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**ABSCESSSES AND PHLEGMON
IN ADMAXILLARY TISSUES
OF THE UPPER JAW**

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МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
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КАФЕДРА ЧЕЛЮСТНО-ЛИЦЕВОЙ ХИРУРГИИ

С. Н. КАЧАЛОВ

**АБСЦЕССЫ И ФЛЕГМОНЫ
ОКОЛОЧЕЛЮСТНЫХ ТКАНЕЙ
ВЕРХНЕЙ ЧЕЛЮСТИ**

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IN ADMAXILLARY TISSUES
OF THE UPPER JAW**

Учебно-методическое пособие



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На английском языке

Ответственный за выпуск А. С. Ластовка

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INTRODUCTION

The purpose of the lesson: on the basis of the analysis of clinical and radiological data and the results of the examination by special methods to learn how to diagnose purulent inflammatory processes in the maxillary ocular tissues, to carry out their differential diagnosis, to make a survey plan.

Lesson objectives:

1. Learn how to make a plan of examination of patients with purulent-inflammatory processes in admaxillary tissues of the upper jaw.

2. To learn how to collect complaints, medical history, to detect early clinical symptoms characteristic of abscesses and phlegmon in admaxillary tissues of the upper jaw.

3. Learn to read radiological signs of destructive processes in the bone tissue of the upper jaw, the walls of the maxillary sinus.

4. Learn to assess the severity of purulent inflammation and prevent the possibility of severe complications.

Requirements for the initial level of knowledge. To fully master the topic, you must repeat the material from the following sections:

The morphology of the person:

- anatomy of upper jaw, orbit, temporal bone, skull base;
- blood supply to the head and neck;
- ways of regional lymph flow from the maxillofacial region and neck;
- muscles in the area of the upper jaw;
- cellular-fascial spaces in the area of the upper jaw.

Radiodiagnostics: radiation diagnosis of destructive processes in the upper jaw, in the walls of the maxillary sinus.

Control questions and assignments from related disciplines

1. Anatomical features of upper jaw structure.
2. Which blood vessels supply the upper jaw?
3. Name the pathways of lymph flow from the upper jaw.
4. Does skin color change when edema of soft tissues is present?
5. What general complications can be observed in patients with inflammatory processes in the bones of the facial skeleton?
6. What information do laboratory tests give about the patient with inflammatory process in admaxillary tissues of the upper jaw?
7. What are the main groups divided modern types of surgical interventions, depending on the characteristics of surgical techniques in maxillofacial surgery?
8. List the research methods and tools used to examine a patient with surgical pathology of the maxillofacial region.

An abscess is a limited purulent focus in the form of a cavity, which occurs as a result of purulent melting of submucosal, subcutaneous, intermuscular,

interfacial fiber, lymph nodes, muscle tissue or bone. Formation of abscesses occurs *mainly* in admaxillary tissues. The boundary of the abscess is associated with formation of a wall around it from a layer of granulation tissue, which may end up in development of phlegmonous process.

A phlegmon is a diffuse purulent inflammation of tissue beneath the skin, mucous membrane, between muscles and fascia.

ETIOLOGY AND PATHOGENESIS

A number of factors are essential for development of purulent inflammatory processes of the maxillofacial region and neck, which also should be taken into consideration for correct diagnostics of abscesses and phlegmons in admaxillary tissues of the upper jaw in order to prevent possible more severe complications:

- 80–95 % cases of abscesses and phlegmons in maxillofacial region are caused by odontogenic infection;

- odontogenic purulent-inflammatory processes can occur with development of severe complications in 3–5 days, which may be explained by the nature of causal microflora;

- topographic and anatomical features of the structure of maxillofacial region and neck, presence of lots of cellular spaces, communicating with each other fascial bridges and neurovascular bundles create an opportunity for rapid spread of purulent-inflammatory process by contact;

- presence of a well-developed network of lymphatic and blood vessels can lead to lymphogenic or hematogenic spread of infection;

- the proximity of vital organs and systems of the body (brain, respiratory, vision, hearing, speech, smell) may determine its involvement into purulent inflammation, which exacerbates severity of the disease and can really threaten patient's life.

- intensive blood flow to the tissues of the maxillofacial area and neck when properly conducted complex treatment allows to create optimal conditions for wound healing after relief of the acute effects of inflammatory process (the possibility of imposing secondary sutures early) and speed up the process of rehabilitation of patients.

For the emergence and further development of abscesses and phlegmon of the maxillofacial region and neck, a combination of local and general factors is necessary.

The local factor is aerobic and anaerobic infection (staphylococci, streptococci, enterococci, diplococci, intestinal, gram-positive and gram-negative sticks, Proteus, rarely-Mycoplasma, protozoa from Trichomonas, spirochetes, and fungi of Candida genus).

The role of infection sources may be taken on by:

- foci of odontogenic acute, chronic apical or marginal periodontitis, odontogenic periostitis and osteomyelitis of jaws;
- acute or chronic inflammatory diseases of the oral mucosa, tongue (more often with a necrotic component of inflammation);
- acute or chronic inflammatory processes in the maxillary sinus, nasal cavity;
- inflammatory processes localized in large salivary glands and its ducts;
- inflammatory processes in tonsils, adenoid vegetations of the nasopharynx, regional lymph nodes;
- inflammatory processes of the auricle, external, middle, inner ear (perichondritis, meso- and epitimpanitis);
- boils, carbuncles on face and neck skin;
- external microflora brought together with foreign bodies (in wounds of soft and supporting tissues of maxillofacial region and neck).

Common factors are reduction of immunological protective reactions (cellular and humoral immunity), disorder of cerebral cortex regulation. Concentration of causal microflora plays an important role in purulent-inflammatory processes of head and neck development and course. General and local non-specific and specific protective factors, state of various organs and systems play its role as well as anatomical and topographic features of maxillofacial tissues.

All of the above determine nature of inflammatory response: normergic, hyperergic, hypoergic, anergic. Rapid development of inflammatory process spreading to surrounding tissues and vascular pool with formation of thrombosis, diffuse edema, accompanied by lymphatic vessels and nodes involvement and development of not only extensive local, but also severe general reaction of the body is **hyperergic** reaction, despite timely and rationally conducted treatment.

In another group of patients, the process develops slower. In this case, inflammatory infiltrate involves smaller amount of tissue. General reaction of the organism is expressed in a slight increase in temperature; changes in composition of peripheral blood are adequate. This **normergic** reaction to purulent odontogenic infection and local purulent process can be liquidated easier by timely and adequate treatment. As for some other patients, local purulent disease occurs with poorly expressed local and general reaction. In such patients inflammation is limited only by localized abscess, edema of surrounding tissues is not significant; lymphangitis, lymphadenitis, thrombosis are not observed, the rate of increase is negligible.

Such processes with weakly expressed local and general reaction proceed according to the **hypoergic** type. The purulent process can be located superficially in tissues or can involve deeply laying tissues in process over

a considerable length. This leads to formation of a common intermuscular phlegmon, or spread to the subcutaneous tissue, i.e. cause spilled epifascial phlegmon with detachment and destruction of significant areas of skin. The result of local reaction of a macroorganism to microorganisms penetrated into it is protective barriers development. Firstly, a leukocytic shaft is formed that delimits the focus of infection from the surrounding tissues. Lymphatic vessels and lymphatic nodes are also the same barriers. During the development of tissue reaction around the suppurative focus and multiplication of connective tissue cells, a granulation shaft forms, which reliably separates the purulent focus. With the prolonged existence of a limited purulent process, a dense connective tissue pyogenic membrane is formed from the surrounding granulation shaft, which is a reliable barrier limiting further spread of infection. In presence of highly virulent infections and a weak response of the macroorganism protective barriers react slowly, which often leads to a breakthrough of the infection through the lymphatic system into the blood stream and generalization of infection occurs. Simultaneously with local reaction to the introduced microbes, general reaction of the organism is noted, the degree of which is determined by a number of conditions. The degree of severity of such a reaction depends on the number of bacterial toxins and tissue degradation products that have penetrated the body from the lesion, the body's resistance. Developing intoxication leads to dysfunction of hematopoiesis in the bone marrow, resulting in anemisation come fast and significant changes in the composition of white blood. The main difference between general reaction of the organism to the purulent process from sepsis is that all the symptoms of it sharply weaken or disappear when performing surgical treatment of the purulent focus and creating an adequate outflow for the wound discharge. With sepsis, the symptoms of the inflammatory reaction after that almost do not change. Determination of the degree of General reaction of the organism to the local purulent odontogenic infection is essential for correct assessment of patient's condition, possible prediction of complications, preparation of a comprehensive treatment plan.

