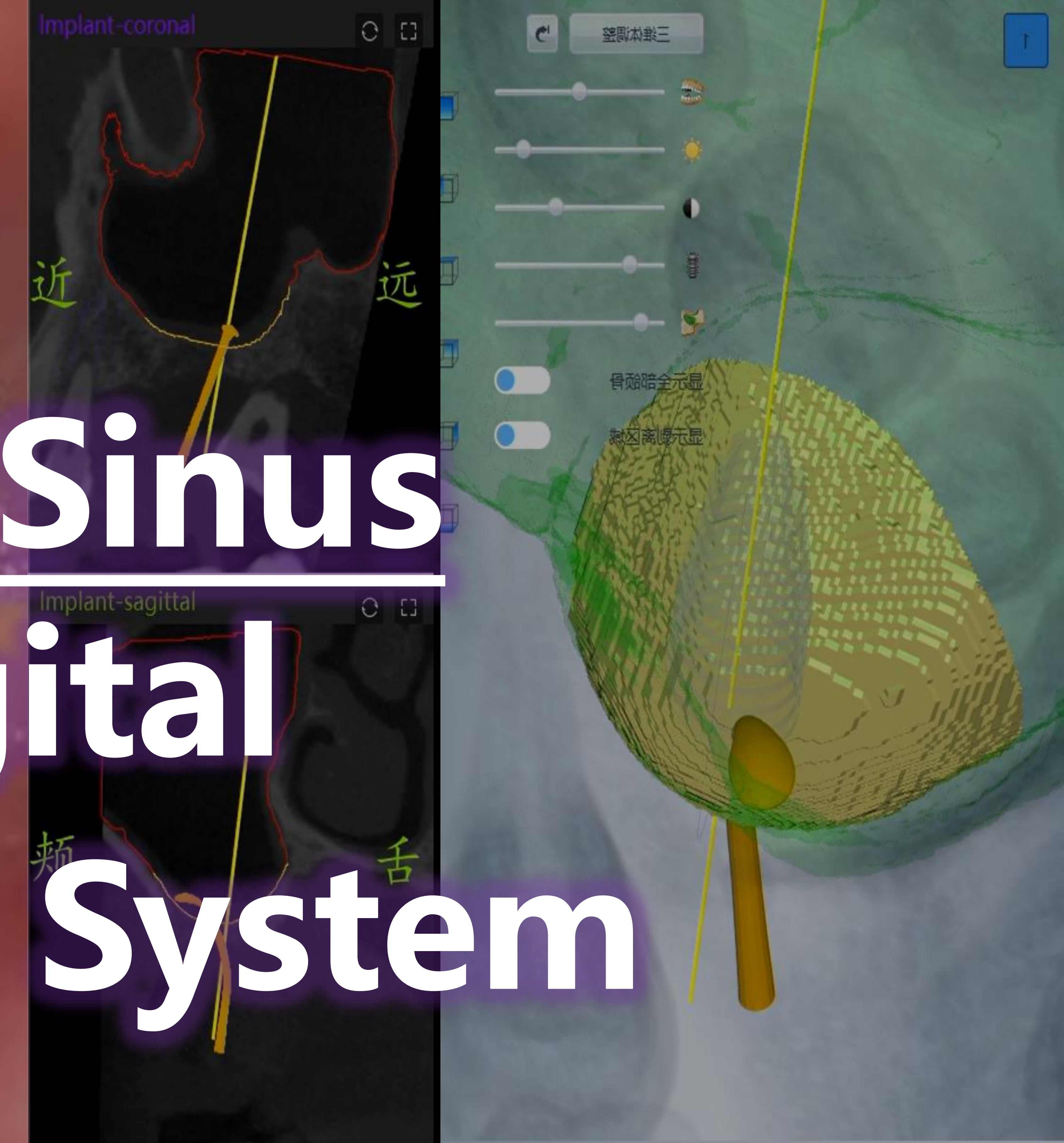




Visual Transcrestal Sinus Elevation With Digital Dynamic Navigation System



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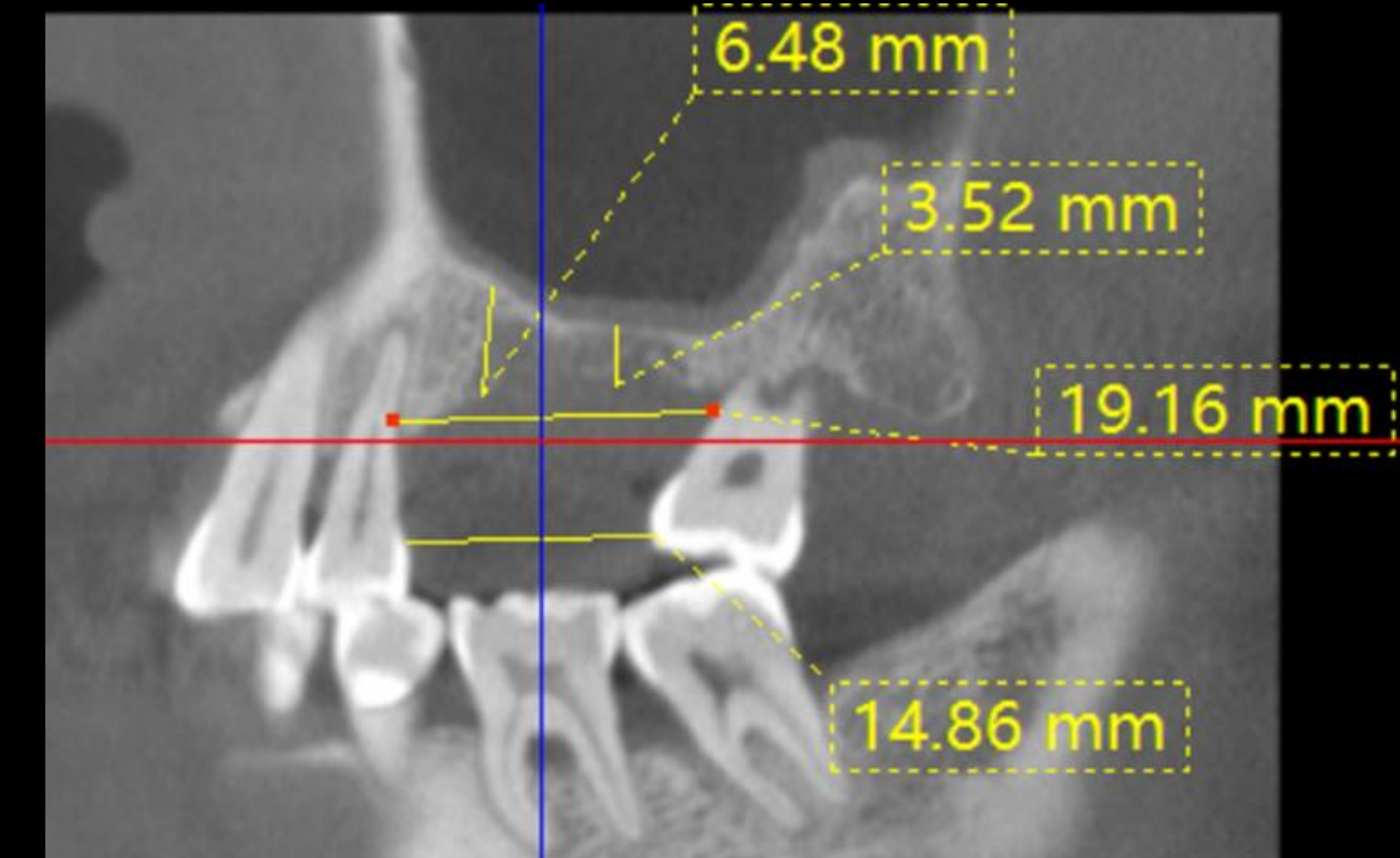
Introduction

Transcrestal sinus elevation is a less invasive technique to achieve bone augmentation in the posterior maxilla to meet implantation conditions.

Nonetheless, it is hard to directly observe and detach the Schneiderian membrane from limited field of view in the sinus lifting procedure, causing worrisome complications such as perforation and unforeseeable bone grafting range. With the development of digital technologies, dynamic navigation system has been a popular way to help surgeons visualize the real-time procedure of placing implants in a designed and exact way.

