 3 space planes between the initial planning position versus the actual placement of the implants.

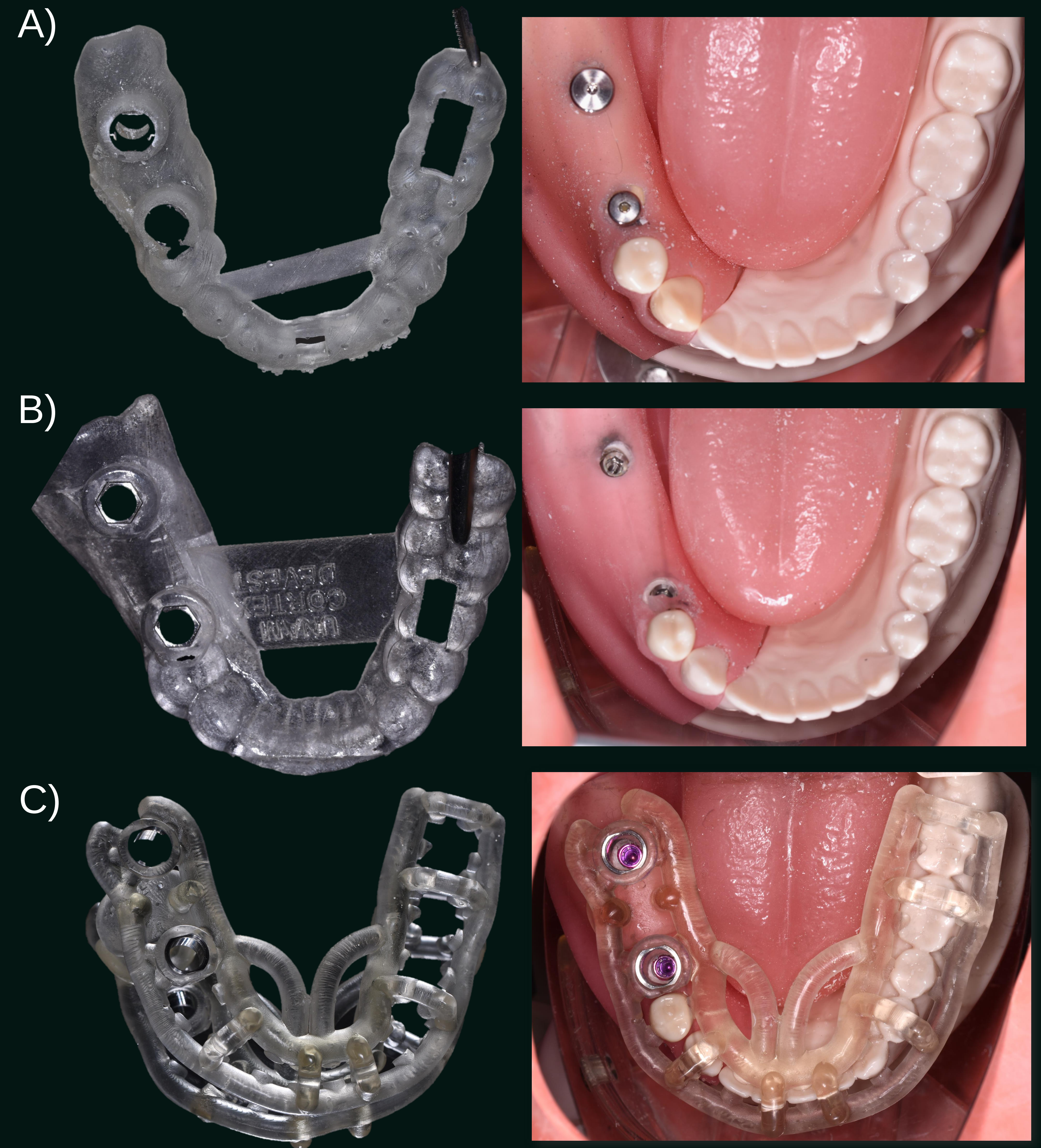
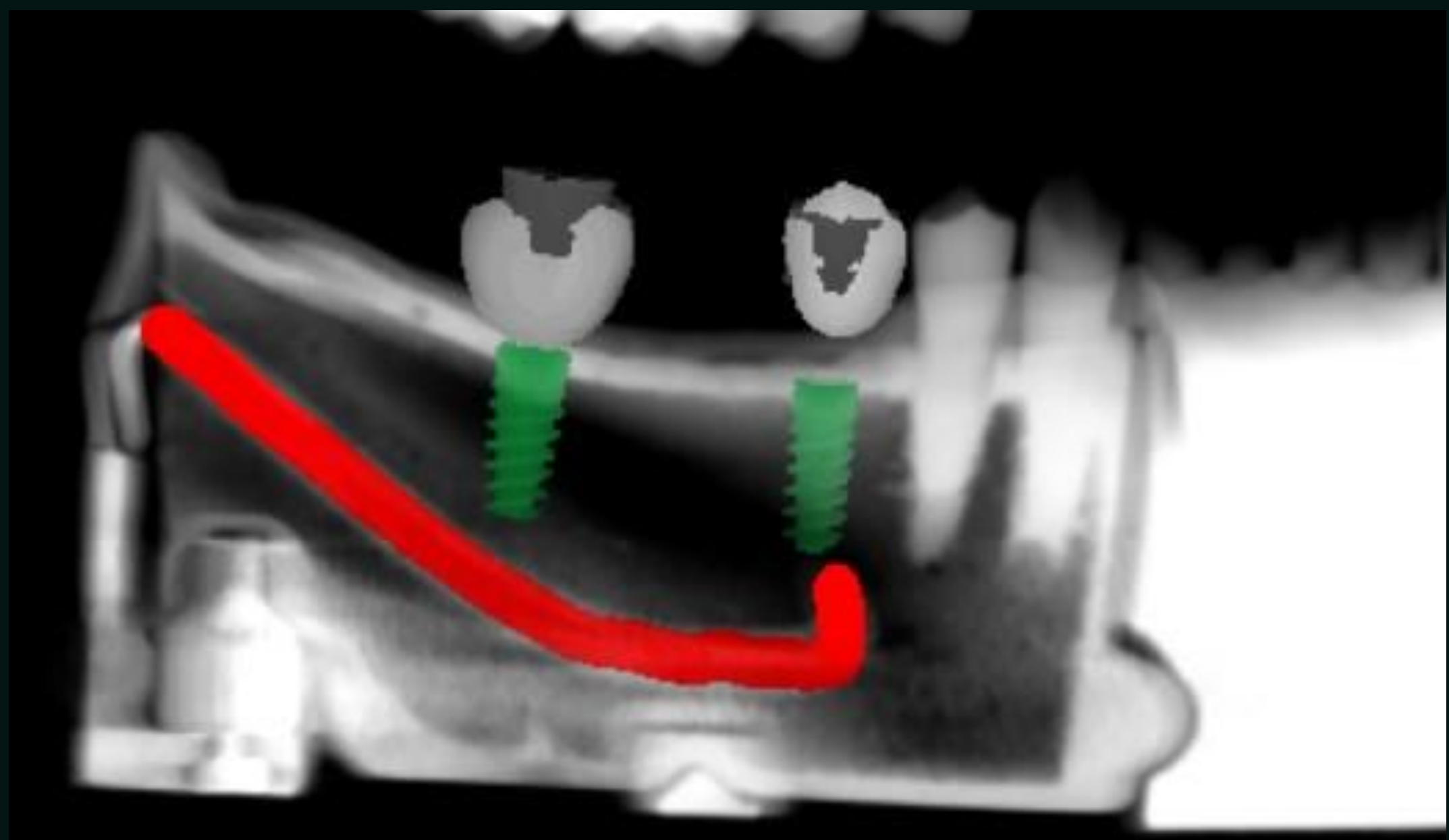


Figure 1. Implants placed using each guided system: