

RADIOLOŠKA ANALIZA HIPODONCIJE U ORTODONSKOJ PRAKSI

RADIOGRAPHIC STUDY OF HYPODONTIA IN ORTHODONTIC PATIENTS

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Apstrakt

Uvod: hipodoncija podrazumeva nedostatak jednog ili više zuba i predstavlja najčešću razvojnu anomaliju zuba.

Cilj rada: da se sproveđe ortopantomografska studija i utvrdi distribucija i frekvencu hipodoncije kod ortodontskih pacijenata.

Materijal i metode: analizirano je 505 ortopantomografskih snimaka (OTS), za dijagnozu hipodoncije kod oba pola i životne starosti od 8 - 17 godina. Zub se proglašavao kao kongenitalno (razvojno) nedostajući, kada radiološki nije bio vidljiv ili prepoznatljiv na bazi svog stepena mineralizacije tj. kalcifikacije i kada nije postojao podatak o njegovoj ekstrakciji. Dobjiveni podaci su obrađeni programom SPSS 15.0, korišćenjem Hi kvadrata ili Fišerov testa egzaktne verovatnoće nulte hipoteze.

Rezultati: Utvrđeno da je agenezija zuba prisutna u 55 pacijenata (10,89%), kod 34 devojčica (12,10%) i kod 21 dečaka (9,38%), ali bez statistički značajne razlike ($\chi^2=0,95$, $p=0,3288$). Ukupno je nedostajalo 142 zuba. Utvrđeno je da u maksili nedostaje 61 zub (42,96%) a u mandibuli 81 zub (57,04%). Najčešći zub koji nedostaje, je donji drugi levi premolar i to kod devojčica (6,05%), zatim da je najveći broj pacijenata (24) imao nedostatak 2 zuba - (4,75% u odnosu na celokupan broj ispitanika i 43,64% u odnosu na broj pacijenata sa hipodoncijom). Oligodoncija je nadjena kod 8 (1,58%) pacijenata analiziranih u ovom radu odnosno kod 14,55% od svih pacijenata sa hipodoncijom. Simetrična hipodoncija nadjena je kod 38 pacijenata (7,52%) a asimetrična hipodoncija kod 17 pacijenata (3,37%) u odnosu na sve ispitanika. Prisustvo simetrične hipodoncije je statistički značajno češće od asimetrične.

Zaključak: urođeni nedostatak jednog ili više zuba imalo je 10,89% naših ispitanika u češći nedostatak zuba kod devojčica (12,10%) nego kod dečaka (9,38%). Hipodoncija je bila češća u donjoj vilici i to kod devojčica (8,19% sa desne strane i 7,47% sa leve strane) u odnosu na dečake (4,02% desno i 5,36% levo). Broj zuba koji je nedostajao kretao se od 1—9, najveći broj pacijenata je imao nedostatak 2 zuba.

Ključne reči: hipodoncija, radiološka analiza, kongenitalno nedostajući zubi

Uvod

Nedostatak jednog ili više zuba, predstavlja najčešću razvojnu anomaliju zuba. Hipodoncija podrazumeva nedostatak jednog ili više zuba¹⁵.

Abstract

Introduction: Hypodontia implies a lack of one or more teeth and is the most common developmental dental anomaly.

Purpose: To conduct an orthopantomographic studies and to establish the distribution and frequency of hypodontia in orthodontic patients.

Material and methods: 505 orthopantomograms were analyzed (OTS), for diagnosis of hypodontia of both gender and age range from 8 - 17 years. Tooth was declared as a congenital (developmental) missing when it wasn't visible or radiological recognizable based on its own degree of mineralization and calcification, and when there was no data on its extraction. The obtained data were statistically processed by SPSS 15.0 software, using the Hi square test or Fisher exact probability null hypothesis.

Results: There were agenesis of teeth in 55 patients (10.89%); at the 34 girls (12.10%) and at the 21 boys (9.38%), but with no statistically significant differences ($\chi^2=0,95$, $p=0,3288$). A total of 142 missing teeth were detected. It was found that in the maxilla is missing 61 teeth (42.96%) and 81 mandibular teeth (57.04%). The most common missing tooth, was the lower left second premolar at the girls (6.05%); the most patients (24) had the lack of 2 teeth - (4.75% compared to the total number of respondents and 43.64 % compared to the number of patients with hypodontia). Oligodontia was found in 8 (1.58%) patients analyzed in this paper and in 14.55% of all patients with hypodontia. Symmetric hypodontia was found in 38 patients (7.52%) and asymmetric hypodontia in 17 patients (3.37%) compared to all respondents. The presence of symmetric hypodontia was significantly more frequent than asymmetrical ($p < 0,01$).

Conclusion: The congenital missing one or more teeth had 10.89% of our patients with the common missing of teeth in girls (12.10%) than boys (9.38%). Hypodontia was more common in the lower jaw and in girls (8.19% on the right side and 7.47% on the left side) compared to boys (4.02% left and 5.36% right side). Number of missing teeth ranged from 1-9, and most patients had a lack of 2 teeth.

Key words: hypodontia, radiographic analysis, congenitally missing teeth

Introduction

Abscence of one or more teeth, is the most common developmentally dental anomaly. Hypodontia implies a lack of one or more teeth¹⁵.

