

**ANTERIOR CROSSBITE TREATMENT USING  
TONGUE BLADE IN EIGHT-YEARS-OLD  
CHILDREN VIA TELEDENTISTRY DURING  
PANDEMIC  
(PERAWATAN GIGITAN SILANG ANTERIOR  
MENGGUNAKAN TONGUE BLADE PADA ANAK USIA  
8 TAHUN VIA TELEDENTISTRY DI MASA PANDEMI)**

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**ABSTRACT**

Anterior crossbite is a condition in which one or more of the upper front teeth are located lingually to the lower front teeth during centric occlusion. Dentistry involves close face-to-face interactions with patients, so during the COVID-19 pandemic, it has been largely suspended. Teledentistry is a solution to continue the practice of dentistry during this pandemic. This case report describes an eight-year-old insecure boy who came with a complaint that his upper left front tooth had grown behind his lower front teeth since four months ago. The patient was diagnosed with Class 1 Angle malocclusion types 1 and 3. The patient education and instructions treatment used a tongue blade via teledentistry via video call. The consideration of using this treatment is due to a not ideal condition caused by the COVID-19 pandemic. This technique was done one or two hours a day. The result was twenty-one tooth malocclusion was corrected. The result indicates by the twenty-one tooth position which has passed the mandibular incisor to the labial

direction. The conclusion suggests that early treatment, in this case, is necessary to modify the growth direction to prevent further malocclusion. It is also concluded that Anterior crossbite treatment via teledentistry using a tongue blade gives significant results.

**Keyword:** anterior crossbite; teledentistry; tongue blade

### **ABSTRAK**

*Crossbite anterior adalah suatu kondisi di mana satu atau lebih gigi depan atas terletak secara lingual dari gigi depan bawah selama oklusi sentrik. Kedokteran gigi melibatkan interaksi tatap muka yang dekat dengan pasien, sehingga selama pandemi COVID-19, sebagian besar telah ditangguhkan. Teledentistry menjadi solusi untuk melanjutkan praktik kedokteran gigi di masa pandemi ini. Laporan kasus ini mengenai seorang anak laki-laki tidak percaya diri berusia delapan tahun yang datang dengan keluhan gigi depan kiri atas tumbuh di belakang gigi depan bawah sejak empat bulan yang lalu. Pasien didiagnosis maloklusi Kelas 1 Angle tipe 1 dan 3. Edukasi pasien dan instruksi pengobatan menggunakan tongue blade melalui teledentistry melalui video call. Pertimbangan menggunakan pengobatan ini karena kondisi yang tidak ideal akibat pandemi COVID-19. Teknik ini dilakukan satu atau dua jam sehari. Hasilnya adalah maloklusi gigi dua satu terkoreksi. Hasil tersebut ditunjukkan dengan posisi gigi dua satu yang telah melewati insisivus rahang bawah ke arah labial. Kesimpulan menunjukkan bahwa pengobatan dini, dalam hal ini, diperlukan untuk memodifikasi arah pertumbuhan untuk mencegah maloklusi lebih lanjut. Disimpulkan juga bahwa perawatan gigitan silang anterior melalui teledentistry menggunakan tongue blade memberikan hasil yang signifikan.*

**Kata kunci:** gigitan silang; teledentistry; tongue blade

## INTRODUCTION

Malocclusion is an important problem after caries and periodontal disease. Malocclusion is a condition that deviates from normal occlusion due to a mismatch between the teeth and jaws when both jaws are closed, or the teeth are in occlusion. Anterior crossbite is a condition in which one or more of the upper front teeth are located lingual to the lower front teeth if the jaw is in centric occlusion.<sup>1-3</sup>

During the mixed dentition period, especially in children aged around six years, anterior dental crossbite involving one or two permanent teeth is a case that is often encountered in clinics, both in general dental clinics, pediatric dentistry specialists, and in speech therapy clinics. Clinicians must be able to identify, diagnose and prevent these occlusion problems because some experts recommend repairing these malocclusion problems as soon as possible.<sup>4</sup>

