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Kondenzirajući ostitis - prikaz slučaja

Condensing Osteitis - Case Report

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Sažetak

Kondenzirajući ostitis je patološko zadebljanje kosti u čeljustima, a karakteriziraju ga blagi klinički simptomi. Zadebljanje nastaje zbog poremećene pregradnje kosti, kao reakcija na blagu infekciju iz zubne pulpe.

Ekstremno zadebljanje kosti lijeve strane maksile uzrokovalo je i asimetriju lica, a kliničkim te radiološkim pregledom nije se mogla postaviti konačna dijagnoza. Diferencijalno-dijagnostički, u obzir su dolazili svi tumori koštanog tkiva i cementom te kondenzirajući ostitis zbog dugotrajnog neuspješnog konzervativno-endodontskog tretmana gornjega prvog molara.

Nakon kirurškog tretmana u lokalnoj anesteziji uklonjena je patološki promijenjena koštana masa i ekstrahirani zub uzročnik, jer se više nije mogao izliječiti konzervativnom terapijom. Patohistološki nalaz potvrdio je upalnu etiologiju koštane promjene. Postoperativni klinički i radiološki pregledi pokazali su potpunu sanaciju područja te koštano cijeljenje odgovarajuće gustoće i trabekularnosti.

Slučaj predstavljamo kao ekstremni primjer kondenzirajućeg ostitisa zbog veličine koštane promjene, a pokazuje kako i razmjerno blaga infekcija iz zuba može prouzročiti dosta velike koštane promjene.

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Ključne riječi

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Uvod

Kronični fokalni sklerozirajući osteomijelitis je lezija kod koje odebljavaju kosti u području apeksa zuba, a uzrok je blaga infekcija pulpe. Sinonimi za kronični fokalni sklerozirajući osteomijelitis su kondenzirajući i sklerozirajući ostitis (1). Lokalizirana područja sklerotične kosti nastaju unutar kostiju čeljusti, a uzrok mogu biti različiti agensi kao što su trauma, stres i infekcija (2). Ako je sklerotičnost kosti izravno uzrokovala infekcija, koristi se naziv kondenzirajući ostitis (3, 4), a nastaje kao rezultat kroničnoga, blagog podražaja iz korijenskog kanala. Podražaj koji uzrokuje reakciju kosti može biti upalno promijenjena zubna pulpa u slučaju kroničnog pulpitisa, ili mikroorganizmi slabe virulencije

Introduction

Chronic focal sclerosing osteomyelitis is a lesion characterized by growth of the periodical bone. Bone growth is caused by mild infection of dental pulp. The synonyms are condensing osteitis and sclerosing osteitis (1). Localized areas of sclerotic bone occur in jaw bones and can be caused by various agents such as trauma, stress or infection (2). When the occurrence of sclerotic bone is directly caused by infection, the lesion is termed condensing osteitis (3, 4). Condensing osteitis is caused by chronic, mild irritation of the root canal. Inflamed dental pulp in chronic pulpitis or low-virulence microorganisms in residual, necrotic pulp after inappropriate endodontic treat-

ako je riječ o ostatku nekrotične zubne pulpe zbog neodgovarajućeg liječenja korijenskih kanala (5-8).

Histološki, kondenzirajući ostitis, s obzirom na to da se kost neadekvatno remodelira, obično sadržava izmjenu normalne koštane srži s fibroznom vezivnim tkivom, a to ponekad prati upalni stanični infiltrat, formiranje nove kosti i koštani sekvstar. Upalni stanični infiltrat može biti rijedak i tada se teško otkriva (9-13). Kondenzirajući ostitis također sadržava gusto smještene trabekule s ograničenim prostorom koštane srži smanjene u veličini, tako da može nalikovati na kompaktnu kost (14, 15). Koštano tkivo je ispunjeno osteoplastima, a koštana srž sadržava infiltraciju limfocita (16). Važno je istaknuti da kod kondenzirajućeg ostitisa dominiraju osteoplastične aktivnosti, što rezultira apozicijom kosti. U ovom slučaju blaga periapikalna infekcija potaknula je apoziciju kosti (17, 18), što je vrlo često kod ljudi s vrlo visokim stupnjem otpornosti tkiva (19).

