Procjena spontanog zacjeljivanja kosti nakon enukleacije velike rezidualne ciste u maksili bez korištenja presadaka: prikaz slučaja

Evaluation of Spontaneous Bone Healing After Enucleation of Large Residual Cyst in Maxilla without Graft Material Utilization: Case Report

Introduction

Cystic lesions of the jaws are a relatively commonly encountered pathology. Fortunately, approximately 86% of them are periapical lesions and their treatment is not complex (1). Large cysts of the jaws are rare and mainly result to be follicular cysts and keratocysts. Scientific community still continues to use the term 'odontogenic keratocyst' more favorably than 'keratocystic odontogenic tumor' although both terms remain acceptable synonyms (2). However, radicular and residual cysts can also grow substantially in size, thus causing considerable osseous defects (3).

Sažetak

Cistične lezije čeljusti kao što su keratociste (naziv je vraćen i smatra se boljim negoli keratocistični odontogeni tumori, iako su pojmovi i dalje prihvatljivi sinonimi), folikularne i radikularne ciste te rezidualne ciste mogu dosegnuti velike razmjere i uzrokovat će znatnu razgradnju kosti. Enukleacija cističnih lezija u čeljusti oštćuje kosti koje se mogu regenerirati spontano ili nakon intervencije korištenjem autogenih koštnih transplantata ili drugih materijala za njihovo nadomještanje. U ovom kliničkom istraživanju opisuje se spontana regeneracija kosti nakon enukleacije rezidualne ciste u distalnom dijelu maksile. Njezin napredak praćen je na temelju kliničkog pregleda, rendgenske pro-cjene i subjektivnih simptoma pacijenta. Regeneracija kosti i smanjenje cistične šupljine dokumentirani su nakon šest mjeseci i poslije jedne godine na panoramskoj rendgenskoj snimci. Fiziološki proces koagulacije osnova je za spontano stvaranje kosti, čak ako je košteni deo velik, pod uvjetom da je okružen dovoljno koštnih stijenki.

Uvod

Cistične lezije čeljusti razmjerne su česta patološka pojava. Srećom, oko 86 posto njih su periapikalne, pa liječenje nije složeno (1). Velike ciste u čeljusti rješete su i u uglavnom su posljedica folikularnih cista i keratocista. Znanstvena zajednica i dalje se više koristi terminom „odontogeno keratocista“ negoli „keratocistični odontogeni tumori“, premda su oba pojmna prihvatljiva (2). No, radikularne i rezidualne ciste također mogu značajno rasti, što uzrokuje velike koštno-ne deekte (3).

Rezidualne (radikularne) ciste razvijaju se od epitelnih ostataka čiju proliferaciju stimulira upalni odgovor koji nastaje iz nekrotične pulpne prije toga izvraćenih avitalnih zuba (4). Zapravo, to su radikularne ciste koje ostaju u čeljusti nakon vađenja zuba i nastavljaju autonomno rasti. S vremenom se može pojaviti regresija cista, stagnacija ili daljnji rast, ali nažalost malo se zna o njihovoj evoluciji i ekspanziji i zašto se uopće razvijaju (3). U usporedbi s drugim velikim cistama kao što su radikularne i folikularne ciste te keratociste, rezid
Velika rezidualna cista u maksili

Perjući i sur.

A 36 year-old female patient was referred to the Department of Oral Surgery, University Dental Clinical Center of Kosovo – Prishtina with a chief complaint of swelling in the right upper molar region, observed before one month. Her medical history did not reveal any health problems. Dental examination revealed the absence of the first molar (tooth 16 FDI) accompanied with a firm tumefaction located buccal -ly to the molar region of the right maxilla. Discoloration of the agonist teeth was noted, namely second molar and second premolar. During intraoral palpation of the tumefaction deep in the fornx, Dupuytren's phenomenon was detected.

