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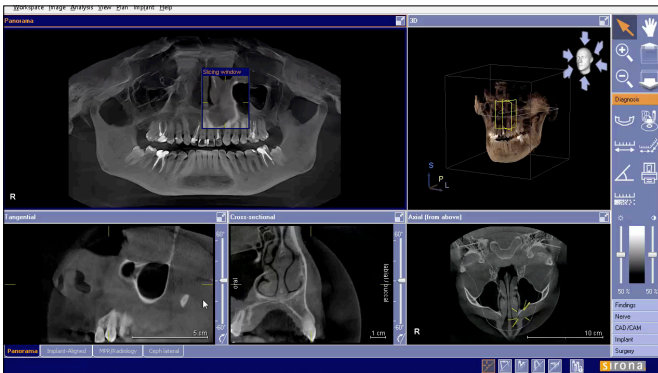
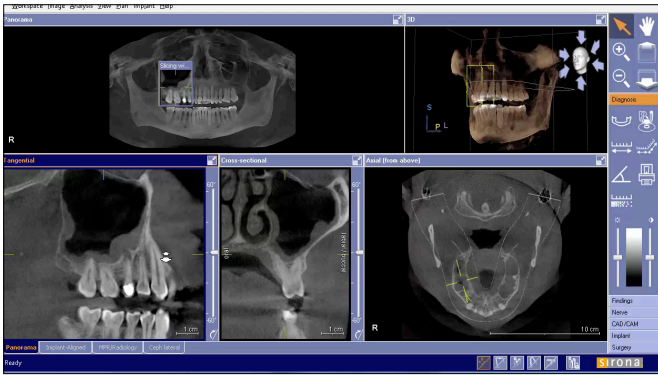
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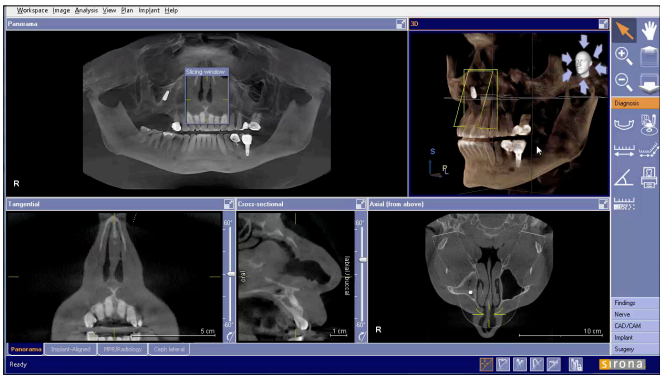
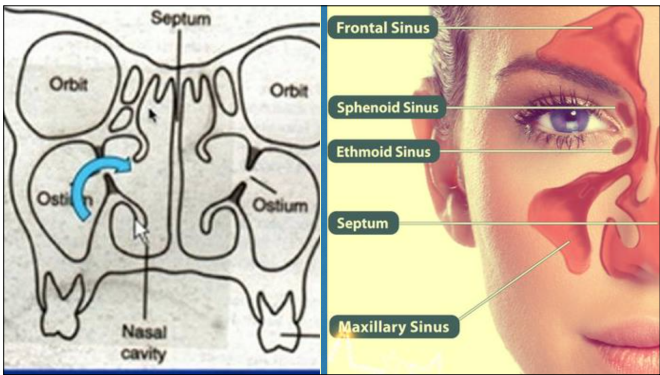
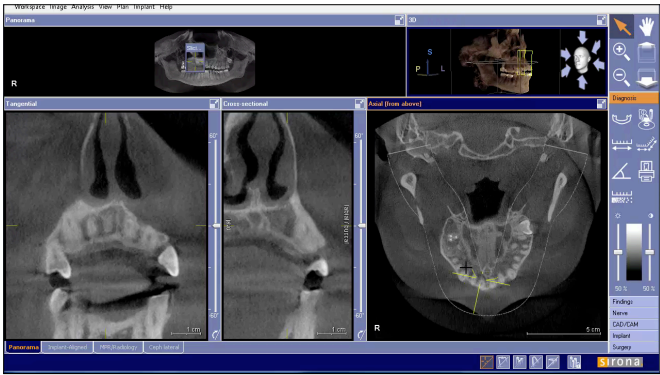
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CONTEMPORARY REVIEW



### Obstructive Sleep Apnea in Cardiovascular Disease: A Review of the Literature and Proposed Multidisciplinary Clinical Management Strategy

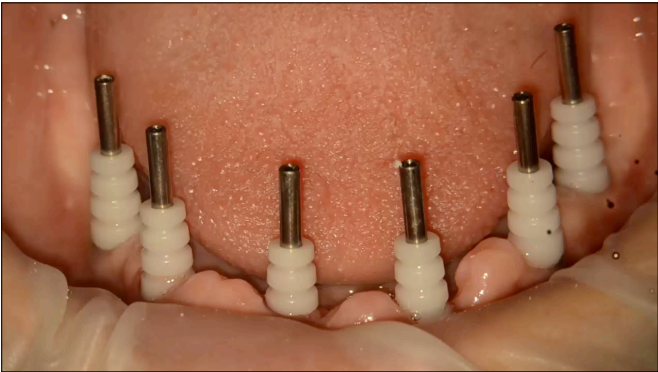
Jeremy R. Tietjens, MD; David Claman, MD; Eric J. Kezirian, MD, MPH; Teresa De Marco, MD; Armen Mirzayan, DDS; Bijan Sadroonri, MD; Andrew N. Goldberg, MD; Carlin Long, MD; Edward P. Gerstenfeld, MD; Yarem Yeghiazarians, MD

Cardiovascular disease (CVD) remains a highly prevalent cause of morbidity and mortality, both in the United States and worldwide. In parallel with the development of new and improved therapies for established CVD such as coronary artery disease or heart failure (HF), there has been an increased focus on modification of cardiovascular risk factors for both primary and secondary prevention, reflecting an evolving understanding of CVD as a systemic process with numerous determinants.

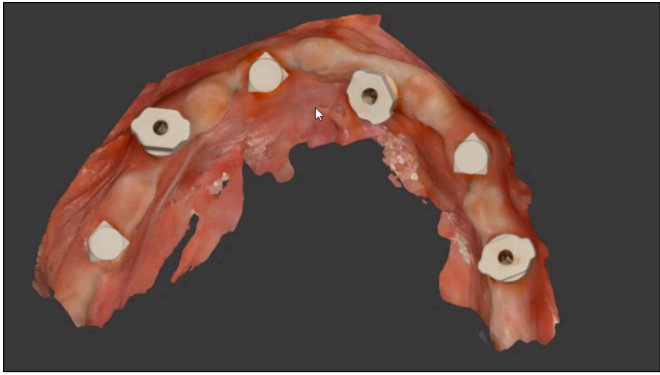
Obstructive sleep apnea (OSA) has been associated with

remains controversial, as randomized trials performed to date remain limited in number as well as design, highlighting the need for further study.<sup>6</sup> Furthermore, the current literature suggests that the impact of diagnosing and treating OSA varies between specific CVD processes, implying the need for a more sophisticated understanding and nuanced clinical approach to this issue. In this article we review the literature pertaining to OSA in patients with CVD. Additionally, we offer a practical clinical approach to the evaluation and management of known or suspected OSA in patients with CVD

