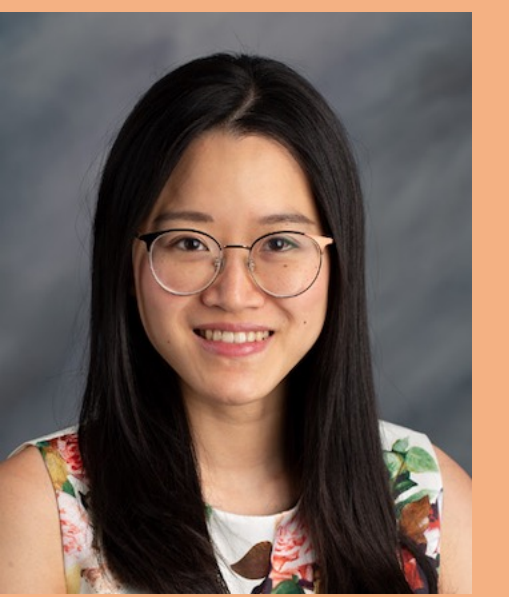


# Teledentistry in Pediatric Dentistry: A Literature Review and Case Report

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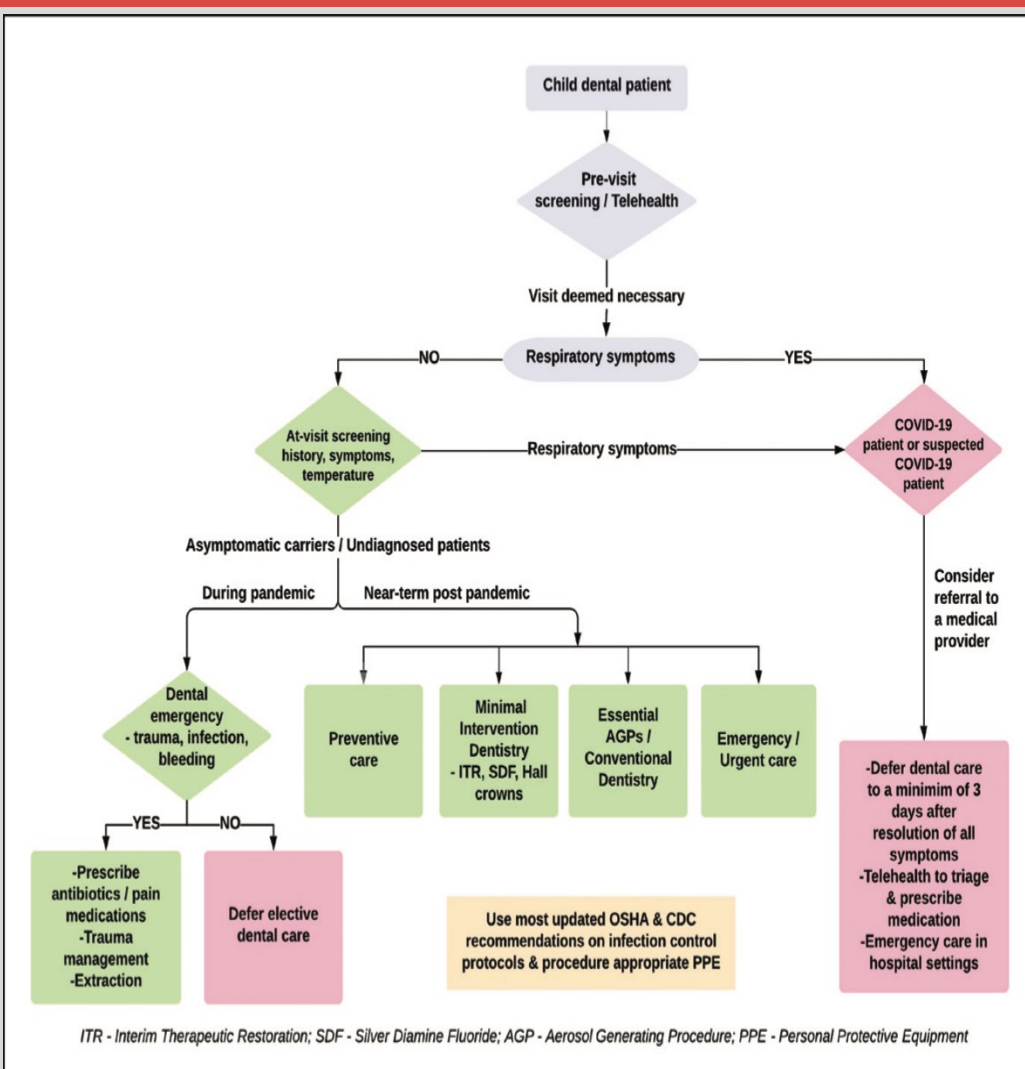
## Introduction

