Risk Factor Assessment of Transcrestal Maxillary Sinus Floor Elevation

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朝阳种植视点

Abstract:

Objective： To assess the risk factors of transcrestal maxillary sinus floor elevation and provide a basis for clinical decision - making.

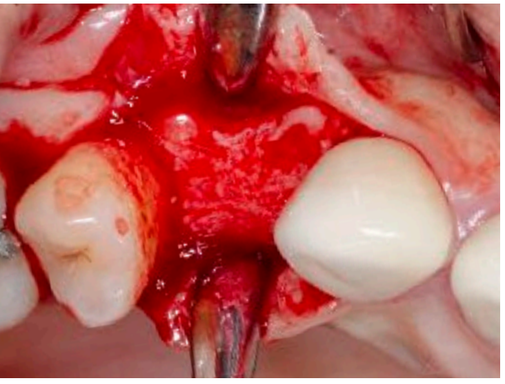
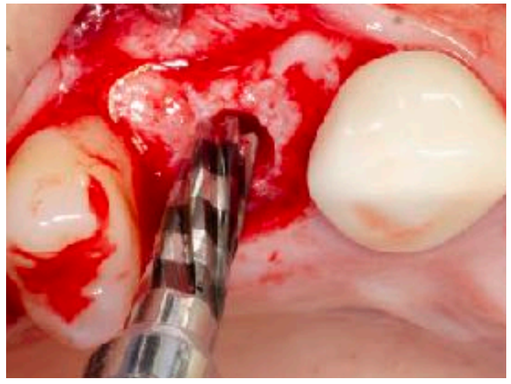
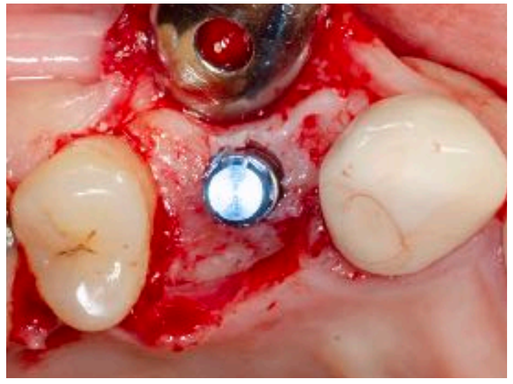
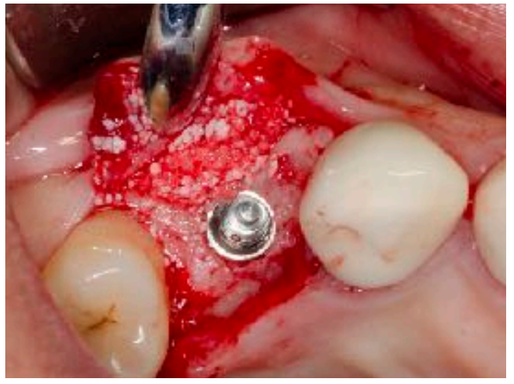
Methods： The risk factors were evaluated from aspects including bone defect type (horizontal, vertical, mixed), the height of bone to be elevated, maxillary sinus floor morphology, sinus membrane status (assessed by imaging), and maxillary sinus ostium condition. Each factor was classified into three levels of difficulty: easy, medium, and difficult.

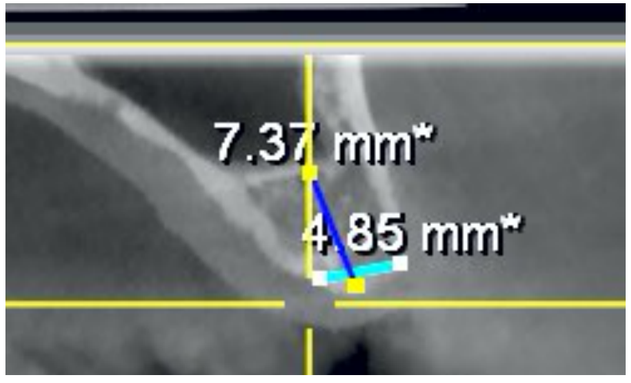
Results： For **bone defect type**: no horizontal or vertical bone defect was in the easy level; slight defects were in the medium level; severe defects were in the difficult level, and there was no easy level for mixed - type defects. For the **height of bone to be elevated:** elevation within 2mm was easy; 3 - 4mm was medium; more than 4mm was difficult. **Maxillary sinus floor morphology**: flat was easy; slope < 30° was medium; slope > 30° or with septum was difficult. **Sinus membrane status（imaging）:** 1 - 3mm was easy; < 1mm or > 3mm was medium; abnormal status (like spherical shape, fluid level, bubble shadow, calcification spots, etc.) was difficult. **Maxillary sinus ostium:** open was easy; obstructed was difficult.