Table 4. Overview of Surgical Procedures for Obstructive Sleep Apnea		
Anatomic Region	Specific Procedures	Outcomes
Nasal	<ul style="list-style-type: none"><li>• Turbinate reduction</li><li>• Septoplasty</li><li>• Nasal valve surgery</li><li>• Rhinoplasty</li><li>• Nasal polypectomy</li><li>• Adenoidectomy</li></ul>	Significant 2.66 cm H <sub>2</sub> O reduction in required CPAP pressure (95% CI 1.67–3.65; <i>P</i> < 0.00001) reported in meta-analysis following nasal surgeries <sup>60</sup> Average nightly CPAP use increased from 3.0 ± 3.1 h preoperatively to 5.5 ± 2.0 h following surgery
Upper pharyngeal	<ul style="list-style-type: none"><li>• Uvulopalatopharyngoplasty</li><li>• Uvulopalatal flap</li><li>• Several other variants of UPPP are used</li><li>• Tonsillectomy</li></ul>	Pooled polysomnographic success rate 50% <sup>61</sup> for UPPP in meta-analyses; however, results from individual studies vary significantly, with success rates up to 83% in more selective cohorts <sup>62</sup>
Lower pharyngeal	<ul style="list-style-type: none"><li>• Tongue reduction procedures</li><li>• Tongue advancement/stabilization procedures</li><li>• Epiglottis procedures</li></ul>	Polysomnographic success rate ranges from 35% to 62% across studies of various hypopharyngeal procedures <sup>63</sup>
Global upper airway procedures	<ul style="list-style-type: none"><li>• Maxillomandibular advancement</li><li>• Tracheotomy</li><li>• Upper airway stimulation</li></ul>	Pooled efficacy results from meta-analyses of each procedure type: <ul style="list-style-type: none"><li>• MMA: 86% success rate<sup>64</sup> and 43% cure rate<sup>64</sup></li><li>• Tracheotomy: significant reduction in AHI by mean 79.82 events/h (95% CI 63.7–95.9, <i>P</i> &lt; 0.0001)<sup>65</sup></li><li>• Hypoglossal stimulation: significant reduction in AHI by mean 17.51 events/h (95% CI 20.7–14.3)<sup>67</sup></li></ul>







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Fixture Position

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# Biomimetic Dentistry

C-Factor

Compressive Strength

Fracture Resistance

Wear Resistance

Compatibility

Tensile Strength

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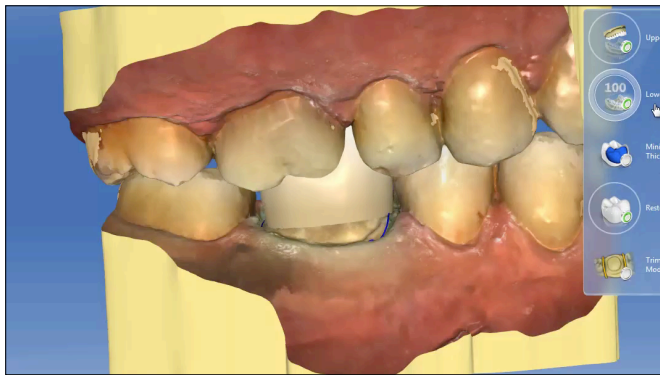
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## Prosthetically Driven Implant Placement

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## Prosthetically and Surgically Balanced Implant Placement

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## Biomimetic Implant Therapy