The term of “Teledentistry” comes from “Telemedicine”, which includes a growing variety of applications and services using two-way video, email, smart phones, wireless tools, and other forms of telecommunications technology.”<sup>1</sup> Teledentistry, according to the ADA’s Comprehensive Policy Statement on Teledentistry, refers to the use of telehealth systems and methodologies in dentistry.

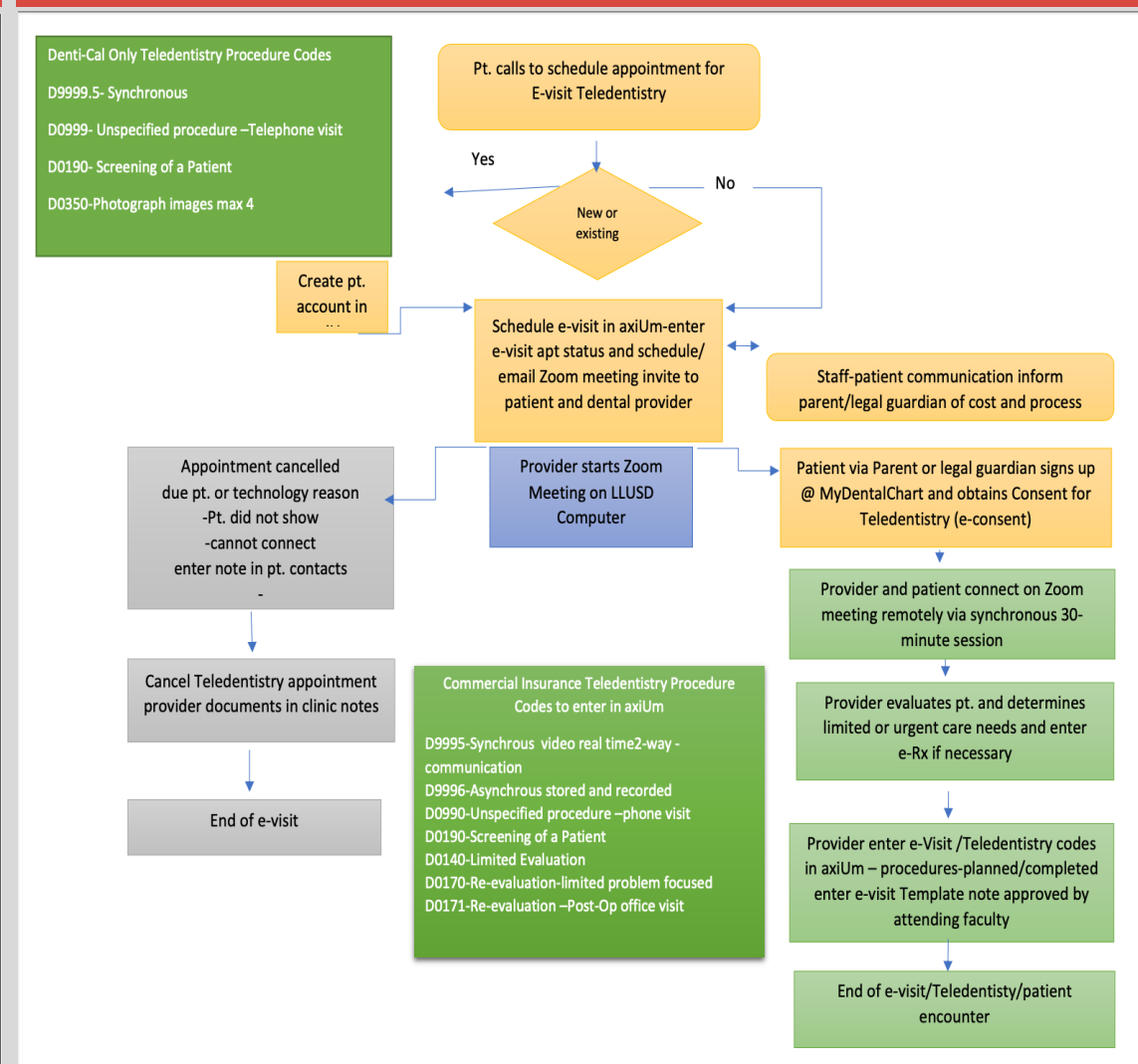
Teledentistry can include patient care and education delivery using, but not limited to, the following modalities: 1) Live video (synchronous) 2) Store-and-forward (asynchronous) 3) Remote patient monitoring (RPM) 4) Mobile health (mHealth).<sup>2</sup> Being the ‘provision of real time and offline dental care such as diagnosis, treatment planning, consulting and follow-up via electronic transmission from different sites’,<sup>3</sup> it aims to improve patient care, dental education, and effectuation of the communication between dentists and dental laboratories.

