

# Esophagitis in a Post-Liver Transplant Patient: A Case of Cytomegalovirus and Herpes Simplex Virus-1 Coinfection

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Title Page:

## **Esophagitis in a Post-Liver Transplant Patient: A Case of Cytomegalovirus and Herpes Simplex Virus-1 Coinfection**

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**Taher Jamali:** Substantial contributions to the diagnosis and treatment aspects of the case. Review and interpretation of relevant medical literature. Critical revision of the manuscript for important intellectual content. Final approval of the version to be published.

**Abdullah Sohail MD:** Substantial contributions to the diagnosis and treatment aspects of the case. Review and interpretation of relevant medical literature. Critical revision of the manuscript for important intellectual content. Final approval of the version to be published.

**Allyce Caines:** Oversight of the case report project. Critical contributions to the conceptualization and design of the manuscript. Substantial revisions and intellectual input during the manuscript preparation. Final approval of the version to be published.

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### **Clinical message:**

In post-liver transplant patients with esophagitis, consider CMV and HSV-1 coinfection, particularly with severe symptoms; early diagnosis via EGD and biopsy facilitates timely antiviral treatment and immunosuppression adjustment.

### **Introduction:**

This case report discusses the clinical presentation, diagnosis, and management of a rare coinfection of cytomegalovirus (CMV) and herpes simplex virus-1 (HSV-1) in a post-liver transplant patient, highlighting the clinical challenges and implications of managing esophagitis in immunocompromised individuals.

### **Case History/Examination:**

The patient, a 59-year-old female with a history of primary sclerosing cholangitis, had undergone orthotopic liver transplantation from a CMV seropositive donor six years prior. She presented with a one-week history of

dysphagia. Her immunosuppression regimen post-transplant included prednisone, tacrolimus, and mycophenolate. She also had a history of achalasia secondary to scleroderma, which was treated with esophageal peroral endoscopic myotomy (EPOEM) one year ago. The differential diagnosis included infectious agents like CMV, HSV, and Candida, typical in immunocompromised patients with esophagitis.

### Methods:

The diagnosis was confirmed via esophagogastroduodenoscopy (EGD), which revealed severe esophagitis characterized by extensive serpiginous and confluent non-bleeding ulcerations (Figure 1).

### Results and Conclusion:

Biopsies confirmed a coinfection of CMV and HSV-1. Treatment commenced with valganciclovir and a temporary halt to mycophenolate, resulting in undetectable CMV levels subsequently. A follow-up EGD conducted two months later showed that the esophageal ulcers had no new bleeding, and biopsies indicated candida esophagitis without signs of CMV or HSV infection. The diagnosis of CMV and HSV-1 coinfection is a rare occurrence but crucial to identify due to its association with higher complication rates, including perforation and bleeding (1).

### Discussion:

The esophagus is frequently a target for infections in immunocompromised individuals, particularly transplant recipients, those receiving chemotherapy or steroids, and organ transplant recipients. However, concurrent infections by multiple viruses are rare (2, 3).

Various microorganisms, most notably Candida, HSV, and CMV, can cause infectious esophagitis. HSV-related esophagitis primarily affects immunocompromised hosts, although it can also occur less frequently in immunocompetent individuals (4). Endoscopically, characteristic findings include erosions and distinct ulcers with yellow borders, predominantly in the distal esophagus (5, 6). Microscopically, these ulcers exhibit multinucleated squamous cells at their edges, displaying nuclear molding and a ground-glass appearance with chromatin margination and eosinophilic intranuclear inclusions (Cowdry A-type)(6).

CMV esophagitis also tends to occur in immunocompromised patients such as those with HIV, long-term steroid users, and organ transplant recipients. The ulcers associated with CMV are larger and differ from those caused by HSV, being linear, longitudinal, deep, and typically located in the distal esophagus (5, 6). Histologically, these ulcers demonstrate viral cytopathic effects at the ulcer base in infected endothelial, stromal, or glandular epithelial cells characterized by cellular and nuclear enlargement and large intranuclear inclusions separated from the nuclear membrane by a halo. Cytoplasmic inclusions may also be observed (6).

Bonacini et al. and Wilcox et al. investigated the causes of esophageal infections in patients with HIV, identifying CMV as a frequent cause, followed by idiopathic ulceration and infections by HSV, with coinfections of CMV and HSV being particularly rare (3, 5). Further investigations in transplant recipients by McDonald et al. demonstrated that a significant proportion develop infectious esophagitis, primarily caused by HSV, CMV, and Candida, with a notable incidence of coinfection between CMV and HSV (7, 8).

Our case highlights the clinical complexity and diagnostic challenge of esophagitis due to concurrent CMV and HSV-1 infections in a post-liver transplant patient. While single CMV and HSV infections are relatively common in post-transplant patients due to their immunocompromised status, simultaneous infection of the esophagus with both viruses is notably rare but critical to recognize due to potentially severe complications(3). While the number of reported cases remains scarce, a recent series by Bannoura et al. shed light on the coinfection of the esophagus with CMV and HSV in immunocompromised patients (9). However, none of these cases exhibited such a severe and distinctive gross endoscopic presentation as observed in our patient's case.

### References:

1. Yeh PJ, Wu RC, Chen CM, Chiu CT, Lai MW, Chen CC, et al. Risk Factors, Clinical and Endoscopic Features, and Clinical Outcomes in Patients with Cytomegalovirus Esophagitis. *J Clin Med*. 2022;11(6).
2. Vodovnik A, Cerar A. Synchronous herpes simplex virus and cytomegalovirus esophagitis. *Z Gastroenterol*. 2000;38(6):491-4.
3. Wilcox CM, Schwartz DA, Clark WS. Esophageal ulceration in human immunodeficiency virus infection. Causes, response to therapy, and long-term outcome. *Ann Intern Med*. 1995;123(2):143-9.
4. Canalejo E, Garcia Duran F, Cabello N, Garcia Martinez J. Herpes esophagitis in healthy adults and adolescents: report of 3 cases and review of the literature. *Medicine (Baltimore)*. 2010;89(4):204-10.
5. Bonacini M, Young T, Laine L. The causes of esophageal symptoms in human immunodeficiency virus infection. A prospective study of 110 patients. *Arch Intern Med*. 1991;151(8):1567-72.
6. Rosolowski M, Kierzkiewicz M. Etiology, diagnosis and treatment of infectious esophagitis. *Prz Gastroenterol*. 2013;8(6):333-7.
7. Alexander JA, Brouillette DE, Chien MC, Yoo YK, Tarter RE, Gavaler JS, Van Thiel DH. Infectious esophagitis following liver and renal transplantation. *Dig Dis Sci*. 1988;33(9):1121-6.
8. McDonald GB, Sharma P, Hackman RC, Meyers JD, Thomas ED. Esophageal infections in immunosuppressed patients after marrow transplantation. *Gastroenterology*. 1985;88(5 Pt 1):1111-7.
9. Bannoura S, Barada K, Sinno S, Boulos F, Chakhachiro Z. Esophageal Cytomegalovirus and Herpes Simplex virus coinfection in an immunocompromised patient: Case report and review of literature. *IDCases*. 2020;22:e00925.

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