

# A Modern Approach to the Treatment of Facial Pain

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**Abstract** Neurostomatic syndromes are common among neurological diseases; their diagnosis and treatment are relevant due to different clinical patterns and intensity of painful paroxysms. Trigeminal neuralgia is the most common type of prosopalgia. It is of great scientific and practical importance due to the high incidence of the disease and the very high intensity of painful paroxysms, the difficulty of diagnosis and the difficulties of treatment. One of the modern methods of treatment of trigeminal neuralgia is laser treatment. In 77 patients examined in the article the treatment of paroxysms of pain with laser therapy was evaluated on the basis of international questionnaires and scales.

**Keywords** Laser therapy, Trigeminal neuralgia, Prosopalgia, Pain paroxysms

## 1. Introduction

Today, in most countries of the world, rapid introduction of laser radiation in biological research and medical practice is observed. The unique properties of laser light have opened up a wide range of applications in various fields: surgery, therapy and diagnostics. Clinical observations have shown the effectiveness of laser ultraviolet, visible and infrared spectra on the pathological center and the whole organism. A laser, or optical quantum generator, is a technical device in which directed beams of electromagnetic waves emit light from a very narrow spectral range. In fact, “Laser” is an abbreviation of the English word “Light Amplification by Stimulated Emission of Radiation”, which means “stimulated amplification of light rays”. Laser therapy occupies a special place in modern medicine. First, as a very versatile method, it helps many different diseases; secondly, as one of the safe methods; thirdly, as one of the most effective methods of treatment without drugs. In neurology, laser therapy began to be actively used in the late 80s and early 90s. During these years, hundreds of thousands of patients were successfully treated, many scientific works and books were written, and candidate’s and doctor’s dissertations were defended on this method. Therefore, today this method of treatment is one of the most studied methods of physiotherapy, which gives it great confidence. The full name of this technique is “low density magnetic infrared laser therapy”. This name reflects the influencing factors: permanent magnetic field, infrared laser radiation and a small power of certain radiation. Therapeutic laser devices with a pulse radiation power of no more than 30 mW/cm<sup>2</sup> are used for treatment [4, – p. 12–13; 5, – p. 493–497].

Laser radiation of the infrared range is observed to enter the body tissues from the skin. However, in the presence of a constant magnetic field, the laser penetration is significantly increased. With such a combination, laser radiation penetrates the tissues of the body to a depth of 2.5–3 cm. This means that the laser beam penetrates completely into the nerve fibers, large blood vessels and nerve tangles under the skin, vegetative nodes, tendons, muscles, tendons, periosteum, as well as lymph nodes and ticks. Due to such a complex effect on various organs, their blood supply is improved. Due to these effects, the pain syndrome caused by tissue inflammation is quickly removed in patients, swelling returns, muscle contraction decreases, nerve conduction improves, and sensitivity and muscle tone begin to recover. Blood supply to the brain and neck improves, venous circulation improves, headaches, sleep disorders, mental activity, memory and attention improve. Laser radiation has a bio-stimulating effect on various tissues of the body. Under the influence of strong light flux, the activity of tissue enzymes increases, which leads to the acceleration of biochemical processes. It helps to improve cell and tissue regeneration.

Laser therapy leads to the mobilization of the body’s protective forces, increase in the activity of blood microcirculation, concentration of nutrients and oxygen in tissues, as a result of which the damaged areas are quickly healed.

For therapeutic purposes, laser radiation reduces blood viscosity, increases lymph flow, optimizes the work of the immune system, has analgesic, antiviral, anti-inflammatory, soothing, antimicrobial and anti-inflammatory effects. A course of laser therapy quickly eliminates the pain syndrome, shortens the duration of treatment. Laser therapy is actively used in trigeminal neuralgia. Contraindications to laser therapy are cases of trigeminal neuralgia caused by tumor or diffuse encephalomyelitis. If neuralgia is the result of an

infection in the teeth or nasal sinuses, then laser treatment will not work without eliminating this infection [7, – p. 611–629; 8, – p. 577–589].

Irradiation is carried out along the relevant branches of the trigeminal nerves as follows:

1. The lower jaw nerve, including the corner of the lips, the lower jaw joint, to the end of the crown of the temporal bone;
2. In the projection of the maxillary nerve, including the cheekbone, the area under the eyes, the teeth, and the teeth;
3. From the upper orbital depth to the middle of the temporal bone.

Laser treatment lasts 10 or 15 courses, once a day. If it is necessary to repeat the laser therapy, it cannot be done before 21–30 days.

