# Endodontsko liječenje 46 s četiri korijenska kanala: prikaz slučaja

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Sažetak

*Pacijentica u dobi od 30 godina javila se zbog povremenih smetnji u području 46. Nakon kliničkog pregleda kojim je utvrđena rubna pukotina na ispunu, bolnost na okomitu perkusiju i avitalnost zuba, učinjene su osnovne rtg snimke na kojima je vidljiva periapeksna promjena u području distalnoga korijena. Provedena je instrumentacija četiriju korijenskih kanala modificiranom "Balanced force" tehnikom. Kanali su ispunjeni Diaket punilom i standardiziranim gutaperka štapićima tehnikom hladne lateralne kondenzacije. U svim fazama provedene su radiološke kontrole.*

Ključne riječi: *donji prvi molar, endodontsko liječenje.*

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## Uvod

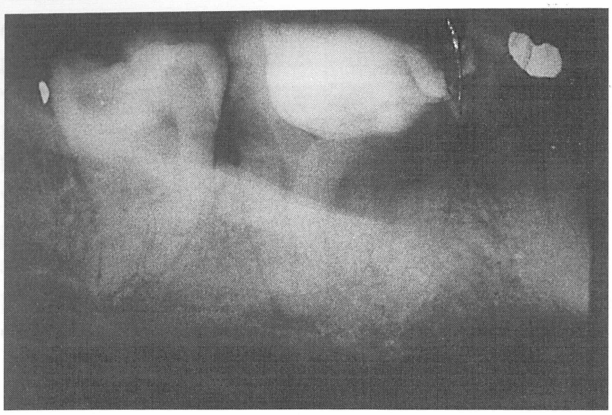
Uspješnost endodontske terapije ovisi o svim fazama liječenja, tj. odstranjenju organskoga tkiva i nekrotičnih dijelova i punjenju korijenskih kanala. Imperativ za provedeni postupak jest poznavati anatomiju i moguće varijacije u broju korijenova i u broju korijenskih kanala. Već je dokazano da molari donje čeljusti pokazuju niz varijacija u morfologiji. Njihov kanalni sustav sastoji se od multiplih kanala, obično povezanih transverzalnim anastomozama (1,2). Prvi donji molar, iako najstabilniji u skupini, pokazuje varijacije u broju korijenova i korijenskih kanala. Najčešće ima dva korijena i tri korijenska kanala, od toga dva mezijalna i jedan distalni (3) koji se javlja u 70% slučajeva. Dva distalna kanala utvrđena su u 30% slučajeva (4). Pineda i Kuttler (5) u svojem istraživanju navode da 5,3% od 300 mandibularnih molara imaju četiri kanala.

Svrha ovoga rada bila je prikazati endodontsko liječenje prvoga donjeg desnog kutnjaka s četiri korijenska kanala.

## Prikaz slučaja

Pacijentica u dobi od 30 godina javila se je zbog povremenih bolova u području prvoga donjeg desnog kutnjaka. Kliničkim pregledom utvrđena je rubna pukotina ispuna, bolnost na okomitu perkusiju i avitalnost zuba. Na radiološkoj snimci u području distalnog korijena vidljiv je patološki proces veličine 3x2mm (Slika1). Temeljem kliničkog i radiološkog pregleda postavljena je dijagnoza *Parodontitis apicalis chronica.*

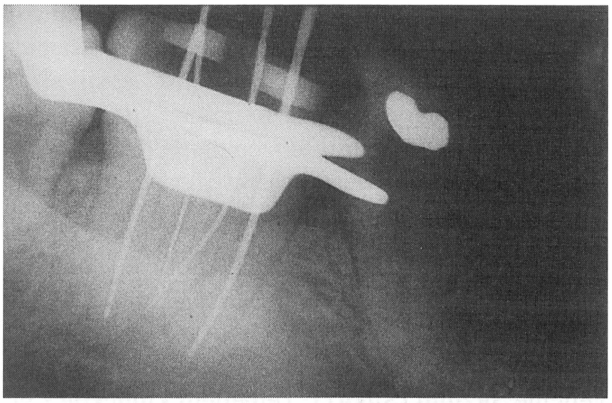
Provodnom anestezijom anesteziran je *nervus mandibularis* 2% Xylocainom (ESPE, Seefeld, Njemačka). Uklonjen je ispun i sav karijesno promijenjeni dentin te oblikovan endodontski kavitet i prikazano dno pulpne komorice. Pošto je postavljen Coffer dam, kavitet je ispran 2,5% natrij-hipokloritom i utvrđena je dužina korijenskih kanala uporabom endometra Endometar II (Artronic, Zagreb, Hrvatska). Provedena je instrumentacija četiriju korijenskih kanala modificiranom "Balanced force" tehnikom, uz obilno ispiranje 2,5% otopinom natrij-



