

Review Article

Influence of the Palatal Expander on Children's Life Habits

Saccomanno S^{1*}, Silenzi Ederli L¹, D'Angelantonio M², Jubani J³, Palermiti M², Garcia-Godoy F³ and Marzo Giuseppe³

¹Department of Life Science, Health and Health Professions, Link University, Italy

²Department of Health, Life and Environmental Science, University of L'Aquila, Piazza Salvatore Tommasi, Italy

³Department of Bioscience Research, College of Dentistry, University of Tennessee Health Science Center, USA

Abstract

Introduction: The use of palatal expanders has been one of the most common practices in orthodontics; the use of this device may lead to discomfort and change children's habits for some time, if not treated at an early age, surgery may be necessary to resolve this problem.

Method: 33 patients completed a questionnaire of 18 questions regarding children's life and habits change after the application of palatal expander.

Results: During the first few days the patients had phonetic and nutritional problems which, however, resolved themselves within a few days.

Conclusion: Rapid palatal expanders can lead to transient negative effects, which self-resolve in a short time.

Keyword: Orthodontics; RPE; Children; Habits; Orthopedics; Surgery

Introduction

Maxillary transverse deficiency is a prevalent skeletal anomaly in the craniofacial region, with a reported prevalence ranging from 2.7% to 23.3% [1].

Various factors, such as myofunctional disorders linked to negative oral habits like thumb sucking, can contribute to this condition. Additionally, an individual's breathing pattern can impact the development of the maxillary bone [2].

Common characteristics associated with a reduced transverse dimension of the upper jaw include a posterior crossbite, high palatal vault, decreased nasal permeability, and elevation of the nasal floor [3]. This anatomical configuration can result in narrower nasal cavities and reduced nasal airway flow, often leading to mouth-breathing and a low tongue position [4].

Orthodontic treatment for maxillary expansion is performed to correct malocclusions, regaining space, increasing arch perimeter, improving nasal breathing, and enhancing class II interarch relationships (Figure 1) [5].

Expansion appliances are typically categorized into tooth-borne, bone-borne, and hybrid appliances (Figure 2 and 3). Tooth-borne appliances transfer stress to roots and periodontal ligaments, and produce the opening of the palatal bone [6].



Figure 1: Tooth-borne palatal expander.

However, drawbacks of this method include potential side effects on anchor teeth and the inability to maintain bone movements during the consolidation phase [7].

On the other hand, skeletal expansion in bone-borne appliances involves separating the maxillary halves at the mid-palatal suture, which can be achieved non-surgically in young adolescents and surgically in mature adults [8].

Hybrid appliances have been developed to mitigate side effects and enhance skeletal and dental changes [9].

There are many expansion protocols, over the years a consensus has been reached on the type of protocol with tooth borne and hybrid type expanders, where 1-2 activations are made on the day of delivery of the device; parents will have to carry out an activation at home per day until the designated problem is corrected. Subsequently the treatment will follow to a consolidation phase where the appliance will be left in the mouth to allow stabilization of the palatal bone.

This phase usually lasts between 9 and 12 months. A separate discussion must be made for bone borne expanders, where a general

Citation: Saccomanno S, Silenzi Ederli L, D'Angelantonio M, Jubani J, Palermiti M, Garcia-Godoy F, et al. Influence of the Palatal Expander on Children's Life Habits. *Ann Clin Case Stud.* 2025; 7(1): 1102.

Copyright: © 2025 Sabina Saccomanno

Publisher Name: Medtext Publications LLC

Published date: Apr 07th, 2025

***Corresponding author:** Sabina Saccomanno, Department of Life Science, Health and Health Professions, Link University, Rome, Italy



Figure 2: Hybrid Palatal Expander.



Figure 3: Bone-borne Palatal Expander.

consensus on the type of protocol has not yet been reached. This type of appliance is not used on young patients.

In the event that it was not possible to perform expansion with these devices at an early age or in any case with expansion on miniscrews, the only option remains surgical expansion of the palate.

This article evaluated the uncomfortable feeling that this kind of appliance produce on the young patient, and the methodologies adopted on the adult to solve this skeletal problem.

Material and Method

An anonymized questionnaire available in Italian was diffused between patients (33) who underwent orthodontic treatment with Palatal expander, their questionnaire has been analyzed. Patients were asked to complete the questionnaire between September 2023 and February 2024.

Questions were asked regarding the feeling about the palatal expander, changes in feeding practices and speech and if all these together were transitory or not.

All participants provided the informed consent and accepted the privacy policy for the protection of personal data before compiling the survey. No personal information that identifies the individuals was collected and the data was analyzed only in aggregate form. All responses were collected on an anonymous basis using the Google Form service. The resulting data file used for data analysis was free of any identifiers, including mail and IP addresses or other electronic identifiers. The study was conducted in accordance with the principles outlined in the Declaration of Helsinki.

