

КЛИНИЧЕСКИЕ ДИСЦИПЛИНЫ

OPTIMIZATION OF DIAGNOSTICS AND TREATMENT OF TEMPORAL-MANDIBULAR IMPAIRMENTS

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Abstract. One of the most common pathologies among lesions dentition is dysfunction of the temporomandibular joint (TMJ). According to literature, 70 to 100% of the population suffer from TMJ pathology. The increasing number of patients with TMJ pathology can be explained by improved diagnosis and increased paraclinical methods, especially by the technical capabilities of medical research. Under our supervision there were 86 patients with various disorders of TMJ dysfunction. Anamnesis data revealed that the patients earlier underwent dental treatment for caries and its complications. Comparison group consisted of 15 people with full dental health and orthognatic bite.

One of the assigned tasks was to study the influence of the seal teeth on TMJ.

In terms of limitations to seal the teeth of patients in the main group, 26 patients were observed up to 1 year, 32 patients — up to 2 and 28 patients — up to 3 years. Characteristics of sealed teeth of upper and lower jaws were as follows: front — 19 (incisors and cuspids), premolars and molars — 77.

Revealed that 85% patients of main group in the first days of the sealing had pain when biting and food intake, and at the 20—30 days — crepitation, clicking and noise in the area of TMJ. Assessment of occlusal relations of the teeth and dentition were determined using wax occlusal and copy paper, with subsequent removal of the casts of both jaws. The models placed into the articulator and received data were recorded in designed “Personal data sheet” of TMJ.

Establishing the causes, acute or chronic changes of occlusal relationships (supercontext) should be considered as a fundamental trigger in the pathogenesis of TMJ dysfunction as well as forced position the lower jaw with formation of pathological conditions. In this aspect main role should be given to mistakes and complications during recovery and teeth filling that can cause the dysfunction of TMJ, periodontosis etc.

When planning therapeutic interventions in case of TMJ dysfunction clinical and radiographic evaluation, orthopantomography, computed tomography, functional methods of investigation (electronography), and the elimination of the causes leading to its development (occlusal relation of the jaws) are necessary that will greatly enhance the capabilities of diagnosis and treatment.

Key words: tooth filling, parodontitis, malocclusion, dysfunction of the temporal-mandibular joint.

INTRODUCTION

One of the most wide-spread pathologies among maxillo dental impairments is the dysfunction of the temporal-mandibular joint (TMJ). We should mention that according to different literature sources 70 to 100% of the population suffers from this pathology.

The increase of the number of patients with TMJ pathology can be explained by improved diagnostics and paraclinical methods, mainly by the technical possibilities of medical investigations [2; 3]

Vast number of patients with dysfunction of TMJ can be correlated with the growth of functional disturbances related to increasing psychological, stressful exertion of people due to a lot of information, urbanization and social shock [1; 3; 6].

Increased application of patients can be explained also by their better information about the symptoms and possible consequences of TMJ pathology [4].

According to polyetiology of this disease, complicated clinical picture and diagnostics, the treatment should be complex: psychotherapeutic (to stop of emotional tension)), medicamentous, physiotherapeutic, orthopedic, orthodontic, occlusal etc [5; 7].

Urgency of the problem treating and rehabilitating patients with TMJ dysfunctions is greatly conditioned by the wide spreadness of main dental diseases, namely caries and its complications with all negative consequences due to them [1; 6]. Precise restoration of teeth and dentition based on their functional and anatomical peculiarities is a serious problem for the dentists as well as to reveal the pathogenic mechanisms in TMJ pathologies because many questions remain open and demand further investigations.

MATERIAL AND METHODS

86 patients with different impairments of TMJ dysfunctions have been under our observation. Anamnesis data have shown that all patients had earlier undergone treatment for caries and its complications. The control group included 15 people with full sanitation of the mouth cavity and orthognathic occlusion. The age and sex differences in the both groups are shown in Table 1.

Table 1

**Distribution of patients according to sex and age groups
(classification according to the WHO recommendations)**

Group	Control group (years)	Main group (years)					Total number
		21—30	31—40	41—50	51—60	60 and above	
Sex	21—30	21—30	31—40	41—50	51—60	60 and above	
Male	9	8	12	18	6	6	50
Female	6	6	8	12	4	6	36
Total	15	14	20	30	10	12	86

One of our raised problems was to study the influence of the stopped teeth on TMJ. Distribution of teeth according to their belonging to the upper or lower jaws is shown in Table 2.

In each separately taken case special attention was paid to the presence of roentgenic changes of the dental-parodontic complex considering tooth filling prescription and the state of TMJ structural changes.

Methods of X-ray examinations were conducted by “Haino” and “Sironaq” HeliodentVario apparatus on “Kodak” film with the following regimens: 25kV tension, current power 9.6 mA, exposition 3 sec. Distance of the object was 60 cm. Orthopantomograms were obtained with “Planmeca” apparatus. Computed tomographies (CT) were made by “PlanmecaProMax 3D”.

