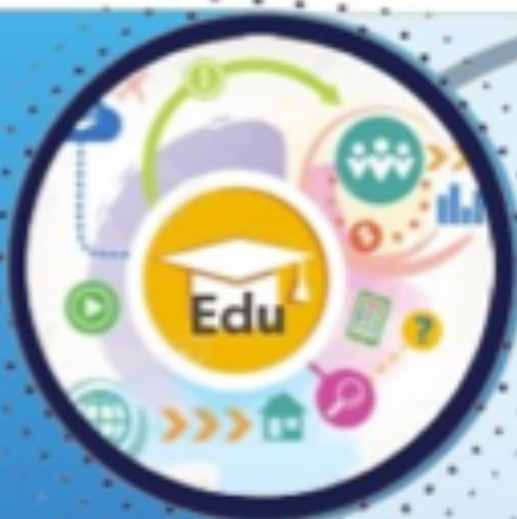


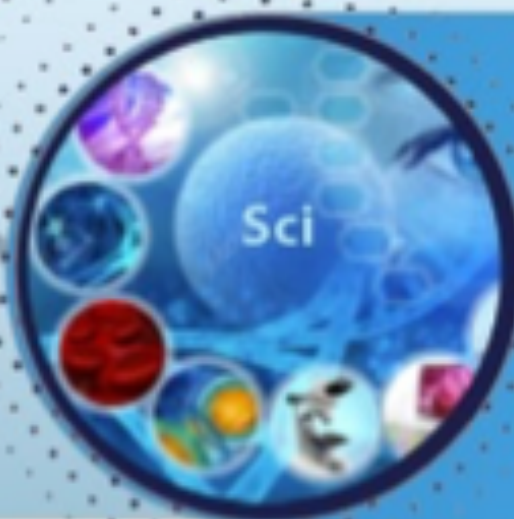


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# Errors and Causes of Ineffectiveness of Primary Operations for Phlegmons of the Face and Neck

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## ABSTRACT

**Background.** To date, surgical intervention on the primary purulent focus remains fundamental in the overall treatment program for purulent surgical patients with any localization of the inflammatory process. However, the operation on the primary purulent focus is not always radical and there may be a need for a second operation.

**Material.** A study of clinical manifestations and the state of homeostasis in 117 patients with phlegmons of the maxillofacial region and neck of odontogenic origin, operated repeatedly, was carried out. The studies were conducted on the clinical basis of the Department of the Maxillofacial Surgery of the Tashkent State Dental Institute.

**Conclusion.** The main reasons for the ineffectiveness of primary operations for phlegmons of the face and neck are errors in nosological and topical diagnostics, the discrepancy between the volume of surgical intervention and the localization and prevalence of the inflammatory process, the nature of the inflammatory reaction and the imbalance of general therapy depending on the form of purulent infection. Indications for repeated surgery are determined by an increase in the intensity and expansion of the range of local and general complaints, a low detoxifying effect of previous surgical intervention, increased signs of a local inflammatory reaction and negative dynamics of paraclinical indicators.

**Keywords:** facial phlegmon, neck phlegmon, mediastinitis, systemic inflammatory reaction syndrome, sepsis

## INTRODUCTION

Despite advances in the study of the problem of purulent surgical infection, the treatment of patients with phlegmons of the face and neck continues to be an urgent task of modern maxillofacial surgery and dentistry [2,4,8,12].

The total number of acute inflammatory processes, including severe forms of diseases, often developing against the background of a systemic inflammatory response and sepsis with severe, life-threatening complications in the form of contact mediastinitis, secondary intracranial inflammatory processes, septic shock, arterial bleeding remains at a high level [1,3,6,13,26].

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Mortality in the development of the disease against the background of sepsis continues to be high [5,10,15,20].

To date, the strategic provisions for the complex treatment of acute purulent surgical diseases, including localization in the face and neck area, have been sufficiently fully developed [7,9,11,14,16,17].

To date, surgical intervention on the primary purulent focus remains fundamental in the overall treatment program for purulent surgical patients with any localization of the inflammatory process [18,19].

However, the operation on the primary purulent focus is not always radical and there may be a need for a second operation.

