Dental Anomalies among Students of Faculty of Dentistry, University of Sarajevo

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The aim of our study was to establish the prevalence of dental anomalies among the student population at the Faculty of Dentistry of Sarajevo University. The aim of the research was to find out the most common dental anomalies in this particular group. The participants were 268 students at the Faculty of Dentistry. The examined students came from different regions of Bosnia and Herzegovina. The students were examined by the dentists employed at the Faculty while the findings were recorded on charts created specifically for this purpose and in accordance with the recommendations of WHO (World Health Organization). The students' age ranged from 18 to 23. The results were statistically analyzed, and compared with the relevant facts from the literature. Our conclusion is that the most prevalent dental anomalies pertain to the teeth position (54%) followed by the teeth crowding at ICS (intercanine segment) (50%). The most negligible changes were found in the tooth shape, and this could be accounted for by the anthropological changes of the human teeth.

Key words: Tooth Abnormalities; Anodontia; Students; Bosnia-Herzegovina.

Introduction

Within congenital anomalies of the human body, dental anomalies can also be studied. The tooth anomalies refer to disturbances during the tooth development. These disturbances are manifested with regard to the number, size, shape, and/or position of the teeth in jaws. Dental anomalies could appear as isolated, or related to various other syndromes.

Dental anomalies can be congenital or acquired (1, 2, 3). The **c**auses of these anomalies are shown in table 1. As many as 7% of children are born with some disturbances in the orofacial system (1).

Table 1. Causes of development of congenital and acquired dental anomalies

Congenital anomalies	Acquired anomalies
Heritage (approximately one quarter)	Malnutrition (energetic and protein deficit)
External factors (only 1%)	Influence of chemical substances medicines, vitamins, etc. (3-4%)
Multi causal etiology (rest)	Disturbances of metabolism (2%)
	Infections, especially of viral etiology (2-3%)

The tooth development starts in the sixth week of intrauterine life (4, 2, 3) and it can be divided into five physiological stages:

– Initiation
– Proliferation
– Morphodifferentiation
– Histodifferentiation
– Apposition

Dependent on the tooth development stage, different kinds of dental anomalies can develop. As a result, dental anomalies can be classified as follows:

– Anomalies of number (initiation stage)
– Anomalies of size (proliferation stage)
– Anomalies of shape (morphodifferentiation stage)
– Anomalies of structure (histodifferentiation and apposition stages)
– Anomalies of color (apposition stage)
– Anomalies of position

Anomalies of the number of teeth occur as a result of disturbances in the initiation stage during the tooth bud development. They can be as follows:

– Hyperdontia, supernumerary teeth (enlarged number of teeth)
– Hypodontia or partial anodontia (lack of one tooth, or a group of teeth)
– Anodontia (lack of all teeth – a very rare phenomenon, occurring concurrently with other syndromes).

Anomalies of the size of teeth are a consequence of disturbances in the proliferation stage of the tooth bud development. They can be as follows:

– Macrodontia (enlarged tooth size in comparison with average measures)
– Microdontia (reduced tooth size in comparison with average measures)

Anomalies of the shape of teeth are caused by disturbances in the morphodifferentiation stage in the tooth bud development. They represent the biggest group of dental anomalies. They are as follows:

– Fusion or gemination (twinning)
– Invagination of teeth
– Evagination of teeth
– Premolarisation or molarisation of teeth
– Abnormal or accessory cusps on occlusal surface
– Taurodontism
– Group of different morphological anomalies (incisors of shovel shape, Hutchinson's incisors, Pfluger's molar, Turner's teeth, enamel pearl, etc.)
– Morphological anomalies of the root (supernumerary roots, accessory roots, dilaceration, angulation, concrescence of the roots).

Anomalies of the structure of teeth are a consequence of disturbances occurring either in the histodifferentiation stage or the apposition stage (layering of mineral components in the organic matrix of the hard tooth tissues). They are as follows:

– Enamel hypoplasia
– Amelogenesis imperfecta
– Dentinogenesis imperfecta
– Odontogenesis imperfecta

Aim of the study

Aim of our study was: 1. to establish the prevalence of dental anomalies among students of the Faculty of Dentistry at Sarajevo University, and 2. to establish the most common dental anomalies.

Subjects and methods

The group of 268 students of the Faculty of Dentistry at Sarajevo University was examined. They came from various parts of Bosnia and Herzegovina. The students' age ranged from 18 to 23. They were examined by dentists employed at the Faculty of Dentistry, with dental probe and mirror, and their findings were recorded in charts. The charts were specifically created for this purpose and in compliance with the recommendations of World Health Organization (WHO).

Results

The research findings indicate the dental anomalies found among dental students (Table 2, Figure 1- 9).