Table 2

Distribution of the stopped teeth of different jaws concerning caries and its complications with TMJ dysfunction

Tooth group	Unilateral dysfunction of TMJ		Total	Bilateral dysfunction of TMJ		Total
	Upper jaw	Lower jaw		Upper jaw	Lower jaw	
Incisors	2	3	5	2	1	3
Canine	2	4	6	3	2	5
Premolar	8	6	14	8	10	18
Molar	7	8	15	8	12	20
Total	19	21	40	21	25	46

High sensitivity of CT method to the changes of roentgen density of the studied tissues is conditioned by the fact that unlike the usual X-ray film the obtained image is not distorted by the application of the imaging of other structures through which roentgen bundle passes.

The evaluation of radiation absorption degree (roentgenic density of the tissues) is conducted by the relative scale of coefficient absorption (CA) of the roentgen radiation. In this scaleun. H is considered as 0 (H-unit of Housefield) absorption into water, 1000 un H in air. Contemporary tomographs allow to understand (see) the difference of density in 4—5 un. H, reveal layers of 1.5 mm thickness as well as to get three-dimensional reconstructive imaging of the studied region.

In TMJ dysfunction CT-investigation in axial projection gives additional information about the state of bone tissues, location of longitudinal axes of the articular heads, reveals hypertrophy of chewers

One of the symptoms of TMJ dysfunction is murmur in the joint area when opening and closing the mouth. The aim of using this method is the demonstration on the own material the possibility of conducting electrosonography for optimizing differential diagnostics of articular murmur and TMJ dysfunction with the help of ESGI apparatus produced by “MIOTRONICS” company and the computer programs worked out by the same company for analysis and procession of the obtained data.

The murmur recording is carried out with the help of highly sensitive microphones which are applied on the surface of the skin in the joint area. The patient opens and closes the mouth at maximum amplitude. Recording is done during 4-second cycles and later the program analyses by interpreting the obtained data.

Taking into consideration that our task was the problem of occlusion in a flat (plane) condition of the contact surface of the upper and lower jaw teeth, we didn't focus our attention to the methods of filling the root channels. When observing the filled teeth we have paid attention to the marginal adjustment of the filling, the contact points, height in the correlation with the tooth antagonists, the state of the periapical tissues (clinical, paraclinical, roengenological data). In all cases of stomatologicalinterventions the patients gave a written consent for further manipulations.

For the right correction of the occlusion height we received the upper and lower tooth casts, diagnostic models with their subsequent installation into articulator. The contacts and super contacts obtained in the articulator with the help of wax occlusogram and carbon-paper later served as a base for interpolishing during the stomatological interventions in the mouth cavity. To work out the digital significance we have used the results of the investigations in the computer data base which was conducted by Microsoft program.

RESULTS AND DISCUSSION

According to the term of limitation of the patients' filled teeth who were in the control (main) group of observation, there were 26 patients (up to one year), 32 patients (up to 2 years) and 28 patients (up to 3 years). According to the type-groups of the filled upper and lower teeth there were: 19 frontal teeth I (incisors and canines), 77 premolars and molars.

Anamnesis data revealed that 85% of main group patients had pains during the first days of filling when biting, difficult food intake and on the 20—30th day was noted crepitation, clicking and murmur in the area of the TMJ. The assessment of occlusion correlation of the teeth and the dentition was done with the help of wax occlusograms and carbon-paper with the subsequent removal of the casts of the both jaws, installation of the models into the articulator and recording the obtained data in the chart "Patient's Personal Data" of TMJ developed by us.

It was objectively defined that the absence of the contact in the area of the chewing teeth brings to the occlusion contact of the frontal teeth, which enables their overloading which is one of the causes (frontal occlusion) of joint head, displacement of the intra-articular disc, strained capsule and ligament.

For making a diagnosis it's necessary to define the primary central occlusion and the secondary central occlusion — adapted position of the mandible — maximum contact between the present teeth on the occlusion surface.

The deviation of the central lines of dentition brought to TMJ dysfunction, which was revealed with the help of the auscultation, palpating (bimanual), roentgenological examinations, electrosonography.

Let's bring an example for illustration:



Picture 1. Female patient, 36, medical card № 91, applied to the "Tatdent" clinic on 22.08.2013. DS. Left-side dysfunction of TMJ, super contact, 36 filled for deep caries



Picture 2. The same patient, 6 months after filling tooth 36. Diagnostic cast models. Dysocclusion, displacement of tubercle-fissure contact. Left –side dysfunction of TMJ



Picture 3. The same patient, 6 months after filling tooth 36. Left –side dysfunction of TMJ. Diagnostic cast models. Polishing super-contacts until obtaining orthognathic occlusion, restoration of the tubercle-fissure contact



Picture 4. The same patient. 1 year after observation (follow up).
Central correlation of the jaws in norm. After final polishing

Polishing of the obtained diagnostic cast models where super contacts were eliminated and central occlusion was obtained, served as a base for its interpolishing in the clinic (picture 4), where all the existing deviations of TMJ were eliminated after 1 year of observation.