The spread of coronavirus disease (COVID-19) has caused widespread public health concerns since 2020. During the pandemic, teleconsultation, telediagnosis, telerriage, and telemonitoring are subunits of teledentistry that have important functions relevant to dental practice. The American Academy of Pediatric Dentistry (AAPD) recommends using teledentistry as a tool in COVID-19 interim care pathways for managing a pediatric dental patient since it reduces the chance of patient to come in dental clinic and further lower down the incidence of high risk exposure.<sup>4</sup>

## AAPD recommendation of teledentistry in interim care pathways



## Loma Linda University School of Dentistry Teledentistry flow chart



## Case Report

A 12-year-old female presented to the pediatric dental clinic at Loma Linda University with the chief complaints of crowding teeth. She exhibited a convex profile, an acute nasolabial angle, and protruded upper anterior teeth that made her hard to close her mouth. On smiling, she displayed prominent upper central incisors and canines. (Figure 1) The intraoral photographs (Figure 2) and dental casts revealed severe crowding in both maxilla and mandible with large overbite and overjet. In addition, unilateral crossbite was present on the left side. Cephalometric analysis indicated a skeletal Class II relationship with maxillary protrusion. (Figure 3)

During the COVID lockdown periods, we presented the orthodontics treatment plan to the patient and her mom via teledentistry. The teledentistry was conducted by synchronous method in a zoom meeting. We provided the treatment options of extraction/non-extraction and explained to the patient and mom by drawing pictures and summarized words. The diagnostic casts (Figure 4) and pictures of removable appliance were shown by store-and-forward method to show the arch deficiency, demonstrate what’s the function of different appliances, and explain the pros and cons of each treatment options. (Figure 5) The E-visit completed in 50 minutes. The patient and mom chose to have non-extraction treatment with removable expanders. The appliances were successfully delivered at the appointment one month later.



Figure 1. Extraoral photos show concave profile with protruded upper anterior teeth, which made the patient hard to close her mouth.