Table 2. Prevalence of dental anomalies among students (%) of The Faculty of Dentistry, University of Sarajevo

	Anomaly of number	Anomaly of size	ICS crowding	ICS spacing	Anomaly of position	Anomaly of shape	T.anomale Carabelli	Sign of Carabelli	Anomaly of structure	Anomaly of color
Without anomaly	93	89	50	86	46	98	55	52	91	100
Some of the anomalies present	7	11	50	14	54	2	45	48	9	0
Total	100	100	100	100	100	100	100	100	100	100

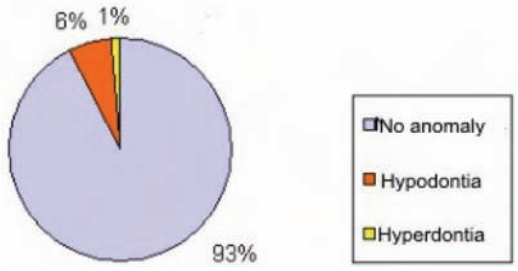

Figure 1. Prevalence of anomalies of number of teeth

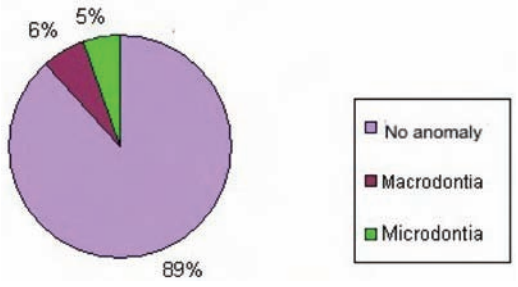

Figure 2. Prevalence of anomalies of size

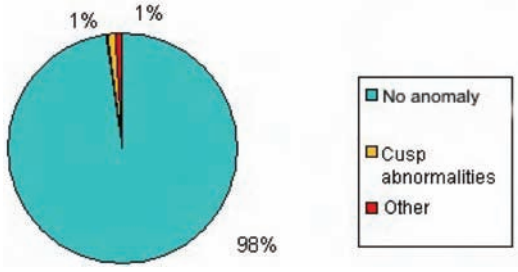

Figure 3. Prevalence of anomalies of shape

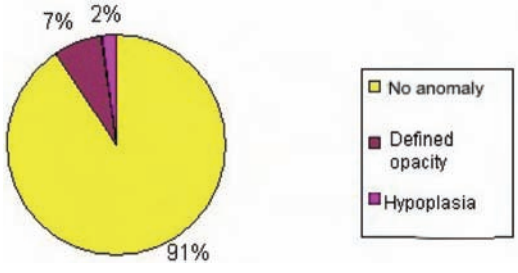

Figure 4. Prevalence of anomalies of structure

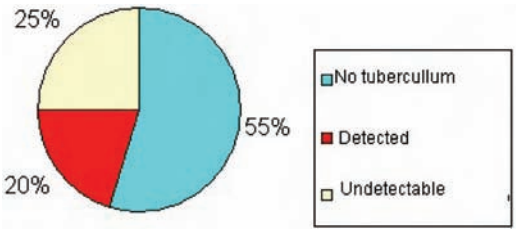

Figure 5. Prevalence of T. anomale Carabelli (Carabelli trait) appearance

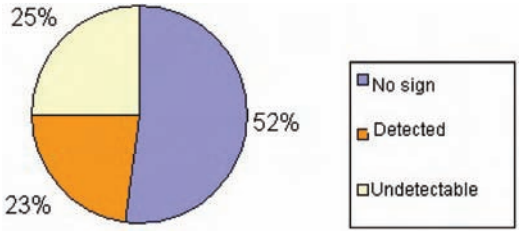

Figure 6. Prevalence of Carabelli's sign appearance

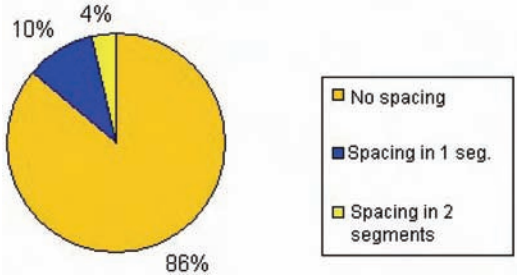

Figure 7. Prevalence of inter canine segment spacing

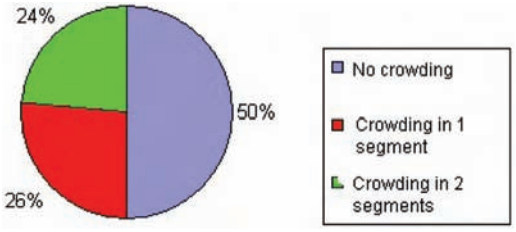

Figure 8. Prevalence of inter canine segment crowding

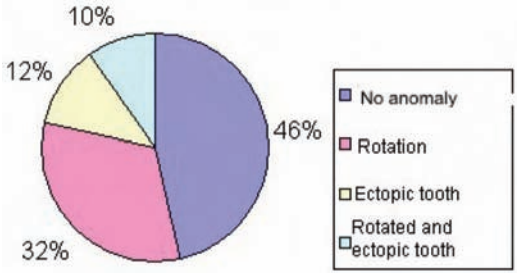

Figure 9. Prevalence of anomalies of position

Correlation between the compression in inter canine sector (ICS) and anomalies of position is 0.55. There is a significant connection between the ICS compression and anomalies of the position of teeth. Figures 11 and 12 show examples of ICS crowding and anomalies of tooth position.

