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EFFECTIVENESS OF USE OF RADIO FREQUENCY ABLATION IN THE TREATMENT OF FACIAL PAIN

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Abstract:
The article presents the results of a scientific study on the treatment of patients with facial pain. The technique of radiofrequency ablation surgery and its effectiveness in the treatment of facial pain are presented. Complex treatment of patients with trigeminal neuralgia accompanied by facial pain must be carried out on the basis of a multidisciplinary approach with the active assistance of a dentist and anesthesiologist with the joint implementation of regional analgesia and radiofrequency ablation methods as basic therapy

Keywords: facial pain, trigeminal neuralgia, prosopalgy, radiofrequency ablation, exeresis, branches of the trigeminal nerve

According to WHO estimates, the annual mortality from all CVDs is 17 million people, the main cause of which is coronary heart disease (CHD). The relevance of the problem of classical neuralgia of the maxillofacial region is the presence of significant pain syndrome that occurs due to compression of the root or branches of the trigeminal nerve [**Error! Reference source not found.**]. The World Health Organization notes that the incidence reaches a limit of 30-50 patients, and the incidence is 2-4 people per 100,000 population.

In the literature there are many works devoted to various species [2,**Error! Reference source not found.**,**Error! Reference source not found.**]. However, there are not enough works devoted to the conservative treatment of this pathology. Consequently, further study of this issue has important theoretical and practical significance [6]. Further study of this issue is of great medical and social importance.

The researchers have established that a mandatory and successful result is obtained during diagnostic examination and treatment of patients with this pathology in highly specialized inpatient or outpatient institutions. Since the pathology is multifaceted with different courses and pain mechanisms, many related specialists, namely dentists, neurologists, physiotherapeutic workers and psychologists, should definitely be involved in the diagnosis and treatment. Painful human suffering is a serious problem of the present time, and is possible only with an integrated interdisciplinary approach [7]. A more in-depth disclosure of pathophysiological changes in the pathology of the facial area with the approach of interdisciplinary positions of doctors of various profiles: dentists, neurologists, anesthesiologists, reflexologists, this will allow us to have a clear understanding of the pathogenesis of facial pain, as well as a mandatory integrative approach to use effective pathogenetically based treatment [**Error! Reference source not found.**].

Purpose of the study

To increase the effectiveness of the treatment of facial pain by using the radiofrequency ablation method as a basic component, taking into account the impact of dental disorders.

Materials and research methods

As part of this study, a prospective randomized analysis of a clinical sample collected from 60 patients admitted to an outpatient dental surgery clinic from 2020 to 2023 with complaints of pain attacks in the face and jaws was conducted.

The rule for including patients was the presence of pain and the absence of an acute phase of development of dental pathology.

Patients who were included in the study were randomized (Table 1). Group I patients were treated

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according to the standard treatment protocol, group II - according to the proposed treatment regimen. The observation period was 3 months, appointments were called three times: upon presentation, after the start of treatment for 1 month, then at the end after 3 months.

Table 1
Distribution of patients by gender and age

Group No	n=number of patients	Duration of the disease	Patient age, years	M/F
Group I	30	from 3 months up to 5 years	45-66	15/15
Group II	30	from 3 months up to 5 years	45-66	15/15
Total	60	from 3 months up to 5 years	45-66	45/15

The research methods were a clinical neurological examination, consisting of a survey of complaints, anamnesis vitae, anamnesis morbi, the data of which were entered into the "Pain Properties" questionnaire.

Neurological standard examination focused on the location of the pain point, the presence of trigger points and increased sensitivity.

Radiofrequency ablation. It is based on the physical principle of generating a high-frequency current on an active electrode, due to which the fluid molecules in the tissues begin to vibrate, thereby causing damage to the sensory (sensitive) nerve fibers.

There are two fundamentally different variants of the RFA technique: thermal ablation and pulsed ablation. The essence of thermal ablation is that the tissue at the location of the electrode is heated to 80 ° C, which causes damage of about 10 mm in diameter. This leads to various histological changes in the nerve fiber: Wallerian degeneration of nerve fibers; ruptures of the basement membrane, perineurium; other axonal damage. It should immediately be noted that the main areas where RFA is performed consist of axons (long processes of nerve cells). All these damages are reversible and, as a rule, nerve conduction is restored within 1–2 years.

The second option for the RFA technique is pulsed ablation. It is based on the generation of short radiofrequency pulses, in which no significant heating of tissue occurs, and the analgesic effect is achieved through modulation of the conduction of nerve impulses (this phenomenon has not yet been fully studied). Pulsed RFA is performed if it is necessary to influence mixed (motor and sensory) fibers.

Radiofrequency destruction of the trigeminal nerve root for trigeminal neuralgia - one of the most common manipulations performed to treat chronic pain syndromes. Due to its less invasiveness, this manipulation is performed when surgical intervention is impossible or when pain relapses after the intervention. Efficiency is up to 90%.

