Clinical

http://dx.doi.org/10.1590/1981-86372024000820230059

Revista Gaúcha de Odontologia

Orthodontic treatment of a patient with special needs: a case report

Tratamento ortodôntico de um paciente com necessidades especiais: um relato de caso

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ABSTRACT

This report presents the case of an adult patient with mental and intellectual limitations, whose main complaint was dental aesthetics. Dental treatment was performed at the Piracicaba Dental School and approved by the Ethics Committee (CAAE: 65752322.2.0000.5418). Clinically, the patient had inadequacies in the dental arrangement, with periodontal involvement that put the dental elements at risk. In intraoral clinical aspects, the deficiency was identified as maxillary atresia. The buccolingual inclination of the mandibular anterior teeth highlighted

How to cite this article

Aizpurúa ANG, Oliveira SG, Pereira AC, Aguiar FHB, Casati MZ, Santos ECA. Orthodontic treatment of a patient with special needs: a case report. RGO, Rev Gaúch Odontol. 2024;72:e20240008. http://dx.doi.org/10.1590/1981-86372024000820230059

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the severe crowding and anterior crossing of these teeth. Dental treatment was carried out aiming at the remission of periodontal and orthodontic problems in an integrated manner and with approaches that allowed greater interaction, participation, and patient compliance during treatment. Supra and subgingival scrapings and extraction of the upper left lateral incisor were performed. After three months of periodontal treatment, orthodontic treatment was started with fixed orthodontic appliances. The main objective was to level and align the teeth in both arches to achieve better aesthetic and functional conditions. Due to the COVID-19 pandemic, treatment has been discontinued. This resulted in the regression of the results obtained, including regarding self-care. People with disabilities require dental care with specific strategies for their needs, which must be carried out by a multidisciplinary team. Despite the access limitation imposed by the pandemic, the patient reestablished his motivation to restart treatment, which was facilitated by the bond of trust established between him and the team.

Indexing terms: Intellectual disability. Orthodontics. Periodontal disease.

RESUMO

Este relato apresenta o caso de um paciente adulto com limitações mentais e intelectuais, cuja queixa principal era a estética dental. O tratamento odontológico foi realizado na Faculdade de Odontologia de Piracicaba e aprovado pelo Comitê de Ética (CAAE: 65752322.2.0000.5418). Clinicamente, o paciente apresentava inadequações no arranjo dentário, com comprometimento periodontal, que colocava em risco os elementos dentais. Nos aspectos clínicos intrabucais, a deficiência foi identificada como atresia maxilar. A inclinação vestíbulo-lingual dos dentes anteriores inferiores destacou o apinhamento severo e o cruzamento anterior desses dentes. O tratamento odontológico foi realizado visando à remissão dos problemas periodontais e ortodônticos de forma integrada e com abordagens que permitissem maior interação, participação e adesão do paciente durante o tratamento. Foram realizadas raspagens supra e subgengivais e extração do incisivo lateral superior esquerdo. Após três meses de tratamento periodontal, iniciou-se o tratamento ortodôntico com aparelhos ortodônticos fixos. O objetivo principal foi nivelar e alinhar os dentes em ambas as arcadas para alcançar melhores condições estéticas e funcionais. Devido à pandemia de COVID-19, o tratamento foi interrompido. Isso resultou na regressão dos resultados obtidos, inclusive quanto ao autocuidado. As pessoas com deficiência requerem atendimento odontológico com estratégias específicas para suas necessidades, que devem ser realizadas por uma equipe multidisciplinar. Apesar da limitação de acesso imposta pela pandemia, o paciente restabeleceu sua motivação para reiniciar o tratamento, o que foi facilitado pelo vínculo de confiança estabelecido entre ele e a equipe.

Termos de indexação: Deficiência intelectual. Ortodontia. Doença periodontal.

