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SOME ASYMMETRY ASPECTS IN FACIAL-MANDIBULAR REGION AS A WHOLE AND IN ORAL CAVITY PARTICULARLY**Fazeli N.M.K., Tkachenko E.V.**

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In the review the analysis of some sources concerning a question of asymmetry of maxillofacial area in general and a mouth in particular has been carried out. Authors bring to a focus that the given question has both theoretical and applied value as there is a number of the pathological conditions connected with disturbances of mouth opening, the sizes and position of the jaws. It is emphasized that the estimation of symmetry of facial part, electromyography of masticatory muscles, symmetrometry, symmetrospectroscopy, photosymmetrospectroscopy and other techniques are rather informative in orthodontics, surgical, therapeutic and children stomatology.

Key words: asymmetry, maxillofacial area, mouth.

Asymmetry nowadays is considered to be common-biological law [17] and is a characteristics of a considerable variety of phenomena in animate and inanimate nature. This organizational principle begins its functioning in Protozoa [16], flowers and continues up to mammals particularly human being. Asymmetry has touched all the organs and systems in human body and has influenced on all the levels (micro-, meso- and macromolecular ones). There exist data that the more asymmetrical living organism is, the more developed it is. Asymmetry depends on sex (it is more expressed in males than in females) [11], age [20]. There are several approaches to asymmetries classification: physiological and pathological; biochemical, physiological and pharmacological; morphological and functional; genotypic and phenotypic; molecular, subcellular, cellular, tissular, organic, systemic, organismic, populational-species; motoric, sensoric, psychical etc. Among the key roles of asymmetry the adaptive one may be emphasized, talking about injuring conditions. And, of course, it regulates optimal organism functioning at all its levels.

Up to the near past scientists considered that asymmetry is an only nervous system feature. And taking into account that asymmetry real study began its origin from 1836 (Max Dax was the first who told about brain hemispheres asymmetry in neurological patients suffered from aphasy) and then 1861 (Paul Broka gave data about motoric aphasy and primarily localization of motoric speech center in posterior part of inferior frontal lobe), 1870 (Karl Vernike found out that patients with left hemisphere temporal lobe posterior part injure often had difficulties in speech understanding) one can tell that asymmetry study approximately 100 years was dealt only with nervous system as a whole and hemispheres particularly.

A forehead under the normal conditions has average temperature level and looks like symmetrical and equal two-sided structure. It was observed that at tiredness our forehead has soft right-left thermoasymmetry which we must tell is equal or less than 0.4°C.

Facial right part in the vast majority of people is more in size than the left one [1,10]. Findings about the problem what parts are considered to be more asymmetric in comparison with others – less is still not ordinary. As it has been suggested asymmetry correlates and depends on human body functional activity – more active parts of human body demonstrate more expressed asymmetry. For example, upper extremities are considered to be more bilateral in comparison with lower ones. Mandible sizes are characterized by more pronounced asymmetry than maxillary ones which are less active. These data point out the direct asymmetry functional interdependence. Oral right part is more active in 86% of right-handers and 67% of left-handers during conversation. In the majority of people facial right half is the dominant than left one as for mimical expression.

It is known that gum vestibular surface mucosa tactile sensitivity is higher on the right than on the left [4]. At the same time, gum oral surface nociceptive sensitivity is also higher on the right than on the left. Such asymmetry may be explained by innervation peculiarities: nervous receptor structures in their maximum number are located on the right.

Human lips possess superior-inferior asymmetry [8]. Volumary circulation velocity differences have the biggest expression. These differences prove that inferior lip blood supply is rather higher than superior one. There are superior-inferior significant (reliable) asymmetry of circulation ending diastolic velocity, maximal circulation speed averaged by time, pulsational index and circulation volumary velocity. At the same time insignificant asymmetry was observed on blood stream maximal systolic rate, resistance index and systolo-dyastolic correlation. Data received told about coloured and impulse-waved dopplerography parameters symmetry on both lips. Superior lip vascular system adaptive reaction and lability level is significantly lower comparatively to inferior lip.

According to literature [5] there exists insignificant asymmetry in teeth size on maxilla and mandible: maxilla first premolars are not so high

and wider than mandibular ones (particularly at typical and fast-progressive parodontitis). The facts represented in [3] deserve attention [3]: enamel solubility of maxillary teeth is higher than that of mandible teeth. Moreover mandible tooth enamel on vestibular surface is higher than on oral one. Inferior tooth enamel of oral surface is characterized by the lowest solubility. Maximal enamel solubility is found on such maxillary teeth as premolars, second incisors, first molars, on mandible – on second premolars.

Under the experimental conditions it has been established that there exist electrical current threshold level at which absolute functional asymmetry (asymmetry co-efficient is equal to 100%) is observed [7]. At current force increasing absolute secretory asymmetry in parotid glands is changed into relative one. Such state is characterized by salivation producing not only by ipsilateral but also by contralateral gland. Polarization force further enforcement causes saliva total quantity reducing and, as a result, relative functional asymmetry co-efficient decreasing.