Panoramic radiography revealed a radiolucent lesion on the right side of the maxillary molar region, approximately 35 mm in size in antero-posterior and 50 mm in crano-caudal direction (Figure 1). In order to fulfill the complete set of diagnostic criteria, aspiration with sterile syringe was performed and straw colored fluid, rich in cholesterol crystals, a characteristic of cystic cavity hygiene and subsequent enucleation not earlier than three months after the initial surgery. The method of choice for the treatment of cystic lesions of the jaws is enucleation of the lesion and biological treatment with or- ganization of coagula and new bone formation. The treatment is carried out completely in one session, which accounts for faster cystic cavity reduction due to centripetal healing of bone. This usually happens after enucleation of small cysts, while enucleation of large cysts of the jaws creates substantial osseous defects.

The aim of this case report was to present spontaneous bone regeneration after enucleation of a large sized residual cyst in the maxilla, evaluated by clinical examination and panoramic radiography.

Case report

Prikaz slučaja

Tridesetšestogodišnja pacijentica upućena je u Zavod za oralnu kirurgiju Sveučilišnog stomatološkog kliničkog centra Sveučilišta u Prištini, zbog oteline u području gornjih desnih kutnjaka nastale mjesečne dana prije. U medicinskoj anamnezi nisu otkriveni nikakvi zdravstveni problemi. Stomatološkim pregledom ustanovljeno je da joj nedostaje prvi kutnjak (zub 16) te zadebljanje bukalno u području desnoga gornjeg kutnjaka. Zabilježena je promjena boje agonističkih zuba, drugog kutnjaka i drugog pretkutnjaka. Tijekom introra-

onalne palpacije zadebljanja duboko u fornišku otkriven je Dupuytrenov fenomen.

Na panoramskoj snimci otkrivena je radiolucentna lezi-

ja na desnoj strani u području gornjih kutnjaka veličine pri-

blizno 35 milimetara u anteroposteriornom i 50 milimeta-

ra u kraniokaudalnom smjeru (slika 1). Da bi se primijenio niz dijagnostičkih kriterija, provedena je aspiracija sterilnom štrcialjkom i dobivena je obojena tekućina bogata kristalima kolesterola karakterističnim za cističnu tekućinu (slika 2).

Test vitaliteta pulpe (električno ispitivanje pulpe – Parkell Inc., Edgewood, New York) drugog kutnjaka i drugog pretkutnjaka pokazao je da su oba zuba vitalni.

Kirurški zahvat obavljen je u lokalnoj anesteziji (Lidocain - adrenalin, 40 mg/0,025, 2 ml, Alkaloid Skopje). Odignut je mukoperiostealni režanj nakon čega je slijedio uklanjanje bukalne kortikalne kosti koja je bila jako tanka, te je izložena cistična membrana. Cistična membrana pažljivo je odvojena od okolne kosti i potpuno uklonjena. Pregledom preosta-

tion and expansion and why they develop in the first place (3). Compared to other large cysts such as radicular cysts, follicular cysts and keratocysts, residual cysts are rare amount-

ing only to 10% to 18% of dental cysts (1). The diagnosis of a residual cyst is often established inadvertently, either during routine radiography or when the cyst is infected (5,6).

Surgical treatment of cystic lesions of the jaws can be accomplished by means of enucleation or marsupialization (7). Marsupialization or decompression is a technique that releases pressure from the cyst, allowing for bone formation and reduction of the cystic cavity in order that later in the course of treatment enucleation can be accomplished more easily and with less risk to vital structures. This technique requires close patient cooperation, frequent visits, maintenance of cystic cavity hygiene and subsequent enucleation not earlier than three months after the initial surgery (8). The method of choice for the treatment of cystic lesions of the jaws is enucleation of the lesion and biological treatment with organization of coagula and new bone formation. The treatment is carried out completely in one session, which accounts for faster cystic cavity reduction due to centripetal healing of bone (4). This usually happens after enucleation of small cysts, while enucleation of large cysts of the jaws creates substantial osseous defects.