INTRODUCTION

Patients with special needs (PSN) and intellectual disabilities tend to have greater impairment of oral health conditions in adulthood. The difficulty in carrying out basic hygiene care, such as oral hygiene, associated with a diet rich in carbohydrates and often offered in the form of a paste, favors the accumulation of bacterial plaque. Limitations in motor coordination and manual control make oral hygiene difficult, making the maintenance of basic oral health care dependent on the caretaker's attention. Over time, the persistence of these factors favors the high prevalence and severity of periodontal diseases and the cumulative effects of caries disease [1]. PSN often have more than one dental problem, in addition to systemic problems and the use of medications that can influence the patient's oral health conditions, such

as xerostomia and gingival hyperplasia. The loss of dental elements and inefficient restorations are more prevalent in adults with special needs than in the general population, especially in young adults (25 and 34 years old) with severe intellectual and motor limitations [2].

Dental care for a PSN requires planning that reconciles their needs and conditions. The treatment must rely on a multidisciplinary team and establish a relationship of mutual trust with the patient [3-5]. The use of strategies that promote and stimulate the patient's motivation helps in their adherence and participation throughout the treatment [6]. Difficulties in accessing the treatment of these patients in specialized dental services and qualified professionals contribute to the worsening of patients' oral health conditions [4,5,7]. In addition, socioeconomic factors such as low education and lack of information contribute to the worsening and complexity of cases [8].

Fixed appliances lead to a greater propensity for the accumulation of biofilm and greater difficulty in cleaning. Thus, patients undergoing integrated orthodontic and periodontal treatment and users of fixed appliances require greater attention to oral hygiene care to achieve the planned biomechanical results without causing damage to the periodontal tissues. The intervention time when both treatments are necessary may vary and, in some cases, the sequence of periodontal and orthodontic procedures is performed according to the clinical experience of the dental surgeon [9-11]. Furthermore, orthodontic movements such as buccal tipping of incisors, intrusion and extrusion of teeth can cause gingival recession, if not well planned [12,13].

This report presents the case of an adult patient with mental and intellectual limitations, whose main complaint was dental aesthetics. Clinically, the patient presented inadequacies in the dental arrangement, with periodontal involvement that put the dental elements at risk. These conditions were generating a negative psychosocial impact on the patient's life [14]. The dental treatment was carried out aiming at the remission of periodontal and orthodontic problems in an integrated way. Reception and some of the challenges that the dental treatment of a PSN may require were also addressed, highlighting its influence on the conduct of the case.

CASE REPORT

A male patient, 35 years old, with mental and intellectual disabilities, attended the Piracicaba Dental School (FOP) - UNICAMP, seeking dental care. The main complaint was the aesthetics of the smile. The patient had harmonious facial thirds, convex profile and biprotrusion with lip seal. The facial angle was normal and harmonious with the face, the lower mandibular angle was slightly accentuated, and the length of the jawline was short (figure 1 A). He had a molar and canine Angle Class I malocclusion and anterior crossing of the upper and lower incisors.

In the intraoral clinical aspects, a deficiency was identified in the transverse of the dental arches, evidencing maxillary atresia. The buccolingual inclination of the lower anterior teeth highlighted the severe crowding and the anterior crossing of these teeth (figure 1 B and C). Hygiene was precarious, with the presence of advanced periodontal disease, with mobility of the anterior teeth. The radiographic evaluation evidenced the periodontal involvement of these teeth, with bone resorption being observed, resulting from occlusal trauma (figure 1 D).

Initially, supragingival and subgingival scrapings and extraction of the upper left lateral incisor were performed. After three months of periodontal treatment, orthodontic treatment was started. The main

Figure 1. Photographic and radiographic record. A) extraoral photographs. B) anterior tooth crowding. C) occlusal photographs: upper arch (in the characteristic triangular shape of an atresic arch) and lower arch (the lower arch follows the atresia with marked lingualization of the lower teeth) and D) periapical radiograph: periodontal involvement of the upper teeth missing teeth of the periodontal support the upper left lateral incisor, which led to its inheritance.

objective of leveling and aligning the teeth in both arches was to achieve better aesthetic and functional conditions.