Anterior crossbite can be caused by several factors, namely abnormal growth of the jaw due to hereditary factors or trauma, the persistence of deciduous teeth which causes the replacement teeth to erupt by taking a crossbite position, growth of the upper incisors that are hindered by the lower incisors from moving forward, lack of space, and bad habits like sleeping on one arm or resting on the chin.<sup>2,5</sup>

Untreated anterior crossbite will

cause abnormal function of the lower incisors. Mandibular incisor compensation leads to a reduction in the labial alveolar bone and/or gingival recession. Treatment of anterior crossbite in mixed dentition is highly recommended because this malocclusion cannot be corrected with growth or age. The anterior crossbite correction is the main goal of early treatment in cases of malocclusion. Untreated patients can lead to severe Class III malocclusion so is only possible to treat with a combination of orthodontic treatment methods and orthognathic surgery.<sup>6,7</sup>

Interceptive treatment is used to reduce the severity of malocclusion, improve facial profile to increase self-confidence, eliminate bad habits, facilitate normal tooth eruption, and improve growth patterns. There are several possible and recommended approaches for the treatment of simple anterior dental crossbite, such as (1) therapeutic tongue blade, (2) lower incline plane, (3) reverse stainless steel crown, (4) Hawley retainer with auxiliary spring, and (5) expansion screw.<sup>1,2,8</sup>

The COVID-19 pandemic has challenged the existing healthcare systems across the globe. As it spreads by droplets, face-to-face interaction of healthcare professionals with the patient carries a risk of its transmission. Dental treatment involves close inspection, examination,

diagnostic and therapeutic interventions of the naso-oropharyngeal region. Dental professionals are most susceptible to getting infected with the coronavirus. A dental practice will need to reorganize and innovate to continue dental care with minimal risk of cross-infection.

Teledentistry can provide an innovative solution to continue dental practice during the current pandemic. Teledentistry (a subunit of telehealth along with telemedicine) is the remote facilitating of dental care, guidance, education, or treatment via the use of information technology rather than through direct face-to-face contact with any patient. Over the years teledentistry has proved to be beneficial for a remote dental screening, making a diagnosis, providing consultation, and proposing treatment plans.<sup>9,10-12</sup>

## CASE REPORT

An eight-year-old patient who came accompanied by his mother suffers that his upper left front tooth had grown behind his lower front teeth since 4 months ago. It was caused him insecure when smiling and uncomfortable when biting. The patient's mother and the patient want a treatment that returns the teeth to a good and normal position.

The patient has no history of the disease, and at present time. Dental history

such as premature loss and dental trauma was denied. The patient's mother said that the patient had a bad habit of biting his nails while watching TV or daydreaming. Based on family history, the patient's mother has crowding teeth.



**Figure 1.** Extra-oral examination.

The results of the extra-oral examination revealed a symmetrical face with disharmonious facial proportions, and a convex facial profile. The patient's lips are symmetrical, the proportions are normal, the relation is competent, and the tone is normal. On intra-oral examination, the maxillary and mandibular labial frenulum and right and left buccal frenums were classified as moderate, and U-shaped palate, medium size, medium depth; There were no ulcerations, fissures, and no abnormalities in the papillae or rugae.



**Figure 2.** Intra-oral examination.

Intraoral examination showed persistence of teeth 72 and 82 accompanied by the mobility of teeth 72, an eruption of tooth 22, and caries of teeth 75 and 85. The patient's upper and lower jaws showed sufficient space. The only teeth 21 were palatoverted which resulted in negative overjet and teeth 32 and 42 were also palatoverted. The persistence of teeth was 72 and 82. Based on Angle malocclusion calcification, the diagnosis in this patient was Angle class one malocclusion types one and three.

