

Root Canal Treatment of an Extensive Periapical Lesion

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SUMMARY

Chronic apical periodontitis (CAP) is one of the most common endodontic diagnosis caused by microbial infection within the root canal system of the affected tooth. Endodontic therapy is one of the possible treatment modalities for CAP, but the prognosis depends on numerous factors. The size of the periapical lesion is always singled out as one of the most significant, as its increase drastically decreases the degree of success of endodontic therapy. Certain periapex radiographic indices (PAI, CBCT-PAI, PESS) are used to evaluate the size and characteristics of the periapical lesion, as well as to monitor the outcome of the implemented therapy. A 30-year-old patient presented with pain caused by an acute exacerbation of CAP on tooth 37. Radiographic analysis revealed the presence of an extensive, diffuse radiolucency in the area of tooth 37. A complete endodontic procedure was performed. One year after, there were clear, radiographic signs of the reduction of the lesion. Findings of periapical radiographic indices indicated the success of therapy as well. The aim of this paper was to present, on one case from clinical practice, complete endodontic therapy protocol of an extensive periapical lesion with symptoms of exacerbation.

Keywords: apical periodontitis; apical cyst; endodontic treatment; periapical index; PAI; CBCT-PAI

INTRODUCTION

Chronic apical periodontitis (CAP) develops as a result of microbial infection within the root canal system of the affected tooth. It represents an important defense mechanism against bacterial penetration into the alveolar bone and other nearby or distant structures. In the essence of this condition lies chronic inflammation followed by periapical bone resorption, which is why the characteristic radiographic image shows radiolucency in the periapical area of affected tooth. CAP is most often asymptomatic in nature and usually does not show clinical symptoms such as pain or swelling except in possible phases of exacerbation of the disease. Therefore, the diagnosis of this condition is based on clinical findings and additional radiographic analyses. Tibúrcio-Machado et al. found that the prevalence of CAP when using orthopantomography, retroalveolar radiography, and cone beam computed tomography (CBCT) was 46%, 56%, and 70%, respectively [1].

According to the results of recent literature reviews and meta-analyses, the estimated prevalence of this disease in the world is 52% [1, 2], which means that more than half of the world's population has at least one tooth with CAP. A study conducted by Ilić et al. [3] on the part of urban population in Serbia showed that 51.8% of the treated teeth had radiographic signs of CAP, with the frequency being significantly higher in teeth with inadequate compared to those with adequate root canal filling (72.2% and 25.9%, respectively). In support to the existence of a connection between CAP and general health, it should be mentioned that a significant difference of about 15% was observed in the frequency of CAP between healthy people and people

suffering from some chronic disease [1], where it is most often registered in diabetics [4, 5], cardiovascular patients [6, 7] and smokers [8, 9]. In addition, it was shown that CAP is significantly more often described around the roots of teeth that have been previously endodontically treated (39% - 41% of all treated teeth), compared to teeth that have not been previously treated (3%), which further complicates the performance of endodontic therapy and reduces degree of success of CAP treatment [1, 2, 3].

Endodontic therapy in cases of CAP gives a success rate of 53.6% to 87.8% [10, 11, 12]. Studies have shown [13] that increasing lesion size directly increases the failure rate of non-surgical endodontic therapy for CAP. Therefore, although it is not a contraindication for orthograde endodontic treatment, the size of the periapical lesion, its borders, as well as the relationship with the tooth roots and surrounding important anatomical structures must always be taken into account. In addition to this parameter, Ng et al. [14] state pain, presence of swelling or fistula, deep periodontal defects, achievement and preservation of apical patency, non-transfer of septic material through the apex, absence of exacerbations during therapy as significant pre-, intra- and postoperative prognostic factors, the elapsed time until the placement of definitive restoration and the quality of the crown seal.

