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## Ritualno sakaćenje zuba i rad forenzičnog stomatologa: pregled literature

### *Dental Ritual Mutilations and Forensic Odontologist Practice: a Review of the Literature*

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#### Sažetak

**Uvod:** Etnička sakaćenja imaju antropološko značenje, kako u suvremenom tako i u nekadašnjem ljudskom ponašanju, ovisno o geografskim, religioznim i kulturnim čimbenicima koji znatno mogu pomoći forenzičnom stomatologu u postupku izrade dentalnog profila. Sakaćenje zuba i ukrasi na njima bili su, i još uvijek jesu, uobičajeni među mnogim etničkim skupinama i kulturama. Kroz povijest ljudskoga roda zdravlje zuba bilo je simbol mladosti, ljepote i snage, ali može imati i druga značenja. Sakaćenje zuba obilježje je mnogih nestalih kultura i prakticiralo se uglavnom tijekom religijskih rituala, u estetske svrhe i kao simbol pripadnosti određenoj socijalnoj skupini. No slični običaji i danas su uobičajeni u nekim područjima diljem svijeta. **Materijali i metode:** Članak je zapravo sustavni pregled literature o ritualnom sakaćenju zuba iz ranih 1960-ih, a uključeni su i podatci s PubMeda, Scopusa i Google Scholar. Istraživanje je namjerno ograničeno na ritualno sakaćenje koje se može definirati kao *bilo koje nepovratno narušavanje integriteta ljudskoga organizma učinjeno u ritualne svrhe i bez namjere liječenja*. Zato su isključeni svi slučajevi pojedinačnih ili višestrukih samovadenja zuba učinjenih iz psihotičnih razloga te oralno sakaćenje djece jer se takva praksa u nekim etničkim skupinama smatra terapijskom. **Zaključak:** Spoznaje o promjenama na zubima nakon oralnoga sakaćenja važne su pri identifikaciji živih ili umrlih osoba, ili čak ljudskih ostataka jer *odaju* odgovarajuće informacije o etničkom i kulturološkom podrijetlu subjekta. U ovom članku navedena su i neka medicinskopravna stajališta o sakaćenju zuba, a namijenjena su doktorima dentalne medicine.

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#### Ključne riječi

obredno ponašanje; društvena pripadnost; etničke grupe; otkidanje zuba; samosakaćenje; forenzička stomatologija; stomatološko ritualno sakaćenje; lakiranje zuba

#### Uvod

Od davnina su zubi, usta i lice bili posebno zanimljivi i fascinirali su ljude, što potvrđuju mitovi, sačuvani tekstovi, tradicija i praznovjerje te popratni običaji tijekom ukrašavanja i/ili sakaćenja.

Namjerna modifikacija oblika ljudskih zuba nazvana *sakaćenje*, poznata je i opisana na različitim stranama svijeta – u Oceaniji (Pacifik), Aziji, Africi te južnoj i srednjoj Americi. Čak su i u ljudskim ostacima iz pretpovijesnoga doba pronađene i dokumentirane traumatske promjene na tijelu, uključujući vađenje zuba i preoblikovanje njihove površine i oblika (primjerice, brušenje, zarezivanje, urezivanje, glodanje, bojenje i otkidanje). Tijekom duge povijesti ljudskoga roda zdravi zubi uvijek su bili simbol mladosti, ljepote, snage i zdravlja, ali mogli su *poslati* i drukčije poruke zbog čvrstoće svoje strukture. Ritualno sakaćenje uključuje lomljenje, vađenje, brušenje, umetanje ili rezanje krune zuba (ili samo njezina dijela), oblikovanje u šiljak, lakiranje ili bojenje te prekrivanje krune draguljima ili listićima plemenitih metala. Običaj sakaćenja zuba uočen je kod stanovnika i razvijenih i nerazvijenih područja, a slični rituali prakticiraju se i

#### Introduction

Since ancient times, the teeth, mouth and face have had an intrinsic interest and fascination to mankind expressed through many oral and written beliefs, superstitions and traditions as well as through a wide range of decorative and/or mutilatory practices.

A deliberate modification of the shape of the human teeth - called tooth mutilation - has been reported in various regions of the world, including the Pacific, Asiatic, African, South and Central American area. The intentional alteration of traumatic origin, including tooth extraction and modification of the tooth surface or shape (e.g. by filling, notching, drilling, grooving, grinding, staining and chipping) has been documented in human remains since prehistorical times.

Throughout the long history of mankind, healthy teeth have always represented a symbol of youth, beauty, strength and health, but they can send other kinds of messages because of the relative intrinsic strength of the tooth structure.

Ritual mutilations include breaking, extracting, filling, inlaying or cutting away the crown of the teeth (or just part of it), sharpening to a point, laquering or staining, incrustat-

danas (1). Znamo da se iza mnogih oblika ritualnog sakaćenja, uključujući vađenje zuba i puštanje krvi, nalaze kulturni i antropološki motivi (2–4). Namjerno preoblikovanje ili sakaćenje zuba simbolično se obavlja u mnogim ritualnim i socijalnim prigodama – tijekom ceremonije inicijacije (5), u pubertetu, na vjenčanjima, njime se označava ulazak mladeži u društvo ratnika, olakšava prehrana u slučaju tetanusa, omogućuje učinkovitije pljuvanje, poljepšava izgled, oponaša se izgled nekih životinja, označava pripadnost i unutarplemenski status, omogućuje izgovor posebnih glasova, poboljšava žvačna funkcija ili olakšava oralni seks (6). Ponegdje je čak i znak žaljenja. Preoblikovanje zuba moglo je biti i sredstvo za pokazivanje pripadnosti skupini, ili suprotno tome – identifikacija bližnjih, što je rašireni običaj. Neke modifikacije radile su se i zbog seksualne privlačnosti ili zastrašivanja tijekom sukoba. Preoblikovanje zuba često je sredstvo za pokazivanje prijelaza iz jedne životne faze u drugu, kao što je to prelazak iz adolescencije u odraslo doba. Premda je sakaćenje zuba često bolno, obično koristi pojedincu pa mu ta spoznaja pomaže izdržati bol. Kod mnogih etničkih skupina sakaćenje zuba obavlja se kao svečanost inicijacije, ako je riječ o mladeži u pubertetu, i smatra se pristupnim ritualom koji ističe ljepotu, ali i izdržljivost u podnošenju fizičke boli (5). Mnoge skupine i danas sudjeluju u običajima lomljenja zuba i brušenja, a kod nekih je modifikacija ograničena na lakiranje i nanošenje boje. Sva navedena ritualna sakaćenja zuba i danas se obavljaju u ruralnim zajednicama ili su običaj u domorodačkim plemenima u nekim dijelovima svijeta, poput Afrike, Azije i Oceanije (tablica 1). Ritualno sakaćenje zuba konstantno je prisutno u tradicionalnim, ali ne nužno i primitivnim društvima i nije uvijek znak zaostalosti, nego jednostavno drukčije kulture. Taj običaj usko je povezan s područjem s kojega populacija potječe, a danas se uočava i u zapadnim zemljama gdje ga prakticiraju imigranati, osobito oni rođeni u Africi ili njihova djeca, a obavlja se tijekom posjeta matičnim zemljama (7, 8).