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Pulp vitality testing (by electric pulp tester – Parkell Inc., Edgewood, New York) of the second molar and second premolar revealed that both of them were vital.

The surgical procedure was performed under local anesthe-

sia (Lidocaine-Adrenaline, 40mg/0,025, 2ml, Alkaloid Skopje). Reflection of the mucoperiosteal flap, followed by removal of buccal cortical bone which was considerably thin, and exposure of the cystic membrane was carried out. The cystic membrane was carefully separated from the surrounding bone and
le koštane srži i nakon cistektomije uočena je ekspanzija ciste u svim smjerovima, vestibularno te u smjeru sinusa, uzrokujući tako izlaganje (intaktne) Schneiderove membrane intaktnog maksilarnog sinusa (slika 3.). Veliki koštani defekt koji je nastao nakon enukleacije cistične lezije ispran je sterilnom fiziološkom otopinom (0.9-postotni natrijev klorid). S obzirom na nedostatak usisnih alata za drenažu nakupljenih tekućina, kao što su krvi i serum u koštanom defektu nastalom cistektomijom, koristili smo ručno izrađenih zavoj od gaze s jodoformom, a sastojao se od trake pamučne gauze u steralnu fiziološku otopinu (0.9-postotni natrijev klorid) i impregnirane jodnim prahom (PPH Cerkamed – Varna, Bugarska).

was completely removed. Inspection of the remaining osseous defect following cystectomy displayed expansion of the cyst in all directions, buccally as well as in the direction of the sinus, thus causing exposure of the intact Schneiderian membrane of the intact maxillary sinus (Figure 3). The large osseous defect produced after enucleation of the cystic lesion was rinsed with sterile saline solution (0.9% Sodium Chloride). Considering our lack of suction tools for the drainage of the accumulated fluids such as blood and serum in the cystectomy osseous defect, we used handmade wound dressing of iodoform gauze tape, consisting of a cotton gauze strip immersed in sterile saline solution (0.9% Sodium Chloride) and impregnated with iodoform powder (PPH Cerkamed – Varna, Bulgaria).
Gaza s jodoformom presavijena je i umetnuta u koštani depekt kako bi se postigla kompresija (slika 4.), s jednim labavim krajem za komunikaciju s usnom šupljinom kroz primarno zatvoreno reprozicionirani i zašiveni mukoprostapani režanj (3-0, obloženi VICRYL®, poliglaktin 910, Suture-Ethicon-GMBH, NJemačka). Ova gaza ostala je unutar depekt-a dva dana nakon operacije te je djelovala kompresivno radi hemostaze unutar preostalog koštanog depekta, a istodobno je služila i za drenažu nakupljene tekućine.

Propisani su antibiotici (Amoksiklav tablete 625 mg, Lek, Ljubljana) svakih osam sati tijekom šest dana te je pacijentica savjetovana da se uzdrži od vrućih napitaka i čvrste hrane 24 sata nakon kirurškog zahvata. Sljedećeg dana tijekom rutinske poslijepreobrijezi kontrole gaza je djelomično uklonjena, a dan poslije (48 sati nakon operacije) uklonjena je potpuno. Postoperativni edem bio je mali i pacijentica je navela da osjeća lagun bol, pa je uzimala samo jednu tabletu ibuprofena od 400 mg (FarmaVita, Sarajevo). Savofi su uklonjeni sedmi dan poslije zahvata. Patohistološko mikroskopsko ispitivanje koštanih materijala (enukleata cistične ležije) pokazalo je cističnu stijenu prećvunu slojevitoj slojevini epitelom i izjmovi fibrotičnog tkiva, gustog infiltrata te upalnih i blijalnihčestica uzirotnos estraziviranih eritrocita (slika 5. a, b). Stoga je patohistološki nalaz konačno potvrdoj dioj nazovadi radikularne ciste.