Rather interesting new research data were received during latest 3 years in Donetsk Medical State University. They took particularly following data dealt with parotid glands functional asymmetry. 5-7-year-old children and 13-15-year-old teenagers possess maximal asymmetry degree in their parotid glands as for haemostasis, specific and non-specific organism protection indexes (lysozyme, myeloperoxidase, alkaline phosphatase) [13]. Intermediate asymmetry degree is observed in elder people (60-82 years) and minimal one – in adult people (30-43 years). In all groups assessed antibacterial substances and local immunity factors level was dominant in left parotid gland. Parotid saliva from the right gland had more expressed procoagulant features in children and adolescents and the left gland saliva – in elder ages [14]. Total antifibrinolytic activity in children and adolescents was dominant on the left, in the old aged persons – on the right. Adult persons have more expressed pro- and antifibrinolytic activity on the left. Parotid secretion velocity asymmetry was dominant in the adult and insignificant in other age periods and has left reaction type.

Data of decay injuries asymmetry have special importance for dentists [2]. Different teeth injury rate is non-equal: maxilla teeth are injured more often with caries than mandible teeth. Incisors and canines are injured significantly more seldom than premolars and molars. There exist an opinion that incisors injury with decay especially of mandibular ones indicates to protective mechanisms of low level. It is interesting that maxilla and mandible tooth injury on the right and on the left are symmetrical and are observed with equal rate. It shows again that asymmetry degree is

decreased at pathological conditions and such reducing degree reflects disease degree. There exists local condition symmetry in oral cavity symmetrical parts. It has been proved by the fact that at any tooth absence injury rate of neighbouring tooth (surface to removed tooth) is significantly less than on opposite side where such tooth is intact. It results in the fact that caries occurrence is influenced both by local factors and oral cavity conditions.

Dentists must remember about such pathological conditions as [15]:

1) jaws size anomalies:

macrognathies (superior, inferior, combined),
micrognathies (superior, inferior, combined),
asymmetry;

2) jaws location anomalies in the skull:

prognathia (superior, inferior),
retrognathia (superior, inferior),
asymmetry;

3) mouth opening movement asymmetry [9,12]:

deviation – side movement which is striving to the middle at mouth continuous opening;

deflexion – if such becoming equal is impossible even at maximal mouth opening.

Inferior macrognathia is considered to be the hardest as for its morphological picture and difficulties in treatment. Asymmetries belong to face halves developmental disorders.

Finally we can't help saying about such dental methods and tools as symmetrosopes, photosymmetrosopes and symmetrographes.

Symmetroscopy is teeth location detective method in transversal and sagittal directions; photosymmetroscopy consists of symmetroscopy plus jaws diagnostic models taking picture in a definite regimen. Then special millimetric rulers are used. Symmetrography is jaws models study while their fixating to special devices with scales.

Also mandible angles on the right and on the left are measured in patients for their size estimation at different dental-mandibular anomalies. Such measurements are usually performed both before and after treatment. Special angulometers are applied.

Facial symmetry assessment belongs to obligatory part of any orthodontic examination.

Temporal-mandibular joint is assessed to its mobility. Such term as "laterotrusion" is used [6, 18]. Such "laterotrusion" must be equal from the right and from the left. Asymmetry of such joint movement indicates to pathological conditions. For instance, one-sided movement diminishing indicates to joint movement blockade (due to disk replacement or muscular hypertone).

Masticatory muscles electromyography comparison on the right and on the left allows to assess muscles co-ordination from both sides [19]. Electromyography is used in all dentistry branches

like surgical, therapeutical, orthopeudical and children.

Face teleroentgenograms give additional information at crossing denturing, mandible lateral movement and face halves non-equal growth.

So, this topic may be essential in dental pathology treatment and diagnostics and has not only theoretical but also applied character.

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Реферат

НЕКОТОРЫЕ АСПЕКТЫ АСИММЕТРИИ ЧЕЛЮСТНО-ЛИЦЕВОЙ ОБЛАСТИ ВООБЩЕ И РОТОВОЙ ПОЛОСТИ В ЧАСТНОСТИ
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Ключевые слова: асимметрия, челюстно-лицевая область, ротовая полость.

В обзоре проведен анализ некоторых источников относительно вопроса асимметрии челюстно-лицевой области вообще и ротовой полости в частности. Авторы акцентируют внимание на том, что данный вопрос имеет не только чисто теоретическое, но и прикладное значение, так как существуют ряд патологических состояний, связанных с нарушением открывания рта, размеров и положения челюстей. Также отмечается, что оценка симметричности лицевого черепа, электромиография жевательных мышц, симметрография, симметроскопия, фотосимметроскопия и другие методы являются информативными в ортодонтии, хирургической, терапевтической и детской стоматологии.

Реферат

ДЕЯКІ АСПЕКТИ АСИМЕТРІЇ ЩЕЛЕПНО-ЛИЦЕВОЇ ДІЛЯНКИ ВЗАГАЛІ ТА РОТОВОЇ ПОРОЖНИНИ ЗОКРЕМА
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Ключові слова: асиметрія, щелепно-лицьова ділянка, ротова порожнина.

У огляді наведений аналіз деяких джерел відносно питання асиметрії щелепно-лицьової ділянки взагалі та ротової порожнини зокрема. Авторі акцентують увагу на тому, що дане питання має не лише чисте теоретичне, але й прикладне значення, тому що існує ряд патологічних станів, які пов'язані з порушенням відкривання рота, розмірів та положення щелеп. Також відмічається, що оцінка симетричності лицьового черепа, електроміографія жувальних м'язів, симетрографія, симетроскопія, фотосиметроскопія та інші методи є інформативними в ортодонтії, хірургічній, терапевтичній та дитячій стоматології.