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## ANALYSIS OF THE DISTRIBUTION AND COURSE OF ODONTOGENIC PHLEGMONS OF MAXILLOFACIAL LOCALIZATION

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Despite the rapid development of stomatological science, the problem of the spread of purulent-necrotic diseases remains relevant. An analysis of patient cases histories of the maxillofacial surgery department of Poltava Regional Clinical Hospital named after M.V. Sklifosovsky for the period from 2018 to 2023. Among all patients of the department of maxillofacial surgery, the share of patients with maxillofacial phlegmons in different months ranged from 9 % to 32 %, with average annual indices from 12.0 % to 16.2 %. Depending on the localization, the following were most often affected: submandibular area in 59.8 % of cases; pterygomandibular space – 18.7 % of cases; submasseteric space – 8.8 % of cases; buccal area – 4.2 % of cases; floor of the oral cavity – 20.5 % of cases; phlegmon of the neck – 2.6 % of cases. The COVID-19 pandemic led to a certain increase in the number of such patients and a slight extension of the length of stay in hospital treatment.

**Key words:** odontogenic phlegmon, maxillofacial localization, inflammatory process, intoxication, complex treatment.

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## АНАЛІЗ РОЗПОВСЮДЖЕНОСТІ ТА ПЕРЕБІГУ ОДОНТОГЕННИХ ФЛЕГМОН ЩЕЛЕПНО-ЛИЦЕВОЇ ЛОКАЛІЗАЦІЇ

Незважаючи на стрімкий розвиток стоматологічної науки проблема розповсюдження даних гнійно-некротичних захворювань залишається актуальною. Був проведений аналіз історій хвороб пацієнтів відділення щелепно-лицевої хірургії КП «Полтавська обласна клінічна лікарня ім. М.В. Скліфосовського» Полтавської обласної ради за період з 2018 по 2023 роки. Серед усіх пацієнтів відділення щелепно-лицевої хірургії частка пацієнтів із флегмонами щелепно-лицевої локалізації в різні місяці становила від 9 % до 32 % при середніх річних показниках від 12,0 % до 16,2 %. У залежності від локалізації найчастіше уражалися: піднижньощелепний простір 59,8 % випадків; крилонижньощелепний простір – 18,7 % випадків; субмасетеріальний простір – 8,8 % випадків; щічна ділянка – 4,2 % випадків; дно порожнини рота – 20,5 % випадків; клітковинні простори ший – 2,6% випадків. Пандемія COVID-19 призвела до певного збільшення кількості таких пацієнтів та незначного подовження терміну перебування на стаціонарному лікуванні.

**Ключові слова:** одонтогенна флегмона, щелепно-лицева локалізація, запальний процес, інтоксикація, комплексне лікування.

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Odontogenic phlegmons are acute diffuse purulent inflammation of subcutaneous, intermuscular, interfascial tissues, which most often occur as a result of periodontitis, periostitis, osteomyelitis, difficult eruption of the lower wisdom tooth, suppurative cysts, sialadenitis, gingivo-stomatitis, periodontitis [2, 7]. Despite the rapid development of dental science, the problem of the spread of purulent-necrotic diseases remains relevant. Moreover, it is worth paying attention not only to the course of odontogenic phlegmon of maxillofacial localization, but also to the development of possible complications, such as odontogenic generalization of the purulent-inflammatory process, sepsis and odontogenic mediastinitis [8, 9, 14].

It should be noted that the predominant vectors of the spread of the phlegmonous process by contact at the initial stage of the formation of odontogenic phlegmon are: vertical-lower (into the submandibular tissue space) with consecutive horizontal-frontal (into the submaxillary tissue space). Under conditions of further unilateral spread of the initial phlegmonous process, the horizontal posterior-internal (into the pterygoid-mandibular space) becomes the dominant vector [13]. The course of odontogenic phlegmons of maxillofacial localization can have an unfavorable prognosis for the patient's recovery, work capacity and life. Attention should also be paid to the wide spread of self-medication among such patients and their reluctance to seek medical help, which leads to an even greater complication of the course of these diseases [3, 12].

It is also important to optimize the surgical and medical therapy of patients with this pathology, which is determined by the high risk of further complications and the long time required for the treatment and rehabilitation of such patients [15]. In the development and course of purulent-inflammatory processes of the head and neck, a significant role is played by the concentration of the causative microflora, general

and local non-specific and specific protective factors of the body, the state of various organs and systems of the body, as well as anatomical-topographic features of the tissues of the maxillofacial localization [5, 6, 10, 11].

**The purpose of the study** was to analyze the prevalence, duration of treatment and the development of possible complications among patients with odontogenic phlegmons of maxillofacial localization.

