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PRIKAZ SLUČAJA
CASE REPORT

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Parodontni apsces uzrokovan neprimjerenim ortodontskim silama: prikaz slučaja

Periodontal Abscess Due to Inadequate Orthodontics Forces: Case Report

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Sažetak
Svrha ovog prikaza jest pokazati da nedovoljno znanje iz biomehanike i fiziologije tkiva uključenih u korekcije malokluzije može rezultirati ijatrogenim oštećenjima parodonta. Integracija ortodoncije i parodontologije važna je zato što parodontologija zahtijeva funkcionalni integritet parodontnog tkiva, a ono mora ostati zdravo tijekom ortodontske terapije i nakon njezina završetka.

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Ključne riječi
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Uvod

Godine 1976. Kessler je upozorio da neadekvatan ortodontski tretman te nepoznavanje osnovnih parodontnih struktura uzrokuje kolaps parodontnih tkiva. Ortodontske sile koje uzrokuju okluzalnu traumu i upalu parodontnih tkiva odgovorne su za brže razaranje parodonta negoli upale parodonta uzrokovane drugim čimbenicima (1).

Danas je odraslim osobama sve češće potreban ortodontski tretman. No, novi profesionalci dolaze na tržište rada bez odgovarajućih kvalifikacija te tako uzrokuju ijatrogena oštećenja zbog neadekvatne primjene ortodontskih sila. Tim postupcima zanemaruju osnovna tehnička i biološka načela koja omogućuju siguran ortodontski tretman. Novije studije na životinjama i ljudima upućuju na različite uređaje i pomagala proizvedena kako bi se postigao kon-

Introduction

In 1976, Kessler warned that inadequate orthodontic treatment performed without knowledge of periodontal structures contributes to the collapse of supporting tissues. With regard to orthodontic forces, occlusal trauma and inflamed periodontal tissues are capable of destroying the periodontium in a more accelerated fashion than inflammation alone (1).

Currently, there has been a considerable increase in the demands of adult patients for orthodontic treatment. New professionals have entered the job market without the appropriate qualifications and therefore produce iatrogenic conditions due to the inadequate application of forces that are not compatible with correct orthodontic mechanics, thereby neglecting the basic technical and biological principles that

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trolirani ortodontski pomak u skladu sa svakim individualnim slučajem (2-5).

Ortodontski tretman temelji se na primjeni sila na zube koje tada uzrokuju pomak zuba preoblikujući strukture oko zuba. Zato je vrlo važno, ako želimo postići zadovoljavajuće rezultate, da postoje zdrava parodontna tkiva. Multidisciplinarna integracija između specijalizacija stomatologije, posebice ortodoncije i parodontologije, vrlo je važna ako želimo postići uspjeh kod ortodontskih korekcija (6-8).

Ortodontski tretman smije početi samo ako pacijent zadovoljava razinu oralne higijene i nema nikakvih znakova upale. Osim tih uvjeta, kod korekcije malokluzije uvijek moramo misliti i na mehaniku pokreta zuba. Drugim riječima, parodontno tkivo mora biti zdravo prije početka ortodontske terapije. Imajući sve to na umu, potreban je profesionalni program za održavanje zdravog parodonta prije ortodontske terapije, dok ona traje i nakon što je završena, kako bi se spriječila repopoluacija parodontnih tkiva periopatogenim mikroorganizmima.

Ortodontske naprave otežavaju oralnu higijenu te retiniraju biofilm (plak). To kod genetski predisponiranih osoba završava, ako se stanje ne liječi, kroničnim rubnim i hiperplastičnim gingivitisom. Potvrđeno je da se sastav biofilma može mijenjati tijekom korištenja ortodontskih naprava, posebice fiksnih. U tom slučaju povećava se broj periopatogenih anaerobnih mikroorganizama, a smanjuje količina fakultativnih aeroba oko ortodontskih prstenova (9-12). Preventivna kontrola biofilma zadaća je parodontologa, a ortodont je zadužen za ispravnu uporabu ortodontskih naprava i sila kako bi se izbjegli problemi kao što su dehiscijencija kosti, resorpcija alveolarnog grebena, promjene u parodontnom ligamentu, pomičnost zuba, promjene u pulpi te resorpcija korijena (13-16).