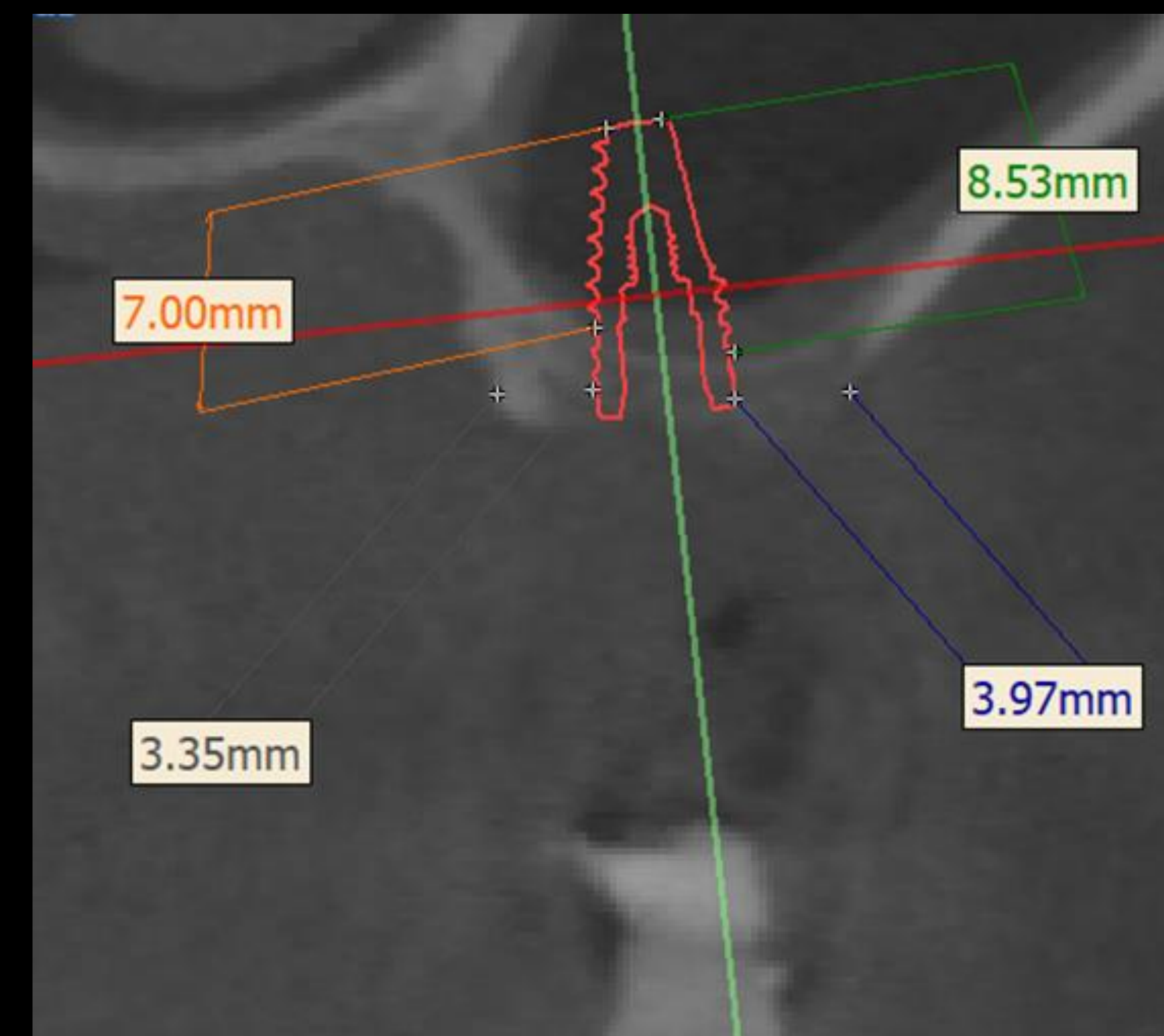
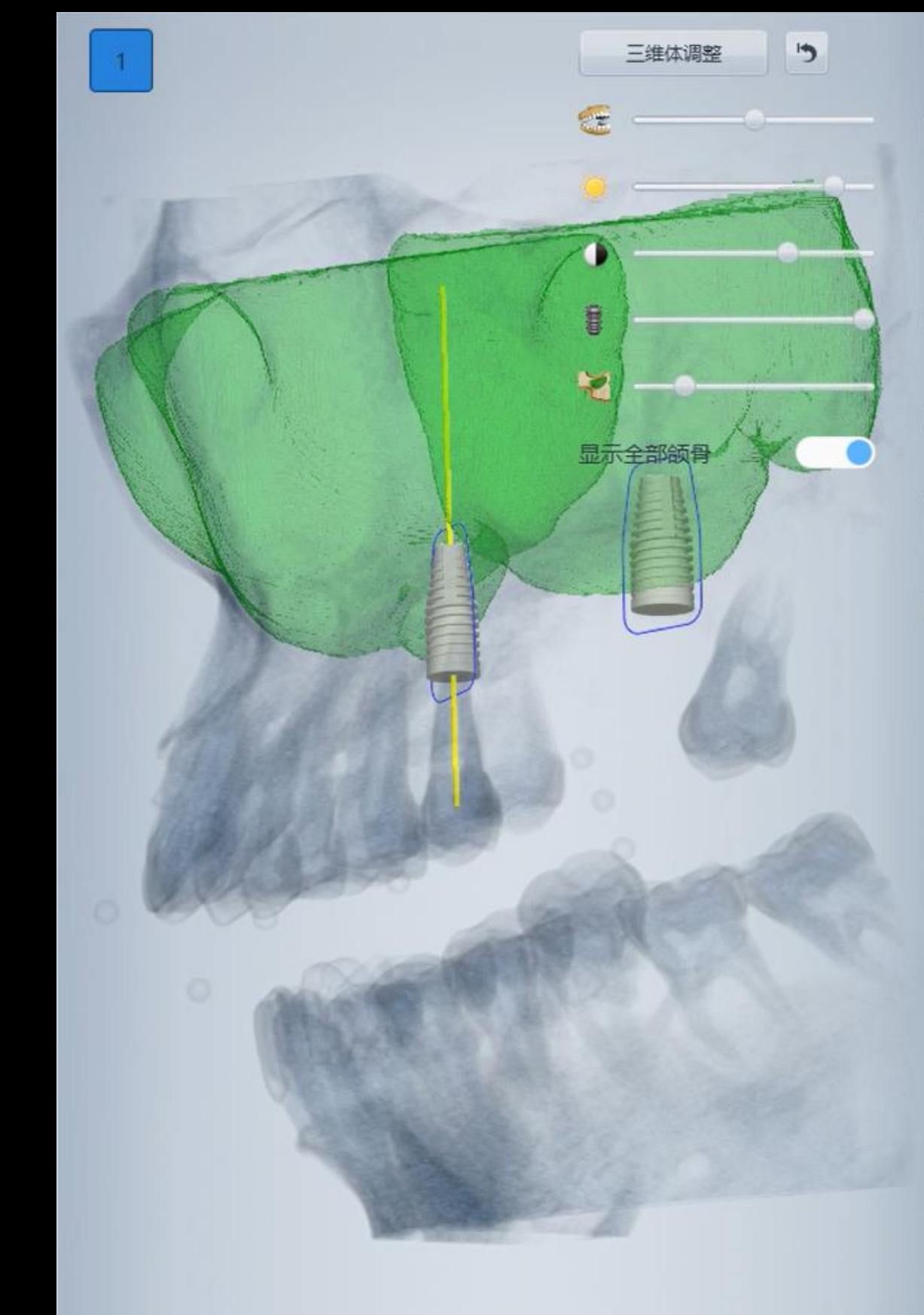
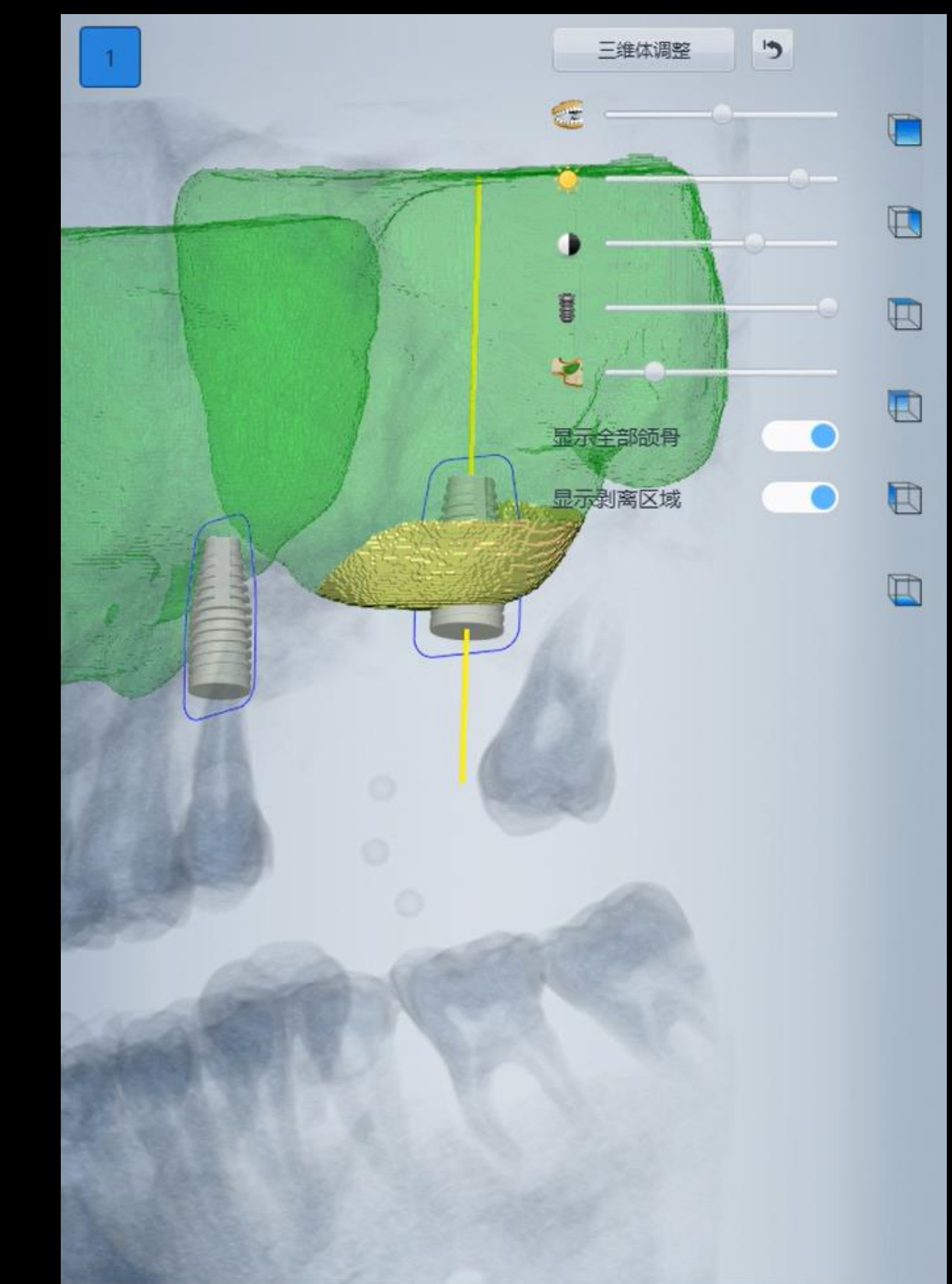
If navigation can visualize the drilling process, why cannot it visualize sinus elevation?