Svrha ovog istraživanja jest dati sustavni pregled literature i opis onih ritualnih preoblikovanja morfologije zuba koja još danas postoje bilo gdje na svijetu. Spoznaja o tim različitim vrstama ritualnog sakaćenja može pomoći u forenzičnoj stomatologiji ili forenzičnim stručnjacima u razumijevanju podrijetla ili geografske prevalencije subjekta promatranja. Stoviše, saznanje o tipičnim oblicima ritualnog sakaćenja omogućuje forenzičarima razlikovanje oralnoga sakaćenja obavljenog u ritualnim zajednicama i onoga povezanog s malim skupinama od postupaka provedenih radi liječenja male djece. Strogo ritualno sakaćenje razlikuje se od oralnoga sakaćenja djece jer ovo drugo, iako je *ritualno*, kao primarnu namjeru ima liječenje. Oralno sakaćenje djece (IOM) provodi se ako mala djeca pate od dijareje ili imaju groznicu. Tada se podvrgavaju vađenju mliječnih zuba, najčešće očnjaka, što je uobičajeni postupak u liječenju njihove bolesti. Budući da se obavlja iz *medicinskih razloga* i to na djeci koja nisu u mogućnosti dati pristanak (8, 9), IOM se jasno i duboko razlikuje od poznatije prakse kulturno utemeljene modifikacije zuba.

ing the crown with gems or precious metals. Teeth mutilation practices have been noticed in inhabitants of the developed and under-developed world regions and similar rituals have been preserved until nowadays (1).

It was discovered that the unifying cultural and anthropological theme standing behind many forms of ritual mutilations, including tooth extraction, is blood flowing (2–4). The intentional dental ritual of re-shaping or mutilation is symbolically performed on many cultural, ritual and social occasions: initiation ceremonies (5), puberty, marriage, entry into the warriors' society, feeding in case of tetanus, to allow more efficient spitting, to improve personal appearance, to mimic the appearance of an animal or just to avoid it, to provide a form of tribal and intra-tribal social class identification, to allow the emission of special linguistic sounds, to improve the masticatory function or apparently to facilitate oral sex (6) or even as a sign of mourning.

Modifying the shape of the teeth can also be a means to achieve self identity, or, on the contrary, of identification with kinsmen, if it is considered a widely performed practice. Some dental modifications are made as a means of sexual attraction, or as an intimidatory sign when a dispute arises. Dental modification is often a means to show the passing of status from one phase of life to the next, as it happens in the change from adolescence to adulthood. Even though performing dental mutilations is often a painful procedure, we can consider that there should be in some way a perceived benefit in the participation in them, which helps the individual endure the pain.

In many ethnic groups the dental mutilation performed during initiation ceremonies in puberty is perceived as a prideful ritual which enhances beauty and as a trial of resistance to physical pain (5). Many groups participate today in rituals which involve both tooth ablation and filing, whilst in some ethnic groups the tooth modification is limited to laquering or color application. Such dental ritual mutilations are performed today in rural communities or indigenous tribes in several areas of the world, most notably in Africa, Asia and Oceania (Table 1).

Continuously practiced in traditional but not primitive societies, the dental ritual mutilations are not the testimony of a missing culture, but are simply signs of a different one.

These mutilations are in fact closely related to the region and to the population of origin, and in our western countries they have been reported in immigrant patients, especially born in Africa or children with African parents, and have possibly been performed during visits to their home countries (7, 8).

The aim of this research is the systematic review of the literature and the systematic description of those ritual modifications of tooth morphology which nowadays persist in some areas of the world. Knowledge of such different types of ritual mutilations may help the forensic odontologists or forensic experts to understand the ethnic origin or the geographical provenance of the subject.

Moreover, the knowledge of typical aspects of ritual mutilation allows the forensic odontologist to discriminate the oral mutilation performed in ritual communities, from those

## Materijali i metode

Istraživanje je provedeno uz pomoć pretraživačkih programa PubMed, Scopus i Google Scholar. Korištene su ključne riječi *samosakaćenje, modifikacija tijela i zuba, ritualno sakaćenje zuba i vađenje zuba*. Odabrani su članci od 1960. do 2013. godine. Istraživanje je namjerno ograničeno na ritualna sakaćenja koja se mogu definirati kao *bilo kakvo nepovratno mijenjanje cjelovitosti ljudskog organizma* (u ovom kontekstu usta i zuba) učinjeno u ritualne svrhe i bez ikakve kurativne namjere. Zato su isključeni svi članci u kojima su opisane pojedinačne ili višestruke samoekstrakcije psihotičnog podrijetla te sakaćenja djece jer se toj praksi među etničkim skupinama opredijeljenima za ovaj običaj, pripisuje terapijska namjera. Sakaćenja su grupirana u pet kategorija: avulziju/ekstrakciju, brušenje i preoblikovanje, bojenje, ukrašavanje i ostalo.