A fixed orthodontic appliance was installed, using fully pre-adjusted brackets according to the Maxilla Transversal Bioadaptation (MTB) prescription, which provides greater inclination of the upper incisors and control of the lower incisors, preventing their inclination during crowding correction and leveling of the curve of Spee and supplying the deficient torque of other prescriptions [15].

Before and shortly after the installation of the orthodontic appliance, consultations were held for oral hygiene guidance, to raise awareness and train the patient to perform hygiene routines during treatment.

The patient's motivation and compliance demonstrated over the period provided adequate clinical conditions for the installation of the fixed appliance. The first stage of orthodontic treatment consisted of obtaining space, performing dental expansion of the upper arch with the placement of 0.14" and 0.16" NiTi wires, and raising the occlusion for more significant orthodontic movement. Traditionally, obtaining space can be performed by expansion by palatine disjunction or rapid maxillary expansion (RME) or by extraction of premolars, which was not accepted by the patient. In the lower arch, the dental expansion had the WALA line as an anatomical reference, for the inclination of the dental elements.

After 12 months of treatment, the spacing and alignment planned arch was achieved. However, throughout this period, the patient's adherence to treatment came to represent a limiting factor. Thus, to guarantee the comfort and well-being of the patient and to follow the guidelines of the initially proposed planning, we decided on the incisor inclination associated with the buccal inclination of the crowns of the premolars and molars in both arches, reducing the time of treatment and ensuring adequate morphofunctional conditions.

The orthodontic leveling phase was started after the best tooth positioning and arch shape. For this, the rectangular Niti wire 0.017" x 0.025" was chosen, which allows the best root angulation by torque, moving the dental roots in the buccolingual direction. To preserve the space corresponding to the extracted element, the anterior unit was fixed with a clamp and an open-section spring. The elastic of the chain was used to control the inclination of the teeth. The final phase of the orthodontic treatment was performed with the placement of NiTi wire 0.019" x 0.025", to favor the torque of the dental roots in the arches and the intercuspation of the canine and molar relationship, benefiting the stability of the occlusion (figure 2).

