



Oral surgical procedures and prevalence of oral diseases in Oral Surgery Department in Faculty of Dentistry Sarajevo

Sadeta Šečić*, Samir Prohić, Sanja Komšić

Department of Oral Surgery, Faculty of Dentistry, University of Sarajevo

ABSTRACT

Introduction: The aim of this study is to determine prevalence of oral diseases and oral surgical procedures at Department of Oral Surgery, Faculty of Dental Medicine, University in Sarajevo.

Methods: The current study is retrospective analysis of oral surgical procedures performed from January 2011 to December 2012 at Department of Oral Surgery, Faculty of Dental Medicine, University in Sarajevo. The data were statistically analyzed by T-test of independent samples and using Chi-squared test. P value lower than 0,001 was considered to be statistically significant.

Results: A total of 1299 patients were included in study. The age range is from 18 to 84 years, with mean age \pm SD= 35 \pm 15 years. There were 42 different clinical diagnoses, and 13 diagnoses appeared in more than 1% of all patients. Impacted and semi-impacted teeth, periapical lesions and retained roots are the most frequent diagnoses and represent 68% of all diagnoses. Embedded and impacted teeth (35%) and diseases of pulp and periapical tissues (31%) are the most frequent diagnoses with respect of ICD-10. Impacted teeth is the most common diagnosis and removal of impacted third molars is the most common oral surgical procedure.

Conclusion: Study points out variety of dentoalveolar pathology and complexity of dental health care that often requires interdisciplinary approach in order to achieve optimal outcome for patient.

Keywords: cross-sectional studies; dental health surveys; prevalence; public health dentistry; surgery, oral

INTRODUCTION

Oral health is considered as important part of patient's general health. Oral diseases are the most

common of the chronic diseases and are important public health problems because of their prevalence, their impact on individuals and society, and the expense of their treatment (1). Therefore improvement of oral health and the quality of life is the aim of contemporary dental care. Oral health, quality of life and public health are closely related (2). Quality of dental care is based on integrity of health services and their mutually harmonization through system of primary, secondary and tertiary health care. Oral

*Corresponding author: Sadeta Šečić, DDS, PhD
Department of Oral Surgery, Faculty of Dentistry
University of Sarajevo, Bolnička 4a, 71000 Sarajevo
Bosnia and Herzegovina
Email address: sadetas@gnet.ba

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surgery as a dental speciality that deals with diagnostics and treatment of diseases, trauma and defects of dentoalveolar structures is represented in every level of health care. Relatively simple procedures are performed in dental offices by general dental practitioners according to their competence and training. Majority of oral-surgical procedures are performed by specialist oral surgeons in Departments of oral surgery in hospitals. The most difficult and complex cases are referred to specialized consultative health care on Department of Oral surgery Faculty of Dentistry University of Sarajevo. This arrangement of health care provides high quality of health care services, efficiency in the use of health technologies and human resources as well as optimal patient outcome. Because of this, epidemiological analysis of oral-surgical procedures is not just representation of prevalence of oral diseases in population, but also is an important indicator of quality and organization of health care overall. Several epidemiological studies are done in neighbour countries of Bosnia and Herzegovina. Epidemiological study of oral surgery procedures of patients referred to Department of Oral Surgery at Clinical Center in Rijeka, Croatia showed the most common referral diagnosis is chronic osteitic processes, followed by retained roots and impacted teeth (3). Analysis of ambulatory oral surgery diagnoses at the Department of Oral Surgery at University Hospital Dubrava in Zagreb, Croatia showed retained roots, chronic periapical lesions, and deep caries represented 70% of all ambulatory diagnoses (4). This kind of epidemiological study has not been conducted in Bosnia and Herzegovina. The aim of this study is to determine prevalence of oral diseases and oral surgical procedures at Department of Oral Surgery, Faculty of Dental Medicine, University in Sarajevo.