Due to objective impossibility of histopathological analysis of each lesion, the definitive diagnosis of CAP is established by radiographic findings. Certain radiographic indices are available to clinicians in order to, in combination with clinical findings, evaluate the possibility of success of planned endodontic therapy. The PAI index (periapical index) [15] is a scoring system that evaluates the condition of



Figure 1. Retroalveolar radiograph done at first visit presenting previously treated lower, left second molar and an extensive radiolucency around both roots

Slika 1. Retroalveolarni radiogram sa početka terapije na kome se uočava prethodno lečen zub 37 sa ekstenzivnim rasvetljenjem oko oba korena

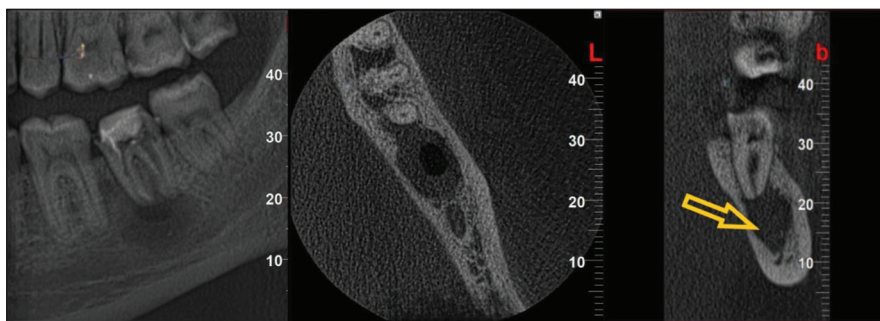


Figure 2. Representative sections from CBCT made right after the first visit: (a) coronal plane; (b) axial plane presenting well-defined radiolucency inside the bigger, diffuse radiolucency; (c) sagittal plane presenting breakdown of the roof of the mandibular canal

Slika 2. Reprezentativni preseki CBCT snimka načinjenog nakon dezopturacije i uspostavljanja transkanalne drenaže: (a) koronalni presek i (b) aksijalni presek, na kojima se uočava jasno ograničeno rasvetljenje unutar većeg difuznog; (c) sagitalni presek, na kome se uočava oštećenje krova mandibularnog kanala

the periapical bone on a retroalveolar radiograph, with the lowest score of 1 being assigned to a healthy apical periodontium, and the highest score being 5 to diffuse periapical radiolucency. CBCT-PAI (CBCT – periapex index) [16] is a scoring system for 3D radiographic findings obtained by CBCT, scores from 0 to 5, whereby the size of the lesion is determined linearly in three dimensions (buccal-oral, mesio-distal and diagonal), and the lesion is evaluated with the highest score. Radiolucencies smaller than 1 mm receive a score of 1, while the highest score of 5 is given to lesions that are larger than 8 mm in at least one dimension. The CBCT-PAI index, in addition to the grade, may also contain the letters E or D, which describe the expansion and destruction of the cortical bone, respectively. PESS (Periapical and Endodontic Status Scale) is a hybrid index [17] and differs from the previously described indices in that it not only evaluates the radiological characteristics of CAP, but also the quality of endodontic treatment. It consists of two indices (COPI and ETTI). COPI (Complex Periapical Index) evaluates CAP threefold, according to: the size of the lesion, its relationship with the root, i.e. the roots of the teeth, and the location of CAP in relation to important anatomical structures. ETTI (Endodontically Treated Tooth Index) evaluates the quality of endodontic treatment by analyzing: length of filling, homogeneity of filling, quality of crown sealing and possible presence of errors or complications (such as perforations, resorption, untreated canals, etc.).

The aim of this work is to present the effects of endodontic therapy of large periapical lesions on one case from clinical practice.

CASE REPORT

A 30-year-old male patient came to the Clinic of Restorative Odontology and Endodontics due to pain and swelling in the area of tooth 37. He did not report in his medical history any chronic disease and denied taking any medications. The patient stated that tooth 37 was primarily endodontically treated more than 10 years ago, and that

in the past 7 years, several exacerbations occurred during which he took antibiotics, without dental interventions.

The patient described the pain as unbearable, non responsive to analgesic therapy. It lasted for hours, constantly and extended over the entire left half of the face towards the ear and temple region. He stated that the swelling appeared one day before reporting to this institution. Clinical examination revealed submandibular extraoral and intraoral swelling in the area of the tooth 37, that had a metal-ceramic crown and with exceptional sensitivity to percussion. Analysis of the retroalveolar image (Figure 1) revealed a diffuse, ellipsoidal extensive radiolucency, approximately 10 × 12 mm around both roots of the tooth 37. It was assigned a score of 5 according to the PAI index (diffuse radiolucency). A shadow corresponding to a metal intracanal post was observed in distal canal.

