THE CHALLENGES OF ORTHODONTIC TREATMENT IN TIMES OF PANDEMIC

OS DESAFIOS DO TRATAMENTO ORTODÔNTICO EM TEMPOS DE PANDEMIA

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Resumo

O isolamento social imposto pela COVID-19 levou à restrição de acesso a alguns serviços, dentre eles o acompanhamento de pacientes em tratamento ortodôntico. Desde então, a ida ao consultório tornou-se obrigatória e necessária apenas em algumas situações de urgência ou emergência. O objetivo deste trabalho foi apresentar através de uma revisão de literatura as principais ocorrências encontradas frente a pandemia da COVID-19 no âmbito da ortodontia, as suas implicações clínicas e as futuras perspectivas dos profissionais e dos pacientes em tratamento. Pode-se concluir que o reforço das práticas de biossegurança e o desenvolvimento de uma nova ferramenta alternativa apresentaram grande importância na diminuição da propagação deste novo vírus.

Palavras-chave: Pandemias. Ortodontia. Infecções por coronavirus.

Abstract

Social distancing imposed by COVID-19 (coronavirus disease) severely restricted the access to some services, including follow-up of patients undergoing orthodontic treatment. Since then, going to the doctor's office has been mandatory and strictly necessary only in urgent or emergency situations. The objective of this work is to present, through a literature review, the main occurrences of the kind in the specific context of orthodontics and the COVID-19 pandemic, also discussing their clinical implications and the future perspectives of professionals and patients who are undergoing treatment. Its conclusion is that the reinforcement of biosafety practices and the development of alternative tools were of great importance in reducing the spread of the novel coronavirus.

Keywords: *Pandemics. Orthodontics. Coronavirus infections.*

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INTRODUCTION

On January 30, 2020, the World Health Organization (WHO) declared coronavirus disease – or COVID-19 – a threat to public health. This news reached major proportions and had worldwide repercussions. The disease caused by the coronavirus (SARS-CoV-2) led to measures aimed at preventing or slowing the community transmission of the virus, including social isolation and the closing of dental clinics (1).

In the current pandemic scenario and considering the resultant restriction of care, Dentistry has established a new form of care that offers security to professionals, auxiliary staff and patients (2). Thus, many orthodontists have committed to maintaining their own safety by defining rigorous and effective infection-control protocols, which are necessary when recurrent emergencies must be dealt with (3).

This article assessed the literature to survey the main occurrences brought about by the COVID-19 pandemic in the scope of orthodontics, as well as the pandemic's implications for clinical practice and for the future perspectives of professionals and patients who are undergoing treatment.

LITERATURE REVIEW

This article's bibliographic search and selection strategies were applied to the PubMed, Medline and Lilacs databases, as well as to conceptual books and publications by the appropriate health authorities/bodies, in English and Portuguese, while using the following terms: coronavirus, COVID-19, orthodontic emergency, reinfection, treatment duration, pandemic.

Spread of the disease

In 2020, more precisely on March 11, the WHO declared a global outbreak of COVID-19, characterized as a pandemic. It counted dental surgeons among the health professionals with the highest risk of contamination (4). The main routes of transmission and dissemination include direct transmission of the virus through coughing, sneezing and saliva droplets, in addition to contact with the eyes and with the oral and nasal mucous membranes (3, 5-8). Asymptomatic infected people remain a potential transmission hazard, and cases of reinfection have been reported in the literature (9).

Weekly update reports by the WHO present an overview of COVID-19 at the global, regional and national level. According to these reports, by February 9, 2021, 105.4 million cases and 2.3 million deaths had been recorded and confirmed (8).

Suspension of elective consultations

To reduce the spread of the virus, in March 2020, the Federal Council of Dentistry (CFO) released official letter No. 477/2020, demanding the suspension of dental activities in the country – except for cases of urgency and emergency – considering the direct, proximate and lengthy contact between dentists and their patients (10). Since then, with the closing of dental offices, follow-up consultations for routine orthodontic treatment had to be interrupted (6).