METHODS

The current study is retrospective analysis of oral surgical procedures performed in Department of Oral surgery from January 2011 to December 2012. The total of 1584 patients from the Canton of Sarajevo consecutively referred to Department of Oral Surgery by general dental practitioners in two-year period. To ensure representative and randomized sample of general population in Canton of Sarajevo,

the only exclusion criteria was patients younger than 18 years of age, as growth is essentially completed by this age. All patients with indication for oral surgical treatment accepted the invitation to participate in study. A total of 1299 patients were included in study. There were 511 males and 788 females, the patients' age ranged from 18 to 84 years. After diagnostics that includes complete medical and dental history, clinical and radiographical examination and blood laboratory tests, the surgical treatment was indicated. Medically compromised patients underwent internistic preparation if needed and internistic agreement was necessary for dental treatment. After informing patients about medical procedure patients signed informed consent. Study was conducted in accordance with Helsinki declaration of ethical principles for medical research. All procedures were performed by different surgeons in local anesthesia 1,8 ml Lidocain 2% Adrenalin 1:80000 (Alkaloid®, Skopje, Republic of Macedonia) in the same operating room under same conditions. The data were entered in operation protocols, and then in specially designed data base created for this study containing the following information: number of protocol, gender, age, age group and diagnosis. Diagnosis was established according to International Classification of Diseases (ICD-10) (5). To ensure protection of privacy, patient's names and number of dental form and dental charts were not recorded in data base and only the main researcher had complete access to data-base and oral-surgery protocols. Data were processed and analyzed in statistical software SPSS 20.0 (SPSS Inc, Chicago, IL, USA). The data were statistically analyzed by T-test of independent samples and the comparison between the groups was made using Chi-squared test. P value lower than 0,001 was considered to be statistically significant.

RESULTS

The total of 1299 patients were included in this study: 511 males and 788 females, gender ratio 1:1.54 in favor of females. The age range is from 18 to 84 years, with mean age \pm SD= 35 \pm 15 years. Majority of patients is in age group 20-29 years (n=503; 39%), followed by <19 years (n=237; 18%), 30-39 years (n=235; 18%), 40-49 years (n=156; 12%), 50-59 years (n=141, 11%) and >60 years (n=121;

TABLE 1. Clinical diagnoses of oral surgical procedures performed at Department of Oral Surgery, Faculty of Dentistry Sarajevo, from January 2011 to December 2012

Clinical diagnose	Number of patients (frequency)	Percent (%)
Dens subimpactus	244	17.7
Dens impactus	239	17.4
Periodontitis periapicalis chronica	216	15.7
Radix relict	178	12.9
Cystis radicularis maxillae	162	11.7
Exostosis processus alveolaris maxillae	36	2.6
Cystis radicularis mandibulae	35	2.5
Hyperplasio mucosae vestibuli oris maxillae	28	2.0
Sinus maxillaris apertus	26	1.9
Retentio dentis	22	1.6
Dens germinatus	20	1.4
Frenulum labii superior tectolabialis	19	1.4
Exostosis pars alveolaris mandibulae	18	1.3
Tu buccae	13	.9
Cystis e retentione labii inferioris	11	.8
Cystis residualis maxillae	10	.7
Dens supernumerarius	10	.7
Epulis	8	.6
Cystis residualis mandibulae	5	.4
Cystis follicularis	5	.4
Hyperplasio mucosae oris pars alveolaris mandibulae	5	.4
Fistula oroantralis	5	.4
Sinus maxillaris apertus cum dentis in antro	4	.3
Odontoma	4	.3
Tu mucosae vestibuli oris	4	.3
Tu labii inferior	4	.3
Tu linguae	4	.3
Dentitio difficilis	3	.2
Tu labii superior	3	.2
Tu palati duri	3	.2
Hyperplasio tuberis maxillae	2	.1
Lingua acreta	2	.1
Plica buccalis tectolabialis	2	.1
Proptosis buccae	2	.1
Sinusitis maxillaris chronica	2	.1
Focalosis	2	.1
Papillomatosis palati duri	2	.1
Mandibular tori	2	.1
Verucca vulgaris	1	.1
Fibromatosis palati duri	1	.1
Osteoma	1	.1
Corpus alienum in sinus maxillaris	1	.1

9%). There were 42 different clinical diagnoses, and 13 diagnoses appeared in more than 1% of all patients. Frequency of clinical diagnoses is shown in Table 1. Impacted and semi-impacted teeth (n=483; 35%), periapical lesions (n=216; 15,7%) and retained roots (n=178; 13%) are the most frequent diagnoses and represent 64% of all diagnoses. Embedded and impacted teeth (35%) and diseases of pulp and periapical tissues (31%) are the most frequent diagnoses with respect of ICD-10.

