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CLINICAL CHARACTERISTIC OF DIFFERENT TYPES OF CONSERVATIVE TREATMENT OS PATHOLOGICAL SCARS OF HEAD AND NECK

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There are a lot of different types of conservative and surgical treatment of pathological scars. The purpose of study was to analyze the result of using of ultraphonophoresis of Contractubex and electrophoresis with lidase in case of conservative treatment of scars of maxillofacial region. The study involved 40 patients of the Department of Maxillofacial Surgery of the Poltava Regional Clinical Hospital with pathological scars of maxillofacial localization. All patients were divided into two clinical groups of 20 people each. Patients of the first clinical group were administered the Contractubex daily using ultraphonophoresis. Patients of the second clinical group underwent electrophoresis with lidase. The nature of the scars was assessed by four clinical signs (type, texture, color and sensitivity), expressed on a 4-point scale. Both methods of conservative treatment of maxillofacial scars have a predominant effect on subjective indicators, such as itching. A more pronounced effect of treatment was noted after the use of ultraphonophoresis of contractubex, in this group of patients there was also a significant improvement in such an objective clinical indicator as the color of the scar. The use of lidase electrophoresis led only to a reliable improvement in subjective feelings (P4), in the absence of such in relation to three objective indicators. Thus, the investigated methods of conservative treatment mainly affect the subjective characteristics of scar tissue. Moreover, the use of contractubex ultraphonophoresis has a more pronounced effect than the use of lidase electrophoresis.

Key words: *pathological scars, treatment of scars, maxillofacial area, clinical symptoms.*

Connection of the publication with planned research works.
The work is a fragment of the SRW “Diagnosis, surgical and medical treatment of patients with injuries, defects and deformations of tissues, inflammatory processes of the maxillofacial area” (state registration number: 0119U102862).

Introduction.

A scar (Cicatrix) is a secondary morphological element of the skin, which is a dense formation that contains hyalinized connective tissue rich in collagen fibers. Its formation occurs as a result of the processes of reparative regeneration at the site of the inflammatory process, which occurs as a result of damage to the skin. Scarring is a pathophysiological process of skin regeneration aimed at closing its defect [1, 2].

In some patients, the normal scarring process is disturbed. There are many reasons for this: lack of adequate alignment of the gaping edges, strong tension of the skin adjacent to the wound, hypoxia, burns, suppuration of the wound, peculiarities of the body’s immune system, hereditary predisposition, etc. Some of these factors play a contributing role, but in the process of wound healing, their value can change in any direction, which leads to the emergence of the so-called “vicious circle”. Then, instead of a normal flat scar, a concave or protruding scar is formed, and in rarer cases, a keloid scar. Some authors consider damage to the nerves of the skin to be one of the causal factors of hypertrophic scarring, which, in their opinion, also leads to the disruption of relationships with the central nervous system, which gives “free will” to the growth of the scar [3, 4].

The nature of scar tissue formation is influenced by various factors, such as the depth and area of the formed defect, the state of the body’s reparative processes. The quality of scar tissue formation depends on the way the wound heals. When the wound is healed by primary tension, the scar tissue has a small volume, since young connective tissue fibroblastic strands sprout between the cellular elements already in the first days after the injury [5].

During wound healing by secondary tension, the wound undergoes a phase of granulation tissue formation, which causes a significant increase in volume and a change in color of the newly formed scar. This is caused by the growth of fibrous structures of the connective tissue between the cells of the inflammatory infiltrate (lymphocytes, fibroblasts, macrophages, plasmocides, etc.) and newly formed vessels [6].

The wide distribution of pathological scars among the population creates the need to implement a wide register of methods for their correction. There is no consensus on the timing of treatment. Some researchers do not recommend correction of scars until their final organization (6-12 months after traumatic injury) [7]. Other authors, on the contrary, believe that more optimal treatment results can be obtained up to 1 year [5].

Despite the large number of scientific developments and achievements of modern medicine regarding the establishment of the causes of postoperative pathological skin scars, this topic remains relevant for maxillofacial surgery due to the increase in the frequency of their occurrence and the lack of a single dominant opinion regarding etiology and pathogenesis. Also there are a lot of different types of conservative and surgical treatment of pathological scars [8].

To correct scars that have existed for up to 6 months, methods aimed at normalizing microcirculation and collagen synthesis processes are used. Such a method is ultrasound therapy, which also contributes to a deeper introduction of drugs that contribute to the resorption of scar tissue. This effect of ultrasound is due to the formation of microcavities under the influence of pressure fluctuations, which is associated with a change in the speed of propagation of an ultrasonic wave during its passage through the medium [9].

The aim of the study.

To analyze the result of using of ultraphonophoresis of Contractubex and electrophoresis with lidase in case of conservative treatment of scars of maxillofacial region.

Object and methods of research.

