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## References:



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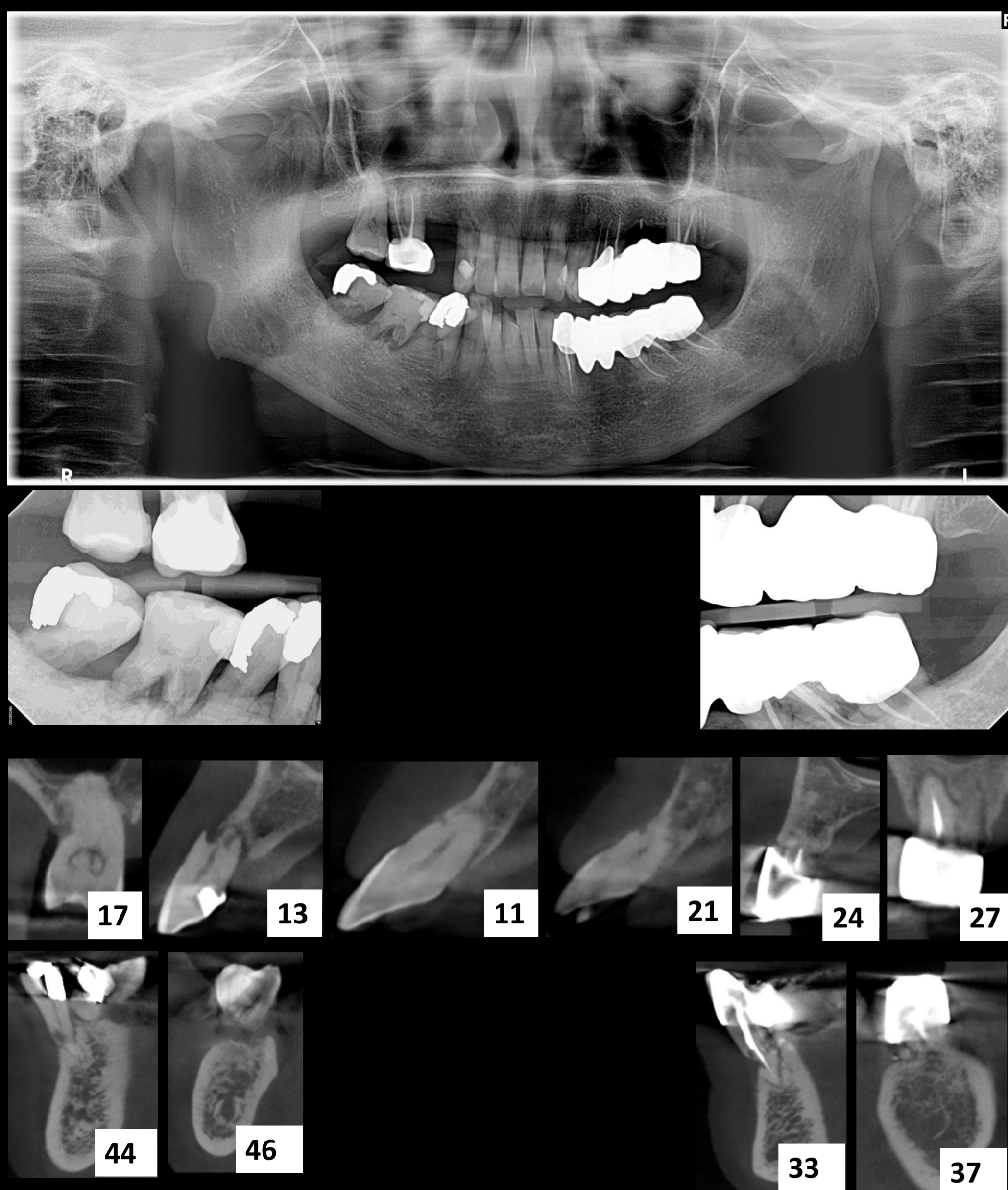
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**Background** - Systemic sclerosis (scleroderma or SSc) is a chronic autoimmune disease with connective tissue fibrosis, posing surgical and prosthetic **challenges**. This case involves a SSc patient, who sought treatment with the **chief concern** of compromised chewing on the right side. **Findings** included non-physiological occlusion marked by reduced chewing function (missing and mobile teeth), malocclusion (severe crowding), incompetent lips, limited mouth opening (LMO), dry mouth, generalized external root resorption (ERR) and periodontitis.



**Figure 1** - Extra-oral and intra-oral patient photos.



**Figure 2** - Radiographic images.

**Treatment objectives** - Extraction of hopeless teeth, providing therapeutic occlusion. Removable dentures and tooth supported fixed prostheses were excluded (LMO, ERR and periodontitis). The patient chose implant-supported fixed dental prostheses.