Radiološki, kondenzirajući ostitis izgleda kao uniformna gusta radioopakna masa u blizini apeksa zuba (7) s dobro definiranim rubovima i neoštrim prijelazima u okolnu kost, te kombiniran s gubitkom lamine dure apikalno i proširenjem periodontalne membrane (5, 20). Važno je razlikovati kondenzirajući ostitis od idiopatske skleroze koja najčešće nije vezana za patološke promjene u pulpi zuba - nije upalni ili neoplastični proces (21, 22). Etiologija idiopatske skleroze još nije razjašnjena. Riječ je o asimptomatskoj intrakoštaloj tvorbi nepoznatog podrijetla koja histološki odgovara neupalnoj trabekularnoj kosti (23). Mora se istaknuti da se idiopatska skleroza ne javlja samo u kostima čeljusti, nego i u drugim kostima u tijelu, kao što su zdjelica i duge kosti (24, 25). Neki autori idiopatsku osteoskleroza smatraju normalnom anatomskom varijacijom kosti (26).

U ovom radu opisujemo slučaj kondenzirajućeg ostitisa u području maksilarnoga prvog molara i njegovo kirurško uklanjanje.

Prikaz slučaja

Muškarac u dobi od 33 godine primljen je zbog zadebljanja alveolarnoga grebena lijeve strane maksile i povremenih blagih bolova u području prvoga lijevog maksilarnog molara. Koštano izobličene u posljednjih godinu dana toliko je naraslo da je čak počelo odmicati lijevi obraz te je postala vidljiva asimetrija lica.

Kliničkim pregledom usne šupljine uočena je bukalno kompaktna koštana masa dobro ograničenih

ment, may act as agents inducing bone response (5-8).

Histologically, due to impaired bone remodeling, condensing osteitis usually includes normal bone marrow exchange with fibrous connective tissue, occasionally accompanied by inflammatory cell infiltration, *de novo* bone formation, and presence of bone sequestrum. The inflammatory cell infiltrate can be rare and thus difficult to detect (9-13). Condensing osteitis also includes dense trabeculae with a limited area of bone marrow, reduced in size, thus possibly resembling compact bone (14, 15). The bone tissue includes osteoblasts, while bone marrow contains lymphocyte infiltrate (16). It should be noted that condensing osteitis is characterised by dominant osteoblast activity, that results in bone apposition. In this case, a mild periapical infection stimulates bone apposition (17, 18), frequently observed in subjects with a very high level of tissue resistance (19).

Radiologically, condensing osteitis appears as a uniform, dense, radiopaque mass adjacent to the apex of the tooth (7), with well defined margins and vague transition to the surrounding bone, combined with the loss of lamina dura apically and with widening of periodontal ligament space (5, 20). Condensing osteitis should be differentiated from idiopathic sclerosis, which is mostly unrelated to pathologic lesions of dental pulp, and is not an inflammatory or neoplastic process (21, 22). The etiology of idiopathic sclerosis has not been elucidated yet. It is an asymptomatic intraosseous growth, corresponding histologically to a non-inflammatory trabecular bone (23). It should be noted that idiopathic sclerosis does not only occur in jaw bones but also in other bones of the body such as pelvis and long bones (24, 25). Some authors consider idiopathic osteosclerosis as a normal anatomic bone variation (26).

In this article a case of condensing osteitis in the region of first upper molar and its surgical removal is presented.

Case Report

A 33-year-old man was admitted due to alveolar ridge growth on the left side of the maxilla and mild sporadic pain in the area of the first left upper molar. Over the past year, bone deformity had grown to such an extent that it was pushing the left cheek, with obvious facial asymmetry.