Slika 1. *Prikaz patološkog procesa u području distalnog korijena*

Figure 1. *A pathological process in the area of the distal root*

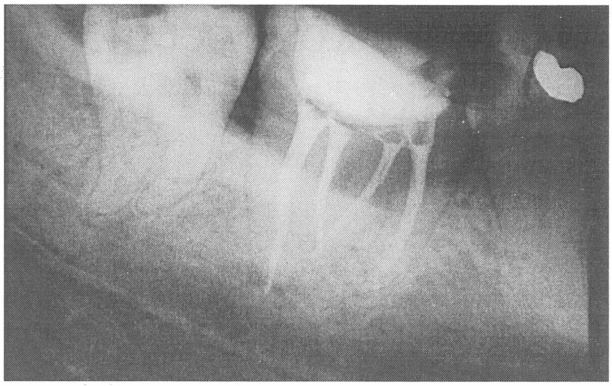
-hipoklorita. Napravljena je kontrolna radiološka snimka s ručnim endodontskim instrumentima u kanalima na kojoj se vidi prohodnost i oblik kanala prije punjenja (Slika 2).



Slika 2. *Kontrolna radiološka snimka s instrumentima u korijenskim kanalima*

Figure 2. *Control X-ray with instruments in the root canals*

Prije punjenja korijenski su kanali isprani 2,5% natrij-hipokloritom, posušeni papirnatim štapićima te ispunjeni tehnikom hladne lateralne kondenzacije uz uporabu standardiziranih gutaperka štapića i poliketonske smole Diaketa (ESPE, Seefeld, Njemačka). Napravljena je završna kontrolna radiološka snimka na kojoj se vidi odgovarajuća duljina i kompaktnost punjenja. Završno liječenje prikazano je na Slici 3.



Slika 3. *Ispunjeni korijenski kanali*

Figure 3. *Filled root canals*

## Rasprava

Istraživanja morfologije endodontskog prostora mandibularnih prvih molara pokazala su kompleksnost u broju i rasporedu korijenskih kanala. Postoji velika razlika u rezultatima između studija (6,7) koje mogu nastati ovisno o postupku ispitivanja, stupnju kalcificiranosti kanala i populaciji u kojoj se provodi ispitivanje (8). Pineda i Kuttler (5) u svojem su istraživanju rabili radiološku tehniku ispitivanja kojom nije moguće utvrditi ekstremno kalcificirane kanale ili kanale koji se međusobno superponiraju. Većina prvih donjih molara ima tri korijenska kanala kojih se širina razlikuje s obzirom na starost ispitanika. Ponekad je moguće pronaći ulaze u dodatni korijenski kanal koji je obično uži i teži za instrumentaciju. Ako ga se ne pronađe, to može biti uzrokom neuspjeha endodontskog liječenja zbog zaostalog pulpnog tkiva ili nekrotičnih masa. Goel i sur. (9) utvrdili su radiološkom studijom u 60 zuba pojavnost trećega kanala u mezijalnom korijenu u 15% slučajeva, a četiri kanala u 3,3%. Reeh (10) je prikazao endodontsko liječenje donjega prvog molara sa sedam korijenskih kanala. Pojavnost dvaju korijenskih kanala u distalnom korijenu kreće se oko 28,9% (11). Smatra se da dodatni kanali nastaju kao posljedica pregradnje unutar endodontskoga prostora tijekom starenja zuba. Instrumentacijom je moguće spojiti dva korijenska kanala u jedan jer su pregrade obično tanke.

Svrha ovoga rada bila je prikazati endodontsko liječenje donjega prvog desnog molara s četri korijenska kanala, dva smještena mezijalno i dva distalno, koji su se protezali od dna pulpne komorice do

vrška zuba. Distalni kanali bili su užeg promjera i otežavali instrumentaciju posebno apeksnog dijela. Potpunom obturacijom kanalnoga prostora pacijentica se je riješila bolova i zub je sačuvao svoju potpunu funkciju.

Poznavanje anatomije endodontskog prostora spriječava postotak neuspjeha liječenja zuba. Praktičar mora znati sve varijacije u broju korijenskih kanala radi izbjegavanja nekompletne instrumentacije i punjenja. Rtg snimka koja služi kao dodatni postupak za utvrđivanje anatomije samo je dvodimenzionalna projekcija trodimenzionalnog prostora i zbog superponiranja može prikriti pravi broj korijenskih kanala. Stoga bi tijekom zahvata trebalo napraviti dvije snimke iz različith projekcija kao bi se prikazao endodontski prostor.

