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"EVALUATION AND ANALYSIS OF THE CLINICAL PICTURE OF ABSCESSES AND PHLEGMONS IN CERTAIN AREAS OF THE FACE AND NECK"

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ABSTRACT

Abscesses and phlegmons of the maxillofacial region and neck remain among the most serious infectious-inflammatory conditions encountered in oral and maxillofacial surgery. These diseases are characterized by rapid progression, severe intoxication, diffuse spread through fascial spaces, and the potential development of life-threatening complications such as airway obstruction, mediastinitis, sepsis, and intracranial infections. The purpose of this article is to evaluate and analyze the clinical manifestations, diagnostic approaches, anatomical localization, and treatment outcomes of abscesses and phlegmons occurring in different areas of the face and neck. The article discusses the etiological role of odontogenic infections, microbial flora, anatomical pathways of infection spread, and the importance of early diagnosis. Particular attention is paid to clinical symptoms including swelling, pain, trismus, dysphagia, fever, and respiratory impairment. Modern diagnostic methods such as contrast-enhanced computed tomography, ultrasonography, laboratory inflammatory markers, and microbiological investigations are reviewed. The study also evaluates therapeutic strategies involving surgical drainage, antimicrobial therapy, detoxification, and airway management. Early intervention and multidisciplinary management significantly reduce morbidity and mortality. Understanding the clinical characteristics of infections in various anatomical regions allows clinicians to improve differential diagnosis, optimize treatment planning, and prevent severe complications.

Introduction

Inflammatory purulent diseases of the face and neck represent a major clinical problem in oral and maxillofacial surgery due to their aggressive course and tendency to spread rapidly through anatomical fascial spaces. Abscesses are localized purulent collections surrounded by inflammatory tissue, whereas phlegmons are diffuse

suppurative inflammations without clear boundaries. Odontogenic infections remain the leading cause of deep facial and cervical infections.

The complex anatomical structure of the maxillofacial region facilitates rapid dissemination of infection from dental and periodontal tissues into deeper fascial spaces. Infections originating from mandibular molars frequently involve the submandibular, pterygomandibular, and parapharyngeal spaces, while maxillary infections may spread toward the canine, buccal, and orbital regions.

The clinical significance of these conditions is associated with severe systemic intoxication, airway compromise, septic complications, and prolonged hospitalization. Delayed diagnosis may result in descending mediastinitis, cavernous sinus thrombosis, meningitis, or sepsis.

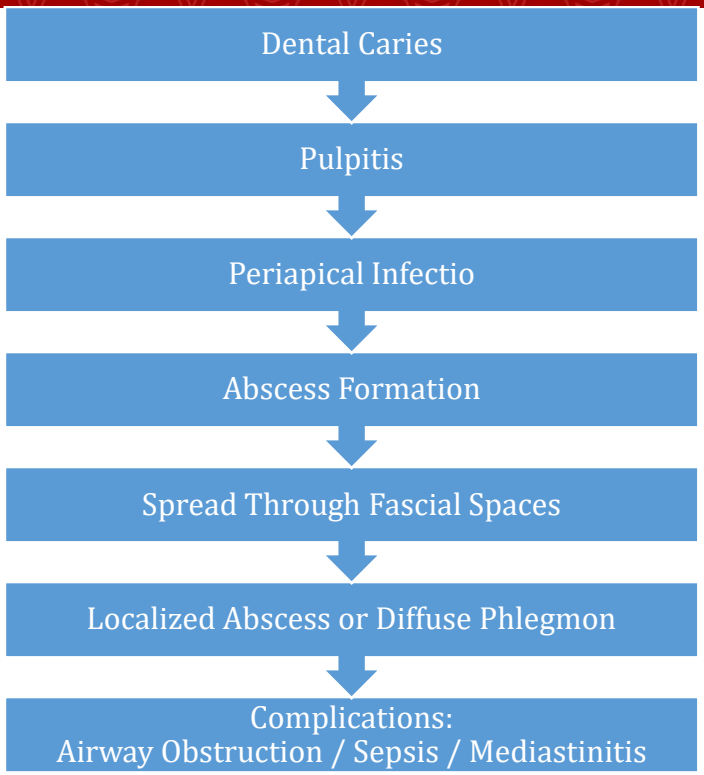
Recent studies demonstrate an increasing incidence of severe odontogenic infections requiring hospitalization and surgical treatment. Therefore, timely recognition of clinical manifestations and adequate therapeutic intervention remain essential in preventing fatal outcomes.