In order to relieve pain, the metal-ceramic crown and the intracanal post were removed in the same visit. Root canal filling material was removed from canals and transcanal drainage was established in each canal to the size of the apex of K#40 master file. Abundant purulent content was obtained, and the tooth was allowed to drain spontaneously. Antibiotic therapy was prescribed (Amoxiclav tab. 1.0) and advice was given on cold compresses. The patient was referred for a small-field CBCT scan of the region of the tooth 37. Analysis of the CBCT scan (Figure 2) described a diffuse change of grade 5 according to the CBCT-PAI index (dimensions 13.5×10×9.3 mm), within which a clear limited radiolucency was described. (dimension 4×4×5.5 mm). On the COPI scale, the change is graded S3 (the highest grade that refers to the size of the lesion and which is used to evaluate changes greater than 5mm in one of its dimensions), R2 (the grade that describes the relationship of the change to the roots of the teeth and is assigned to lesions that are in contact with more than one root, while not affecting the area of furcation) and D2 since the roof of the mandibular canal was damaged (a score that describes the localization of the lesion in the bone and which indicates lesions that communicate with important anatomical structures, but did not lead to destruction of cortical jaw bones). In addition, significant thinning of the lingual lamella of the



Figure 3. Retroalveolar radiograph done three months after therapy presenting healing of radiolucency and appearance of thin calcification of the central lesion wall

Slika 3. Retroalveolarni radiogram načinjen tri meseca posle početka terapije, na kome se uočava smanjenje veličine rasvetljenja, kao i formiranje tankog zasenčenja zida centralne promene

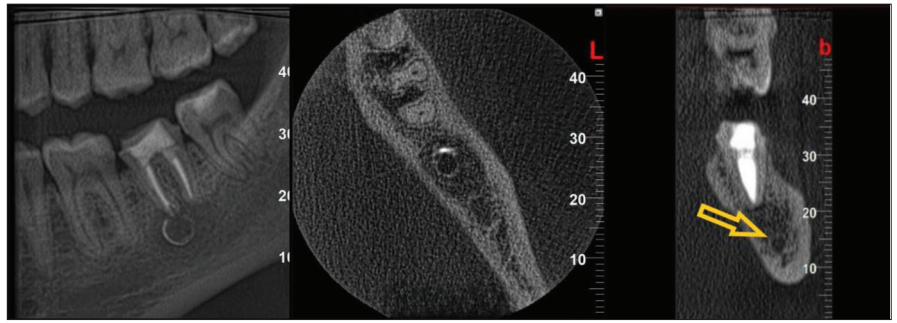


Figure 4. Representative sections from CBCT made one year after therapy: (a) coronal and (b) axial plane presenting reduction of diffuse lesion as well as calcification of the wall of central radiolucent lesion; (c) sagittal plane presenting newly formed mandibular canal roof

Slika 4. Reprerativni preseki CBCT snimka godinu dana posle terapije: (a) koronalni presek i (b) aksijalni presek, na kojima se uočava smanjenje dimenzija difuzne promene, kao i kalcifikacija zida jasno ograničene promene sa početka; (c) sagitalni presek, na kome se uočava ponovno formiranje krova mandibularnog kanala

cortical jaw bone was also described. Since the tooth was de-optimised before the CBCT image was taken, it was not possible to evaluate the primary endodontic treatment with the three-dimensional ETI scale. However, the analysis of the two-dimensional retroalveolar radiogram describes a homogeneous obturation of adequate length, as well as the presence of an adequate coronary restoration that appears radiographically intact. The presence of endodontic complications such as perforations, root resorption, forgotten and untreated canals was not observed.