Scheme of the indicative basis of actions in the diagnosis of purulent-inflammatory processes of maxillofacial localization in patients taking into account the assessment of the immune system.

To conduct examination of the patient:

A. Clarify complaints: General weakness, lethargy, drowsiness, headache, sleep disturbance, poor appetite, the presence of functional disorders of the organs and systems of the maxillofacial region and their relationship with the dynamics of the inflammatory process of the maxillofacial localization. To clarify the presence of complaints related to respiratory, brain, hearing, vision, liver, spleen and their relationship with the inflammatory process.

B. To collect anamnesis of inflammatory disease: the appearance of the first signs, the development of this disease with an emphasis on the identification of complications, prolonged course and the nature of the temperature reaction of the body, the treatment and its effect, the possible use of immunomodulators and their effectiveness.

C. To collect anamnesis of vitae with the specification migrated and associated chronic pulmonary diseases, upper respiratory tract, liver, kidney, relapsing forms of inflammatory, viral and mycotic diseases (especially in the mouth), long low-grade fever of unknown etiology, lymphadenopathy, courses R-therapy and chemotherapy, the presence of neoplastic processes, migrated surgical interventions and the nature of postoperative wound healing, the presence of previously deferred inflammatory diseases of maxillofacial area and their complications, allergic status, the use of immunosuppressants and glucocorticoids for therapeutic purposes.

D. To find out the nature of work and occupational hazards associated with chemicals and carcinogens, radiation, severe injuries and burns.

E. Identify common and local manifestations of inflammation; conduct a survey of the organs and systems of the patient. If necessary, to involve doctors neurologist, ophthalmologist, otorhinolaryngologist, therapist, hematologist for consultation. Identify inconsistencies in the nature, location, severity of the inflammatory process with the nature of clinical and laboratory manifestations in the patient. On the basis of the received data to carry out differential diagnostics of purulent-inflammatory diseases of adjacent areas.

Additional methods of examination: General blood and urine tests, biochemical blood tests, as the acid-base composition of blood, the study of purulent exudate, laboratory and immunological evaluation of immune status of patients on the basis of immunological laboratory, X-rays (the production of a review of the radiographs of the maxilla and paranasal sinuses, dental radiographs, according to testimony contrast tomography).

Classification:

1. Surface abscesses and phlegmon in admaxillary tissues of the upper jaw:
 - a) abscesses and phlegmon of the infraorbital area;
 - b) abscesses and phlegmon of the buccal area;
 - c) abscesses and phlegmon of the zygomatic area.
2. Deep abscesses and phlegmon of the soft tissues of the upper jaw:
 - a) abscesses and phlegmon of the pterygoid-palatine fossa;
 - b) abscesses and phlegmon of the temporal region;
 - c) abscesses and phlegmon of the infratemporal fossa;
 - d) abscesses and phlegmon of the orbit.

ABSCESSSES AND PHLEGMON OF THE INFRAORBITAL AREA

Borders of the infraorbital area: upper-lower edge of the orbit, lower-alveolar process of the upper jaw, outer-a vertical line drawn along the zygomatic-maxillary suture to the edge of the lower jaw, inner — the edge of the pear-shaped hole.

In the infraorbital area , the following muscles are located: lifting the upper lip; muscle, raising the upper lip and the wing of the nose; small zygomatic muscle; large zygomatic muscle and laughter muscle. Between these muscles, there are loose fat layers that serve as ways in which the inflammatory process spreads. In the infraorbital area due to the sheets of the superficial fascia, covering the muscles of expression, the formation of three layer cellular spaces. In addition to subcutaneous fat, there are two intermuscular cellular spaces: superficial and deep. According to the arrangement of these cellular spaces, surface and deep phlegmons of the infraorbital area are isolated.

Distinguish between abscesses and phlegmon infraorbital area.

Main sources and pathways of infection:

1. Foci of odontogenic infection in the 15, 14, 13, 12 | 22, 23, 24, 25 teeth.
2. Infected wounds to the skin of the infraorbital area.
3. Secondary lesion due to the spread of infection from the cheek area and the lateral part of the nose.

Patient general complaints: fever, weakness, chills, sweating, headaches.

Locally: sharp tearing spontaneous pain in the infraorbital area, radiating to the eye and temple, pain of the causative tooth, changing the configuration of the face, breaking eye opening due to pronounced edema of the lower eyelid (Fig. 1).



Fig. 1. Phlegmon of the infraorbital area (<http://www.zdravosil.ru/xirurgicheskaya-stomatologiya-uchebnik/page/134>)

Objectively: with superficial phlegmon there is a pronounced asymmetry of the face due to infiltration of tissues of the infraorbital area, edema of the eyelids. The skin over the infiltration is hyperemic, glossy, not going to fold. With deep phlegmon of the infraorbital area, a diffuse, moderately pronounced asymmetry of the face is noted due to swelling of the tissues of the infraorbital area, edema of the lower eyelid. Due to swelling of the lower eyelid can be difficult disclosure eye slits. The nasolabial fold is smoothed. The skin over the infiltration hyperemic, tense. Palpation of the infraorbital area is painful. The arch of the mouth in the zone of the so-called “causal tooth” is smoothed by infiltration of tissues, the mucosa is hyperemic. In the oral cavity a causative tooth is often detected, (apical, marginal periodontitis) or the remote, or recently endodontically treated.

Path of infection: buccal region, zygomatic region, infratemporal fossa, the cavity of the orbit.

Complications: the presence of anastomoses between the vessels of the subglacial area and the vascular bed of the orbit, brain, its membranes determines the possibility of spreading purulent inflammatory process in thrombophlebitis of the angular vein into the orbit with the development of thrombosis of the eye vein, phlegmons of retrobulbar tissue, and in the case of propagation in the cavity of the skull-with the development of thrombosis of cavernous sinus, meningitis, encephalitis.

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamines therapy;
- therapy with nonsteroidal anti-inflammatory drugs;
- detoxification therapy;
- antiplatelet therapy.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PST) of the purulent focus.

The technique for conducting PST with a superficial phlegmon of the infraorbital region is performed using an extraoral cut 2.5–3 cm long, which is performed along the nasolabial fold (Fig. 2). Opening of the purulent infiltrate is performed by stratifying the subcutaneous fat with the help of a hemostatic clamp toward the center of the inflammatory infiltrate. The operation is completed by draining the abscess by introducing gauze drains with hypertonic solution into the surgical wound, rubber glove graduates and applying an aseptic dressing.

Techniques for conducting PST with a deep phlegmon of the infraorbital area are performed using intraoral access. The incision of the mucosa and the periosteum (gums) of the alveolar process of the upper jaw is produced from

the transitional fold of the mucosa of the arch of the vestibule from the 2-nd incisor to the 2-nd premolar tooth. Opening of the purulent focus in the area of the “dog fossa” is carried out by detaching the soft tissues (including the periosteum) with a hemostatic clamp or raspator towards the center of the abscess. The operation is completed by draining the abscess by inserting rubber glove graduates into the surgical wound.