## Ritualna sakaćenja

### 1) Avulzije/Ekstrakcije

U Južnoj Africi i danas se u gradu Cape Townu često ritualno prakticiraju avulzije u povodu prelaska adolescencata u odraslu dob (crnaca, ali i bijelaca) i to gotovo isključivo u obiteljima nižega socijalno-ekonomskog statusa. Ljudi koji žive u Cape Floatsu (pokrajina Western Cape – Zapadni rt) unatrag 60 godina obavljaju modifikaciju zubala uklanjanjem sjekutića (10, 11). Jedno od najdojmljivijih trajnih obilježja južnoafričkoga crnačkog stanovništva jest nedostatak prednjih zuba, no razlog je mnogima i dalje nepoznat, ali smatra se olakotnom okolnošću za oralni seks. Popularno se naziva *praznina strasti* ili *osmijeh Cape Flatsa*. Drugi razlozi za vađenje zuba su moda, pritisak okoline i gajnsterizam. Ovaj običaj uzeo je maha posljednjih godina premda doktore dentalne medicine obvezuje etički kodeks i ne smiju vaditi zdrave zube. U Južnoj Africi su stomatolozi izradili tisuće djelomičnih proteza za pacijente kojima je potreban prihvatljiv izgled za radno mjesto ili u posebnim prigodama. Vađenje zuba uobičajeno je među domicilnim afričkim plemenima, a najčešće je kod Nilota u Nigeriji, Tanzaniji i Sudanu (12).

U Sudanu (plemena Dinka, Nuer i Maban), te osobito u ruralnim područjima južno od Sahare, vade se donji sjekutići (katkad i ocnjaci) nedugo nakon nicanja, što se smatra ritualnim prelaskom u zreliju dob, isticanjem ljepote i pokaziva-

related to very small groups, or practices carried out for curative purpose, mostly in children.

Mutilations of a “strictly ritual nature” differ from infant oral mutilation, since the latter, even if “ritual” in the practice, have however a primarily curative intent.

Infant oral mutilations (IOMs) are in fact practices carried out on young children mostly affected by diarrhea and fevers who undergo the extraction of deciduous tooth buds, often canines, as an accepted remedy for their illness. Since they are performed for a medical “benefit” and on infants who are incapable of consenting to this practice (8,9), IOMs clearly and deeply differ from the more commonly recognized practices of culturally based dental modifications.

## Materials and methods

The research was made through the following search engines: PubMed, Scopus, Google Scholar. The key words utilized were “self mutilation”, “body modification and teeth”, “ritual mutilation of teeth” and “tooth extraction”. The articles were selected from a time span ranging between 1960 and 2013. The research was deliberately limited only to the *ritual mutilations*, which can be defined as “any irreversible impairment of the integrity of the human organism (in this context, mouth and teeth), made with a ritual purpose and without any curative aim”. Therefore, all the articles dealing with single or multiple dental self extractions of psychotic origins were excluded, as well as the infant oral mutilations, since the practice is deemed to have therapeutical effects among ethnic groups dedicated to this practice. Mutilations have then been grouped into five categories: avulsions/extractions, filing and shape modifications, coloring, decorations, and others.

## Ritual Mutilation

### 1) Avulsions/Extractions

In South Africa, in the now modern city of Cape Town, the practice of ritual avulsion still abounds, often as a rite of passage for teenagers (blacks and also whites) almost exclusively belonging to low socio-economic status families. The people living on the Cape Flats (Western Cape) have been performing dental modification by having their incisors removed for at least 60 years (10,11). One of the most enduring images of the so called South African “*Coloureds*” people is the absence of their anterior teeth, and the reason is still a mystery to many, but which is popularly believed to be a facilitation for oral sex. It is popularly called the “Passion Gap” or the “Cape Flats Smile”. Other reasons for removing teeth are fashion, peer pressure, gangsterism. The practice has increased, in the last few years, even though dentists are obviously bound to their ethical code and not allowed to remove healthy teeth. The South African dentists have therefore applied thousands of partial dentures in patients who need an acceptable look at their workplace or on special occasions.

The practice of tooth extraction is common among indigenous African tribes, but it is mainly a Nilotic custom in Kenya, Tanzania and Sudan (12).

In Sudan (Dinka, Nuer and Maban tribes) and especially in the rural villages of South-Saharan regions, people extract



**Slika 1.** 18-godišnji Masai iz Zanzibara; ritualno su mu izvadena dva središnja sjekutića – postupak je primijenjen kod mnogih stanovnika te zemlje

**Figure 1** Masai 18 years old man of Zanzibar. The extraction of two central lower incisors is performed on ritual basis and it has been observed in many other individuals of the same community.

njem pripadnosti plemenu, a omogućuje i izgovor pojedinih glasova te olakšava oralni seks (6, 13 – 15). Katkad je vađenje zuba oblik inicijacije na prijelazu u odraslu dob, kao u skupini Luo čiji pripadnici vade šest donjih zuba, ili u kenijskome plemenu Masaja, gdje se ritualno vade donji mliječni sjekutići djeci u dobi od šest mjeseci i poslije trajni sjekutići u dobi od šest godina, slika 1. Taj običaj primjenjuje se samo na dječacima radi lakšeg hranjenja u slučaju tetanusa i onemogućavanja otimanja novorođenčadi (16).

Sličan razlog za ritualno vađenja zuba – vade se gornji srednji sjekutići, poznat je na Novim Hebridima gdje se taj postupak obavlja na djevojčicama u pubertetu kao znak ulaska u odraslu dob i žrtvovanje koje predstavlja vrijednost smrti u patnji, socijalno buđenje djevojke i postanak ženom (3).

U sjevernokenijskoj etničkoj skupini Turkana, te u populaciji Negro, Jebel Moyi obično uklanjaju dva donja sjekutića i gotovo svi nose usne čepove (eng. *Lip plugs*). Obično su u obliku nokta ili diska, pa se vađenje zuba ponekad obavlja radi stavljanja većeg čepa (17).

U drugim populacijama također je uobičajeno ritualno uklanjanje četiriju gornjih sjekutića, primjerice u Kamerunu, Maliju i Mozambiku (12) ili na Borneu, gdje se to obavlja iz magično-religioznih razloga, radi lakšeg hranjenja u slučaju tetanusa, ili zato što omogućuje jači izdah pri uporabi *sumtipana* ili pihaljke, kako bi se povećao doseg pri izbacivanju otrovnih strelica (18).

