

Generalized Pustulosis Diagnosed as Acute Generalized Exanthematous Pustulosis: Tzanck Smear and Pathological Evaluation of the Pustule Roof Can Provide Evidence for Early Diagnosis

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Dear Editor:

An 83-year-old male patient presented with a 1-day history of fever (38.6°C) and pruritic rash over the whole body. He had history of diabetes and cerebral infarction, but no drug allergies or psoriasis. He had been hospitalized due to common bile duct stone with cholangitis and pneumonia. Piperacillin/tazobactam had been prescribed for 19 days before the emergence of his skin rash, and levofloxacin and vancomycin had been added 10 days and 7 days before the rash appeared, respectively. All antibiotics were discontinued after he developed skin eruption; imipenem/cilastatin replaced them. Three days later, generalized pustules appeared over the erythema (Fig. 1). His lips were eroded; palms and soles were spared. Laboratory studies showed neutrophilia (15,562/mm³; before rash, 3,999/mm³), elevated blood urea nitrogen (43 mg/dl) and C-reactive protein (>20 mg/dl), and thrombocytopenia (32,000/mm³); transaminase levels were normal. Eosinophilia, atypical lymphocytes, and lymphadenopathy were absent. The differential diagnosis included acute generalized exanthematous pustulosis (AGEP), toxic epidermal necrolysis (TEN), generalized pustular psoriasis (GPP), sta-

phylococcal scalded skin syndrome (SSSS), and hypersensitivity syndrome. He refused skin biopsy; Tzanck smear and frozen section of pustule roof were done. The Tzanck smear showed many neutrophils, eosinophils, and lymphocytes without bacterial cocci (Fig. 2A). The histopathology of the pustule roof demonstrated subcorneal pustules with marked neutrophilic and eosinophilic infiltration without immunofluorescence (Fig. 2B). Bacterial cultures from blood and pustule contents were negative. From the clinical and pathologic findings, AGEP was strongly suspected. Although the patient's skin lesions cleared and his laboratory abnormalities were normalized with conservative treatment in 14 days, he died of underlying infection. Generalized pustulosis accompanied by fever and neutrophilia, a characteristic manifestation of AGEP, sometimes presents a diagnostic challenge. While dysfunction of internal organs is unusual in AGEP, systemic involvements have been re-



Fig. 1. Generalized pustules arising on an erythematous background on the trunk.

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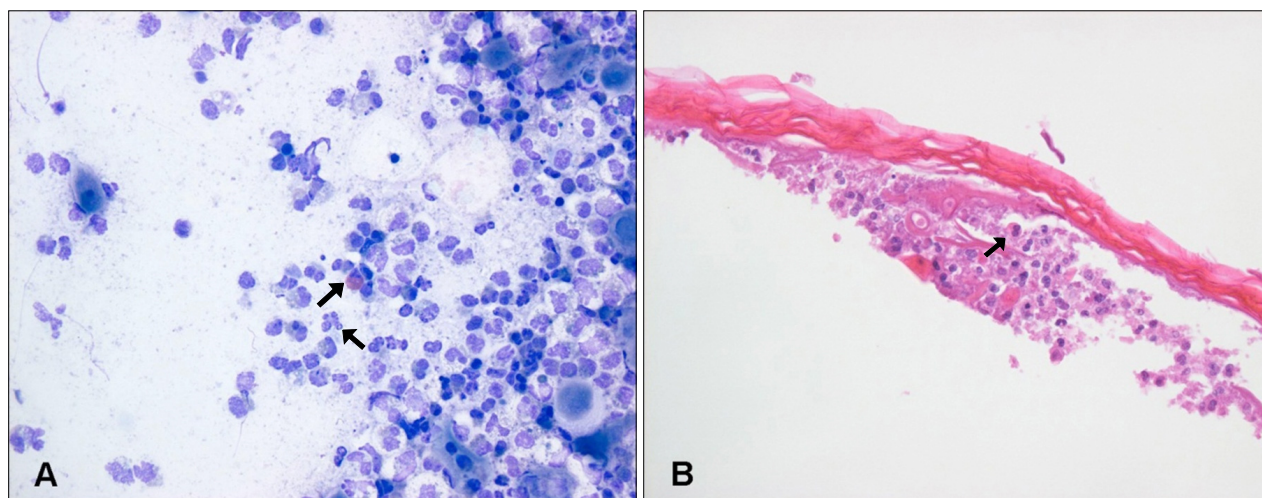


Fig. 2. (A) Tzanck smear showing many polymorphonuclear leukocytes, mainly neutrophils (↖) and a few eosinophils (↗) (Diff Quik, $\times 400$). (B) The pustule roof showing subcorneal separation with mixed inflammatory cell infiltration composed of neutrophils and a few eosinophils (↗) (H&E, $\times 400$).

ported¹. When systemic manifestations develop, wide spectrum of diseases including infections, inflammations, and drug reactions are considered. Early diagnosis is important in avoiding unnecessary investigations and determining proper treatment options. AGEF is mostly caused by drugs². In this patient, the causative drug was uncertain because multiple antibiotics were prescribed before he developed skin eruption. One of the key histopathological features that distinguishes AGEF from GPP is the presence of eosinophils, both in the subcorneal/intraepidermal pustules and dermis (in 32%~58% and 81%~95% of cases, respectively) on skin biopsy^{3,4}. Contrariwise, in GPP, eosinophils are not observed or scarcely found⁴. Tzanck smear is rapid, non-invasive, and useful in sites and cases for which skin biopsy is difficult to obtain⁵. In SSSS, Tzanck smear and pathology of blister roof show uppermost epidermal cells without inflammatory cells⁵. In TEN, blister roof reveals subepidermal splitting with full-thickness necrosis of epidermis; Tzanck smear demonstrates necrotic basal keratinocytes with fibroblasts and inflammatory cells⁵. To our knowledge, there has been no report on Tzanck smear and pathological evaluation of the pustule roof in AGEF. In this patient, Tzanck smear and the pathological evaluation of the pustule roof revealed eosinophils, which are a histopathological characteristic of AGEF. Although Tzanck smear and the pathological evaluation of the pustule roof

may not be replacements for skin biopsy, these can provide evidence for the early diagnosis of generalized pustulosis while the results of other tests are pending.

REFERENCES

- Hotz C, Valeyrie-Allanore L, Haddad C, Bouvresse S, Ortonne N, Duong TA, et al. Systemic involvement of acute generalized exanthematous pustulosis: a retrospective study on 58 patients. *Br J Dermatol* 2013;169:1223-1232.
- Choi MJ, Kim HS, Park HJ, Park CJ, Lee JD, Lee JY, et al. Clinicopathologic manifestations of 36 Korean patients with acute generalized exanthematous pustulosis: a case series and review of the literature. *Ann Dermatol* 2010;22:163-169.
- Halevy S, Kardaun SH, Davidovici B, Wechsler J; EuroSCAR and RegiSCAR Study Group. The spectrum of histopathological features in acute generalized exanthematous pustulosis: a study of 102 cases. *Br J Dermatol* 2010;163:1245-1252.
- Kardaun SH, Kuiper H, Fidler V, Jonkman MF. The histopathological spectrum of acute generalized exanthematous pustulosis (AGEP) and its differentiation from generalized pustular psoriasis. *J Cutan Pathol* 2010;37:1220-1229.
- Ruocco E, Brunetti G, Del Vecchio M, Ruocco V. The practical use of cytology for diagnosis in dermatology. *J Eur Acad Dermatol Venereol* 2011;25:125-129.