Postoperativni tijek praćen je uobičajenim kontrolnim posjetima u određenim vremenskim razmacima kako slijedi: nakon 24 sata, zatim poslije dva dana, tjedan, mjesec dana, te šest i dvanest mjeseci.

Tijekom rutinskog pregleda mjesec nakon kirurškog zahvata pacijentica nije navela nikakve probleme ili tegobe, ali je test vitaliteta pulpe (Electric Pulp Tester, Parkell Inc, Edgewood, New York) susjednih zuba otkrio gubitak vitaliteta drugog kutnjaka koji je nakon toga liječio specijalist endodoncije. Nakon jednogodišnjeg praćenja nije se žalila ni na drugog kutnjaka koji je nakon toga liječio specialist endodoncije. Nakon jednogodišnjeg praćenja nije se žalila ni na kakve probleme. Panoramska slika pokazala je intenzivnu neprozirnost kostiju, što upućuje na dovoljnu formiranost nove kosti s margina prema središtu depekta, značajno smanjujući preostalu koštiju šupljini u usporedbi s preoperativnim radiografom (slika 6).

Rasprava

Nakon enukleacije kostiju ostaju defekti različitih veličina i oblika. Preostali mali kirurški defekti obično spontano zacijeljuju fiziološkim apozicionim mehanizmom rastom kosti. Preostala koština šupljina puni se krvnim ugruškom koji postaje okosnica za formiranje nove kosti. No u slučaju velikih kirurških defekata uzrokovanih enukleacijom, krvni ugrušak u defektu ileteko je rizičan jer se lako može inficirati ili potaknuti stvaranje velikog hemotoma kao posljedice nekontroliranog nakupljanja krvi u koštanoj šupljinji.

Kako bi se smanjio postoperativni volumen koštanog depekta i spriječilo spomenute komplikacije, koristimo se različitim kirurškim metodama i drenažom velikih čeljusnih cista, ovisno o iskustvu i sklonosti kirurga.

The iodoform gauze tape was inserted and folded with compression inside the bone defect (Figure 4) with one loose end for communication with the oral cavity through the primary closure of the repositioned and sutured mucoperiosteal flap (3-0, Coated VICRYL®, polyglactin 910, Suture-Ethicon-GMBH, Germany). This gauge tape remained inside the defect for 2 (two) days postoperatively, accomplishing the effect of compressive hemostasis inside the remaining bone defect and, simultaneously, serving for drainage of the accumulated fluids inside the osseous defect.

Antibiotics were administered (Amoksiklav 625mg tablets, Lek, Ljubljana) every 8 hours for 6 days and the patient was advised to refrain from hot beverages and solid foods for 24 hours after the surgical procedure. During the routine postoperative follow up visit next day, the gauze tape was partially removed and the day after (48 hours postoperatively) it was removed completely. Postoperative edema was minor and the patient declared that she had slight pain; hence she used only one tablet of Ibuprofen 400 mg (FarmaVita, Sarajevo). The sutures were removed on the seventh postoperative day. Histopathological microscopic examination of the biotic material (enucleated cystic lesion) displayed a cystic wall coated with stratified squamous epithelium and effusion of fibrotic tissue, dense infiltrates of inflammatory and hyaline particles, and presence of extravasated erythrocytes. (Figure 5.a, b) Hence, the final histopathological report with diagnosis of “radicular cyst” was confirmed.

The postoperative course of the case was followed with routine visits made at certain time intervals as follows: after 24 hours, two days, one week, one month, six months and twelve months.