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# Endodontic Treatment of 46 with Four Root Canals: Case Presentation

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Summary

*A female patient, aged 30 years, was admitted because of temporary pain in area 46. A clinical examination established a lateral fissure in the filling, sensitivity to vertical percussion and avitality of the tooth. Preoperative radiograph showed periapical change of the distal root. Instrumentation of the four root canals was performed by "Balanced Force Technique". The canals were filled with Diaket sealer and standardized gutta-percha points by "cold lateral condensation technique". Radiographs were taken at all stages.*

Key words: *endodontic treatment, first lower molar.*

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## Introduction

The success of endodontic treatment depends on all phases of root canal therapy, i.e. the removal of all soft tissue debris and the filling of root canal space. Knowledge of root canal anatomy and possible variation in the number of roots and root canals is an imperative for such treatment. It has already been proved that mandibular molars show different variations in morphology. Their canal space consists of multiple canals, usually connected by transversal anastomosis (1,2). The first lower molar, although the most stable in the group, shows variation in the number of roots and root canals. Normally mandibular first molars have two roots and three root canals, two mesial and one distal (3) that appear in 70%. Two distal canals have been found in 30%. Pineda and Kuttler (5) state that 5.3% out of 300 mandibular molars had four root canals.

A clinical case is presented demonstrating endodontic treatment of the first right mandibular molar with four root canals.

## Case report

A female patient, aged 30 years, was admitted because of temporary pain in the area of the first right mandibular molar. A clinical examination established a lateral fissure in the filling as well as sensitivity to vertical percussion and avitality of the tooth. Preoperative periapical radiograph showed a pathological process, 3x2 mm, in the area of the distal root (Figure 1). After a clinical and radiological examination, *Parodontitis apicalis chronica* was diagnosed.

The right inferior alveolar nerve was anaesthetized using 2% Xylocain (ESPE, Seefeld, Germany). The filling and all the carious dentin was removed and access to the cavity ensured. After rubber dam placement, the cavity was rinsed with 2.5% solution of sodium hypochlorite. The length of the root canals was determined by endometar II (Artronic, Zagreb, Croatia). Instrumentation of the root canals was done by modified "Balanced-Force Technique" and irrigated with 2.5% sodium hypochlorite solu-

tion. The control radiograph was taken with endodontic instruments to determine the length and form of the root canals before filling. The final irrigation was done with 2.5% sodium hypochlorite, dried with paper points and obturated with cold lateral condensation technique, using standardized gutta percha points and poliketon resin Diaket (ESPE, Seefeld, Germany). Postoperative radiograph shows the root filling (Figure 3).

## Discussion

Studies of the morphological structure of the first mandibular molars have demonstrated complexity in the number and distribution of root canals. There is a considerable difference in the results of the studies (6,7) due to differences in the examination methods, classification system and population being examined (8). In their examination Pineda and Kuttler (5) used radiographic technique which may not be able to detect extremely calcified canals or canals that are superimposed onto each other.

The majority of first lower molars have three root canals of varying size, according to the age of the tooth. However, it is possible to find other entrances to the root canal system from the pulp chamber which are usually not as wide and are more difficult for instrumentation. If it cannot be found this could lead to failure of the treatment because of the remaining pulp tissue or necrotic mass. In a radiographic study of 60 teeth, Goel et. al (9) reported that 15% had three canals in the mesial root. Four mesial canals were found in 3.3% of their samples. Reeh (10) showed endodontic treatment of the first mandibular molar with seven root canals. It is believed that additional canals occur as a results of remodelling inside the endodontic space during the aging of the tooth. It is possible during instrumentation to connect two root canals into one because the partitions are thin.

The present case report describes the treatment of a first mandibular molar with four root canals, two mesial and two distal with separate entrances. The diameter of the distal canals was much smaller than the mesial two and instrumentation was difficult, especially in the apical part. By complete obturation of the root canal system, the patient was relieved of pain and the tooth kept its function.

Knowledge of endodontic space lessens the percentage of failure in endodontic treatment. Clinicans should be aware of the differences in root canal morphology so as to avoid incomplete instrumentation and obturation of root canal space. Other methods such as X-ray procedures limit the three dimensional vieno to only two, and because of superposition, it could conceal the real number. Thus, during the procedure two radiographs from different projections should be taken in order to show the endodontic space.