Kod Aboriđina u Australiji guljenje zuba znak je žalovanja ili označava prelazak u odraslo doba, pa si u pubertetu mnogo australskih dječaka sami izbijaju zube (2, 19), tablica 1.

## 2) Punjenje i morfološke modifikacije

U nekim plemenima i kulturama glavni razlog za sakaćenje zuba jest nastojanje da se nekomе svidite ili jasno razli-

the lower incisors (and sometimes also the canines), shortly after their eruption, as a rite of passage, to enhance beauty, to show their tribal identity, to allow the emission of specific linguistic sounds and to facilitate oral sex (6,13-15).

Sometimes, the tooth extraction is a form of initiation into adulthood, as in the Luo group, among which the extraction of six lower teeth is performed, or in the Maasai tribes of Kenya (Figure 1), among which the ritual extraction of lower deciduous incisors at six months and the extraction of the lower permanent incisors at six years are performed; this practice is performed only in males to facilitate the feeding in case of tetanus and to exorcize the kidnapping of little babies (16).

A similar reason explains the ritual extraction of the two upper central incisors in the New Hebrides, where this mutilation, made in puberty and only in females, is a sign of entrance into adulthood and a sacrifice representing the value of death in suffering, the price of the social renaissance for a girl becoming a woman (3).

The Turkana ethnic groups from northern Kenya, as well as the black population of Jebel Moya usually remove their two lower incisors and nearly all of them wear lip plugs. The plugs are usually nail or disk-shaped and sometimes the tooth extraction is performed to fit the larger types of plugs (17).

Among other populations, the ritual of removing the four upper incisors, as in Cameroon, Mali and Mozambique (12), still exists, or in Borneo, where the practice is performed because of magical-religious beliefs, to allow feeding in case of tetanus, or to allow the performance of a stronger blast at the sumpitan or blow-pipe, increasing the thrusting power of poisoned arrows (18).

In some Australian aboriginal tribes, tooth ablations as a rite of passage or as a sign of mourning is a very common practice; in puberty, many Australian boys have a tooth knocked out (2,19), Table 1.

## 2) Filing and morphological modifications

Among some tribes and cultures, the desire to be alike or to be clearly different from animals seems to be the core rea-

**Tablica 1.** Plemena koja praktiraju avulziju ili ekstrakciju i/ili geografska područja gdje se to čini  
**Table 1** Tribes practicing teeth avulsions or extractions, and/or geographical areas where they are widespread

Avulzija/vadenja • Avulsions/extractions	Prednji zubi • Front teeth	Donji sjekutići • Lower incisors	Očnjaci • Canines	Šest donjih zuba • Six lower teeth	Dva gornja središnja sjekutića • Two upper central incisors	Dva donja sjekutića +/- čep za usne • Two lower incisors +/- lip plug	Četiri gornja sjekutića • Four upper incisors	Bez pravilnih pojedinost • Not specified
Južna Afrika • South Africa	x							
Sudan (plemena Dinka, Nuer i Maban) • Sudan (Dinka, Nuer and Maban tribes)		x	x					
Južnosaharska plemena • South Saharian tribes		x	x					
Pleme Luo (Kenija i Tanzanija) • Luo tribe (Kenya and Tanzania)				x				
Pleme Masaja (Kenija) • Maasai tribe (Kenya)		x (muš. • males)						
Turkani (sjeverna Kenija) • Turkana (northern Kenya)						x		
Jebel Moya						x		
Novi Hebridi • New Hebrides					x (žen. • females)			
Kamerun • Cameroon							x	
Mali							x	
Mozambik • Mozambique							x	
Borneo							x	
Australija (++)Aboridžini) • Australia (++)Aboriginal								x

kovanje od izgleda životinja. Primjerice, neki južnoamerički Indijanci u dolini Amazone bruse središnje maksilarne sjekutiće u oblik oštrice, imitirajući piranje, ribe kojih se jako boje, a zašiljene zube smatraju i znakom ljepote (20). U Kamerunu, Kongu, Gvineji, Zairu i Ugandi zubi se oštře da bi bili nalik na krokodilske – taj se običaj naziva *akuha*.

U Tanzaniji (u plemenima Makonda) običaj je da se ritualno odlamaju dijelovi cakline gornjih i donjih sjekutića tako da njihovi zubi imaju oblik klina. To se čini iz estetskih razloga i kao znak snage, a simbolizira također prelazak adolescencata u odraslo doba (21). Isti je običaj i u plemenu Masaja – oni bruse zube u sklopu ceremonije u povodu izlaska iz puberteta.

Ljepota je iznimno važna domorodačkom stanovništvu indonezijskoga otočja Mentawai jer se ondje vjeruje da, ako duša nije zadovoljna izgledom vlasnika, osoba umire. A da bi bile lijepje, tamošnje mlade djevojke u pubertetu obrađuju zube kamenom i odlamaju komadiće dok ne postignu veličinu oštře točke.

Među pripadnicima etničkih grupa s Jave, Sumatre i Bornea sjekutići se stanjuju i skraćuju. Duboki poprečni urezi rade se turpijom, kamenom, bambusovim štapićem ili pijeskom dok se ne dobije šiljak velik poput točke. Tako obrađeni zubi su talisman i trebali bi ih štiti od duhova predaka ili olakšavati žvakanje bambusa u čistilištu, tablica 2.

son of many dental mutilations. Some South American Indians of the Amazon Valley, for example, continue the practice of filing their maxillary central incisors to a sharp shape as a means of imitating the piranha fish which they greatly fear; consequently, sharpened teeth are also considered a mark of beauty among them (20). In Cameroon, Congo, Guinea, Zaire and Uganda the teeth are sharpened to resemble those of a crocodile: this practice is named *akuha*.

In Tanzania (among Makonde tribes) the ritual of chipping off part of the upper and lower incisors enamel, so that the teeth appear peg-shaped, still exists. This practice is performed for decorative purposes, esthetic reasons, signs of strength, the passage from teenage to adulthood (21), as among Malay races, where the filing of teeth takes place with a ceremony at puberty.

Beauty is extremely important for the natives of the Mentawai Islands (Indonesia), because they believe that if a soul is not satisfied by the appearance of its owner's body, the person dies. In order to get more beautiful, young Mentawaiian females who have reached puberty sharpen their teeth with a rock and a chisel and reduce them to a point.