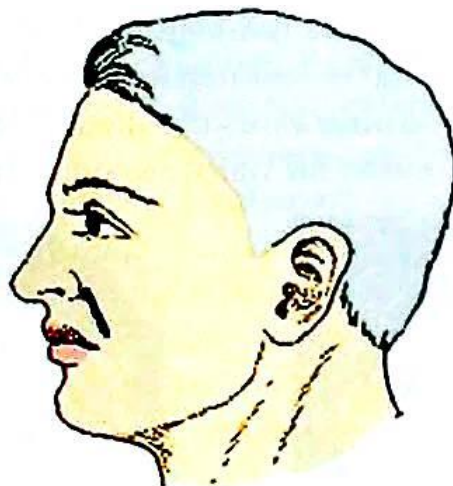


Fig. 2. Incision line with extraoral access, primary surgical treatment of abscess of the infraorbital region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-podglaznichnoy-oblasti>)

ABSCESSSES AND PHLEGMON OF THE BUCCAL AREA

Boundaries of the cheek area: upper-lower edge of the zygomatic bone, lower — lower edge of the lower jaw, rear — anterior edge of the masticatory muscle, anterior-line drawn from the zygomatic-maxillary suture through the corner of the mouth to the lower edge of the lower jaw.

In the buccal region, there are superficial and deep cellular spaces. The superficial cellular space is located over the buccal muscle, between the muscle of laughter and m. platysma from the outside, and the buccal muscle with the buccal aponeurosis covering it and the lower jaw body from the inside.

In addition to loose fiber, space contains the facial artery, vein and fat body of the cheek, which is delimited from the surrounding tissues by its own case, whose appendages penetrate into neighboring areas. The lower part of the fat body of the cheek lies in the buccal region, the middle part — under the zygomatic arch. The upper deep part of the fat body of the cheek extends to the temporal region, with the posterior appendages penetrating the subaponeurotic cellular space, the upper one — to the lower infraorbital fissure and the medial — into the pterygoid fossa. The medial process can enter the intracranial surface of the sphenoid bone through the upper orbital gap and adhere to the wall of the cavernous sinus. This anatomical feature can cause

sinus thrombosis as a result of the spread of the infection without involving the face in the veins process. The fatty lump of the cheek and its fascial case can serve as a conductor of the infection in the buccal region from the parotid-chewing and temporal.

Thus, in the buccal region there are two forms of phlegmon: superficial and deep.

Main sources and pathways of infection:

1. Foci of odontogenic infection in the upper and lower premolars, molars.
2. Infected wounds to the skin and mucous membrane of the cheek.
3. Secondary lesions result from the spread of infection from the infraorbital, parotid-chewing, cheek and infratemporal regions.

Complaints

General: fever, weakness, chills, sweating, headaches.

Local: with phlegmon on sharp tearing spontaneous pains in the buccal region, pains increase with mouth opening and chewing, pain of the causative tooth, changing the configuration of the face (Fig. 3).



Fig. 3. Abscesses and phlegmons of the buccal region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-flegmoni-shechnoy-oblasti>):

a — abscess of the buccal area; *b* — phlegmons of the buccal area; *c* — spontaneously revealed phlegmon buccal area

Objectively: at superficial phlegmon sharply expressed asymmetry of the face due to inflammatory infiltration of tissues of a cheek is defined. The skin is tense, hyperemic. Palpation causes pain. Restriction of opening the mouth.

If a deep abscess is determined by the asymmetry of the face due to swelling of the cheeks. Skin discoloration. When viewed from the oral cavity revealed swelling of the cheek mucosa due to infiltration. Mucosa is hyperemic and tense. Palpation causes pain. Mouth opening is limited.

In the oral cavity a causative tooth is often detected (apical, marginal periodontitis) or the remote, or recently endodontically treated.

Pathways of infection: the subglacial area, the pterygoid-mandibular space, temporal area, parotid-chewing area.

Complications: phlegmon of the orbit, osteomyelitis of the skull base bones, erosive damage to the walls of large vessels, brain abscess, meningitis, thrombophlebitis of the veins of the face, thrombosis of the cavernous sinus.

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamine therapy;
- therapy with nonsteroidal anti-inflammatory drugs.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PST) of the purulent focus.

The technique of PST in the superficial phlegmon of the cheek region is revealed by off-site access by radial incisions from the ear tragus to the outer corner of the eye slit, to the wing of the nose and to the corner of the mouth. and cellulitis located in the lower portion of buccal area, use permit, parallel edge of the lower jaw and below 1–1.5 cm (Fig. 4). Then stupidly go to the place of accumulation of pus. The operation is completed by draining the purulent focus by introducing gauze drainage with a hypertonic solution and applying an aseptic bandage.

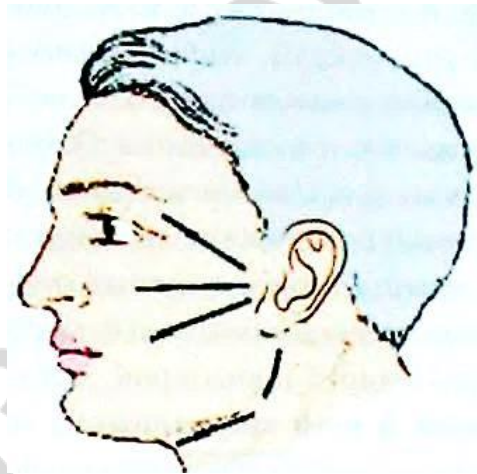


Fig. 4. Incision line with extraoral access, primary surgical treatment of abscess of the buccal region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-flegmoni-schechnoy-oblasti>)

The technique of PST in deep phlegmon of the cheek region is used intraoral access, by dissecting the mucous membrane of the cheek parallel to the projection of the excretory duct of the parotid salivary gland-above or below. Then stupidly go to the place of accumulation of pus. The operation is completed by draining the abscess by introducing rubber glove graduates into the operating wound.

When combined superficial and deep phlegmons produce simultaneously extraoral and intraoral cuts.

ABSCESSSES AND PHLEGMON OF THE ZYGOMATIC AREA

Borders of the region. The skull area corresponds to the location of the zygomatic bone, the edges of which are the boundaries of the region: the upper one is the lower-outer edge of the orbit, the lower one is the lower edge of the zygomatic bone and its temporal appendix, the anterior part is the proctal-maxillary suture, the posterior border corresponds to the temporal-zygomatic suture.

In the subcutaneous tissue of the zygomatic area, the initial fibers of the zygomatic muscle (m., Zygomaticus) can be traced. Sensitive innervation is provided by the branches n. Zygomaticus (from the second branch of the trigeminal nerve), motor — with the same branches of the facial nerve. The blood supply is provided by the cheek-arthritis artery (a. Zygomatocorbitalis), which extends from the transverse artery of the face.

Main sources and pathways of infection:

1. Foci of odontogenic infection in the area 16 15 14 24 25 26 teeth.
2. Infectious inflammatory skin lesions, infected wounds of the zygomatic area.
3. The secondary lesion as a result of the spread of the infectious-inflammatory process from neighboring areas: the infraorbital, buccal, parotid-chewing, temporal regions.

General complaints: high body temperature, headache, chills, weakness.

Local complaints of bursting, throbbing pain in the zygomatic area, facial asymmetry due to tissue infiltration, restriction of mouth opening (Fig. 5).