Prikaz slučaja

Pacijentica bijele rase u dobi od 23 godine zatražila je pomoć parodontologa u ordinaciji Fakulteta dentalne medicine u Perambucu u Brazilu. Žalila se na povišenu temperaturu, slabost i intenzivnu bol u prednjem dijelu usne šupljine. Oralnim pregledom ustanovljeno je da nosi fiksni ortodontski aparat, te da ima parodontni apsces na aproksimalnoj stijenki 11. zuba, gingivalnu recesiju 31. zuba i dentalnu ekstruziju/migraciju u frontalnom dijelu maksile (slika 1). Pacijentica je rekla da njezina ortodontska terapija traje dulje od dvije godine, da redovito odlazi na dogovorene specijalističke preglede, ali da joj se položaj zuba mijenja iz dana u dan. Dodala je da se lezija (apsces) pojavljuje u određenim intervalima i nestaje nakon uporabe antibiotika. Također je rekla da joj je gingiva često krvarila prije početka ortodontske terapije te da nije dobila upute o pravilnom održavanju oralne higijene.

govern safe treatment. Current studies carried out with animals and humans have investigated new appliances and accessories designed to achieve controllable orthodontic movement that is more suitable to the situation of each individual case (2-5).

Orthodontic treatment is based on the application of forces on the teeth, producing dental movement through the remodeling of the adjacent structures. Therefore, a healthy periodontal structure is extremely important to achieving satisfactory results regarding dental movement. Multidisciplinary collaboration between all fields of dentistry, especially orthodontics and periodontics, with the combined planning of both treatments, is fundamental to achieving success in orthodontic correction (6-8).

Apart from an awareness of the mechanics involved in orthodontic movement for the correction of malocclusions, treatment should only begin in the complete absence of inflammation and with a satisfactory degree of oral hygiene. In other words, the periodontal tissues must be healthy. There is a need for a professional maintenance program before, during and after treatment, with the specific aim of preventing the repopulation of periodontal sites by periodontopathogenic microorganisms.

Orthodontic appliances adapted to dental surfaces hinder hygiene and retain biofilm (plaque), leading to chronic marginal gingivitis, hyperplastic gingivitis and, when not treated, periodontal disease in genetically susceptible individuals. Moreover, it has been proven that biofilm composition can be altered during the use of orthodontic appliances, especially fixed appliances. There is an increase in anaerobic microorganisms and a reduction in facultative anaerobes around the bands which are periodontopathogenic (9-12). While the control of biofilm with the constant intervention of the periodontist is a preventive measure, the orthodontist is expected to use adequate appliances and forces in order to avoid problems such as bone dehiscence, resorption of the alveolar ridge, alterations in the periodontal ligament, tooth mobility, pulp problems and root resorption (13-16).

Case report

A 23-year-old female Caucasian patient (RHS) sought the periodontal assistance at the Pernambuco School of Dentistry (Brazil), complaining of fever, weakness and intense pain in the upper anterior region of the oral cavity. The oral examination revealed the use of an orthodontic appliance and the presence of a periodontal abscess in the proximal wall of tooth 11, gingival recession on tooth 31 and dental extrusion/migration in the anterior region of both maxillae (Figure 1). The patient reported that she had been orthodontically treated for over two years, with predetermined appointments with the professional for the scheduled clinical interventions, and that the position of her teeth changed day by day. The patient reported that the lesion (abscess) appeared with a certain frequency and disappeared for a time following the use of antibiotics. She also reported that her gums had often been bleeding prior to the placement of the

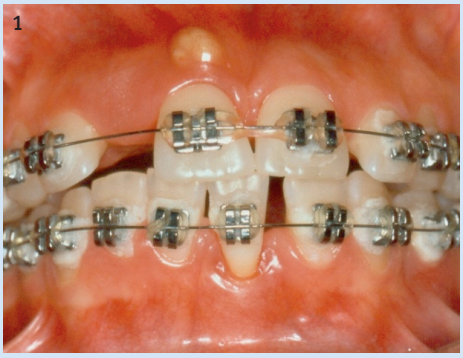
Pregled parodontološkom sondom otkrio je promjenu u dubini pričvrstka samo u području apscesa, a na ostalim ispitanim mjestima nije bilo odstupanja od prosječnih vrijednosti. Klinički postupak sastojao se od lociranja ishodišta fistule (slika 2) i radiološke potvrde lokacije aproksimalno između 11. i 21. zuba (slika 3). Na radiološkoj slici uočen je gubitak kosti.