Among Java, Sumatra and Borneo ethnic groups, the incisors are thinned and shortened. Deep transverse grooves are also made with a file, a stone, bamboo or sand, and the teeth filed to a point. Pointed teeth would act as a talisman against spirits of the ancestors or to facilitate the green bamboo chewing in the purgatory life, Table 2.

**Tablica 2.** Plemena i geografska područja gdje je prošireno punjenje ili oštro oblikovanje zuba  
**Table 2** Tribes and geographical areas where filing and sharp modifications of teeth are widespread

Brušenje i oštrenje zuba • Filing and sharp modifications	Brušenje srednjih maksilarnih sjekutića (poput zuba piranije) • Filing of maxillary central incisors (like piranha)	Zubi naoštreni poput krokodilskih • Teeth sharpened (like crocodiles)	Odlamaje gornjih i donjih sjekutića (klinasti oblik) • Chipping of upper and lower incisors (peg-shaped)	Nespecifično punjenje • Not specified filing	Šiljasti zubi • Pointed teeth	Stanjeni i skraćeni sjekutići (šiljasti zubi) • Thinned down and shortened incisors (pointed)
Južnoamerički Indijanci (područje Amazone) • South American Indians (Amazon Valley)	x					
Kamerun • Cameron		x				
Kongo • Congo		x				
Gvineja • Guinea		x				
Zair • Zaire		x				
Uganda • Uganda		x				
Pleme Makonda (Tanzanija) • Makonde people (Tanzania)			x			
Malajci • Malay races				X		
Otoci Mentawai (Indonezija) • Mentawai islands (Indonesia)					x	
Java						X
Sumatra						x
Borneo						x

### 3) Bojenje

Namjerno bojenje zuba, obično u doba puberteta, navika je s dubokim korijenima u prošlosti i opisana je u društvima diljem svijeta. Običaj bojenja cijelih zuba ili samo djelomično poznat je kao *crnjenje*. Kao i vađenje zuba te punjenje ili ukrašavanje metalom, postupak crnjenja može se svrstati u sakaćenje (22). Važan je u mnogim kulturama, posebice na kopnu i na otocima Jugoistočne Azije (23). Većinu tih običaja obavljaju tradicionalni iscjelitelji, osobito u afričkim ruralnim zajednicama. Pritom južnoafrički iscjelitelji oblače obrednu nošnju i koriste se obrednim instrumentima (noževima, muhomlatima, puhaljkama, i relikvijama (24 – 26). Zubi se boje u crno na Borneu, gdje se to čini mješavinom izgorjele kokosove ljuske i ulja. Ponekad se površina zuba abrađira ili jetka đumbirom ili mangom. Nakon što se mješavina nanese na površinu zuba počinje nalikovati na crni lak. Običaj je nastao jer se vjeruje da su bijeli zubi obilježje životinja i Europljana (27). Točnije, neki ljudi u Maleziji crne zube da bi se razlikovali od psa. To čine i Indijanci Jivaro iz sjevernoga Perua i Ekvadora. Oni smatraju da takav obred sprječava karijes (18). Lakiranje i bojenje zuba obavlja se i u Vijetnamu, Laosu, Tajlandu, Indoneziji i Filipinima (28 – 29), gdje je crnjenje zuba povezano sa seksualnim sazrijevanjem i punopravnim članstvom u društvu. U Indokini se zubi crne jer se usta smatraju *vražjim vratima*. Bojenje zuba u crveno u Maroku, posljedica je žvakanja voća *mkua* (*Hexabobolus senegalensis*) ili oraħa guru (*Cola acuminata*), tablica 3.

### 3) Coloring

The intentional dying of teeth, which is typically performed around puberty, is a habit with strong roots in the past, documented in societies from all around the world. Such dying of the whole or just the visible surfaces of the teeth is known as “teeth blackening”.

Together with the extraction, filing and metal decoration of teeth, the process of teeth blackening has been ranked among dental mutilations (22). This is a practice with an important role in many cultures, especially across Southeast Asia islands and mainland (23).

The majority of these practices are performed by traditional healers, especially in African rural communities.

South African traditional healers dress in ceremonial clothes during the visits and use ceremonial instruments as well (knives, fly whisks, pipes, and divining bones), (24-26).

Black staining exists in Borneo where the teeth are colored in black with a mixture of burnt coconut shells and oil. Sometimes the tooth surface is abraded or etched with ginger or mango fruits. The mixture is applied on the tooth surface giving the impression of a black varnish. The practice lies in the conviction that white teeth are characteristic of animals and European people (27). More specifically some individuals in Malay blacken their teeth in order to differentiate themselves from dogs.

The blackening of the teeth is performed also among the Jivaro Indian people of Northern Peru and Ecuadorians, with the belief that the practice could prevent dental caries (18). Tooth lacquering and dying is performed also in several other regions of the world like Vietnam, Laos, Thailand, Indonesia and Philippines (28,29), where teeth blackening is

**Tablica 3.** Plemena koja praktiraju bojenje zuba te i/ili geografska područja gdje se to čini  
**Table 3** Tribes practicing lacquering and coloring of teeth, and/or geographical areas where they are widespread

Lakiraje i bojenje • Lacquering and coloring	Crnjenje • Blackening	Crvena boja • Red Staining
Jugoistočna Azija (Vijetnam, Laos, Tajland, Indonezija, Filipini) • Southeast Asia (Vietnam, Laos, Thailand, Indonesia, Philippines)	X	
Borneo	X	
Malezija • Malay	X	
Južna Afrika • South Africa	X	
Pripadnici plemena Ivaroe (Perù) • Ivaro Indian People (Perù)	X	
Ekvador • Equadorians	X	
Maroko • Morocco		X

#### 4) Ukrasi

Ukrašavanje zuba ima drevno podrijetlo. Naime, već stari Meksikanci stavljali su u zube drago kamenje kao umetak – inlay (18). Taj običaj raširen je i na Borneu gdje domorodci tankim mesinganim listićima zvanima *lios* oblažu sjekutiće ili ih kvače oko kutnjaka. Katkad se prednji zubi, četiri maksilarna sjekutića, potpuno pokrivaju zlatnim krunicama koje mogu biti i u obliku košara s prednjim otvorom u obliku srca, djeteline ili točke (18). Pripadnici plemna Dyaksa, iz istoga područja, buše rupicu u poprečnom žlijebu i u nju postavljaju mjedeni klin koji se u šupljinu ukucava u obliku zakovice, ili umeću zlato ili neki drugi metal. U plemenu Iban na Borneu crne se i bruse prednji zubi te ukrašavaju mjedenim klinovima usrdlanima u sredinu. Tijekom bolnog postupka pacijent obično grize komad drveta. U jednom plemenu u sjeveroistočnoj Ugandi (jezero Alberta Nyanza) obično se dječacima i djevojčicama umeće metalni navoj u sva četiri donja sjekutića (30).