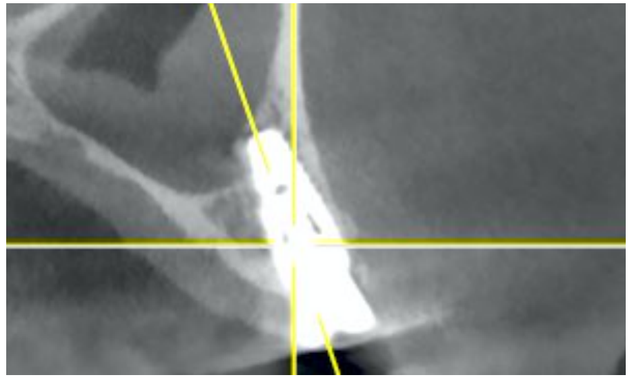
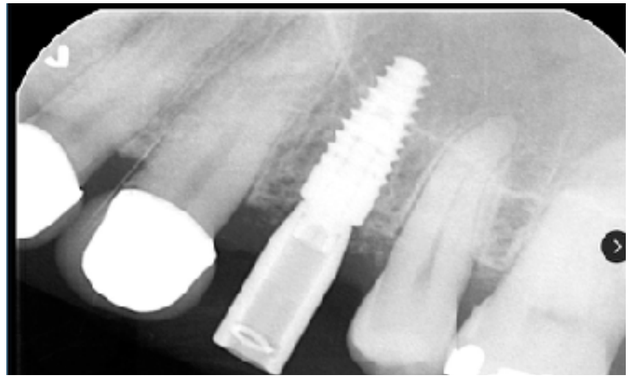
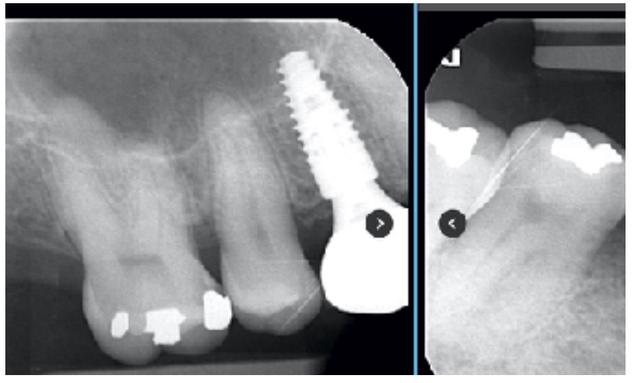
Conclusion： The risk of transcrestal maxillary sinus floor elevation (internal elevation) varies with different factors. Classifying risk factors into different difficulty levels helps clinicians choose appropriate surgical strategies and improve the safety and effectiveness of the operation.

Keywords： Transcrestal Maxillary Sinus Floor Elevation; Risk Assessment; Bone Augmentation； dental implant

	Easy	Medium	Difficult
Bone Defect Type			
Horizontal bone defect	None	Slight	Severe
Vertical bone defect	None	Slight	Severe
Mixed type	-	Slight	Severe
Height to be elevated	Elevation height within 2mm	Elevation height 3 - 4mm	Elevation height more than 4mm
Maxillary sinus floor morphology	Flat	Slope < 30°	Slope > 30° or with septum
Sinus membrane status (imaging)	1 - 3mm	< 1mm; > 3mm	Abnormal status (such as spherical shape, fluid level, bubble shadow, calcification spots, etc.)
Maxillary sinus ostium	Open		Obstructed

