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**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1136536>Available online at: <http://www.iajps.com>**Research Article****FREQUENCY OF TRAUMATIC COMPLICATIONS OF ORTHODONTIC TREATMENT DEPENDING ON TYPE OF BRACES WHICH ARE USED****V.V. Platonova¹, A.S. Nevdakh², M.I. Kuznetsova³, A.V. Sevbitov⁴, S.N. Mironov⁵,
V.V. Borisov⁶, S.D. Danshina⁷**I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation
(Sechenov University).¹Doctor of Medicine, Professor, Professor of Department of Propedeutics of Dental Diseases in Federal State Autonomous Educational Institution of Higher Education (FSAEI of HE) - I.M. Sechenov First Moscow State Medical University (First MSMU) of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0001-5228-6635²Orthodontist of Dental Clinic "Orthodont-Centre", Competitor for a Scientific Degree of Department of Propedeutics of Dental Diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0002-2869-5540³Candidate of Medicine, Associate Professor, Associate Professor of Department of Propedeutics of Dental Diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0002-5488-8979⁴Doctor of Medicine, Professor, Head of Department of Propedeutics of Dental Diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0002-8247-3586⁵Candidate of Medicine, Assistant in Department of Propedeutics of Dental Diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0001-9218-0448⁶PhD, Associate Professor of the Department of propaedeutics of dental diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) <https://orcid.org/0000-0001-6233-0775>⁷Resident in Department of Propedeutics of Dental Diseases in FSAEI of HE - I.M. Sechenov First MSMU of the Ministry of Health of Russia (Sechenov University) ORCID ID 0000-0002-9467-078X**Abstract:**

Traumatizing elements of orthodontic appliances can cause patients' discomfort and pain. We examined 447 medical cases where brace systems, which are made of various materials, were used during treatment. A relationship between variations of morphological forms of complications and types of used braces was revealed.

Key words: *braces, oral mucosa, ulcers, erosions.***Corresponding author:****Borisov Vitaly Victorovich,**

PhD in Medical sciences,

Associate Professor,

Department of Dental Propedeutics,

I.M. Sechenov First Moscow State Medical University

Of the Ministry of Health of the Russian

Federation (Sechenov University),

Ministry of Health of Russia;

E-mail: karapeta12121985@gmail.com

QR code



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INTRODUCTION:

Topicality of the research issue is determined by modern person's high requirements to his or her appearance, especially to smile. Traumatic lesions of oral mucosa are observed in a significant part of patients who undergo orthodontic treatment [1-3]. Presences of such complications as traumatic ulcers and erosions as well as painful sensations, which are connected with them, deepen social disadaptation. Their possible chronization or frequent recurring can cause development of orthodontic patients' depressions with dysfunctions of viscera and deterioration of life quality. In some cases, addition of infectious complications is observed which are determined by deterioration of hygiene of oral cavity. There is also a risk of malignization of chronic erosive-ulcerous elements. Level of discomfort depends on many factors: information awareness of patients and their motivation for therapy, general condition of organism and oral cavity, degree of difficulty of various nosologic forms of dentoalveolar

and facial anomalies, type and method of use of orthodontic appliances. The therapy, which has been started in proper time, lets improve condition and prognosis of such patients in most cases. In view of the above mentioned factors, a research seems to be topical which studies methods of prophylaxis and treatment of traumas of oral mucosa when nonremovable orthodontic appliances are used [4,5]. **RESEARCH OBJECTIVE** is to study frequency of traumatic complications of orthodontic treatment depending on type of braces which are used.

MATERIALS AND METHODS:

Objects of the research were two types of the most severe forms of traumatic injuries of oral mucosa - erosions and ulcers (acute and chronic ones) whose diagnostics and therapy were conducted in the course of usual orthodontic practice (Pic. 1).



Picture 1: Traumatic erosive-ulcerous lesions on oral mucosa

447 medical records of patients were analyzed who had undergone treatment by nonremovable orthodontic appliances in dental clinic "Orthodont-Centre" (Moscow) and its branches during 2013-2015. The braces of companies 3M Unitek and ORMCO of the following types were used in the provided treatment with various frequencies:

1. Metallic braces (Victory Series™) – in 15.5 % (69 cases)
2. Ceramic ones (Clarity ADVANCED) – in 50.9 % (227 cases)

3. Combined ones (DamonClear + Q, incisors and canines - ceramic ones, premolar and molar teeth - metallic ones) - in 33.6 % (151 cases).

RESULTS OF OWN RESEARCH:

During use of the above mentioned types of braces the various morphological forms of complications were revealed, their frequency distribution is shown in the Table 1.

Table 1: Distribution of main forms of traumatic complications of orthodontic treatment depending on type of braces which are used

	Metallic braces		Combined ones		Ceramic ones		Total	
	N	%	N	%	N	%	N	%
Scratches	24	35.8±5.9	49	32.5±3.8	58	25.3±2.9	131	29.3±2.3
Chafing	22	32.8±5.7	45	29.8±4.0	51	22.3±2.8	118	26.4±2.1
Erosions	14	20.9±5.0	35	23.2±3.4	41	17.9±2.5	90	20.1±1.9
Ulcers	4	6.0±2.9	9	6.0±1.9	7	3.1±1.1	20	4.5±1.0
Total complications	64	95.5±2.5	138	91.4±5.2	157	68.6±3.1	359	80.3±1.9
		+		*		*		
Total cases	67		151		229		447	

Note: * and + are the symbols by which differences, which are significant if $p \leq 0.001$, between respective parameters are marked

It was revealed that frequency of traumatic injuries of oral mucosa during use of brace systems reaches significant values but the material, of which the braces are made, exerts a significant and reliable influence on a concrete value of this parameter; this fact is proved by development of such injuries in 95.5 % of cases where metallic braces, in 91.4 % of cases where combined ones and in 68.6% of cases where ceramic ones were used. It seems obvious in the light of received results that in a significant amount of cases, where brace systems are used, the main traumatogenic factor is presence of a metal which is used either as the main structural material of the braces or as a minor component within their structure.

Since hardness of ceramic materials is not inferior to hardness of metallic ones, it is possible that cause of traumatogenic effect of prominent elements can be not only their direct irritative mechanical effect but emergence of unfavorable spontaneous ion fluxes too, which emerge in the system "metal-oral mucosa".

Such supposition can be partly and implicitly proved by absence of statistically reliable correlation between individual forms of traumatic injuries of oral mucosa and characteristics of their material base.

The revealed tendency of almost twofold reduction of frequency of ulcerous lesions of oral mucosa, when ceramic braces are used (3.1 % as compared with 6.0% when metallic and combined ones are used), requires a further confirmation on the basis of a more extensive material.

On the whole, the received data point with a high degree of reliability to the fact that ceramic braces have a considerably greater noninvasiveness as compared with metallic and combined ones; it lets consider them as means of choice in order to avoid

possible traumatic complications.

CONCLUSION:

Thus, main objectives of prophylaxis and therapy of traumas of oral mucosa are: elimination of an injuring factor, the fastest suppression of focus of traumatic injury and inflammatory reactions, which are connected with it, achievement of the fastest full restoration of epithelial cover. An individual selection of the least traumatic types of brace systems is necessary for prophylaxis of such complications too.

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