a) Group 1; b) Group 2; c) Group 3.

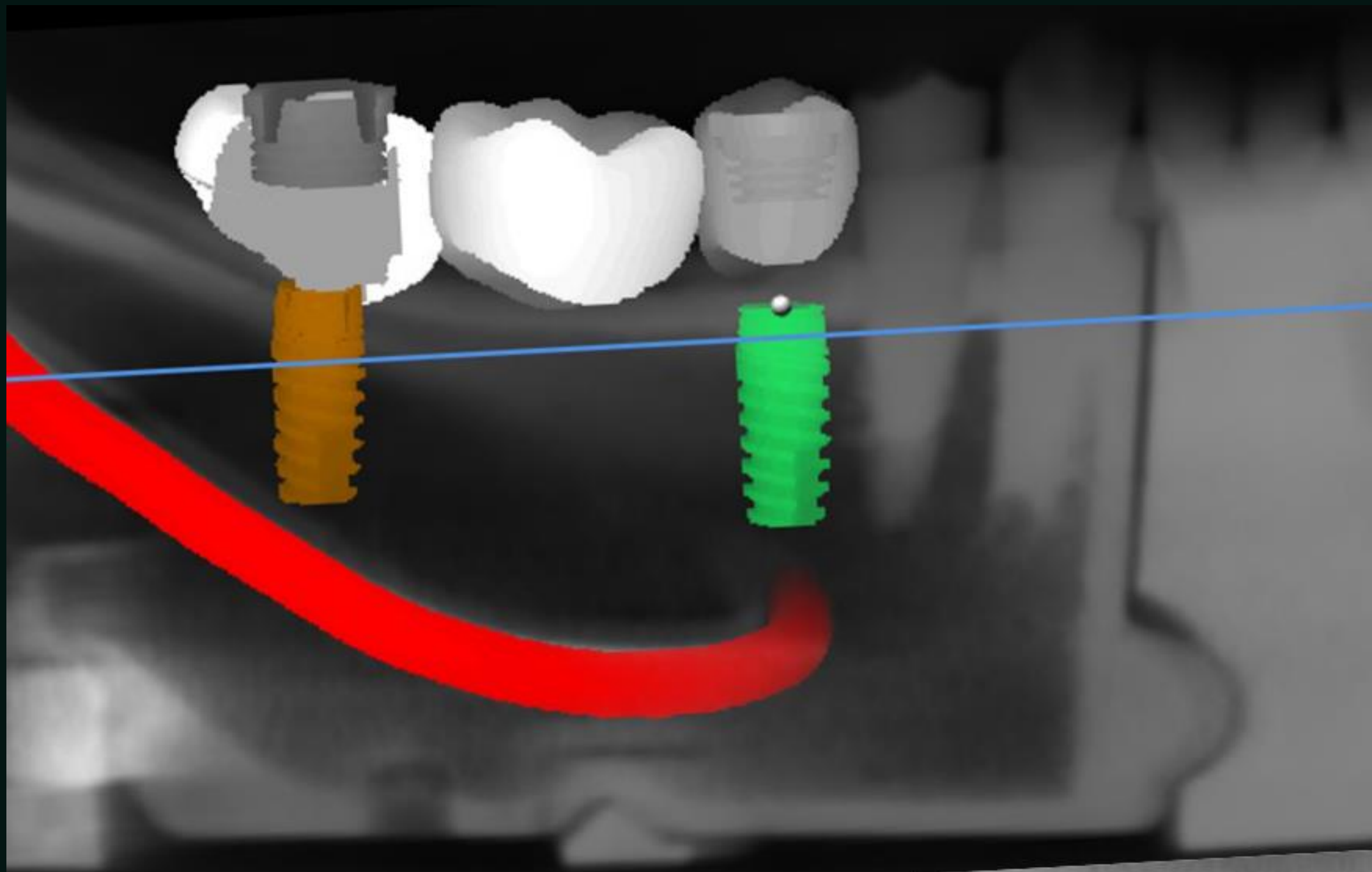
RESULTS: PILOT STUDY

PLANNING

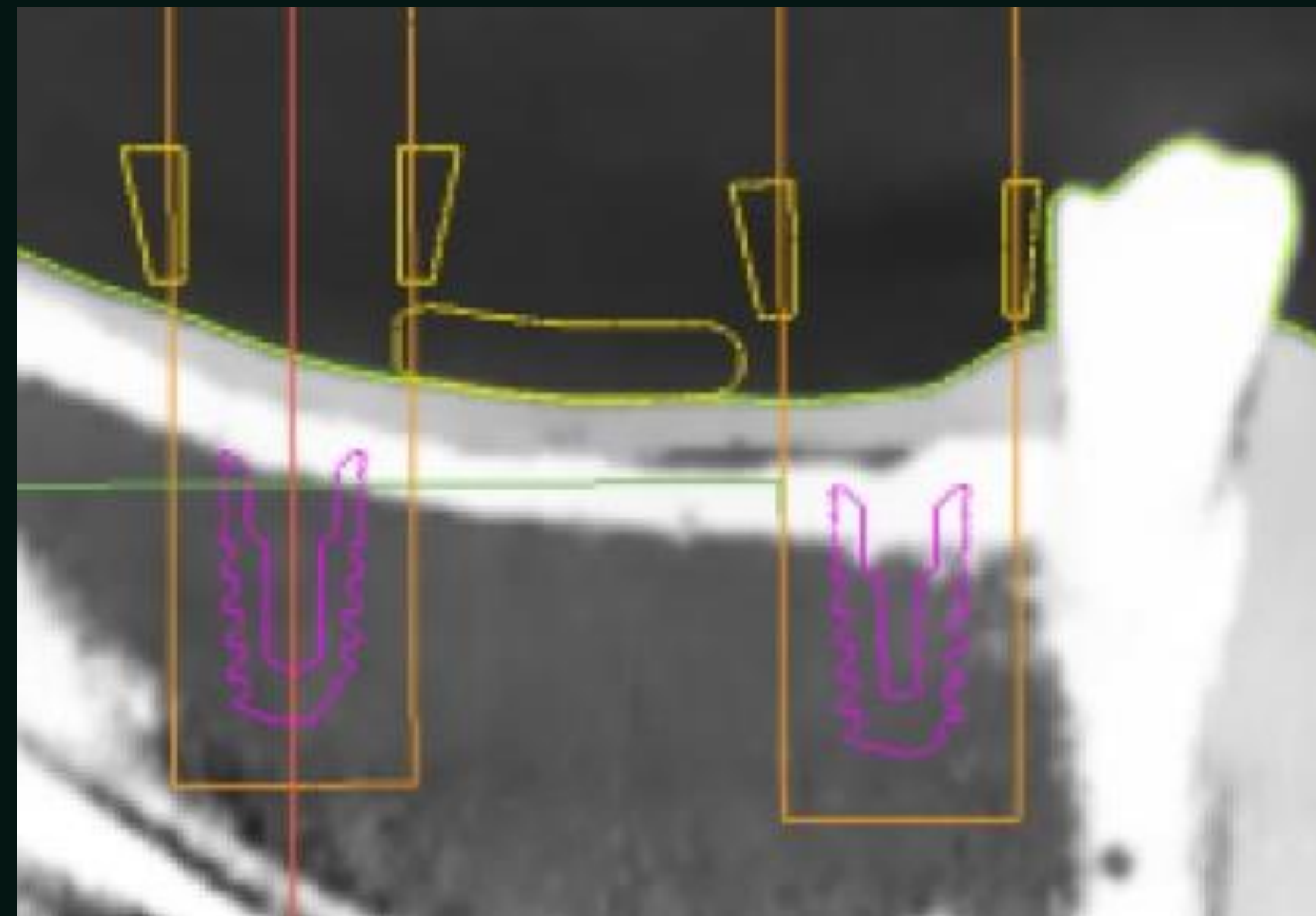
A)



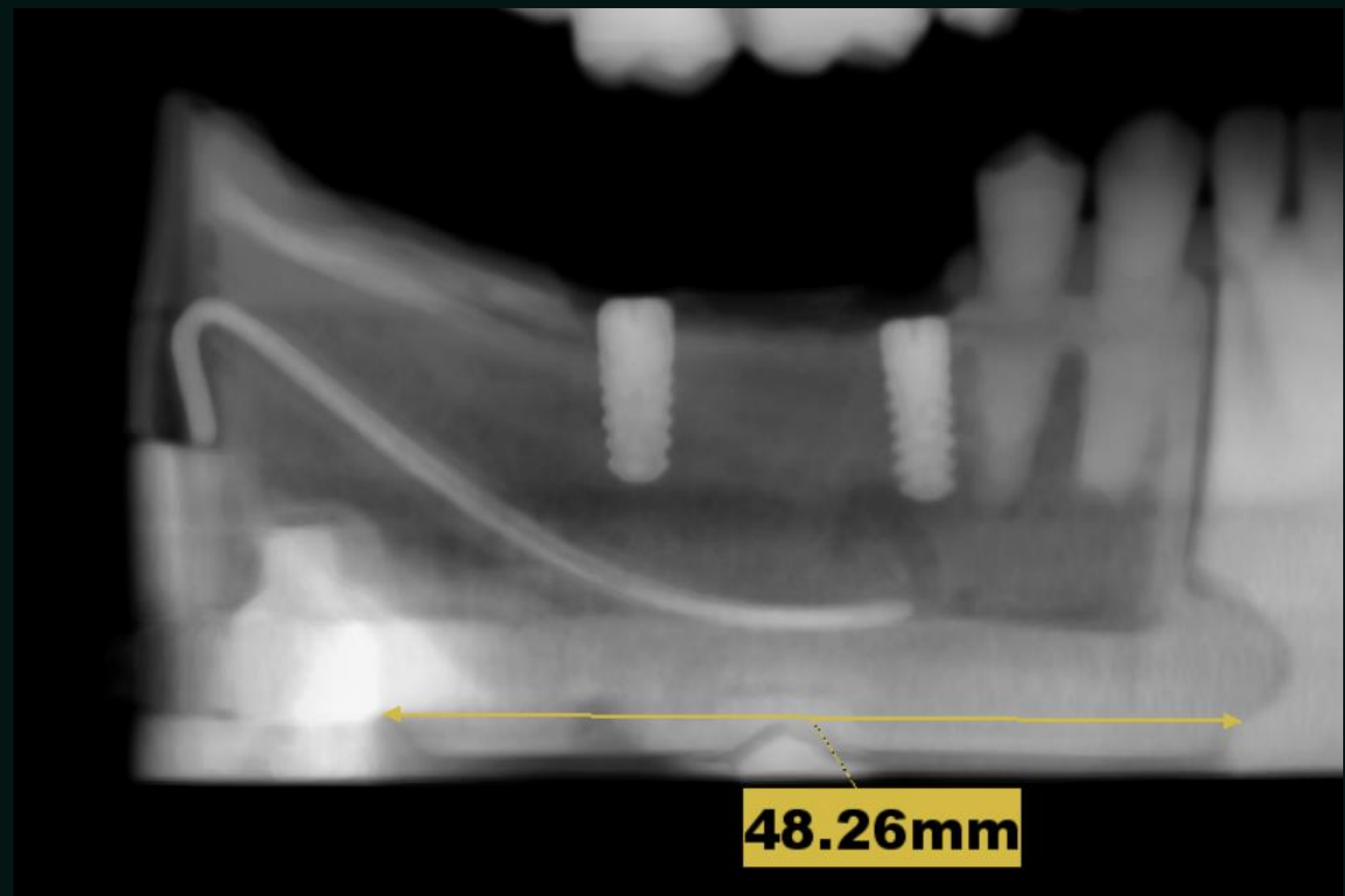
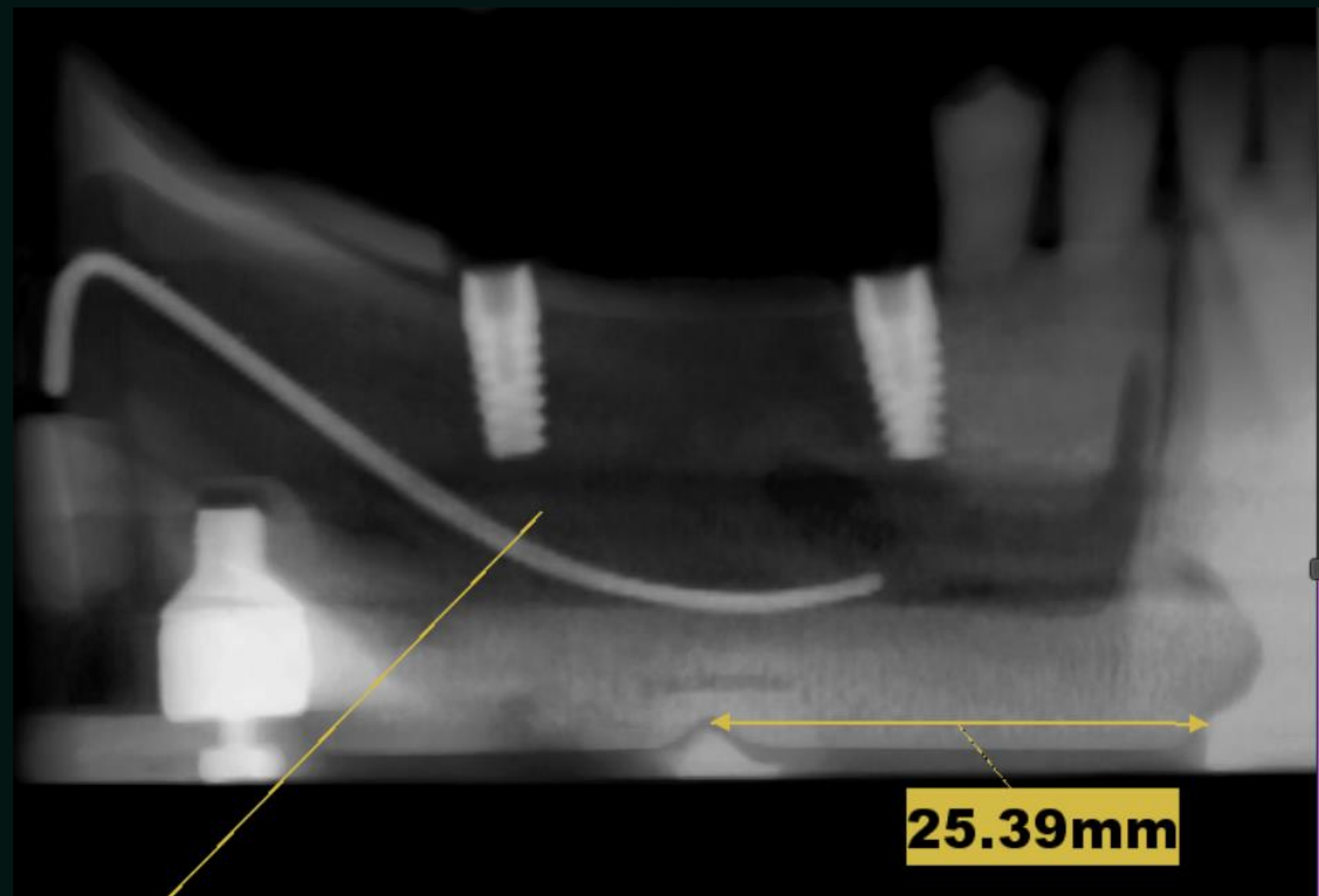