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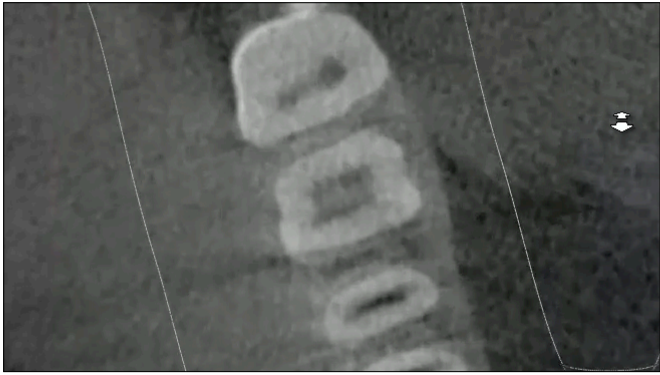
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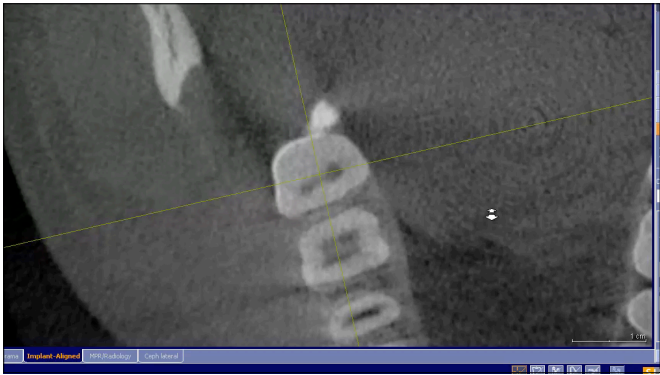
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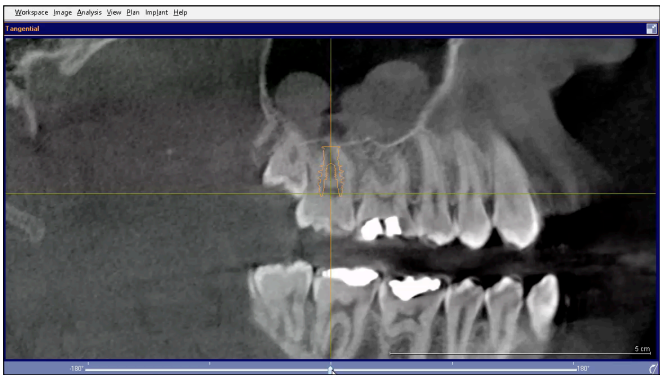
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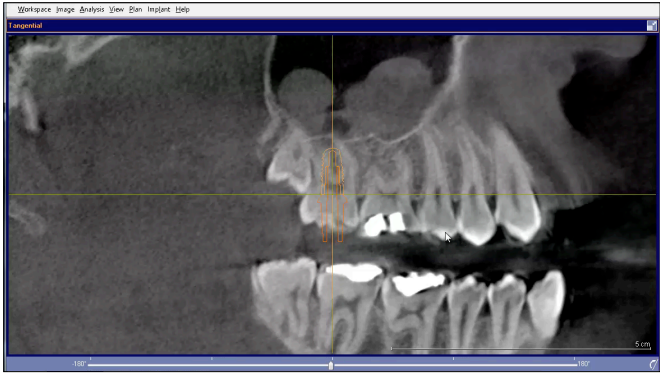
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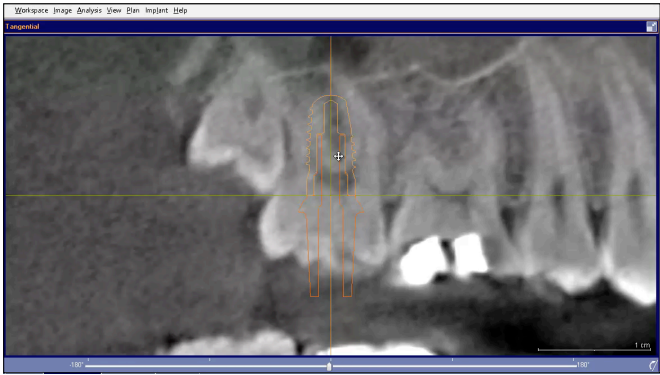
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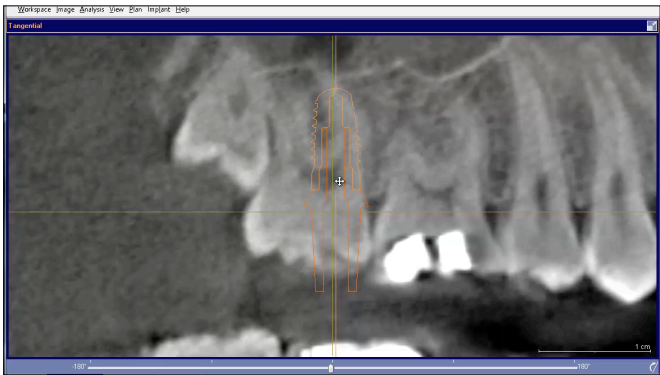
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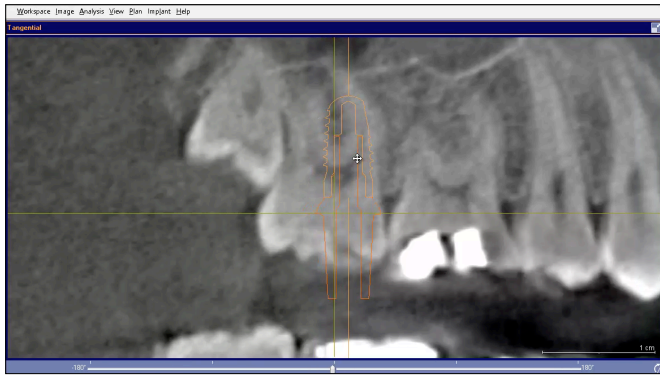
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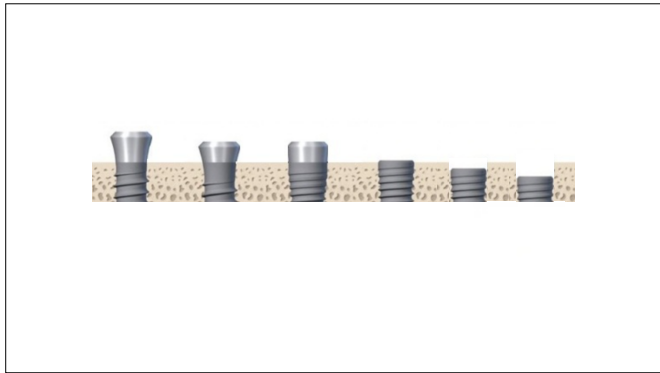
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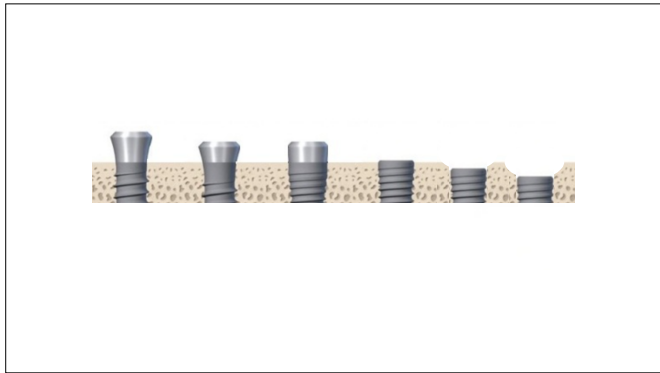
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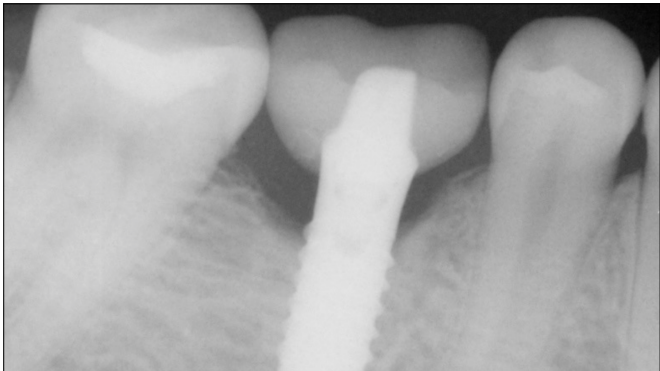
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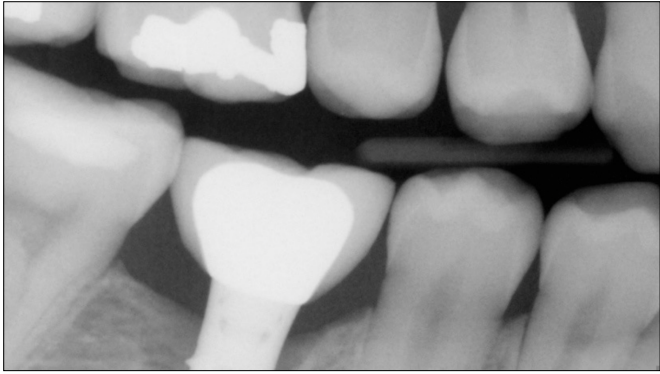