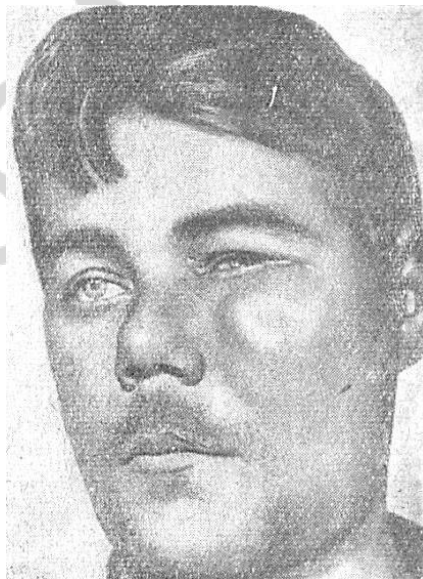


Fig. 5. Abscess of the zygomatic area (<http://stomekspert.ru/flegmona-skulovoy-oblasti.html-0>)

Objectively: the skin above the infiltrate is strained, hyperemic, palpation causes pain. Fluctuation can be determined, and when the inflammatory process spreads to the chewing muscle at the place where it is attached to the malar bone — the restriction of opening the mouth.

Ways of infection: in the future, the infection extends to the infraorbital, buccal, parotid-chewing, temporal areas, the orbit.

Complications: phlegmon orbit, contact osteomyelitis.

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamine therapy;
- therapy with nonsteroidal anti-inflammatory drugs.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PST) of a purulent focus.

The phlegmon of the zygomatic area depends on the localization of the process.

With a subperiosteal abscess of the zygomatic area, the opening of the purulent focus is performed by intraoral access. Under local infiltration anesthesia, under the background of premedication, an incision is made of the mucosa and the periosteum (gingiva) of the alveolar process of the upper jaw along the arch of the mouth of the mouth over 4 5 6 teeth. Peel the periosteum with a raspator in the area of the zygomaalveolar ridge and anterior to it. Stratifying the soft tissues with a hemostatic clamp, move along the anterior annulus of the zygomatic bone toward the center of the inflammatory infiltrate, dissect the abscess, evacuate the pus. Through the wound into the cavity of the abscess, ribbon drainage from glove rubber, polyethylene film or so-called semi-tubular drainage, manufactured by longitudinal dissection into two halves of a rubber (polyvinyl) drainage tube, is introduced.

With abscess of subcutaneous fat of the zygomatic area, operative access from the skin is used. Anesthesia consists of local infiltration anesthesia. The incision of the skin and subcutaneous fatty tissue is carried out along the lower edge of the zygomatic bone and its temporal process.

The autopsy of the purulent foci is carried out by stratification of soft tissues over the malar bone with the help of a hemostatic clamp. After evacuation of pus into the abscess cavity, gauze drainage with hypertonic solution and band drainage from glove rubber are introduced. Apply a cotton-gauze aseptic bandage with hypertonic sodium chloride solution or a solution of antiseptics.

ABSCESSSES AND PHLEGMON OF THE PTERYGOID PALATINE FOSSA

Border of pterygoid palatine fossa: anterior — posterior surface of upper jaw body and orbital process of palatine bone; the posterior is the pterygoid process of the sphenoid bone, the inner one is the vertical plate of the palatine bone, the upper one is the lower surface of the body and the base of the large wing of the base bone, the large wing of the sphenoid bone (Fig. 6).

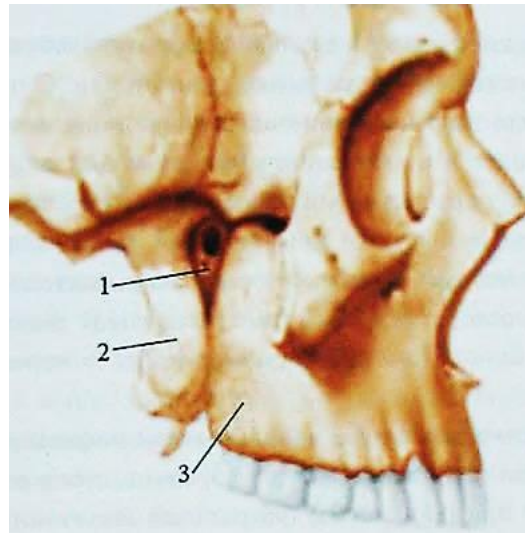


Fig. 6. Topography of the pterygoid palatine fossa:

1 — pterygoid fossa; 2 — pterygoid process of the sphenoid bone; 3 — tubercle of the upper jaw (from Sinelnikov R. D. Atlas of Human Anatomy. Moskva, 1996. T. 1 with changes.

<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-flegmoni-krilonebnoy-i-podvisochnoy-yamok>)

The projection of the pterygopalatine fossa to the skin is an equilateral triangle, the base of which is the middle third of the line drawn along the upper edge of the zygomatic arch from the upper edge of the tragus of the ear to the outer corner of the eye. From this line, at the 60 angle, two lateral sides are built (Fig. 7).

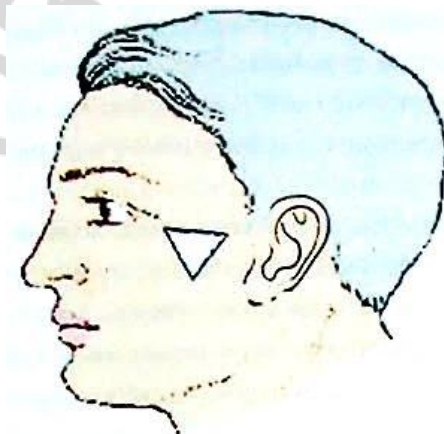


Fig. 7. Projection of the pterygoid palatine fossa on the skin (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-flegmoni-krilonebnoy-i-podvisochnoy-yamok>)

The pterygo-palatine fossa lies in the depth between the maxilla and the pterygoid process. With the infratemporal fossa, the pterygoid fossa is joined by a sickle-shaped fissure. The pterygoid fossa communicates with the orbit through the lower orbital fissure; with a nasal cavity — through a wedge-palatal opening, which is located on the medial wall of the pterygoid fossa; with the oral cavity through the large palatal canal, which opens with large and small palatine orifices; with the middle cranial fossa — through a round hole; with the outer base of the skull — through the pterygoid canal.

Main sources and pathways of infection:

1. Foci of odontogenic infection in the region of large molars of the upper jaw 16, 17, 18, 26, 27, 28.

2. Infection during tuberal anesthesia.

3. The secondary lesion as a result of the spread of infection along the length from the pterygo-jaw space, from the temporal, buccal, parotid-chewing areas.

Complaints:

– general: high body temperature 39–40 degrees, chills, sweating, weakness, headache, pain in muscles, joints, lack of appetite;

– locally: intense tearing spontaneous pain in the upper jaw region radiating into the eye and temporal region, limiting mouth opening, limiting eye opening, swelling in the cheek and temple area (Fig. 8).



Fig. 8. Phlegmon of the pterygoid palatine fossa (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-flegmoni-krilonebnoy-i-podvisochnoy-yamok>)

Objectively: the face is asymmetric due to the moderately pronounced swelling of the tissues of the lower eyelid.

The hyperemia of the mucous membrane of the vestibule of the mouth is determined. When palpation, infiltration is noted in the posterior part of the arch

of the vestibule of the mouth behind the tubercle of the upper jaw, sharply painful. Opening the mouth moderately limited. In the oral cavity, the causative tooth, (apical, marginal periodontitis), or previously removed, or recently endodontically treated, is often determined.

Appearance of the patient with a phlegmon of the pterygopalatine fossa.

Ways of spread of infection: scales of the temporal bone, membranes of the brain, brain; an orbit, a sinus of a dura mater, a brain; pterygoid-mandibular space, pterypharyngeal space, anterior mediastinum.

Complications: phlegmon of the orbit, osteomyelitis of the skull base, brain abscess, meningitis, thrombophlebitis of the veins of the face, thrombosis of the cavernous sinus, mediastinitis, sepsis

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamine therapy;
- therapy with nonsteroidal anti-inflammatory drugs;
- detoxification therapy;
- antiplatelet therapy.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PST) of a purulent focus.