Hipodoncija se još i klasificuje kao izolovana ili nesindromična i sindromična ili hipodoncija udružena sa sindromima. Oligodoncija predstavlja nedostatak 6 i više zuba, a anodoncija potpuni nedostatak zuba¹⁵. Smatra se da hipodoncija predstavlja veoma važno patološko stanje jer dolazi do narušavanja estetskog i funkcionalnog oralnog statusa pacijenta. U primarnoj denticiji prevalenca hipodoncije se kreće od 0,08% - 1,55%, a u stalnoj denticiji je od 2,3% - 11,3%¹⁴. Važno je istaći da hipodoncija trećeg molara ima prevalencu od 9% - 37%.

U stručnoj literaturi postoje mnogobrojne studije o prevalenci i distribuciji hipodoncije. Međutim u brojnim studijama su uočeni nedostaci^{6,12}. Prvi važan podatak o mogućim nedostacima u okviru jedne studije je pogrešna starost pacijenta za analizu rendgen filma. Imperativ je da se u dečijem uzrastu analiziraju rendgen filmovi pacijenata kod kojih je završena mineralizacija stalnih zuba⁶. Ako se napravi ovakav previd i analiziraju rendgen snimci dece kod kojih nije završena mineralizacija zuba, onda će se dobiti lažno pozitivan rezultat o zubima koji nedostaju. Drugi važan podatak o mogućim nedostacima u okviru jedne studije odnosi se na vizuelizaciju zubnih klica na rendgen filmu koja zavisi od stepena mineralizacije zubnih klica. Poznata je činjenica da zubni pupoljak drugog mandibularnog premolara pokazuje kasni početak mineralizacije što može dovesti do postavljanja lažno-pozitivne dijagnoze agenezije na rendgen filmu¹². Dijagnozu agenezije zuba u stalnoj denticiji treba uraditi posle šeste godine života, a za ageneziju trećeg molara – posle desete godine života¹. Takođe postoje poteškoće u razlikovanju nedostatka između mandibularnog centralnog sekutića i mandibularnog lateralnog sekutića, pogotovo kada je zub koji je ostao – neiznikao⁹. Treći važan podatak o mogućim nedostacima odnosi se na nemogućnosti preciznog razlikovanju mandibularnih sekutića zbog anatomskih artefakata koji se dobijaju od superpozicije vratnih pršljenova na mentalni region mandibule.

Uzimajući u obzir probleme u dijagnostici zuba koji nedostaju kao i mogućim terapeutskim izborom, sprovedena je ortopantomografska studija sa ciljem da se ustanovi distribucija i frekvencija hipodoncije kod ortodontskih pacijenata.

Hypodontia are also classified as isolated or non-syndromic and syndromic or hypodontia associated with the syndromes. Oligodontia is the lack of 6 or more teeth, and anodontia is complete lack of teeth¹⁵. It is believed that hypodontia is very important pathological condition because there is distortion of aesthetic and functional oral status of the patient. In the primary dentition hypodontia prevalence ranges from 0.08% - 1.55%, and in the permanent dentition ranges from 2.3% - 11.3%¹⁴. It is important to note that hypodontia of third molars has a prevalence of 9% - 37%.

In the professional literature, there are numerous studies on the prevalence and distribution of hypodontia. However, numerous studies have identified shortcomings^{6,12}. The first important information about possible deficiencies in the study of patients, is the wrong age for the analysis of X-ray films. It is imperative that at the children's age, are considered for analysis x-ray films of patients at whom who completed the permanent tooth mineralization⁶. If researcher make such an oversight and analysed X-ray's of children in whom no complete mineralization of teeth occurred, then researcher will get a false positive result on a teeth that are missing. Other important information about possible deficiencies in a study related to the visualization of the dental germ of X-ray film, which depends on the degree of mineralization of dental germs. It is a known fact that the dental bud of mandibular second premolars showed delayed start of mineralization which may give rise to false-positive diagnosis of agenesis on the X-ray films¹². Diagnosis of agenesis of teeth in the permanent dentition should be done after six years of life, and agenesis of third molars - after tenth years of life¹. There are also difficulties in differentiating between a lack mandibular central incisors and lateral incisors, especially when the tooth which is in jaw is unerupted⁹. The third important fact about the possible disadvantages related to the inability to distinguish the precise mandibular incisors because of anatomical artifacts that come from the superposition of cervical vertebrae in the mental region of mandible.

Considering the problems in the diagnosis of missing teeth and possible therapeutic choice, an orthopantomographic study was conducted in order to establish the distribution and frequency of hypodontia in orthodontic patients.

Materijali i metode

U ovoj studiji je analizirano je 505 ortopantomografskih snimaka (OTS), za dijagnozu hipodoncije. Korišćeni su OTS pacijenata oba pola i beleženi su zubi koji nedostaju i upisivani u istraživački karton. Raspon godina pacijenata u momentu snimanja je bio od 8 – 17 godina. Snimci su analizirani pod normalnim sobnim osvetljenjem i na negatoskopu, a u slučajevima kada je ustanovljen nedostatak zuba – takvi snimci su (posle prve dijagnoze agenezije zuba), ponovo analizirani nakon mesec dana kada se postavlja definitivan zajlučak. U ovoj studiji je korišćena definicija kongenitalnog zuba koji nedostaje, da su to oni zubi koji nisu iznikli u u usnu šupljinu i koji se ne vide na OTS snimku¹¹. Zub se proglašavao kao kongenitalno (razvojno) nedostajući kada nije bio vidljiv ili prepoznatljiv radiološki na bazi svog stepena mineralizacije tj. kalcifikacije i kada nije postojao podatak o njegovoj ekstrakciji¹⁶. Za analizu su uzimani OTS koji ispunjavaju standarde u pogledu radiološke kondicije snimanja. Dobijeni podaci statistički su obrađeni programom SPSS 15.0, korišćenjem Hi kvadra ta ili Fišerov testa egzaktne verovatnoće nulte hipoteze. Rezultati statističke analize prikazani su tabelarno i grafički.