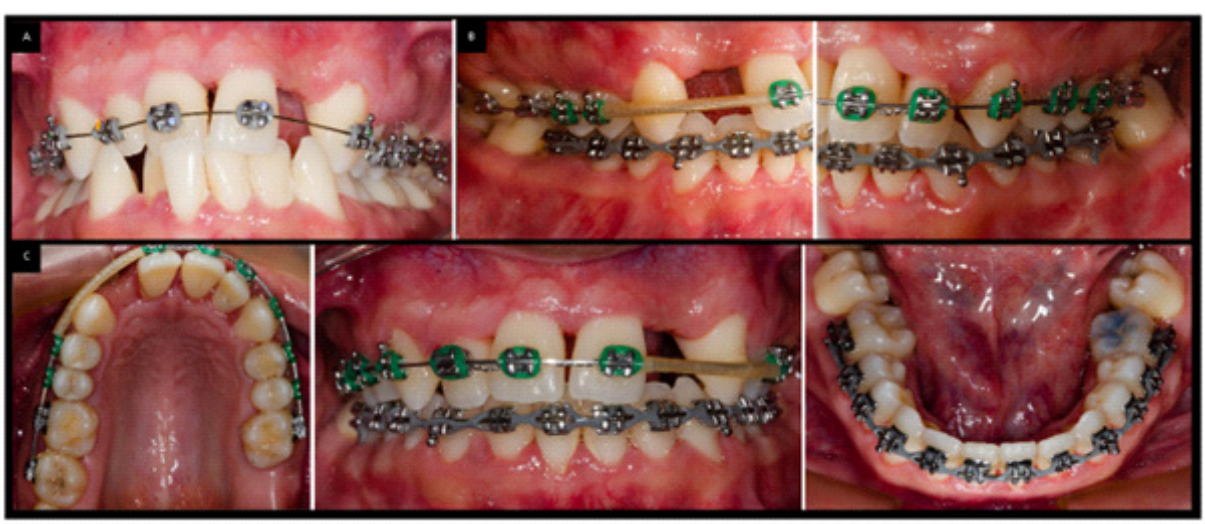

Figure 2. Orthodontic treatment. A) MBT prescription brackets with 0.14" Niti wire - installation of the orthodontic appliance in the upper arch with bite lifting of the lower molars. B) leveling with installation of a 0.17"x 0.22" rectangular NiTi wire (one unit from the left central incisor to the right lateral incisor, spring with open section and current elastic in the lower arch): occlusal of the upper arch; frontal and occlusal of the lower arch and C) Angle Class I canine and molar brace: left and right views.

The fixed orthodontic appliance was removed after 12 months. At this time, the patient had an Angle Class I molar relationship, better conformation of the dental arches, leveling of the marginal ridges, contact points, absence of rotations, mesiodistal angulation of the teeth, buccolingual inclination of the teeth, Spee, occlusion guides, balances dental and facial harmonization (figure 3).

During treatment, there were periods when the patient showed less adherence to oral hygiene care, leading to increased biofilm accumulation. During these periods, scheduling maintenance appointments became more frequent. Some appointments were directed only to biofilm control and others to orthodontic treatment follow-up. To preserve alignment and leveling in both arches, a removable retainer was installed for 6 months. A stock tooth was placed in the upper arch to preserve space for the extracted element (figure 3).

Figure 3. Orthodontic treatment finalization and installation of removable containment. A) Removal of the fixed appliance. B) Removable containment.

At this stage, the COVID-19 pandemic began and only two years later did the patient return. After clinical and radiological evaluation, it was verified that the interruption of the treatment resulted in the regression of the previously obtained results (figure 4). In addition to signs of reduced self-care with high accumulation of biofilm, dental calculus, halitosis, gingival bleeding on probing and gingivitis. During the period in which he was away, the first upper left premolar was extracted, due to an irreversible acute pulpitis (figure 4). Crowding of the mandibular anterior teeth and buccal tipping of the mandibular premolars and molars recurred. The space of the tooth extracted at the beginning of the treatment, the alignment of the upper arch and the Angle Class I canine and molar key were maintained. Due to periodontal and hygienic conditions associated with poor patient compliance, the case restarted with prophylaxis procedures for periodontal treatment every two months.

DISCUSSION

This case reports the orthodontic treatment integrated with the periodontal treatment of a patient with special needs. Currently, about 15% of the world's population has some type of disability and 80% of

Figure 4. Reassessment of the patient after the period of absence due to the COVID-19 pandemic. A) headgear. B) upper occlusal (premolar extraction) and lower (recurrence of crowding in the anterior region) and C) intraoral.

this population lives in developing countries [16]. In Brazil, approximately 45 million people have some type of special need, and about 1% of them have mental or intellectual disabilities [17].

Patients with special needs are part of the population with less access to dental treatment. This difficulty is twice that faced by patients without special needs [1,18]. In addition, the resistance to treatment that a PNE can present is a frequent and potentially more limiting feature in patients with mental and intellectual limitations than in patients with hearing, visual or motor impairments. This characteristic makes dental care even more challenging according to the severity of the limitations, making it difficult to carry out routine self-care practices and communication with the patient [18,19].

Adult patients who need orthodontic treatment are often affected by periodontal problems, whose incidence and severity increase with age and aggravate the functional and aesthetic impairment [9-11]. Periodontal problems such as increased tooth mobility and reduction of the cortical region in the bone crest and in the apical region are associated with occlusal trauma resulting from malocclusion [20]. In this case, in addition to the occlusal trauma, the presence of anterior dental crowding and transversal deficiency of the arches were conditions for the indication of orthodontic treatment [11].