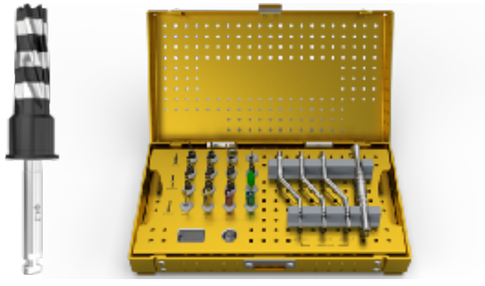



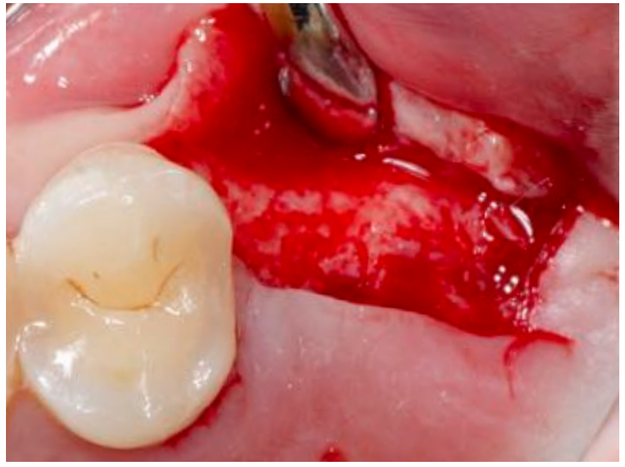
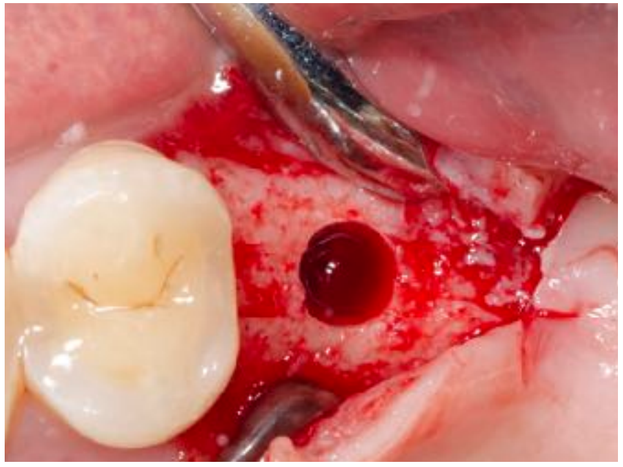
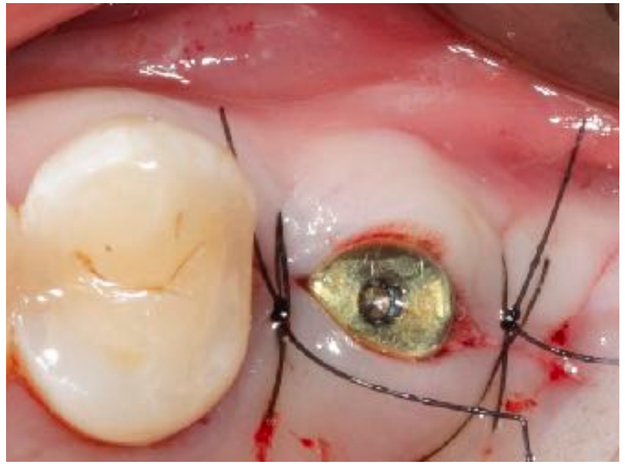