Rezultati

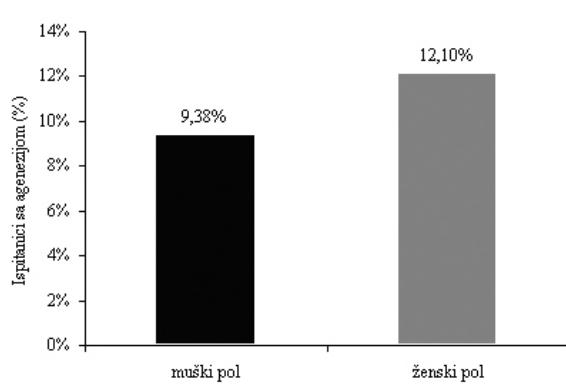
Metodom slučajnog izbora analizirano je 505 ortopantomografskih snimaka dece oba pola. Od ukupnog broja ispitanika 224 je bilo muškog i 281 ženskog pola. Analizom je utvrđeno da je agenezija zuba prisutna u 10,89% slučajeva (55 pacijenata). Analiza po polu pokazala je da je hipodoncija češća kod devojčica 34 (12,10%) nego kod dečaka 21 dečaka (9,38%), ali bez statistički značajne razlike ($\chi^2=0,95$, $p=0,3288$) (Grafikon 1). Ukupno je nedostajalo 142 zuba. Utvrđeno je da u maksili nedostaje 61 zub (42,96 %) a u mandibuli 81 zub (57,04%), što govori o češćem odsustvu zuba u mandibuli u odnosu na maksilu, ali bez statistički značajne razlike. U gornjoj vilici kod dečaka, na desnoj stani nadjena je hipodoncija kod 8 (3,57%), na levoj kod 10 (4,46%), kod devojčica 19 (6,76%) na desnoj i 16 (5,69%) na levoj strani vilice. Kod dečaka u donjoj vilici hipodoncija je prisutna u većem procentu - kod 9 (4,02%) desno i 12 (5,36%) levo, a

Materials and methods

This study analyzed the 505 ortopantomograms (OTS), for diagnosis of a hypodontia. For radiographic analysis were taken OTS that meet standards of radiological condition recording. The OTS of both gender are used , and missing teeth were recorded, and enrolled in the research form. Age range of patients at the time of the recording was from 8 - 17 years. OTS were analyzed under normal room lighting at the light box. In cases where the lack of teeth is established - these OTS are (after the first diagnosis of teeth agenesis), re-analyzed after one month when the final diagnosis were done. This study used the definition of congenitally missing teeth,which are teeth that are not arising in the oral cavity and which are not seen on the OTS ¹¹. Tooth is declared as a congenitally (developmentally) missing when it could not be identified radiographically on the basis of degree of its mineralization and calcification and when there is no data about its extraction¹⁶. The obtained data were statistically processed by SPSS 15.0 software, using the Hi square test or Fisher exact probability null hypothesis. Obtained results of statistical analysis are presented in tables and charts.

Results

Using the method of random selection, it has been analyzed 505 ortopantomograms of patients of both gender. Out of total number of respondents, 224 respondents were male and 281 female. The analysis determined that agenesia of teeth was in 55 patients (10.89%). Gender analysis showed that hypodontia is more common and there were in 34 girls (12.10%) and in 21 boys (9.38%), but without statistically significant differences ($\chi^2=0,95$, $p=0,3288$) (Chart 1). A total of 142 missing teeth detected. It was found that in the maxilla is missing 61 teeth (42.96%) and 81 mandibular teeth (57.04%), which indicate more often the absence of teeth in the mandible compared to maxilla, but without statistically significant differences. In the upper jaw of boys on the right side hypodontia was found in 8 (3.57%)patients, and on the left side in 10 (4.46%)patients. In 19 girls (6.76%) hypodontia were on the right side and in 16 girls (5.69%) on the left side of the jaws. For boys in the lower jaw, hypodontia is present



Grafikon 1. Procentualno izraženo prisustvo agenezije zuba u odnosu na pol

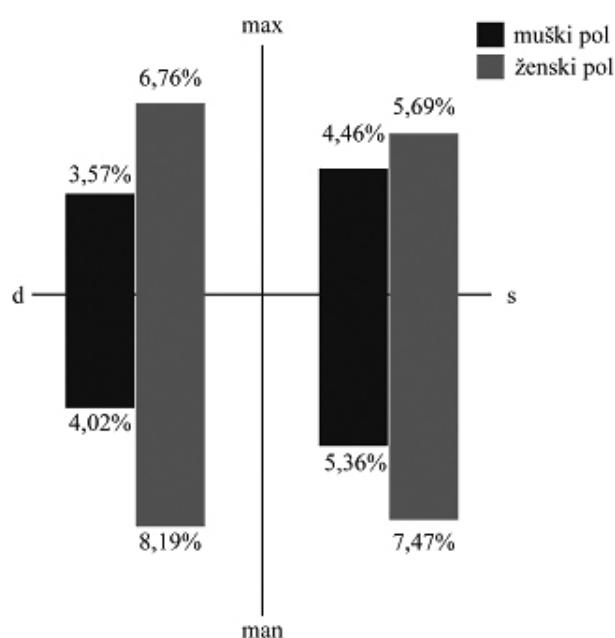
Chart 1. Percentages of agenesis of teeth presence in relation to gender.