For cases where care is essential, the Brazilian Association of Intensive Care Medicine (AMIB), with the support of the CFO, created the *Comitê de Odontologia de Enfrentamento* à COVID-19 (Dentistry Committee Against COVID-19). This partnership resulted in guidelines for unavoidable dental care services provided by dental surgeons in their consulting rooms, including additional protective measures such as temperature checking and reinforced individual protection measures during treatment (11).

Main complications and clinical implications for orthodontics

An orthodontic urgency can be described as a problem resulting from an orthodontic appliance that requires an unscheduled appointment but does not involve increased risk of death for the patient (12). Breaking the device is an inevitable nuisance that, at best, is an inconvenience and, at worst, can result in significant pain or discomfort. When this type of problem is present, a timely additional consultation may need to be scheduled alongside a specialist (13-15).

According to the American Dental Association (ADA), during the COVID-19 pandemic, the adjustment, exchange or removal of the arch or orthodontic device that is ulcerating the oral mu-

cosa may be regarded as urgent dental care (Table 1). It is important to note that other factors also lead to patient discomfort and to urgent or emergency dental care demands. However, orthodontic-appliance maintenance procedures must be postponed if such a procedure is regarded as elective, so as to minimize, reduce or prevent the risk of coronavirus contamination and spread (16).

Table 1 - Dental treatment types

URGENCY	ELECTIVE
• Irreversible pulpitis; • Pericoronitis; • Surgical post-operative osteitisor dry socket dressing changes • Abscess or localized bacterialinfection resulting in localized pain andswelling • Tooth fracture resulting in painor causing soft tissue trauma • Dental trauma withavulsion / luxation; • Final crown / bridge cementation if the temporary restoration is lost, broken or causing gingival irritation • Extensive dental caries ordefective restorations causing pain • Suture removal; • Denture adjustment onradiation/oncology patients; • Mucositis; • Denture adjustments or repairswhen function impeded; • Replacing temporary filling onendo access openings in patients experiencing pain; • Snipping or adjustment of anorthodontic wire or appliances piercingor ulcerating the oral mucosa;	• Initial or periodic oralexaminations and recall visits; • Routine radiographs; • Routine dental cleaning; • Routine periodontal therapy; • Orthodontic procedures otherthan those to address acute issues (e.g.pain, infection, trauma); • Extraction of asymptomatic teeth; • Restorative dentistry includingtreatment of asymptomatic cariouslesions; • Aesthetic dental procedures.

During the pandemic period, longer completion times for orthodontic treatments have been a relevant clinical implication. A study by Uribe et al. showed that the average completion time of orthodontic treatment does not match patients' expectations, and in Brazil, when taking the standards of the American Board of Orthodontics (ABO) as a reference point, orthodontic treatment completion times exceed the world average by 24.6 months (17, 18). Long interruptions not only prolong treatment time; they may also lead to decreased patient motivation due to loss of confidence in the appliance or in the orthodontist, as well as breakage of orthodontic appliances and poor oral hygiene (19).

In this context, a report regarding Brazilian orthodontists' experience showed that among 395 specialists interviewed, the highest frequency of urgent care services provided during the pandemic involved the breaking of brackets, wires, tubes and/or loosening of the molar bands (20). Not only do urgent situations associated with the fixed appliance's components lead the patient

to seek professional care, but the application of biomechanics to tooth movement also requires adequate supervision.

Orthodontic tooth movement requires light and continuous forces capable of producing adequately sized systems whose performance does not vary significantly over time (21). There are situations in which orthodontists must closely follow-up with the patient for 10-12 weeks – some examples include cases in which the appliance contains a nickel-titanium wire with a reverse curve or patients who need an intervention to move an impacted tooth (22). For this, the orthodontist needs to have knowledge of the wires used in the treatment and their elastic properties, which are indicated according to treatment stages (initial, intermediate or final). In this sense, there is no single ideal orthodontic wire for all these phases (23). Monitoring the position of the incisors within the alveolar bone, for example, prevents undesirable movements from being performed (24).

