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**ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE**

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STUDY OF CLINICAL AND LABORATORY CHARACTERISTICS OF MAXILLOFACIAL DEFECTS IN PATIENTS WITH COVID-19

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✓ *Resume*

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has led to a huge numbers of complications, which can influence the respiratory system of human. Nowadays maxillofacial defects are diagnosed by healthcare system more often then, period until COVID-19 pandemic. This article purposes are research the clinical and laboratory features, which determined with maxillofacial defects in after COVID-19 patients, a comprehensive researches about early diagnosis and effective management of this issue were conducted by our study group.

Key words: maxillofacial defects, covid-19, clinical characteristics, laboratory characteristics, oral health

COVID-19 BILAN OG'RIGAN BEMORLARDA YUZ-JAG' NUQSONLARINING KLINIK VA LABORATORIYA XUSUSIYATLARINI O'RGANISH

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COVID-19 pandemiyasi, SARS-CoV-2 virusi sabab, asoratlarni katta raqamlar olib keldi, qaysi inson nafas olish tizimi ta'sir qilishi mumkin. Hozirgi kunda yuz-jag' nuqsonlari sog'liqni saqlash tizimi tomonidan tez-tez tashxis qilinadi, COVID-19 pandemiyasigacha bo'lgan davr. Ushbu maqolaning maqsadi: covid-19 bemorlaridan keyin yuz-jag' nuqsonlari bilan aniqlangan klinik va laboratoriya xususiyatlarini o'rganish, bizning tadqiqot guruhimiz tomonidan erta tashxis qo'yish va ushbu masalani samarali boshqarish bo'yicha keng qamrovli tadqiqotlar o'tkazildi.

Kalit so'zlar: yuz-jag' nuqsonlari, covid-19, klinik xususiyatlari, laboratoriya xususiyatlari, og'iz bo'shlig'i salomatligi

ИЗУЧЕНИЕ КЛИНИКО-ЛАБОРАТОРНЫХ ХАРАКТЕРИСТИК ДЕФЕКТОВ ЧЕЛЮСТНО-ЛИЦЕВОЙ ОБЛАСТИ У ПАЦИЕНТОВ С COVID-19

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✓ Резюме

Пандемия COVID-19, вызванная вирусом SARS-CoV-2, привела к большому количеству осложнений, которые могут повлиять на дыхательную систему человека. В настоящее время дефекты челюстно-лицевой области часто диагностируются системой здравоохранения в период, предшествующий пандемии COVID-19. Цель этой статьи: изучить клинические и лабораторные особенности, выявленные у пациентов с covid-19 с лицево-челюстными дефектами, наша исследовательская группа провела обширные исследования по ранней диагностике и эффективному лечению этой проблемы.

Ключевые слова: дефекты челюстно-лицевой области, covid-19, клинические особенности, лабораторные характеристики, здоровье полости рта

Relevance

The COVID-19 pandemic has affected significantly global health with over 200 million confirmed cases worldwide. While the primary focus has been on respiratory complications, there is growing evidence of COVID-19's impact on other body systems, including the maxillofacial region. Maxillofacial defects can be result post viral effects, secondary infections or complications from prolonged mechanical ventilation.

Materials and methods

Common clinical symptoms are fever, headache, dyspnea, sore throat, dry cough, abdominal pain, diarrhea, and nausea. On the other hand, the results of various studies related to oral and maxillofacial manifestations in patients with COVID-19 have reported contradictory results in different places, which shows the role of different geographical and individual factors in the occurrence of oral manifestations. In this study, we reviewed oral and maxillofacial complications caused by Covid 19 disease. Originally, olfactory and gustatory disturbances associated with COVID-19 were possible indications of SARS-CoV-2 infection and were sometimes even described as the only symptom of the disease. Oral and olfactory disturbances and facial and neck pain were queried. Common symptoms were headache, olfactory and gustatory disturbances, rhinorrhea, and nasal congestion. The prevalence of rhinorrhea and headache was significantly higher in women. In some isolated cases, mouth sores, red spots (mainly on the palate; in addition to the gums), and mucosal vesicles on the lower lip and cheeks were reported.

However, a numerous patients with maxillofacial defects related to COVID-19 most common symptoms, such as: facial swelling - can be a result of inflammatory responses or secondary bacterial infections. Pain - severe pain in the facial region, particularly in the jaw and sinuses. Ulceration - mucosal ulceration in the oral cavity, which can lead to necrosis if not treated promptly. Fistulas - the formation of abnormal connections between the oral cavity and other facial structures. Osteonecrosis - bone destruction in the maxillofacial region, which can lead to significant deformities.