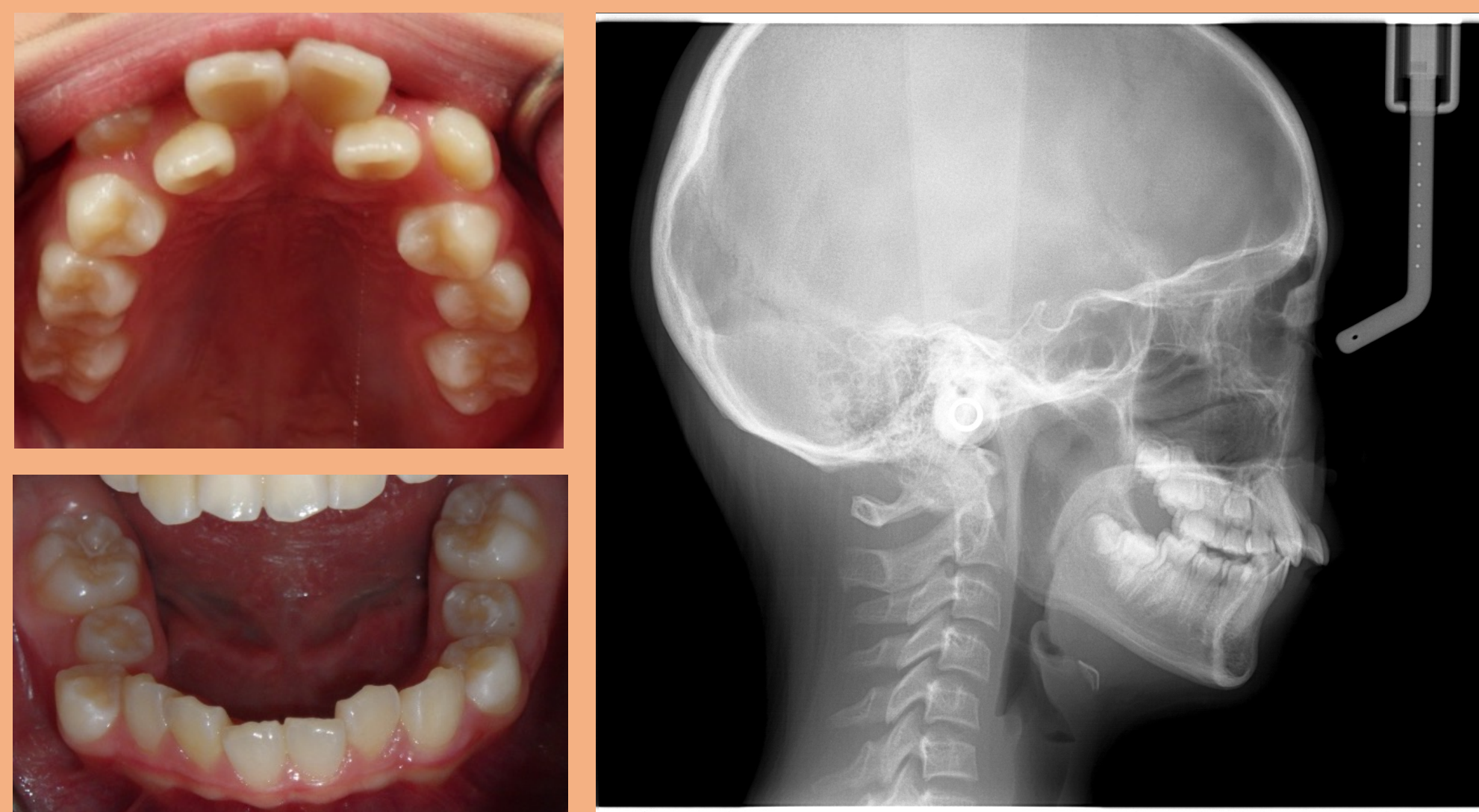


Figure 2. Intraoral photos show severe crowding. Upper lateral incisors blocked in with protrusive central incisors and canines, which indicates arch length deficiency.