Etiology and pathogenesis

Anaerobic bacteria play a significant role in the development of diffuse phlegmonous infections.

The pathological process generally begins in the periapical region of an infected tooth. Bacterial invasion leads to inflammatory edema, tissue infiltration, vascular dilation, and progressive accumulation of purulent exudate. Depending on the resistance of surrounding tissues and the virulence of microorganisms, the infection may remain localized as an abscess or spread diffusely through connective tissue spaces, resulting in phlegmon formation. The complex anatomical structure of the facial and cervical regions facilitates rapid dissemination of infection into neighboring fascial compartments. Infections of mandibular molars often spread into the submandibular, pterygomandibular, and parapharyngeal spaces, whereas infections associated with maxillary teeth tend to involve the canine, buccal, and infraorbital spaces.

Flowchart 1. Infection spread



Anatomical classification of facial and neck abscesses

Inflammatory lesions of the face and neck may involve superficial or deep anatomical spaces. Superficial spaces include the buccal, canine, infraorbital, and submental regions. Deep infections involve the temporal, infratemporal, pterygomandibular, submandibular, parapharyngeal, and retropharyngeal spaces. Deep neck infections are particularly dangerous because of the possibility of airway obstruction and extension into the mediastinum. Anatomical continuity between fascial layers enables infection to spread rapidly, especially in patients with weakened immune defense or delayed medical treatment.

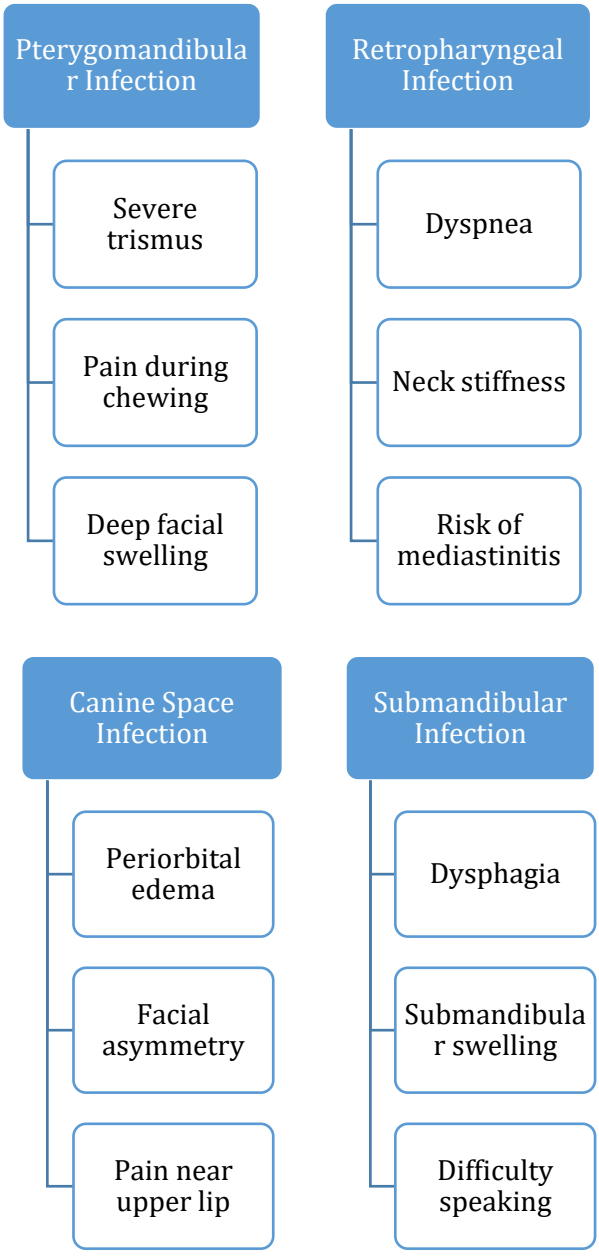
Clinical manifestations and diagnostic methods