Clinical inspection of the oral cavity revealed a compact osseous buccal mass of well delineated margins and mildly inflamed, reddish mucosa in

rubova i blago upaljena crvena sluznica u području prvoga gornjeg lijevog maksilarnog molara (Slika 1.). Tvorba je bila palpatorno neosjetljiva. Gornji prvi maksilarni molar nije pokazivao nikakve reakcije na vertikalnu i lateralnu perkusiju. Pulpna komora zuba duže je bila otvorena i bez patološkog sadržaja. Pacijent je naveo endodontske zahvate na tom zubu tijekom proteklih 5 godina.

Pacijent je imao rendgensku sliku od prije godinu dana na kojoj se vidi, u području apeksa lijevoga maksilarnog molara, forma kroničnog apikalnog parodontitisa s gubitkom lamine dure (Slika 2.). Korijenski kanal je preinstrumentiran endodontskim instrumentom, a vjerojatna je i apikalna perforacija korijenskog kanala. Napravljena je RVG-slika gornjega maksilarnog molara te je pokazala izgled kroničnog apikalnog parodontitisa i koštanu masu koja superponira s korijenima gornjega maksilarnog molara (Slika 3). Pomoću RVG-programa Planmeca Dimaxis izmjerena je udaljenost korijenskog kanala maksilarnog molara od maksilarnog sinusa - iznosila je 1,2 mm. Odlučeno je da se potpuno ukloni koštana masa u području maksilarnog molara i sam zub te obavi modelacija kosti.

Kirurški zahvat obavljen je u lokalnoj infiltracijskoj anesteziji. Klasičnim mukoperiostalnim flapom prikazana je koštana masa, a uklonjena je kombinacijom kirurškog mikromotora s internim hlađenjem i kirurškim dljetom. Zub je izvađen kirurškim kliještima i to u jednom komadu (Slika 4). Nakon toga slijedila je ekskoleacija periapikalnog upalnog sadržaja i ispiranje rane fiziološkom otopinom. Zbog blizine maksilarnog sinusa (1.2 mm) moralo se jako paziti kako ne bi bilo dodatnih komplikacija (stvaranje antooralne komunikacije). Radi bržeg zacjeljivanja i što manje mogućnosti infekcije, u ranu je stavljeno nekoliko želatinskih spužvica Roeko Gelatamp® koje sadržavaju 5% koloidno srebro. Rana je zatvorena pojedinačnim neresorptivnim šavovima Ethicon Mersilk® Perma-Hand 3-0, a uklonjeni su nakon 7 dana, kada je obavljena i toaleta rane 3-% vodikovim peroksidom. Rana je cijelila uredno i bez komplikacija te se pacijent dobro osjećao. Na kontrolu je došao dva mjeseca nakon operacije te su tada učinjene kontrolne RVG i druge snimke. Snimka operiranog područja pokazala je uredno zacjeljenu sluznicu bez patoloških procesa i komplikacija (Slika 5), također nije bilo nikakvih patoloških formacija u kosti, a pokazivala je i odgovarajuću gustoću te kompaktnost bez patoloških translucencija (Slika 6).

Primarno se sumnjalo na periapikalni kondenzirajući ostitis, ali zbog veličine i masivnosti pojave

the region of the upper left first molar (Fig. 1). The growth was insensitive to palpation. The upper left first molar showed no response to vertical and lateral percussion. The pulp chamber of the tooth had been open for a long time, without pathologic content. The patient reported endodontic procedures on the tooth in the last five years.

A year-old radiograph revealed chronic apical periodontitis with the loss of lamina dura in the apical region of the left upper molar (Fig. 2). The root canal was treated over the apex that was perforated. Radiovisiograph (RVG) Planmeca Dixi2(Planmeca, Finland) digital imaging of the upper molar presented chronic apical periodontitis and a bone mass superimposed over roots of the upper molar (Fig. 3). The distance between the upper molar root canal and maxillary sinus, measured by the Planmeca Dimaxis(Planmeca, Finland) software program, was 1.2 mm. It was decided that the bone mass was to be removed, together with the tooth itself, and bone remodelled.