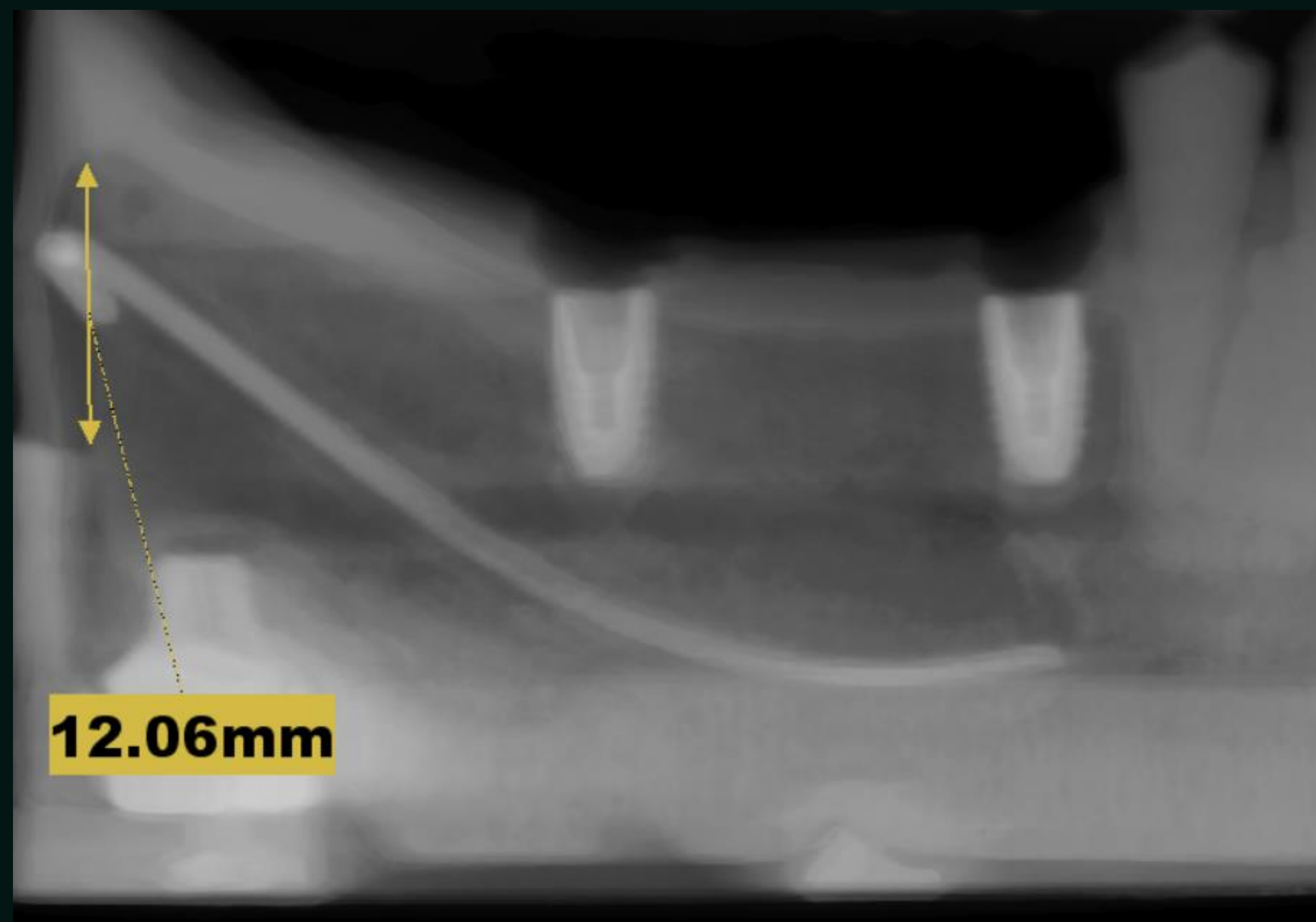
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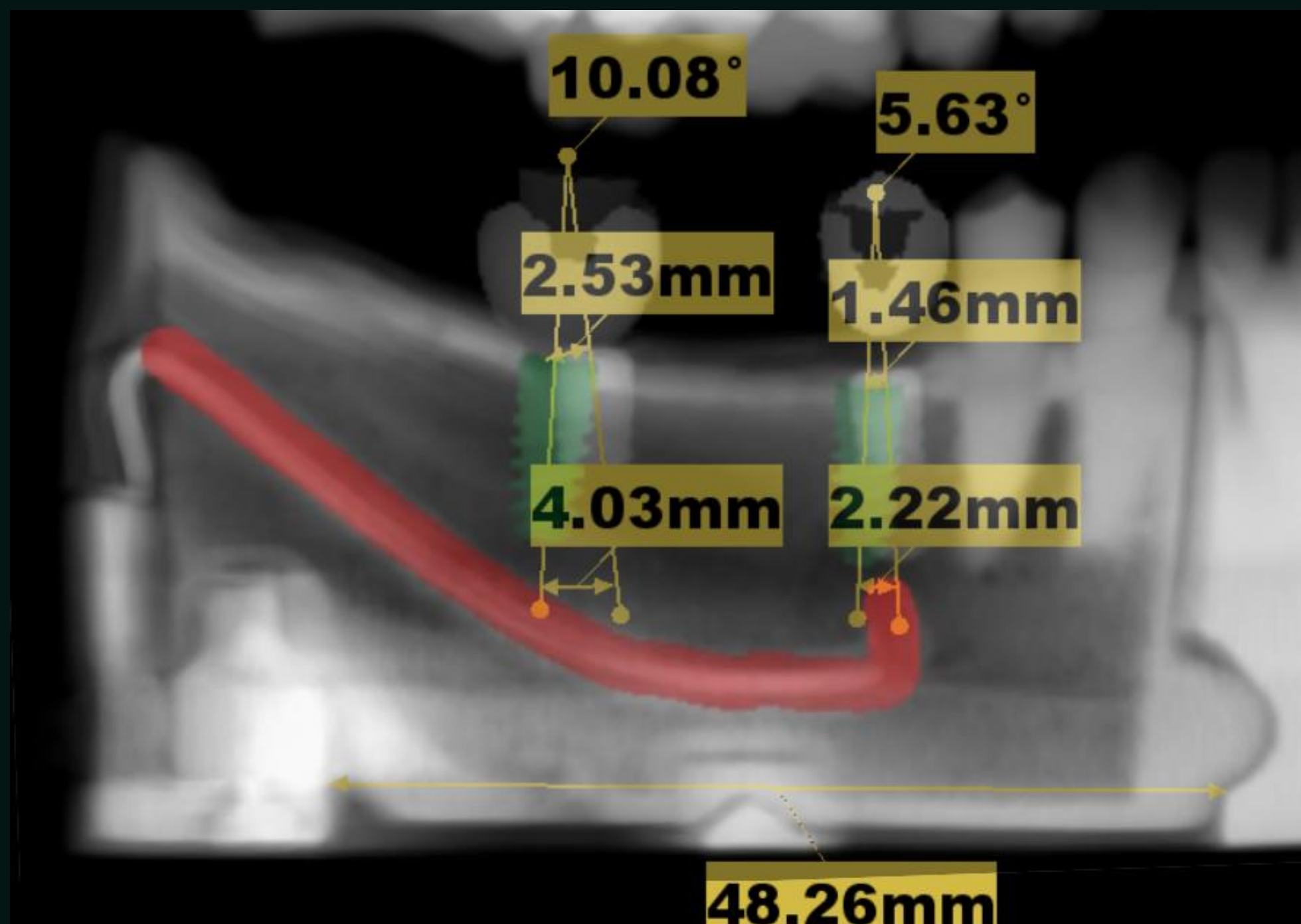
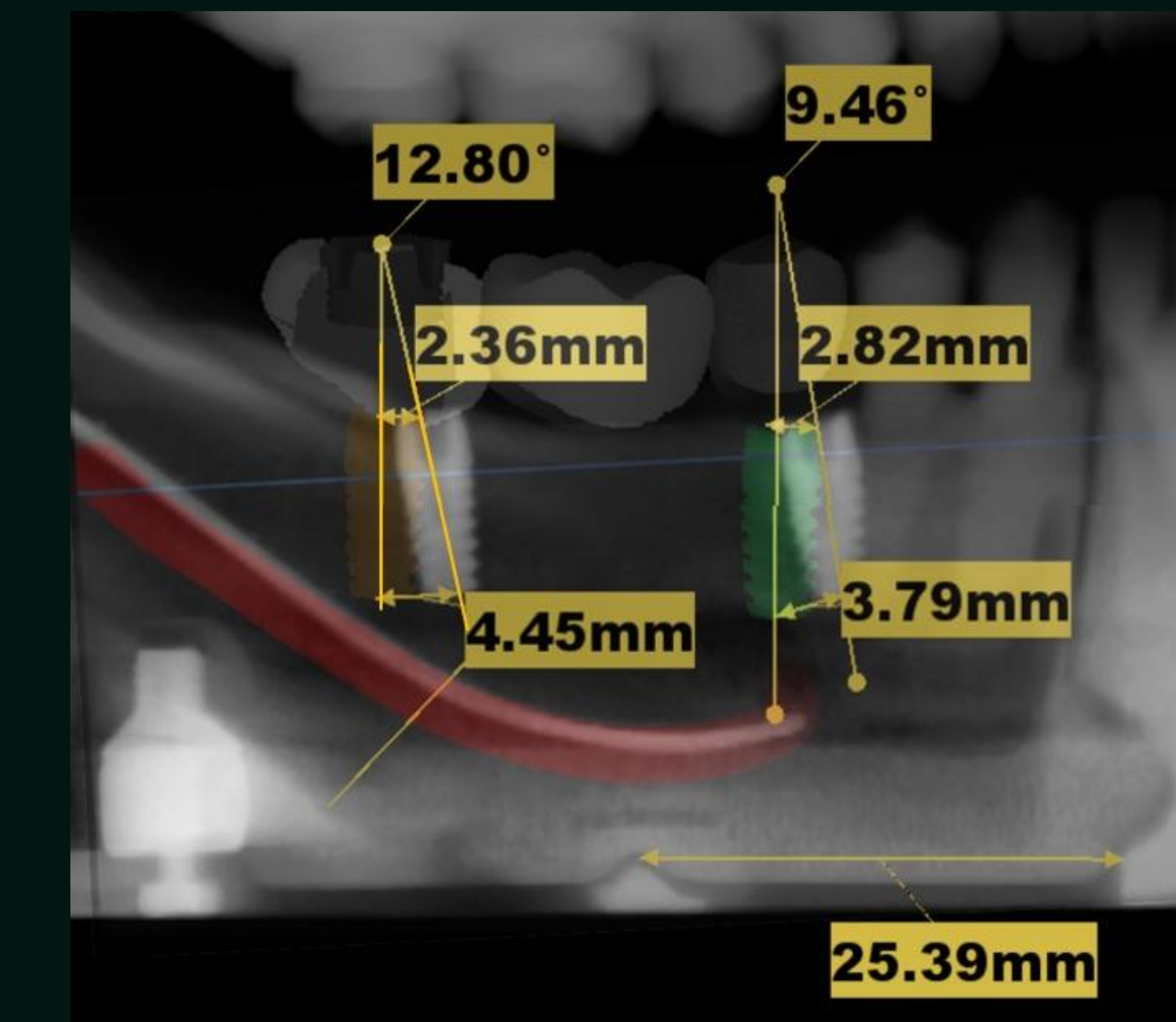
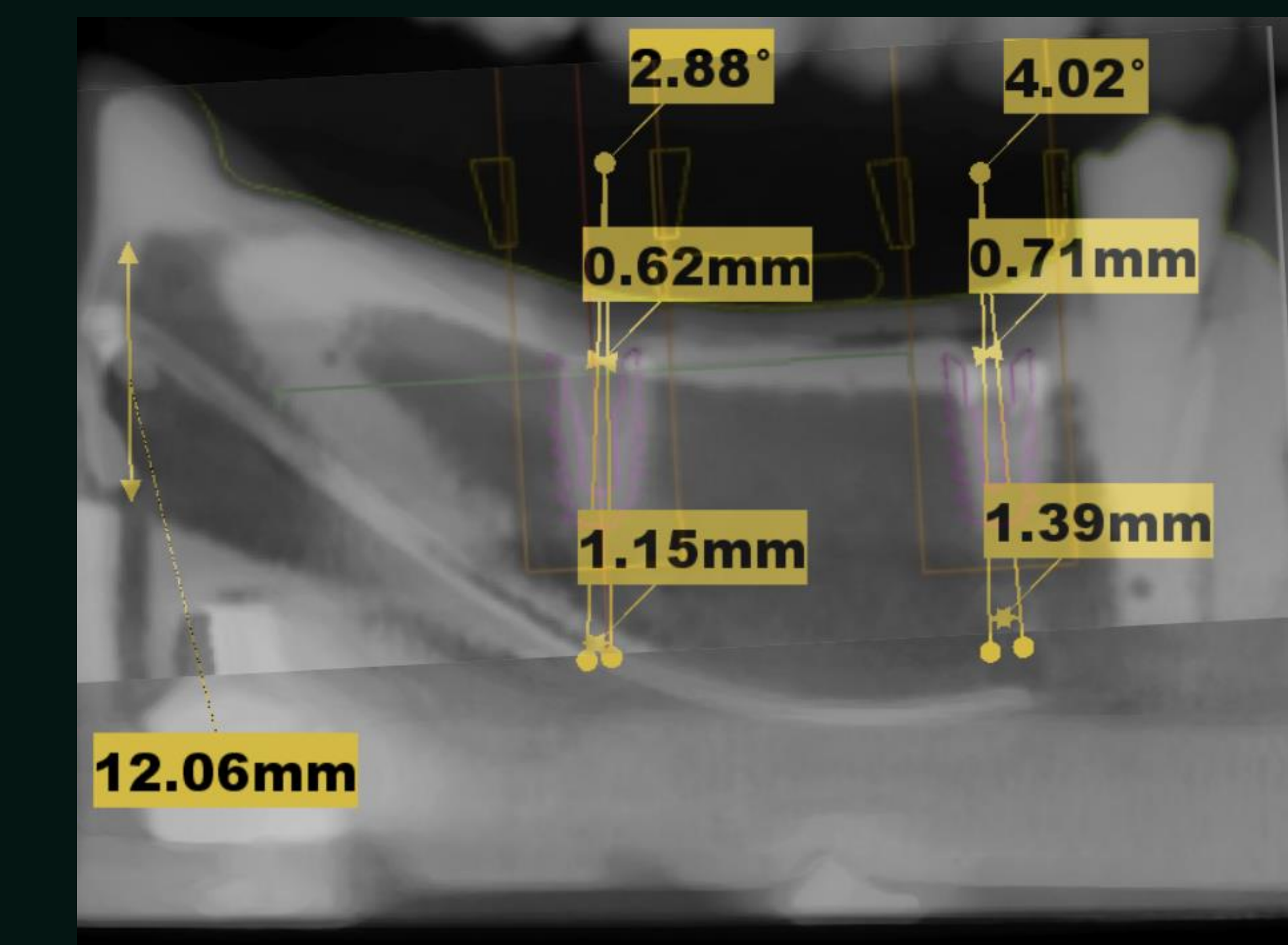
C)



SURGERY



COMPARISON



DISCUSION AND CONCLUSIONS

Although that guided surgery offers greater precision for placement dental implants, its limits are still established by the deviation that exists between the planning and the result of implant placement.

The experimental design of this study helped to minimize the possible variables that can generate discrepancies between the different systems. However, the different components of each system, the design of the surgical guides, as well as the implants themselves, can generate variations in precision.

Differences were found in the precision of the different guided systems, which suggests that factors specific to each surgical guide may influence the precision of implant placement.

Table 1. Deviation measurements for each guided surgical system at the entry point, apex, and angulation.				
GUIDED SURGERY SYSTEM		DESVIATION		
		ENTRY POINT (mm)	APEX (mm)	ANGULATION (°)
<u>Group 1</u>	<u>#47</u>	2.53	4.03	10.08
	<u>#45</u>	1.46	2.22	5.63
<u>Group 2</u>	<u>#47</u>	2.36	4.45	12.80
	<u>#45</u>	2.82	3.79	9.46
<u>Group 3</u>	<u>#47</u>	0.62	1.15	2.88
	<u>#45</u>	0.71	1.39	4.02

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