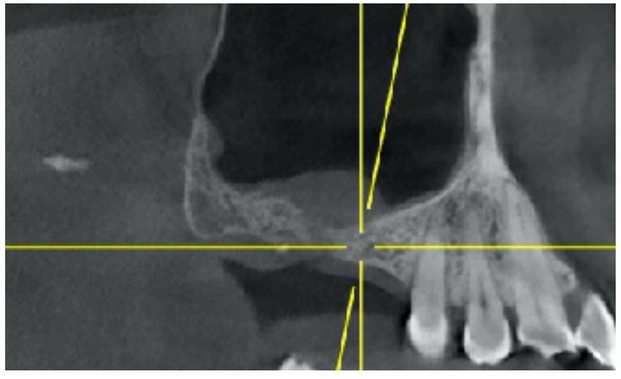
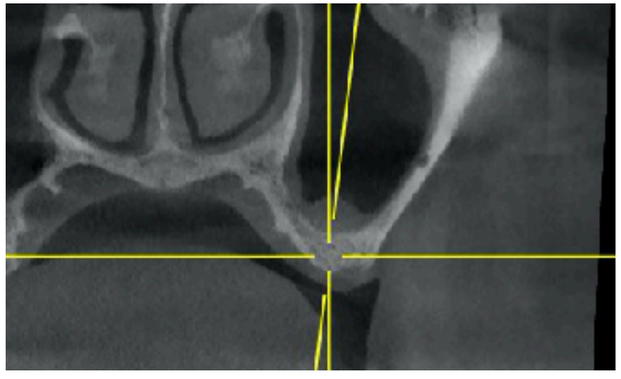
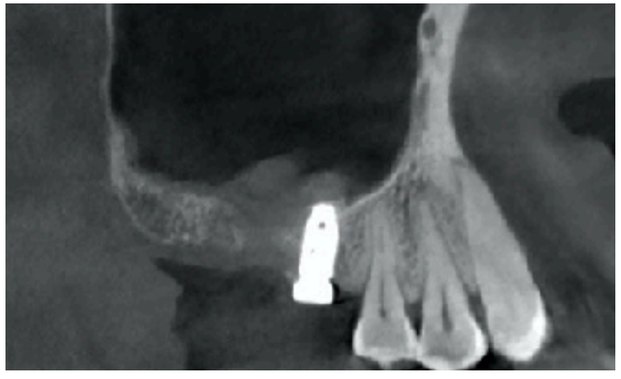
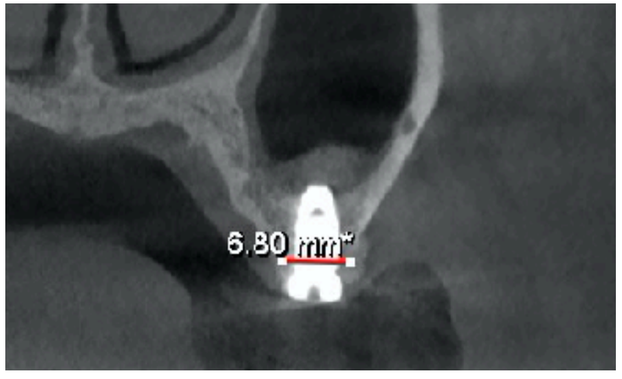
Case Information

A 35-year-old female patient presented to the clinic with the absence of the right maxillary first premolar for more than 1 year. Intraoral examination revealed the absence of tooth #14 (per FDI Dental Numbering System), with normal gingival color and texture, and adequate prosthetic space. CBCT examination showed that the maxillary sinus was relatively narrow in the buccolingual direction, with an available bone height of approximately 7.3 mm, and the maxillary sinus mucosa was healthy.

In this case, the surgery was successfully performed using the maxillary sinus elevation drill designed by Dr. Zhao Yang, achieving an elevation height of about 3 mm. During the operation, a Straumann implant (4.1 mm × 10 mm, BLT) and 50 mg of Bio-collagen were placed, with the final insertion torque reaching 35 Ncm. A successful prosthetic restoration was ultimately accomplished.