After complete relief of symptoms, which occurred a few days after the emergency treatment, the endodontic therapy continued. The canals were prepared using the double cone technique. Apex preparation was completed with a K#60 instrument in both mesial canals and a K#80 in the distal canal. For irrigation, the following were used: 0.5% NaOCl, 10% citric acid, saline and 2% CHX with ultrasonic activation. In the course of further therapy in the third visit, about 5 ml of serous content was obtained from the mesial canals by transcanal aspiration with a standard syringe and a 27G needle. Fresh Ca(OH)₂ paste was used as an intracanal medication, which was applied three times for 7 days. One month after the start of therapy, in the absence of symptoms and clinical signs of infection, tooth 37 was definitively filled with AH plus endodontic paste (Dentsply Sirona, Tulsa, Oklahoma, USA) and gutta-percha points using the cold lateral compaction method. The tooth was closed with a temporary material based on resin-reinforced glass ionomer cement Fuji II (GC Europe, Louvain, Belgium), and after 7 days a temporary acrylic crown was placed.

At the first check-up, after 3 months, the patient was without symptoms, and a comparative analysis of new (Figure 3) and the primary retroalveolar radiograph (Figure 1) showed a decrease in the size of the radiolucency, as well as formation of a thin shadowing of the wall of the central change. Radiolucency still remains in the domain of two-dimensional assessment PAI 5. At the next check-up, after one year, a small-field control CBCT was

performed (Figures 4), which showed a decrease in the size of CAP in all three dimensions (11.4×7.5×7.6 mm). However, the lesion still remains in CBCT-PAI grade zone 5. Also, the thickening of the lingual lamella and formation of the roof of the mandibular canal, as well as semi-circular linear light corresponding to the hypercalcified bone in the central zone are observed. On the COPI scale, although the lesion has decreased, it still remains in the domain of S3 and R2, while in relation to important anatomical structures it receives a lower value of D1. The ETI index is now L0, H1, CS2 and CF0, which indicates adequate length (L0) and homogeneity of filling (H1), as well as the absence of visible errors and complications (CF0). A temporary crown remained on the tooth even during this check-up, with the patient's explanation that time constraints prevented a visit to the prosthodontist and definitive treatment with a new crown. Therefore, coronary restoration was assessed as inadequate (CS2).

DISCUSSION

Currently available evidence does not provide clinicians with reliable and clear guidelines for the management of extensive periapical lesions. There is no evidence of superiority of surgical compared to non-surgical approach to the treatment of CAP after one year, nor after 4 and 10 years [18]. For the treatment of primary lesions, clinicians generally opt for an endodontic approach, while for the treatment of secondary lesions, they more often opt for a surgical approach [19, 20]. However, in the era of endodontic microscopes, ultrasound preparation and irrigation, as well as better instrumentation that ensures a more certain retreatment outcome, the need for primary surgical therapy is decreasing [21, 22].

In the tooth shown, the presence of clearly limited radiolucency within the larger periapical diffused lesion indicates the existence of a cystic formation within the granuloma, which is consistent with clear, serous content

obtained by transcanal aspiration. Transcanal aspiration was performed after it was noticed that the root canals of the teeth were intensively filled with clear content and that it was not possible to dry them in the initial stages of therapy. Since the apical preparation was done with #60 and #80 canal files, it was possible to pass the needle (27G) passively over the tip of the root of the tooth and aspirate contents without further dentin removal. Transcanal aspiration is not part of the usual endodontic protocol in the treatment of CAP, but decompression achieved this way has been suggested as a method that can sometimes give success [23]. This way, with the synergistic effect of decompression of the cyst walls and an adequate antimicrobial protocol enhanced by the activation of irrigants, the prerequisites for healing of periapical lesion were created.

Complete calcification of the walls of the cystic lesion, clearly visible on the control CBCT image, may be a consequence of the collapse of the epithelial cover of the cyst and its demarcation by a defensive osteogenic reaction. We interpret this as a sign of arresting the pathological process, while monitoring the condition of the bone in the following years is of course necessary. Large periapical lesions that clinically and radiographically correspond to apical cysts with transcanal drainage and full mechanical-drug root canal treatment may respond well to non-surgical endodontic therapy [24].

