



(CASE REPORT)



Interdisciplinary approach to tongue thrust habit and partial edentulism in a pediatric patient: A case report

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Abstract

Introduction: Premature loss of permanent teeth in children, often due to severe caries, can significantly impact oral function, aesthetics, speech, and psychosocial well-being. One of the common resulting complications is the development of a tongue thrusting habit, which can further disrupt occlusion and oral development.

Case History: This case report presents a 10-year-old girl who experienced partial edentulism following the extraction of six permanent teeth under general anesthesia due to massive caries and infection. Clinical findings revealed multiple diastemas, anterior protrusion, and a confirmed tongue thrusting habit.

Discussion: An interdisciplinary treatment approach was implemented using a modified fixed partial denture with a palatal crib in the maxilla and a removable partial denture with a labial bow in the mandible. The palatal crib served to intercept the tongue thrusting habit, while the prosthetic appliances restored function and aesthetics. After three months, habit cessation was confirmed, allowing removal of the palatal crib and labial bow, with the remaining appliances functioning solely as partial dentures. This hybrid prosthetic strategy successfully addressed both the functional and behavioral issues. The case highlights the importance of early diagnosis and a tailored, multidisciplinary intervention for children with complex dental conditions.

Conclusion: Modified partial dentures combined with a palatal crib offer a practical, effective solution for managing tongue thrusting and partial edentulism in growing children, promoting oral health, function, and aesthetic development.

Keywords: Palatal Crib; Partial Denture; Tongue Thrusting; Permanent Tooth Loss; Good Health and Well-Being

1. Introduction

The loss of permanent teeth in children due to dental caries is a concerning issue that can have long-lasting impacts on their oral health and overall well-being. Dental caries, which can be attributed to a variety of factors, including poor oral hygiene, dietary habits high in sugar and carbohydrates, and genetic predisposition, can be particularly devastating when it leads to the premature loss of permanent teeth in children.

The premature loss of permanent teeth in children can have significant effects on their oral health, aesthetics, and overall quality of life. It also can impact a child's ability to chew and speak effectively. In addition, the absence of permanent teeth can lead to cause bad habit since the space creates an unstable environment where the tongue may unconsciously move to compensate for the lack of support and stability. This can lead to the development of a tongue thrust, where the tongue pushes against the front teeth when swallowing, speaking, or at rest.[1]

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Furthermore, the loss of permanent teeth in children can also have psychological and social implications. Children may experience feelings of embarrassment and low self-esteem as a result of missing teeth, which can impact their confidence.

The management of permanent tooth loss and tongue thrusting in children requires a comprehensive and multidisciplinary approach that considers the underlying causes, individual patient needs, and potential long-term implications. Dental interventions such as space maintenance, orthodontic treatment, and restorative procedures may be necessary to address the consequences of tooth loss and restore proper dental function and alignment.[2]

In this case report, we will explore the challenges and considerations involved in managing permanent tooth loss and tongue thrusting in children. By highlighting evidence-based strategies, successful treatment approaches, and interdisciplinary collaboration, we aim to provide insights into effective management strategies that promote optimal oral health, functional outcomes, and overall well-being for children facing these complex dental issues.

2. Case History

A-10 year-old girl accompanied by her parents came to Pediatric Dentistry Specialist Clinic, Universitas Airlangga Dental Hospital - Surabaya with the chief complaint of loss of anterior upper and lower first molar teeth (missing teeth 12 11 21 22 36 46) (Figure 1) after extracted under General Anesthesia 6 months ago in the other hospital, due to infective and massive caries that causing extra oral swelling. On clinical finding, we found that there are multiple diastema and protrusion in lower anterior teeth caused by tongue thrusting habit. To confirm a tongue thrusting habit, we do the examination for the tongue pushing forward against the front teeth during swallowing, speaking, or even at rest. In addition, patient often get ridiculed from his surrounding and unable to eat and pronouncing some sounds properly, hence the patient showed enthusiastic desire to received treatment.



Figure 1 Intra oral examination showing missing teeth 12 11 21 22 36 46

On this case, on maxilla, modified partial denture and palatal crib was chosen because it was considered as an appliance that can break the bad habit, recover the function of mastication, speech and aesthetic. Fixed partial denture was designed to replace teeth 12 11 21 22 with molar band as retention on 16 and 26 added with partial crib (Figure 2) on the palatal side followed by positive reinforcement, encouraging the patient to break the habit. We prefer to use fixed appliance instead of removable appliance considering removable appliances very dependent to the patient's cooperation, which can lead in failure achieving desired results.