During routine examination one month after the surgical procedure, the patient did not report any problems or concerns, but the pulp vitality test (Electric Pulp Tester, Parkell Inc, Edgewood, New York) of the neighboring teeth revealed loss of the second molar vitality, which was afterwards treated by an endodontist. On a follow-up examination after one year, the patient did not report any particular problems. Panoramic image revealed intense bone opacity indicating sufficient formation of new bone from the margins to the center of the defect, significantly reducing the remaining osseous cavity when compared to the preoperative radiograph. (Figure 6)

Discussion

Defects of various sizes and shapes remain after enucleation of bone cysts. The remaining small surgical defects after enucleation of cysts commonly heal spontaneously by the physiological appositional mechanism of bone growth. The residual bone cavities are replenished with blood clots, which become the scaffold for new bone formation. However, in case of large surgical defects caused by enucleation, a blood clot in the bone defect is a considerable risk as it can easily become infected or lead to the formation of a large hematoma as a result of uncontrolled accumulation of blood in the bone cavity.

Aiming to reduce the postoperative osseous defect volume and to prevent the above mentioned complications, dif-
Jedna od metoda liječenja je zatvorena cistektomija s postoperativnom drenažom koštane šupljine s pomoću trake jedne gaze kao u našem slučaju, ili usisavanjem koje djeluje negativno na tlak stvorenom u koštanoj šupljinji u razdoblju od pet do sedam postoperativnih dana. Usisavanjem se povla- či meko tkivo prema središtu koštanog defekta, što smanjuje njegov volumen i potiče primarno zacijeljivanje rana, kao u slučaju malih koštanih šupljina. Ova metoda jednostavna je u slučaju liječenja velikih koštanih cista jer rezultira kraćom rehabilitacijom i potpunom regeneracijom koštanoga tkiva u razdoblju od dva do šest mjeseci (9).

Hern i Milijavec (10) otkrili su da se veliki koštani defekti nastali nakon enukleacije velikih čeljusnih cista postoperativno spontano regeneriraju od onih malih. Njihovi rezultati pokazuju da je konačna gustačka kosti formirana nakon 12 mjeseci u malim defektima (20 – 30 mm) 97 posto, a u velikim defektima 84 posto, u usporedbi s gustočom susjedne zdrave kosti (10). Stoga enukleacija velikih cističnih defekata otvara dilemu o tome treba li koštane defekte ispunjavati na-domjesima kosti ili ne.

Postoje različita mišljenja o primjeni koštanih presadaka kosti u liječenju koštanih defekata nakon enukleacije velikih cista čeljusti (11 – 13). Mnogi autori zaključili su da korište- nje autogenih koštanih transplantata (3, 14) i aloplastičnih materijala (15) može pomoći u liječenju koštanih defekata smanjujući rizik od mogućih prijeloma čeljusti, a smanjuje i razdoblje oporavka.

Iako su autogeni koštani transplantati zlatni standard za rekonstrukciju defekata u maksilo-fazijalnoj regiji, s obzirom na to da su biološki kompatibilni, vaskulariziraju se i sese integriraju s okolnom kosti uz minimalni rizik od inflamacije i odstupanja, njihova uporaba ima nedostatke i ograničenja. Njihovi rezultati uključuju produljeno trajanje operacije s obzirom na vrijeme potrebno za ulaganje transplantata, morbiditet donorskog mjesta, resorpciju transplantata, ograničenu dostupnost te male količine koje su nedostatne za nadoknadu velikih koštanih defekata itd. (16).

Slijedom toga, aloplastični materijali i ksenogen kost za popunjavanje koštane šupljine nakon enukleacije ciste koriste se kao alternativa autogenim transplantatima (14,17 – 19). Dakle, istraživanje Khaleda (15) pokazuje da je gustoča- ki tri i šest mjeseci nakon enukleacije ciste, s lezijama dimenzija od 1,5 do 3,5 cm, bila veća u skupini pacijenata čiji je koštani defekt bio ispunjen granulama Agipore (korali) i u onoj koja je bila tretirana laserskim nizem intenziteta, negoli u kontrolnoj skupini u kojoj su oštećene kosti ostala prazna. Unatoč činjenici da upotreba aloplastičnog materijala smanjuje morbiditet i komplikacije, a njihova količina je neo grianičena (16), ti su materijali pokazali smanjenu osteogenu ak- tivnost jer se najprije moraju resorбирati i zamijeniti novim osteogenskim tkivom (8, 19). Odsječeni oporavak takoder se opaža zbog usporene resorpcije ili izloženosti transplantata te infekcije nakon toga (9). Horowitz i Bodner (19) otkrili su uspjeh u 20 posto slučajeva s velikim defektima kosti po- vezanih s ksenogenom kosti preporučeno za poticanje rege- neracije kostiju. Smatra se da uporaba koštanih transplantata smanjuje opasnost od spontanih prijeloma nakon enukleacije velikih cista (3, 14, 20).