The questions were as follows:

- 1) Gender
- 2) Age
- 3) In the first 5 days after having the expander, did the child lose weight? If yes, how much? (answer in kg)
- 4) In the first 5 days after having the expander, did the child change the consistency of the foods he/she ate? If yes, how?
- 5) In the first 5 days after having the expander, did the child increase his meal intake times?
- 6) In the first 5 days after having the expander, did the child reduce the amount of food he ate throughout the day?
- 7) In the first few days after having placed the expander, did the child express discomfort about it and the desire to remove it?
- 8) Has the adult's understanding of the child's language worsened in the first few days?
- 9) After the first 5 days did the child resume normal meal intake times?
- 10) After the first 5 days, has the child resumed eating the same amount of food as before the orthodontic appliance was put in place?
- 11) After the first 5 days, has the child's speech returned to normal?
- 12) After the first 5 days, has the child accepted to keep the device without showing any further annoyance or discomfort about it?
- 13) How did you feel immediately after getting braces? (QUESTIONS TO THE CHILDREN)
- 14) Immediately after having braces, were you able to eat as before? (QUESTIONS TO CHILDREN)
- 15) Immediately after having braces, what type of food were you able to eat better? (QUESTIONS TO CHILDREN)
- 16) Did you feel like you were speaking strangely immediately after getting braces? (QUESTIONS TO THE CHILDREN)
- 17) After a few days were you able to speak better? (QUESTIONS TO THE CHILDREN)
- 18) Did your friends notice that you had braces? (QUESTIONS TO THE CHILDREN)

Results

The patients' feedback aligned with the existing literature, indicating that individuals who undergo a rapid palatal expansion encounter initial discomfort in the initial days following the insertion of the device. This discomfort may manifest as difficulties in feeding, speech, and even feelings of anger. However, as the patients adapt to the device, these discomforts gradually diminished, allowing them to resume their normal eating habits and speech patterns. Notably, the questionnaire revealed an intriguing finding regarding the weight loss of young patients, which exhibited a variable range, in some patients, this weight loss can be attributed to a temporary shift in their diet from solid to semi-solid foods during the initial days of therapy, but it is important to note that this change is reversible (Figure 4).

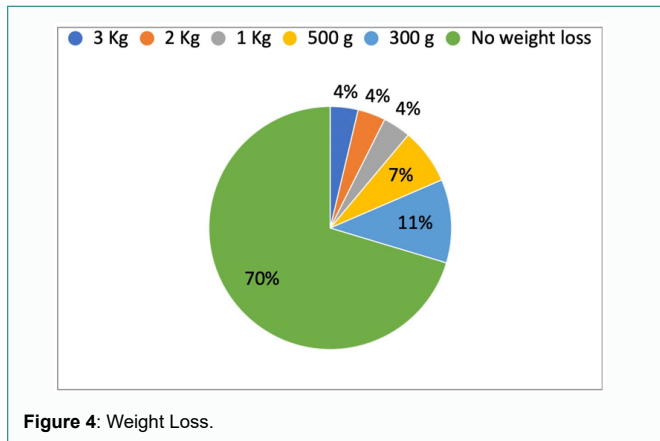


Figure 4: Weight Loss.

Table 1: Advantages & Disadvantages of palatal Expander.

Advantages of Palatal Expander	Disadvantages of Palatal Expander
Efficient correction of posterior cross bite	Initial discomfort
Improve archform	Difficulty of speaking and eating
Promote eruption	Infection
Enlarge airways	Gingival Inflammation
Reduce buccal corridor	Psychological impact
Match up basal bone dimension	Needs cooperation for activation

Discussion

The utilization of rapid palatal expander has noticeable effects on various aspects of children's well-being, including their eating habits [10,11].

The presence of the device in the mouth can pose challenges in consuming solid foods and chewing, potentially altering their food preferences requiring adjustments in their daily diet [12,13].

A feeding protocol could be a solution to help young patients to adapt to this kind of appliance, to minimize discomfort while eating.

This will help the child not to develop a negative attitude to orthodontic treatment and the family to be aware of the temporary difficulties and annoyances that the child will encounter, preventing them from returning to the office after 2 days, hyper-alarmed because the child is not eating.

In the first 5 days of rapid expansion the child will certainly eat less and there may even be a slight weight loss.

To minimize all this, a typical menu where it is recommended to maintain the consistency of the meal while modifying and varying the type of food is suggested. In a very general way, it is recommended to favor semi-solid and slippery substances that do not create stagnation or filaments in the oral cavity.