Impacted teeth are the most frequent diagnosis in younger age groups: 50% in age group 20-29 years, and 90% in age group to 39 years. Radicular cysts and periapical lesions are also the most frequent in age group 20-29: 39% and 45% of patients are in that age group, respectively. Pre-prosthetic surgery is represented in elderly age groups: 85% of pre-prosthetic surgical procedures is performed in patients older than 40 years. Diseases of maxillary sinus most commonly develop in third decade (36%), 84% of patients are in age group 20-59 years.

Mandibular third molars are the most frequently impacted teeth. Frequency of impacted teeth is shown in figure 1. Impactions have gender-prevalence: frequency of impacted teeth (except mandibular premolars) is higher in females ($p<0,001$). Impacted third molars are the most frequent in age group 20-29 years ($p<0,001$): impacted maxillary third molars 55%, impacted mandibular third molars 53%, semi-impacted maxillary third molars 52% and semi-impacted mandibular molars 61%.

Radicular and residual cysts are more common in maxilla: 11.7% vs. 2.5% and 0.7% vs.0.4% respectively. Radicular cysts predominantly affect the anterior region of maxilla- canine to canine segment (n=139; 86%; $p<0,001$), while there is no statistical significance in occurrence of radicular cysts in anterior (n=20; 57%) and posterior (n=15; 43%) segment of the mandible ($p>0,001$). Radicular maxillary and mandibular cysts are the most common in third decade: 39% and 42%, respectively, and

TABLE 2. Surgical treatments performed at Department of Oral Surgery, Faculty of Dentistry Sarajevo, from January 2011 to December 2012

Surgical treatment	Number of patients	%
Surgical extraction	647	49.8
Cystectomy	226	17.4
Apicoectomy	204	15.7
Excision	64	4.9
Alveoloplasty	52	4
Frenectomy	21	1.6

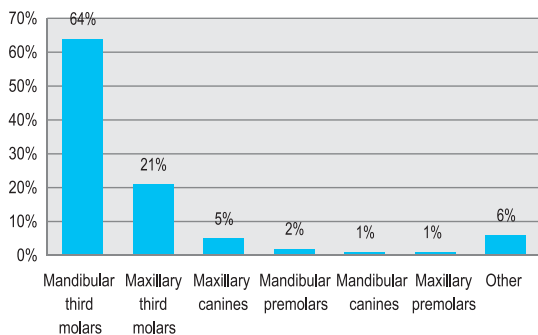


FIGURE 1. Frequency of impacted teeth.

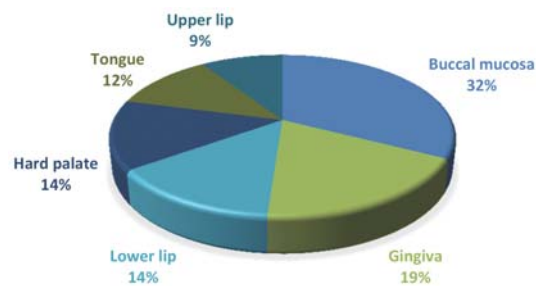


FIGURE 2. Localization of non-malignant lesions in oral cavity

residual cysts in fifth decade of life (50%). Higher prevalence of radicular cysts is found in male patients ($p < 0.001$).

Majority of non-malignant oral lesions is in fourth decade of life (23%). Localization of non-malignant lesions of oral cavity is shown in figure 2.

The most common disease of maxillary sinus is oroantral communication (81%), with 9% of oroantral communications with tooth or root displaced in sinus. Oroantral fistula was identified in 14% of cases.

The cause of oro-sinus communication is extraction of maxillary first molar (56%), second molar (20%), second premolar (12%), third molar (8%) and first premolar (4%). Highest number of oroantral communication and fistula are in age groups 30-39 years (34%) and 58% in age group 20-39 years. Mucoceles of sinus presented in 2% of maxillary sinus diagnoses.

Surgical extraction including extraction of impacted teeth and retained roots is the most common surgical procedure. Table 2 shows surgical treatments performed more than 20 times.

