

LETTER TO THE EDITOR

Infectious endocarditis with multiple cerebral infarctions in a patient with severe atopic dermatitis

Dear Editor,

Infectious endocarditis (IE) is a rare but serious complication of atopic dermatitis.^{1–3} Here, we report a case of IE with multiple cerebral infarctions and briefly review related Japanese studies.

A 41-year-old woman had severe atopic dermatitis (AD) from early childhood and had been treated by local dermatologists. However, since she was 20 years old, she began using folk medicine such as spa therapy and refused the standard medical treatment. Three days before the first visit, she had fever and incoherent speech. She was transported to our hospital under the suspicion of meningitis. On examination, she had fever with a body temperature of 38.6°C, and her consciousness level was a Glasgow Coma Scale score of 3–5–6. The outer side of the eyebrows was lost, showing Hertoghe's sign (Fig. 1a). Diffuse infiltrative and lichenification erythema with many stretched marks were observed on the face, trunk

and extremities (Fig. 1a–c). Osler nodes (red nodules) were noted on her fingers. Blood examination revealed a white blood cell count of 18 800/μL (normal, 3170–8400) and C-reactive protein level of 30.24 mg/dL (normal, 0–0.30). Methicillin-susceptible *Staphylococcus aureus* (MSSA) was detected from the blood culture. Transthoracic echocardiography revealed a wart with a maximum diameter of 2 cm in the mitral valve (Fig. 1d). Computed tomography of the head revealed multiple areas of low absorption in both cerebellar hemispheres and the left occipital lobe (Fig. 1e,f). Focal high-density areas were also noted within the low absorption areas, indicating bleeding within the cerebral infarction. Magnetic resonance imaging of the head showed high signals within the areas in which low absorbance was found on computed tomography (Fig. 1g,h). Thus, she was diagnosed as having MSSA IE and multiple cerebral infarction, associated with exacerbation of AD.

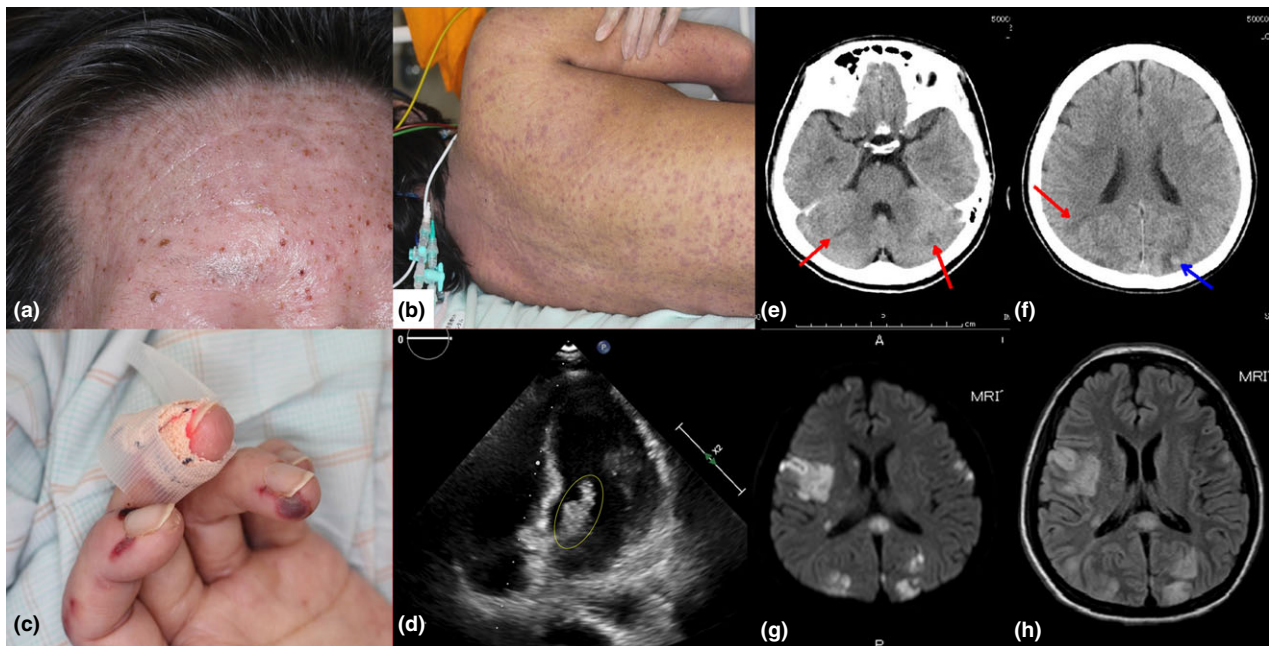


Figure 1. (a) Loss of the outer side of the eyebrow, showing Hertoghe's sign, and lichenified diffuse erythema with small pustules and erosions on the forehead. (b) Dry, diffuse erythema with numerous pustules on the back. (c) Osler nodes (red nodules) on the index and ring fingers. (d) Transthoracic echocardiography showing a wart in the mitral valve (yellow oval circle). (e,f) Computed tomography of the head revealing multiple areas of low absorption (red arrows) and a high-density area (blue arrow). (g,h) Magnetic resonance imaging of the head showing areas with high signals in the areas having low signal on computed tomography.

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Antibiotic treatment with cefepime dihydrochloride hydrate 2 g/day was started, and mitral valve replacement surgery was performed on the 16th hospital day. Treatment with systemic antibiotics and local steroid ointment successfully controlled IE and AD. The patient is currently undergoing rehabilitation for motor function recovery.