The clinical manifestations depend on the localization, severity, and stage of inflammation. Patients commonly present with fever, weakness, headache, tachycardia, malaise, and signs of systemic intoxication. Local symptoms include pain, swelling, redness, tissue tension, and limited function of adjacent structures. In abscesses, the inflammatory process is localized and fluctuation can often be detected during palpation. In phlegmons, the edema is diffuse, dense, and rapidly progressive without clear boundaries.

Infections involving the submandibular and parapharyngeal spaces are frequently accompanied by dysphagia, odynophagia, impaired speech, and respiratory distress. Pterygomandibular involvement often causes severe trismus and inability to open the mouth. Canine space infections are characterized by swelling of the upper lip and periorbital region. Retropharyngeal infections may lead to neck stiffness, dyspnea, and severe airway compromise. The severity of symptoms usually correlates with elevated inflammatory laboratory

markers such as leukocytosis, increased erythrocyte sedimentation rate, and elevated C-reactive protein.

Flowchart 2. Clinical symptoms according to localization



Clinical examination remains one of the most important stages of diagnosis. Inspection and palpation help determine the location, size, and consistency of inflammatory infiltration. Assessment of mouth opening, swallowing, and airway patency is mandatory in severe cases. Percussion and vitality testing of teeth may help identify the odontogenic source of infection. In advanced inflammatory processes, the skin may appear tense, hyperemic, and painful.

Laboratory investigations play an important role in evaluating the severity of infection. Typical findings include leukocytosis with neutrophilia, elevated C-reactive protein levels, increased erythrocyte sedimentation rate, and metabolic disturbances associated with systemic intoxication. Blood cultures and microbiological analysis of purulent

exudate may assist in selecting appropriate antibiotic therapy.

Imaging studies are essential for determining the extent of deep infections. Ultrasonography is useful in identifying superficial fluid collections and guiding puncture procedures. Contrast-enhanced computed tomography is considered the most reliable imaging modality for diagnosing deep facial and cervical abscesses. CT allows accurate visualization of fascial spread, abscess cavity formation, tissue necrosis, and airway narrowing. Magnetic resonance imaging may provide additional information regarding soft tissue involvement and possible intracranial complications.

Flowchart 3. Diagnostic algorithm

Treatment Principles

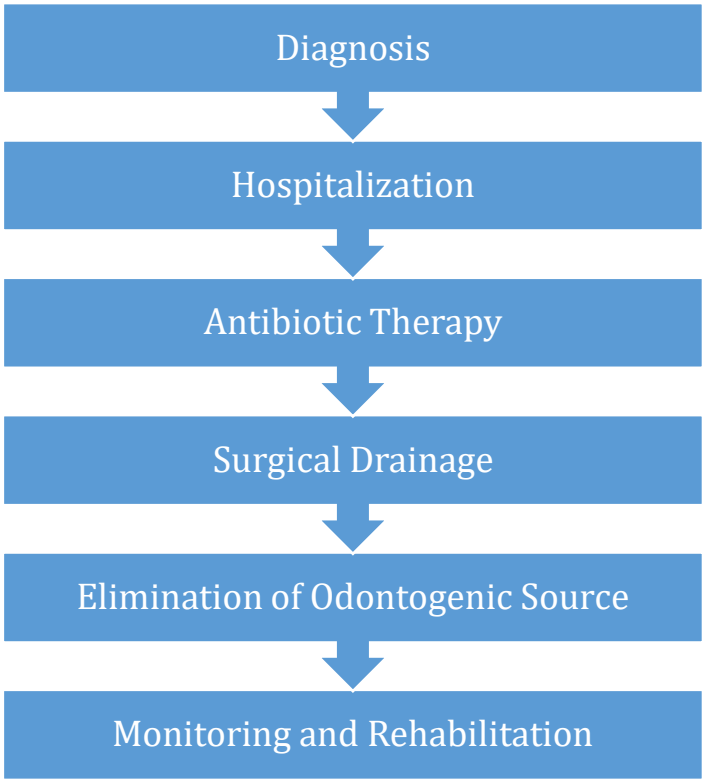
Management of abscesses and phlegmons requires urgent and comprehensive treatment. The primary therapeutic principle is elimination of the infectious source combined with adequate surgical drainage. Incisions are performed according to anatomical localization while preserving vital neurovascular structures. Necrotic tissues are removed and drainage systems are placed to ensure continuous evacuation of purulent exudate.