The following study involved 40 patients (23 males and 17 females) of the Department of Maxillofacial Surgery of the Poltava Regional Clinical Hospital with pathological scars of maxillofacial localization. All patients were divided into two clinical groups of 20 people each. The study was conducted in accordance with the principles of the Helsinki Declaration on the Protection of Human Rights, the Council of Europe Convention on Human Rights and Biomedicine, and the provisions of the relevant laws of Ukraine. The study protocol was approved by the Local Ethics Committee for all participants. Written informed consent was obtained from all patients who participated in the study.

Patients of the first clinical group were administered the Contractubex daily using ultraphonophoresis, the drug was applied to the scar area. Mode of administration: intensity not more than 0.2 W/cm^2. The duration of the procedure was 10 minutes daily, the course was 15 procedures.

Patients of the second clinical group underwent electrophoresis with lidase. The drug in the amount of 64 IU was dissolved in 30 ml of acetate buffer. The drug layer was wetted with a solution of lidase. The enzyme was introduced from the anode; the current density was not more than 0.1 mA/cm^2. The duration of the procedure was about 20 minutes daily, the course was 15 procedures.

The nature of the scars was assessed by four clinical signs (type, texture, color and sensitivity), expressed on a 4-point scale.

The main parameters of the clinical assessment of skin scars:

P1 scar type: normotrophic – 0; hypertrophic homogeneous – 1; hypertrophic with nodules – 2; noticeable keloid – 3; pronounced keloid – 4.

P2: scar consistency: normal – 0; small seal – 1; pronounced induration – 2.

PS: scar color: healthy skin – 0; slight erythema – 1; severe erythema – 2.

P4: scar sensitivity: tension – 0; itching – 1; burning – 2; pain – 3.

The higher the score, the less pronounced the total therapeutic effect of the course of treatment. The lower the total scores for four clinical signs, the more pronounced the total therapeutic effect of the treatment.

To determine the significance of statistical differences in quantitative indicators in the formed groups, the Student's t-test was used.

Research results and their discussion.

The result of clinical indicators before and after 15 days of conservative treatment (Contractubex ultraphonophoresis and electrophoresis of lidase) of scars of head and neck are shown in the **table 1**.

When analyzing clinical indicators, it was found that after the treatment, the P1 index decreased in both study groups, but these changes were not significant.

Improving the consistency of the scar, due to a decrease in the level of the P2 indicator, also did not have a statistically significant character, in both clinical groups, using Contractubex ultraphonophoresis and Lidase electrophoresis for 15 days.

Table 1 – Clinical characteristic of pathological scars in case of different types of treatment

Indicator	First group (n=20)		Second group (n=20)	
	Before treatment	After treatment	Before treatment	After treatment
P1	1,7±0,3	1,3±0,3	1,9±0,3	1,7±0,3
P2	1,5±0,2	1,0±0,2	1,6±0,3	1,5±0,3
P3	1,4±0,2	0,7±0,1 *	1,4±0,2	1,2±0,2
P4	1,2±0,2	0,5±0,1 *	1,4±0,2	0,6±0,1 *
Total	5,7±0,2	3,6±0,2 *	6,3±0,3	5,0±0,2 *

Notes: * – p<0.05 compared to the first day of the study.

When analyzing the color of cictrical tissues, a statistically significant decrease in the P3 index by 50% was noted in patients who underwent a course of therapy using Contractubex ultraphonophoresis. The second clinical group was characterized by a decrease in this indicator, which was not statistically significant.

The subjective clinical indicator (scar sensitivity) experienced statistically significant changes in both clinical groups. Namely, a statistically significant decrease of P4 index on 58.3% after treatment in the first clinical group and 50.0% in the second clinical group, respectively. There were no heartburn complaints in both clinical groups after the different types of conservative treatment.

The total scores experienced a statistically significant decrease in both clinical groups. During the 15-days course of therapy with Contractubex ultraphonophoresis, a statistically significant decrease in the total indicator by 36.8% was noted. And in the second clinical group (in case of using Lidasa electrophoresis) it was decrease on 20.6%, respectively. Obtained data describes the positive effect of such methods of conservative treatment of cicatrical tissues. But such level of positive changes of clinical characteristics has light result and can be used for the combine treatment of such pathological conditions of skin.

So, the objective clinical symptoms in case of different types of treatment mainly had no statistically significant changes (except P3 in the first clinical group). But in all groups of patients it was noted significant decrease of subjective symptoms.

Therefore, it should be noted that both methods of conservative treatment of maxillofacial scars have a predominant effect on subjective indicators, such as itching. A more pronounced effect of treatment was noted after the use of ultraphonophoresis of contractubex, in this group of patients there was also a significant improvement in such an objective clinical indicator as the color of the scar. The use of lidase electrophoresis led only to a reliable improvement in subjective feelings (P4), in the absence of such in relation to three objective indicators (P1-P3).