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Endodontska terapija velike periapeksne lezije

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KRATAK SADRŽAJ

Hronični apeksni periodontitis predstavlja jedno od najrasprostranjenijih endodontskih oboljenja, a razvija se kao posledica infekcije u kanalu korena zuba. Endodontska terapija jedan je od mogućih modaliteta lečenja hroničnog apeksnog periodontitisa, a prognoza uspeha zavisi od brojnih faktora. Kao jedan od najznačajnijih uvek se izdvaja veličina periapeksne lezije, sa čijim povećanjem drastično opada stepen uspeha endodontske terapije. Za evaluaciju veličine i karakteristika periapeksne lezije, kao i praćenje ishoda sprovedene terapije koriste se određeni periapeksni radiografski indeksi (PAI, CBCT-PAI, PESS). Pacijent starosti 30 godina javio se zbog bolova uzrokovanih akutnom egzarcerbacijom hroničnog apeksnog periodontitisa na zubu 37. Radiografska analiza pokazala je postojanje velikog difuznog rasvetljenja u predelu zuba 37. Realizovana je kompletna endodontska intervencija i nakon godinu dana uočavaju se radiografski znaci smanjenja lezije, a nalazi periapeksnih radiografskih indeksa ukazuju na uspeh terapije. Cilj ovog rada je bio da se na jednom slučaju iz kliničke prakse prikaže postupak ortogradne endodontske terapije velike periapeksne lezije sa simptomima egzarcerbacije.

Ključne reči: hronični apeksni periodontitis; apikalna cista; endodontska terapija; periapeksni indeks; PAI; CBCT-PAI

UVOD

Hronični apeksni periodontitis (HAP) razvija se kao posledica infekcije u kanalu korena i predstavlja važan odbrambeni odgovor organizma na prodor mikroorganizama u alveolarnu kost i druge, bliske ili udaljene strukture. Patološki supstrat ove promene je hronična inflamacija praćena resorpcijom periapeksne kosti, zbog čega je i karakteristična radiografska slika prisustvo rasvetljenja u zoni vrha korena obolelog zuba. Hronični apeksni periodontitis je najčešće asimptomatske prirode i obično ne pokazuje kliničke simptome poput bola ili otoka, osim u mogućim fazama egzarcerbacije bolesti. Stoga se dijagnoza ovog stanja postavlja na osnovu kliničkog nalaza i dodatnih radiografskih analiza. Tibúrcio-Machado i sar. su utvrdili da je prevalenca HAP-a kada je korišćena ortopantomografija, retroalveolarna radiografija i kompjuterizovana tomografija konusnog snopa (CBCT) redom bila 46%, 56% i 70% [1].

Prema rezultatima skorašnjih pregleda literature i metaanaliza procenjena prevalenca ovog oboljenja u svetu je 52% [1, 2], što znači da više od polovine svetske populacije ima makar jedan zub sa HAP-om. Studija koju su sproveli Ilić i sar. [3] na delu urbane populacije Srbije pokazala je da je 51,8% lečenih zuba imalo radiografske znake HAP-a, pri čemu je učestalost bila značajno veća kod zuba s neodgovarajućim u odnosu na one s odgovarajućim punjenjem kanala korena (72,2% i 25,9%, redom). U prilog postojanju veze između HAP-a i opšteg zdravlja treba pomenuti da je primećena značajna razlika, od oko 15%, u učestalosti HAP-a između zdravih osoba i osoba koje boluju od neke hronične bolesti [1], pri čemu je najčešće registrovana kod dijabetičara [4, 5], kardiovaskularnih pacijenata [6, 7] i pušača [8, 9]. Dodatno, pokazano je da se HAP značajno češće opisuje oko korenova zuba koji su prethodno endodontski lečeni (39–41% svih lečenih zuba) u odnosu na zube koji nisu prethodno zbrinjavani (3%), što dodatno otežava izvođenje endodontske terapije i smanjuje stepen uspeha lečenja HAP-a [1, 2, 3].