Ukrašavanje zuba prakticira se u mnogim područjima. Fielding smatra da su i proteze postale modni dodatak jer se ukrašavaju zlatom ili komadićima dragog kamenja u različitim oblicima (10). I dalje su neuobičajena pojava u Sjedinjenim Američkim Državama i uglavnom to čine Afroamerikanci. Danas traže da im se zlatne ukrasne krune postavje na prednje zube, što je znak ponosa i zdravlja. Zlatne krune ugrađene iz estetskih razloga smatraju se ukrasom, pa su poneke izrezane u različite oblike ili imaju prozorčić. Popularne su u različitim kulturama diljem Amerike (23) u kojima se smatra da si samo bogataši mogu priuštiti luksuz da imaju zlatne zube, pa je to korisno pokazati suprotnom spolu ako ga se želi odabrati za seksualnog partnera. Posljednjih godina je među Afroamerikancima u Sjedinjenim Državama moderno postavljanje tzv. *zubnog grilla*, čime se pokazuje visok socijalni status. Ta je naprava izrađena od zlata, platine ili nekoga drugog plemenitog metala i obložena draguljima, a navlači se na vrhove prednjih maksilarnih zuba (31). Jednostavno se skida, tako da osoba može danju obavljati sve svoje dužnosti bez nje. Kada se želi postići određeni socijalni učinak, *grill* se može jednostavno staviti. Istaknimo da je

related to sexual maturation and full membership in society. In Indo-China the blackening of the teeth is also done because the mouth is considered the evil's door.

Red staining is common in Morocco, it is the consequence of the habit of chewing “mkua fruit” (*Hexabolus Senegalensis*) or guru nuts (*Cola Acuminata*), Table 3.

#### 4) Decorations

The habit of applying decorations to the teeth has ancient origins, since the ancient Mexicans put precious stones as inlays in the teeth (18).

This habit is typically widespread in the region of Borneo, where the natives apply a thin brass plate called *lios*, worn over the incisors and hooked onto the molars. Total tooth coverage is made in the form of anterior gold crowns in the four maxillary incisors, shaped as a basket with a front window with a heart, diamond, club and spade in it (18). The Dyaks, a tribe from the same region, make a small hole in the transverse groove and insert a pin of brass, which is hammered to a nail-head shape in the hollow, or they inlay the teeth with gold and other metals. Also the Iban people of Borneo both blacken and file their front teeth which are further beautified by a brass stud in a hole drilled in the middle. The patient usually bites a piece of wood during the painful procedure.

Furthermore, in a north-eastern tribe of Uganda (Albert Nyanza Lake) they usually extirpate with a metal thread the four lower incisors of children of both sexes (30).

Teeth decoration is a practice still commonly performed in many places; Friedling said that the dentures themselves have become a fashion item, being decorated with gold or pieces of precious stones in various shapes and design (10).

There are, however, more unusual trends of dental modification nowadays in the United States, mainly involving African-Americans. Ornamental gold crowns placed on the anterior teeth, as a sign of pride and wealth are nowadays a fad among African-Americans in the US. The gold crowns, that are placed on the teeth, purely for esthetic reasons, are named as tooth jewelry; some of these crowns even have cut-out designs or windows that are popular in various cultures throughout America (23). Only the wealthy people can afford the luxury of having gold teeth and this is useful to show to the opposite sex that the individual is someone who should be considered in the sexual partner selection.

Even more recently, another developing trend among the African-American community in the US is the application of

ta naprava skuplja od zlatnih kruna, pa se nositelji tih ukrasa smatraju više rangiranima na društvenoj ljestvici negoli oni sa zlatnim navlakama. Kako su različiti oblici oralnog nakita postali u *hip-hop* industriji statusni simbol, tako su draguljari počeli izrađivati mnogo takvih naprava, a doktori dentalne medicine postavljati. No, ljudi nižega socijalno-ekonomskog statusa nabavljaju *grill* lošije kvalitete (32). Možemo također reći da nošenje *grilla* zahtijeva dodatne troškove jer se oko zuba zadržava hrana u kojoj nakon nekog vremena počnu bujati bakterije, pa ubrzo nastaju karijesne lezije (33). Od poznatih osoba u SAD-u *grill* nose Kesh, Kanye West, Nelly i Li'l Wayne, Usher, Snoop Dogg, Lil Jon, Thug Mike Jones, Bun B. i Sean Diddy Combs, tablica 4.

a *dental grill* as a demonstration of high social status. A *grill* is a dental device, made of gold, platinum, or other metals, that is often encrusted with jewels and which can be inserted on the top of the maxillary anterior teeth (31). This device can be easily removed so that, during the day, the person can normally perform its duties with no grill on. The grill can be later inserted over the anterior teeth when in the desired social context. The grills are more expensive than gold caps, and therefore these people are most likely viewed as higher ranked in the social scale than those who have just gold caps. As far as different types of oral jewelry have become status symbols within the hip-hop industry and milieu, a lot of such items are usually crafted by jewelers and then applied by dentists. People of lower socio-economic status, however, wear grills of lower quality (32). Additionally, we must say that grill-wearing is a cost-inducing practice since the grill allows food and debris trapping and is a ground for bacterial growth and the cause of carious lesions (33). An example of American celebrities who love grills culture are Kesh, Kanye West, Nelly and Li'l Wayne, Usher, Snoop Dogg, Lil Jon, Thug Mike Jones, Bun B. and Sean Diddy Combs, Table 4.