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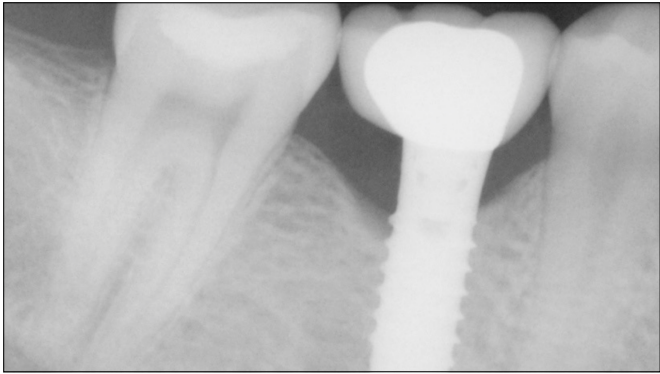
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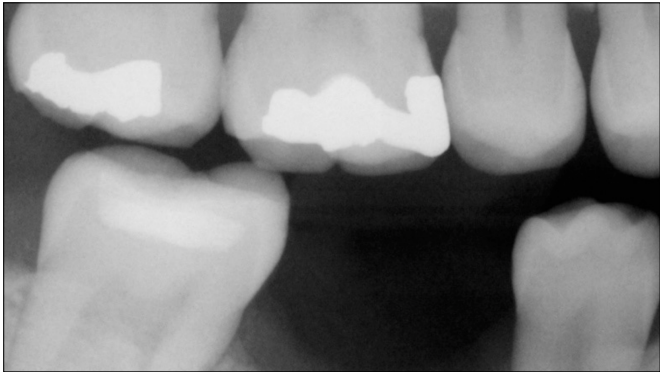
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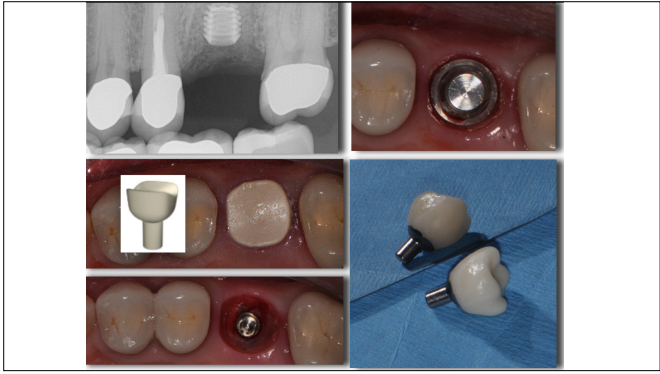
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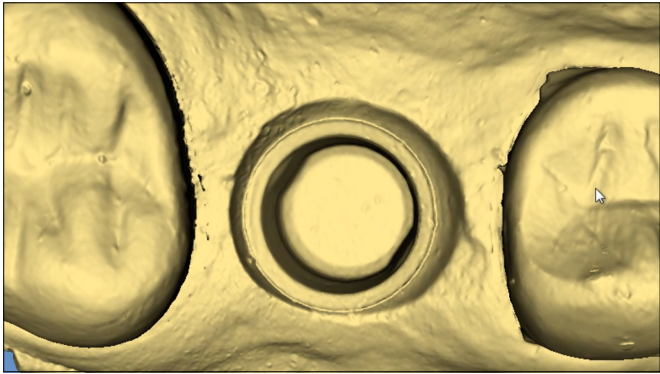
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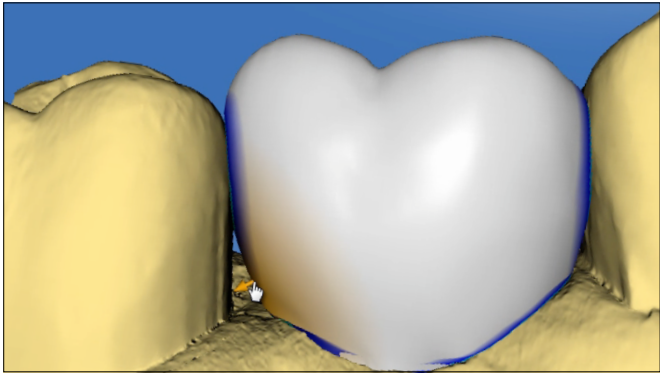
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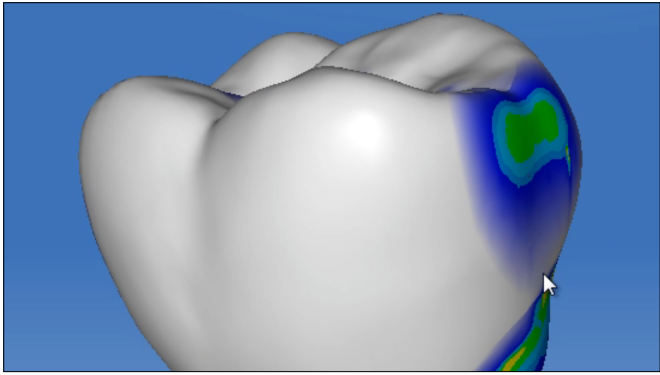
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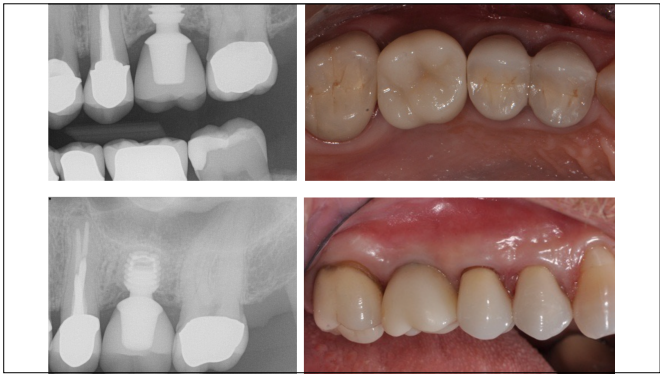
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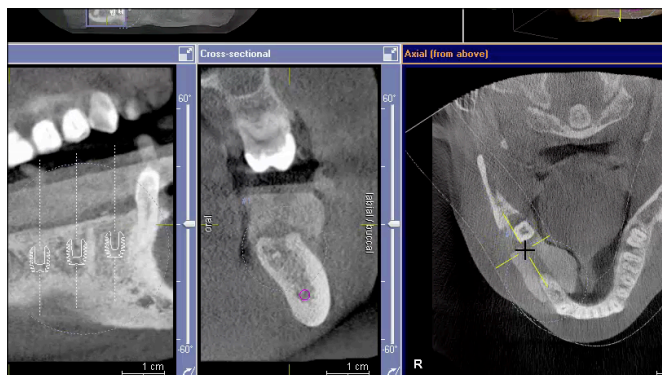
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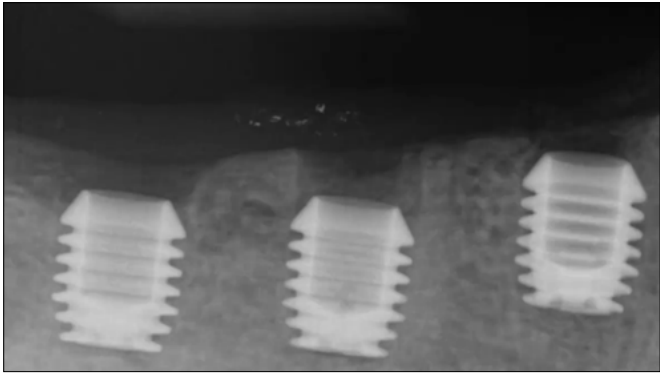
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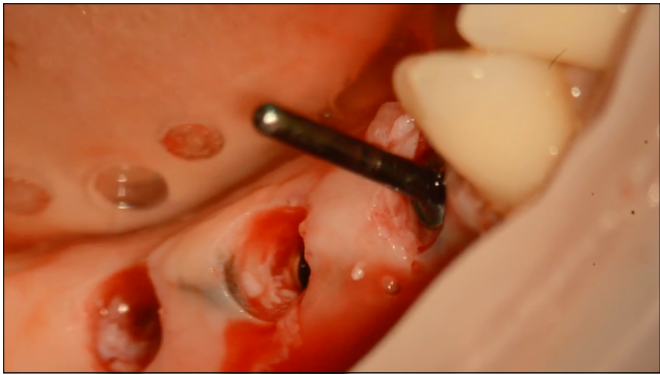
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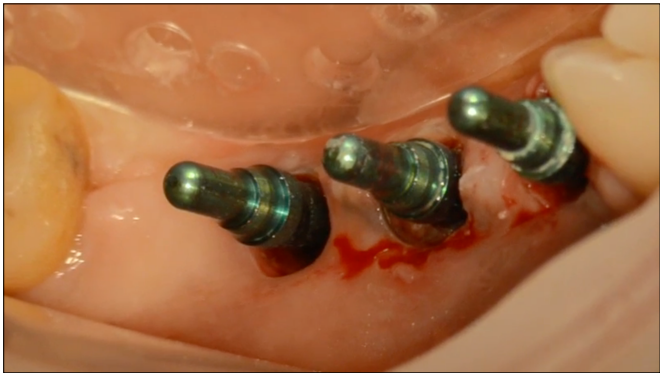