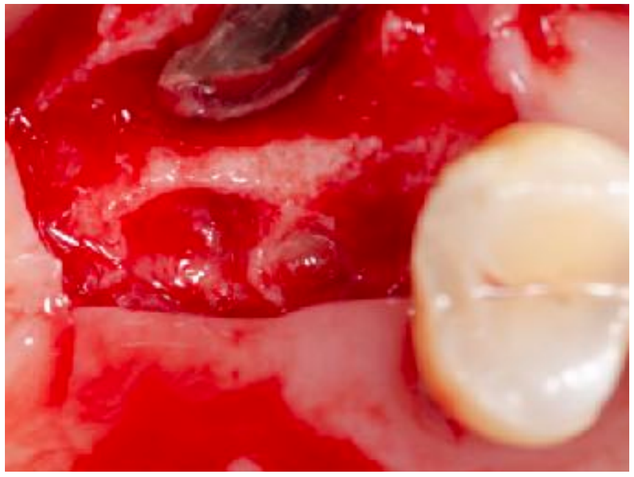




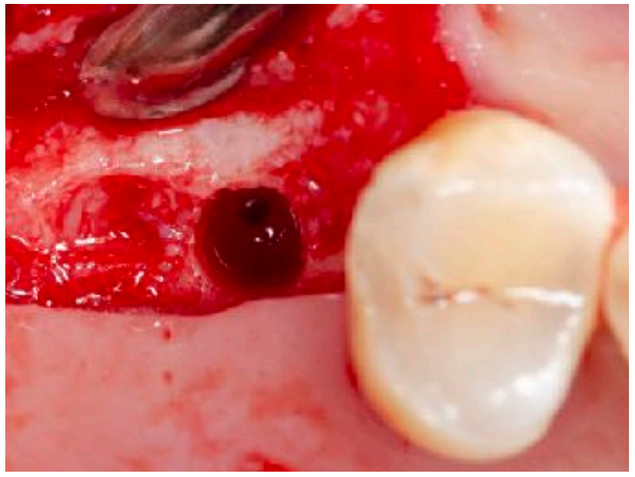





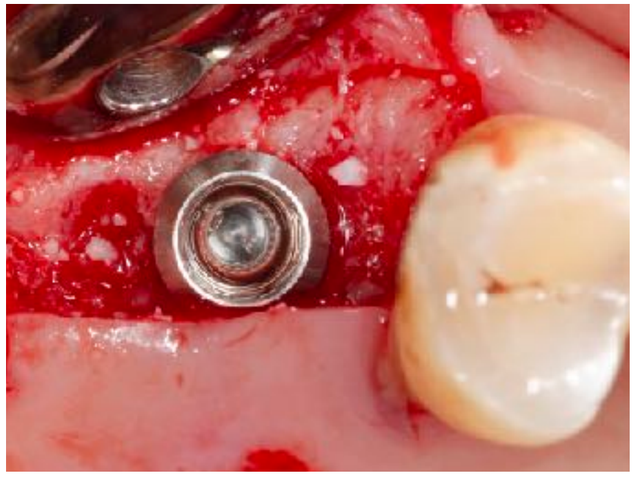
Case Information

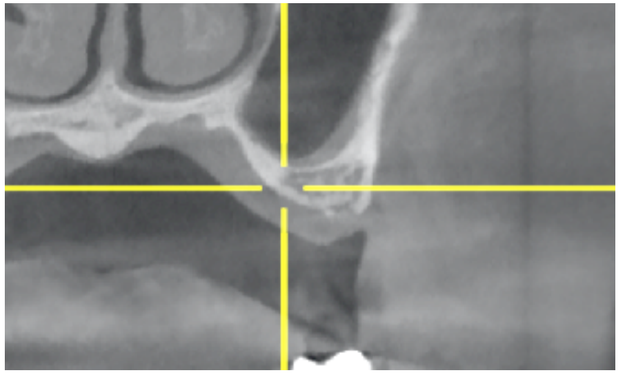
A 55-year-old female patient visited the clinic due to the absence of the left maxillary first molar for more than 1 year. Intraoral examination revealed the absence of tooth #26 (in FDI numbering system), with normal color and texture of the gingiva and adequate prosthetic space. CBCT examination showed that the maxillary sinus presented a sloped shape from mesial to distal, with a slope angle of approximately 30 degrees and an available bone height of about 3-5 mm. Slight thickening of the maxillary sinus mucosa was observed.

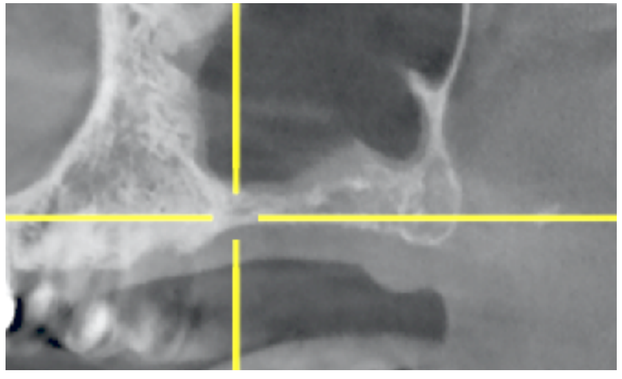
In this case, the surgery was successfully performed using the maxillary sinus elevation drill designed by Dr. Zhao Yang, achieving an elevation height of approximately 4 mm. During the operation, 50 mg of Bio-collagen was grafted.