The technique of PST with isolated defeat of the pterygopalatine fossa utilizes the intraoral cut in the upper vestibule of the mouth slightly below the transitional fold of the mucosa at the level of the last two molars.

Then the upper edges of the wound are peeled off from the upper jawbone and the curved clamp bluntly passes behind the tubercle of the upper jaw into the pterygoid-palatine fossa to the place of accumulation of pus. The operation is terminated by draining the abscess by inserting tubular PVC drainage and rubber glove graduates through the surgical wound in the mouth.

The phlegmon of the crenellated fossa is usually combined with the lesion of the cellular spaces of adjacent anatomical regions. In such cases, drainage of the moving cellular space is combined with the operational accesses used to open the phlegmon of neighboring interested areas, that is, external sections.

ABSCESSSES AND PHLEGMONS OF THE TEMPORAL REGION

Borders of the temporal region: upper and posterior — temporal line; lower — a transverse comb of the base bone; internal — temporal area, formed by the temporal, parietal and basic bones; outer — zygomatic arch.

In the temporal region there is a superficial and intrinsic temporal fascia. The intrinsic temporal fascia begins from the temporal line on the covering skull of the skull and covers the temporal muscle. It splits twice: the superficial leaf is

attached to the outer leaf, and the inner leaf is attached to the inner surface of the zygomatic arch. Between the sheets above the zygomatic arch, an interaponeurotic space is formed, filled with fatty tissue. Despite the considerable density of the temporal fascia, the contraction of the temporal muscle is noticeable when chewing.

The abscess and phlegmon of the temporal region occur again during the spread of odontogenic infection from the buccal and parotid-chewing areas, the pterygo-mandibular and perigid area, as well as from the pterygoal fossa. Abscess of the temporal region is rare, phlegmon more often. Clinically, the following phlegmon forms are distinguished in the temporal region:

1. Superficial.
2. Interaponeurotic.
3. Subaponeurotic.
4. Deep.
5. Diffuse.

SUPERFICIAL ABSCESS, PHLEGMON OF TEMPORAL REGION

The phlegmon of the subcutaneous fat of the temporal region is located between the skin and the superficial temporal fascia (Fig. 9).

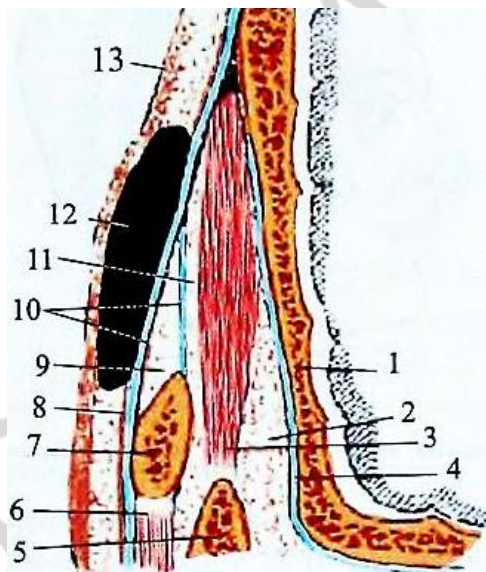


Fig. 9. Scheme of localization of superficial abscess, phlegmon of the temporal region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>):
1 — temporal bone; *2* — musculoskeletal tissue; *3* — temporal muscle; *4* — periosteum; *5* — coronoid process of the lower jaw; *6* — chewing muscle; *7* — zygomatic arch; *8* — superficial fascia; *9* — interaponeurotic fiber; *10* — own fascia; *11* — subaponeurotic fiber; *12* — subcutaneous phlegmon; *13* — the skin

The main sources and ways of infection: purulent skin diseases of the temporal region (furuncles, carbuncles), infected wounds, phlegmon of adjacent areas — the transverse, frontal, zygomatic and parotid-chewing area.

Objectively: there is an asymmetry of the face due to a pronounced swelling of the temporal region, skin hyperemia, inflammatory infiltration has no clear boundaries.

Ways of spread of infection: catheter, frontal, zygomatic, parotid-chewing area.

Technique: the opening of the superficial phlegmon of the temporal region is carried out by radial incision of the skin through the middle of the inflammatory infiltrate throughout its entire length (Fig. 10).

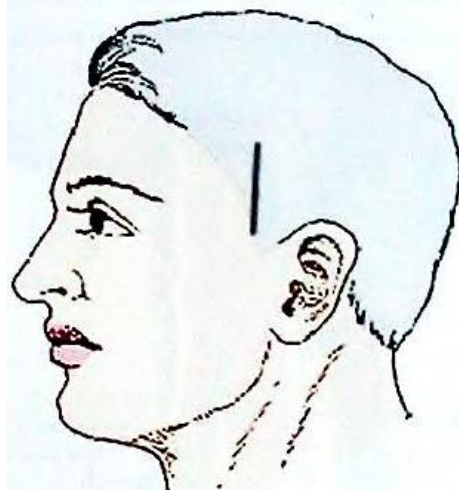


Fig. 10. Scheme of opening of superficial abscess, phlegmon of temporal region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>)

Stratifying the subcutaneous fatty tissue with a clamp, open the cavity of the abscess and evacuate the pus. The operation is completed by draining the abscess by inserting rubber glove graduates into the surgical wound.

INTERAPONEUROTIC ABSCESS, PHLEGMON OF THE TEMPORAL AREA

Interaponeurotic abscess of the temporal region is located between the surface and deep leaves of the temporal fascia (Fig. 11).

The main sources and pathways of infection: osteomyelitis of the malar bone.

Objectively: there is an asymmetry of the face due to swelling of the temporal region, moderate skin hyperemia, an inflammatory infiltrate occupies the lower part of the temporal region and has a clearly delineated border along the upper edge of the zygomatic arch.

Ways of spread of infection: a special feature of the interaperaeurotic space of the temporal region is its relative closure due to the fact that the superficial and deep leaves of the temporal fascia are attached to the outer and inner surfaces of the zygomatic arch. Therefore, with an abscess of the interapearoneurotic space, the inflammatory infiltrate occupies the lower part of the temporal region and has a clearly delineated border along the zygomatic arch.

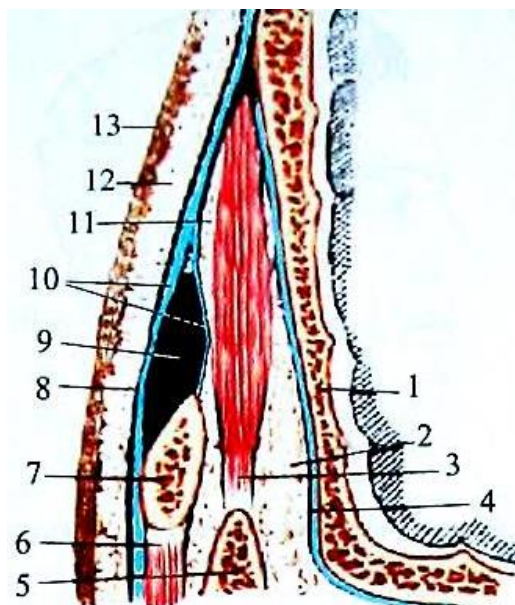


Fig. 11. Scheme of localization of the interaponeurotic abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>):
 1 — temporal bone; 2 — fiber behind and in front of the temporal muscle; 3 — temporal muscle; 4 — periosteum; 5 — coronoid process of the lower jaw; 6 — chewing muscle; 7 — zygomatic arch; 8 — interphononeurotic fiber; 9 — own fascia; 10 — subcutaneous phlegmon; 11 — superficial fascia; 12 — the skin

Technique: the opening of the interaponeurotic abscess of the temporal region is performed by a cut along the upper edge of the zygomatic arch (Fig. 12).