The problem of repeated operations in purulent soft tissue surgery, abdominal, thoracic, vascular surgery, oncology, etc., is devoted to fundamental works of a monographic nature, dissertation studies and numerous journal articles [22,29,34,37].

At the same time, the section on repeated operations in facial and neck surgery did not receive proper coverage in the periodicals.

## MATERIALS AND METHODS

The study of clinical manifestations and the state of homeostasis in 117 patients with phlegm of the maxillofacial region and neck of odontogenic origin, operated repeatedly. Studies were conducted on the clinical basis of the Department of Maxillofacial Surgery of the Tashkent State Dental Institute.

The vast majority - 86 people (73.5%) were under the age of 60 years inclusive, from 61 and older there were 31 people (26.5%). Males predominated - 70 people, women were 47 (40.2%). Background diseases, among which diseases of the circulatory system and diabetes mellitus prevailed, were established in 32 patients (27.3%). Taking into account the prevalence of the primary inflammatory focus, all 117 patients were divided into three groups (see Table 1).

From the above data it follows that the most significant array (65.0%) is represented by patients with phlegmons within five or more cellular spaces of the maxillofacial region and neck.

Table 2 shows the data reflecting the distribution of patients in accordance with the form of purulent infection.

As can be seen from the data presented in 89 patients (76.0%), the disease proceeded with pronounced manifestations of a general infectious syndrome, and in 16 of them in the most severe form - in the sepsis variant.

Table 1.  
Quantitative characteristics of patients in accordance with the prevalence of the primary purulent focus

Prevalence of primary purulent focus	Number of patients	
	N	%
Phlegmon within 1-2 cellular spaces	14	12
Phlegmon within 3-4 cellular spaces	27	23
Phlegmon within 5 or more cellular areas	76	65
Total:	117	100

Table 2.  
Quantitative characteristics of patients in accordance with the form of purulent infection

Form of purulent infection	Number of patients	
	N	%
Local form of purulent infection	28	24
Systemic inflammatory response syndrome	73	62,4
Sepsis	16	13,6
Total:	117	100

Along with the standard clinical trial (analysis of complaints, anamnesis data, assessment of the general condition and local manifestations of the disease), a complex of special laboratory tests was carried out, the choice of which was determined by the purpose and objectives of the work, the need to obtain operational information in order to monitor the general condition, determine the severity of the disease, develop indications for repeated surgical intervention and objectively monitor the effectiveness of complex treatment in whole.

For these purposes, the Apache II scale, widely tested in general practitioners, was used.

Along with the determination of express indicators of homeostasis, a complex of laboratory biochemical, immunological and microbiological studies was carried out in the relevant units of the laboratory service of the central research laboratory of the Tashkent State Dental Institute in a planned manner.

Express studies (Apache II scale) were performed upon admission of patients to the hospital, the next day after the first and second operation, during the period of stabilization of the clinical manifestations of the disease and before discharge from the hospital after the completion of treatment. Planned laboratory tests were carried

out during the period of acute manifestations of the disease, stabilization and before discharge from the hospital.

Statistical processing of clinical material was carried out using the package of applied statistical programs "Statistika" (Statsoft, version 6). The criterion for the threshold level of statistical significance  $p$  (the probability of erroneously rejecting the null hypothesis) was the value of 0.05. In order to check the differences in the average studied features in the study groups, student's  $t$ -criterion was used. With a value of  $p < 0.05$ , an alternative hypothesis was taken about the existence of differences in average values. The differences in the compared indicators were considered statistically significant with the degree of probability of an alternative hypothesis equal to 95% or more ( $p < 0.05$ ).

Treatment of patients was carried out according to the generally accepted comprehensive program, which provided for the possibility of intensifying therapeutic measures for all major components in accordance with the dynamics of the clinical manifestations of the disease.

## RESULTS

A study of the clinical picture and the state of homeostasis in 117 patients with phlegm of the face and neck with an unfavorable development of the disease, which required a second operation on the primary focus of inflammation, was carried out. Analysis of local and general clinical manifestations of the disease, assessment of express indicators of homeostasis showed that when hospitalized in a hospital, they generally corresponded to the established nosological form and localization of the inflammatory process.