Laboratory tests in patients with maxillofacial defects due to COVID-19 typically reveal for recognizing inflammatory processes we use CRP (Increasing levels of C-reactive protein), erythrocyte sedimentation rate (ESR) and interleukin-6 (IL-6). Leukocytosis: An elevated white blood cell count, often indicative of secondary bacterial infections. Hyperglycemia: Elevated blood glucose levels, which can be a risk factor for mucormycosis. 4. Coagulation Abnormalities: Elevated D-dimer levels, indicative of a hypercoagulable state, which can contribute to vascular complications.



Figure 1: Necrosis in the maxillofacial region due to secondary mucormycosis in a COVID-19 patient.

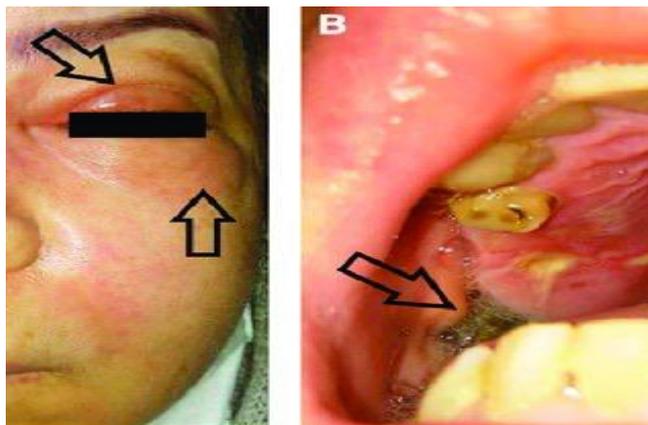


Figure 2: COVID-19-associated maxillofacial defect patient with significant facial tissue oedema.

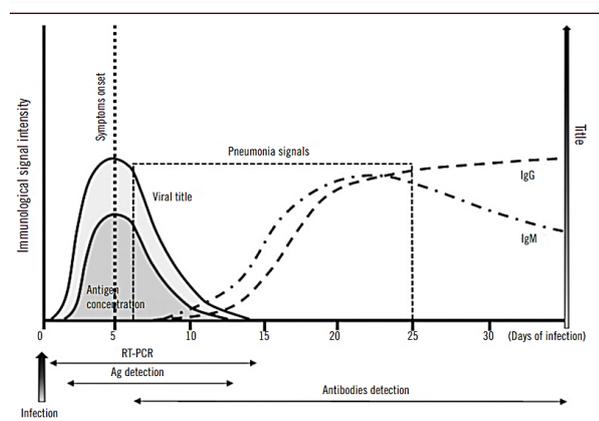


Figure 3: Laboratory results showing elevated inflammatory markers in a COVID-19 patient with maxillofacial defects

Serum interleukin-6 (IL-6) levels increase with the course of SARS, contributing to COVID-19 pathogenesis. In the first week, the condition can lead to pneumonia and respiratory disorders. Inflammatory cytokines such as IL-2, IL-7, IL-10, GCSF, IP-10, MCP-1, MIP-1 α , and TGF α are significantly elevated during this progression (50). Patients in intensive care units (ICU) exhibit elevated plasma levels of cytokines such as IL-2, IL-7, IL-10, GCSF, IP-10, MIP-1 α , and TGF α (5). COVID-19 in ICU patients is characterized by lymphopenia, depletion of CD4 and CD8 lymphocytes, extended prothrombin time (PT), elevated LDH, D-dimer, PCR, transaminases, and increased cytokines. Laboratory abnormalities were identical to those found in patients with SARS-CoV and MERS-CoV infection. The platelet/lymphocyte ratio (PLR) has been linked to hospital stay length and case outcomes (51). Severe cases have led to decreased partial oxygen pressure (PaO₂) and [PaO₂/FiO₂] ratios. Additionally, patients with COVID-19 showed significant increases in monocyte distribution width (MDW), particularly in those with severe clinical symptoms. Prognostic indicators include elevated levels of LDH, AST, ALT, total bilirubin, creatinine, cardiac troponin, D-dimer, PT, PCT, and CRP, while serum albumin levels decrease. Laboratory findings have been linked to COVID-19 severity, including hypoalbuminemia, lymphopenia, high levels of CRP, D-dimer, and LDH, as well as higher viral load. However, these correlations are not consistent, necessitating additional evidence for clinical use. The viral nucleic acid detection test is the primary approach for laboratory diagnosis, and it is critical in the present pandemic caused by the new coronavirus. RT-PCR is regarded the gold standard for viral detection in individuals with clinical symptoms during the acute phase of the disease, and it is used in a variety of screening methods in suspected cases. The pathophysiology of maxillofacial defects in COVID-19 patients is multifactorial: direct viral invasion-SARS-CoV-2 can directly infect and damage endothelial cells, leading to vascular compromise in the maxillofacial region. Secondary Infections - immunocompromised states and prolonged use of corticosteroids can predispose patients to secondary bacterial and fungal infections, such as mucormycosis. Hyperinflammatory Response-a cytokine storm can lead to significant tissue damage and necrosis. Prolonged mechanical ventilation-intubation and mechanical ventilation can cause trauma and pressure necrosis in the maxillofacial area.