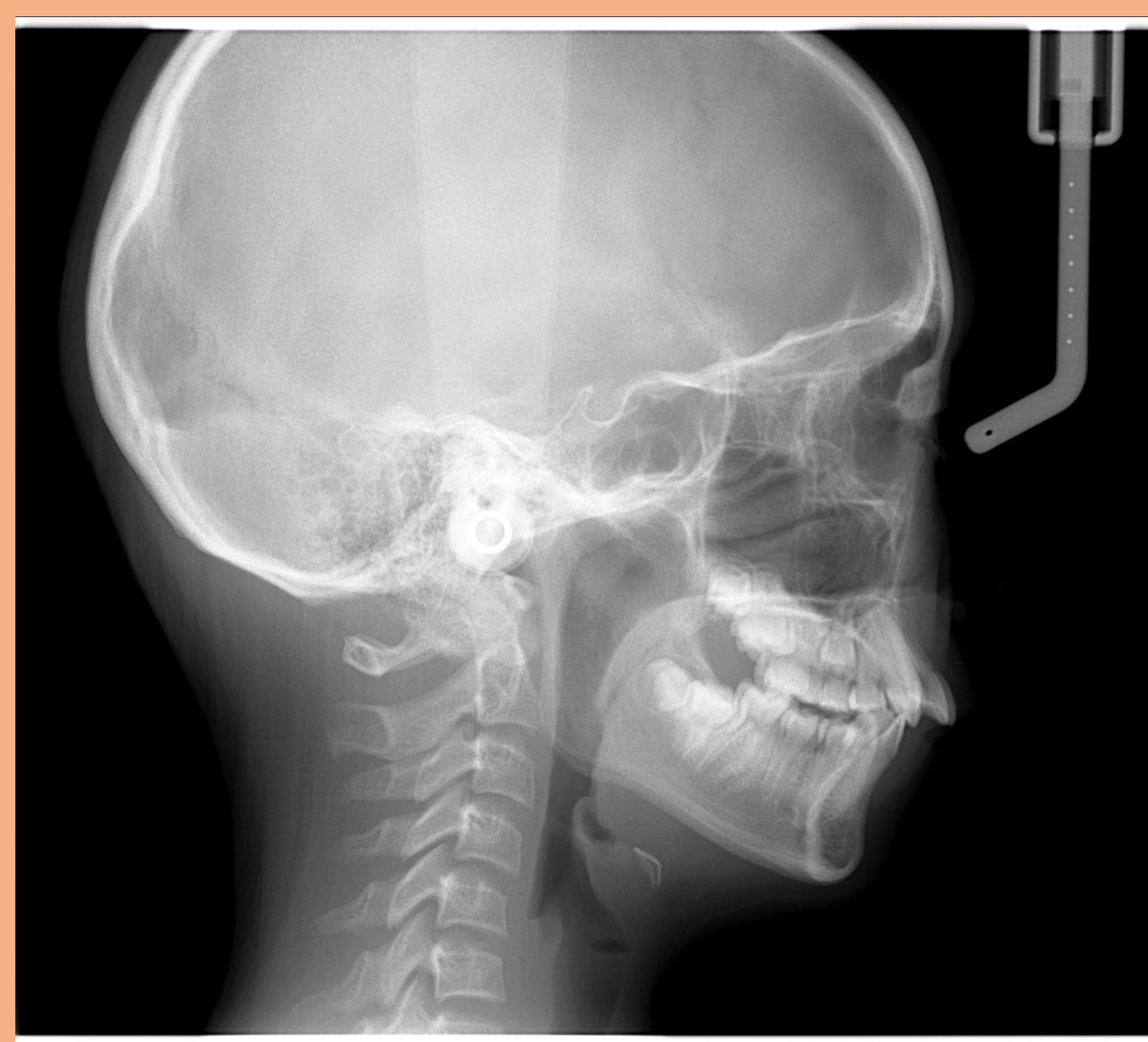


Figure 3. Cephalometric analysis indicated a skeletal Class II relationship with maxillary protrusion.

Figure 4. The diagnostic casts were shown by store-and-forward method to show the arch deficiency

