



USE OF AESTHETIC-FUNCTIONAL SPACE MAINTAINER FOR EARLY LOSS OF PRIMARY TEETH: CASE REPORT

USO DE MANTENEDOR DE ESPAÇO ESTÉTICO-FUNCIONAL PARA PERDA PRECOCE DE DENTES DECÍDUOS: RELATO DE CASO

USO DE MANTENEDOR DE ESPACIO ESTÉTICO-FUNCIONAL EN LA PÉRDIDA TEMPRANA DE DIENTES TEMPORALES: REPORTE DE CASO



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ABSTRACT

The early loss of primary teeth causes functional and aesthetic damage, ranging from the migration and/or inclination of adjacent teeth into the edentulous space, arch shortening, and antagonist extrusion, to phonetic and aesthetic impairment. Therefore, space maintainers are one of the viable resources to minimize these consequences. This article reports the case of a 7-year-old child patient who was prescribed an aesthetic- functional space maintainer due to the early loss of primary central and lateral incisors, and first and second primary molars. Clinical examination revealed active and advanced caries lesions in the primary anterior teeth (upper primary central and lateral incisors) and in the posterior teeth (lower primary first and second molars), where only root remnants were present. Radiographic examination revealed that the permanent successors of the extensively destroyed primary teeth were below Nolla stage 8, indicative of early loss. After conclusively analyzing the need for rehabilitation treatment to maintain the early loss of space, planning for a removable aesthetic-functional space maintainer was undertaken. This case report, which demonstrated acceptance and adherence to the appliance by the child patient and her mother, combined with satisfactory functional and aesthetic results, concludes that space maintainers are viable and affordable options for early loss of primary teeth.

Keywords: Space Maintenance. Orthodontic. Tooth. Deciduous. Pediatric Dentistry. Child.

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RESUMO

A perda precoce de dentes decíduos ocasiona danos funcionais e estéticos, que vão desde a migração e/ou inclinação dos dentes adjacentes para o espaço edêntulo, encurtamento do arco, extrusão do antagonista, até o prejuízo fonético e estético. Mediante isto, os mantenedores de espaço configuram-se como um dos recursos viáveis para minimizar tais consequências. O presente artigo, tem como objetivo relatar um caso clínico de uma paciente infantil, de 07 anos de idade, na qual foi indicada a instalação do mantenedor de espaço estético-funcional em decorrência da perda precoce de dentes decíduos incisivos centrais e laterais decíduos, primeiros e segundos molares decíduos. Ao exame clínico observou-se lesões de cárie em atividade, e em estágio avançado, nos dentes anteriores decíduos (incisivos centrais e laterais decíduos superiores) bem como nos dentes posteriores (primeiro e segundo molares decíduos inferiores), os quais, havia apenas presença de restos radiculares. Ao exame radiográfico, foi observado que os sucessores permanentes dos dentes decíduos.

Palavras-chave: Mantenedor de Espaço em Ortodontia. Dente Decíduo. Odontopediatria. Criança.

RESUMEN

La pérdida temprana de dientes primarios causa daños funcionales y estéticos, que van desde la migración y/o inclinación de dientes adyacentes hacia el espacio edéntulo, el acortamiento de la arcada y la extrusión antagonista, hasta el deterioro fonético y estético. Por lo tanto, los mantenedores de espacio son uno de los recursos viables para minimizar estas consecuencias. Este artículo reporta el caso de un niño de 7 años a quien se le prescribió un mantenedor de espacio estético-funcional debido a la pérdida temprana de incisivos centrales y laterales primarios, y primeros y segundos molares primarios. El examen clínico reveló lesiones de caries activas y avanzadas en los dientes anteriores primarios (incisivos centrales y laterales primarios superiores) y en los dientes posteriores (primeros y segundos molares primarios inferiores), donde solo se presentaron restos radiculares. El examen radiográfico reveló que los sucesores permanentes de los dientes primarios extensamente destruidos se encontraban por debajo del estadio 8 de Nolla, indicativo de pérdida temprana. Después de analizar concluyentemente la necesidad de tratamiento rehabilitador para mantener la pérdida temprana de espacio, se planificó un mantenedor de espacio estético-funcional removible. Este reporte de caso, que demostró aceptación y adherencia al aparato por parte de la paciente infantil y su madre, combinado con resultados funcionales y estéticos satisfactorios, concluye que los mantenedores de espacio son opciones viables y asequibles para la pérdida temprana de los dientes primarios.