**Materials and methods.** The study was carried out on the base department of maxillofacial surgery of the Poltava Sklifosovsky Regional Clinical Hospital for the period from 2018 to 2022 years. An analysis of inpatient logs (from 2018 to 2022) and patient cases of histories (112 cases in 2018; 134 cases in 2019; 108 cases in 2020; 115 cases in 2021; 186 cases in 2022) of the maxillofacial surgery department have been carried out. In our study, we have considered the data of all patients of the department of maxillofacial surgery aged 17 to 71 years, regardless of gender. We have taken into account the percentage of patients with odontogenic maxillofacial phlegmons from the total number of patients in this department, both monthly and annually, as well as the age and gender of the patients. In our study, we did not include cases of history of patients with purulent-inflammatory skin diseases such as abscessing furuncles and carbuncle, as well as purulent-inflammatory diseases of the jaws, such as osteomyelitis of various genesis. We have taken into account the data of patients regardless of the presence or absence of concomitant pathology.

In our study, we have taken into account the following indices: the age and gender of patients, the number and localization of affected tissue spaces, the length of stay in hospital treatment, the quality of diagnostics at the pre-hospital stage (correspondence of the preliminary diagnosis at the time of hospitalization with the final clinical diagnosis), the development of such complications as sepsis and odontogenic mediastinitis (including the fact that such patients are transferred to intensive care and intensive care department), the performance or absence of secondary suture surgery after purulent wound cleaning. We also have taken into account in our study the treatment that was given to patients with odontogenic phlegmons of the maxillofacial area, including the need of the extraction the "causative" tooth, and carrying out an antibioticogram to optimally determine the sensitivity of microorganisms. We have compared the prevalence of maxillofacial odontogenic phlegmons by season. We also have compared the obtained data in the pre-COVID period and during the period of COVID-19 pandemic.

The research results were processed by the method of variational statistics on a personal computer with the determination of the reliability of differences between the values of the studied indicators, as well as by the method of correlation using the Statistica program package and Excel 2010 spreadsheets.

**Results of the study and their discussion.** Among all patients of the department of maxillofacial surgery of the Poltava Regional Clinical Hospital named after M.V. Sklifosovsky, the share of patients with maxillofacial phlegmons in different months ranged from 9 % to 32 %, with average annual indicators

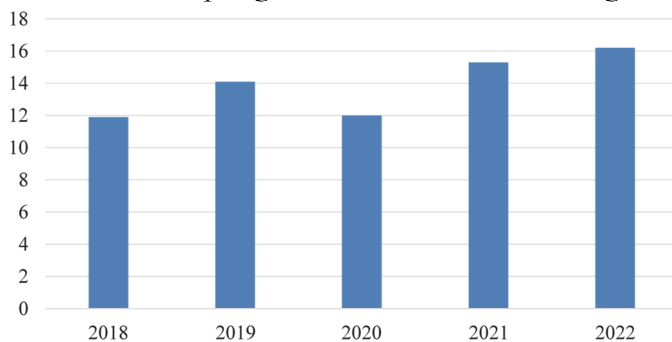


Fig. 1 Prevalence of phlegmon of maxillofacial localization among patients of the department of maxillofacial surgery of Poltava Regional Clinical Hospital named after M.V. Sklifosovsky (%).

from 12.0 % to 16.2 %. No significant dependence of the number of such patients on the season was noted. Among these purulent-inflammatory diseases, 75 % processes had the odontogenic origin. Moreover, no statistically significant difference was found in the proportion of patients with phlegmons of maxillofacial localization, depending on the period of their stay in the hospital. A slightly higher number of such patients were noted during the COVID-19 pandemic, but these data were not statistically significant (Fig. 1).

No gender differences were found among patients with maxillofacial odontogenic phlegmons. The age of the patients ranged from 17 to 71 years. The age of the vast majority of patients with this pathology was from 30 to 45 years old, which reflects the most able-bodied layer of the population, which increases the negative prognosis for the course of odontogenic phlegmons.

When the majority of patients were referred to a maxillofacial hospital, the referring institution's diagnosis corresponded to the final clinical diagnosis, but almost a third of patients were not diagnosed with all affected cellular spaces. Correct diagnosis of phlegmon of the oral floor and neck took place in 85 % of cases. In none of the cases a lesion of the submasseteric space was diagnosed. It should be noted that even a slight inaccuracy in the established diagnosis did not affect the speed of referral of such diseases

in the department of maxillofacial surgery, where they received complex treatment, which had a positive effect on the duration of the purulent-inflammatory process and the risk of developing complications.