Endodontska terapija u slučajevima HAP-a daje stepen uspeha od 53,6% do 87,8% [10, 11, 12]. Studije su pokazale [13] da se povećanjem veličine lezije direktno povećava stepen neuspeha nehirurške endodontske terapije HAP-a. Stoga, iako ne

predstavlja kontraindikaciju za ortogradni endodontski tretman, veličina periapeksne lezije, njene granice, kao i odnos sa korenovima zuba i okolnim važnim anatomskim strukturama uvek se moraju uzeti u obzir. Pored ovog parametra, Ng i saradnici [14] kao značajne preoperativne, intraoperativne i postoperativne prognostičke faktore navode bol, postojanje otoka ili fistule, duboke periodontalne defekte, postizanje i očuvanje apikalne prohodnosti, neprebacivanje septičnog materijala preko apeksa, odsustvo egzarcerbacija u toku terapije, proteklo vreme do postavljanja definitivne restauracije i kvalitet krunicnog zaptivanja.

Budući da se, zbog objektivne nemogućnosti histopatološke analize svake lezije, definitivna dijagnoza HAP-a postavlja radiografskim nalazom, kliničarima su dostupni određeni radiografski indeksi kako bi, u kombinaciji sa kliničkim nalazom, procenili mogućnost uspeha planirane endodontske terapije. PAI indeks (periapikalni indeks) [15] je sistem bodovanja kojim se ocenjuje stanje periapeksne kosti na retroalveolarnom radiogramu, pri čemu se najniža ocena – 1 dodeljuje zdravom apeksnom parodontijumu, a najviša ocena – 5 difuznom periapeksnom rasvetljenju. CBCT-PAI (CBCT – periapeksni indeks) [16] predstavlja sistem bodovanja 3D radiografskog nalaza dobijenog primenom CBCT-a, ocenama od 0 do 5, pri čemu se veličina lezije linearno određuje u tri dimenzije (bukooralnoj, meziodistalnoj i dijagonalnoj), a lezija se ocenjuje najvećom ocenom. Rasvetljenja manja od 1mm dobijaju ocenu 1, dok najveću ocenu – 5 dobijaju lezije koje su veće od 8 mm u makar jednoj dimenziji. CBCT-PAI pored ocene može sadržati i slova E ili D, koja opisuju redom ekspanziju, odnosno destrukciju kortikalne kosti. PESS (Periapical and Endodontic Status Scale) hibridni je indeks [17] i razlikuje se od prethodno opisanih indeksa po tome što ne ocenjuje samo radiološke karakteristike HAP-a već i kvalitet endodontskog lečenja. Sastoji se iz dva indeksa (COPI i ETTI). COPI (Complex Periapical Index) trostruko ocenjuje HAP i to prema veličini lezije, njenom odnosu sa korenom, odnosno korenovima zuba, i lokacijom HAP-a u odnosu na značajne anatomske strukture. ETTI (Endodontically Treated Tooth Index) ocenjuje kvalitet endodontskog lečenja analizirajući dužinu punjenja, homogenost punjenja, kvalitet krunicnog zaptivanja i eventualno

prisustvo grešaka ili komplikacija (poput perforacija, resorpcija, neobrađenih kanala itd.).

Cilj ovog rada je da se na jednom slučaju iz kliničke prakse prikažu efekti endodontske terapije velikih periapikalnih lezija.

PRIKAZ SLUČAJA

Pacijent muškog pola, starosti 30 godina, javio se na Kliniku za bolesti zuba zbog bola i otoka u predelu zuba 37. U anamnezi navodi da ne boluje od hroničnih bolesti i negira uzimanje ikakvih lekova. Pacijent je naveo da je zub 37 primarno endodontski lečen pre više od 10 godina, kao i da su se u proteklih sedam godina nekoliko puta javljale egzacerbacije, u toku kojih je uzimao antibiotike, bez stomatoloških intervencija.

Pacijent je opisivao bol kao neizdrživ, koji nije prolazio na analgetsku terapiju, koji je trajao satima, konstantno i pružao se celom levom polovinom lica ka uhu i slepoočnici. Naveo je da se otok pojavio jedan dan pre javljanja u ovu ustanovu. Kliničkim pregledom uočen je submandibularni ekstraoralni, kao i intraoralni otok u predelu zuba 37, koji je bio zbrinut metalokeramičkom krunom i sa izuzetnom osetljivošću na perkusiju. Analizom retroalveolarnog snimka (Slika 1) uočeno je difuzno, elipsoidno ekstenzivno rasvetljenje, približnih dimenzija 10×12 mm oko oba korena zuba 37. Dodeljena mu je ocena 5 prema PAI indeksu (difuzno rasvetljenje). U distalnom kanalu se uočava senka koja odgovara metalnom intrakanalnom kočiću.