takodje i kod devojčica 23 (8,19%) sa desne strane i 21 (7,47%) sa leve strane mandibule - Grafikon 2. Na osnovu dobijenih rezultata, može se zaključiti da je hipodoncija izraženija kod devojčica nego kod dečaka, češća u mandibuli u odnosu na maksilu, ali bez statistički značajnih razlika, gledano kako u celom uzorku tako i u grupi ispitanika sa hipodoncijom. Bliži podaci o rezultatima analize što se tiče lokalizacije nedostajućih zuba, po vilici, strani vilice i polu, mogu se videti na tabelama 1 i 2.

Najčešći zub koji nedostaje (6,05%), obeležen po kvadrantima, je donji drugi levi premolar (35) kod devojčica (Slika 1), zatim donji drugi desni premolar (45), takodje kod devojčica (5,34%), slede gornji desni lateralni sekutić (12) devojčice (4,27%), gornji levi lateralni sekutić (22) takodje devojčice (3,91%), donji levi drugi premolar (35) kod dečaka (4,46%) i donji desni drugi premolar (45) takodje kod dečaka (3,57%) (Grafikon3).

Nije utvrđeno da nedostaju sledeći zubi : gornji centralni incizivi kod oba pola, gornji očnjaci kod devojčica , gornji prvi premolari kod oba pola, gornji prvi molari kod oba pola, gornji drugi molari kod dečaka, donji očnjaci kod oba pola, donji prvi premolari kod dečaka, donji prvi molari kod oba pola i donji drugi molari kod dečaka.

Utvrđena je razlika u nedostatku zuba u maksili i mandibuli na levoj i desnoj strani. Simetrična hipodoncija nadjena je kod 38 pacijenata (7,52%) Asimetrična hipodoncija registrirana je kod 17 (3,37%) pacijenata. Posmatrano na ukupan broj ispitanika u ovoj studiji, Pearsonovim testom utvrđeno je da je prisus-



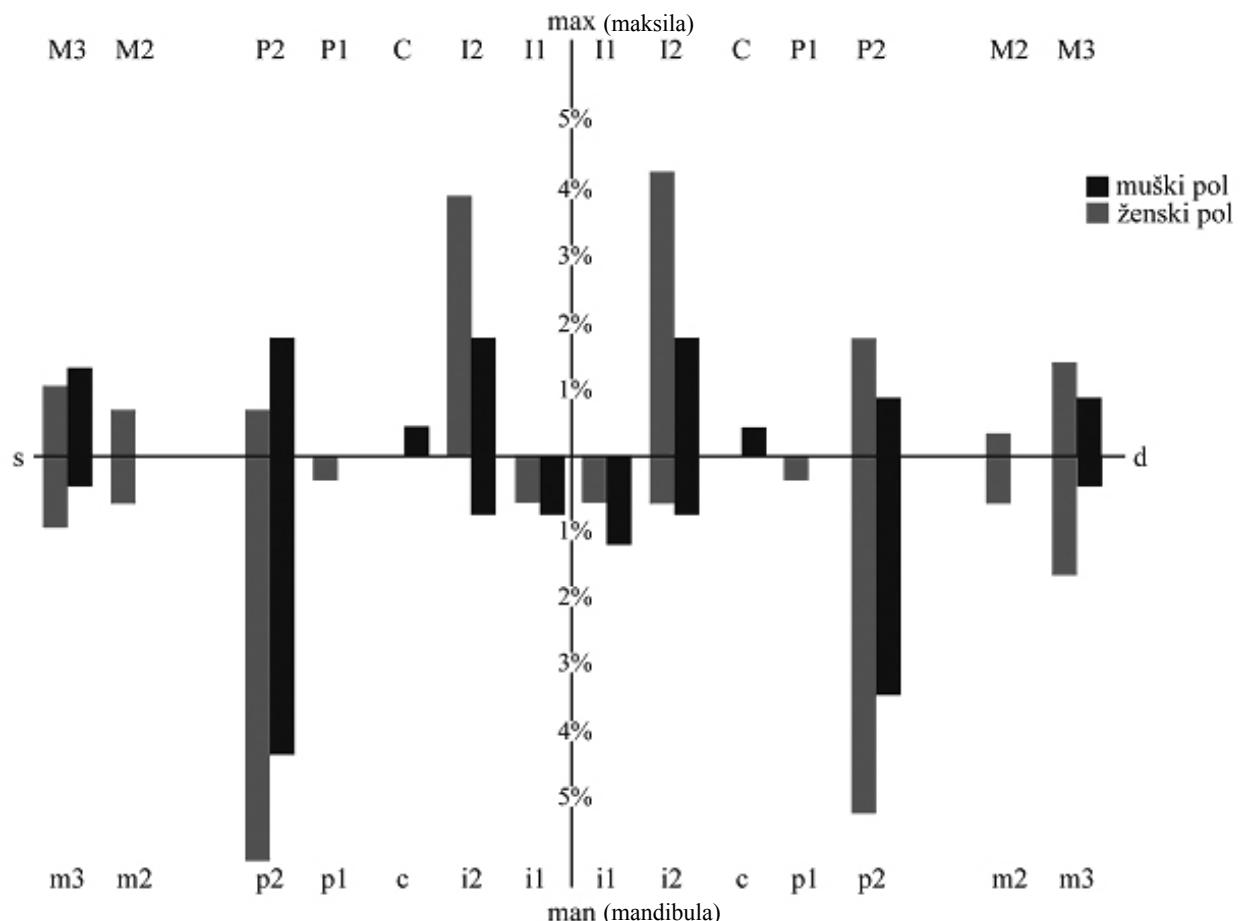
Grafikon 2. Procentualno izraženo prisustvo hipodoncije na levoj i desnoj strani maksile i mandibile, u odnosu na pol.