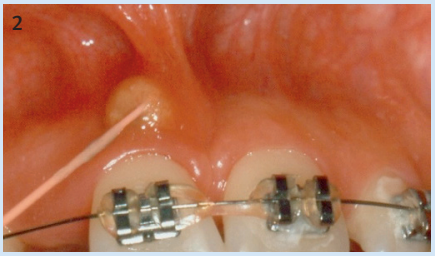
Nakon drenaže apscesa slijedio je test vitaliteta pulpe, a on je bio pozitivan uz mali intenzitet (slika 4). Pacijentici je propisan deset dana Amoxicillin od 500 mg i Metronidazol od 250 mg, kako bi se akutno stanje pretvorilo u kronično tijekom mehaničko/kirurške parodontološke obrade. Nakon početne terapije upućena je u Zavod za ortodonciju da bi se eliminirale ortodontske sile te u Zavod za endodonciju radi liječenja kanala. Cilj je bio, zbog sveobuhvatnog liječenja, integrirati parodontološku terapiju s ostalim potrebnim oblicima liječenja.

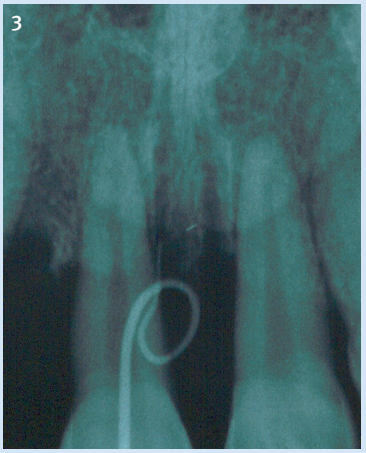
orthodontic appliance and that she did not get any instructions regarding adequate hygiene.

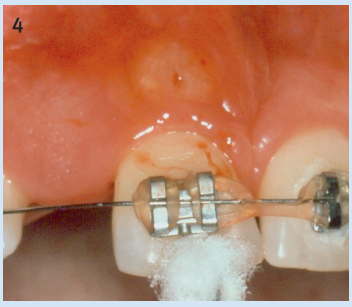
The examination with the periodontal probe revealed an alteration in depth only in the area of the abscess and otherwise normal mean patterns. The immediate clinical procedure was to track the fistula (Figure 2), with the radiographic determination of its trajectory toward the lateral periodontium between the proximal surfaces of teeth 11 and 21 (Figure 3), along with an image suggestive of bone loss.

The abscess was then drained and the pulp sensitivity test was performed, for which the response was positive, but with little intensity (Figure 4). Five hundred mg of amoxicillin and 250 mg of metronidazol were prescribed for a period of 10 days in order to eliminate the acute condition, turning it chronic for the subsequent administration of mechanical/surgical periodontal procedures. After the initial procedures, the patient was sent to the orthodontic department to eliminate the forces applied and the endodontic department for root canal treatment with the aim of performing integrated treatment concomitant to the periodontal treatment.









Slika 1. Parodontni apsces u aproksimalnom području 11. zuba
Figure 1 Periodontal abscess located in proximal region of tooth 11.
Slika 2. Sinus-trakt lociran štapićem gutaperke
Figure 2 Sinus tract traced with gutta percha.
Slika 3. Rentgenska slika pokazuje zahvaćenost parodonta između 11. i 21.zuba
Figure 3 Radiograph, tracing indicating periodontal involvement between teeth 11 and 21.
Slika 4. Test vitaliteta pulpe 11. zuba te pozitivan rezultat kod malog intenziteta
Figure 4 Pulp sensitivity test of tooth 11, with positive response of low intensity.

Rasprava

Istraživanja *in vitro i in vivo*, koja se bave učinkom normalnih ortodontskih sila na zdravi parodont, kod korekcije malokluzije potvrđuju fiziološki fenomen resorpcije kosti na mjestu djelovanja sile te posljedične apozicije bez dugotrajnih negativnih posljedica nakon završetka tretmana. No, ako se pojave aplikacije neadekvatne sile i nema dovoljno kontrolnih pregleda, mogu nastati sljedeća patološka stanja: resorpcija korijena, povećana pomičnost zuba zbog sve većeg parodontnog prostora, promjena u transseptalnim i kolagenim vlaknima parodonta i pričvrstka, recesije gingive kao posljedica tankih desni i kosti, parodontni apsces i upala gingive zbog negativnog djelovanja bakterija biofilma, konstantne