Palabras clave: Mantenimiento del Espacio en Ortodoncia. Diente Primario. Odontología Pediátrica. Niño.



1 INTRODUCTION

Dental caries is a chronic, non-communicable and multifactorial disease that affects people of all ages globally. (Beraldi MIR et al, 2020; Matta AKB et al; 2019)

Early childhood caries, also called IPC, in turn, is defined, according to the AAPD (American Association of Pediatric Dentistry), as the presence of one or more decayed tooth surfaces, including cavitated or non-cavitated lesions, absent, due to caries, or restored in any deciduous tooth, in a child under the age of six. (AAPD, 2024)

Regarding its prevalence in childhood, the most recent national epidemiological survey of Oral Health (SB Brasil), 2020, in its preliminary data, indicate that at 5 years of age, the percentage of the decayed component was 82.9%, based on the reference of the caries index for deduction deciduous dregs. These results draw attention and point to a still precarious scenario of oral health in childhood, despite the advances and efforts to reduce the main oral health problem, which is caries disease (Silva, L. A. E. D. et al, 2025)

The early loss of deciduous teeth can lead to local consequences, such as migration and/or inclination of adjacent teeth to the edentulous space, reduction or closure of the region that would be occupied in the future by the permanent successor; dental crowding; shortening of the arch; extrusion of the antagonist; increase in vertical overjet; reduction in chewing capacity; phonetic disorders, deleterious oral habits; as well as influences on aesthetic perceptions and children's self-esteem (Alves et al., 2020; Moreira et al., 2020; Silva et al., 2020a). Within this perspective, the maintainers of spaces are configured as one of the viable resources to minimize such changes. (Guimarães, C. A.; Oliveira, R. G, 2017)

According to Ramakrishnan M, Dhanalakshmi R, Subramanian EMG, 2019 factors such as the patient's age, the size and position of the missing tooth elements, the presence or absence of tooth migrations, as well as the stage of coronary and root development of the permanent successor, are determinants in the choice of treatment of the type of space maintainer and the time of its use.

In view of this scenario, this article aims to report the clinical case of a seven-year-old female patient for whom the installation of an aesthetic-functional space maintainer was indicated due to the early loss of deciduous teeth: maxillary central and lateral incisors, as well as mandibular first and second molars.

2 METHODOLOGY

This is a descriptive clinical case report, carried out through ethical aspects, with the signature of the Free and Informed Consent Form (ICF) made by the guardian of the child patient in question.

3 CASE REPORT

A 7-year-old female child patient attended the pediatric dentistry school clinic of the Faculty of Dentistry of Pernambuco (FOP/UPE) with her guardian. The mother reported an aesthetic complaint due to her daughter's smile, in addition, in the anamnesis, a cariogenic diet was observed, recorded by the requested food diary. Clinical examination showed a patient with mixed dentition due to the presence of the first permanent molars in all quadrants; In addition, she had active and advanced caries lesions in the anterior deciduous teeth (central incisors and lateral upper deciduous incisors) as well as in the teeth posterior molars (mandibular first and second deciduous molars), in which there was only the presence of root remains.

Figure 1

Initial appearance of the anterior region, with the presence of root remains of the deciduous teeth, central incisors and lateral teeth, respectively; 51, 52 and 61. Tooth 62 with the appearance of extensive caries lesion (ICDAS index score 6)



Source: The authors.

Figure 2

Initial appearance of the posterior teeth. Teeth 84 and 85 presenting as root remains, and tooth 74 with extensive caries lesion (ICDAS index score 6)



Source: The authors.

Figure 3

For the correct planning of the case, a panoramic radiography of the jaws was requested in order to obtain the relationship of the degree of rhizolysis of the deciduous teeth in question, as well as the degree of rhizogenesis of their permanent successors. In accordance with Nolla's stages, it is found that the germs of the successors did not reach stage 8.



Source: The authors.

Figure 4

After the conclusive analysis of the real need for rehabilitative treatment with a space maintainer due to the patient's age, with tooth loss configuring as early loss, plaster study models were obtained to plan the design of the removable device.



Source: The authors.

Figure 5

Postoperative images of tooth extractions of anterior and posterior deciduous teeth. Namely: Teeth 51, 52, 61 and 62; 84, 85 and 74.



Source: The authors.

Figure 6

Postoperative images of tooth extractions of anterior and posterior deciduous teeth. Namely: Teeth 51, 52, 61 and 62; 84, 85 and 74.



