Cytomegalovirus in Cutaneous Ulcers in a Patient with Adult T-cell Lymphoma

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Sir,

Cytomegalovirus (CMV) is a major cause of morbidity and mortality in immunocompromised patients. CMV infection in immunocompromised patients may present as mononucleosis, pneumonitis, hepatitis, encephalitis, gastroenteritis, choreoretinitis, or as a cutaneous eruption (1). The clinical presentations of cutaneous CMV are highly variable, including ulcers, nodules, maculopapular eruptions, verrucous or indurated plaques, vesicles and purpura (2, 3).

Here, we report a case of cutaneous CMV ulcers in a patient with adult T-cell lymphoma (ATL), in which routine light microscopic examination of the excised specimen revealed diagnostic intranuclear and cytoplasmic viral inclusions. We discuss the possibility that these ulcers may have a role in reactivation of CMV during the wound healing process.

CASE REPORT

A 51-year-old woman was admitted to our hospital in December 1994 with a 5-month history of infiltrated erythema and a nodule on her left thigh. Skin biopsy and Southern blot analysis on genomic DNA from both skin and peripheral blood mononuclear cells suggested a diagnosis of ATL. The patient was treated with topical corticosteroids, psoralen + ultraviolet light A (PUVA), etretinate, oral corticosteroids, radiation for the skin eruptions, and with systemic chemotherapy, but repeated recurrences and remissions continued to occur.

Eight years later, the patient had many infiltrated erythematous papules and reddish nodules that caused severe itching on her upper limbs, thighs and trunk. After chemotherapy, the infiltrated reddish nodules on her right thigh and left knee underwent ulceration and many erythematous papules around the ulcer became erosive (Fig. 1).

Physical examination revealed two spindle-shaped 3.5×3 cm ulcers with an overlying yellowish necrotic tissue and surrounding erythema on the posterior aspect of the right thigh and the lateral aspect of the left knee, respectively. The ulcers were refractory to conventional measures, such as cleansing and various ointments for 3 months. Therefore, the ulcer on the right thigh was excised and closed under local anaesthesia. The ulcer on the left knee was treated with Terdermis® (an artificial collagen dermis) for wound bed preparation. At that time the patient was afebrile and there were no bacterial infections on the ulcers.

Examination of the excised specimens showed that the upper dermis consisted of inflammatory granulated tissue with extravasation of erythrocytes and perivascular infiltrates consisting mostly of lymphocytes and some neutrophils. The deep dermis and subcutis showed thick fibrosis. Some endothelial cells were characteristically enlarged with large purplish intranuclear inclusions surrounded by clear halo and occasional eosinophilic cytoplasmic inclusions, suggestive of CMV infection (Fig. 2).

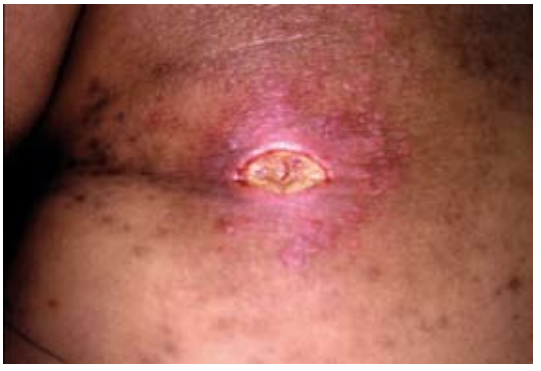

Fig. 1. Cutaneous ulcer on the right thigh, showing a raised border and eroded papules around the ulcer.

Immunohistochemistry showed positive staining for CMV antigens in the nucleus and cytoplasm of the enlarged endothelial cells (Fig. 3). Similar findings were also detected in some macrophages. No mitoses or nuclear atypia could be observed, and staining for fungi and mycobacteria was negative. Based on these results, a diagnosis of CMV ulcer was made.