## Discussion - Prosthetic challenges with SSc:

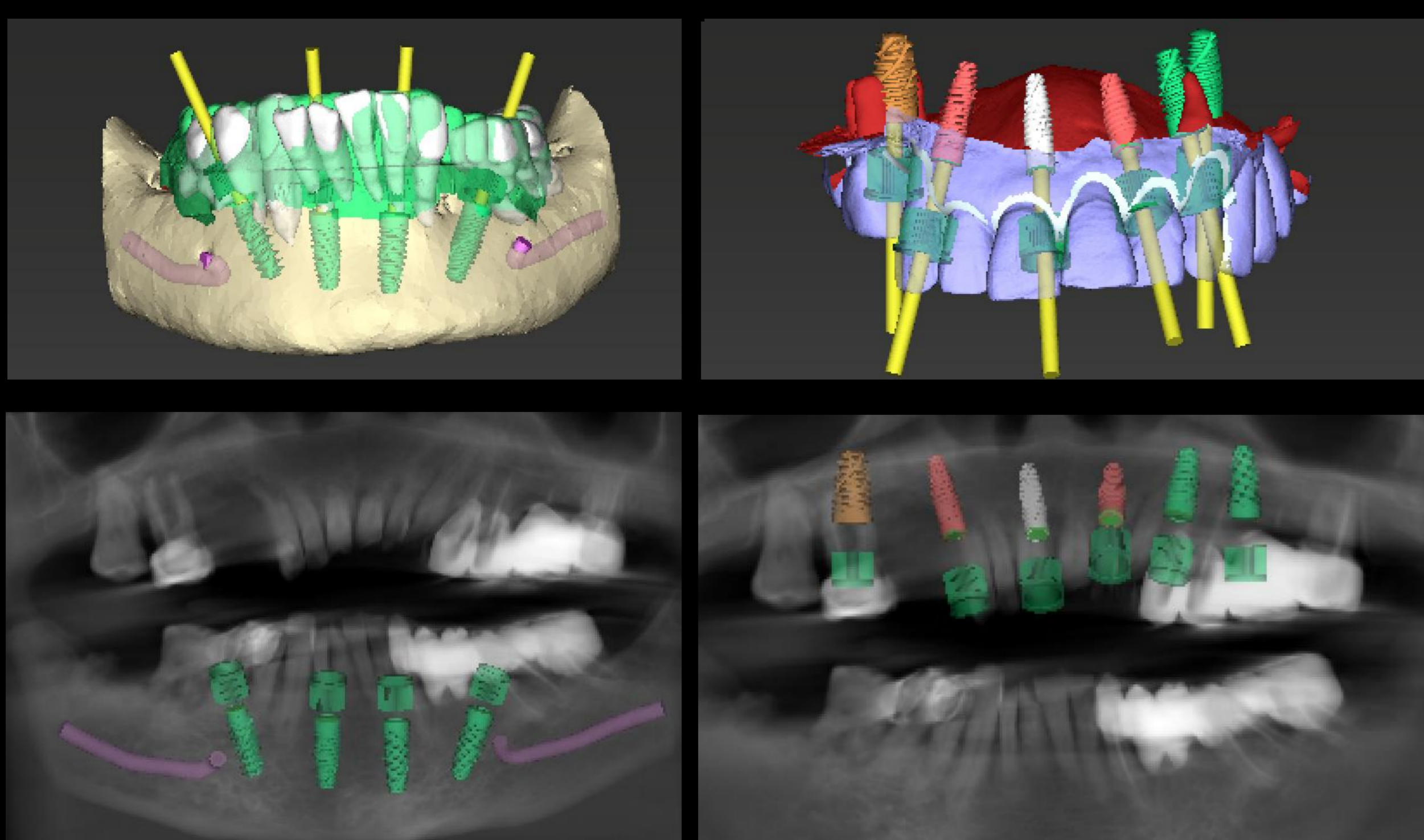
- 1. Limited mouth opening (LMO)** - Challenges: Impressions, registration procedures and prosthesis removal / insertion. Considerations: Mild LMO - rotational path of insertion and reduction in VDO. Severe LMO - sectional trays and sectional prosthesis design. Feasibility of prosthesis maintenance?<sup>1,2</sup>
- 2. Dry mouth** - Risk of oral candidiasis, caries, periodontal disease, halitosis, burning mouth, and dysphagia. Treatment: saliva substitutes, lubricants, cholinergic drugs, sugarless chewing gum, lozenges, and frequent fluid consumption<sup>3,4</sup>.
- 3. External root resorption (ERR)** - Possible causes: Periodontal / pulpal infection, orthodontic forces, and ankylosis. Treatment: Target cause. When diagnosed, initiate treatment immediately. Symptomatic treatment for pain relief and mobile teeth stabilization<sup>5,6</sup>.

## Discussion - Surgical challenges with LMO and SSc:

- 1. General anesthesia (GA)** - May ease LMO in absence of anatomical barriers. However, SSc may pose GA challenges such as intubation - increased bleeding risk in endotracheal tube placement, and postoperative ventilation requirement due to fibrosis of lung tissues<sup>7,8</sup>.
- 2. Guided surgery** - The surgical guide, drill, and handpiece requires between 30-49.5 mm of mouth opening which may not be feasible with LMO, especially in the molar region<sup>9,10</sup>.
- 3. Interventions** - Surgical interventions - coronoidectomy, commissurotomy. Non-surgical - physiotherapy, hyaluronic acid, and Botox injections<sup>11</sup>.



**Figure 3** - Patient models and tooth-setup.



**Figure 4** - Dental implant planning (coDiagnostiX®)

## Conclusions:

- 1. Treatment planning in SSc patients** - Considerations - Progressive nature of the disease, prostheses maintenance feasibility, probability of the patient to withstand surgical treatment, impressions, and long-term prognosis of natural dentition.
- 2. Fixed treatment generally preferred** - Due to LMO, a removable prosthesis may not be possible. Due to ERR and periodontitis, tooth-supported options may be unfeasible.
- 3. Adaptations required** - LMO affects impression techniques, prosthesis insertion, and implant placement. Alternatives such as sectional trays / dentures, altered insertion paths, and customized surgical guides may be necessary.