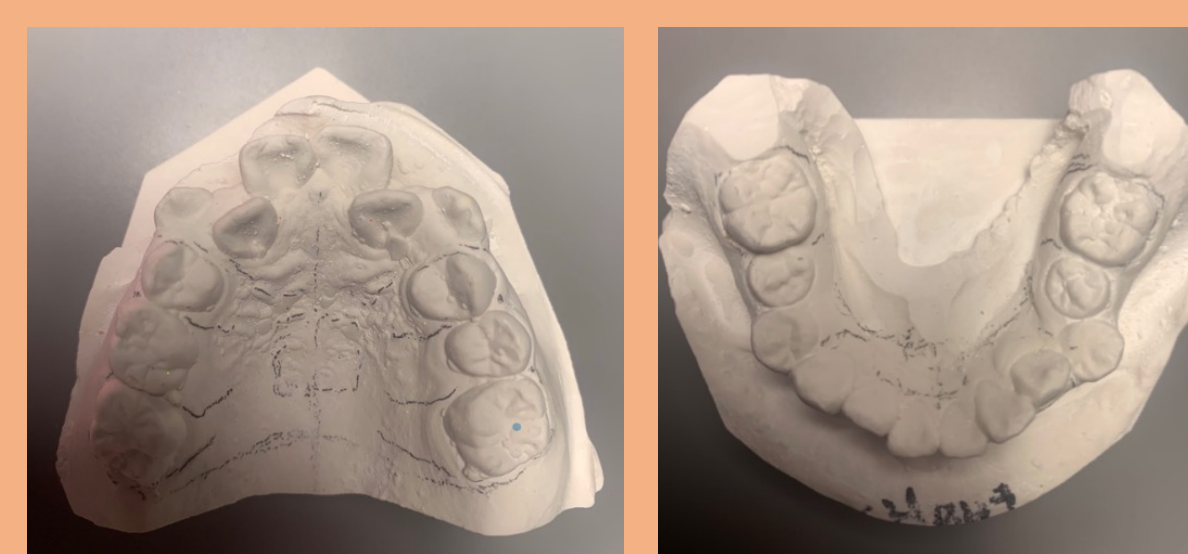
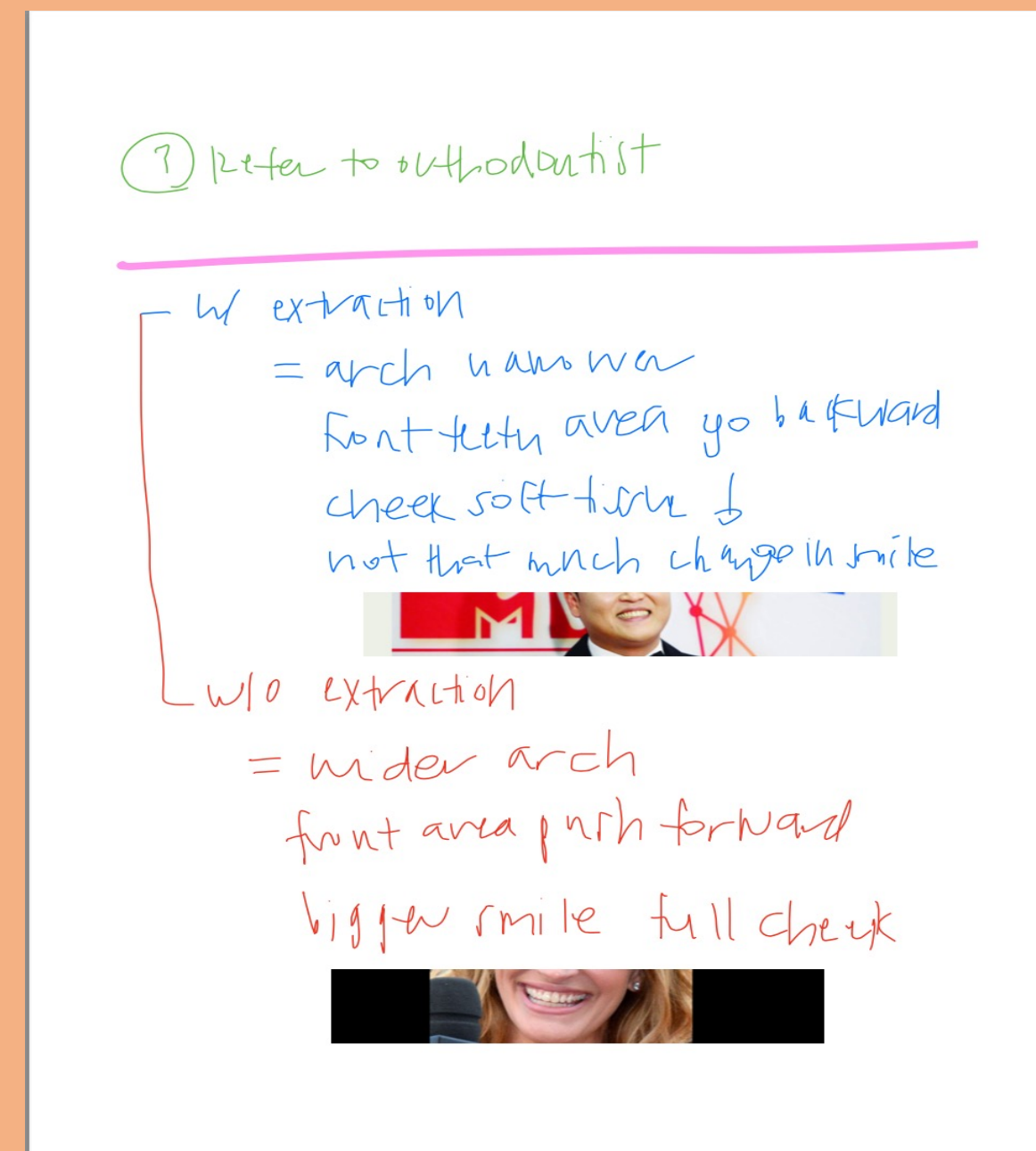