The procedure was performed in local infiltration anesthesia. The bone mass was exposed by a mucoperiosteal flap. The bone mass was removed using a combination of a surgical handpiece with internal cooling and a surgical chisel. The tooth was extracted and alveola was cleaned (Fig. 4) of the inflamed content, the wound rinsed with saline. Due to the vicinity of the maxillary sinus (1.2 mm), the procedure was performed with great care, to avoid any additional complications such as the maxillary sinus opening. Several Roeko Gelatamp® (Roeko-Coltène / Whaledent, Langenau, Germany) gelatin sponges containing 5% colloid silver were placed into the wound to facilitate healing and to prevent infection. The wound was closed by individual sutures (3-0 Ethicon Mersilk®, J&J, USA), that were removed after 7 days, when the wound was cleaned with 3% hydrogen peroxide. Uneventful wound healing, free of complication followed, and the patient felt well. Control RVG and other examinations were performed at 2 months postoperatively. Clinically we observed normally healed mucosa without any pathologic processes or complications (Fig. 5). The RVG image revealed no pathologic bone formation, and the bone showed appropriate density and consistency without any pathological translucencies (Fig. 6).

There was initial suspicion of a periapical condensing osteitis in this patient; however, other bone tissue tumors were also taken in consideration because of the size and extension of the lesion. A bone



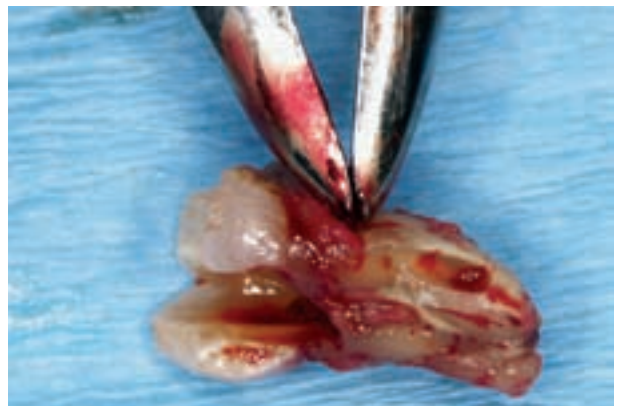
Slika 1. Upaljena crvenkasta sluznica u području /26/
Figure 1 Reddish mucosa in the region /26/



Slika 2. Retroalveolarna rendgenska snimka zuba /26/
Figure 2 Periapical radiograph of tooth/26/



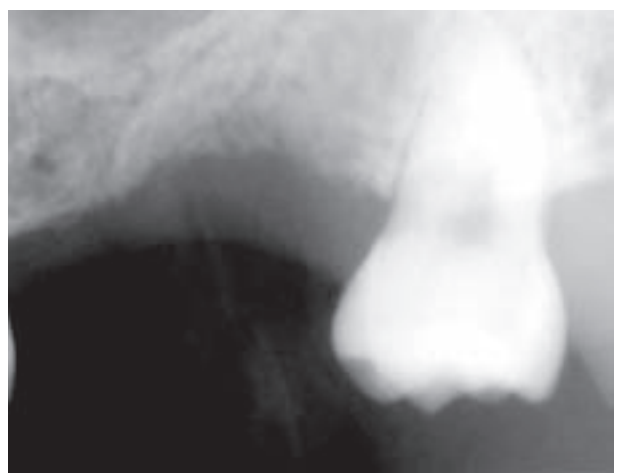
Slika 3. Kronični periapikalni parodontitis /26/ na RVG
Figure 3 Chronic apical periodontitis /26/ on
Radiovisiograph



Slika 4. Izvađeni zub /26/
Figure 4 Extracted tooth /26/



Slika 5. Zubni luk nakon operativnog zahvata
Figure 5 Dental arch after surgical treatment



Slika 6. RVG snimka nakon operativnog zahvata
Figure 6 Radiovisiograph after surgical treatment

u obzir su dolazili i tumori koštanog tkiva. Zato je uzorak koštanog tkiva poslan na patohistološku dijagnostiku i nalaz je pokazao koštani isječak nepravilnog oblika s najvećim promjerom od 1,5 cm. Histološki je to koštano tkivo bilo dijelom kompaktno s izraženim cementnim linijama, a dijelom trabekularna kost s masno promijenjenim medulom. U pojedinim dijelovima reaktivno promijenjenih gređica pronađena je osteoblastična aktivnost. Dva manja segmenta veličine 0,4 cm bila su histološki vezivno tkivo s limfoplazmacitoidnom upalnom infiltracijom.