The indicator of the integral assessment of the severity of the patient's condition in accordance with the form of the disease revealed that, in patients with a local form of purulent infection, the total number of points was 5 conventional units, corresponding to the indicators characteristic of the state of stable compensation. In patients with phlegmons developing against the background of a systemic inflammatory response, the total number of points was 14 conventional units, which corresponded to the state of unstable compensation. In patients with phlegmons developing against the background of a systemic inflammatory response, the total number of points was 14 conventional units, which corresponded to the state of unstable compensation. (subcompensation). In patients with sepsis, the total number of points was 27, which corresponded to the upper limit of the indicators of the state of unstable compensation, clearly approach-

ing the boundaries of decompensation indicators of life support systems (29-42 points).

Comprehensive clinical and laboratory studies have shown that the unfavorable course of the disease, predetermining the need for repeated operations, was characterized by well-defined patterns and features. In general, this is a deterioration, a worsening of the course of the disease, judging by the dynamics of local and general complaints, local manifestations, and indicators of the Apache II scale (Table 3).

Table 3.

The frequency of detection and the nature of the dynamics of changes in the main clinical and laboratory parameters in patients with phlegmons of the face and neck in the early postoperative period with adverse development of the disease

Clinical and laboratory criteria	Number of patients	
	N	%
Increased spontaneous pain in surgical intervention	117,0	100,0
The emergence of new characteristics of local spontaneous pain	88,0	75,0
Expansion of the range of pain sensations	82,0	70,0
Strengthening of existing complaints of a general nature	108,0	92,0
Expanding the range of general complaints	94,0	80,0
Increased general complaints in patients with established background pathology	31,0	97,0
Deterioration of the general condition by clinical indicators	108,0	92,0
Negative dynamics of laboratory indicators (Apache II scale in points)	102,0	87,2
Negative dynamics of changes in psycho-emotional reactions.	105,0	90,0

As follows from the data provided, with an unfavorable course of the disease, the first day of the postoperative period is characterized by negative dynamics of the main clinical and laboratory manifestations of the disease. This is reflected in the increasing dynamics and the expanding range of local and general complaints, the assessment of the general condition of patients and the indicators of the Apache II scale.

Analysis of the results of complex clinical and laboratory studies and their changes in the dynamics of the development of the disease and treatment, allowed to for-

ulate a therapeutic and diagnostic algorithm for the study of patients with phlegmons of the face and neck from the prehospital period and at the main stages of the patient's stay in a specialized hospital of a multidisciplinary medical institution.

At the prehospital stage, an assessment of complaints, anamnesis data, the effectiveness of previous treatment, the detection of background pathology, X-ray, special dental examination, assessment of the general condition, nosological and topical diagnostics are carried out. With the established diagnosis of phlegmon - the patient is sent to a specialized hospital.

At the hospital stage in the conditions of the admission department of the hospital, nosological and topical diagnostics are clarified according to clinical data. An extended X-ray examination is performed (radiography of the jaw bones, chest organs, according to the indications, computed tomography of the skull, chest is performed. Indications for these research methods are suspicions of intracranial inflammatory processes and contact mediastinitis. An ultrasound examination is performed. When establishing the background pathological state of the body with signs of sub- or decompensation, specialists are consulted on to the appropriate profile. The volume of laboratory tests is carried out according to the Apache II program, ECG studies, integral assessment of the severity of the disease.

In the preoperative period, it is necessary to monitor hemodynamics and external respiration. An assessment of the behavioral reaction and their dynamics is carried out. The indicators of the Apache II scale are evaluated and the obtained clinical and laboratory data are systematized with the determination of the nature of the inflammatory reaction: a variant of formed or progressive phlegmon, a possible putrefactive-necrotic variant of the development of phlegmon. The form of the disease is established (local or with the manifestation of a systemic inflammatory reaction syndrome with a possible manifestation in the form of sepsis and its clinical variants). The question is solved: determining the composition and volume preoperative preparation, the choice of the method of anesthesia. With an increase in signs of acute respiratory failure (forced position in bed, the inability to maintain a horizontal position for more than 5 minutes, increasing cyanosis of the nasolabial triangle, the frequency of respiratory movements more than 30 times in 1 minute), the question of conducting an emergency tracheostomy is decided.