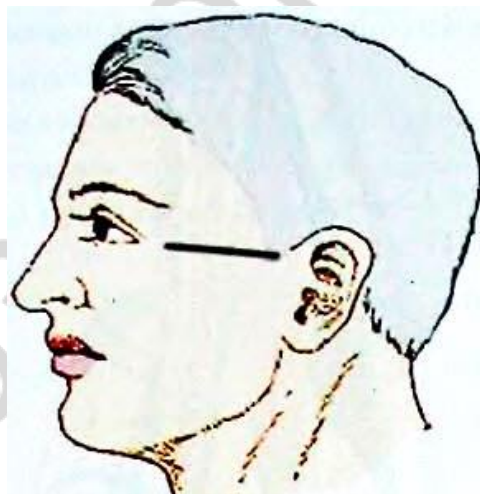


Fig. 12. Scheme of opening of the interaponeurotic abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>)

Using a hemostatic clamp, subcutaneous fat is removed from the outer surface of the temporal aponeurosis by 0.5–1 cm up from the edge of the zygomatic arch. We dissect the surface layer of the temporal aponeurosis at

the attachment point to the temporal arch by 2 cm. Insert the clamp into the interaponeurotic space and exfoliate the cellulose, open the purulent focus, evacuate the pus. The operation is completed by draining the abscess by inserting rubber glove graduates into the surgical wound.

SUBAPONEUROTIC ABSCESS, PHLEGMON OF THE TEMPORAL REGION

Subaponeurotic form of the abscess, phlegmon of the temporal region is located between the deep leaf of the temporal fascia and the temporal muscle (Fig. 13).

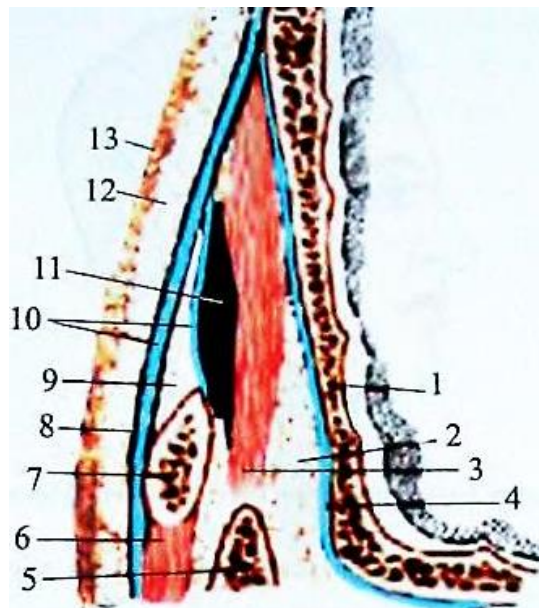


Fig. 13. Scheme of localization of the subaponeurotic abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>): 1 — temporal bone; 2 — fiber behind and in front of the temporal muscle; 3 — temporal muscle; 4 — periosteum; 5 — coronoid process of the lower jaw; 6 — chewing muscle; 7 — zygomatic arch; 8 — interphononeurotic fiber; 9 — own fascia; 10 — subcutaneous phlegmon; 11 — superficial fascia; 12 — the skin

Objectively: there is a moderate asymmetry of the face due to the swelling of the temporal region, collateral edema extending to the upper and lower eyelid, mild skin hyperemia, the inflammatory infiltrate at the top is limited to the temporal region by the attachment line of the temporal aponeurosis, palpation of the infiltrate causes pain, inflammatory contracture of the temporal muscle.

Ways of spreading the infection: into the submasseter space, and from there to the fat body of the cheek through the temporal process of the cheek lump of Bish.

Technique: opening of the subaponeurotic abscess, phlegmon of the temporal region is carried out by radial incision through the middle of the inflammatory infiltrate throughout its extent (Fig. 14).

Having seized and raised the temporal aponeurosis, cut it. Through the incision, a clamp is inserted into the subaponeurotic cellular space, and then the temporal aponeurosis is dissected over the dilated branch jaws throughout the skin wound. Stupidly open the abscess and evacuate the pus. To prevent glueing of the edges of the wound and create favorable conditions for complete drainage of the abscess, an additional dissection of the temporal aponeurosis in the transverse direction is performed. The operation is completed by draining the abscess by inserting rubber glove graduates into the surgical wound.

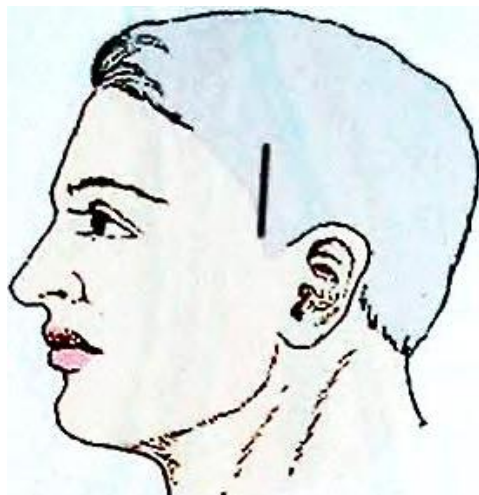


Fig. 14. Scheme of opening of the of the subaponeurotic abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>)

DEEP ABSCESS, PHLEGMON OF THE TEMPORAL AREA

Deep form of abscess, phlegmon of the temporal region is located between the temporal muscle and the periosteum of the temporal bone (Fig. 15).

Objectively: there is a moderate asymmetry of the face due to swelling of the temporal region, a weak hyperemia of the skin, an inflammatory infiltrate is strictly limited at the top of the temporal region by the attachment line of the temporal aponeurosis, palpation of the infiltrate causes pain, and the opening of the mouth is severely limited.

Ways of spreading the infection: the inflammatory process spreads into the infratemporal and pterygoid fossa. The most dangerous is the spread of phlegmon to the base of the skull, and hence to the cranial cavity.

Technique: opening of a deep abscess, phlegmon of the temporal region is carried out by radial incision of the skin through the middle of the site of the greatest fluctuation of the infiltrate throughout its extent (Fig. 16).

Having seized and raised the temporal aponeurosis, cut it. Through the incision, a clamp is inserted into the subaponeurotic cell space, and then the temporal aponeurosis is dissected over the dilated branch jaws throughout the wound. To prevent glueing of the edges of the wound and create favorable

conditions for complete drainage of the abscess, an additional dissection of the temporal aponeurosis in the transverse direction is performed. Using a clamp, the temporal muscle fibers are spread apart from the inflammatory infiltrate, bluntly stripping the tissues with a clamp, penetrating into the axillary cell space, opening the abscess and evacuating the gnom. The operation is completed by draining the abscess by inserting rubber glove graduates into the surgical wound.

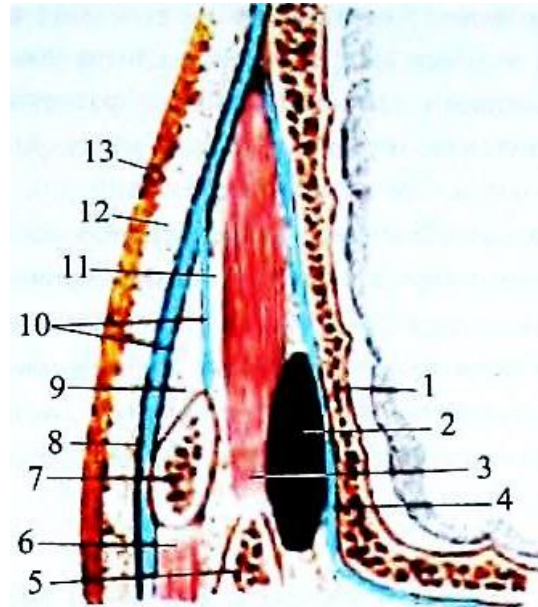


Fig. 15. Scheme of localization of deep abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>): 1 — temporal bone; 2 — fiber behind and in front of the temporal muscle; 3 — temporal muscle; 4 — periosteum; 5 — coronoid process of the lower jaw; 6 — chewing muscle; 7 — zygomatic arch; 8 — interpharyngeal fiber; 9 — own fascia; 10 — subcutaneous phlegmon; 11 — superficial fascia; 12 — the skin