DISCUSSION

Impacted teeth is the most common diagnosis and removal of impacted third molars is the most common oral surgical procedure. This is in accordance with results of other studies, thus showing increase of prevalence of impacted teeth in oral-surgical procedures (6,7). The analysis of available literature shows that in the Anglo-Saxon population groups the problems with the third molars are much more common, which may be related to lesser incidence of caries as a result of better prevention, better availability of dental health care and treatment and significantly smaller number of extractions, particularly of the first molars (6). Retained teeth and dentitio difficilis were the most common diagnosis in younger age groups (<19 years) and impacted teeth in older age groups (20-29 years). The predominant age group for impacted teeth in our study is third decade, which is in accordance with results of other international studies (8-10). Several studies reported gender predilection in third molar impactions (11-13). Results of our study are in agreement with previous reports, since there is statistical significance in distribution of impacted teeth between females and males ($p < 0.001$). The higher frequency reported in females is due to the consequence of difference between the growth of males and females. Females usually stop growing when the third molars just begin to erupt, whereas in males, the growth of the jaws continues during the time of eruption of the third molars, creating more space for third molar eruption (14).

Odontogenic cysts amount for 7-13% of the lesions diagnosed in oral cavity (15-17). Radicular

cysts are the most prevalent odontogenic cysts according to all studies reviewed, with variations only in percentages (18). Radicular cysts are more common in maxilla, which is consistent with findings of other studies (18-20). Radicular cysts were more common in the third decade of life, consistent with the findings of Selvamani (20) and Souza (21). The higher prevalence of male gender in some studies may be explained by the fact that men usually have poorer oral hygiene habits and are more susceptible to trauma than women (22). The current study has some limitations and results are difficult to compare with other studies, due to different sampling method. In our study diagnosis was based upon clinical findings, unlike other studies where roentgenographic data analysis was performed or samples were obtained periapical lesions.

Pre-prosthetic surgery is found in 9% of oral-surgical procedures. Approximately 66% of exostoses are encountered on maxilla, which is in accordance with findings of Bouquot and Gundlach (23). Same studies showed higher prevalence in older age groups, similar to our study: 37% patients in age group older than 60 years, but in our study exostoses are frequent also in younger age groups (fifth decade 29% and sixth decade 26%). Our findings suggest prevalence of exostoses is increasing after fourth decade of life, which may be related with increasing of edentulism in elderly age groups. Different prevalence of exostoses in various race and ethnic groups suggests genetic factors, and higher prevalence in elderly age groups suggests environmental factors such as masticatory stress in their development (24). Recently, several authors have postulated that the etiology of tori consists of an interplay of multifactorial genetic and environmental factors (25). Prevalence of tori mandibularis is higher in males (2:1 ratio; $p < 0.001$), which is in accordance with findings of Jankittivong (24). Jankittivong observed an increasing correlation between marked exostoses and a significant attrition of teeth in some older subjects. This may be a similar phenomenon as that which occurs in subpontic hyperostosis, which postulates that stress causes the crestal alveolar bone to grow under the pontic along a vector opposing the forces of occlusion. That suggest functional influences may contribute to the development of exostoses, and possibly may explain the higher prevalence in elderly

people such as cumulative effect of occlusal forces and higher prevalence in male patients since male patients have significantly larger values of occlusal forces than females (26).

Oral non-malignant lesions are most frequently localized in gingiva and buccal mucosa, similarly to other studies (27,28).

Prevalence of oroantral communication is reported in range 0.31-4.7% (29) and in our study is represented with 2.5%. Extraction of maxillary first molar (56%) is the main etiologic factor of oroantral communication, which is in accordance with Hernando (30). The maxillary sinus reaches its greatest size during the third decade of life; consequently, the incidence of oro-sinus communication is higher after that, which is in accordance with results of our study ($p < 0.001$) and the results of other authors (29).

CONCLUSION

Present study shows variety of oral-surgical procedures is performed in Department of Oral Surgery University of Sarajevo: diagnostics and treatment of dental diseases, jaw lesions, cysts, non-malignant lesions of oral cavity, diseases of maxillary sinus, odontogenic infections and pre-prosthetic surgery. Study showed impacted teeth are the most frequent diagnosis and surgical removal of impacted mandibular third molars is the most common procedure. Radicular cysts and chronic periapical lesions are the most frequent jaw lesions. Oral non-malignant lesions are most frequently localized in gingiva and buccal mucosa. The highest prevalence of oroantral communication is in third decade of life and the most common etiologic factor is extraction of maxillary first molar. Study points out variety of dentoalveolar pathology and complexity of dental health care that often requires interdisciplinary approach in order to achieve optimal outcome for patient.

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