During the operation, an assessment of soft tissue lesions is performed. The boundaries and depth of the lesion, the type of inflammatory reaction, the statement of the nature of the spread of the inflammatory process - through the cellular spaces or transfascially with the development of necrotizing fasciitis and myositis are determined. An analysis of the criteria for the radicality of surgical intervention is carried out. Clinical identification of the causative agent of infection. Collection of discharge or fragments of soft tissues for bacteriological, cytological and (or) morphological examination. During the period of anesthesia, dynamic monitoring of blood circulation indications and respiratory parameters is performed.

In the postoperative period, a dynamic analysis of local and general complaints, including those caused by background pathology, is carried out. Laboratory study and dynamic evaluation of the Apache II scale and the main indicators of hemodynamics, metabolism and immunity, markers of intoxication (leukocyte index of intoxication, the level of medium-weight molecules), sepsis (procalcitonin level, regular blood cultures for sterility). Clinical control is carried out by assessing the boundaries of edema, infiltrate, wound type, nature of the discharge, timing of wound cleansing, the appearance of granulations, microbiological and cytological control of the course of the wound process. Making changes to the program of complex treatment in accordance with the dynamics of the main clinical and laboratory manifestations of the disease.

As follows from the data presented, the implementation of the treatment and diagnostic algorithm provides for the possibility of objectification in many areas of diagnosis (nosological and topical diagnostics), an integral assessment of the severity of the disease, the determination of the form of purulent infection, the nature of the inflammatory reaction, the effectiveness of preoperative preparation, clarification of the form and boundaries of the spread of the inflammatory reaction according to intraoperative data, multivariate analysis clinical and laboratory indicators reflecting the dynamics of the course of the postoperative period, which, of course, is extremely important in everyday clinical practice.

Analysis of the dynamics of clinical manifestations of the disease and laboratory data from the moment of initial manifestations, the period of admission to the hospital, on the first day after the operation, the results of intraoperative evaluation, made it possible to identify the

main, the reasons that predetermined the need for repeated operations:

- errors in nosological diagnostics (16.2%);
- errors in topical diagnostics (42.5%);
- inconsistency of the primary surgical intervention (36.0%) with the nature (features) of the local inflammatory reaction;
- insufficient balance and intensity of general therapy (76.0%);
- a combination of causes (78.6%).

In general, the phenomenon of a combination of causes that predetermined the unfavorable development of the disease after the primary operation was detected in the vast majority - 92 patients (78.6%). As a rule, these were patients with widespread and progressive phlegmons with a frequent predominance of alteration processes in the local inflammatory reaction and developing against the background of a systemic inflammatory response.

Based on the studies conducted, indications for repeated operations were determined:

- Low detoxifying effect of the operation of opening phlegmon or increasing symptoms in intoxication in the early postoperative period;
- Increasing the intensity and range of local complaints;
- Increased signs of a local inflammatory reaction (expansion of the boundaries of perifocal edema, inflammatory infiltrate, skin hyperemia, increasing restriction and intensification of pain during movements of the lower jaw, etc.);
- Negative dynamics of paraclinical indicators (body temperature, heart rate, indicators of blood pressure, "shock" index and number of respiratory movements).

## DISCUSSION

Preoperative preparation was carried out for all patients operated on again, in accordance with the provisions developed in the clinic [29,33,35,37]. As a rule, three options for preoperative preparation adapted to the form and severity of the disease are used. [21,27,33,34,36]

The frequency of use of individual methods of anesthesia in groups of patients was not unambiguous. Thus, of the patients of the control group, local anesthesia was used in 21.4% and, at the same time, only in 4.2% of patients of the main group. Local anesthesia in combination with neuroleptanalgesia was used in 71.4% of patients of the control and 83.0% of the main group and endotracheal anesthesia in 7.1% and 12.8%, respectively.

Surgical tactics for repeated operations were based on the implementation of two main provisions:

- preoperative forecasting;
- intraoperative evaluation of clinical data.

Preoperative prognosis should contain answers to questions related to the upcoming re-surgical intervention:

- Definition of operational access;
- the sequence of revision of the cellular spaces involved in the inflammatory process;
- technical and technological support for the implementation of the principle of active surgical treatment.

