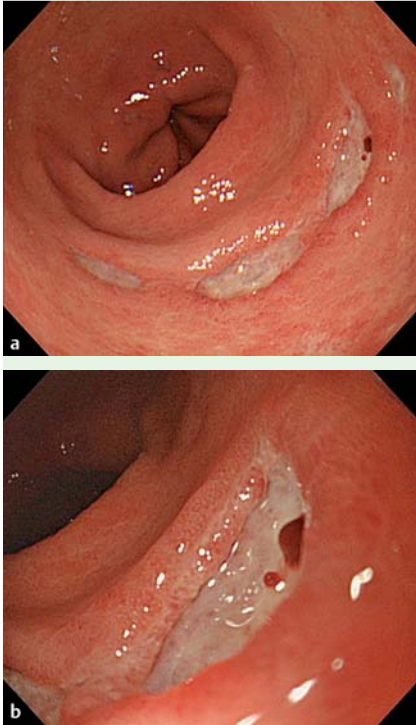
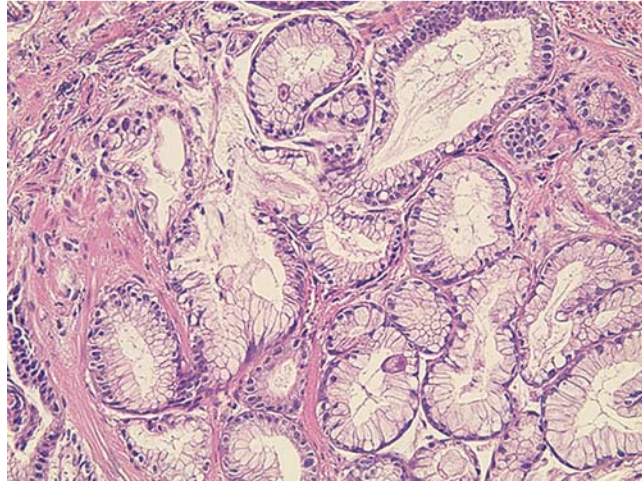


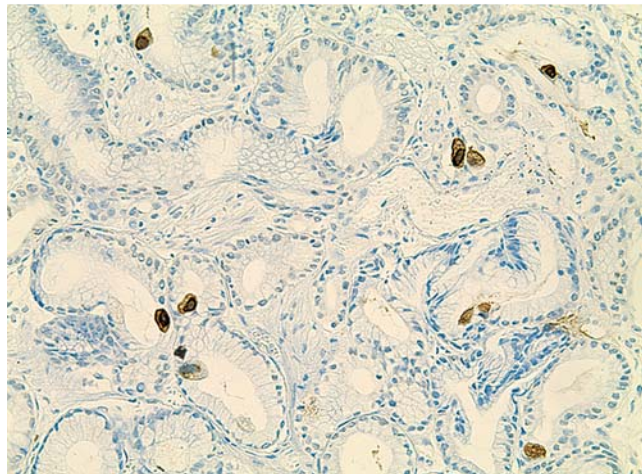
## Cytomegalovirus-associated gastric ulcers in a patient with dermatomyositis treated with steroid and cyclophosphamide pulse therapy



**Fig. 1** **a** Endoscopic view of multiple deep, punched-out ulcers in the antrum of the stomach. **b** One of the ulcers, with blood vessels at the base.



**Fig. 2** Histological image of characteristic "owl's-eye" cells with enlarged nuclei and peripheral halos in the gastric epithelial cells (hematoxylin and eosin staining,  $\times 200$ ).



**Fig. 3** Immunohistochemical staining showing multiple cytomegalovirus (CMV)-positive cells (CMV immunostaining,  $\times 200$ ).

A 63-year-old woman presented with epigastric pain and melena. She had been diagnosed as having dermatomyositis and treated with immunosuppression therapy, including three courses of steroid pulse therapy, intravenous immunoglobulin, and two courses of double-filtration plasmapheresis. She presented with symptoms 5 days after additional cyclophosphamide pulse therapy. Her hemoglobin level had dropped from 9.1 to 6.3 g/dL in 2 days. Serum cytomegalovirus (CMV) pp65 antigenemia was strongly positive ( $1150/1.5 \times 10^5$  leukocytes), and CMV-DNA was remarkably elevated to  $2.5 \times 10^5$  copy/ $10^6$  leukocytes. Endoscopy revealed multiple deep, punched-out ulcers with blood vessels, in the antrum of the stomach (• **Fig. 1**). Histopathological examinations of the biopsy specimen showed large epithelial cells with enlarged nuclei and peripheral halos ("owl's-eye" cells) (• **Fig. 2**). Immunochemical staining was positive for CMV (• **Fig. 3**).

The patient was treated with ganciclovir. Improvement of CMV antigenemia and gastric ulcers took 5 weeks because of the continuation of the immunosuppression therapy for the patient's primary disease. CMV is a very common viral pathogen that usually causes an asymptomatic infection in normal hosts. In immunocompromised hosts, however, primary or reactivated infection often causes serious damage to systemic organs, including the gastrointestinal tract. As shown in this case, cyclophosphamide pulse therapy in combination with steroid pulse therapy correlates with higher CMV antigenemia [1]. Esophagitis and colitis are the most common manifestations of CMV-associated gastrointestinal disease [2]. Although a CMV antigenemia test is a useful tech-

nique for assessing the activity of CMV viral replication, the detection of CMV-infected cells in tissue biopsies is still the gold standard for diagnosis of CMV-associated gastrointestinal disease [3]. As abdominal pain from CMV-associated gastritis may precede a positive CMV antigenemia test [4], endoscopy and mucosal biopsies should be performed at an early stage and may enable correct diagnosis and prompt treatment in immunocompromised patients.

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**Competing interests:** None

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