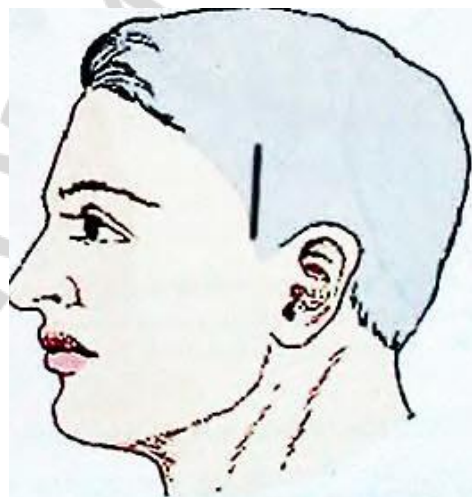


Fig. 16. Scheme opening of the deep abscess, phlegmon of the temporal area (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>)

DIFFUSE PHLEGMON OF THE TEMPORAL AREA

The diffuse phlegmon of the temporal region is a total inflammatory process in which all the above cellular spaces are involved.

Technique: phlegmon opening is carried out by an arcuate incision above the line of attachment of the temporal muscle to the temporal bone and a horizontal cut along the upper edge of the zygomatic arch (Fig. 17).



Fig. 17. Diffuse phlegmon in the temporal region (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-visochnoy-oblasti>):

a — scheme of opening of diffuse phlegmon in the temporal area; *b* — diffuse phlegmon of the temporal area

Hook pull the lower edge of the wound down, cross the temporal aponeurosis and the temporal muscle along the upper temporal line. Flaking the temporal muscle from the place of its attachment to the temporal bone, enter the axillary space, bluntly uncover the purulent focus and evacuate the pus. The operation is completed by draining the abscess by inserting tubular drains into the surgical wound.

ABSCESSSES AND PHLEGMON OF THE INFRATEMPORAL FOSSA

Border of the infratemporal fossa: anterior — hill of upper jaw and lower part of temporal surface of zygomatic bone, posterior — styloid process of temporal bone with muscles leaving from it and anterior surface of condylar process of lower jaw; external — the inner surface of the mandible, the inner — the outer plate of the pterygoid process of the sphenoid bone, the upper one — the scallop of the large wing of the sphenoid bone (Fig. 18).

From the lower medial side, the pterygoal fossa is bounded by the medial pterygoid muscle, which starts from the pterygoid fossa and attaches to the inner surface of the angle of the lower jaw.

The lateral pterygoid muscle, the maxillary artery, the pterygoid venous plexus and the branches of the mandibular nerve are located in the tracheal fovea of the deep facial region. The subclavial fossa medially communicates with the pterygoid fossa. There are no any anatomical formations that separate these two spaces.

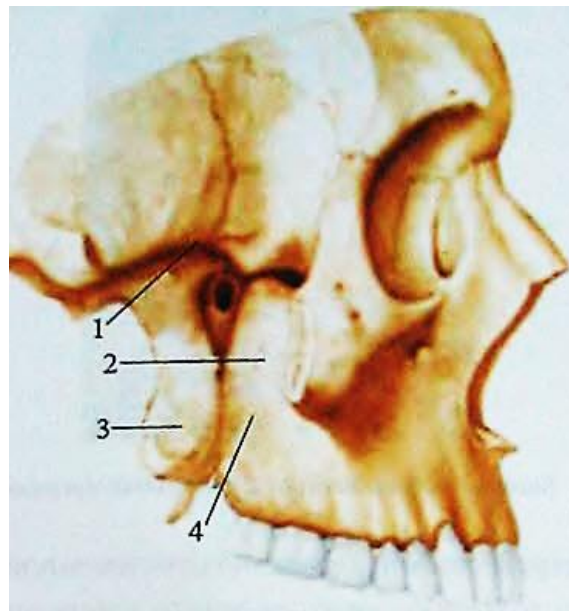


Fig. 18. Topography of the infratemporal fossa:

1 — cutting comb; 2 — infratemporal fossa; 3 — pterygoid process of the sphenoid bone;
4 — tubercle of the upper jaw (from: Sinelnikov R. D. Atlas of human anatomy.

<http://hirstom.ru/abstsessi-i-lelegmoni-golovi-i-shei/abstsessi-flegmoni-krilonebnoy-i-podvisochnoy-yamok>)

Main sources and pathways of infection:

1. Foci of odontogenic infection in the area of 18, 17, 27, 28 teeth,
2. Infection during tuberal anesthesia.
3. Secondary lesion as a result of the spread of infection along the length from the pterygo-jaw space, from the temporal, buccal, parotid-chewing areas.

Complaints:

- general: high body temperature 38 degrees, chills, sweating, weakness, headache, pain in muscles, joints, lack of appetite;
- locally: intense tearing spontaneous pain in the upper jaw region radiating into the eye and the temporal region, restriction of the opening of the mouth, swelling of the buccal and temporal areas.

Objectively: the configuration of the face is changed due to the presence of edema in the temporal region with the presence of a constriction in the area of the zygomatic arch (simtom hourglass), the integuments in color are not changed. Local signs of inflammation are very well revealed when viewed from the oral cavity in the form of a smoothening of the posterior arch of the vestibule of the mouth, hyperemia of the mucous membrane. When palpation is

determined by infiltration behind the tubercle of the upper jaw, sharply painful. The hyperemia of the mucous membrane of the vestibule of the mouth is determined. Opening the mouth is limited. With the phlegmon of the inframammary fossa, in most cases an infiltrate is determined in the region of the transitional fold of the upper-posterior section of the oral cavity; with the phlegmon of the temporal region this symptom is absent. In the oral cavity, the causative tooth, (apical, marginal periodontitis), or previously removed, or recently endodontically treated, is often determined.

Ways of spread of infection: temporal, parotid-chewing areas, pterygo-mandibular and okolohlotochee spaces, pterygo-palatine fossa, eye socket, sinuses of the dura mater, brain.

Complications: phlegmon of the orbit, osteomyelitis of the skull base, brain abscess, meningitis, thrombophlebitis of the veins of the face, thrombosis of the cavernous sinus.

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamine therapy;
- therapy with nonsteroidal anti-inflammatory drugs (NSAIDs);
- detoxification therapy.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PST) of a purulent focus.

The technique of PST with isolated lesion of the pterygoal fossa uses an intraoral cut in the upper vestibule of the mouth slightly below the transitional fold of the mucosa at the level of the last two molars.

Then the upper edges of the wound are peeled off from the upper jawbone and the curved clamp bluntly passes behind the tubercle of the upper jaw into the infratemporal fossa to the place of accumulation of pus. The operation is terminated by draining the abscess by inserting tubular PVC drainage and rubber glove graduates through the surgical wound in the mouth.

The phlegmon of the crenellated fossa is usually combined with the lesion of the cellular spaces of adjacent anatomical regions. In such cases, drainage of the moving cellular space is combined with the operational accesses used to open the phlegmon of neighboring interested areas, that is, external sections.

ABSCESSSES AND PHLEGMON OF THE ORBIT

The boundaries of the orbit region correspond to the walls of the orbit cavity with its contents.

The walls of the orbital cavity: the upper — the orbital surface of the frontal bone and the small wing of the sphenoid bone; lower — the orbital

surface of the upper jaw, the outer one — the malar bone and the large wing of the sphenoid bone, the inner one — the orbital plate of the latticed bone and the lacrimal bone. The lower incision gap connects the orbit with the pterygoid and inframaxillary fossa between each other.