Diferent methods of surgical treatment and drainage of the large jaw cysts are used, depending on the experience and prefer- ence of the surgeon.

One of the treatment methods is closed method cystectom y with postoperative bone cavity drainage by iodine gaze tape, which was used in our case, or by suction which works by means of negative pressure created in the bone cavi- ty within a period of 5-7 postoperative days. The suction acts by pulling the soft tissue towards the center of the osseous de- fect, which decreases the volume of the defect and supports primary wound healing as in cases of small bone cavities. This method of treatment is simple for treating large bone cysts, resulting in a shorter rehabilitation time and complete regen- eration of the bone tissue within 2-6 months (9).

Hern and Milijavec (10) have found that large osseous defects created after enucleation of large jaw cysts show show- er postoperative spontaneous regeneration than small osseous defects. Their results show that the final bone density formed after 12 months, in small defects (20-30 mm) was 97%, while in large defects it was 84%, compared with healthy neighboring bone density (10). Therefore, enucleation of large cystic defects creates a dilemma of whether to fill the osseous defect with bone substitutes or not.

There are different views about the application of bone grafts for the treatment of osseous defects after enucleation of large cysts of the jaws (11-13). Many authors have concluded that the use of autogenous bone grafts (3, 14), and alloplastic grafts (15) can help with healing of osseous defects by re- ducing the risk of possible fractures of the jaws and shorten the recovery period.

Although autogenous bone grafts are considered the gold standard for the reconstruction of defects in the maxillofa- cial region, considering they are biologically compatible, they become vascularized and osseointegrated with surrounding bone with minimal risk of infection and dislodgement, their use has disadvantages and limitations. These disadvantages include: prolonged time of operation considering the time for graft harvesting, donor site morbidity, graft resorption, limited availability with the small amounts being insufficient for replenishing large defects etc. (16).

Consequently, alloplastic graft materials and xenograft bone for filling bone defects after cyst enucleation are used as an alternative to autogenous grafts (14, 17-19). Thus, the study of Khaled (15) shows that bone density 3 and 6 months after cyst enucleation, with lesions measuring from 1.5 to 3.5 cm, was higher in the group of patients whose osseous defect was filled with Agipore granules (corals) and in the group treated with lower laser intensity, than in the control group where the bone defects remained empty. Despite the fact that usage of alloplastic material lowers morbidity and complications, and their usage is unlimited (16), these materials have shown reduced osteogenic activity since they first have to be resorbed and then replaced with new osteogenic tissue (8,19). Recovery delays are also observed due to slow resorption or exposure of graft and infection afterwards (9). Horowitz and Bodner (19) have found failure in 20% of cases with large bone defects associated with xenograft bone recommended for promotion of bone regeneration. It is considered that the
Ettl i suradnici (12) utvrdili su da uporaba koštanih transplantata u lezijama nakon enukleacije cista nije imala prednosti, a jednostavna enukleacija cista sa zacijeljivanjem preko krvnog ugruška pokazuje nisku stopu komplikacija i dovoljnu regeneraciju kosti čak i u slučaju velikih defekata. Chiapasco i suradnici (11) te Wågård i njegovi kolegi (21) također su ustanovili da spontana regeneracija kosti može nastati u velikim mandibularnim cistama bez primjene materijala za punjenje.

