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PROSTHETIC REHABILITATION WITH FIBERGLASS POSTS AND LITHIUM DISILICATE CROWNS IN PEDIATRIC DENTISTRY - CLINICAL CASE REPORT

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CASE REPORT

ABSTRACT

Background: The prosthetic reconstruction of the anterior deciduous teeth with fiberglass posts and indirect crowns can restore the function and aesthetics of these teeth after great coronal destruction, preventing their early loss, and allowing the child to chew correctly and speak appropriately, in addition to improving the appearance of the smile. Although deciduous teeth are temporary teeth, they play a fundamental role in the child's oral health, craniofacial growth, and dentition development, as they guide the eruption of permanent teeth.

Objective: This paper exposes the treatment of a toddler who presented at Nove de Julho University Dental Clinic with early childhood caries, accompanied by facial edema related to tooth 52 (D).

Method: This patient was treated respecting the three phases of the treatment plan; after urgence and contamination reduction in the oral cavity, with preventive procedures, endodontics, and ATR (atraumatic treatment restoration) caries removal, in phase 1; the glass ionomer was partially removed, and teeth were restored with dental composite, the anterior teeth were reconstructed with fiber posts and lithium disilicate crowns in phase 2; then in phase 3 periodic appointments monitored relapses or failures, and the emergence of permanent successors.

Conclusion: The rehabilitation of anterior deciduous teeth with fiberglass posts and lithium disilicate crowns is a restorative therapy that preserves space for the permanent teeth, while the primary teeth are kept in position and exfoliate naturally.

Keywords: Prosthetic rehabilitation; oral health; fiberglass post; primary teeth; caries.

REABILITAÇÃO PROTÉTICA COM PINO DE FIBRA DE VIDRO E COROAS DE DISSILICATO DE LÍTIO NA ODONTOPEDIATRIA - RELATO DE CASO CLÍNICO

RESUMO

Introdução: A reabilitação protética de dentes decíduos anteriores com pinos de fibra de vidro e coroas indiretas devolve forma e função ao sistema estomatognático, devolvendo estética a esses dentes após grande destruição coronária, prevenindo perdas precoces e permitindo que a criança mastigue corretamente e fale adequadamente, além de melhorar a aparência do sorriso. Os dentes decíduos desempenham um papel fundamental na saúde bucal da criança, no crescimento craniofacial e no desenvolvimento da dentição, pois guiam a erupção dos dentes permanentes.

Objetivo: Este trabalho apresentou o tratamento de uma criança de 1 ano e 9 meses, que chegou à Clínica Odontológica da Universidade Nove de Julho apresentando cáries da primeira infância, e edema facial relacionado ao dente 52 (D).

Método: Este paciente foi tratado respeitando as três fases do plano de tratamento: após urgência e redução da contaminação na cavidade oral, com procedimentos preventivos, terapia pulpar dos dentes anteriores superiores, e restaurações temporárias de cáries com cimento de ionômero de vidro dos dentes posteriores, na fase 1; na fase 2, o cimento de ionômero de vidro foi rebaixado, e os dentes posteriores foram restaurados com resina composta devolvendo dimensão vertical, e os dentes anteriores foram reconstruídos com pinos de fibra e coroas de dissilicato de lítio; posteriormente, na fase 3, consultas periódicas foram programadas para monitorar recidivas ou falhas, e o irrompimento de sucessores permanentes.

Conclusão: A reabilitação da dentição decídua com pinos de fibra de vidro e coroas de dissilicato de lítio em dentes anteriores é uma terapia reabilitadora que permite a preservação do espaço para a erupção dos dentes permanentes, mantendo os dentes decíduos em posição, até esfoliarem naturalmente.

Palavras-chave: Reabilitação oral; saúde bucal; pino de fibra de vidro; dentes decíduos, cárie.

