

## New Views in the Diagnosis and Clinic of Temporomandibular Joint Dysfunction

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### ABSTRACT

*The article describes new technologies and modern aspects of diagnostics and clinic of temporomandibular joint dysfunctions. The author presented a wide review of the literature of both foreign and domestic scientists, detailed the various diagnostic methods for this pathology. Various methods for assessing the violation of the biomechanics of the lower jaw, which leads to dysfunctions of the temporomandibular joint, are also described.*

**KEYWORDS:** *Temporomandibular joint, gnathodynamometry, computed tomography, masticiogram.*

The main focus in the diagnosis of temporomandibular joint dysfunction [TMJ] is a detailed analysis of complaints, collection of anamnesis and data from the main research methods characterizing the dental status of profile patients in the form of structural algorithms using databases focused on this pathology. Taking into account modern scientific views, the clinical methods of diagnosis of functional disorders of the dental system are summarized [1.3.5.7].

A number of authors offer a non-contact method of computer assessment of the state of movements of the lower jaw. With the use of the latest computer technologies, such as the T-Scan device [TEKSCAN, USA], ARCUS digma [Kavo] and a virtual articulator with software from the Italian company ZIRKONZAHN, occlusive disorders are now reliably detected by using intraoral scanners. It remains relevant in the diagnosis and treatment of TMJ dysfunction, the use of high-tech hardware research methods, in particular, electronic axiography [2.4.6.8].

By registering biopotentials, electromyography examination of masticator muscles allows for an effective and differentiated assessment of muscle balance in patients with TMJ dysfunction [9.10.11.13].

The possibility of diagnosing the state of masticatory and temporal muscles using computer neuromyographic analyzer in persons with TMJ pathology.

During gnathodynamometry, the jaw compression force of patients with TMJ dysfunction is reduced by half in relation to normal indicators, which allows for differential diagnosis with spinal osteochondrosis [11, 12, and 16].

The tomogram of the joint with dysfunction determines the uneven narrowing and expansion of the particular gap in different parts of the right and left. In this regard, computed tomography and digital technologies in general remain the most informative method of visualizing the topographic relationships of joint elements in the process of diagnosis and treatment planning of patients with dysfunction [10].

It is advisable to use tomography to diagnose anatomical and topographic changes of the TMJ in distal occlusion [14.15.19].

The algorithm for estimating the parameters of the particular gap and the structural elements of the TMJ is possible with the help of a new technique of visualization and analysis of X-ray images based on CBCT data in the program "Osteovizor" [17.18].

It was found that with craniometry of tomograms, angular indicators have greater reliability, unlike linear ones, which somewhat changes the idea of the characteristics of the particular gap along the external contours [20.21.23.25].

Separately, it is noted that in order to timely identify the asymmetry of the facial skeleton, leading to a violation of the mutual disposition of articular elements and the development of dysfunction, it is advisable to use telereöntgenography. This method is used to diagnose sagittal anomalies of occlusion of dentition [22.24].

There is evidence of the role of staged orthopantomograms in the treatment of malocclusion and prevention of TMJ dysfunction [26.27.28].

During the study of movements of the mandible during chewing in patients with TMJ dysfunction, vertical movements, in comparison with similar ones in clinically healthy people, were realized much slower, characterized by limited amplitude and greater variability of the terminal chewing position [10]. There are data that draw attention to the need for a thorough study of the biomechanics of the mandible during the examination and at the stages of treatment in view of the curvature of vertical movements of the mandible diagnosed in 71.8% of patients [29.30.31]. Based on the examination of the state of TMJ occlusion in 110 patients aged 23-25, evidence was obtained of the relationship between the violation of the ratio of the areas of near-contact zones of the first, second and third order and TMJ pathology [20].