U cilju pružanja prve pomoći, u istoj poseti uklonjena je metalokeramička kruna, kao i intrakanalni kočić. Svi kanali su dezopturirani i u svakom je uspostavljena transkanalna drenaža do veličine apeksne master turpije K#40. Dobijen je obilan gnojni sadržaj, a zub je ostavljen da se spontano drenira. Ordinirana je antibiotska terapija (Amoksiklav tabl. 1,0) i dat savet o hladnim oblogama. Pacijent je upućen da uradi CBCT snimak malog polja regije zuba 37. Analizom CBCT snimka (Slika 2) opisuje se difuzna promena ocene 5 prema CBCT-PAI indeksu (dimenzija $13,5 \times 10 \times 9,3$ mm) unutar koje se opisuje jasno ograničeno rasvetljenje (dimenzija $4 \times 4 \times 5,5$ mm). Na COPI skali promena dobija ocene S3 (najveća ocena koja se odnosi na veličinu lezije i kojom se ocenjuju promene veće od 5 mm u jednoj od svojih dimenzija), R2 (ocena kojom se opisuje odnos promene s korenovima zuba i koja se dodeljuje lezijama koje su u kontaktu sa više od jednog korena, a pri tome nisu zahvatile predeo furkacije) i D2, budući da je narušen krov mandibularnog kanala (ocena kojom se opisuje lokalizacija lezije u kosti i kojom se označavaju lezije koje komuniciraju sa važnim anatomskim strukturama, a nisu dovele do destrukcije kortikalne kosti vilice). Pored toga, opisuje se i značajno istanjenje lingvalne lamele kortikalne kosti vilice. Budući da je zub dezopturisan pre nego što je načinjen CBCT snimak, nije bilo moguće primarno endodontsko lečenje oceniti trodimenzionalnom ETTI skalom. Međutim, analizom dvodimenzionalnog retroalveolarnog radiograma opisuje se homogena opturacija adekvatne dužine, kao i prisustvo adekvatne koronarne restauracije koja radiografski deluje intaktno. Ne uočava se prisustvo endodontskih komplikacija poput perforacija, resorpcija korena, zaboravljenih i netretiranih kanala i slično.

Nakon potpunog smirivanja simptoma, koje se javilo nekoliko dana nakon urgentnog tretmana, endodontska terapija je nastavljena. Kanali su preparisani tehnikom dvostrukog konusa.

Apeksna preparacija završena je instrumentom K#60 u oba mezijalna kanala i K#80 u distalnom kanalu. U irigaciji su korišćeni 0,5% NaOCl, 10% limunska kiselina, fiziološki rastvor i 2% CHX uz ultrazvučnu aktivaciju. U toku dalje terapije u trećoj poseti, transkanalnom aspiracijom učinjenom standardnom brizgalicom i iglom promera 27G iz mezijalnih kanala dobijeno je oko 5 ml seroznog sadržaja. Kao intrakanalni medikament korišćena je sveža pasta $\text{Ca}(\text{OH})_2$, koja je postavljena tri puta na po sedam dana. Nakon mesec dana od početka terapije, u odsustvu simptoma i kliničkih znakova infekcije, zub 37 je definitivno opturisan AHplus endodontskom pastom (Dentsply Sirona, Tulsa, Oklahoma, SAD) i gutaperka poenima metodom hladne lateralne kompakteže. Zub je zatvoren privremenim materijalom na bazi smolom ojačanog glasjonomernog cementa Fuji II (GC Europe, Luven, Belgija), a posle sedam dana postavljena je privremena akrilatna kruna.