U mnogim istraživanjima dokumentirano je spontano zacijeljivanje koštanih defekata nakon enukleacije velikih cista bez uporabe koštanog presatka (10, 13, 22). Shokier i suradnici (22) uočili su spontano zacijeljivanje bez uporabe koštanih presadaka kod 20 pacijenata, od kojih su deset bile keratoceste, pet folikularne ciste i pet radikularne ciste s monokortikalnim defektima kosti veličine od 2,5 do 6 cm. Autori su procijenili gustoću kostiju u intervalima od 6, 12 i 24 mjeseca te otkrili postupno smanjenje veličine koštanih defekata u svim slučajevima, a gustoća kosti značajno se povećava. Povećanje gustoće kosti bilo je znatno veće u prvih šest mjeseci u usporedbi s idičkim mjesecima (23). Wågård i suradnici (21) također su otkrili povećanje gustoće kosti sa statističkom značajnošću od 90,8 posto i to šest mjeseci nakon enukleacije i primarnog zatvaranja 16 odontogenih cista veličine od 3 do 10 cm. Autori su zabilježili veću gustoću kosti u mandibularnim koštanim šupljinama od onih u maksili. Schmitz i Hollinger (24) koštane defekte dijele na one kritične i nekritične veličine, ovisno o broju stijenki koje ih okružuju. Autori su otkrili da su defekti s dvjema stijenkama koje nedostaju nekritične veličine i mogu spontano zacijeliti bez obzira na veličinu defekta, a defekti koji imaju samo jednu stijenku, a sve druge nedostaju, kritične su veličine i rekonstrukcija je prijeko potrebna. U istraživanju provedenom na zeevciima opaženo je da je spontano zacijeljivanje koštanih defekata bilo moguće kad je defekt bio unikortikalni i ne veći od osam milimetara, a nije uspjelo kada su defekti bili bikortikalni i u promjeru veći od 15 milimetara (25).

Podatci iz literature pokazuju da su se preostali koštani defekti nakon enukleacije ciste regenerirali spontano unatoč veličini šuplje, histološkom tipu, spolu i dobi, kad god je bilo moguće sačuvati residualne koštane ploče koje su činile periost i endost (10, 23, 26).

Suprotno tome, N. Hern i M. Miljavec (2008.) ustanovili su da povećana dob negativno utječe na liječenje, a oblik koštanog defekta bio je važniji čimbenik cijeljenja od volušmena (10).

Naš slučaj prikazuje subjektivnu i rendgensku procjenu zacijeljivanja rezidualnih koštanih defekata veličine od 35 do 50 milimetara, okruženih dovoljnom količinom koštanih stijenki i primarno zatvorenih mukoperiostealnim režnjem nakon enukleacije velike ciste u maksili, bez uporabe nadomješnog koštanog materijala.

Panoramska snimka godinu dana nakon čistekтомije otkrila je povećana neprozirnost kositi. To upućuje na novu formaciju kositi od rubova prema središtu koštanog defekta, što pokazuje značajno smanjenje veličine preostalog koštanog defekta u usporedbi s preoperativnom rendgenskom slikom. use of bone grafts reduces the risk of spontaneous fractures after enucleation of large cysts (3, 14, 20).

Ettl et al. (12) found that the use of bone grafts in lesions after cyst enucleation showed no superiority and that simple cyst enucleation with blood clot healing shows low complication rates and sufficient bone regeneration even in large defects. Chiapasco et al. (11) and Wågård SS et al. (21) also found that spontaneous bone regeneration could occur in large mandibular cysts without the aid of any filling materials.

Numerous investigations have documented spontaneous healing of bone defects after large cyst enucleations, without the use of bone graft (10, 13, 22). Shokier et al. (22) have observed spontaneous healing without the use of bone grafts in 20 patients, out of which 10 were keratoceysts, 5 follicular cysts and 5 radicular cysts, with monocortical bone defects ranging from 2.5 to 6 cm. The authors evaluated bone density formed at intervals of 6, 12 and 24 months and found gradual reduction of the size of osseous defects in all cases, with bone density increasing significantly. The bone density increase was significantly higher in the first 6 months compared to the subsequent months (23).