The module developed for the analysis of biometric parameters of occlusal contacts and near-contact zones of antagonizing teeth should be considered relevant [19]

Earlier studies of patients with TMJ dysfunction emphasize the change in the trajectory and amplitude of movements of the lower jaw when opening the mouth, and as a result, the importance of registering movements of the lower jaw [20]. The studied literature emphasizes the key expediency of using simple and non-invasive devices for recording movements of the mandible in the process of complex treatment of patients with TMJ dysfunction [31.32].

There are separate works on the analysis of the parameters of masticationograms with subsequent evaluation of the criterion of the functioning of the chewing system and optimization of the load level of the chewing apparatus based on the determination of the masticationographic index. According to modern authors, the period of mastication of the masticatory apparatus in patients with temporomandibular joint dysfunction according to the results of mastication is more than 6 months. At the same time, this research method is especially important in assessing the functional state of the chewing apparatus [6].

Gnathodynamometry indicators of children and adolescents with TMJ disorders correlate with age and body mass index. Evaluation of the effectiveness of correcting the location of TMJ elements during orthopedic treatment is achieved by using expensive research methods, in particular, spiral computed tomography. [32].

In the context of an increase in the prevalence of TMJ dysfunction among the population to 28%, the authors' research is aimed at involving more and more high-tech research methods in the diagnostic process, such as computed tomography, magnetic resonance imaging and ultrasound [31].

During ultrasound examination of the masticatory muscles of patients, many authors confirm the presence of trigger points in the form of hyper echoic inclusions of point or linear shape, which

manifest clinically both actively and latently, forming the so-called "myotonic syndrome", manifested by incomplete asymmetric relaxation of the masticatory muscles. The results of the study of hemodynamic using ultrasound Dopplerography revealed several times the increased frequency of deformation and stenosis of the carotid and vertebral arteries in patients with TMJ dysfunction compared with healthy ones. In addition, these patients had a decrease in blood flow velocity against the background of an increase in the pulsation index [28.29].

A special role in the diagnosis of the disease should be given to psychosomatic manifestations accompanied by neurotic disorders of the depressive and hysterical nature of the patient's personality [5].

The earliest clinical manifestations of TMJ dysfunction, against the background of the absence of complaints from articulation, are: change in the nature of the biomechanics of the particular heads and deviation of the mandible [9].

It has been repeatedly confirmed that the appearance of signs and symptoms of TMJ dysfunction is extremely rarely caused by a decrease in interalveolar height [30]. In addition, the central position of the mandibular heads in the articular fossa is not characteristic [32]. It was found that the sizes of the mandibular heads significantly differed in patients with TMJ dysfunction and the control group, while there were no differences in the parameters of articular gaps [29.30].

Patients with dislocation of the articular disc are characterized by the posterior position of the mandibular heads [23]. In the presence of bilateral disc displacement with reduction, the articular heads were located more distally compared to the control group [29]. Asymmetry of the sizes and shapes of articular heads, according to Ukrainian scientists, is one of the causes of compression-dislocation dysfunction of the TMJ [11].

Early signs of TMJ dysfunction in modern literature include deviation of the lower jaw up to 5 mm to the side, zigzag opening of the mouth, violation of smoothness of movements, limitation of the amplitude of mouth opening to 3 cm, click when opening the mouth, fatigue of the chewing muscles [2, 3]. In the examined patients with TMJ dysfunction complicated by masticator muscle hypertonicity, the following clinical forms were identified: pain dysfunction syndrome [Kosten's syndrome] in 50.6% of cases, "clicking" jaw in 37.1% and osteoarthritis of the joint in 12.3% of cases, respectively. In the examination of 244 patients with TMJ dysfunction, occlusive-40 articulator dysfunctional syndrome was detected in 29.1% of cases, neuromuscular dysfunctional syndrome was diagnosed in 18.1% of individuals, dislocation of the intraarticular disc was detected in 31.1% of the examined, and subluxation and habitual dislocation of the joint were detected in 21.7% of patients. According to the authors, taking into account the symptom complex, the palette of bad habits and predisposing factors, it is possible to more accurately diagnose by establishing the nosological form of TMJ dysfunction. The clinical picture of diseases accompanied by facial pain is constantly changing in the context of the intensity and localization of symptoms, according to a number of authors, the prevalence of orofacial pain decreases with age, while the manifestations of pain syndromes of other localization increase [30]. Earlier literature in TMJ dysfunction emphasizes the special role of pain syndromes of the maxillofacial region of myogenic and neurogenic genesis and the complexity of their diagnosis in polyclinic practice, as soon as these symptom complexes manifest themselves; patients seek help from a specialist [31].