The tactics of the actual surgical intervention, based on the results of intraoperative revision, provide for a consistent and dynamic analysis of local clinical manifestations of the inflammatory reaction - starting from the superficial (skin and fiber) to deeply located layers - fascia, muscles, intermuscular tissue, lymph nodes, salivary glands, etc. One of the tasks is to determine the vastness and depth of tissue damage, the second is to establish the nature of the inflammatory reaction.

The results of the studies predetermined the tactics of surgical treatment and were the basis of the therapeutic and diagnostic algorithm.

The main criteria for assessing the radicality of the operation in patients with phlegmons of the face and neck were formulated.

- guaranteed elimination of the primary odontogenic source of infection.
- the use of accesses that provide an exhaustive revision of all cellular spaces of the face and neck involved in the inflammatory process, the guaranteed absence of unopened purulent foci.
- the revision of the wound should include the determination of the nature of the inflammatory reaction, its boundaries and the extent of the spread of the inflammatory process.
- in patients with manifestations of anaerobic non-clostridial infection, surgical intervention should be carried out with wide exfoliation of the subcutaneous tissue, dissection of fascia and muscle arrays, include mandatory necrotomies and adequate drainage followed by prolonged wound dialysis, in areas of hard-to-reach deep cellular spaces of the face and neck affected by the inflammatory process.

The choice of surgical access should ensure not only the maximum opening of the wound, but also the possibility of full-fledged treatment with staged necrotomy, wound dialysis and the use of the necessary local treat-

ments, taking into account the phases of the wound process

- wide and multiple incisions should not be limited to fears of significant tissue defects. Subsequently, they can be eliminated by plastic surgery.

Stage-by-stage improvement of surgical tactics and the use of criteria for assessing the radicality of operations in the overall complex of therapeutic measures have significantly increased the effectiveness of treatment.

Thus, out of 70 patients in the control group, repeated surgical intervention was exhaustive and radical in 66 (94.3%) patients. In four patients (5.7%), due to the progression of the local inflammatory response, another surgical intervention was performed. At the same time, in all 47 patients (100.0%) of the main group, the second operation was exhaustive.

In 113 patients (96.6%), reopened, a positive dynamics of the clinical manifestations of the disease was established, which was generally quite typical and was reflected in the changing nature of local and general and complaints, the general condition, direction and intensity of psycho-emotional reactions and local manifestations of the disease. homeostasis indicators.

## CONCLUSION

The unfavorable development of the disease in patients with phlegmons of the face and neck after the initial operation is characterized by an increasing intensity and expansion of the range of local and general complaints, an increase in the clinical manifestations of the local inflammatory reaction and a significant increase in the point score on the Apache II scale. at the stages of examination and treatment of patients - on an outpatient basis, the admission department and the maxillofacial hospital with a differentiated choice of clinical and laboratory research methods in accordance with the specific clinical situation.

The main reasons that predetermine the unfavorable course of the disease after the initial operation are errors in the nosological and topical diagnosis, the inadequacy of the surgical intervention performed, the prevalence of the inflammatory process and the nature of the inflammatory reaction, as well as the insufficient balance of the overall complex treatment. Indications for repeated operations in patients with phlegmons of the face and neck are the increasing local manifestations of the disease, the absence or low detoxifying effect of primary surgical intervention, the negative dynamics of the Apache II scale.

Surgical tactics for repeated operations in patients with phlegmons of the face and neck should be focused on establishing the type of inflammatory reaction according to intraoperative data and provide for expanding the range of surgical intervention in purulent-necrotic and, especially, putrefactive-necrotic type of inflammation, conducting wide multiple incisions that provide not only the disclosure of the zone of inflammation, but also the revision of possible ways of spreading infection with a simultaneous the highest possible necrotomy.

The developed therapeutic and diagnostic algorithm of measures made it possible to reduce the percentage of repeated operations (from 11.3% to 6.7%), to qualitatively improve the results of treatment of patients with phlegmons of the face and neck (to reduce the percentage of postoperative complications from 21.4% to 4.3%, the total duration of treatment in the hospital from 15.4±0.8 to 13.5±1.0% of bed-days and the mortality rate from 1.4 to 0%).