Figure 10. Inter canine sector crowding in lower jaw

Figure 11. Rotation and ectopic upper canine

Discussion

The relevant literature dealing with the prevalence of various dental anomalies is hard to obtain since it appears that few researches have tackled this issue as illustrated in Table 3.

Our study included the group of 268 students of the Faculty of Dentistry aged from 18 to 23. They all come from different parts of Bosnia and Herzegovina.

Table 3. shows the findings of different authors who have researched the dental anomalies problems (5-19).

The most common dental anomalies found in the examined group of dental stu-

Table 3. Prevalence of various dental anomalies according to different authors

AUTHOR	COUNTRY	YEAR	ANOMALY	RESULTS (%)
Hauswright (5)	USA	2002	Hypodontia	2.9-10
Vasconsellos (6)	Brazil	2003	Hypodontia	5.4
			Hyperdontia	2.4
			Macrodontia	0.6
			Microdontia	2.0
Rolling et al. (7,8)	Denmark	2001	Hypodontia	0.16
Thompson et al. (9)	Canada	1974	Hypodontia	7.4
Šutalo (10)	World	1994	Hyperdontia	3.6
			T. anomale Carabelli	17.4
			Carabelli's sign	44
Backman et al. (11)	Sweden	2001	Hyperdontia	1.9
			Fusion / gemination	0.3
	World	1988	A. imperfecta	<1/800
Knežević et al. (12)	Croatia	2002	Hyperdontia	0.2
			Fusion / gemination	0.2
Schuurs (13)	World	2000	Fusion / gemination	0.1-1
Hovland (14)	World	1977	Dens in dente	0.04-10
Cochran et al. (15)	Ireland	2004	Enamel opacity	61
	Greece	2004	Enamel opacity	28
Keros (1)	World	2000	T. anomale Carabelli	14.7
Konjhodžić (16)	Ex-Yugoslavia	1980	T. anomale Carabelli	56
Maneva et al. (17)	Macedonia	2004	ICS spacing	9.3
			ICS crowding	63.7
Buchang et al. (18)	USA	2004	ICS crowding	50
Legovic et al. (19)	Croatia	2003	Crowding	45.2

dents from the Faculty of Dentistry, University of Sarajevo, were as follows: anomalies of the number of teeth - 7%, anomalies of the size of teeth – 11%, anomalies of the structure of teeth – 9%, anomalies of the color of teeth – 0%, anomalies of the shape of teeth – 2%, ICS teeth spacing – 14%, ICS crowding – 50 %, anomalies of the position of teeth – 54% .

The most common anomalies were ICS (inter canine segment) crowding – 50%, and anomalies of the position of teeth – 54%.

The above research findings are closely connected with the fact that dental anomalies are commonly caused by various factors such as those related to heritage, disease, endocrine dysfunction, and more specifically, to local factors (trauma, pressure, early loss of deciduous teeth, bad habits, etc). The hereditary quality has a significant influence on the formation, calcification, eruption, shape, structure, size and number of teeth, but also on the tooth arch width and depth.

Furthermore, we would also like to emphasize the anthropological aspect in respect of evolution of the human jaws and teeth. The last phylogenic changes of the teeth refer both to their shape and size (teeth are atavism). On the other hand, the relations between the size of the teeth, jaws and cranium had changed during the phylogenic transition of human race. The visceral cranium (upper and lower jaw) does not prevail any more, and it is getting smaller. The neurocranium prevails, which is a result of the brain enlargement.

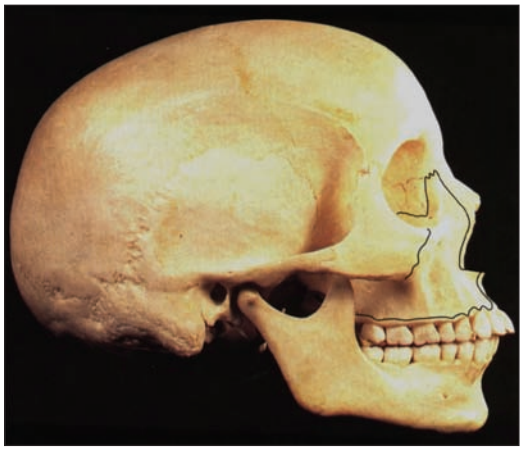

Figure 12. Skull of contemporary man

Figure 13. Skull of Australopithecus

In conclusion, we can state that the research findings of the present study, and of those conducted by other researchers, show that the most prevalent dental anomalies pertain to the position and crowding of teeth in both intercanine segments. These anomalies result from the discrepancy between the size of jaws and the teeth. The jaws have become too small for all the teeth. Looking at this problem in a broader anthropological sense, it is very likely that these anomalies will become more prevalent in the future. As a result, orthodontics will become an increasingly important service in dental medicine.

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