According to modern scientists, TMJ dysfunction, as a syndrome, is a craniomandibular disorder based on neuromuscular syndromes, and alternately involving various components of the maxillofacial system, forming polyetiopathogenetic disorders, while not being an independent pathology [30]. Violation of the biomechanics of the spine in combination with TMJ dysfunction is often manifested by the presence of headache and dizziness [29].

Manifestations of TMJ dysfunction detected during a preventive examination, according to modern literature, are determined in 46% of adolescents who have pain in the TMJ area in 8.7% of cases, crunch is determined in 47.8% and clicking is detected in 42.7% of the examined [3.9]. In general, the prevalence of signs of TMJ pathology among the population can reach 72% [28].

Manifestations of TMJ dysfunction associated with burning of the tongue are determined in patients in conditions of violation of the relationship of the elements of the joint, accompanied by a decrease in the particular gap in the posterior part [31.32].

In patients with TMJ dysfunction, there is a limitation of the amplitude of lateral movements of the lower jaw in the healthy direction, the value of which is 4 times less than the norm, which indicates mechanical internal disorders inside the joint. Thus, during the examination of 175 patients with TMJ dysfunction, the authors diagnosed "Dislocation of the intra-particular disc of the temporomandibular joint" in 62 cases [25].

In the clinical picture of functional TMJ disorders, there are also otolaryngological manifestations, ear congestion, tickling and burning in the throat, dizziness and tinnitus, while the most frequent are ear pain and sudden hearing loss. Pain syndrome in TMJ dysfunction can often erase the clinical picture of changes in the state of articulation, imitating pharyngitis, sinusitis or otitis media [13, 14]. A number of authors draw attention to the fact that in patients with impaired TMJ function, clinical manifestations, in addition to the maxillofacial region, are characterized by pain in 42 neck muscles and impaired hand sensitivity [26].

There is a statistically significant association between manifestations of nocturnal gnashing of teeth [sleep bruxism] and pain symptoms of the TMJ and masticatory muscles, expressed in women under the age of 60, which reaches a prevalence of 54.51% among the study subjects experiencing chronic pain [28].

Tension headaches are more common in this category of patients, often reaching 70% among the examined. The characteristics of pain syndrome symptoms in individuals with and without headache complaints may have significant differences [18].

For many years, the problem of the diagnostic significance of psychological stress in the origin of my official disorders has remained debatable [11]. Literature data indicate that patients complaining of pain, clicking and crunching in the TMJ have premature contacts, which in 68% of cases are associated with malocclusion, in 13% of patients these manifestations were due to poor-quality prosthetics, 11% of cases were associated with tooth loss and 8% with filling. It should be noted that along with centric premature contacts in this category of patients, in 40% of cases, those are detected in anterior occlusion [23].