Methods

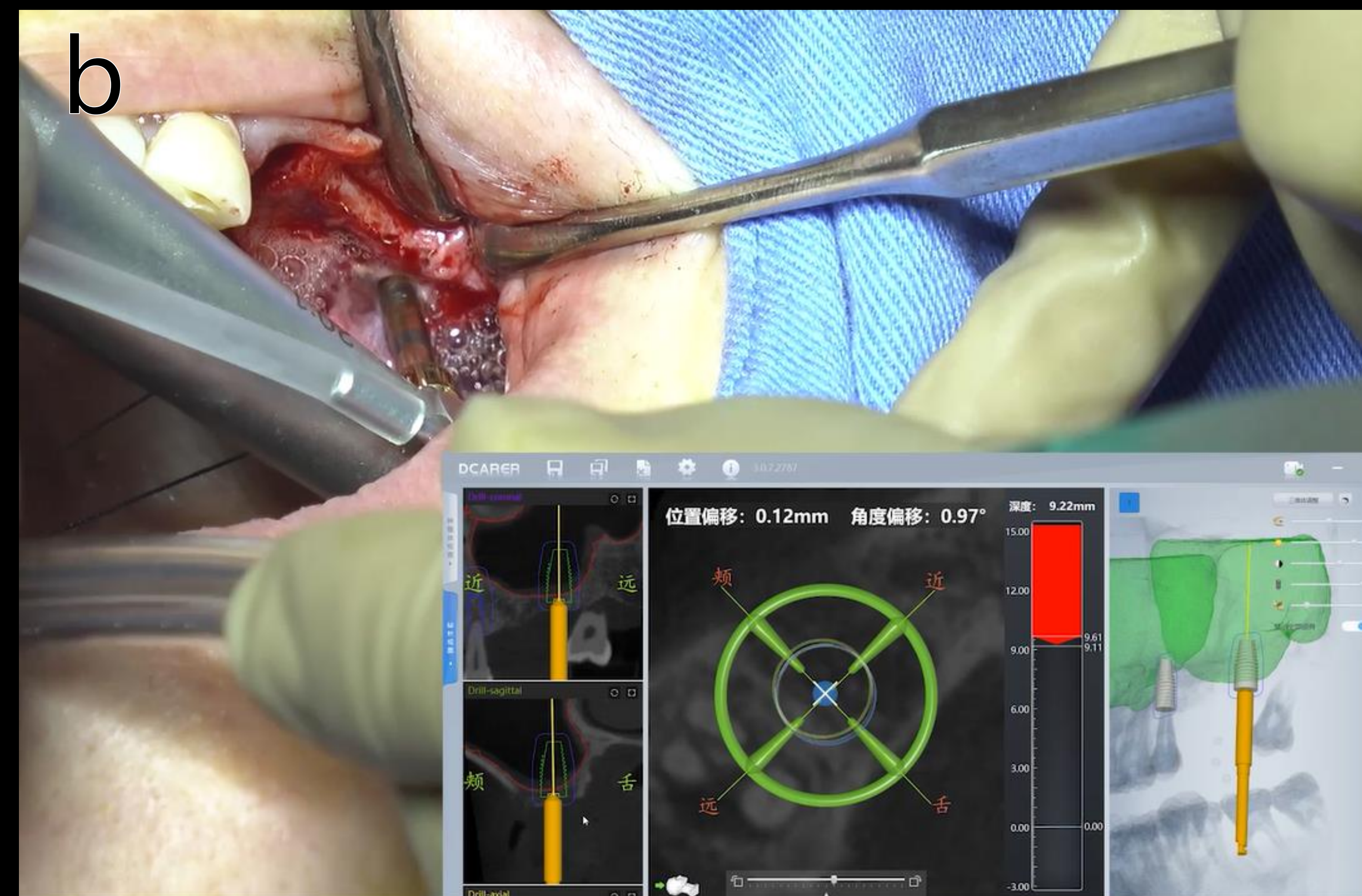
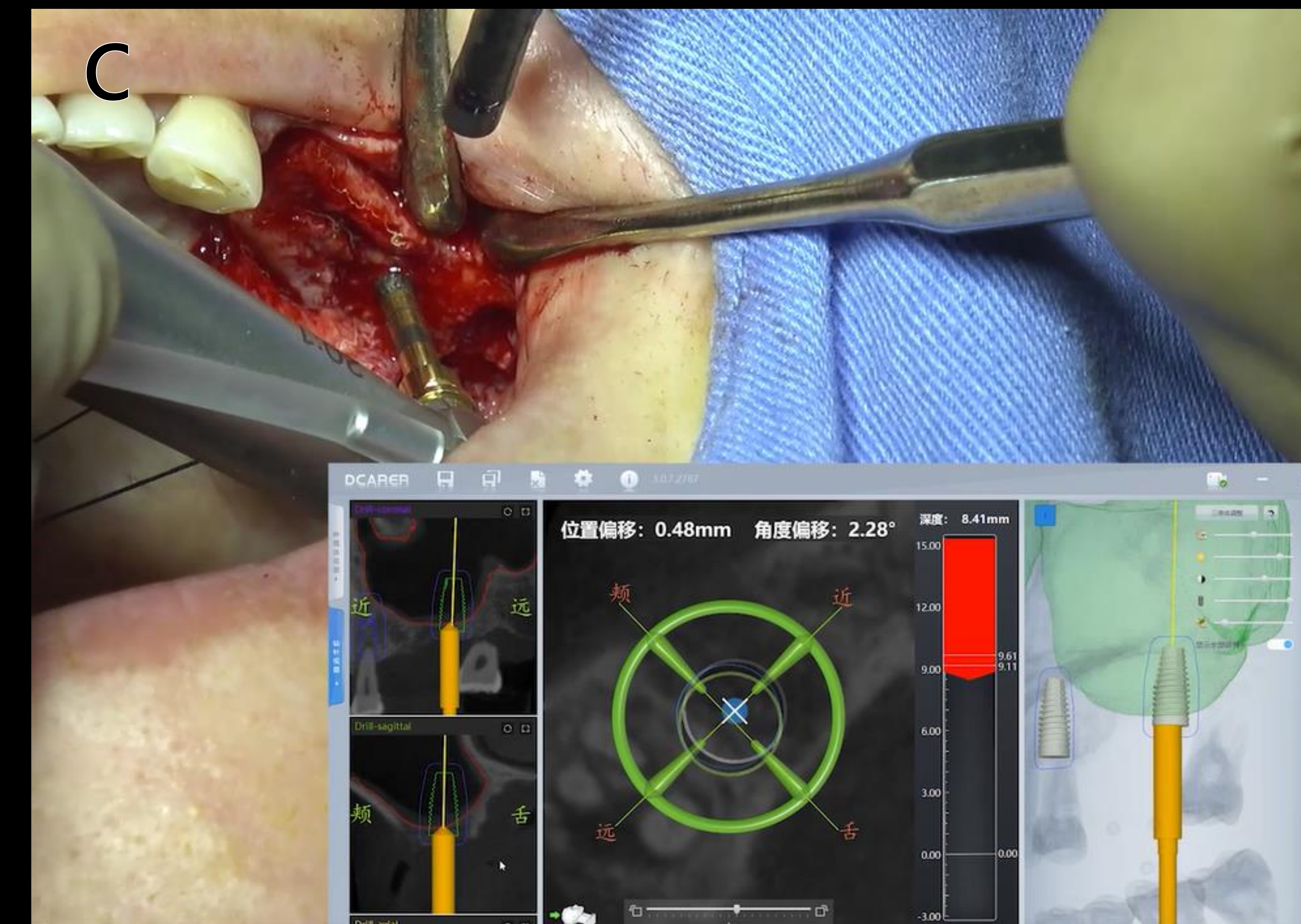