Chart 2. Percentages of hypodontia presence on the left and right side of the maxilla and mandible in relation to gender.

in higher percentage - in 9 boys(4.02%) on the right side and in 12 boys (5.36%)on the left side; hypodontia were in 23girls (8.19%) on the right side and 21 girls(7, 47%) on left side of mandible (Chart 2). Based on these results, it can be concluded that the hypodontia is higher in girls than in boys, common in the mandible compared to maxilla, but with no statistically significant differences, considering both, the total sample and in groups of patients with hypodontia.

More detailed information about the results of the analysis regarding the location of missing teeth, the jaws, jaw's site and gender, can be seen in tables 1 and 2 .The most common missing tooth, marked by quadrant # 35, the lower left second premolar is at girls in 6.05% (Figure 1), then the lower right second premolar # 45, also at girls in 5.34%, followed upper right lateral incisor # 12 at girls in 4.27%, upper left lateral incisor #22 also at girls in 3.91%, lower left second premolar #35 at boys in 4.46% and lower right second premolars #45 also at boys in 3.57% (Chart 3).

It was not established that the missing teeth as follows: upper central incisors in both sexes, upper canines in girls, upper first premolars in both sexes, upper first molars in both sexes, the upper second molar in boys, lower canines in both sexes, the lower first premolars in boys , the lower first molars in both sexes and the lower second molar in boys.



Procentualno izražen nedostatak zuba na levoj i desnoj strani maksile i mandibule, i u odnosu na pol.

Grafikon 3. Percentage expressing a lack of teeth on the left and right side of the maxilla and mandible in relation to gender.
Chart 3. Percentage expressing a lack of teeth on the left and right side of the maxilla and mandible in relation to gender.

Označavanje

I1-maksilarni centralni inciziv
I2-maksilarni lateralni inciziv
C-maksilarni očnjak
P1-maksilarni prvi premolar
P2-maksilarni drugi premolar
M2-maksilarni drugi molar
M3-maksilarni treći molar

i1-mandibularni centralni inciziv
i2-mandibularni lateralni inciziv
c-mandibularni očnjak
p1-mandibularni prvi premolar
p2-mandibularni drugi premolar
m2-mandibularni drugi molar
m3-mandibularni treći molar

Tags

I1-maxillary central incisors
I2-maxillary lateral incisors
C-maxillary canine
P1-maxillary first premolars
P2-maxillary second premolars
M2-maxillary second molar
M3-maxillary third molar

i1-mandibular central incisors
i2-mandibular lateral incisors
c- mandibular canine
p1-mandibular first premolars
p2-mandibular second premolar
m2-mandibular second molar
m3-mandibular third molar

Two symmetric hypodontia statistically significantly more common than asymmetric ($p < 0.01$).

The number of teeth that are congenitally absent in this analysis varies from 1-9 teeth. It was determined that the highest number of patients had 2 teeth missing - 24 patients (4.75%) in relation to the total number of respondents in this study, the Pearson test revealed that the presence of symmetric hypodontia significantly more frequently than asymmetric ($p < 0.01$).

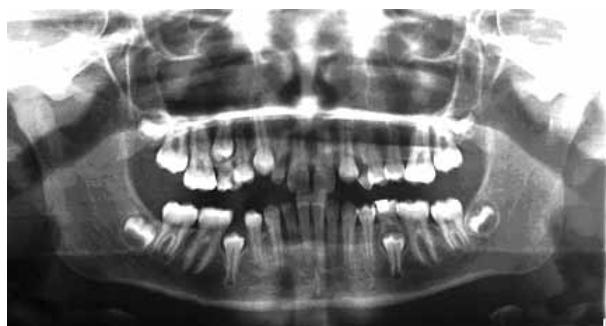
The difference in the absence of teeth in the maxilla and mandible on the left and right is determined. Symmetric hypodontia was found in 38 patients (7.52%). Asymmetric hypodontia is registered in 17 patients (3.37%). Seen on the total number of respondents in this study, the Pearson test revealed that the presence of symmetric hypodontia significantly more frequently than asymmetric ($p < 0.01$).