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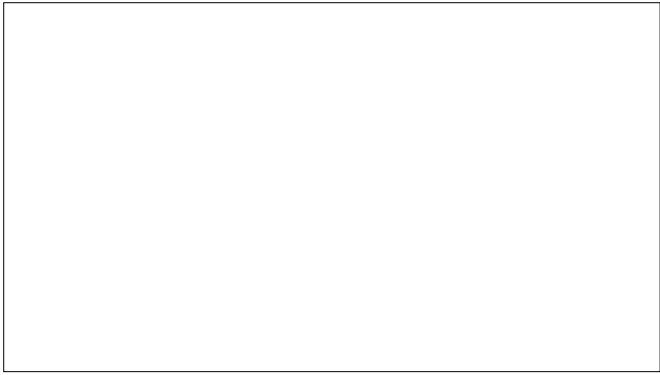
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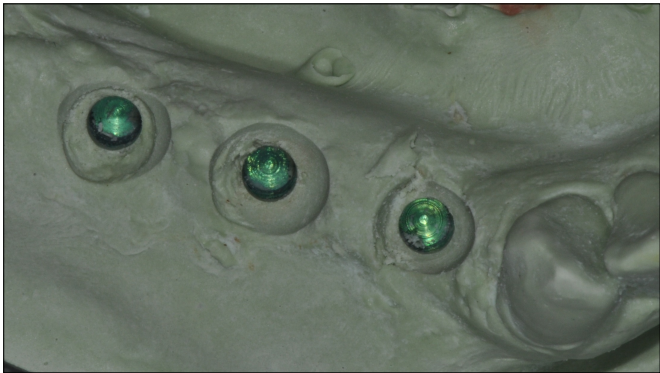
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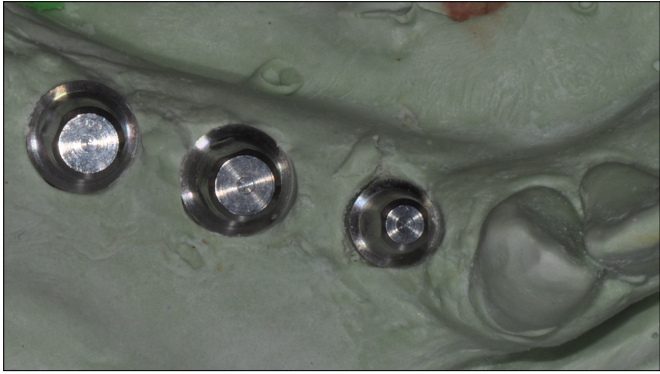
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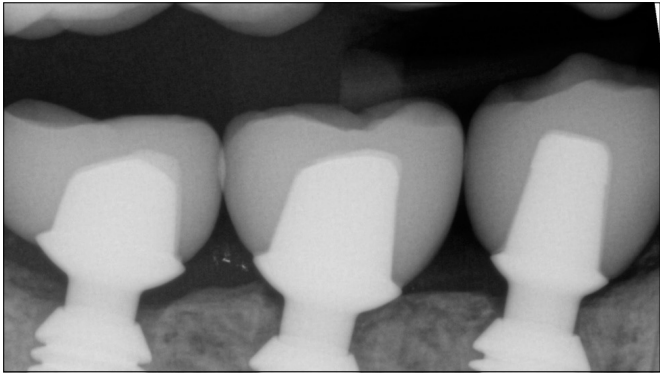
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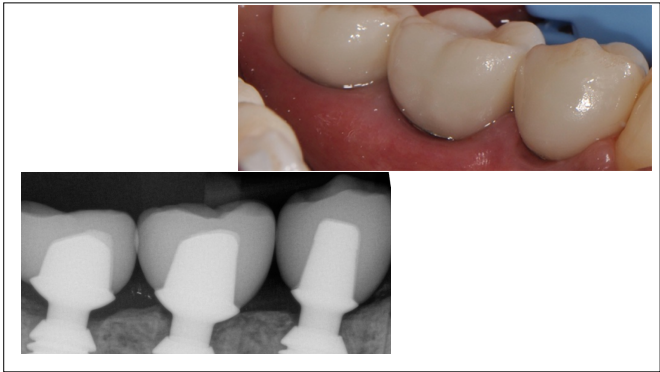
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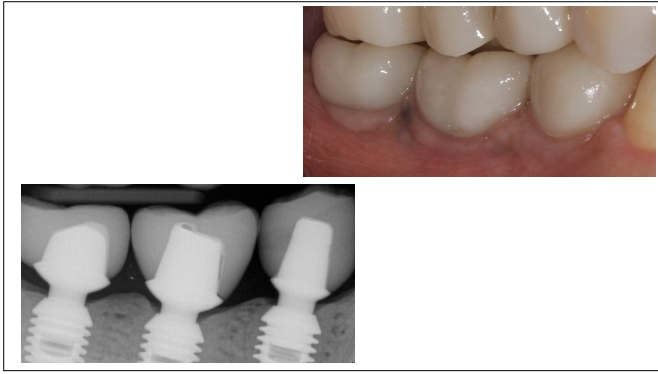
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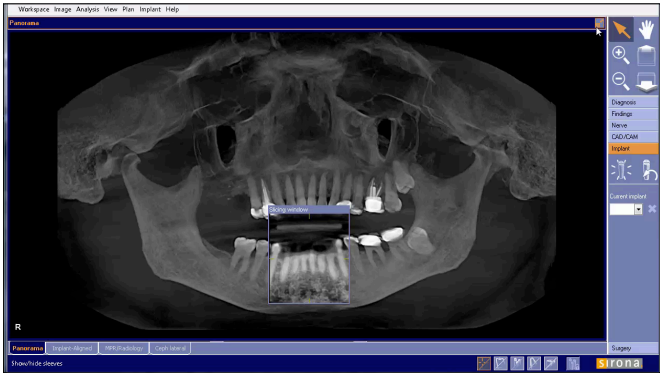
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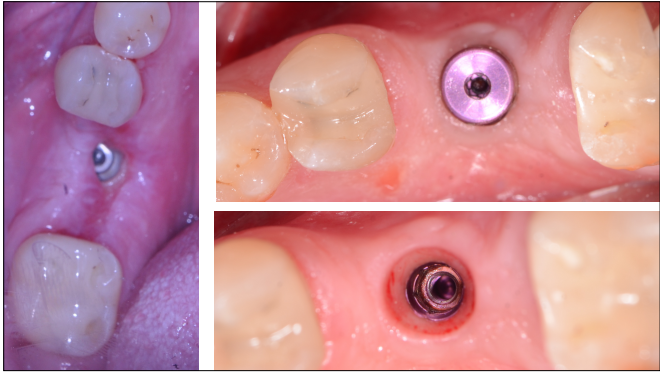
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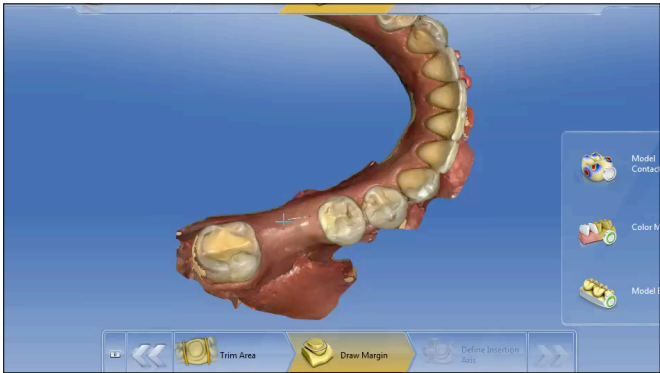
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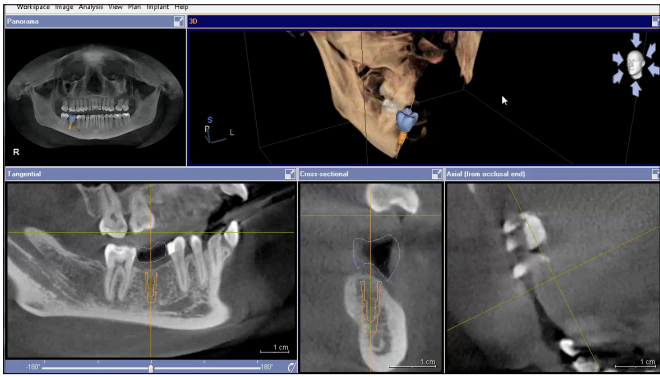
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Surgical Stent Design