Source: The authors.

Figure 7

Images of the top and bottom removable device installed



Source: The authors.

Figure 8

Images of the top and bottom removable device installed



Source: The authors.

Figure 9

Images of the top and bottom removable device installed



Source: The authors.

4 DISCUSSION

Classically, according to Guedes-Pinto (2016), early loss of a deciduous tooth is considered to occur at least one year before its physiological exfoliation or when, after radiographic confirmation, it is verified that the successor permanent tooth has not yet reached Nolla stage 8, that is, it has less than two-thirds of its root formation completed (Figure 3)



In the present clinical case, early loss was found in agreement with the literature, since the panoramic X-ray showed root formation of the permanent successors of the first and second primary molars much lower than stage 8. Considering the extensive coronary destruction observed in these deciduous molars (Figure 2), tooth extraction was chosen as the therapeutic approach, followed by the indication of upper and lower space maintainers.

In this context, the absence of these devices could result not only in the early loss of the deciduous molars, but also in a prolonged interval until the eruption of the permanent premolars, resulting in the loss of space in the dental arch as the main functional impairment.

With regard to space maintainers, as mentioned earlier, they are a viable and accessible device for the rehabilitation of early tooth loss. For Lin YT, Lin WH, Lin YT; 2011, such devices must have some fundamental characteristics for their correct performance, such as maintenance of the edentulous space, allow the eruption of the successor tooth, restore the masticatory function, prevent the extrusion of the antagonist tooth, not be irritating to the soft tissues, avoid unwanted forces on the teeth where they are cemented, be affordable, simple to manufacture, have resistance to distortion, and also allow small adjustments and repairs.

The characteristics observed in the device used in the present clinical case are in line with the criteria established in the literature, since there was good adherence to treatment by the patient, favored by an adequate follow-up of her occlusal function and masticatory load. It is also noteworthy that the provision was well accepted by the legal guardian, especially due to the aspect of financial accessibility, a factor widely highlighted as relevant in previous studies.

Space maintainers can be classified as fixed or mobile devices in terms of fixation and functional, semi-functional or non-functional (Almeida RR et al., 1999; Félix JLJL, 2019; Menegaz AM et al., 2015). Functional devices, in addition to maintaining space in the anteroposterior and vertical directions, also reestablish functions such as chewing, aesthetics and phonation. In the present clinical case, we chose to use a functional space maintainer with an aesthetic component, considering the simultaneous demand for both functions: functional, due to the early loss of deciduous molars, and aesthetic, related to the absence of central and lateral incisors (Figures 7, 8 and 9).

However, one of the divergent aspects that deserves to be highlighted refers to hygiene and cooperation on the part of the child patient. According to Duque et al. (2013), the main advantages of fixed space maintainers are the fact that they do not depend on the patient's collaboration for use and maintenance, are less susceptible to loss, and have a relatively simple. However, they have relevant disadvantages, such as greater accumulation



of biofilm, with a consequent increase in the risk of caries, greater demand for clinical time for their installation, and the limitation of not being functional. In addition, in situations of tooth loss that require aesthetic restitution, these devices are not recommended.

In the present clinical case, we chose to use a removable space maintainer, considering its advantages, such as lower biofilm retention, and the fact that the patient, due to her age (seven years), was very cooperative in the use and hygiene of the device.

Regarding the aesthetic demand presented in the present case, due to the complaint being reported both by the mother and by the patient herself, the option for the installation of acrylic teeth (Figures 7, 8 and 9) was justified by this specific need. Such conduct is corroborated by Menegaz et al. (2015), who, in their systematic review, highlight the relevance of the maintainer of functional space with the inclusion of artificial acrylic teeth. This approach contributes to preventing parafunctional habits, promoting smile aesthetics, and offering psycho-emotional benefits to the child.

In view of the above, it is coherent to state that space maintainers, when well indicated and planned, result in an option of great predictability and functionality in the face of early loss of primary teeth.

5 CONCLUSION

It is concluded that the use of space-maintaining appliances proves to be extremely beneficial for the preservation of the space of deciduous teeth lost early, which thus prevents functional impairments such as: migration and/or inclination of adjacent teeth to the edentulous space, reduction or closure of the region that would be occupied in the future by the permanent successor, deleterious oral habits such as lingual interposition, In addition to the aesthetic factor in the anterior region of the smile, It is considered essential to recognize the aesthetic demand of the child, as well as its psychosocial and emotional impact.

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