Fig. 19. Phlegmon of the orbit (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-oblasti-glaznitsi>)

The entrance to the orbit cavity is represented by a dense fascia called the orbital septum (*septum orbitale*). This fascial plate on one side is fixed to the periosteum of the bones restricting the entrance to the orbit, and on the other hand to the cartilages of the eyelids. Proceeding from this, the orbital septum divides the orbital region into two parts — a superficial one, or mark the eyelid and the deep or proper orbital area, where the eyeball, vessels, muscles, nerves and fatty tissue are located. The eyeball is surrounded by a dense connective tissue capsule, on top of which is the fat body of the orbit. This fatty body of the orbit fills the space between the eyeball and the bone walls of the orbit, facilitating the ease of movement of the eyeball as a kind of spherical joint. Behind it, there is a deep cell space (*retro bulbar fiber*), which is a large accumulation of fat cells covering the vessels and nerves passing here.

The main sources of infection and ways of its penetration:

1. Phlegmon superficial cellular space occurs when infected wounds of the skin of the eyelids, sebaceous glands, festering with hematoma, etc.

2. Phlegmon deep — in the presence of foci of odontogenic infection in the canine region and 15, 14, 13, 23, 24, 25 teeth.

3. Thrombophlebitis of the angular vein, as well as in frontitis, etmoiditis, etc.

4. The secondary lesion as a result of the spread of pus from the maxillary sinus, trellised bone, infraorbital, buccal, transverse and pterygoid pits.

General complaints: high body temperature 39–40 degrees, chills, sweating, weakness, headache, pain in muscles, joints, lack of appetite.

Locally: intense tearing spontaneous pain in the eyeball, severe restriction or inability to open the eye, impaired vision.

Objectively: there is edema of the eyelids and conjunctiva of the eyeball, exophthalmos. Hyperemia of the eyelid skin. The glottis is narrowed, the movement of the eyeball is limited. The pressure on the eyeball causes pain. Vision is impaired (diplopia) (Fig. 20).

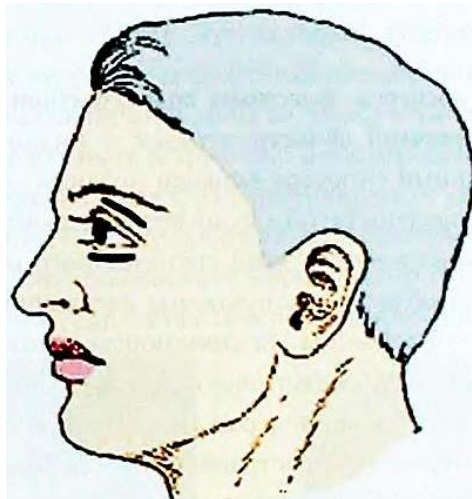


Fig. 20. Scheme opening of the phlegmon of the orbita (<http://hirstom.ru/abstsessi-i-flegmoni-golovi-i-shei/abstsessi-i-flegmoni-oblasti-glaznitsi>)

Ways of spread of infection: venous sinuses of the dura mater, metamorphosis and pterygoid fossa, brain envelopes, brain, corneas of the eye.

Complications: brain abscess, meningitis, cavernous sinus thrombosis, sepsis, optic nerve atrophy, blindness

Treatment:

1. General: complex anti-inflammatory therapy:

- antibacterial therapy;
- antihistamine therapy;
- therapy with nonsteroidal anti-inflammatory drugs (NSAIDs);
- detoxification therapy;
- antiplatelet therapy.

2. Local:

A. Removal of the causative tooth.

B. Primary surgical treatment (PCO) of a purulent focus.

Technique of PCO when opening a superficial abscess in the upper eyelid area is cut through the center of the infiltration flux in the region of the uppermost orbit of the orbit. When the infiltration is localized in the lower eyelid region, incisions are made along the lower-outer edge of the orbit, deviating 0.5 cm from it in one case downwards, and in the other, upwards (Fig. 20).

When using the upper cut for opening the deep phlegm of the orbit in the upper eyelid, a detachment of the lower edge of the wound from the periosteum is performed. An orbital septum is located in the place of attachment to the upper or lower edges of the orbit. Autopsy of the abscess is made by stratifying the fiber of the upper orbit and then using a hemostatic clamp pass over the eyeball, focusing on the osseous bone walls.

The technique of intraoral access with the phlegmon of the orbit: operative withdrawal through the maxillary sinus by trepanation of the bottom wall of the orbit. This access makes it possible to pass into the lower, lateral and distal orbital divisions and is advisable in the primary lesion of the maxillary sinus. Sometimes both cuts are carried out — by external access and through the maxillary sinus, creating a better outflow of exudate.

CONTROL QUESTIONS ON THE TOPIC OF THE LESSON

1. What are the main sources of infection of the temporal region?
 - a) odontogenic infection in the region of 18, 17, 27, 28 teeth;
 - b) odontogenic infection in the region of 14, 15, 24, 25 teeth;
 - c) secondary damage as a result of the spread of the inflammatory process from the pterygoal fossa;
 - d) infectious and inflammatory skin lesions, infected wounds of the temporal region.
2. Highlight the local signs of the development of the inflammatory process in the inframaxillary fossa.
 - a) restriction of opening the mouth;
 - b) difficulty breathing;
 - c) painful swallowing;
 - d) swelling of soft tissues below the zygomatic arch;
 - e) swelling of soft tissues above the zygomatic arch.
3. What causes thrombosis of the cavernous sinus with a purulent focus in the infraorbital area?
 - a) purulent sinusitis;
 - b) purulent thrombophlebitis of the angular vein;
 - c) contact osteomyelitis of the upper jaw;
 - d) purulent lymphadenitis.
4. Where can purulent exudate be located with superficial localization of the temporal region abscess?
 - a) between the aponeurosis of the temporal muscle and the bone of the cranial vault;
 - b) between the skin and aponeurosis of the temporal muscle;
 - c) between the external aponeurosis and the temporal muscle.

5. What functions are violated in the phlegmon of the temporal region?
a) chewing; b) swallowing; c) speech; d) breathing;
6. Determine the most likely ways of spreading the purulent-inflammatory process from the metamorphosis and pterygopalatine pits
a) cavity of the eye socket;
b) submandibular region;
c) pterygo-mandibular space;
d) parapharyngeal space space.
7. What are the main sources of infection of the infraorbital area?
a) incisors of the upper jaw;
b) canines and premolars of the upper jaw;
c) again due to spreading from the buccal region.
8. Symptoms of exophthalmos and diplopia are typical for:
a) abscess of the infraorbital region;
b) abscess of the inframaxillary fossa;
c) abscess of retrobulbar fiber;
d) abscess of the buccal region;
e) abscess of the zygomatic area.
9. Chemosis is typical for:
a) abscess of the infraorbital region;
b) abscess of pre-bulb fiber;
c) abscess of retrobulbar fiber;
d) abscess of the buccal region.
10. What are the main sources of infection in the buccal area?
a) molars and premolars of the upper jaw;
b) molars and premolars of the lower jaw;
c) infected wounds of the buccal region;
d) infected wounds of buccal mucosa.
11. What phlegmon is characterized by the restriction of opening the mouth?
a) the infraorbital area;
b) the infratemporal fossa;
c) orbits.
12. Which of the following symptoms are characteristic of the phlegmon of the orbit?
a) pulsating pain in the eyeball area; d) reduction of visual acuity;
b) swelling in the eyelids; e) headache;
c) restriction of mouth opening; f) painful swallowing.

Answers to control questions about the topic of the lesson: 1 — a, c, d.
2 — a, e. 3 — b. 4 — b, c. 5 — a. 6 — a, c, d. 7 — b, c. 8 — c. 9 — b, c.
10 — a, b, c, d. 11 — b. 12 — a, b, d, e.

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