According to foreign authors, occlusive disorders accompanied by the loss of five or more chewing teeth do not contribute to the development of TMJ dysfunction [57]. At the same time, there is evidence that the absence of chewing teeth aggravates the severity of TMJ dysfunction, in which the frequency of pain in the joint and masticatory muscles increases twice, and the click with movements of the lower jaw; it manifests itself 7 times more often [30]. Earlier studies also indicate the important role of dentition defects and the presence of premature occlusal contacts in the development of TMJ dysfunction [31]. When assessing the dynamic parameters of occlusal relationships, it was revealed that premature contacts on the working side are not associated with manifestations of dysfunction, whereas on the balancing side they are manifested [27]. The same researcher established a strong correlation between the complex of dysfunctional TMJ disorders and the discrepancy between the positions of the central occlusion with the position of maximum tooth contact by more than 2 mm [22]. The search and construction of a prosthetic plane is a preventive measure of functional overload of the masticatory apparatus and TMJ [24]. Ear congestion, based on

modern research, can often be associated with a local increased tone in the medial pterygoid muscle, contributing to an indirect impairment of the function of the auditory tube [31]. There are works substantiating the effect of ischemia on the occurrence of functional disorders of the dental system [26].

There are separate works describing the properties of trigger points of the masticatory muscles to reflect pain, designating concomitant [satellite] trigger points in the head and neck, forming a symptom complex outside the maxillofacial region [27]. A special role is given to the facts of the formation of secondary trigger points, for example, in the muscle straining the eardrum, leading to hearing impairment and deafness, as well as in the stirrup muscle, the manifestation of which is ringing in the ears. Moreover, the process of studying the specifics of the spread of muscle pain, accompanied by paresthesia, skin discoloration, sweating and other vegetative manifestations in projections of other areas of the body, has been engaged since the middle of the last century [30]. According to foreign authors, symptoms of sleep disorders are both an indicator of the risk of development and a sign of existing TMJ dysfunction [23]. Dysfunction of the central antinociceptive system with the formation of an irritative focus of pathological activity plays a role in the pathogenesis of the disease [23]. According to domestic and foreign studies, the key etiopathogenetic mechanism for the development of TMJ dysfunction is masticatory muscle spasm [28]. Thus, the main pathogenetic mechanisms for the development of TMJ dysfunction are an anomaly in the dental-maxillary system, changes in the masticatory muscles, particular disc, capsular-ligamentous component of the biomechanical system [22]. Among the causes of dysfunction, occlusive articulation disorders have become widespread, which arose as a result of irrational prosthetic structures, defects and deformations of the dentition, complicated by a violation of the biomechanics of the mandible, stress and bruxism are the causes of central genesis [24].

#### LIST OF LITERATURE

1. Азимова Ш.Ш., Аbruев У.Р, Расулов М.М. Тиш-жағ тизими аномалияларининг Бухоро шаҳар мактаб ёшдаги болалар орасида тарқалиши. //Доктор Ахборотномаси. 2020. - №1. - С. 23-28 бет.
2. Ж.Н. Бакаев. Доимий тишларнинг чиқиши вақтининг ўзгариши натижасида тиш-жағ тизим аномалияларининг этиопатогенези, замонавий ёндашув. [Адабиётлар шарҳи] / Тиббиётда янги кун // -2020. -№4 [32]. -С. 119- 123.
3. Бакаев Ж., Олимов С. БИОПОТЕНЦИАЛЫ ЖЕВАТЕЛЬНЫХ МЫШЦ ПРИ МЫШЕЧНО-СУСТАВНЫХ ДИСФУНКЦИЯХ ВНЧС, ДО И ПОСЛЕ ЛЕЧЕНИЯ //Медицина и инновации. – 2021. – Т. 1. – №. 4. – С. 388-396.
4. Гаффоров С.А., Бакаев Ж.Н. Особенности взаимосвязи заболеваний слизистой оболочки полости рта с соматической патологией //Вестник ТМА. - Ташкент, 2019. - № 3. - С.20-24.
5. Гаффоров С.А., Бакаев Ж.Н. Оғиз бўшлиғи шиллик қавати касалликлари – патологик аспектлари ва профилактика асослари // Stomatologiya. - Ташкент, 2019. - №4 [77]. - С.75-80.
6. Казанцев М.А., Влияние ишемии на возникновение функциональных нарушений зубочелюстной системы / М.А. Казанцев, А.С. Романов, Ю.А. Титова // Смоленский медицинский альманах. 2017. №1. С.164-168.
7. Олимов С.Ш. Значение метаболических показателей слюны в развитии зубочелюстных аномалий у детей с метаболическим синдромом.// “Стоматологик касалликларни даволашда ва профилактикасидаги долзарб муаммолар” Илмий амалий конференцияси. Бухоро. 2016.- 33бет.