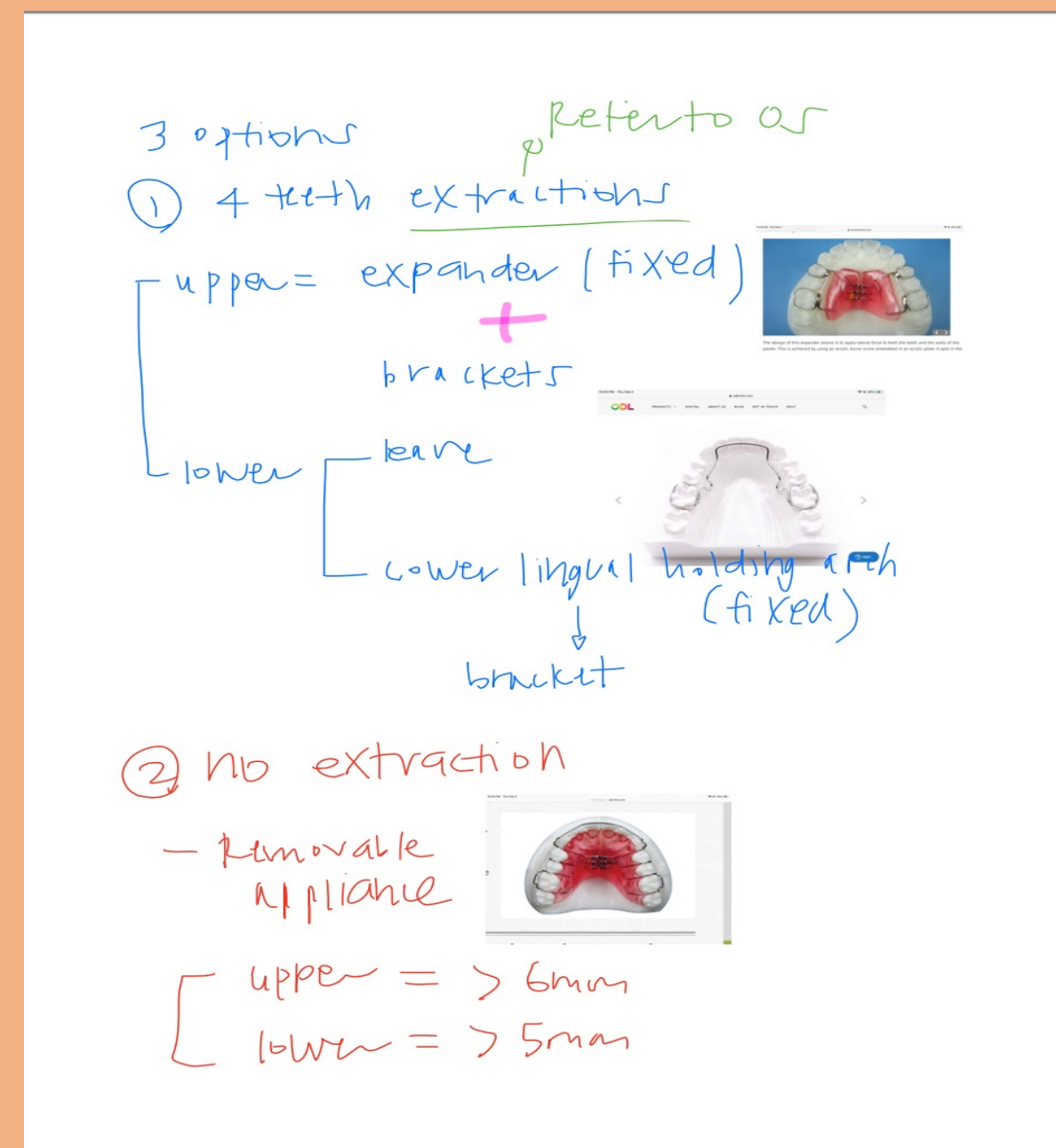
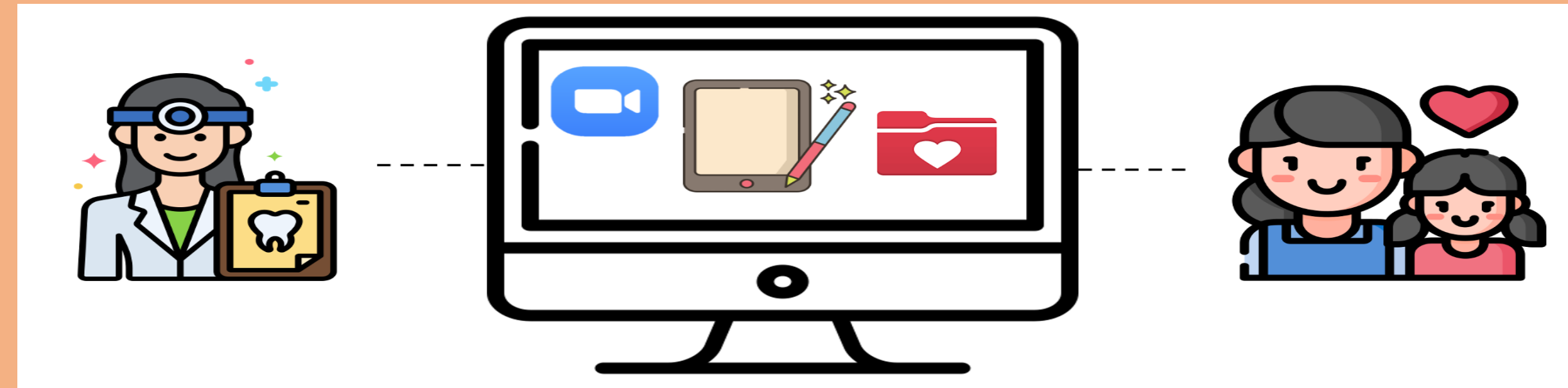


