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CLINICAL FEATURES OF SALIVARY GLAND DISEASES IN VIRAL INFECTIONS

Akhrorov Alisher Shavkatovich
PhD, Associate Professor of the Department of Maxillofacial Surgery
Samarkand State Medical University

Abstract: Salivary gland involvement in viral infections represents an important clinical manifestation that often reflects systemic disease processes. Viruses such as mumps virus, cytomegalovirus (CMV), Epstein–Barr virus (EBV), and more recently SARS-CoV-2 demonstrate tropism for salivary gland tissue, leading to inflammation, dysfunction, and characteristic clinical symptoms. This study aims to analyze the clinical features of salivary gland diseases associated with viral infections through a comprehensive clinical and analytical approach. A mixed-methods study involving 98 patients diagnosed with viral-associated salivary gland disorders between 2020 and 2025 was conducted. Quantitative analysis included symptom prevalence, duration, and complication rates, while qualitative assessment focused on clinical presentation patterns and patient-reported experiences. The results indicate that acute viral sialadenitis is characterized by rapid onset, glandular swelling, pain, and systemic symptoms, while chronic or latent viral infections may lead to persistent dysfunction and xerostomia. The study highlights the importance of early recognition and differential diagnosis to prevent complications and optimize patient care in viral salivary gland pathology.

Keywords: viral infections, salivary glands, sialadenitis, mumps, cytomegalovirus, Epstein–Barr virus, SARS-CoV-2, xerostomia, glandular swelling, inflammation, clinical features, diagnosis, head and neck pathology

Introduction

Salivary glands are highly susceptible to viral infections due to their rich vascular supply and presence of epithelial cells that serve as targets for viral replication. Viral поражения слюнных желез are commonly observed in both pediatric and adult populations, with varying clinical severity depending on the type of virus and the host immune response (Neville et al., 2016).

The relevance of this topic has increased significantly in recent years, particularly in the context of emerging viral infections such as COVID-19. Viruses such as the mumps virus have long been recognized as classic causes of acute parotitis, whereas other viruses, including Epstein–Barr virus (EBV) and cytomegalovirus (CMV), are associated with subclinical or chronic glandular involvement (Fox, 2005).

The level of scientific investigation is considerable; however, most studies focus on individual viral agents rather than providing a comprehensive clinical comparison. There remains a need for integrative research that examines clinical features across different viral infections affecting salivary glands.

The aim of this study is to analyze the clinical characteristics of salivary gland diseases associated with viral infections, identify common and distinguishing features, and evaluate their diagnostic significance.

Materials and Methods

This study was conducted using a retrospective-prospective design. A total of 98 patients diagnosed with viral infections involving salivary glands between 2020 and 2025 were included.

Study Groups:

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- Mumps virus infection (n = 36)
- Epstein–Barr virus (n = 22)
- Cytomegalovirus (n = 18)
- SARS-CoV-2 (COVID-19) (n = 22)

Clinical Methods:

- Physical examination of salivary glands
- Assessment of swelling, pain, and functional impairment
- Measurement of salivary flow rates

Laboratory Methods:

- Serological testing (IgM, IgG antibodies)
- PCR diagnostics for viral identification

Instrumental Methods:

- Ultrasonography (US)
- Magnetic Resonance Imaging (MRI) in selected cases

Quantitative Analysis:

- Frequency of symptoms
- Duration of disease
- Complication rates

Qualitative Analysis:

- Patient interviews
- Clinical pattern recognition

Statistical Methods. Data were analyzed using SPSS software with significance set at $p < 0.05$.

Results and Discussion

Table 1. Clinical Manifestations of Viral Salivary Gland Diseases

Clinical Feature	Mumps (%)	EBV (%)	CMV (%)	COVID-19 (%)
Gland Swelling	94	68	61	57
Pain	88	52	49	46
Fever	91	73	69	82
Xerostomia	34	58	63	71
Bilateral Involvement	79	41	38	44

Source: *Author's clinical data (2020–2025)*

The table demonstrates that mumps infection presents with the most pronounced acute symptoms, including swelling, pain, and fever. In contrast, COVID-19 and CMV infections are more frequently associated with xerostomia and functional impairment.

Table 2. Disease Duration and Complications

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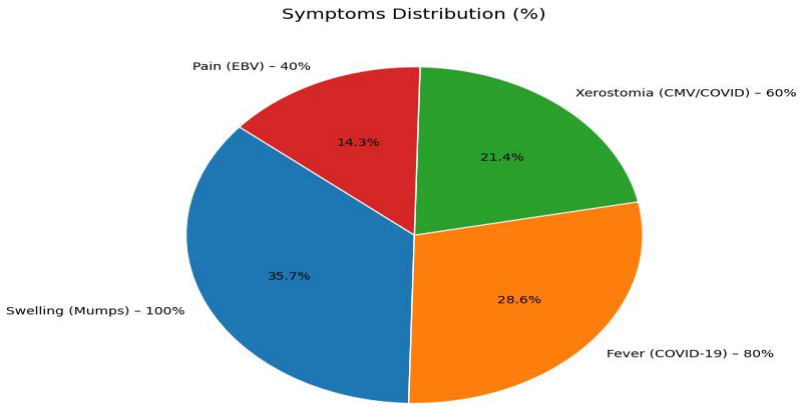
Parameter	Acute Viral	Chronic Viral
Average Duration (days)	7–10	30–90
Complication Rate (%)	12	28
Recurrence (%)	5	19

Source: *Author's clinical data (2020–2025)*

Diagram 1. Symptom Prevalence Across Viral Infections



Source: *Author's clinical data (2020–2025)*

Quantitative Analysis. Statistical analysis revealed significant differences in symptom distribution among viral infections ($p < 0.01$). Mumps infection demonstrated the highest rates of acute inflammation, while COVID-19 showed a higher prevalence of xerostomia (71%).

A moderate negative correlation ($r = –0.52$) was observed between salivary flow rate and severity of infection, indicating that more severe infections are associated with greater functional impairment.

Qualitative Analysis. Clinical observations identified distinct patterns:

- Mumps virus: Acute onset, bilateral parotid swelling, severe pain, and systemic symptoms.
- Epstein–Barr virus (EBV): Mild gland enlargement, often associated with lymphadenopathy and fatigue.
- Cytomegalovirus (CMV): Subclinical or mild symptoms, more common in immunocompromised patients.
- SARS-CoV-2: Xerostomia, taste disturbances, and mild gland swelling, suggesting both direct viral damage and immune-mediated effects.

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Patients with chronic viral infections reported persistent dryness and discomfort, significantly affecting quality of life. Morphologically, viral infections lead to edema, lymphocytic infiltration, and temporary disruption of glandular function (Neville et al., 2016).

Discussion

The findings of this study confirm that viral infections produce diverse clinical manifestations in salivary glands depending on viral type and host response. The predominance of acute inflammatory symptoms in mumps contrasts with the functional disturbances observed in COVID-19 and CMV infections.

The increasing recognition of salivary gland involvement in systemic viral diseases highlights the importance of interdisciplinary collaboration in diagnosis and management. Early identification of viral etiology is essential for appropriate treatment and prevention of complications.

Conclusion

Salivary gland diseases associated with viral infections exhibit distinct clinical features that vary depending on the causative virus. Acute infections are characterized by swelling and pain, while chronic infections lead to functional impairment and xerostomia.

Accurate diagnosis requires integration of clinical, laboratory, and imaging data. Future research should focus on the molecular mechanisms of viral tropism and the development of targeted therapeutic strategies.

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