Orthodontic elastics comprise another device used quite frequently in tooth movement and in the application of biomechanical forces. The degradation of these materials over time promotes a reduction in the magnitude of the originally specified force, decreasing or ceasing the desired movement (25). Ferreira Neto and Caetano studied different sizes of elastics, showing that the greater the number of link segments, the lower the rate of force degradation, allowing for longer intervals between activations, something desirable in a situation in which elective consultations have to be postponed (26).

The impact caused during the initial phase of the COVID-19 pandemic goes far beyond the issue of tooth movement. The anguish prompted by prolonged periods without regular maintenance of the orthodontic appliance has affected more than a third of the patients undergoing treatment, a problem that involves variables such as the type of orthodontic appliance, the interval since the last dental appointment, the patients' means of communication with the orthodontist, and the places wherein the pandemic has been progressing (6). Levels of anxiety have been assessed and shown to be significantly associated with the patients' demand to attend orthodontic consultations (27).

It is worth noting, however, that the pandemic has also effected positive changes concerning the most diverse factors underlying orthodontic treatment. Social isolation has favored the development and reinforcement of new practices and forms of care in regards to personal hygiene, intended at avoiding or postponing the occurrence of comorbidities and risk factors associated with the worsening of cases of COVID-19 and other diseases (28).

FUTURE PERSPECTIVES

In search of alternatives and working towards the future resumption of orthodontic treatments, the Federal Council of Dentistry (CFO) decided – with resolution 226/2020, published on June 4, 2020 – that dentistry would be exercised remotely, mediated by technologies for the monitoring of patients who are undergoing treatment. Due to the high risk of COVID-19 contagion, the CFO's guidance for face-to-face care only in case of urgent and emergency cases – and when all other available methods have been exhausted – has remained in force, meaning that identifying the best time for face-to-face care continues to be a concern (15).

In fact, a study by Saccomanno et al. explored the future implications of this new model of post-emergency consultation care, discussing the use of communication tools (video calls, applications, photographs and instant messages) as a compensating factor for decreased physical presence, which decreases the risk of infections and relieves existing demands without excessively hampering the quality of treatment (29).

In recent years, the rising demand for orthodontic treatment on the part of adults has corresponded to an increased demand for appliances that are more aesthetically pleasing and more comfortable than conventional fixed appliances (30). Aesthetic fixed devices gave way to the comfort promoted by invisible aligners, since the former failed to fully satisfy the aesthetic requisite of "invisibility." Invisible aligners thus became an attractive choice of treatment that requires no brackets (31).

The fact that aligners are removable makes hygiene simpler than for fixed orthodontic appliances, leading to improved periodontal health in individuals who are treated with aligners when compared to those using conventional

brackets (32-34). In this way, the likelihood of emergency complications during treatment is reduced. In times of pandemic, this advantage should be duly considered.

Currently, there are commercially available aligner systems that do not require dentists to potentially intervene at any stage of the tooth movement process. "At home" treatment is offered through professional supervision, regarded as a convenient and cheaper solution (35).

When it comes to teledentistry, professionals have proposed an increased use of digital orthodontics and the monitoring of patients using its tools (4). Some possibilities of care provided by this perspective are the review of clinical records, the explanation of treatment planning, the delivery of aligners via post, the delivery of and explanation on use of rubber bands, as well as the remote provision of monitoring and guidance (29).

In fact, the great financial impact caused to these professionals in the pandemic period has led to concerns that go beyond orthodontic treatment itself. The need for social distancing requires a change towards collaborative and dynamic work, generating significant impacts during a period when these new expenses make it difficult for many practices to go through proper adaptations (20,36).

CONCLUSION

During the pandemic period, a strong ally has been found in communication tools for the remote monitoring of patients undergoing orthodontic treatment. This has generated renewed tranquility and trust between patients and professionals. Moreover, new aesthetic requirements have contributed to the development of safer and more predictable treatment alternatives.

A wide knowledge of the employed techniques and materials leads to greater control over the use of dental appliances in the correction of malocclusion, minimizing future complications. These procedures must respect biosafety measures, since dental care is subject to specificities that represent risk factors for professional contamination and, therefore, for the spread of COVID-19.

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