Also, Wågård et al. (21) have found a bone density increase with statistical significance of 90.8%, 6 months after enucleation and primary closure of 16 odontogenic cysts ranging from 3 to 10 cm in size. Authors have noted higher bone density in mandibular osseous cavities than those in the maxilla.

Schmitz and Hollinger (24) divided bone defects into critical and non-critical size defects, depending on the number of walls that surround them. The authors found that defects with two missing walls are uncritical sized defects and can heal spontaneously regardless of the size of the defect, while the defects that have only one wall with all the other walls missing are critical size defects, reconstruction of which is necessary. From a study performed in rabbits, it was observed that spontaneous healing of osseous defects was superior when the defect was unicortical and not greater than 8mm, and failed when defects were bicortical and greater than 15mm in diameter (25).

Results in the literature show that residual bone defects after cystic enucleation regenerated spontaneously despite the size of the cavity, histological type, gender and age, whenever it was possible to conserve residual bone plates provided by periostium and endostium (10,23,26).

In contrast, Hern and Miljavec (2008) found that increased patient age had a negative effect on healing and that the shape of the osseous defect was a more important healing factor than the volume (10).

Our case study presents the subjective and radiographic assessment of healing of residual bone defect sized 35 to 50mm, surrounded by sufficient bone plates and primarily closed with mucoperiosteal flap after enucleation of large cyst in maxilla, without using any graft material.

One year after cystectomy, the panoramic image revealed increased bone opacity suggestive of new bone formation from the margins to the center of the bone defect, showing significant reduction in size of the residual bone defect when compared to the preoperative radiograph.
Prikazani slučaj opisuje uspješno spontano zacjeljivanje koštanog defekta nakon enukleacije velike ciste bez uporabe bilo kojeg materijala za punjenje, čime se potvrđuju rezultati iz literature o spontanom zarastanju velikih koštanih defekata bez koštanih nadomjestaka (21, 22, 26, 27).

Tijek prikazanog slučaja i rezultati iz literature daju ujvrljive dokaze koji podupiru kirurški pristup liječenju velikih radikularnih cista metodom primarnog zatvaranja, bez uporabe koštanih nadomjestaka.

Zaključak
Na temelju našega kliničkog slučaja i podataka iz literature može se zaključiti da spontano zacjeljivanje kosti nakon enukleacije velikih cista treba biti terapija izbora, čak i u slučaju velikih cističnih supljina kod kojih je rezidualni koštan defekt omeđen dovoljnom količinom kosti. Ova metoda kirurškog liječenja nije složena i jeftina je, a i biološki je vrlo malo rizična. Njome se smanjuje ukupni trošak terapije te opasnost od postoperativnih komplikacija povezanih s transplantacijom.

Sukob interesa
Nije bilo sukoba interesa.

Conflict of interest
None declared

Abstract
Cystic lesions of the jaws such as keratocysts (scientific community still continues to use the term ‘odontogenic keratocyst’ more favourably than ‘keratocystic odontogenic tumour’ although both terms remain acceptable synonyms), follicular cysts, radicular cysts, and residual cysts may reach large proportions, causing considerable bone destruction. Enucleation of cystic lesions in the jaw produces bone defects, which may recover spontaneously or with assisted healing with the use of autogenous bone graft or other bone substitute materials. This clinical study presents a spontaneous bone regeneration after residual cyst enucleation in the distal part of the maxilla. The progress of recovery is followed by clinical and radiographic examination and subjective data obtained from the patient. Bone regeneration and cystic cavity reduction was observed in the panoramic image after six months and after one year. The physiological process of coagulation provides the basic process for the spontaneous bone formation even if an osseous defect is considerably large, provided that the defect is surrounded by adequate bony walls.

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