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INTRODUCTION

Early childhood caries affects 573 million children worldwide. [1]

Dental caries is a biofilm-mediated dysbiosis, diet-modulated, multifactorial, non-communicable, dynamic disease that causes an imbalance in the “des- and re-” mineralization process, leading to a net mineral loss of dental hard tissues, determined by biological, behavioral, psychosocial, and environmental factors. [2]

Early childhood caries refers to the presence of one or more decayed (non-cavitated or cavitated lesions), missing (due to caries), or filled surfaces in any primary tooth of a child under 71 months, with fast progression, which can destroy the primary dentition, due to the frequent consumption of carbohydrates, especially sugars, and inadequate to absent oral hygiene. [3]

Preserving children's deciduous teeth and consequently their dental arches is important for the growth and development of the facial muscles and bones, as they guide the location, alignment, and occlusion of their permanent successors. [4,5]

In early childhood caries, with coronal destruction that affects the integrity of the deciduous anterior teeth, the use of fiberglass posts and indirect crowns [6] can be a viable reconstruction option to restore masticatory function and aesthetics. Preventing early loss of the deciduous teeth or restoring dental anatomy using composite or dental crowns contributes to restoring normal individual facial growth and development. [7]

Although dental care for patients presenting early childhood caries should focus first on dental rehabilitation, parents should understand that prevention is the mandatory next step, as new caries lesions can quickly affect children of inattentive parents.

OBJECTIVE

This study presents a case report of a 1-year-and-9-month-old male toddler, presenting early childhood caries, who had his anterior deciduous teeth submitted to endodontic treatment and prosthetic rehabilitation with fiberglass posts and indirect crowns.

MATERIAL AND METHODS

This treatment was approved by the Ethics Committee of Nove de Julho University and conducted at Nove de Julho University Dental Clinic, in the “Specialization Course of Pediatric Dentistry”.

Parents signed an informed consent for this treatment.

CASE REPORT

Dental history

The mother brought her baby to the University dental clinics searching for treatment.

This child had been admitted two times to the hospital for emergency treatment, presenting facial edema (Figure 1), when his mother was oriented to search for clinical treatment in a dental office, and came to the Child Dental Clinic of University nove de Julho.

Figue 1: initial aspect, facial edema, early childhood caries, initial X-ray.

Anamnesis revealed that the baby weighed 11 kg (24.25 pounds) and had been vaccinated; he did not present an allergic history, asthma, or any other relevant medical diseases. The mother reported a cariogenic diet, and it was possible to identify incorrect mouth cleaning and tooth brushing, due to a high biofilm index.

Intraoral exam showed a large coronal destruction of the upper incisors compatible with early childhood caries (Figure 1), and cavities on the occlusal surface of all the posterior teeth.

During the first appointment at UNINOVE dental clinic, this patient presented with a facial edema, now associated with the upper right lateral incisor (52/D). He was submitted to a periapical X-ray (Figure 1), removal of the contaminated dentin using a dentin scaler, edema drainage via periodontal sulcus, and oral prophylaxis to reduce biofilm.

After this first urgent appointment, the treatment plan was divided into three phases as follows:

At phase one, or the preparatory phase, the guardians received instructions and motivation for oral hygiene, as well as non-cariogenic diet substitutions, to reduce biofilm. The child had a dental prophylaxis to remove dental plaque. Cavities were removed from teeth 52(D), 51(E), 61(F), and 62(G), using dentin scalers, and teeth were

restored with glass ionomer. A fluoride varnish (Enamelast® - Ultradent) was applied to all teeth.

Teeth 51(D), 52(E), 61(F), and 62(G), received endodontic treatments (Figure 2), briefly: the patient was anesthetized using 1 tubette of lidocaine with epinephrine 1:100,000, the root canals were decontaminated, and filled with Guedes-Pinto paste, (camphorated paramonochlorophenol, Rifocort® and Iodoform), sealed with Coltosol®, and restored with glass ionomer temporarily. A final periapical radiograph was taken to check the root canal fillings (Figure 2). [8]