Discussion

All *in vitro* and *in vivo* studies analyzing the action of normal forces on a healthy periodontium for the correction of malocclusion affirm that physiological phenomena, such as bone resorption at the site of the force and consequent apposition, may occur with no lasting negative effects after treatment. However, when incorrect force is applied and there is an absence of follow up, pathological conditions arise, such as root resorption, tooth mobility caused by an increase in the periodontal ligaments space, alterations in the collagen fibers in the bundle of transseptal fibers and throughout the connective tissue, gingival recession as a response of thin gingival tissue and bone, periodontal abscess and gingival in-

traume te varijacije u volumenu i biomehanici gingivne tekućine (3,14,17-20). Ovaj prikaz slučaja služi kao primjer i potvrđuje sve navedeno u literaturi o visokim rizicima koje ortodonske naprave predstavljaju za parodontna tkiva. Navedena literatura zapravo su istraživanja koja se bave funkcijskom primjenom novih materijala kako bi se smanjile ili čak potpuno izbjegle štetne posljedice na parodontnim tkivima ako se poštuju tehnička i biološka načela primjene (5,21).

Isto je tako važno uzeti u obzir činjenicu da nepravilan ortodontski pomak predstavlja veliki rizik za parodontna tkiva, pa bi dobar specijalist morao znati kako adekvatnim metodama smanjiti tu opasnost. Tijekom tretmana specijalist i njegov/njezin tim moraju obavijestiti pacijenta o kontroli biofilma te ga poslati parodontologu na obradu kako bi se izbjegle ireverzibilne posljedice na parodontnom tkivu. Isto tako mora se istaknuti uzajamna povezanost između tehničke strane ortodontskog pomaka zuba i parodontnog tkiva bez izazivanja štete na parodontu (6,19,22). Toga nije bilo u ovom prikazu slučaja.

Zaključak

Ortodont mora znati principe biomehanike i reakcije tkiva koje nastaju kao odgovor na primjenu ortodontskih sila jer samo tako može spriječiti ireverzibilno oštećenje parodontnih tkiva, posebice kada se koristi silama veće jakosti. Iz navoda pacijentice možemo zaključiti da je ortodontsku terapiju počeo stomatolog koji nije bio specijalist ortodoncije. Ovaj prikaz slučaja jasno pokazuje koliko je važna povezanost specijalista ortodoncije i parodontologije u dijagnostičkim i terapijskim postupcima, uzimajući u obzir kompleksnu, multifaktornu etiologiju ijatrogenih patologija koje ugrožavaju parodontna tkiva zbog ortodontskog pomaka zuba.

flammation due to the sum of the action of the biofilm and constant trauma as well as variations in the volume and biomechanics of the gingival fluid (3,14,17-20). The clinical case presented here exemplifies this situation and corroborates the literature, which recognizes that orthodontic appliances constitute a high risk of harm to periodontal tissues. The indexed literature offers studies that address the functional applicability of new materials with the aim of minimizing or even avoiding irreversible harm to these tissues and applying these materials in compliance with technical and biological principles (5,21).

It is also important to consider that incorrectly performed orthodontic movement places the tissues involved at risk, especially periodontal tissues, and knowing how to reduce this risk with adequate measures is the job of a qualified professional. Throughout treatment, the professional and his/her team must inform the patient regarding the self-control of dental biofilm and send him/her to the periodontist for specific therapeutic measures with the aim of avoiding future irreversible harm to the periodontium. It should also be stressed that there is reciprocity in the technical relations applied to orthodontic movement with periodontal tissues without causing greater harm (6,9,22). This behavior was not observed in the clinical case described here.

Conclusion

In conclusion, an orthodontist must have adequate knowledge regarding the principles of biomechanics and the tissue reactions that occur in response to the application of orthodontic forces in order to prevent irreparable damage to the periodontal tissues, especially when these forces are beyond normal patterns. The patient's history showed that the professional that had initiated the treatment was not a specialist in orthodontics. The case reported here points to the fundamental importance of diagnostic and therapeutic collaboration between the orthodontist and periodontist, considering the complex, multifactor etiology of iatrogenic pathologies that compromise periodontal tissues when orthodontic movement is performed.

Abstract
The aim of the present study was to demonstrate that a lack of knowledge on the biomechanics and physiology of tissues involved in the correction of any type of malocclusion can result in iatrogenic alterations in the periodontium. Moreover, the integration of different fields of dentistry, especially orthodontics and periodontics, is of considerable importance, as the former requires the functional integrity of the periodontal tissue. This tissue must also remain healthy throughout treatment as well as following the conclusion of orthodontic therapy.

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Key words
Periodontal Abscess; Tooth Movement, Iatrogenic Disease

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