Analysis of **table 2** data showed that during ultraphonophoresis of contractubex, a significant decrease on

Table 2 – Local temperature of pathological scars in case of different types of treatment

Indicator	First group (n=20)		Second group (n=20)	
	Before treatment	After treatment	Before treatment	After treatment
Temperature	28,1±0,3	27,0±0,2 *	27,9±0,3	29,4±0,4 *

Notes: * – p<0.05 compared to the first day of the study.

3.9% in scar temperature occurred, while during lidase electrophoresis, the surface temperature of the scar statistically significant increased on 5.4%.

Perhaps, the main role in the change in scar temperature is not played by the administered drug, but by the method of its delivery into the tissue: during electrophoresis, the temperature increases according to the Joule-Lenz law; ultrasonic action on tissues leads to the transition of gels into ashes, and this transition occurs with heat absorption and developing vasoconstriction, as a result of which the surface temperature decreases [9].

Conclusions.

Thus, the investigated methods of conservative treatment mainly affect the subjective characteristics of scar tissue. Moreover, the use of contractubex ultraphonophoresis has a more pronounced effect than the use of lidase electrophoresis.

Prospects for further research.

The problem of conservative treatment of scars is still very important problem. So, it is necessary to continue the clinical research using other methods of conservative treatment of cicatrical tissues, it is also necessary to combine this data with results of biochemical investigations of scary tissues.

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КЛІНІЧНА ХАРАКТЕРИСТИКА РІЗНИХ ВИДІВ КОНСЕРВАТИВНОГО ЛІКУВАННЯ ПАТОЛОГІЧНИХ РУБЦІВ ГОЛОВИ ТА ШИЇ

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Резюме. У дослідженні брали участь 40 пацієнтів відділення щелепно-лицьової хірургії Полтавської обласної клінічної лікарні ім. М.В. Скліфосовського з патологічними рубцями щелепно-лицьової локалізації. Пацієнти були розподілені на дві клінічні групи по 20 осіб у кожній. Пацієнтам першої групи проводили ультрафонофорез Контрактубексу протягом 15 діб. Для пацієнтів другої групи – електрофорез лідази.

Характер рубців оцінювали за чотирма клінічними ознаками (типу, консистенції, кольору та чутливості), вираженим за 4-бальною шкалою.

Об'єктивна клінічна симптоматика при різних видах лікування в основному не мала статистично значущих змін (крім П3 у першій клінічній групі). При аналізі забарвлення тканин рубця відзначено статистично значуще зниження індексу Р3 на 50% у пацієнтів, яким було проведено курс терапії ультрафонофорезом Контрактубекс. Для другої клінічної групи було характерне зниження цього показника, яке не було статистично достовірним. Суб'єктивний клінічний показник (чутливість рубця) зазнав статистично значущих змін в обох клінічних групах. А саме статистично достовірне зниження індексу Р4 на 58,3% після лікування у першій клінічній групі та на 50,0% у другій клінічній групі відповідно. Після різних видів консервативного лікування в обох клінічних групах скарг на печію не було. Загальні бали зазнали статистично значущого зниження в обох клінічних групах. При 15-денному курсі терапії ультрафонофорезом Контрактубекс відзначено статистично значуще зниження загального показника на 36,8%. А в другій клінічній групі (при застосуванні електрофорезу Лідази) воно зменшилось на 20,6% відповідно. Отримані дані свідчать про позитивний ефект таких методів консервативного лікування рубцевих тканин. Але такий рівень позитивних змін клінічних характеристик має легкий результат і може бути використаний для комплексного лікування таких патологічних станів шкіри.

Таким чином, досліджувані методи консервативного лікування переважно впливають на суб'єктивні характеристики рубцевої тканини. Причому застосування ультрафонофорезу контрактубекс має більш виражений ефект, ніж застосування електрофорезу лідази.

Ключові слова: патологічні рубці, лікування рубців, щелепно-лицева ділянка, клінічні симптоми.

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Abstract. 40 patients of the Department of Maxillofacial Surgery of the Poltava Regional Clinical Hospital with pathological scars of maxillofacial localization. Patients were divided into two clinical groups of 20 people each.

Patients of the first group underwent ultraphonophoresis of Contractubex for 15 days. For patients of the second group – lidase electrophoresis.

The nature of the scars was evaluated according to four clinical signs (type, consistency, color and sensitivity), expressed on a 4-point scale.

The objective clinical symptoms in case of different types of treatment mainly had no statistically significant changes (except P3 in the first clinical group). When analyzing the color of cictrical tissues, a statistically significant decrease in the P3 index by 50% was noted in patients who underwent a course of therapy using Contractubex ultraphonophoresis. The second clinical group was characterized by a decrease in this indicator, which was not statistically significant. The subjective clinical indicator (scar sensitivity) experienced statistically significant changes in both clinical groups. Namely, a statistically significant decrease of P4 index on 58.3% after treatment in the first clinical group and 50.0% in the second clinical group, respectively. There were no heartburn complaints in both clinical groups after the different types of conservative treatment.

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Conflict of interest:
The authors declare no conflict of interest.

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