The treatment network of the trigeminal nerve is affected by low-intensity laser beams and electrical stimulation. After surgery, patients with trigeminal neuralgia are treated according to the following procedure: laser irradiation is performed after the surgery (up to 2 weeks) in the projection of the space where the surgery was performed and at the exit points of the damaged trigeminal nerve node and branches. And treatment of the trigeminal nerve with a long-term transcutaneous laser beam using a semiconductor laser device [6, – p. 631–643].

Patients suffering from trigeminal neuralgia as a result of diseases of the ENT organs and surgical operations in them will have to undergo repeated treatment courses.

We used the Zimmer (Germany) laser device once a day for 10 days to eliminate paroxysms of pain in the patients undergoing treatment for various lesions of the trigeminal nerve participating in our study.

In our study, 77 patients suffering from pain paroxysms of various etiologies, 20 of them with pain paroxysms observed due to defects of the cheek–orbital complex, were observed. In addition to a complete neurological examination, international pain assessment questionnaires and scales were used to evaluate the pain paroxysm in them. All patients participating in the study were treated with conventional treatment with Noxopena DP 15 mg 1 tab 2 times for 5 days after meals and with the help of the Zimmer (Germany) laser device once a day for 10 days. Pain paroxysm was evaluated before and after treatment by visual-analog scale (VAS) and McGill pain questionnaire (MPQ) in all patients.

As a task, it was necessary to record the disappearance of maximal pain or minimal presence (by VAS (<1 point); a 50% reduction of pain compared to the initial level was considered as a good response to analgesic therapy (by VAS ( $\geq 2$  points); clinical effect was the initial pain intensity was evaluated as significant with a 20% decrease compared to the instruction on VAS (<1 point).

## 2. Results and Discussion

All patients participating in the study were prescribed the

original drug Noxopen DP against the background of basic metabolic and vascular therapy: in severe pain syndrome, 1 tab (15 mg) 2 times after meals for 5–10 days, in moderate intensity pain, 1 tablet 1 time in 5–10 days was prescribed.

In addition to the assessment of the neurological status, international questionnaires were also used to evaluate the effectiveness of the treatment. According to him, the average summary index of pain intensity on the VAS scale was  $5.1 \pm 0.23$  points before the start of the treatment, after 3 days after the start of the treatment, the pain intensity decreased to  $3.5 \pm 0.41$  points, and after 10 days to  $2.0 \pm 0$ , decreased to 34 points. It follows that after 3 days the intensity of pain on the VAS scale decreased by 1.6 points compared to the initial indicator, and after 10 days it decreased to 3.1 points, i.e. by 39%. This indicator proves the clinical significance of the performed analgesic therapy.

As an etiotropic treatment, the antiviral valocyclovir drug was prescribed according to the scheme, Noxopen DP as an analgesic therapy, and anti-tumor and desensitizing therapy.

In this clinical situation, the advantage of the drug Noxopen DP is provided by its optimal specific form, the ability to penetrate and accumulate in the foci of inflammation, good compatibility with other drugs, as well as ease of use.

Against the background of the use of the drug Noxopen DP, the pain syndrome in which the work of the chewing muscles and tickling of the oral mucosa occurs in patients has significantly decreased. This makes it possible to take the drug together with etiotropic drugs.

## 3. Conclusions

Trigeminal neuralgia is more common in middle-aged and elderly patients, accounting for 70% of cases. 60% of patients are female patients.

Clinical signs of trigeminal neuralgia are represented by a symptom complex of damage; the most characteristic sign is the presence of zones that provoke the development of pain, which is noted in 97% of patients. In most cases, damage to the II and III branches (53%) is observed in the second branch (32.5%) and on the right side (42.5%).

The conducted study showed the high efficiency of the drug Noxopen DP in pain of various etiologies against the background of dysphagia.

The drug showed its effectiveness in 98% of patients treated with pain of varying intensity. Under the influence of the drug Noxopen DP, the intensity of pain significantly decreased, and in turn, the limitation of movement of the masticatory muscles was eliminated. No significant side effects of the drug were observed during the study.

The advantage of the used drug is that compared to other non-steroidal anti-inflammatory drugs, Noxopen DP does not increase the risk of developing myocardial infarction, heart failure, edema, and arterial hypertension. This makes it possible to use it against the background of rheumatic diseases, in patients with acute and chronic circulatory

disorders.

Thus, improvement of blood supply in various organs, restoration of blood microcirculation in these organs, improvement of lymph flow and activation of local immunity (tissue lymphocytes, leukocytes) are achieved as a result of the complex effect of laser therapy. Thanks to this effective treatment, the pain syndrome caused by tissue inflammation quickly subsides in patients, swelling returns and muscle spasm and nerve conduction improves, sensitivity is restored. In addition, blood microcirculation in the brain and neck area is improved, venous congestion; headache, sleep, mental activity, memory and psycho-emotional state caused by pain are also stabilized [9].

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