Na prvoj kontroli, nakon tri meseca, pacijent je bio bez simptoma, a uporednom analizom novog (Slika 3) i primarnog retroalveolarnog radiograma (Slika 1) uočava se smanjenje veličine rasvetljenja, kao i formiranje tankog zasenčenja zida centralne promene. Rasvetljenje još uvek ostaje u domenu dvodimenzionalne ocene PAI 5. Na sledećoj kontroli, nakon godinu dana, načinjen je kontrolni CBCT malog polja (Slika 4), na kome se uočava smanjenje veličine HAP-a u sve tri dimenzije ($11,4 \times 7,5 \times 7,6$ mm). Međutim, lezija i dalje ostaje u zoni ocene 5 CBCT-PAI. Takođe, uočava se zadebljanje lingvalne lamele i formiranje krova mandibularnog kanala, ali i polukružna linijska svetlina koja odgovara hiperkalcifikovanoj kosti u centralnoj zoni kao i na početku terapije. Na COPI skali, iako je došlo do smanjenja lezije, ona ipak ostaje u domenu S3 i R2, dok u odnosu prema važnim anatomskim strukturama dobija manju vrednost D1. ETTI indeks je sada L0, H1, CS2 i CF0, što govori o adekvatnoj dužini (L0) i homogenosti punjenja (H1), kao i o nepostojanju vidljivih grešaka i komplikacija (CF0). Na zubu je i tokom ove kontrole ostala privremena kruna sa pacijentovim obrazloženjem da su vremenska ograničenja onemogućavala posetu protetičaru i definitivno zbrinjavanje novom krunom. Stoga je koronarna restauracija ocenjena kao neadekvatna (CS2).

DISKUSIJA

Trenutno dostupni dokazi ne pružaju kliničarima pouzdane i jasne smernice za lečenje ekstenzivnih periapikalnih lezija. Ne postoje dokazi o superiornosti hirurškog u odnosu na nehirurški pristup lečenju HAP-a posle godinu dana, kao ni posle 4 i 10 godina [18]. Kliničari se za lečenje primarnih lezija uglavnom odlučuju za endodontski pristup, dok se za lečenje sekundarnih lezija češće odlučuju za hirurški pristup [19, 20]. Međutim, sa pojavom endodontskih mikroskopa, ultrazvučne preparacije i irigacije, kao i boljeg instrumentarijuma koji obezbeđuje izvesniji ishod retreatmana, potrebe za primarnom hirurškom terapijom se smanjuju [21, 22].

Kod prikazanog zuba prisustvo jasno ograničenog rasvetljenja unutar veće periapikalne difuzne lezije ukazuje na postojanje cistične tvorevine unutar granuloma u skladu sa čime je i bistar, serozni sadržaj dobijen transkanalnom aspiracijom. Transkalana aspiracija je načinjena nakon što je primećeno da se kanali korena zuba intenzivno ispunjavaju bistrim sadržajem i da ih nije moguće posušiti u početnim fazama terapije. Budući

da je apikalna preparacija urađena kanalnim turpijama broj #60 i #80, bilo je moguće bez daljeg uklanjanja dentina pasivno preći iglom (27G) preko vrha korena zuba i aspirirati prisutan sadržaj. Transkanalna aspiracija nije deo uobičajenog endodontskog protokola u terapiji HAP-a, ali dekompresija postignuta na ovaj način predložena je kao metoda koja nekada može dati uspeh [23]. Na taj način, sinergičnim uticajem dekompresije zidova ciste i adekvatnog antimikrobnog protokola pospešenog aktivacijom irigansa stvoreni su preduslovi za izlečenje periapeksne lezije.

Potpuna kalcifikacija zidova cistične promene, koja je jasno uočljiva na kontrolnom CBCT snimku, može biti posledica kolapsa epitelnog pokrova ciste i njegove demarkacije odbrambenom osteogenom reakcijom. Ovo tumačimo kao znak zaustavljanja patološkog procesa, dok je praćenje stanja kosti narednih godina naravno neophodno. Velike periapeksne lezije koje klinički i radiografski odgovaraju apikalnim cistama uz transkanalnu drenažu i potpuno mehaničko-medikamentoznu obradu kanala korena zuba mogu dobro reagovati na nehiruršku endodontsku terapiju [24].