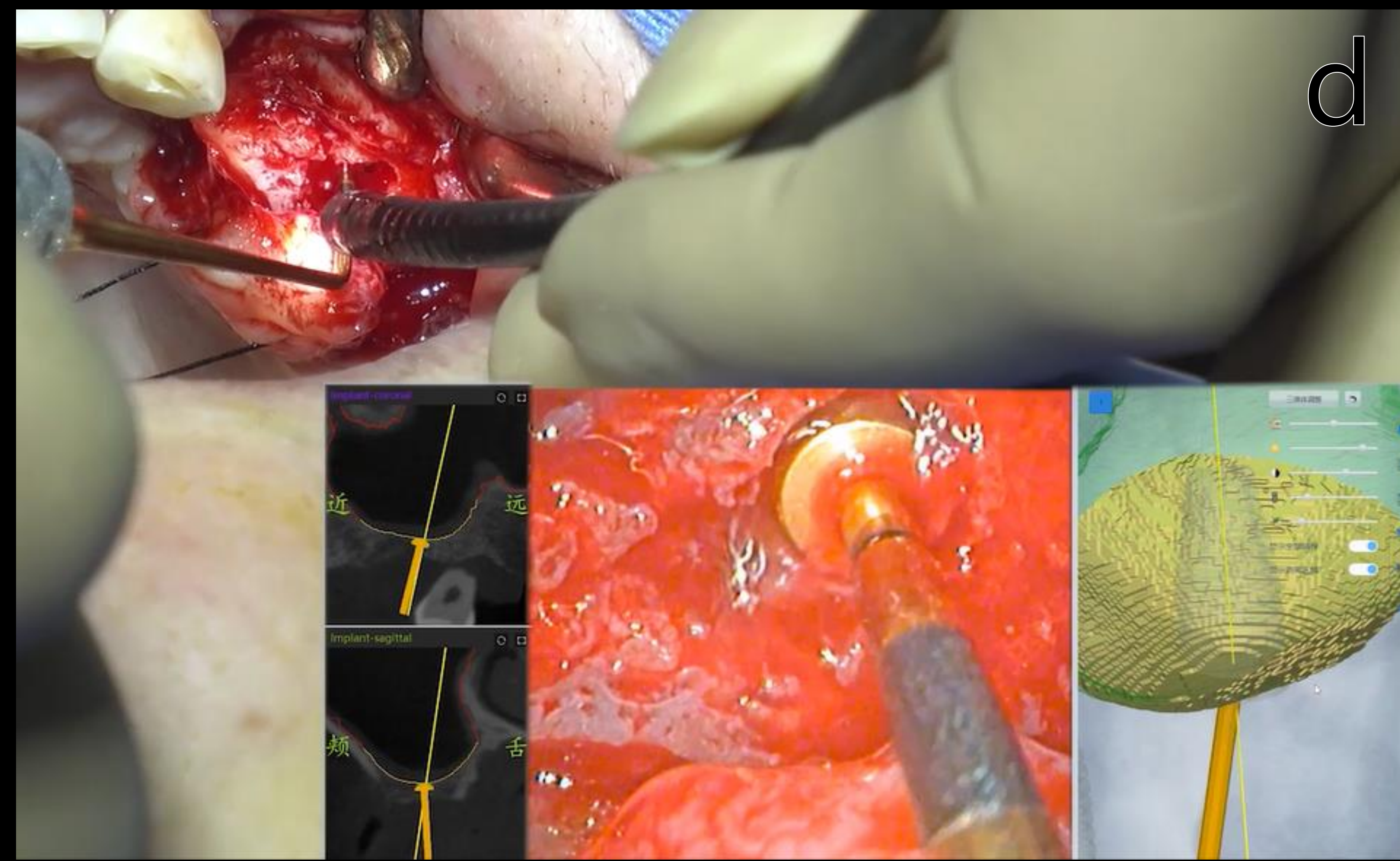
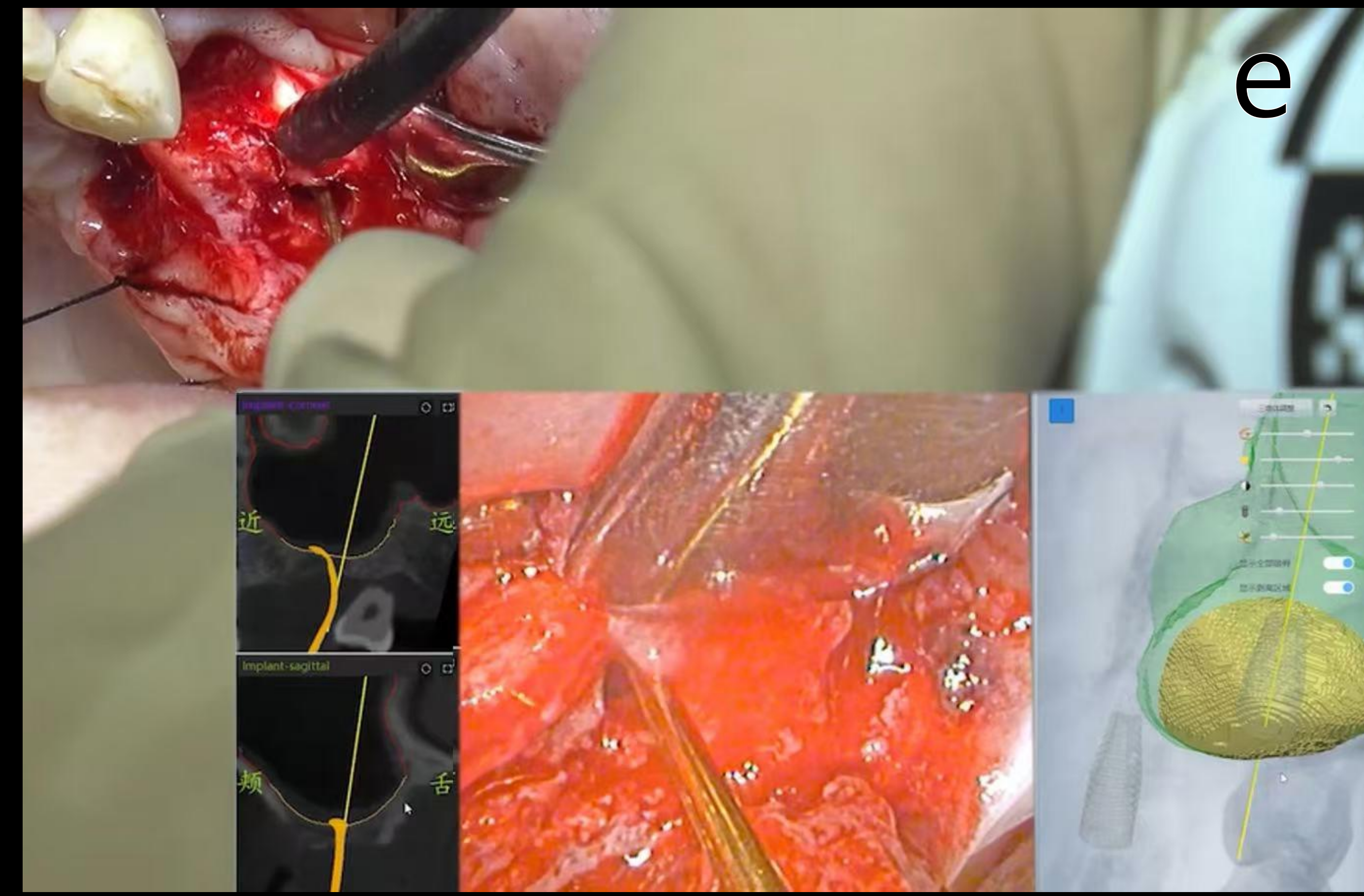
A 48-year-old female without systemic diseases is involved. She consulted about her missing teeth in the sites #13 and #14. And the teeth #12 and #15 had severe mobility. The pre-operative CBCT scan revealed insufficient residual ridge height in the teeth sites #13 and #14.