**Tablica 4.** Različiti oblici zubnih ukarasa i plemensko/geografska područja gdje se prakticiraju  
**Table 4** Different types of teeth decorations, and tribes/geographical areas where they are widespread

Ukrasi • Decorations	Tanka mesingana pločica obavijena oko sjekutića • Thin brass plate over the incisors	Potpuno pokrivanje zuba zlatnom krunicom • Total tooth coverage with gold crowns	Metalni umetci • Metal inserts	Mesingani klin u prednjem zubu • Brass stud in front teeth	Donji sjekutići ekscipirani metalnim koncem • Four lower incisors extirpated with a metal thread	Zlatne krunice na prednjim zubima +/- nakit • Gold crowns on anterior teeth +/- jewelry	Metalni maksilarni zubni grill +/- nakit • Metal maxillary dental grill +/- jewelry
Borneo	x	x					
Dyaks (Borneo)			x				
Pleme Iban (Borneo) • Iban people (Borneo)				x			
Uganda					x		
Afroameri-kanci iz SAD-a • African-Americans of USA						x	x

### 5) Ostali oblici sakaćenja

Težnja da se razlikuju od drugih ljudi ili životinja, razlog je da je lomljenje zuba još uvijek uobičajeno u određenim populacijama. Neki Papuanci, primjerice, to čine kako bi se razlikovali od pripadnika plemena s kojim nisu u dobrim odnosima. Na Maldivima se lome četiri gornja sjekutića da bi se zubi poravnali i kako bi se ljudi razlikovali od životinja (34). Eskimi s rijeke Mackenzie u Kanadi skraćuju krune gornjih sjekutića da bi se razlikovali od psa (18). Moisi (Stiengsi) iz Cochinchina lome kremenom dva gornja sjekutića radi prevencije od bolesti, a to se obavlja u pubertetu na raskošnoj svečanosti. Među plemenima Hinda na Baliju *duhovno bušenje zuba* (ceremonija Mapadesa) čin je prelaska u odraslo doba i slavi se simboličnim razaranjem šest neprijatelja duše – ljutnje, ponosa, pohlepe, požude, zavisti i zbunjenosti (35). Žene u nekim senegalskim plemenima potiskuju gornje sjekutiće tijekom nicanja da bi dobile preklap – *overjet* preko donje usne, tablica 5.

### 5) Other kinds of mutilations

The aspiration to differentiate from other people or animals is the reason why the habit of breaking teeth is still so common among some populations. Some Papuans for example, practice this rite in order to be different from individuals of other disliked Papuan tribes. In the Maldives Islands there is a habit to break all four upper incisors in order to have the teeth aligned at the same level, so differentiating humans from animals (34). The Eskimos of the Mackenzie River, in Canada, instead, cut down the crowns of the upper incisors to be seen different from dogs (18).

The Moisi (Stiengsi) of Cochinchina break the two upper central incisors with a flint as a means of protection from sickness; this is always performed during a sumptuous ceremony at puberty.

Among hindu tribes of Bali the “*spiritual tooth drilling*” (Mapandes ceremony) is performed as a rite of passage: in this case, the entrance into adulthood is celebrated with the



symbolic act of destroying the six enemies of the soul such as anger, pride, greed, lust, envy and confusion (35).

The women in certain Senegal tribes, finally, force the eruption of the upper incisors outward to obtain an overjet beyond the lower lip, Table 5.

**Tablica 5.** Različiti oblici sakaćenja zuba i plemena te geografska područja gdje se prakticiraju  
**Table 5** Various types of teeth mutilations, and tribes/geographical areas where they are widespread

Ostala sakaćenja • Other mutilation	Razbijeni zubi • Broken teeth	Četiri gornja sjekutića slomljena (na istoj visini) • Four upper incisors broken (and at the same level)	Krone gornjeg sjekutića – skraćene • Crowns of the upper incisors cut down	Dva gornja središnja sjekutića – slomljena • Two upper middle incisors broken	Bušeni zubi • Tooth drilled	Pogurani rast gornjih sjekutića • Forced growth of the upper incisors
Plemena Papuanaca • Papuan tribes	x					
Maldivi • Maldivian		x				
Eskimi u Kanadi • Eskimos of Canada			x			
Moisi iz Cochinchina • Moisi of Cochinchina				x		
Hindusi s Balijske • Hindu of Bali					X	
Senegal						x

## Zaključak i forenzične smjernice

Tijekom povijesti, od pretpovijesnoga doba do danas, želio se promijeniti izgled tijela. Ni zubi pritom nisu bili izostavljeni pa se iz estetskih razloga, kao znak socijalnog statusa ili plemenske pripadnosti, u njih stavljaju ispuni ili okviri, graviraju se, boje i ukrašavaju dragim kamenjem.

Slična sakaćenja uočena su, s različitim antropološkim smislom, u znatno udaljenim etničkim skupinama. Sakaćenja i vađenja bila su uobičajena u prošlosti, ali i danas u nekim etničkim skupinama tijekom rituala u povodu inicijacije i plemenske pripadnosti.

Geografska raspodjela tih običaja može biti važna za identifikaciju – ako se uzmu u obzir specifičnosti plemena/područja, podatci o sakaćenju zuba mogu koristiti u slučaju forenzične identifikacije pri određivanju geografskog područja te etničkog i kulturalnog podrijetla pojedinca. Nepovratne morfološke promjene na zubima ostaju na skeletnim ostacima i nakon smrti. Njihovo otkrivanje na zubima moglo bi biti važno i u postupku identifikacije živih subjekata. Osobna identifikacija sve je veći problem zbog sve češće imigracije, trgovine ljudima i organiziranog kriminala. Forenzična odontologija itekako je važna u identifikaciji, ali nalazi ponekad mogu biti nespecifični, a identifikacija otežana. Zato oralna sakaćenja, čak i ona rijetka, mogu znatno pridonijeti prepoznavanju jer upućuju na etničku i geografsku specifičnost. Svi oblici sakaćenja zuba potiču pitanje je li taj običaj medicinski opravdan i legalan. Naime, sakaćenje zuba obično se obavlja kod iscjeljitelja u nesigurnom okolišu i u lošim higijenskim uvjetima, pa su moguće neugodne zdravstvene posljedice. Najčešći neposredni rizici su jako krvarenje, infekcija, osteomijelitis čeljusti, anemija, tetanus, meningitis, aspiracijska bronhopneumonija, prenošenje zaraznih bolesti (uključujući HIV i hepatitis), te često smrt zbog sepsa (36 – 39).