Rasprava

Diferencijalna dijagnoza periapikalnih radioopaknih promjena može uključivati kondenzirajući ostitis i idiopatsku skleroza. Ostale periapikalne radioopakne promjene mogu biti različite fibro-osealne lezije i periapikalni cement (22, 27).

U radu Williamsa i Brooksa (28), od 187 radioopaknih lezija 53,5% klasificirano je kao idiopatska skleroza, a 46,5% kao kondenzirajući ostitis. Od toga je 91% lezija bilo lokalizirano u mandibuli, a samo 9 u maksili.

Kondenzirajući ostitis je uglavnom asimptomatska pojava, pa se može otkriti jedino pregledom rendgenograma. Tako su Williams i Brooks (28) pronašli kondenzirajući ostitis u 4,5% slučajeva, Wood i Goaz (29) u 8% pregledanih rendgenograma, a Marmary i Kutiner (30) u 6,7%.

Istraživanja Marmaryja i Kutinera (30) pokazala su da se kondenzirajući ostitis javlja u donjoj čeljusti u 91,25% slučajeva. To potvrđuje i rad Williamsa i Brooksa (28) u kojemu se kaže da se lezija u 91% slučajeva javlja u mandibuli. Razlika u pojavi lezije s obzirom na lokalizaciju, objašnjava se razlikama u opskrbi krvi i anatomiji kosti (31). Kondenzirajući ostitis je najčešće lokaliziran uz mandibularni prvi molar, a zatim slijedi mandibularni drugi molar. To se objašnjava čestim karijesom i opsežnim ispunima kod donjih molara, a posljedica je velika vjerojatnost za nastanak pulpitisa i nekrozu pulpe (23, 28, 30, 32, 33).

Veličina kondenzirajućeg ostitisa varira od 1 do 22 mm, s prosječnom širinom i visinom od 5 mm. Oblik varira od okrugloga (32%) i nepravilnog (64%) do U-oblika u 4% slučajeva (28).

Važno je istaknuti da kondenzirajući ostitis nastaje najčešće kod zuba s neliječenim dubokim karijesom, dubokim ispunom ili neliječenom pulpom. Takvi slučajevi često završavaju kroničnim pulpitisom, a posljedica je reaktivna osteogeneza u periap-

tissue sample was referred for histopathologic analysis. That showed partly compact bone with marked cement lines, and trabecular bone with fatty altered medulla. Osteoblastic activity was detected in some segments of the reactively altered trabeculae. Two minor segments of 0.4 cm in size showed connective tissue with inflammatory infiltration of lymphocytes and plasmocytes.

Discussion

Differential diagnosis of periapical radiopaque lesions, condensing osteitis and idiopathic sclerosis should be taken in consideration. Other periapical radiopaque changes may include various fibro-osseous lesions and periapical cementoma (22, 27). In the study by Williams and Brooks (28), 53.5% of 187 radiopaque lesions were classified as idiopathic sclerosis, and 46.5% as condensing osteitis, with 91% of the lesions localized in the mandible and only 9% in the maxilla. Condensing osteitis is generally an asymptomatic phenomenon which can be detected only on radiographs. So, Williams and Brooks (28) found condensing osteitis in 4.5%, Wood and Goaz (29) in 8%, and Marmary and Kutiner (30) in 6.7% of radiographically examined cases. The study by Marmary and Kutiner (30) showed condensing osteitis developing in the mandible in 91.25% of cases, which was confirmed by Williams and Brooks (28), who reported on the mandible to be involved in 91% of cases. Differences in the rate of condensing osteitis localization have been attributed to variation in blood supply and bone anatomy (31). Condensing osteitis is most commonly localized adjacently to the first mandibular molar, followed by second mandibular molar. This is explained by the high prevalence of caries and massive fillings in lower molars, with the high consequential probability of the development of pulpitis and pulp necrosis (23, 28, 30, 32, 33). The size of condensing osteitis may vary from 1 mm to 22 mm, with a mean width and height of 5 mm. In shape, it may vary from round (32%) to irregular (64%) and U-shape in 4% of cases (28). It should be noted that condensing osteitis develops most frequently around teeth with deep, untreated caries, deep filling, or untreated pulp. Such cases commonly lead to chronic pulpitis, which in turn entails reactive osteogenesis in the periapical region. These teeth are

eksnom području. Takvi zubi često su opskrbljeni protetskim radovima zbog čega su preopterećeni okluzalnim silama (34, 35).