Slika 1. Hipodoncija donjem levog drugom stalnog premolara(izdvojena deo sa ortopantomografskog snimaka)
Figure 1. Hypodontia of lower second permanent premolars (cropped view from panoramic x-ray)



Slika 2. Hipodoncija zuba 35 i 45
Figure 2. Hypodontia of teeth # 35 and 45



Slika3. Hipodoncija gornjem levog lateralnog sekutića
Figure 3. Hypodontia of upper left lateral incisor



Slika 4.Oligodoncija(nedostatak zuba 12,15,22,25,32,31,41,42)
Figure 4. Oligodontia(missing teeth # 12,15,22,25,32,31,41,42)

Tabela 1. Hipodoncija po vrsti zuba, polu i strani maksile
Table 1. Hypodontia by tooth type, gender and side of maxilla

Zub/Tooth	Muški pol/Male				Ženski pol/Female			
	desno/right		levo/left		desno/right		levo/left	
1	0	0,00%	0	0,00%	0	0,00%	0	0,00%
2	4	1,79%	4	1,79%	12	4,27%	11	3,91%
3	1	0,45%	1	0,45%	0	0,00%	0	0,00%
4	0	0,00%	0	0,00%	0	0,00%	0	0,00%
5	2	0,89%	4	1,79%	5	1,78%	2	0,71%
6	0	0,00%	0	0,00%	0	0,00%	0	0,00%
7	0	0,00%	0	0,00%	1	0,36%	2	0,71%
8	2	0,89%	3	1,34%	4	1,42%	3	1,07%

pacijenti sa nedostatkom 1 zuba, što je utvrđeno kod 17 osoba (3,37% u odnosu na sve ispitanike i 30,91% u odnosu na pacijente sa hipodoncijom) (Slika 3) (Tabele 3 i 4). Najviše ispitanika, nezavisno od pola, imalo je nedostatak dva zuba, a slede oni sa nedostatkom jednog zuba. Nema statistički značajne razlike između polova.

Number of congenital missing teeth, which in this study analysed, ranges from 1-9 teeth. It was found that the majority of the patients(24 patients) had a lack of 2 teeth (4.75% compared to the total number of respondents and 43.64% compared to the number of patients with hypodontia) (Figure 2). The following patients with a lack of teeth was the patients with missing 1 tooth, which is found in 17 pa-

*Tabela 2. Hipodoncija po vrsti zuba, polu i strani mandibule
Table 1. Hypodontia by tooth type, gender and side of mandible*

Zub/Tooth	Muški pol/Male				Ženski pol/Female			
	desno/right		levo/left		desno/right		levo/left	
1	3	1,34%	2	0,89%	2	0,71%	2	0,71%
2	2	0,89%	2	0,89%	2	0,71%	0	0,00%
3	0	0,00%	0	0,00%	0	0,00%	0	0,00%
4	0	0,00%	0	0,00%	1	0,36%	1	0,36%
5	8	3,57%	10	4,46%	15	5,34%	17	6,05%
6	0	0,00%	0	0,00%	0	0,00%	0	0,00%
7	0	0,00%	0	0,00%	2	0,71%	2	0,71%
8	1	0,45%	1	0,45%	5	1,78%	3	1,07%

*Tabela 3. Hipodoncija po broju zuba i polnim grupama u odnosu na ukupan broj pacijenata
Table 3. Hypodontia by the number of teeth and gender groups in relation to the total number of patients*

Hipodoncija/Hypodontia	Muški pol/ Male	Ženski pol/ Female	Oba pola/ Both Gender			
1	6	2,67%	11	3,91%	17	3,67%
2	12	5,36%	12	4,27%	24	4,75%
3	0	0%	4	1,42%	4	1,42%
4	0	0%	1	0,36%	1	0,20%
5	0	0%	1	0,36%	1	0,20%
6	2	0,89%	2	0,71%	4	0,79%
7	0	0%	1	0,36%	1	0,20%
8	1	0,45%	1	0,36%	2	0,39%
9	0	0%	1	0,36%	1	0,20%
Ukupno/Total	21	9,38%	34	12,10%	55	10,89%

Tabela 4. Procentualno izraženo prisustvo hipodoncije po broju zuba i polnim grupama u odnosu na broj pacijenata sa hipodoncijom

Table 4 Percentages of hypodontia presence in relation to the number of teeth and gender groups and in relation to the number of patients with hypodontia

Hipodoncija/Hypodontia	Muški pol/Male	Ženski pol/Female	Oba pola/Both Gender
1	28,57%	32,35%	30,91%
2	57,14%	35,29%	43,64%
3	0,00%	11,76%	7,27%
4	0,00%	2,94%	1,82%
5	0,00%	2,94%	1,82%
6	9,52%	5,88%	7,27%
7	0,00%	2,94%	1,82%
8	4,76%	2,94%	3,64%
9	0,00%	2,94%	1,82%
Ukupno/Total	100,00%	100,00%	100,00%

Posmatrajući u celom uzorku pacijenata , kao i u poduzorku pacijenata sa hipodoncijom, pojava nedostatka 2 , odnosno 1 zuba , za oba pola ukupno, statistički je značajno češća u odnosu na pojavu nedostatka većeg broja zuba - $p <0,001$, $p <0,01$, respektivno.

Oligodoncija je nadjena kod 8 (1,58%) pacijenata analiziranih u ovom radu odnosno kod 14,55% od svih pacijenata sa hipodoncijom (slika 4).