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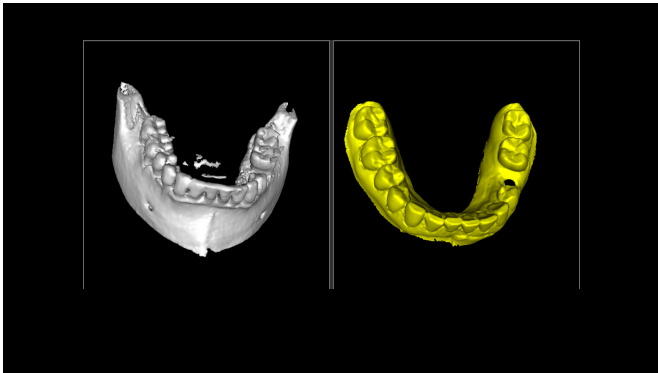
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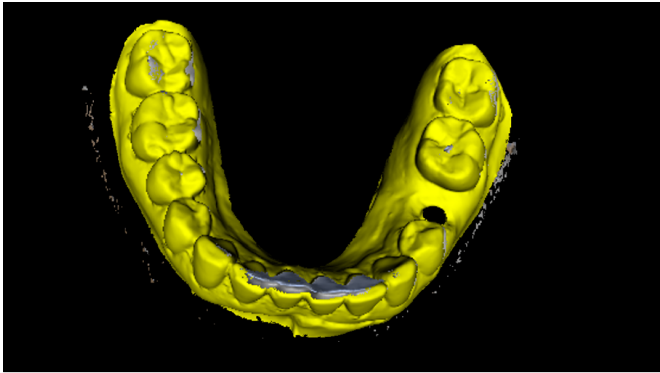
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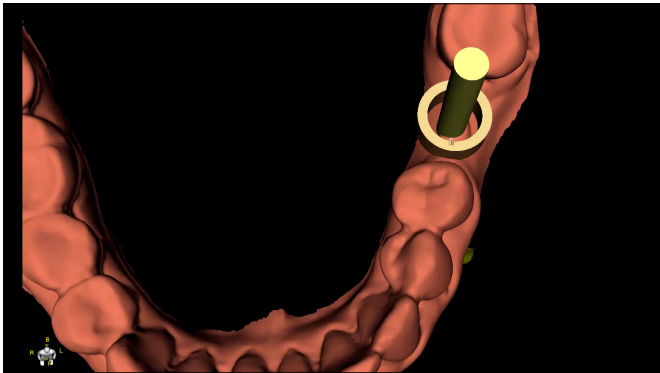
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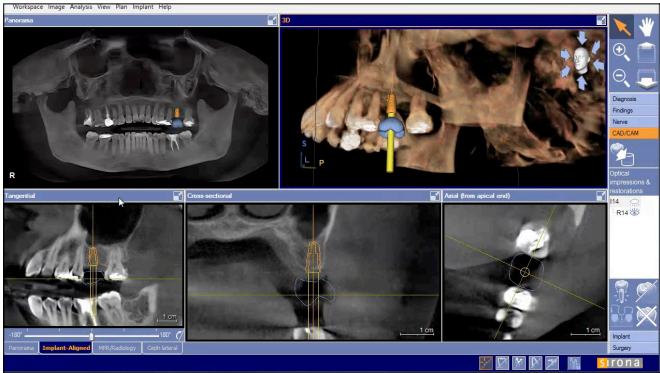
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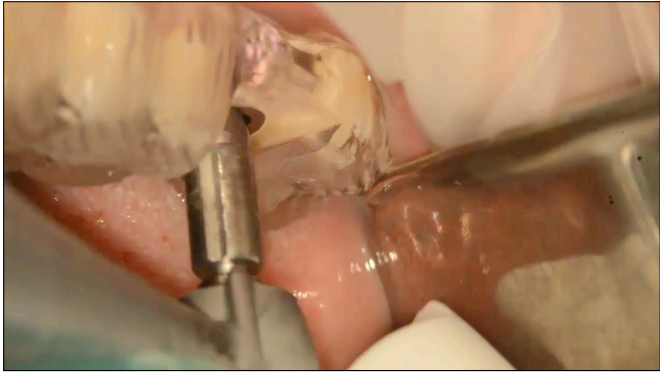
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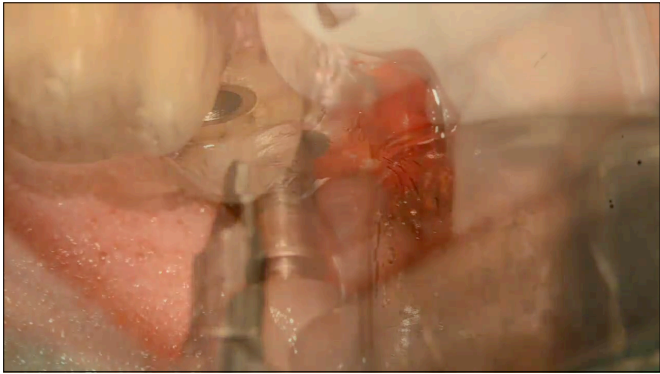
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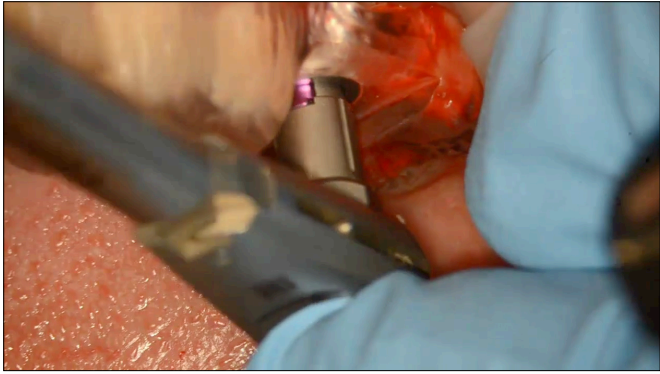
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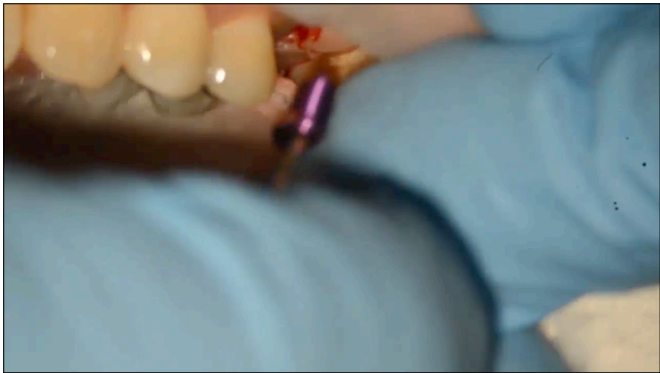
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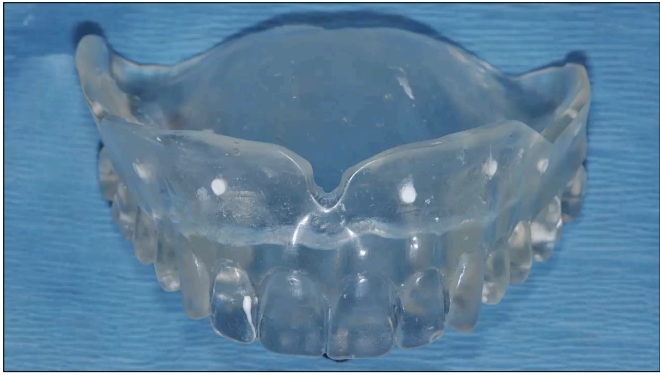
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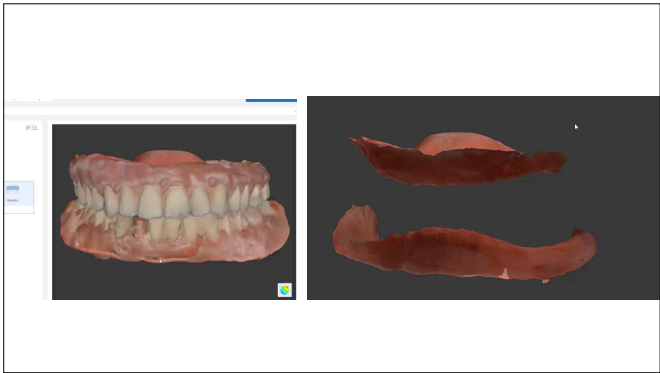
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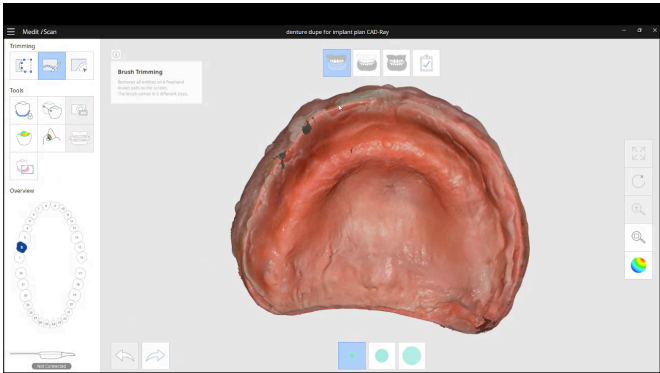
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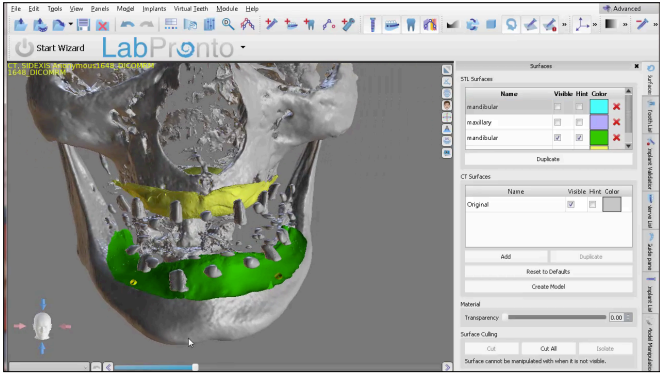
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# Surgical Access