In dynamic observation of infrastructural articular disorders (CT) in terms of up to 1 year three-dimensional reconstructive imaging of the both joints was obtained which showed the recreation of the form (shape) of the bone joint surfaces along all the planes and proved how effective this method was both for diagnostics and differential diagnostics of TMJ organic changes.

One of the symptoms of TMJ is the murmur in the joint area when moving the mandible, for this reason electrosonography method is used. X-ray examinations of the joints (CT, MRI, orthopantomography) don't allow to evaluate (assess) the interrelation of the structures composing the joint during their function.

For this reason ECG is a productive method, as it allows to get the missing information characterizing the state of TMJ. ECG devices which are used today mainly in hospitals cannot widely used in outpatient departments. We have modified and worked out apparatus "Electrosonograph" which has received certificate on invention N.95 on 07.07.2015 [L.V. Tatintyan, G. Yu. Ter-Poghosyan 2015].

The simplicity of this method to investigate TMJ and non-invasive way allow to conduct the recording of the murmur with the help of highly sensitive microphones

applied on the joint area during 10—15 seconds in different movements of opening and closing the mouth cavity.

This functional electronic method enables to analyze the course of the used procedures in the dynamics of treatment, to record information and keep it digitally or graphically.

Modified apparatus Electrosonograph “Device to define murmur of TMJ” is portable, allows at first approach to define changes in TMJ dysfunctions, which undoubtedly provides a wide implementation in the clinical practice.

CONCLUSION

Determination of causes, acute or chronic changes of occlusion, supercontact should be considered as one of the basic starting mechanisms in the pathogenesis of TMJ dysfunction as well as untimely contacts promote forced adapting position of the mandible and formation of the conditioned pathological states. In this aspect main role should be given to the iatrogenic mistakes and complications in restoration and filling of teeth, which can be a cause of TMJ dysfunction, diseases of parodont, etc.

Considering the clinical analysis of the patients with TMJ dysfunction who were under our observation we can state that practically all the patients had malocclusion as a result of iatrogenic mistakes in tooth filling. When planning treating procedures in TMJ dysfunction clinico-roentgenological evaluation, orthopantomogram, CT are necessary, as well as it's important to eliminate the causes (occlusion correlation of the jaws), which will significantly increase diagnostic and treating possibilities of TMJ dysfunction.

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ОПТИМИЗАЦИЯ ДИАГНОСТИКИ И ЛЕЧЕНИЯ НАРУШЕНИЙ ВИСОЧНО-НИЖНЕЧЕЛЮСТНОГО СУСТАВА

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Одной из распространенных патологий среди поражений зубочелюстной системы занимает дисфункция височно-нижнечелюстного сустава (ВНЧС). Следует отметить, что, по различным литературным источникам, патологией ВНЧС страдает от 70 до 100% населения. Увеличение количества пациентов с патологией височно-нижнечелюстного сустава можно объяснить улучшением диагностики и повышением параклинических методик, в частности технических возможностей медицинских исследований [Банух В.Н., 1989; Буланова Т.В., 2005].

Рост числа больных с дисфункциями височно-нижнечелюстных суставов можно соотнести с увеличением функциональных нарушений в связи с возрастающими психологическими, стрессовыми нагрузками людей, связанными с большим потоком информации, урбанизацией и социальными потрясениями [Баданян В.В., 2003; Дергилев А.П., 1997; Lotzman U., 1998].

Повышенную обращаемость пациентов можно объяснить также фактором большой информативности в последние годы населения о симптомах и возможных последствиях патологического процесса в височно-нижнечелюстном суставе (ВНЧС) [В.М. Безруков и др., 2002].

Полиэтиологичность данной патологии, сложность клинической картины и связанная с этим диагностика, лечение должны быть комплексными: купирование эмоционального напряжения (психотерапевтическое лечение), медикаментозное, физиотерапевтическое, ортопедическое, ортодонтическое, окклюзионное и другие [Хватова В.А., 1996.; Татинцян Л.В., Тер-Погосян Г.Ю. Изобретение № 95 от 07.07.2015 г.; Татинцян Л.В., 2012].

Актуальность проблемы лечения и реабилитации больных с дисфункцией височно-нижнечелюстного сустава во многом обусловлены большой распространенностью основных стоматологических заболеваний и связанными с этим негативными последствиями, в частности лечением кариеса и его осложнений (1,8). Точность реставрации зубов и зубных рядов с учетом функционально-анатомических особенностей ставит перед стоматологами серьезные задачи по выявлению патогенетических механизмов при патологии ВНЧС, так как многие вопросы остаются открытыми и требуют дальнейших исследований в этом направлении.

Ключевые слова: пломбирование зубов, пародонтит, нарушение окклюзии, дисфункция височно-нижнечелюстного сустава.