It is important to eat small bites of food, and avoid foods that could get stuck in the appliance. Rapid palatal expansion can also have an impact on children's oral hygiene habits [14,15].

The presence of the device may complicate the process of tooth brushing and the use of dental floss [16,17]. Consequently, changes in oral hygiene behaviors may arise, potentially increasing the susceptibility to caries and gingivitis [18,19]. Furthermore, the use of rapid palatal expansion can affect children's speech and phonetics.

Some children may encounter difficulties in articulating words properly, particularly during the initial stages of adaptation [20]. This

can undermine their confidence in social interactions and potentially lead to frustrations in effective communication.

Additionally, rapid palatal expansion can have implications for children's sleep and comfort.

Certain patients may experience discomfort or difficulties in sleeping due to the presence of the device, particularly in the early phases of treatment [21].

This can have an impact on the quality of sleep and the overall well-being of the child.

But as can be seen from the present study questionnaire, the adverse effects caused by the palatal expander were all transient, even if they have an impact on the life of younger patients.

Although this type of appliance can present complications, the positive effects are many. A small phase of discomfort leads to obtaining numerous beneficial effects, it is a small price to pay to significantly improve the lives of the patients. In case of solving the problem of narrow palate in adults there are two surgical techniques available today.

The SARPE (Surgically Assisted Rapid Palatal Expansion) and the Le Fort I osteotomy are two surgical techniques used to treat narrow palate, but they differ in complexity and indications, SARPE is a combination of orthodontics and surgery, primarily indicated for adults or late adolescents, where the palatal sutures have fused and cannot be expanded solely through orthodontic methods.

In this procedure, the surgeon makes small bone cuts (osteotomies) in the upper palate to weaken the palatal sutures, allowing the use of an orthodontic expander that gradually widens the palate, this technique is effective for moderate cases of palatal constriction, enabling bone expansion and improving dental alignment and breathing function. The main advantage of SARPE is that it treats narrow palates in adults with a less invasive approach compared to more complex surgeries; this procedure is not free from risks, such as the formation of gingival recessions, especially in the molar area [22].

Today, SARPE with septal osteotomy is the most used because it allows excellent results to be obtained with little discomfort for the patient [23].

On the other hand, the Le Fort I osteotomy is a more invasive and complex surgical procedure, used in more severe cases, especially when there is a combination of skeletal malocclusion and palate constriction. This technique involves cutting the upper jawbone along a horizontal line below the nasal cavities, allowing the entire maxilla to be repositioned.

The Le Fort I osteotomy not only enables palatal expansion but also corrects severe jaw misalignments, improving both facial aesthetics and masticatory and respiratory function.

It is often indicated when orthognathic surgery is required to address asymmetries or more complex skeletal issues, while the SARPE is a less invasive procedure to expand the palate in adults through surgical support for orthodontic techniques, the Le Fort I osteotomy is a more advanced surgery used to treat severe deformities requiring repositioning of the entire upper jaw. The choice between these two techniques depends on the severity of the condition and the treatment goals, with Le Fort I reserved for complex cases involving malocclusion and facial skeletal deformities.

Conclusion

Using the rapid palatal expander may result in notable changes in the daily routines of children, affecting different facets of their lives such as eating habits, oral hygiene practices, speech, sleep patterns, and overall comfort levels.

Orthodontists and parents should acknowledge these possible consequences and collaborate to address any difficulties and enhance treatment results. Additional studies are needed to comprehensively grasp the enduring effects of rapid palatal expansion on children's behaviors and overall health.