Figue 2: primary teeth endodontics

The remaining cavities were treated using ATR (atraumatic tooth restoration) therapy, briefly: enamel is removed using a handpiece with a spherical diamond bur to access the cavity; after the whole contaminated dentin is exposed, the cavity is filled for 30 seconds with “Papacárie” (a gel composed by: papain, a proteolytic enzyme that acts to break down decayed tissue, softening it and facilitating its removal, and chloramine T, an antiseptic that helps cleaning and disinfecting the area after cavity removal), contaminated dentin layer is gently scaled preserving the affected dentin layer, a cotton ball moistened with chlorhexidine is left in the cavity for one minute, then dried and glass ionomer restorations restored facial height. [9]

There were no teeth to be extracted, so after all endodontic treatments were finished and caries were removed, the treatment entered the restorative phase, or phase 2:

Impressions were taken from both dental arches to evaluate the remaining anterior teeth (Figures 2,3).

Figue 3: Fiber posts, and dental casts

The temporary glass ionomer fillings of the four upper incisors were removed, and the cervical thirds of the roots were cleaned. The endodontic treatments filled with Guedes paste were sealed with a thin layer (1mm) of glass ionomer (Ionoseal™-VOCO) between the cervical and middle thirds of the root canal, and fiberglass posts (Whitepost™-FGM) were inserted from the cervical third of the root to the first half of the future dental crowns, (Figure 3) carefully evaluating dental occlusion. The posts were bonded using resin dual cement (AllCem™ Core-FGM), and the coronal excess was removed. (Figure 3) The coronary portion of each post was restored using dental composite (IPS Empress Direct™-IVOCLAR) and was prepared to receive dental crowns using diamond burs in a dental handpiece. Impressions of both arches were taken using Vinyl Polysiloxane Impression Material (VPS) Optosil-Xantopren™ (Figure 3) and sent to the laboratory to prepare lithium disilicate dental crowns (Emax™). Temporary dental crowns were proven and bonded (Figure 4).

After one month, Emax™ crowns were received from the laboratory, proven and bonded using resin dual cement (AllCem™ Core-FGM) (Figure 5).

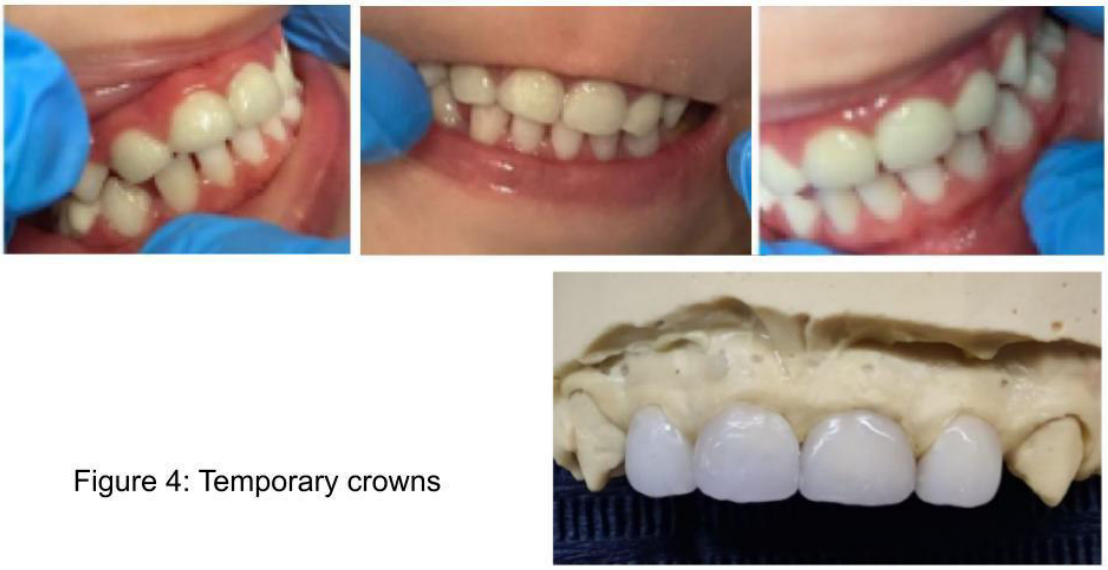

Figure 4: Temporary crowns

Figure 5: Lithium disilicate crowns

The control phase, or phase 3, is characterized by periodic preventive appointments, scheduled according to the risk of developing new cavities, to control dental plaque, to evaluate the effectiveness of the last treatment procedures, to prevent the progression of new caries lesions, and to monitor the development of dental occlusion. This patient was scheduled to return for preventive appointments every three months after this first treatment.[1-3]

DISCUSSION

Providing dental care to children with early childhood caries, who are still discovering the world around them and learning to communicate, is a major challenge for pediatric

dentists who perform aesthetic and functional rehabilitation on patients in this age group.