The number of cellular spaces that were affected by the purulent-inflammatory process was analyzed, namely: one cellular space – 50.5 % of cases; two cellular spaces – 17.9 % of cases; 3 or more cellular spaces – 31.6 % of cases.

Depending on the localization, the following were most often affected: submandibular space in 59.8 % of cases; pterygomandibular space – 18.7 % of cases; submasseteric space – 8.8 % of cases; buccal area – 4.2 % of cases; oral floor – 20.5 % of cases; cellular spaces of the neck – 2.6 % of cases. The frequency of damage to other topographic and anatomical areas was isolated.

Treatment of all patients was combined and included surgical opening of phlegmon, removal of the causative tooth and medication therapy (antibiotic therapy, anti-inflammatory, desensitizing and, if necessary, detoxification). Opening and drainage of affected tissue spaces was carried out according to standard requirements. Bandages of such patients were carried out at least once a day, for isolated cases, surgical wound dressings were used twice a day. Drainage of a purulent wound was passive.

Due to the peculiarities of the structure of the tissue spaces of the neck, the high hydrophilicity of mediastinal tissues, patients with odontogenic phlegmons of the oral floor and neck undergo wide incisions with revision of the neck spaces on both one and two sides to create conditions for adequate drainage of the wound and treatment solutions of antiseptics.

The most unfavorable course of the disease was mainly observed in patients with odontogenic phlegmons of oral floor and neck. About 7 % of such patients were transferred to intensive care and intensive care units. In 11 patients during the studied period, such a complication as odontogenic mediastinitis was noted, which led to an increase in the length of stay in hospital treatment and had high risks for the life and health of such patients. It should be noted that the mortality rate in patients with odontogenic mediastinitis is higher compared to tonsillogenic mediastinitis. The stay of patients with odontogenic phlegmons of the floor of the mouth and neck in the intensive care and intensive care unit was from 3 to 10 days, after which they continued treatment at the maxillofacial surgery department.

After cleaning the purulent wound, 67.7 % of patients underwent surgery to apply secondary sutures, which is a prevention of the formation of hypertrophic scars and facilitates the rehabilitation of such patients. During the COVID-19 pandemic, this index increased by 72.3 %. Other patients did not consent to this surgical intervention, which caused wound healing by secondary tension and complicated the rehabilitation period of these patients [8].

The mean length of stay in the department of maxillofacial surgery of patients with odontogenic phlegmons was  $8.67 \pm 0.26$  days, and during the pandemic this index increased to  $9.70 \pm 0.34$  days, however, the obtained data were not statistically significant. Perhaps a certain increase in the length of stay of patients in inpatient treatment is due to the fact that they were afraid to visit medical institutions in the pre-hospital period due to the fear of contracting COVID-19.

Thus, it was established that despite the rapid development of dental care for the population, the issue of the occurrence of such complications of an inflammatory nature as abscesses and phlegmons of maxillofacial localization does not lose its relevance. This is due to the fact that there is no decrease in the number of such patients in the department of maxillofacial surgery. The course of purulent-inflammatory processes of maxillofacial localization is influenced by a significant number of factors of both exo- and endogenous origin. The obtained data make it necessary to use new methods of preventing the onset of purulent-inflammatory processes of odontogenic origin and methods aimed at optimizing the course of reparative processes [8, 10, 11].

It should be noted that the fairly high frequency of correspondence between the diagnosis of the referring institution and the clinical diagnosis indicates the appropriate theoretical and clinical training of dentists working in dental clinics and private dental offices, which has a positive effect on the course of diseases. The established data can lead to an improvement in the prognosis for the treatment and rehabilitation of patients with odontogenic phlegmons of maxillofacial localization due to early referral to a maxillofacial surgeon.

A certain increase in the number of patients and the terms of their treatment under the conditions of the COVID-19 pandemic may be due to the longer stay of patients at the pre-hospital stage and the deterioration of the general somatic condition of patients after the transfer of COVID-19. However, the fact that these changes were not statistically significant means that the impact of the pandemic on the course of purulent-inflammatory processes of maxillofacial localization of odontogenic origin was not pronounced [1, 4].

### Conclusion

In recent years, there has been no decrease in the number of patients with maxillofacial odontogenic phlegmons. The COVID-19 pandemic even led to a certain increase in the number of such patients and a slight extension of the length of stay in hospital treatment. In the treatment of patients with odontogenic phlegmons of maxillofacial localization, it is mandatory to remove the “causal” tooth, create adequate access for opening and draining the purulent center, and choosing a drainage method; appointment of antibiotic therapy under the control of an antibioticogram.

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