Diskusija

U ovoj studiji dobijeni su konzistentni i sigurni podaci koji pokazuju da je od izuzetnog značaja da se uradi radiološka dijagnostika kod pacijenata sumnjivih na postojanje hipodoncije zuba. Takođe, treba istaći da je klinička dijagnostika hipodoncije insuficijentna, jer u pravilnoj dijagnostici hipodoncije omogućava samo do 70% tačnih dijagnoza o broju nedostajućih zuba¹⁷. Ovakav stav je i doktrinaran kada se uzme u obzir i definicija hipodoncije koja je definiše kao nedostatak zuba koji nije iznikao u usnu šupljinu i koji je nevidljiv na rendgen filmu¹¹. Zbog iznetih činjenica je i sprovedena ovakva studija sa procentom od 99,6% tačne dijagnoze hipodoncije umesto korišćenja kliničkog nalaza i gipsanih radnih modela. Prethodne studije su pokazale da je hipodoncija češća u mandibuli nego u maksili^{4,13}. I u našoj studiji je potvrđen ovakav nalaz i utvrđeno je da je prevalenca hipodoncije veća u mandibuli 81 (57,04%), nego u maksili 61 (42,96%). To je potvrda većeg odsustva zuba u mandibuli nego u maksili, ali bez statistički značajne razlike. Oligodoncija je bila prisutna kod 8 pacijenata i ukupno je nedostajalo i njena prevalenca je bila 1,58% od svih pacijenata ili 14,55% sa hipodoncijom. Ukoliko se uzimaju uzorci za istraživanja hipodoncije u okviru drugih specijalističkih grupa stomatologije onda se dobija manji procenat¹⁰, u odnosu na utvrđeni, dok je u okviru ortodontskih pacijenata ovakav rezultat očekivan⁵. U ortodontskoj literaturi se ističe značaj analiziranja simetrične hipodoncije kao posebnog oblika agenezije zuba. U ovoj studiji je utvrđena simetrična hipodoncija kod 38(7,52% svih, odnosno 69,09% pacijenata sa hipodoncijom), dok je asimetrična hipodoncija registrovana je kod 17 (3,37% svih, odnosno 30,91% pacijenata sa hipodoncijom). Literaturni podaci ukazuju na različite

tients (3.37% compared to all respondents and 30.91% compared to patients with hypodontia) (Figure 3) (Tables 3 and 4). Most respondents, regardless of gender, had a lack of two teeth, followed by those with a lack of one tooth. No statistically significant differences were between the sexes.

Looking at the total sample of patients, as well as in subsets of patients with hypodontia, the appearance of a lack of 2, or 1 tooth, for both sexes overall, statistically is significantly more frequent in relation to the occurrence of the lack of a larger number of teeth - $p <0.001$, $p <0.01$, respectively.

Oligodontia was found in 8(1.58%) patients analyzed in this paper , which is 14.55% of all patients with hypodontia(Figure 4).

Discussion

In this study, consistent and reliable data are obtained, showing the importance of doing radiological diagnosis of patients suspected the existence hypodontia. Also, it should be noted that the clinical diagnosis of hypodontia is insufficient, because the correct diagnosis of hypodontia allows only up to 70% of correct diagnosis of the number of missing teeth¹⁷. This attitude is professionally acceptable when you take into account the definition of hypodontia which is defined as the lack of teeth that is not grew in the oral cavity and is invisible at the X-ray film¹¹. Because of these facts, this study is conducted with the of 99.6% correct diagnosis of hypodontia instead of using clinical examination and plaster working model. Previous studies have shown that hypodontia is common in mandible than in maxilla^{4,13}. In our study this findings is confirmed and found that the prevalence hypodontia is higher in the mandible with 81 missing tooth (57.04%) compared with 61 missing tooth in the maxilla (42.96%). This stressed confirmation of the absence of teeth in the mandible than the maxilla, but without statistically significant differences. Oligodontia was present in 8 patients and a total lack with its prevalence of 1.58% of all patients or 14.55% of patients with hypodontia . If the samples of hypodontia is taken within other specialized groups of dentistry, then researcher gets a lower percent compared to established¹⁰, while in orthodontic patients this result awaited⁵ . In orthodontic literature stressed the importance of analyzing symmetric hypodontia as a special form of tooth agenesis . This study determined symmetric hipodoncija at 38 patients(7.52%

podatke i utvrđeno je da se simetrična hipodoncija kreće od 60-89%^{2,5,14}. Ovakav visok procenat i razlike u procentu u odnosu na pacijente sa različitim geografskim podneblja (Meksiko, Japan, Norveška), ukazuju na povezanost ove anomalije sa genetskim nedostatkom. U ovoj studiji je utvrđen nedostatak od 1 do 9 zuba pri čemu je najčešći nedostatak bio 2 zuba (4,75%) a zatim 1 zub (3,67%), dok je hipodoncija 6 zuba bila prisutna i kod dečaka i devojčica ali u minimalnom procentu (0,89% dečaci, 0,71% devojčice). Magnusson je⁷, u svojoj studiji utvrdio da ne postoje razlike između muškog i ženskog pola u prevalenci hipodoncije dok je naša studija pokazala da postoji veća, mada ne i statistički značajno veća, prevalenca hipodoncije kod ženskog pola (12,10%) u odnosu na muški pol (9,38%). Najnoviji podaci ukazuju da je više od 300 gena uključeno u odontogenetu. Nova istraživanja su pokazala da postoji genetska povezanost sa ovarijalnim karcinomom i hipodoncijom zuba odnosno da osobe ženskog pola koje imaju ovarijalnim karcinomom imaju 8,1 puta više šansi da imaju i hipodonciju zuba. Geni 1 (Msx1) i Pax9 su udruženi sa familijarnom ne-sindromičnom formom hipodoncije dok geni Shh, Pitx2, Irf6 i p63 aktivni u sindromičnim genetskim oboljenjima koja uključuje i ageneziju zuba. Gen Axin2 je uključen u ageneziju zuba ali i u stvaranje karcinoma kolona i ovarijuma^{3,8}. Otkrivanje gena odgovornih za nastanak hipodoncije je od vitalnog značaja jer omogućava ranu onkološku gensku terapiju kod pacijenata koji imaju pozitivnu familijarnu anamnezu hipodoncije i sa aspekta onkologije upozoravaju pacijente na redovan onkološki pregled.