Figure 5. We explained different treatment options, 1) non-extraction with upper and lower arch expanded by fixed appliances, possibly brackets placement. 2) non-extraction with removable appliances. 3) Refer to orthodontic department with extraction or non-extraction treatment. Pictures of different appliances were shown to the patient and mom.

## Discussion

For decades, teledentistry has been used in different specialties in dentistry, including oral medicine and diagnosis, oral and maxillofacial surgery, periodontics, prosthodontics, orthodontics, endodontics, and pediatrics.

Most studies concluded that there is a high level of agreement between teledentistry and clinical consultation and that the use of this resource for diagnostic purposes can reduce costs and the travel time to consult a specialist personally.<sup>5</sup> To prevent the extra visits of children to the dental clinics or hospital-based program, teledentistry plays an important role. Implementation of teledentistry in a private pediatric practice during COVID-19 pandemic shows nearly half of the patient’s urgent dental needs could be managed successfully with teledentistry and without an in-person visit.<sup>4</sup> It is obvious that teledentistry is especially important both within and beyond the current COVID-19 pandemic to maximize safety and minimize inconvenience for both parent and child because it reduces waiting lists and reduces unnecessary face-to-face attendances.

Additionally, teledentistry not only extend care to underserved patient populations, such as those in rural areas, at a reasonable cost, it also provides an opportunity to supplement traditional teaching methods in dental education.<sup>3</sup> It had been successfully used in both undergraduate, postgraduate, and multiple continuous education.

On the other hand, some barriers still exist for teledentistry practice, including legal, educational and insurance issues.<sup>3</sup> Due to the fact that teledentistry becoming emerging trend, most states gradually reform and keep modified their policy in teledentistry. With the improvement of policy of teledentistry, we anticipate that there will be more and more children as well as dentists benefit from it.

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