8. Олимов С.Ш., Гаффаров С.А. Болаларда тиш-жағ тизими нуқсонлари ва соматик касалликлар орасида боғлиқликнинг илмий асослари. [адабиётлар шарҳи].// Журнал. Stomatologiya. -2019й №1.60-65 бет.
9. Олимов С.Ш., Саидов А.А., Гаффаров С.А., Хожиметов А.А. Мактаб ёшдаги болаларда гепатобилиар тизимнинг тиш-жағ нуқсонлари патогенезидаги аҳамияти.// Журнал Доктор ахборотномаси. Самарканд. 2019 -№2. - 35-39 бет.
10. J.N. Bakaev, S. Sh. Olimov. Modern approaches to diagnosis, etiology and pathogenesis of the upper permanent canine retention formation [Literature Review] / European Journal of Molecular & Clinical Medicine // Volume 07, Issue 03, 2020, ISSN 2515-8260 – P. 3815-3830.
11. Bakaev Zh.N.,Olimov S.Sh. New views on diagnostic methods for the formation of retention of the upper permanent canines [LITERATURE REVIEW] / International Journal on Integrated Education // Volume 3, Issue XII, December 2020, e-ISSN : 2620 3502, p-ISSN : 2615 3785, – P. 129-135.
12. Bakaev Zh.N., Olimov S.Sh. Treatment and prevalence of abnormal eruption of permanent canines [Literature review] / Middle EuroDean Scientific Bulletin // VOLUME 7, December 2020, ISSN 2694-9970, – P. 16-19.
13. Bakaev Jasurbek Najmidinovich, Olimov Sidik Sharifovich. Electromyographic studies of masticatory muscles before and after treatment for musculo skeletal TMJ dysfunctions. /Europe's Journal of Psychology [EJOP] // 2021, Vol. 17[3], - P. 114-122.
14. Idiev O. E. Maxillofacial Region in Children with Cerebral Palsy //Middle European Scientific Bulletin. – 2021. – Т. 13.
15. Olimov Siddiq Sharipovich, Bakayev Jasur Najmiddinovich, Safarova Mavludabonu Jamolovna. Modern Interventions for the Occurrence of Pain Syndrome in Dental Diseases. / International Journal of Discoveries and Innovations in Applied Sciences [IJDIA].// ISSN 2792-3983 [online], Published under Volume: 1 Issue: 6 in November-2021, - P. 67-69.
16. Olimov S. Sh., Bakaev Zh. N., Rahmonova F. Z. The use of a modern computerized system in the diagnosis, prognosis and treatment of retentive permanent postyannyh canines / European Journal of Research Development and Sustainability [EJRDS] //Vol. 2 No. 2, February 2021, ISSN: 2660-5570, – P.76-78.
17. Olimov S.Sh., Bakaev J.N., Safarova M.J. Aspects of the formation of pain syndrome in the are a of the masticatory muscles in the disease of the maxillary -mandibular composition. /International Journal On Human Computing Studies//Volume: 03 Issue: 1 January-February 2021, e-ISSN: 2615-8159|p-ISSN: 2 615-1898, – P. 117-121
18. Olimov S. Sh., Bakaev J.N., Nekboev B.N. Etiopathogenesis and digital approaches in the diagnosis of retention of upper permanent canines. [Literature review]. /World Bulletin of Social Sciences [WBSS] Available // Vol. 3, October- 2021 ISSN: 2749-361X, - P. 78-87.
19. Sharipovich O. S., Baxtiyorovich B. B., Ahmadjonovna Y. U. FEATURES OF THE COURSE OF THE CARIOUS PROCESS IN CHILDREN WITH DENTOALVEOLAR ANOMALIES IN THE BUKHARA REGION //Journal of Natural Remedies. – 2021. – Т. 21. – №. 12 [2]. – С. 27-33.
20. Olimov S.Sh., Bakaev J.N., Badriddinov B.B., Yunysova U.A. The importance of somatic diseases in the spread of non-carious dental diseases // Проблемы биологии и медицины. 2021 № 4 (129) 90-94 с.