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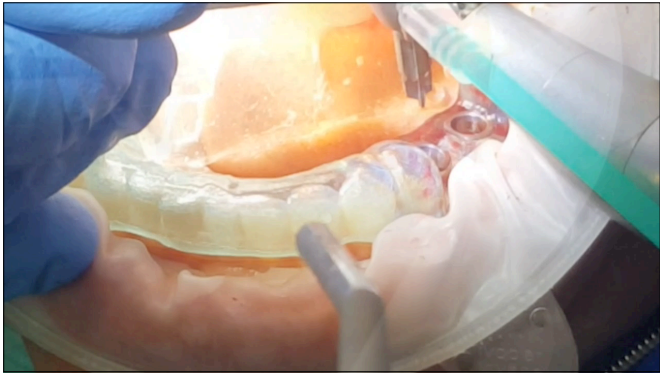
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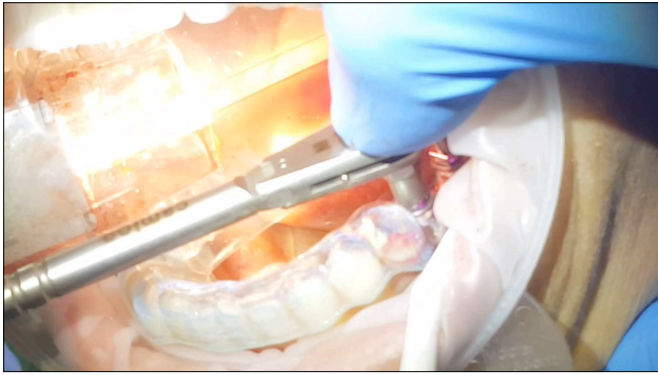
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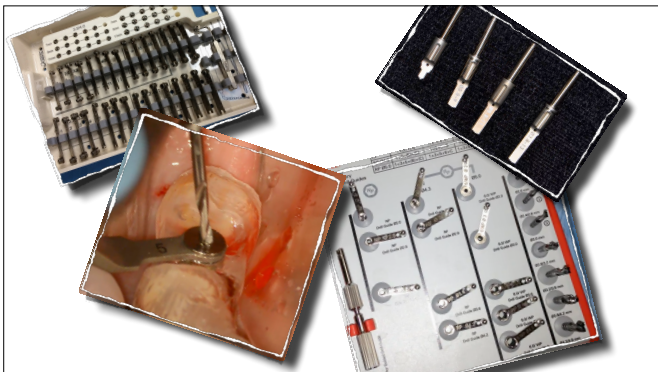
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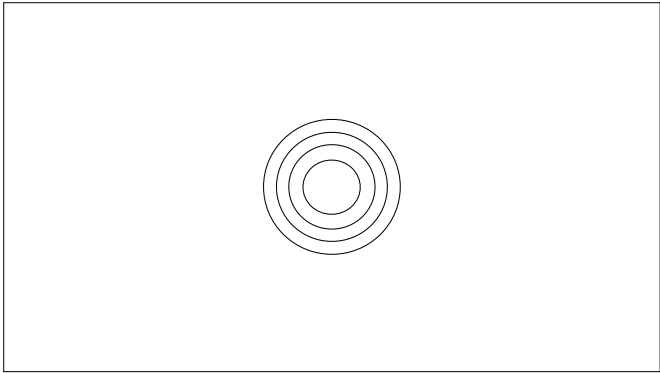
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## Keys and Handles