**Ethics approval and consent to participate** - All patients gave written informed consent to participate in the study.

**Consent for publication** - The study is valid, and recognition by the organization is not required. The author agrees to open the publication

**Availability of data and material** - Available  
Competing interests - No

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**YUZ VA BO'YINNING FLEGMONLARI UCHUN  
BIRLAMCHI OPERATSIYALARNING XATO VA  
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Toshkent davlat stomatologik instituti**

**ABSTRAKT**

**Dolzarbliigi.** Bugungi kunga qadar yallig'lanish jarayonining har qanday lokalizatsiyasi bilan yiringli jarrohlik bemorlarini umumiy davolash dasturida asosiy yiringli diqqatga sazovor joylarga jarrohlik aralashuvi asos bo'lib qolmoqda. Biroq, asosiy yiringli diqqat markazida operatsiya har doim ham radikal emas va ikkinchi operatsiyaga ehtiyoj bo'lishi mumkin.

**Material.** Takroran operatsiya qilingan maxillofacial mintaqaning flegmonlari va odontogen kelib chiqishi bo'yni bilan og'rigan 117 nafar bemorda klinik ko'rinishlar va homeostaz holatini o'rganish ishlari olib borildi. O'quv ishlari Toshkent davlat stomatologik instituti "Maxillofacial xirurgiya" kafedrasini klinik asosda bajarilgan.

**Xulosa.** Yuz va bo'yin flegmonlari uchun birlamchi operatsiyalarning samarasizligining asosiy sabablari nosologik va mavzuli diagnostikadagi xatolar, jarrohlik aralashuvi hajmi va yallig'lanish jarayonining lokalizatsiyasi va tarqalishi, yallig'lanish reaksiyasining xususiyati va yiringli infeksiya shakliga qarab umumiy terapiyaning muvozanatsizligi. Takroriy operatsiya uchun ko'rsatkichlar mahalliy va umumiy shikoyatlar oralig'ining intensivligi va kengayishi, oldingi jarrohlik aralashuvining detoksifikatsiya qiluvchi ta'sirining pastligi, mahalliy yallig'lanish reaksiyasining alomatlarining ko'payishi va paraklinik ko'rsatkichlarning salbiy dinamikasi bilan belgilanadi.

**Tayanch iboralar:** yuz flegmon, bo'yin flegmon, mediastinit, tizimli yallig'lanish reaksiyasi sindromi, sepsis

**ОШИБКИ И ПРИЧИНЫ  
НЕЭФФЕКТИВНОСТИ ПЕРВИЧНЫХ  
ОПЕРАЦИЙ ПРИ ФЛЕГМОНАХ ЛИЦА И ШЕИ**

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**АБСТРАКТ**

**Актуальность.** До настоящего времени хирургическое вмешательство на первичном гнойном очаге остается основополагающим в общей программе лечения гнойных хирургических больных с любой локализацией воспалительного процесса. Тем не менее, операция на первичном гнойном очаге не всегда оказывается радикальной и может возникать необходимость в повторной операции.

**Материал.** Проведено изучение клинических проявлений и состояние гомеостаза у 117 больных флегмонами челюстно-лицевой области и шеи одонтогенного происхождения, оперированными повторно. Исследования проводились на клинической базе кафедры заболеваний челюстно-лицевой области и травматологии Ташкентского Государственного стоматологического института.

**Заключение.** Основными причинами неэффективности первичных операций при флегмонах лица и шеи являются ошибки в нозологической и топической диагностике, несоответствие объема хирургического вмешательства локализации и распространенности воспалительного процесса, характеру воспалительной реакции и несбалансированность общей терапии в зависимости от формы гнойной инфекции. Показания к повторной операции определяются усилением интенсивности и расширением диапазона местных и общих жалоб, низким детоксицирующим эффектом ранее проведенного хирургического вмешательства, усилением признаков местной воспалительной реакции и негативной динамикой параклинических показателей.

**Ключевые слова:** флегмона лица, флегмона шеи, медиастиниты, синдром системной воспалительной реакции, сепсис