Antibacterial therapy is initiated immediately after diagnosis. Broad-spectrum antibiotics effective against aerobic and anaerobic microorganisms are commonly used during the initial stage of treatment. Penicillin derivatives combined with metronidazole, clindamycin, and cephalosporins are among the most frequently prescribed agents. Subsequent correction of antimicrobial therapy is based on microbiological sensitivity results.

Supportive therapy includes detoxification measures, fluid replacement, analgesics, anti-inflammatory medications, antipyretics, and nutritional support. In severe

infections involving respiratory compromise, airway stabilization becomes a priority. Endotracheal intubation or tracheostomy may be necessary in patients with extensive neck swelling or Ludwig's angina.

Flowchart 4. Treatment strategy



Conclusion

Abscesses and phlegmons localized in the facial and cervical regions continue to represent one of the most clinically significant groups of infectious-inflammatory diseases in maxillofacial surgery and emergency medicine. Their importance is determined not only by the frequency of occurrence, but also by the rapid progression of the pathological process, the complexity of anatomical structures involved, and the high risk of severe systemic complications. The present analysis demonstrates that odontogenic infections remain the predominant etiological source, particularly infections originating from untreated carious lesions, chronic apical periodontitis, and pericoronitis of impacted mandibular molars.

The study confirms that early recognition of clinical symptoms and accurate assessment of the extent of infection are fundamental for successful management. Timely diagnostic procedures, including laboratory inflammatory markers and modern imaging techniques such as contrast-enhanced computed tomography, significantly improve diagnostic precision and enable identification of deep fascial involvement, abscess cavity formation, airway compression, and secondary complications. Among imaging methods, CT remains the most informative diagnostic modality for evaluating deep cervical and maxillofacial infections.

The analysis also highlights the critical role of comprehensive treatment

strategies. Successful management requires immediate elimination of the infectious source, adequate surgical drainage, aggressive antimicrobial therapy, detoxification measures, and continuous monitoring of airway function. Surgical intervention remains the cornerstone of treatment because conservative therapy alone is insufficient in diffuse phlegmonous processes. Broad-spectrum antibiotics targeting aerobic and anaerobic microorganisms should be administered as early as possible and later adjusted according to microbiological findings.

Another important observation is that delayed treatment substantially increases the likelihood of severe complications, including sepsis, mediastinitis, osteomyelitis, cavernous sinus thrombosis, meningitis, and septic shock. Mortality rates remain significant in patients with advanced deep neck infections, particularly when airway obstruction or descending mediastinitis develops. Therefore, prompt hospitalization and multidisciplinary collaboration between oral surgeons, otolaryngologists, anesthesiologists, radiologists, and intensive care specialists are essential for improving clinical outcomes.

Preventive dentistry also plays a major role in reducing the incidence of facial and cervical abscesses and phlegmons. Early treatment of dental diseases, maintenance of oral hygiene, routine dental examinations, and public health education are effective preventive measures capable of minimizing severe odontogenic infections and reducing the burden on surgical departments.

In summary, abscesses and phlegmons of the face and neck remain complex pathological conditions requiring early diagnosis, accurate anatomical assessment, and aggressive multidisciplinary treatment. Advances in diagnostic imaging, antimicrobial therapy, surgical techniques, and intensive care management have significantly improved prognosis; however, delayed intervention continues to be associated with high morbidity and mortality. Continuous clinical research and improved preventive strategies are necessary to optimize treatment protocols, reduce complications, and enhance the quality of patient care in maxillofacial infectious pathology.

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