References

- McNamara JA. Maxillary transverse deficiency. *Am J Orthod Dentofacial Orthop.* 2000;117(5):567-70.
- Saccomanno S, Antonini G, D'Alatri L, D'Angelantonio M, Fiorita A, Deli R. Patients treated with orthodontic-myofunctional therapeutic protocol. *Eur J Paediatr Dent.* 2012;13(3):241-3.
- Vali S, Khosravani S, Nobar BR, Motamedian SR. Rapid maxillary expansion supplementary methods: A scoping review of animal studies. *Int Orthod.* 2022;20(1):100614.
- Yoon A, Abdelwahab M, Bockow R, Vakili A, Lovell K, Chang I, et al. Impact of rapid palatal expansion on the size of adenoids and tonsils in children. *Sleep Med.* 2022;92:96-102.
- Fernández-Barriales M, Lafuente-Ibáñez de Mendoza I, Alonso-Fernández Pacheco JJ, Aguirre-Urizar JM. Rapid maxillary expansion in paediatric obstructive sleep apnoea. *Lancet Respir Med.* 2023;11(5):e45.
- Saccomanno S, Antonini G, D'Alatri L, D'Angelantonio M, Fiorita A, Deli R. Case report of patients treated with an orthodontic and myofunctional protocol. *Eur J Paediatr Dent.* 2014;15(2 suppl):184-6.
- Boyd K, Saccomanno S, Lewis CJ, Coceani Paskay L, Quinzi V, Marzo G. Myofunctional therapy. Part 1: Culture, industrialisation and the shrinking human face. *Eur J Paediatr Dent.* 2021;22(1):80-81.
- Gelb M, Montrose JM, Paglia L, Saccomanno S, Quinzi V, Marzo G. Myofunctional therapy. Part 2: Prevention of dentofacial disorders. *Eur J Paediatr Dent.* 2021;22(2):163-7.
- Saccomanno S, Martini C, D'Alatri L, Farina S, Grippaudo C. A specific protocol of myofunctional therapy in children with Down syndrome: A pilot study. *Eur J Paediatr Dent.* 2018;19(3):243-6.
- Saccomanno S, Deli R, Dicintio G, De Corso E, Paludetti G, Grippaudo C. Retrospective epidemiological study of mandibular rotational types in patients with orthodontic malocclusion. *Acta Otorhinolaryngol Ital.* 2018;38(2):160-5.
- Saccomanno S, Quinzi V, Albani A, D'Andrea N, Marzo G, Macchiarelli G, et al. Utility of tele-orthodontics in orthodontic emergencies during the COVID-19 pandemic: A systematic review. *Healthcare (Basel).* 2022;10(6):1108.
- Botzer E, Quinzi V, Salvati SE, Coceani Paskay L, Saccomanno S. Myofunctional therapy. Part 3: Tongue function and breastfeeding as precursor of oronasal functions. *Eur J Paediatr Dent.* 2021;22(3):248-50.
- Saccomanno S, Quinzi V, Santori F, Pisaneschi A, Salvati SE, Paskay LC, et al. Use of edibles as effective tools in myofunctional therapy: A pilot study. *Diagnostics (Basel).* 2024;14(3):251.
- Quinzi V, Marchetti E, Guerriero L, Bosco F, Marzo G, Mummolo S. Dentoskeletal Class II malocclusion: Maxillary molar distalization with no-compliance fixed orthodontic equipment. *Dent J (Basel).* 2020;8(1):26.
- Santana DMC, Nogueira VS, Lima SAM, Fernandes LPA, Weber SAT. The effect of rapid maxillary expansion in children: A meta-analysis. *Braz J Otorhinolaryngol.* 2022;88(6):907-916.
- Marchetti E, Petro E, Gaggioli F, Lardani L, Mancini L, Marzo G, et al. The dentist's role in diagnosis and treatment of obstructive sleep apnea syndrome: A literature review. *J Biol Regul Homeost Agents.* 2020;34(3 Suppl 1):173-80.
- Mazzoleni S, Bonaldo G, Pontarolo E, Zuccon A, De Francesco M, Stellini E, et al. Experimental assessment of oral hygiene achieved by children wearing rapid palatal expanders, comparing manual and electric toothbrushes. *Int J Dent Hyg.* 2013;12(3):187-192.
- Inchingolo AD, Ferrara I, Viapiano F, Netti A, Campanelli M, Buongiorno S, et al. Rapid maxillary expansion on the adolescent patient: Systematic review and case report. *Children (Basel).* 2022;9(7):1046.
- Inchingolo AM, Patano A, De Santis M, Vecchio GD, Ferrante L, Morolla R, et al. Comparison of different types of palatal expanders: Scoping review. *Children (Basel).* 2023;10(7):1258.
- Jia H, Zhuang L, Zhang N, Bian Y, Li S. Comparison of skeletal maxillary transverse deficiency treated by microimplant-assisted rapid palatal expansion and tooth-borne expansion during the post-pubertal growth spurt stage. *Angle Orthod.* 2021;91(1):36-45.
- Yalcin A, Aras I, Gode S, Durusoy D, Sezgin B, Eyigor S, et al. Evaluation of swallowing in transverse maxillary deficiency patients before and after rapid maxillary expansion. *Angle Orthod.* 2023;93(5):552-7.
- Rutili V, Nieri M, Franceschi D, Pierleoni F, Giuntini V, Franchi L, et al. Comparison of rapid versus slow maxillary expansion on patient-reported outcome measures in growing patients: A systematic review and meta-analysis. *Prog Orthod.* 2022;23(1):47.
- Scoppa F, Saccomanno S, Bianco G, Pirino A. Tongue posture, tongue movements, swallowing, and cerebral areas activation: A functional magnetic resonance imaging study. *Appl Sci.* 2020;10(17):6027.