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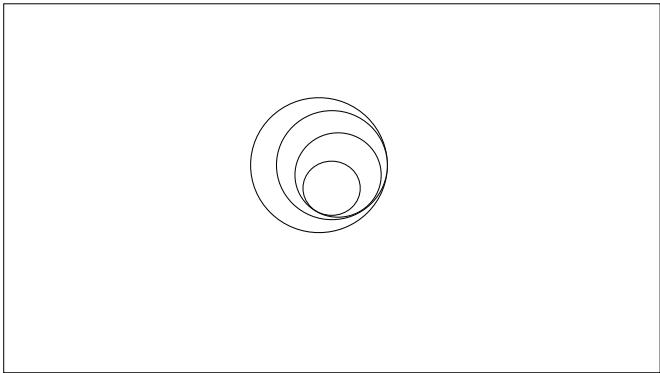
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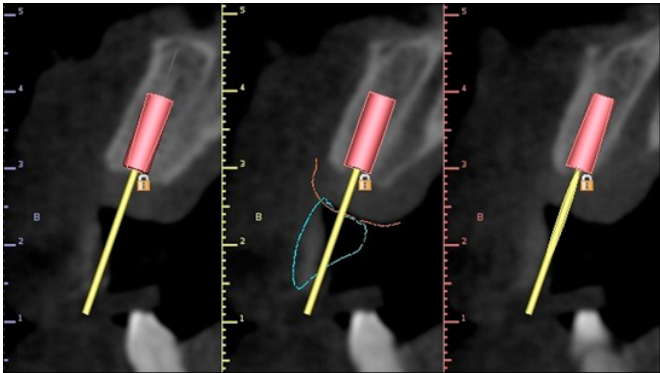
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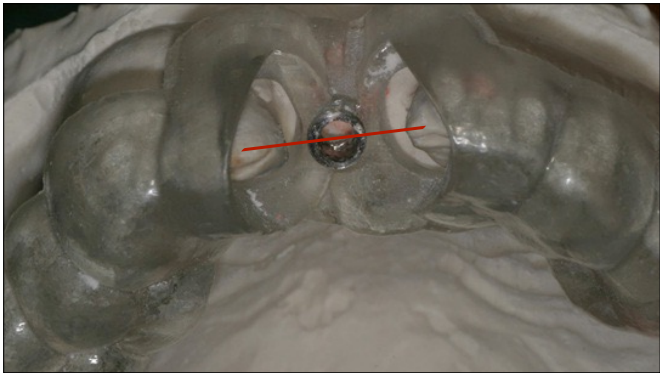
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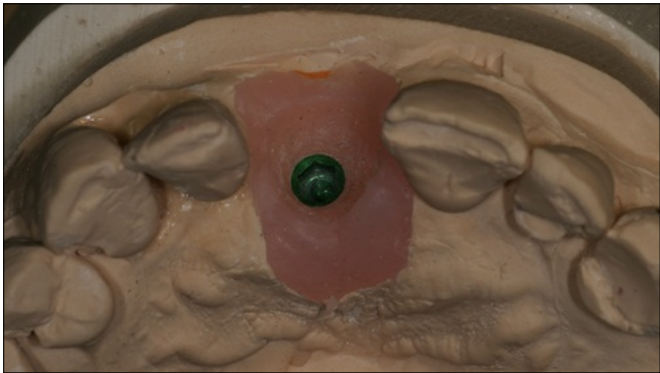
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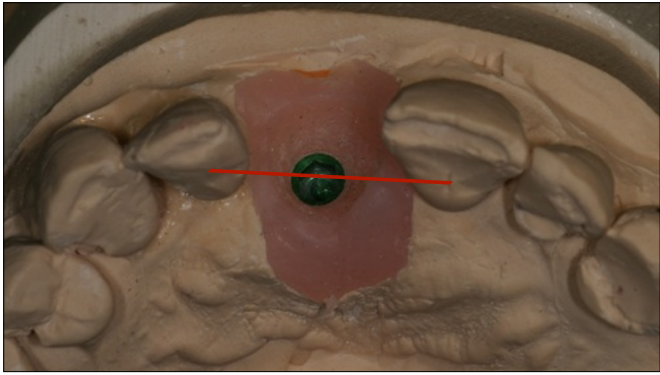
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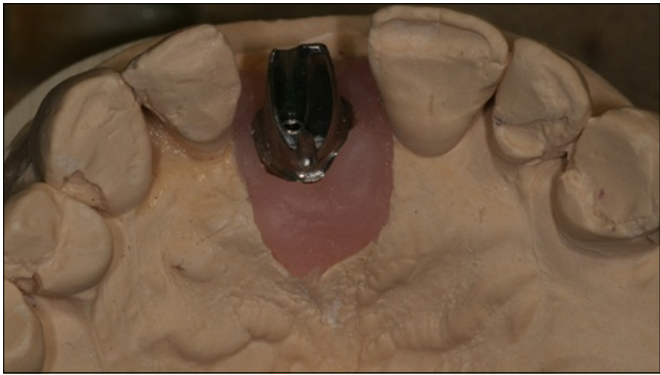
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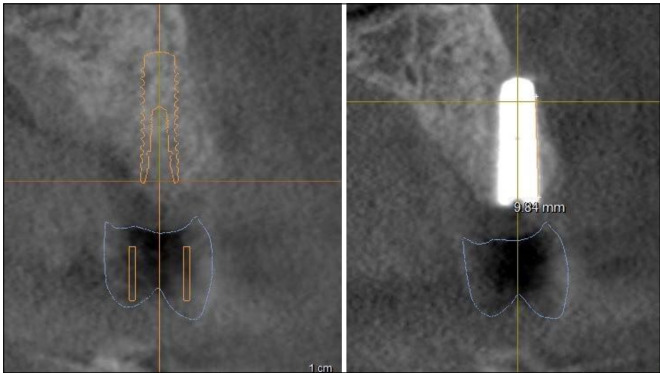
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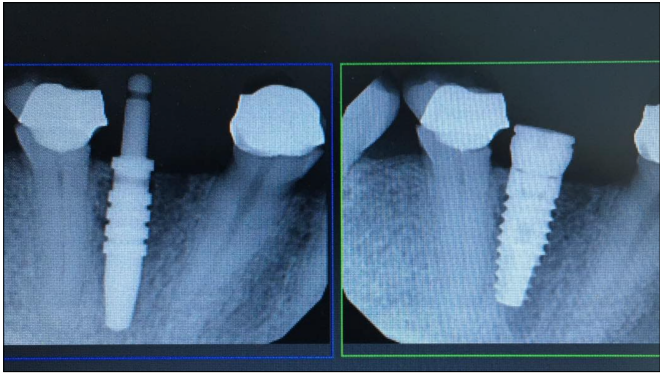
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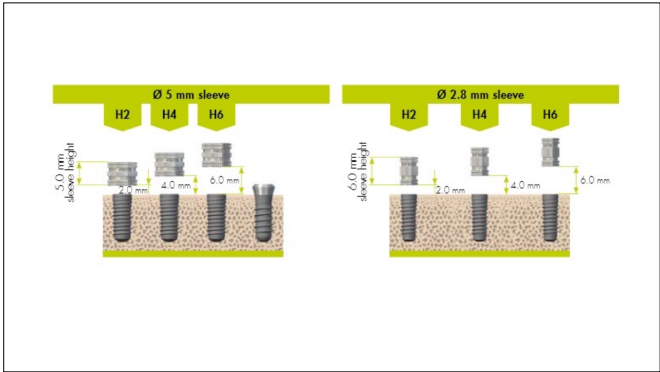
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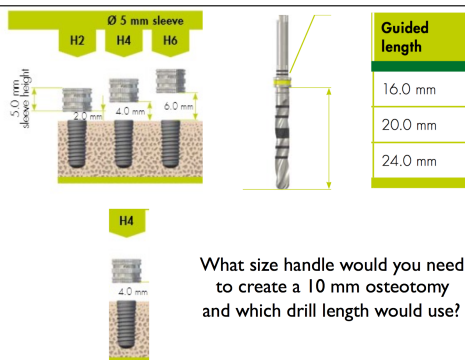
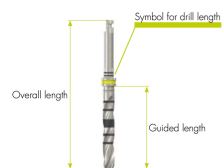
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Implant Position ( ADA )	29	
Implant Art. No.	021.4412	
Implant	BL, RC, Ø4.1mm, 12mm, SLA®	
Sleeve height	5mm	
Sleeve Position	H4	
Milling Cutter	3.5mm	
Cylinder of Drill Handle	+3 mm drill handle	
Guided Drill	extra-long drill	



Drill name	Guided length	Overall length	Symbol for drill length
Short	16.0 mm	32.0 mm	—
Long	20.0 mm	36.0 mm	=
Extra-long	24.0 mm	40.0 mm	≡



What size handle would you need to create a 10 mm osteotomy and which drill length would use?



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