Instruction on hygiene and self-care practices, associated with periodontal and orthodontic treatment, favors the recovery of oral health, and contributes to patient awareness [6,8,19]. In this case, the patient's limiting conditions reflected on the level of adherence to treatment and were considered a limiting factor for the result to be achieved. Absences and delays, mood swings, reduced care with oral hygiene in the home environment, and depressive states can reflect in the worsening of oral health conditions. These aspects usually result in increased biofilm, dental calculus, dental caries, and periodontal disease [5]. Due to these conditions, it was decided to associate orthodontic treatment with fixed appliances with the maintenance of periodontal care and to reduce the interval between consultations. This made it possible to attend closely to the patient and identify their needs in periods of greater resistance, to improve their adherence to treatment, seeking to carry out a biomechanical planning combined with the adequacy of the occlusal, aesthetic and stabilization conditions of the dental elements.

The initial conditions of oral health observed required their recovery through orientation consultations and oral hygiene instruction associated with gingival scaling and biofilm control. To favor patient compliance, consultations were preceded by moments of interaction and relaxation between the patient and the team members, allowing the patient to feel more comfortable with dental care. The interaction promoted in these moments made it possible to know the patient's singularities in more detail and favored the establishment of a bond of security with the patient. The instructive activities addressed guidance on oral hygiene care, its frequency, brushing techniques, and the use of auxiliary materials, such as an interdental brush and dental floss. The continuity of these actions throughout the treatment reinforced its practice and contributed to the improvement of the patient's oral health conditions. Guidance was also provided on the consumption of foods based on sugar and carbohydrates. Except for medical contraindications, the use of sugary drugs that were part of the patient's therapeutic routine is now administered with meals [5,21,22].

The indication of orthodontic treatment in patients with periodontal involvement is not a consensus [9,10,14]. In this case, orthodontic treatment was initiated after three months of periodontal treatment. The alignment of anterior dental elements contributed to the improvement of hygiene conditions and periodontal health, as observed by Zasčiurinskienė and collaborators [10], who obtained the compatibility of orthodontic treatment associated with biofilm control.

In addition to the performance of a multidisciplinary team, the dental treatment of a PSN requires specific skills and strategies. The interdisciplinary and humanized work, combined with the attention and understanding of the patient's attitudes and reactions by the professionals involved, provides improvements in the promotion of mental health, and ensures greater adherence to treatment [6,22,23]. Communication between patients and health professionals is a key factor to ensure the quality of healthcare [23] and is obtained through a relationship of mutual trust [5]. Effective communication avoids patient frustration, helps in the diagnosis, and minimizes the risk of adverse outcomes [1,5]. However, many PSN are faced with adversities for establishing good communication in dental environments and may need additional resources throughout the treatment and to facilitate access to health services [4, 7]. With the main objective of offering adequate dental care to the needs of a PSN, the clinician can use pharmacological techniques

such as sedation or general anesthesia [24] or behavioral management techniques, such as harmonizing the dental environment, the "tell-show-do" technique, and positive reinforcement during treatment. The techniques aim to reduce the patient's anxiety, strengthen the bond between the patient and the health professional and avoid more radical techniques such as physical restraint, in addition to contributing to the patient's well-being and self-esteem [25]. In this case, the positive reinforcement technique proved to be effective for adherence and closer ties with the team. The patient's perception of the results obtained contributed to the practice of self-care. In addition, the improvement in socialization made the patient return to participate in other social groups in addition to the family, resuming school attendance and the practice of extracurricular activities.

CONCLUSION

The dental treatment of a patient with special needs requires care and strategies beyond those routinely used. A welcoming environment and a specialized and trained team can offer adequate care to the individual needs demanded by each patient. The integrated performance of dental specialties allows a more favorable prognosis of the case and its management without interruptions. The bond established with the patient favored their participation, motivation, and consequent adherence to treatment.

Collaborators

ANG Aizpurúa, case report development, manuscript writing/editing, and final review. SG Oliveira, case report development, manuscript writing/editing, and final review. AC Pereira, supervision. FHB Aguiar, methodology and supervision. MZ Casati, methodology and supervision. ECA Santos, selection of the case, methodology, supervision, and final review.

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Received on: 24/7/2023
Approved on: 5/9/2023

Assistant editor: Luciana Butini Oliveira