For the mandible, removable partial denture was chosen to replace teeth 36 and 46, with Adam's clasps as retention in teeth 37 47, and labial bow to correct protruded anterior lower teeth caused by tongue thrusting habit (Figure 2). Labial bow is activated every two weeks to allow the lower anterior teeth back to its right angle.



Figure 2 Modified fixed partial denture and palatal crib (maxilla) and modified removable partial denture (mandible)

The patient feels comfortable with the appliance. Patient and parents are given education of how to use and care of modified partial denture appliances as well as instructions to maintain oral hygiene. The patient was instructed to wear an appliance following habit reversal for at least three months.

After 3 months, we reevaluate the tongue thrusting habit by observing the patient's tongue position during speech, swallowing, and rest. Since the tongue remains at the roof of the mouth or is not protruding forward, it indicates a cessation of thrusting. Palatal crib was removed from the upper appliance. In addition, the angle of mandibular incisor was also corrected which underlies us removing labial bow on the lower appliance, making the remain appliances only used as partial denture to maintain the functional and aesthetic profile of the patient (Figure 3). The patient was kept on regular recall in case we need to adjust and modify the appliance as the child's jaw develops and continues to grow.



Figure 3 Fixed partial denture on maxilla and removable partial denture on mandible

3. Discussion

Permanent tooth loss in children, though relatively uncommon, can have profound implications on oral health, function, and psychosocial development. Etiologies range from traumatic dental injuries, congenital absence, caries, or systemic conditions such as ectodermal dysplasia. Regardless of the cause, early loss of permanent teeth during the developmental years necessitates timely and comprehensive intervention to restore function and aesthetics, as well as to maintain space and guide proper occlusal development. [1,2]

In the present case, the child presented with premature permanent tooth loss led to an abnormal orofacial habit, tongue thrusting. Tongue thrusting can result in an anterior open bite, proclination of anterior teeth, and can hinder normal swallowing and speech development. Furthermore, it may interfere with prosthetic retention and stability, complicating rehabilitation efforts. Addressing such habits early is critical, as they can compromise the long-term success of prosthetic and orthodontic treatment. [3]

The use of a palatal crib appliance in this patient was pivotal. Palatal cribs serve as a simple yet effective interceptive tool to eliminate tongue thrusting habits. They function by physically blocking the tongue from thrusting forward during swallowing or speech, thereby promoting the adoption of a more appropriate resting tongue posture. In this case, the palatal crib was effective in habit correction and allowed stabilization of the anterior occlusion along with prosthetic intervention. [4,5]

Following habit correction, the restorative phase was planned using both fixed and removable partial dentures, tailored to the patient's age, dentition status, and cooperation level. In pediatric patients, prosthetic rehabilitation requires special consideration due to ongoing craniofacial growth and the dynamic nature of the developing dentition. Removable partial dentures offer several advantages, including ease of hygiene maintenance, adjustability as the child grows, and minimal invasiveness. However, they require a high level of compliance. [6,7]

Fixed partial dentures, though less common in younger children due to growth considerations, can be beneficial in certain cases, especially when teeth are present on either side of the edentulous space and the growth potential is nearly complete. In this case, a hybrid approach utilizing both fixed and removable prostheses allowed for improved function, aesthetics, and patient comfort, while preserving future treatment options. [8,9]

Overall, successful management of such cases relies on a multidisciplinary approach involving pediatric dentistry, orthodontics, and prosthodontics. Habit interception, space maintenance, prosthetic rehabilitation, and regular follow-up are essential components of comprehensive care. Long-term monitoring is crucial to adapt the treatment plan as the child grows, and to eventually transition to a more definitive prosthetic or implant-based solution after skeletal maturity.[10]

4. Conclusion

In conclusion, the use of a modified partial denture combined with a palatal crib is an effective interdisciplinary treatment approach for pediatric patients experiencing partial edentulism and tongue thrusting habits. This method not only helps in breaking the harmful habit but also restores masticatory and aesthetic functions during a critical growth period. The treatment demonstrated good results in habit correction, improved oral function, and patient comfort, emphasizing the importance of early, tailored intervention and regular follow-up for sustained oral health outcomes in children.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this document.

Statement of ethical approval

Ethical approval was obtained.

Statement of informed consent

Informed consent was obtained from patient included in the study.

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