The procedure does not require special preparation and is performed on an outpatient basis. At the appointed time, the patient comes to the clinic. He is provided with a comfortable room with all amenities, and from there he goes to the operating room. There, maintaining sterility, the doctor, under X-ray (C-arm) control and sometimes ultrasound, places the cannulas of the RFA device as close as possible to the nerve that causes pain. First, test stimulation is performed to determine whether sensory and motor (motor) fibers responsible for innervating other areas are nearby. After this, radiofrequency ablation of the nerve is performed. After performing the procedure, we observe the patient for 1–2 hours.

Fig.1. Performing radiofrequency ablation manipulation.

Results and its discussion.

There were 30 patients with classical neuralgia who received standard conservative treatment, including 15 men and 15 women. In terms of age, it was observed from 45 to 66 years (average age - 54.6 ± 1.2

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years). In terms of age, women and men differed statistically significantly with reliability (p = 0.045).

The duration of the disease was observed on average in 83.2% of patients who received conservative therapy 5.42 years, and for the remaining 16.8% of patients - 3.13 months. In 13.56% of patients, the final exacerbation lasted on average 12 days, in 79.31% of patients - 3 months and 10 days, in 7.15% of patients - 1 year and 8 months (Table 2).

Table 2

Duration of final exacerbation

Time	%	Average duration
days	13.56	12
month	79.31	3 months and 10 days
year	7.15	1 year and 8 months

In Figure 2 shows the predominant lesion, either jointly or separately, of the 2nd and 3rd branches of the trigeminal trunk. In zone 1 of the innervation branch, neuralgia was found in 1.45% of people, in branches 1 and 2 together, neuralgia was found in 5.80% of subjects, and with innervation of all three branches, it was detected in 2.90% of people [7].

A statistically significant difference (p = 0.0278) with a predominant localization of pain paroxysms was identified on the right side of patients with neuralgia. This predominant localization on the right is obviously associated with the protrusion of the pyramid of the right-sided temporal bone; it leads to the bending of the nerve root through its apex, as well as premature intersection of the dolichoectatic SMA loop with the vertex [7]. The presence of trigeminal pain paroxysms in cases where there are no previous factors is explained by this anatomical feature.

Indicators of clinical and dental examination of persons according to the proposed treatment

In the group of patients with trigeminal neuralgia who underwent radiofrequency ablation, 30 people were observed, among them there were equal numbers of women and men. The age of the subjects ranged from 45 to 66 years (on average - 54.8±1.8). By age, the difference was significantly insignificant (p>0.01), but the line of the older generation of patients was traced, with p<0.05 (p=0.052932).

In this group of subjects, the duration of the pathology was 5.6 years (see Table 5); The average duration of the final exacerbation at the time of contacting the TGSI clinic was 1.5 weeks in 9.5% of patients, 2.7 months in 81% of patients, 3.5 years in 9.5% of patients (Table3).

Table 3

Duration of last exacerbation

Period	%	On average years
a week	9.5	1.5
month	81.0	2.7
year	9.5	3.5

The locations of painful attacks were predominantly found in the projections of the first and second branches of innervation, occurring in 4.76% of cases, in the area of all three branches of the trigeminal nerve together in 4.76% of cases

According to Table 4, the differences were noted to be statistically insignificant (p>0.05) for patients who received the proposed treatment, with neuralgia there was a predominant right-sided lesion.

Table 4

Characteristics of patients with neuralgia depending on the side of the facial lesion

Side	Frequency occurrence (%)
right	57.1
left	42.9

The upper lip, gums of the upper jaw, and wing of the nose, separately and together, were trigger points mainly in patients with surgical treatment.

In the observed group, before treatment, the PI (pain intensity) indicator on the VAS was 9.48 ± 0.25, on the VM scale - 4.81 ± 0.09, characterizing severe pain syndrome. According to the results of the assessment of night sleep questionnaires, both patients receiving conservative treatment and surgical patients had sleep disturbances before treatment. Its average value in group 2 of patients was 19.71 ± 0.71. When assessing the patients' condition using the Hamilton Depression Scale before treatment, depression was detected. The average score on this scale was 11.67 ± 1.32.

The majority of patients (61.9%) who received the proposed treatment had concomitant diseases. Most often they turned out to be hypertension, or its combination with coronary artery disease

A variant of the RFA technique is pulsed ablation. It is based on the generation of short radiofrequency pulses, during which no significant heating of tissue occurs, and the analgesic effect is achieved by modulating the conduction of nerve impulses. Pulsed RFA was performed to target mixed (motor and

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sensory) fibers, and the treatment effectiveness was 90% effective.

Conclusions. Complex treatment of patients with NTN accompanied by facial pain must be carried out on the basis of a multidisciplinary approach with the active assistance of a dentist and anesthesiologist with the joint implementation of regional analgesia and radiofrequency ablation methods as basic therapy

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