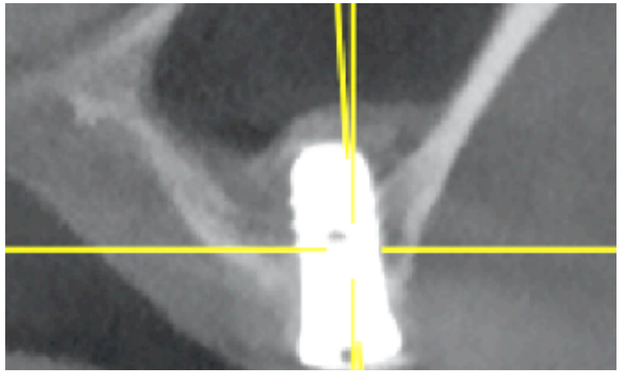



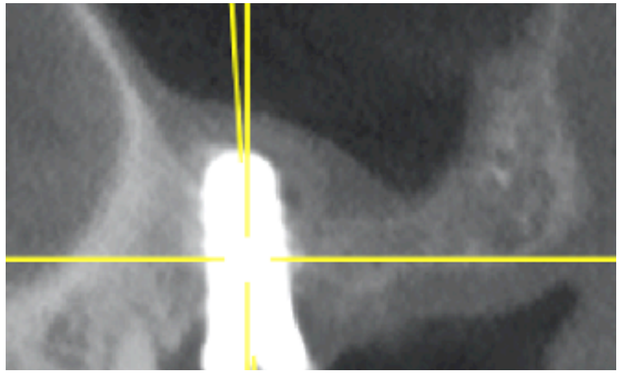








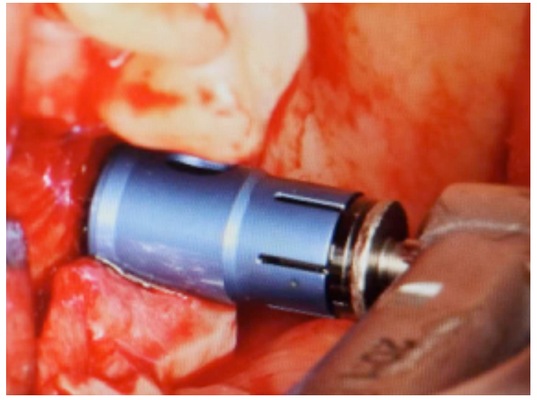
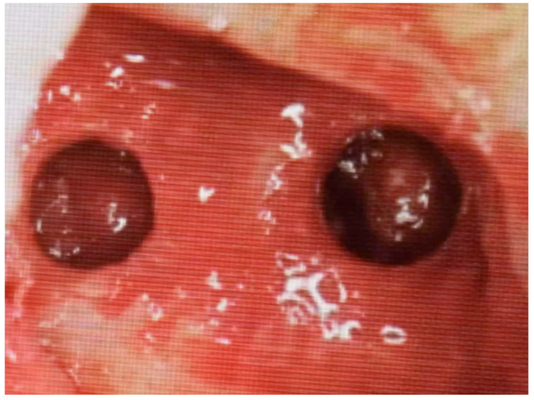
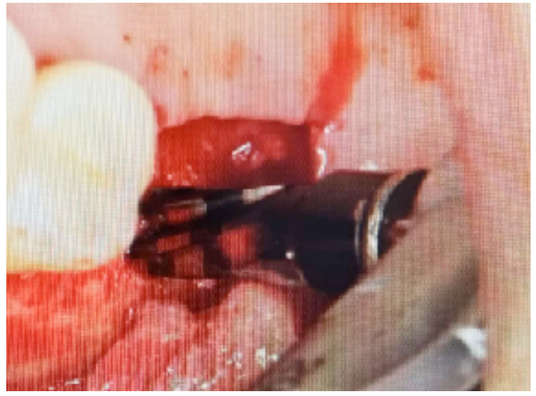