Bender i Mori (36) pokazali su da liječenjem pulpe zuba, nestaju periapikalne sklerotične pojave i kost dobiva normalnu strukturu. Isto tako, u većini slučajeva nakon endodontskog tretmana nestaju patološke sklerotične pojave u periapikalnom tkivu (37, 38). Kako ističe Čelap-Pigac (39), od 1200 pregledanih ortopantomogramskih rendgenskih slika pojavnost kondenzirajućeg ostitisa iznosi 6,7%, a idiopatske skleroze 2,8%.

Pojava kondenzirajućeg ostitisa i idiopatske skleroze jednaka je kod muškaraca i žena (8, 22, 28, 39).

Redoviti kontrolni rendgenogrami presudni su za dijagnostiku kondenzirajućeg ostitisa, jer ovisno o stanju zuba možemo odabrati različite terapijske mogućnosti.

Slučaj smo opisali zbog veličine sklerotične tvorbe koja je odstupala od uobičajene, pa se sumnjalo i na neki od benignih tumora koštanog tkiva. Izabrana terapija bila je: kompletno ukloniti patološki promijenjene kosti i ekstrakcija zuba. Endodontsko liječenje samog zuba ne bi dalo željene rezultate zbog sumnje na vertikalnu frakturu zuba i/ili perforaciju korijena tijekom prijašnjih endodontskih zahvata.

usually submitted to prosthetic treatment, and being burdened with occlusal forces (34, 35). Bender and Mori (36) have demonstrated that periapical sclerotic lesions resolve with dental pulp treatment, and the bone shows normal structure. In the majority of cases, pathologic sclerotic lesions of periapical tissue also resolve after endodontic treatment (37, 38). Čelap-Pigac (39) report on condensing osteitis in 6.7% and idiopathic sclerosis in 2.8% of 1200 cases examined by orthopantomographic radiographs. There is no sex difference in the prevalence of condensing osteitis and idiopathic sclerosis (8, 22, 28, 39).

Regular control radiograph studies play a crucial role in the diagnosis of condensing osteitis. In the management of condensing osteitis, a number of therapeutic options are available and the choice depends on the tooth condition. This case was presented because of the size, which exceeded the usual findings by far, so that even benign tumors of the osseous tissues were suspected. *In toto* removal of the pathologically altered bone with tooth extraction was the treatment of choice. Endodontic therapy of the tooth would not provide desirable results because of the suspected vertical fracture of the tooth and/or root perforation caused by previous endodontic procedures.

Abstract

Condensing osteitis is pathologic growth of the maxillomandibular bones, characterized by mild clinical symptoms. Bone thickening reflects impaired bone rearrangement in response to the mild infection of dental pulp. This case report describes a patient with extreme bone thickening localized in the left maxilla causing facial asymmetry. Clinical and radiological examination failed to point to definitive diagnosis. On differential diagnosis, all bone tissue tumors, cementoma and condensing osteitis with prolonged unsuccessful conservative endodontic treatment of the upper first molar, were considered. A surgical procedure in local anesthesia was performed in order to remove the pathologically altered bone mass and to extract the tooth that could not have been treated successfully. Histopathologic analysis confirmed the inflammatory etiology of the bone lesion. Clinical and radiological follow-up indicated complete healing of the area, with appropriate density and trabeculation of the bone. This case presents as an extreme example of condensing osteitis with major bone lesion, caused by a mild tooth infection.

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Key words

osteitis; infection; jaw; dental pulp

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