Staphylococcus aureus is often isolated from atopic skin, especially during flares.^{4,5} Excoriated and eroded skin can be entry sites of these pathogens for IE. The present patient had “steroid phobia” and refused the standard therapy for 20 years. Table S1 summarizes the 26 IE cases with AD reported in Japan (from 1996). As many as 11 patients (42.3%) did not receive the standard therapy. Among the 11 cases, all but one (no. 12) were complicated with severe systemic disorders such as (multiple) cerebral infarction(s), intracerebral hemorrhage, cardiac failure, splenic infarction, subarachnoid hemorrhage, (multiple) pulmonary infarction(s) and splenic abscess. Ironically, despite the highly hygiene-conscious Japanese society, many cases of IE derived from AD still occur.

This case can be a lesson for patients with AD in general, who should be advised to seek appropriate medical treatment. Appropriate treatment should be based on solid medical evidence. Medical professionals are to serve as mediators to promote the appropriate treatment of AD.

CONFLICT OF INTEREST: None declared.

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REFERENCES

- 1 Narla S, Silverberg JI. Association between atopic dermatitis and serious cutaneous, multiorgan and systemic infections in US adults. *Ann Allergy Asthma Immunol* 2018; **120**: 66–72. e11.
- 2 Patel D, Jahnke MN. Serious complications from *Staphylococcus aureus* in atopic dermatitis. *Pediatr Dermatol* 2015; **32**: 792–796.
- 3 Kobayashi H, Sugiuchi R, Tabata N *et al*. Guess what! Acute infectious endocarditis with Janeway lesions in a patient with atopic dermatitis. *Eur J Dermatol* 1999; **9**: 239–240.
- 4 Geoghegan JA, Irvine AD, Foster TJ. *Staphylococcus aureus* and atopic dermatitis: a complex and evolving relationship. *Trends Microbiol* 2018; **26**: 484–497.
- 5 Gonzalez T, Biagini Myers JM, Herr AB, Khurana Hershey GK. *Staphylococcal* biofilms in atopic dermatitis. *Curr Allergy Asthma Rep* 2017; **17**: 81.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Table S1. Infectious endocarditis cases associated with atopic dermatitis reported in Japan (since 1996).

(Supplemental Table 1) Infectious endocarditis cases associated with atopic dermatitis reported in Japan (since 1996)

Case (Year)	Age/ Sex	Chief complaint	Standard therapy	Causative organisms (blood culture)	Complications
1 (Noda, 1996)	19/M	Fever	No	MRSA	CF
2 (Kawahira, 1996)	27/F	Fever	—	MRSA	CI
3 (Kobayashi, 1999)	33/M	Fever	Yes	MSSA	None
4 (Terada, 1999)	14/M	Fever	Yes	CNS	None
5 (Adachi, 2000)	27/M	Fever Unconsciousness	No	MSSA	Intracerebral hemorrhage and CF
6 (Arai, 2001)	21/F	Fever Unconsciousness	Yes	MSSA	CI and SI
7 (Fukuyama, 2002)	29/M	Fever and headache	—	MSSA	Multi-CI
8 (Hasegawa, 2002)	34/M	Fever	Yes	MSSA	SI and liver abscess
9 (Harada, 2003)	24/F	Fever	No	MSSA	SI
10 (Sumita, 2003)	35/M	Fever	—	MSSA	Liver abscess
11 (Masu, 2005)	34/M	Fever	Yes	MSSA	None

12 (Yamamoto, 2007)	27/M	Fever	No	MSSA	None
13 (Baba, 2008)	25/F	Fever	Yes	MSSA	CF
14 (Yamaguchi, 2010)	18/F	Fever Unconsciousness	No	MSSA	Subarachnoid hemorrhage, multi-CI, and renal infarction
15 (Saito, 2012)	3/M	Fever	No	MSSA	PE
16	26/M	Fever Unconsciousness	Yes	MSSA	CI
17 (Fukagawa, 2012)	20/F	Fever Unconsciousness	No	MSSA	Multi-CI
18 (Fukagawa, 2012)	36/M	Fever Unconsciousness	No	MSSA	PE, cerebral abscess, and RI
19 (Fukumitsu, 2012)	30/F	Fever Unconsciousness	Yes	MSSA	PE, cerebral abscess, and RI
20 (Kawahara, 2013)	34/F	Fever Chest pain	No	MSSA	Splenic abscess and PE
21 (Yuasa, 2013)	15/M	Fever	—	MSSA	CI, SI, and RI
22 (Tanioka, 2015)	26/M	Fever Unconsciousness	Yes	MSSA	CI
23 (Horimoto, 2015)	34/F	Fever	No	MSSA	Multi-PE

24 (Kutsuna, 2017)	29/M	Fever Unconsciousness	Yes	MSSA	Multi-CI, SI, and RI
25 (Sasahashi, 2017)	53/M	Fever and visual field loss	Yes	MSSA	Multi-PE
26 (Present)	41/F	Fever Unconsciousness	No	MSSA	Multi-CI

MRSA, methicillin-resistant *Staphylococcus aureus*; CNS, coagulase-negative *Staphylococcus*; MSSA, methicillin-susceptible *Staphylococcus aureus*; CF, cardiac failure; CI, cerebral infarction; SI, splenic infarction; PE, pulmonary embolism; RI, renal infarction.

The shaded rows represent the cases without the standard therapy.