The patient chose to extract teeth in the sites #12 and #15, and restore #12-#14 with implant-supported fixed bridge. Digital planning for implant placement in the teeth sites #12 and #14 with transcrestal sinus lift was performed.

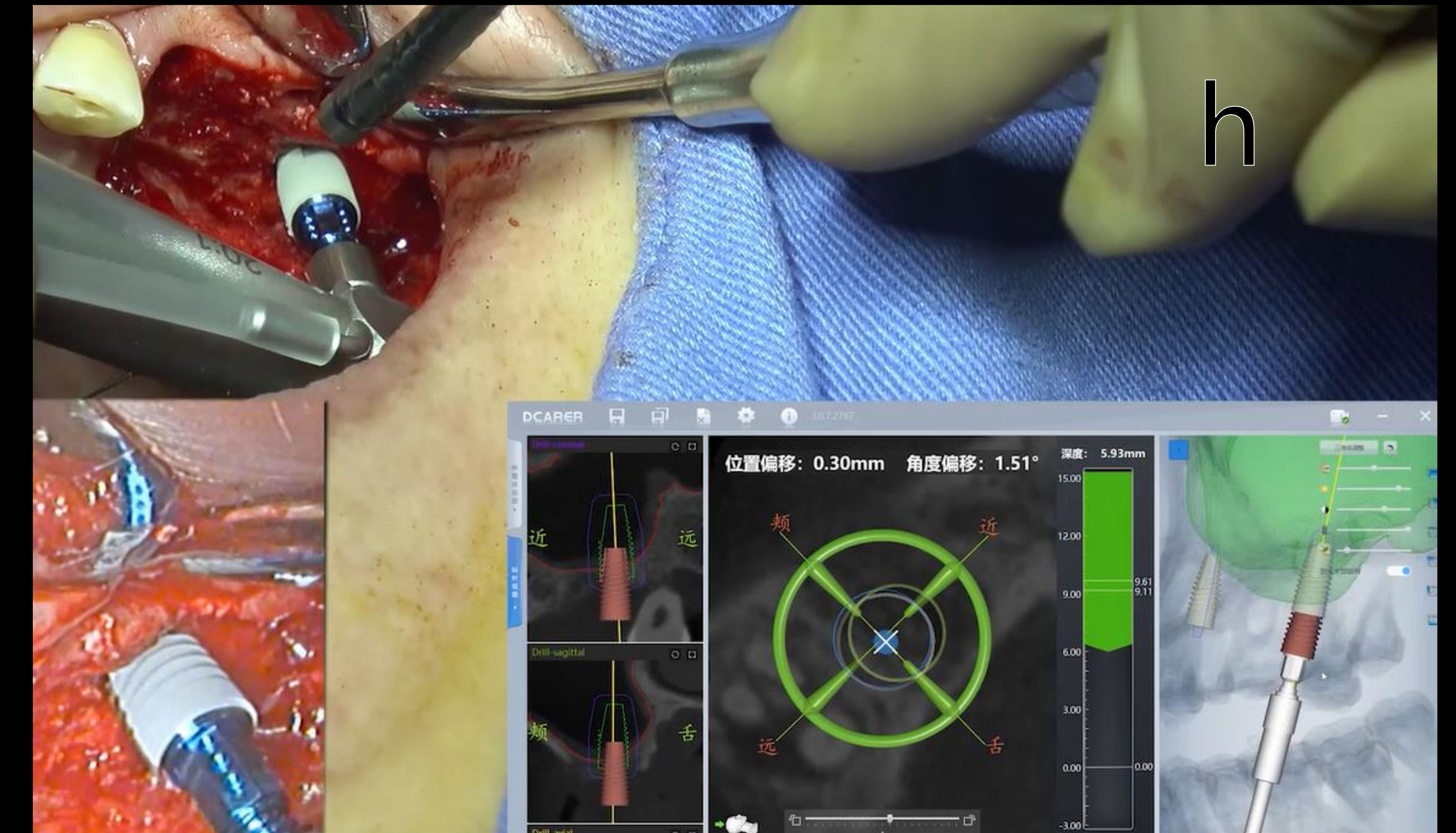
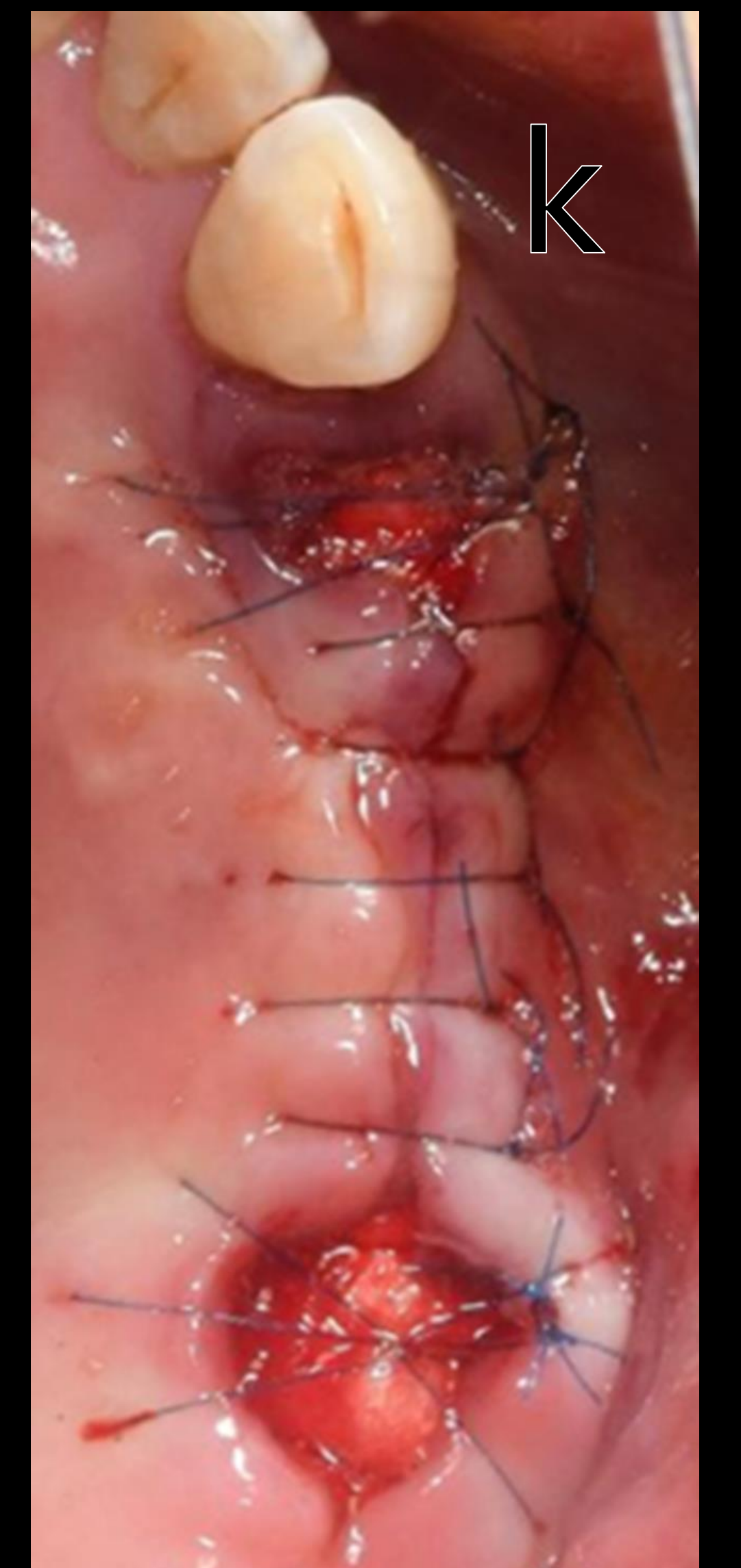