The Academy of Pediatric Dentistry defines early childhood caries as one or more decayed, missing, or filled tooth surfaces in children up to 71 months old; moreover, it is considered a cause for concern when it affects children under 3 years of age. [3,10,11]

The socioeconomic environment where the individuals are inserted directly influences the progression of this pathology, since individuals with lower income and lower levels of education have higher levels of caries. [2,11]

Inadequate habits, such as frequent consumption of sweets and poor oral hygiene, can lead to poor biofilm control, becoming a public health problem. Pediatric dentists should reinforce the importance of oral hygiene and preventive care to children, parents, and relatives. [2,12]

Oral rehabilitation of children who present early childhood caries generally involves a variety of treatments that should restore form and function and, at the same time, help prevent recurrence of caries and restore aesthetics. [6, 14]

When pulp involvement is irreversible, endodontic treatment becomes essential to preserve the deciduous teeth until the time of exfoliation of the permanent successor.

The Guedes paste (a combination of iodoform, camphorated paramonochlorophenol, and rifocort) was used to fill the root canals before prosthetic reconstruction, however, there are other options nowadays, such as CTZ paste (a combination of chloramphenicol, tetracycline, and zinc oxide, often with the addition of eugenol at the time of manipulation). Both pastes produce acceptable results, but the Guedes paste is the endodontic clinical protocol more commonly used in the addition of academic environment and is also less expensive. [8,14,15]

Dental anatomy must be reestablished in the dental arch as soon as possible because the loss of anterior teeth causes changes in the chewing pattern, phonetics, and nutritional deficiencies, impairing the child's growth and development, and causing damage to their aesthetics and social interaction. [6,7,16,17,18]

The use of an intraradicular retainer is indicated in cases where teeth have their crown in a high degree of destruction, but their root portion must be intact. In this sense, endodontic treatment followed by an intraradicular post and a direct veneer or a prosthetic crown can reconstruct the tooth crown. Prosthetic crowns can be more effective than direct restorations; variations in these results may occur depending on the professional’s service, the material used, the restorative technique, the patient's attitude during the procedure, and the responsible party's care. [17,18,19,20]

Different treatments can be used in pediatric patients to restore the affected teeth. However, once performed, they require periodic monitoring to ensure that there are no relapses or failures, and that the emergence of permanent successors is monitored, since the position of the upper anterior deciduous teeth directly influences the facial architecture and the physical appearance of the child.[1,2,3]

FINAL CONSIDERATIONS

The rehabilitation of anterior deciduous teeth with fiberglass posts and lithium disilicate crowns is a restorative therapy that offers several benefits for the child's oral health and well-being. This therapy preserves space for the permanent teeth, while the primary teeth are kept in position and exfoliate naturally.

AUTHORS DISCLOSURE

All the authors disclose financial interests.

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We would like to acknowledge the parents that brought this patient for treatment, and gave consent to this publication.

WORK MANAGEMENT

This toddler was treated by Iara Maria Freitas Romano, a Pediatric dental student at the Specialization course of Pediatric Dentistry of UNINOVE, and the records were presented as her final course essay, a requirement to obtain her Pediatric Dental license in Brazil; Professor Olga Maria Altavista supervised, and Professor Marcelo Mendes Pinto co-supervised this clinical case treatment and the final essay manuscript, Professor Carolina Carvalho Bortoleto, and Professor Marcos Fernando Xisto Braga Cavalcanti are Clinical Professors at Nove de Julho University at the Child Clinic of UNINOVE, Professor Marcos Fernando Xisto Braga Cavalcanti transformed all the records into this article.

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