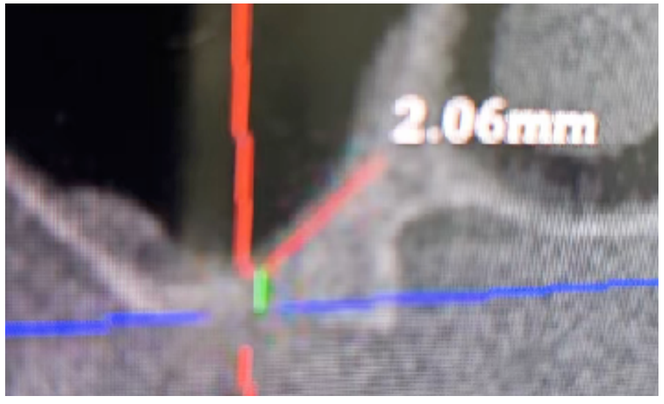


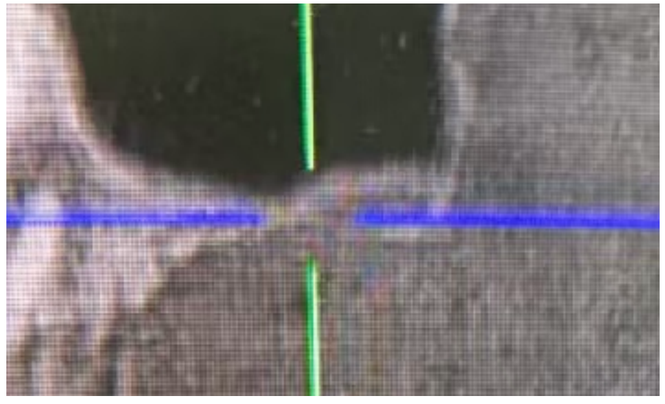
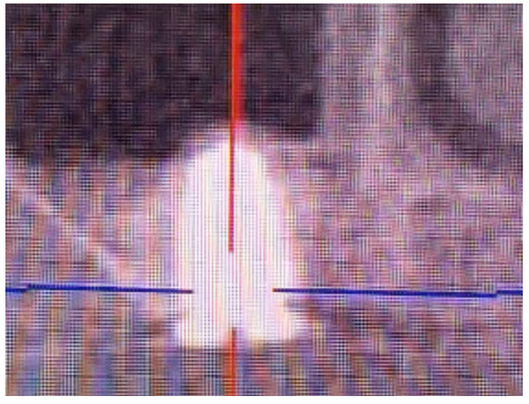
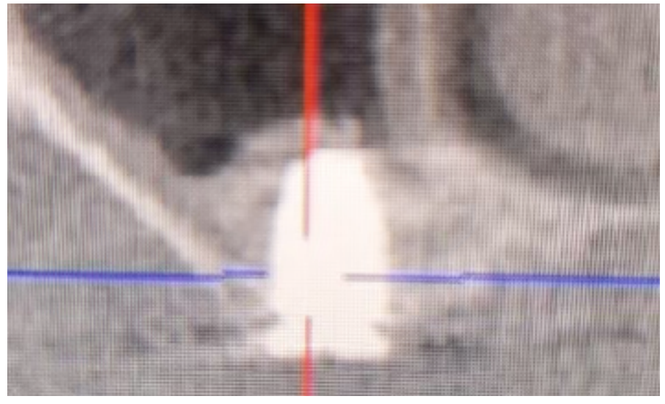
Case Information

A 60-year-old female patient presented to the clinic with the absence of the left maxillary first molar for more than 1 year. Intraoral examination revealed the absence of tooth #26 (per FDI Dental Numbering System), with normal gingival color and texture, and adequate prosthetic space. CBCT examination showed that the maxillary sinus presented a sloped shape from mesial to distal, with a slope angle of approximately 45 degrees. The available bone height at the distal site was about 3 mm, and the maxillary sinus mucosa was healthy.

In this case, the surgery was successfully performed using the maxillary sinus elevation drill designed by Dr. Zhao Yang, achieving an elevation height of approximately 4 mm. During the operation, a Straumann implant (4.8 mm × 8 mm, RN) and 50 mg of Bio-collagen were placed, with the final insertion torque reaching 35 Ncm. A successful prosthetic restoration was ultimately accomplished.

Case Information

A 63-year-old female patient presented to the clinic with the absence of the left maxillary first and second molars for more than 1 year. Intraoral examination revealed the absence of teeth #26 and #27 (per FDI Dental Numbering System), with normal gingival color and texture, and adequate prosthetic space. CBCT examination showed that the maxillary sinus presented a sloped shape from mesial to distal, and the available bone height at the implant sites was approximately 2 mm. The maxillary sinus mucosa was healthy.

In this case, the surgery was successfully performed using the maxillary sinus elevation drill designed by Dr. Zhao Yang, achieving an elevation height of more than 4 mm. During the operation, one Straumann implant (4.8 mm × 8 mm, BLT platform) was placed at each implant site, along with 0.5 g of xenograft bone material. The final insertion torque reached 35 Ncm.