Zaključak

Na osnovu analize i dobijenih rezultata mogu se izvesti sledeći zaključci:

- urođeni nedostatak jednog ili više zuba ima 10,89% naših ispitanika.
- češći nedostatak zuba nadjen je kod devojčica (12,10%) nego kod dečaka (9,38%).
- hipodoncija je češća u donjoj vilici, kod devojčica (8,19% sa desne strane i 7,47% sa leve strane) u odnosu na dečake (4,02% desno i 5,36% levo).
- broj zuba koji nedostaje kretao se od 1—9, s tim što je najveći broj pacijenata imao nedostatak 2 zuba (4,75% svih, odnosno 43,64%

of all, or 69.09% of patients with hypodontia), while the asymmetric hypodontia registered in 17 patients (3.37% of all, or 30.91% of patients with hypodontia). Literature data indicate the different datas founding that symmetric hypodontia ranges from 60-89%^{2,5,14}. Such a high percentage of the difference in percentage in comparison with patients from different geographic region (Mexico, Japan, Norway), indicating an association between these anomalies with genetic deficiency. This study determined the lack of 1 to 9 teeth while the most common deficiency was 2 teeth (4.75%) and 1 tooth (3.67%), while hypodontia of 6 teeth was present in boys and girls but in minimum percentage (0.89% boys, 0.71% girls). Magnusson⁷, in his study found that there are no differences between males and females in prevalence of hypodontia, while our study showed that there is a greater, although not statistically significantly higher, prevalence of hypodontia among girls (12.10%) compared to male sex (9.38%). Latest data indicate that more than 300 genes involved in odontogenesis. New research has shown that there is a genetic association with ovarian cancer and hypodontia and that female with hypodontia are 8.1 times more likely to have ovarian cancer. Genes 1 (Msx1) and Pax9 are familiarly associated with non-syndromic form of hypodontia while genes Shh, Pitx2, Irf 6 and p63 are active in syndromic genetic diseases that includes tooth agenesis. Axin2 gene is involved in tooth agenesis but also participate in the creation of cancer of colon and ovarium^{3,8}. Discovering the gene responsible for the development of hypodontia is vital because it enables early oncological gene therapy in patients with positive family anamnesis of hypodontia from oncological points of view and warn patients on the regular oncological review.

Conclusion

Based on the performed analysis and obtained results the following conclusions could be drawn:

- Congenital absence of one or more teeth has 10.89% of our respondents.
- More frequent missing of teeth was found in girls (12.10%) than boys (9.38%).
- Hypodontia is more common in the lower jaw, in girls (8.19% on the right side and 7.47% left) compared to boys (4.02% on the right side and 5.36% left).
- Number of teeth missing ranged from 1-9, with the highest number of patients had a lack

ispitanika sa hipodoncijom), a zatim nedostatak 1 zuba (3,67 svih, odnosno 30,91% ispitanika sa hipodoncijom).

- najčešći zub koji nedostaje je donji levi drugi premolar kod devojčica (6,05%), zatim desni drugi donji premolar takođe kod devojčica (5,34%), slede gornji lateralni sekutići kod devojčica (4,27% desni i 3,91% levi) a zatim donji drugi premolari kod dečaka (3,57% levi i 4,46% desni).

- nije utvrđeno da nedostaju: gornji centralni incizivi kod oba pola, gornji očnjaci kod devojčica, gornji prvi premolari kod oba pola, gornji prvi molari kod oba pola, gornji drugi molari kod dečaka, donji očnjaci kod oba pola, donji prvi premolari kod dečaka, donji prvi molari kod oba pola i donji drugi molari kod dečaka.

- simetrična hipodoncija nadjena je kod 38 pacijenata (7,52%), a asimetrična hipodoncija kod 17 pacijenata (3,37%) svih ispitanika; prisustvo simetrične hipodoncije je statistički značajno češće od asimetrične.

of 2 teeth (4.75% of all, or 43.64% of respondents with hypodontia), and the lack of 1 tooth (3.67 of all or 30.91% of respondents with hypodontia).

- The most frequent missing tooth was the lower left second premolars in girls (6.05%), then the second right lower premolar teeth also in girls (5.34%), followed by the upper lateral incisors in girls (4.27 right % and 3.91% left) and lower second premolars in boys (3.57% left and 4.46% right).

- It is not determined the lack of: the upper central incisors in both sexes, upper canines in girls, upper first premolars in both sexes, upper first molars in both sexes, the upper second molar in boys, lower canines in both sexes, the lower first premolars in boys, the lower first molars in both sexes and the lower second molar in boys.

- Symmetric hypodontia was found in 38 patients(7.52%), and asymmetric hypodontia in 17 patients(3.37%) of all respondents, as well as the presence of symmetric hypodontia which was significantly more frequently than asymmetrical.

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