Two weeks after treatment of these ulcers, the patient developed a fever and pneumonia resistant to antibiotics. CMV antigenaemia was identified by the demonstration of leukocyte nuclei positive for the CMV lower matrix phosphoprotein pp65. There was no sign of CMV retinitis on ophthalmological examination. Treatment for CMV was started with intravenous gancyclovir, 250 mg twice daily without clinical improvement and the patient died 11 days after starting the therapy for pneumonia. No post-mortem examination was performed.

DISCUSSION

CMV ulcers usually occur in genital and perianal areas and sometimes at other sites (4). There are two possible

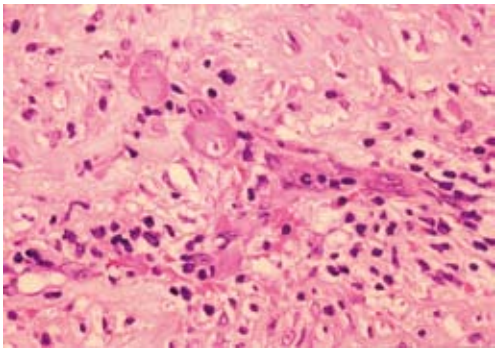

Fig. 2. Cytomegalic inclusions within endothelial cells. (Original magnification × 400).

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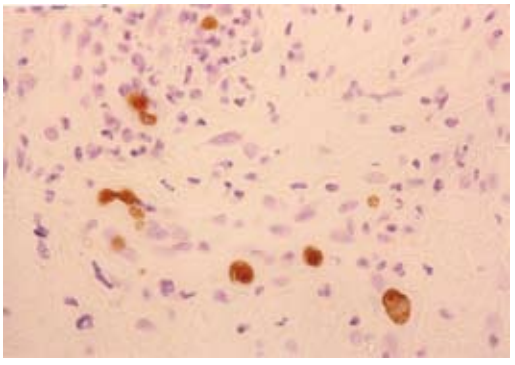

Fig. 3. Positive staining of endothelial cells for cytomegalovirus antigens. (Indirect immunoperoxidase staining; original magnification × 400).

explanations for cutaneous CMV ulcers: reactivation of a local latent virus in endothelial cells during endothelial colonization on the path to haematogenous dissemination, or auto-inoculation in periorificial areas by faecal, urinary or salivary shedding of CMV, coinciding with immunosuppression (5).

Accumulating evidence suggests that CMV may target a long-lived cell population, such as CD34+ haematopoietic cells, that gives rise to monocyte-derived macrophages and dendritic cells as a site of latency (6–8). Furthermore, TNF-α has been suggested to play a key part in CMV reactivation (6–8). In fact, a strong correlation between an elevated TNF-α plasma level and CMV antigenaemia has been reported in transplant recipients, sepsis patients, and patients with moderate to severe chronic plaque psoriasis (9–12).

In wound healing a TNF-α-rich environment is present in the early stages of wound bed preparation (13). As wound healing progresses, granulation tissues with many macrophage infiltrates and hypervascularity develop. During this process, CD34+ bone marrow progenitors differentiate macrophages in the lesion. Moreover, endothelial progenitor cells derived from bone marrow have been isolated from circulating mononuclear cells and shown to be incorporated into foci of neovascularization (14).

Taken together, the above observations suggest that it is likely that latent CMV is reactivated in the ulcer on the path to haematogenous dissemination. Accordingly, infiltrated CD34+ bone marrow cells with latent CMV infection differentiate macrophages and some endothelial cells in the ulcer. Then, in the TNF-α-rich environment the latent CMV is reactivated in the wound bed, and CMV antigenaemia develops. Finally, in immunocompromised patients, CMV dissemination occurs and may cause severe disease.

Our patient showed severe symptoms of pneumonia 2 weeks after treatment, while wound healing was in progress. The patient had not shown any prior symptoms suggestive of CMV infection, but testing for systemic CMV infection had not been performed before the operations. Therefore, the possibility that CMV could have been reactivated systemically before spreading to the ulcers cannot be excluded.

The presence of a CMV ulcer frequently represents the first sign of systemic CMV infection and should prompt treatment as soon as possible (4, 15).

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