The patients' education and use of the tongue blade were carried out from April. The consideration of using a tongue blade is due to the dental hospital (RSGM) is not operating due to the COVID-19 pandemic. Education is carried out via video call accompanied by the patient's mother. Patients were followed up regularly every one week to evaluate the time of using the tongue blade.

Due to the cooperation of the patient and the patient's parents, after two months

of education and instructions using the tongue blade, the patient's dental condition began to show significant changes. The palatoverted tooth 21 which is behind tooth 31 has moved parallel to tooth 11 (according to the dental arch).



**Figure 3.** Tongue blade applied.



**Figure 4.** Extraoral and intraoral examination after 2 months of using the tongue blade.



**Figure 5.** Intraoral examination after 6 months follow-up.

## DISCUSSION

Crossbite is a condition in which one or more teeth are in an abnormal position either in the buccal, lingual, or labial direction concerning the opposing teeth. Anterior crossbite is a condition in which one or more of the upper front teeth are located lingually to the lower front teeth if the jaws are in centric occlusion.<sup>8</sup>

Anterior crossbite can be caused by various etiologies, which in this case was probably due to the delayed eruption of tooth 21. This caused the growth of the upper incisors to be unable to move forward to adjust to the dental arch because they were blocked by the long lower incisors. In addition, it can also be caused by the lack of stimulation of the patient's jaw growth because the patient is usually lazy to chew and rarely eats. This condition causes the jaw that is formed to be smaller and causes limited space in the teeth in the right position.<sup>2,13</sup>

The essence of treatment in cases of crossbite is to open the bite and bring the crossbite tooth through the plane of occlusion to the right position. There are several possible and recommended approaches for the treatment of simple anterior dental crossbite, one of which is tongue blade therapy. A simple dental crossbite involving only one tooth can be corrected.<sup>14</sup>

The patient was instructed to place the tongue blade 45 degrees behind the crossbite tooth. Its use is to insert the appliance into the mouth and touch the appliance to the palatal aspect of the crossbite upper tooth. At the time of jaw closure, the opposing tongue blade will touch the labial aspect of the antagonist mandibular anterior tooth which will serve as the fulcrum. The patient was then instructed to move the oral portion of the tongue blade in a labial direction and to use the lower incisors as support, thereby propelling the maxillary teeth labially. This is done one or two hours a day for 10 or 14 days. There is no precise control over the amount and direction of the applied force. In carrying out this treatment, a collaboration between patients, parents, and dentists is needed to achieve optimal results.<sup>14</sup>

Patients were observed regularly every one week to evaluate the time of using the tongue blade. After two months of using the tongue blade, the patient's teeth condition shows significant changes. The palatovered tooth 21 which is behind tooth 31 has moved parallel to tooth 11 (according to the dental arch).

After six months, the patient's dental arch is in a good condition. The main advantage of early treatment of anterior crossbite is the opportunity to affect the

maxillary growth process and reduce or prevent dentofacial abnormalities in the future as early as possible. It is sufficient and produces significant changes, both functional and esthetic. The treatment is simple or sometimes even does not require tools. If left untreated, a crossbite can cause various health problems.<sup>3,15</sup>

Dentistry forms an important part of our healthcare system. It is severely compromised during the current COVID-19 pandemic. Incorporating teledentistry into a routine dental practice, help the existing dental treatment system during the COVID-19 pandemic. Unlike direct face-to-face contact with the patient, teledentistry used the remote facilitating of dental care, guidance, education, or treatment via information technology prove to be beneficial for remote dental screening. It helps to make a diagnosis, provide consultation, and propose a treatment plan. It also helps a consultation in areas with limited access to facilities, in school, and long-term healthcare facilities.<sup>10-12</sup>

## CONCLUSION

Cases of anterior crossbite in permanent teeth are quite common in children who are growing and developing so early treatment is needed to modify the growth direction to prevent further malocclusion. Anterior crossbite treatment

via teledentistry using a tongue blade can give a good result.

## CONFLICT OF INTEREST

We declare that there is no conflict of interest in the scientific articles.

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