Results and discussions

Several case studies have documented maxillofacial defects in COVID-19 patients: a 55-year-old male with severe COVID-19 developed mucormycosis, leading to extensive necrosis of the maxillary bone.

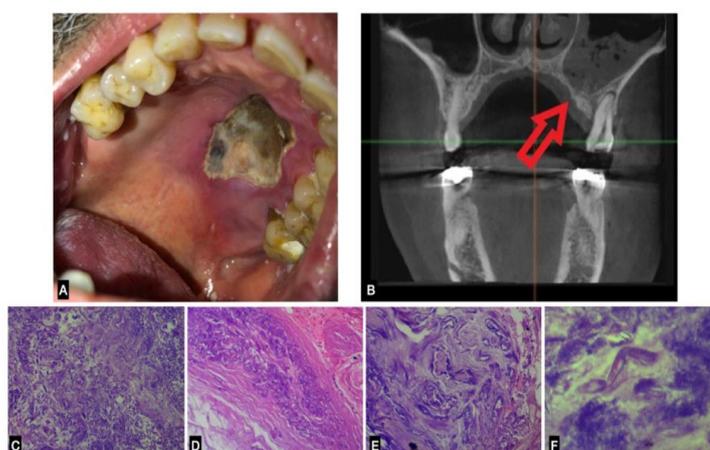


Figure 4: Imaging of maxillary necrosis in Case 1.*

1. ****Case 2:**** A 42-year-old female, post-COVID-19 recovery, presented with osteonecrosis of



the jaw, requiring surgical debridement.



Figure 5: Osteonecrosis of the jaw in Case 2.

3. ****Case 3:**** A 60-year-old male with a history of diabetes and COVID-19 was diagnosed with a secondary bacterial infection causing facial abscesses and fistula formation.



Figure 6: Facial abscess and fistula in Case 3.

The management of maxillofacial defects in COVID-19 patients involves:

1. **Antimicrobial Therapy:** Broad-spectrum antibiotics and antifungals to manage secondary infections.
2. **Surgical Intervention:** Debridement of necrotic tissue and reconstruction of the affected maxillofacial structures.
3. **Supportive Care:** Pain management, nutritional support, and monitoring for further complications.
4. **Preventive Measures:** Early identification and treatment of at-risk patients, including those with diabetes and those on prolonged corticosteroid therapy.
5. **Bone Grafting or Reconstruction:** In cases where the jawbone defect requires reconstruction, bone grafting or other surgical interventions may be considered. This could involve the use of autografts, allografts, or synthetic materials to restore bone structure.
6. **Postoperative Care:** Following any surgical interventions, postoperative care and monitoring are crucial to ensure proper healing and to address any potential complications.
7. **Rehabilitation and Follow-up:** Physical therapy or rehabilitation exercises may be recommended to help restore normal jaw function. Regular follow-up appointments will also be important to monitor progress and address any ongoing issues.

Conclusion

Maxillofacial defects in COVID-19 patients, though rare, represent a significant complication that requires prompt diagnosis and multidisciplinary management. Understanding the clinical and laboratory characteristics of these defects can aid in early detection and improve patient outcomes. Further research is needed to elucidate the underlying mechanisms and to develop targeted treatment strategies.

It's important to emphasize that treatment plans should be individualized based on the patient's specific needs, overall health status, and the nature of the jawbone defect. Additionally, given the potential impact of COVID-19 on various organ systems, close coordination with infectious disease specialists and other relevant healthcare providers is essential.

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