21. S.Sh. Olimov, J. N. Bakaev, Badriddinov B. B, U. A. Yunusova Factors of Non-Specific Protection of Oral Fluid in High School Children with Dental Anomalies // MIDDLE EUROPEAN SCIENTIFIC BULLETIN ISSN 2694-9970 VOLUME 16 Sep 2021. P. 97-105
22. Olimov Siddiq Sharipovich., Badriddinov Baxrom Baxtiyorovich., Yunysova Umida Ahmadjonovna FEATURES OF THE COURSE OF THE CARIOUS PROCESS IN CHILDREN WITH DENTOALVEOLAR ANOMALIES IN THE BUKHARA REGION // Journal of Natural Remedies Vol. 21, No. 12(2), (2021) P. 27-33
23. Юнусова У.А., Бадриддинов Б.Б., Олимов С.Ш. ЛЕЧЕНИЯ ПОСТКОВИДНОЙ ГЕРПЕТИЧЕСКОЙ НЕВРАЛГИИ ТРОЙНИЧНОГО НЕРВА // «Актуальные проблемы стоматологии и челюстно-лицевой хирургии», состоявшийся 10-11 декабря 2021г. в городе Ташкенте.
24. Fozilov U.A. Optimization of prevention of caries development during orthodontic treatment.// AJMIR Asian Journal of Multidimensional Research. – 2020. – Vol. 9. - Issue 1. – P. 48-50
25. Фозиллов У.А. Ортодонтик мосламаларни кўллашда юзага келадиган бошланғич оқдоғ кариесни замонавий даволаш усуллари // Tibbiyotda yangi kun. –2020. - №2 (30). 250-251. - б.
26. Фозиллов У.А. Беморларни ортодонтик даволашда асоратларнинг олдини олишга қаратилган профилактик чора тадбирлар мажмуини қатъий технология ёрдамида ишлаб чиқиш ва амалга ошириш.// Tibbiyotda yangi kun. – Бухоро, 2020. - №2(30). 580-583. - б.
27. Fozilov U.A. White treatment of white spot caries in the application of modern medicine. // academia an international multi disciplinary research journal. – 2020. - vol. 10, issue 5. – P. 1811-1813
28. Fozilov U.A. Diagnostic of caries by using the machine Qrayview C // ICDSIIL-20 International Online Conference In Association with International engineering journal for Research Development. – 2020. - vol. 10, issue 5. – P. 259-262
29. Fozilov U.A. Development and implementation of a set of preventive measures aimed at preventing the development of complications in the orthodontic treatment of patients using fixed technology // American Journal of Medicine and Medical Sciences. – 2020. - №10 (7). – P.469-472
30. Fozilov U.A., Rizaeva S.M. Development of modern preventive programs in orthodontic treatment of dental caries in children on the basis of hygienic requirements // (IEJRD) International Engineering Journal for Research Development. – 2020. ISSN 7149-0771 P. 1-4.
31. Фозиллов У.А. Ризаева С.М. Ортодонтик даволашда кариеснинг ривожланишини Бухоро вилояти худудлари негизида ўрганиш // Stomatologiya. – 2020. - №3 (80). 36-38. - б.
32. Fozilov U.A., Rizaeva S.M. Optimization of diagnosis and prevention of development of caries for orthodontic treatment European Journal of Molecular & Clinical Medicine 2020. Volume 7. Issue 3. - P. 3714-3719.