## Conclusions and forensic considerations

In the course of human history, from prehistoric times until nowadays, there has always been the wish to change the appearance of the body, also of the teeth, with filings, engravings, precious stones, bezels, for esthetic purposes, as a sign of social status and as a tribal identification.

Similar mutilations have been found with different anthropological meaning in ethnic groups very far from each other. Mutilation and extractions were carried out in the past, but are still practiced today among some ethnic groups, for initiation rites and tribal identification.

The geographical distribution of these procedures may result important for identification purposes; given the tribe/region specificity of dental mutilations, they may be useful for forensic identification, to determine the geographical area and ethnic and cultural backgrounds of the individuals. The irreversible morphological changes of the teeth, moreover, are preserved, after death, in the skeletal remains. But the detection of these morphological modifications of the teeth could be valuable also in the identification procedures of living subjects. Personal identification is in fact a growing problem due to the increase of illegal immigration, human trafficking and organized crime. Forensic odontology plays a relevant role in identification, but sometimes findings may be nonspecific, and identification therefore very difficult. For this reason, oral mutilations, even if infrequent, may provide a valuable contribution, because of their ethnic and geographic specificity.

Nevertheless, dental mutilations arouse medical-legal interest which goes beyond personal identification. These practices, in fact, raise ethical as well as legal issues. Dental mutilations are often performed by healers in unsafe environments and poor hygienic conditions, with possible relevant health

Sakaćenje zuba povezano je s nepopravljivim promjenama oralnoga sustava i može smanjiti njegovu funkcionalnost. Tako posljedica vađenja može biti malokluzija ili ortodontske komplikacije povezane s defektom žvakanja zbog promjene oblika zuba. Ponekad posljedica može biti i nehranjenost, ali danas se ne smiju zanemariti ni psihološke posljedice, posebice kad je riječ o imigrantima jer pojedinci osjećaju sram zbog svojega zubnog statusa koji im ograničava osmijeh, govor i društvenu interakciju (40).

Postupci identifikacije omogućuju forenzičarima da provedu kampanju o svjesnosti i informiranosti, posebice među imigrantima i iscjeliteljima, upozoravajući ih na rizike.

Budući da su takvi postupci opasni i štete fizičkom i mentalnom zdravlju, etički su neprihvatljivi i nezakoniti. Zato je potrebno prijaviti sve slučajeve sakaćenja zuba kako bi se pronašli pojedinci koji se u našim zemljama bave tim poslom.

Čak i u slučaju prihvatljivih postupaka, u europskim zemljama ili u Americi *zubni grill* može rezultirati komplikacijama ili štetno utjecati na higijenske uvjete. Može se povezati s iritacijom ili alergijskom reakcijom na metal te, u slučaju loših higijenskih navika, potaknuti razvoj zubnog karijesa (31). Zbog mogućih opasnosti za zdravlje, postavlja se pitanje legitimnosti ovoga postupka i etička se pitanja povezuju s informiranom suglasnosti za terapijski postupak.

consequences. The most common immediate risks include excessive bleeding, infections, osteomyelitis of the jaws, anemia, noma, tetanus, meningitis, aspiration bronchopneumonia, transmission of infectious diseases (including HIV and hepatitis) and death, often from sepsis (36-39).

Dental mutilations are also associated with irreversible alterations of the oral system, and can result in reduction of its functionality. Extractions, for example, can lead to malocclusions or orthodontic complications that are associated with defects of mastication, also related to shape modification. Sometimes it may result in malnutrition, but nowadays even psychological consequences cannot be ignored; especially in the case of immigrants, individuals express their embarrassment about dental status, which limits smiling, speaking and social interaction (40).

The identification procedures allow the forensic odontologist to carry out a campaign of awareness and information, especially among immigrants and healers, warning about the risks. Moreover, since such practices are dangerous and harmful to physical and mental health, they are ethically unacceptable and unlawful. It is therefore necessary to report all cases of dental mutilation in order to identify any individuals engaged in such unjustified practices.

Even if they are generally accepted practices in European countries or in America, dental grilling, can actually lead to complications or detrimental effects especially for hygienic reasons. It can be associated with irritation or metal-allergic reactions, and in the absence of careful hygienic practices it could lead to the development of dental carious lesions (31).

The possible health hazards, pose questions about the legitimacy of the act also connected with ethical and legal issues of information and consent to treatment.

#### Abstract

**Background:** Ethnic mutilations have a social and anthropological significance both in contemporary and past human behavior, influenced by geographic, religious and cultural factors which can greatly help forensic odontologist's practice in dental profiling process. Dental ritual mutilations and dental decorations were - and still are - practiced among many ethnic groups and cultures. Throughout the history of humanity, having healthy teeth has a symbolic meaning of youth, beauty and strength, but it can also have other meanings. Dental ritual mutilations were documented in many cultures in the past and were practiced mainly for religious rituals purposes, for esthetic reasons and because they represented a symbol of status or of belonging to a particular social group. Similar rituals are still performed. **Material and Method:** The present paper is a systematic review of the literature reporting on dental ritual mutilations from the early 1960s and is included in Pubmed, Scopus and Google Scholar. The research was deliberately limited only to the *ritual mutilations*, which can be defined as "any irreversible impairment of the integrity of the human organism, made with a ritual purpose and without any curative aim". Therefore all the articles dealing with single or multiple dental self extractions of psychotic origins were excluded, as well as the infant oral mutilations, since the practice is deemed to have therapeutical effects among ethnic groups dedited to this practice. **Conclusions:** The knowledge of dental alteration due to oral mutilations can be a powerful tool for the identification procedures of living or dead persons or even in human remains especially providing relevant information about the ethnic origins and the cultural background of a subject. Some medical legal issues for the odontologist about dental mutilation are also addressed in the paper.

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Ceremonial Behaviour; Social Identification; Ethnic Groups; Tooth Avulsion; Self Mutilation; Forensic Dentistry; dental ritual mutilations; tooth laquering

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