After extracting #12 and #15 (a), a pilot drill of $\varnothing 3.3\text{mm}$ was used to reach 0.5-1 mm below the sinus floor in the tooth site #14 under the guidance of navigation system (b). Then a grinding drill of $\varnothing 3.7\text{mm}$ was used to reach the sinus floor completely (c).





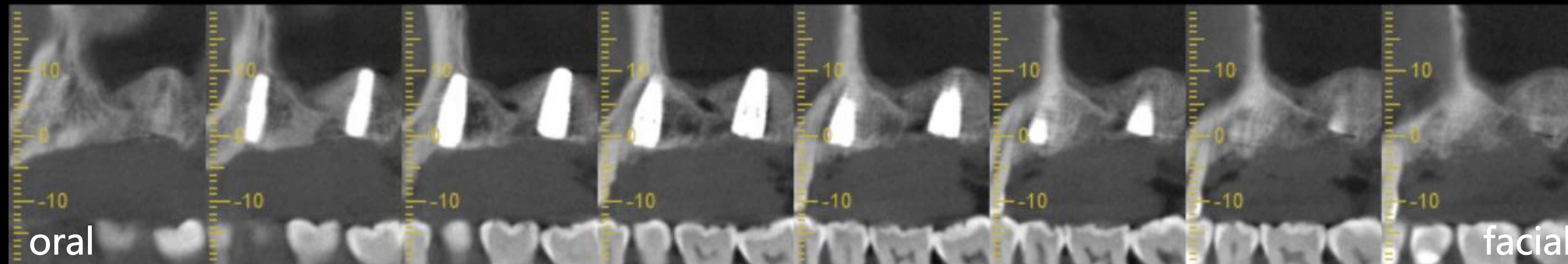
And then another implant was placed at the site #12 under drill tracking of the navigation system (i). The wound was closed post socket preservation (j & k).



A protective round diamond bur was used to grind the sinus floor bone (d) , and a delicate angle-necked elevator was used to elevate the Schneiderian membrane further (e). After the detachment, membrane integrity was confirmed (f) and bone grafting was performed in the prepared site (g). A dental implant was placed at the site #14 (h).

Results

The postoperative CBCT showed ideal implant location in the teeth sites #12 and #14, intact Schneiderian membrane and accurate bone augmentation range after sinus elevation.



Conclusion

The application of dynamic navigation system seems to be a promising approach ensuring visualization and accuracy of transcrestal sinus elevation and bone augmentation, making the surgical procedure exacter, easier and safer.