

## SHORT COMMUNICATION

Erythema Induratum in a Patient with Pulmonary *Mycobacterium avium* InfectionMai Hattori<sup>1</sup>, Akira Shimizu<sup>1\*</sup>, Takeshi Hisada<sup>2</sup>, Takaya Fukumoto<sup>3</sup>, and Osamu Ishikawa<sup>1</sup>Departments of <sup>1</sup>Dermatology and <sup>2</sup>Medicine and Molecular Science, Allergy and Respiratory Medicine, Gunma University Graduate School of Medicine, Showa-machi, Maebashi, Gunma 371-8511, and <sup>3</sup>Sapporo Dermatopathology Institute, Sapporo, Japan. \*E-mail: shimizuakira@gunma-u.ac.jp  
Accepted Jan 21, 2016; Epub ahead of print Jan 25, 2016

Erythema induratum (EI) is a disease of multiple aetiologies, which mainly affects women, causing erythematous nodules and plaques on the lower extremities. Nodular vasculitis has been regarded as synonymous with EI (1). In contrast, erythema induratum of Bazin (EIB) has been recognized as a tuberculid reaction to *Mycobacterium tuberculosis* with tuberculin hypersensitivity (2). We report here a case of EI in a patient potentially associated with pulmonary *M. avium* infection.

## CASE REPORT

A 77-year-old woman presented with a one-month history of tender erythematous nodules on her lower legs in June 2014. On physical examination, indurated erythemas 1–3 cm in diameter were observed scattered mainly on the flexor and lateral sides of her lower legs (Fig. 1a). Her body temperature was normal. There was no family history of tuberculosis and her past history was unremarkable. All laboratory results were normal except for an elevated C-reactive protein level (1.67 mg/dl; normal <0.1 mg/dl). A skin biopsy taken from the right lower leg showed mixed septal and lobular panniculitis (Fig. 1b) and epithelioid granulomas with caseous necrosis and many multinucleated giant cells and eosinophils in the lesion (Fig. 1c). There was no vasculitis. We suspected a diagnosis of EIB caused by *M. tuberculosis* infection, and therefore referred the patient

to a pulmonologist. Chest computed tomography revealed multiple small nodules and pulmonary infiltrates in the bilateral lower lobe of her lung. A tuberculin skin test and the QuantiFERON<sup>®</sup>-TB Gold (QIAGEN, Hilden, Germany) test were negative. The biopsied skin, gastric aspirate, and sputum were all negative for Ziehl-Neelsen staining and PCR analysis for both *M. tuberculosis* and *M. avium*. Bacterial culture of the cutaneous tissue and sputum were also negative; however, *M. avium* was isolated only from the gastric aspirate after incubation for one month. We suspected a diagnosis of EI caused by pulmonary *M. avium* infection. One month later without any medication, numerous indurated erythemas developed suddenly on her trunk (Fig. 1d) and upper legs. Histopathologically, caseous necrosis surrounded by epithelioid granuloma with mononuclear cells and eosinophil infiltrations were also seen as in the leg lesion. We considered that the eruptions had been caused by the same mechanism and treated her with rifampicin 450 mg/day, ethambutol 750 mg/day and clarithromycin 600 mg/day. The erythemas quickly resolved within a few weeks and the subcutaneous nodules in the legs finally improved after 6 months.

## DISCUSSION

EI is typically caused by *M. tuberculosis*; however, it has also been reported that non-tuberculous agents,

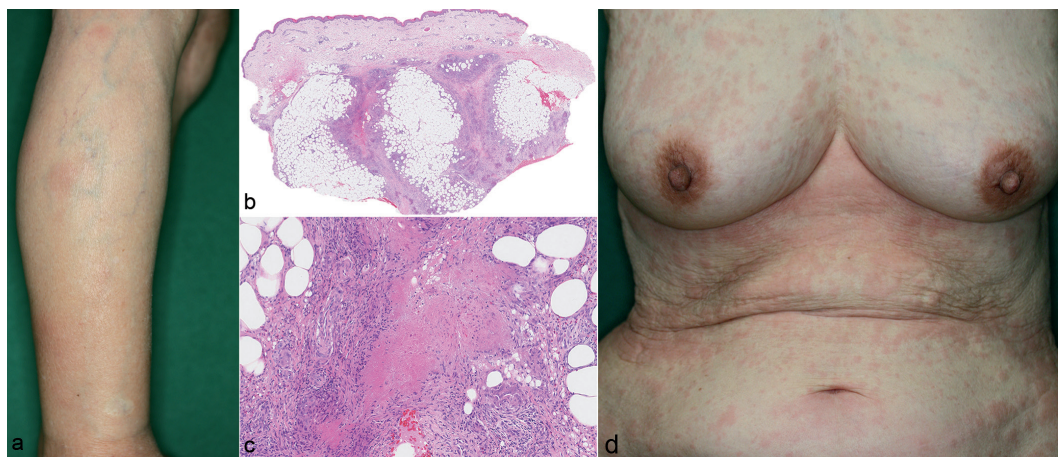


Fig. 1. (a) Erythematous subcutaneous nodule on the patient's right lower leg. (b) Histopathological examination reveals mixed septal and lobular panniculitis (haematoxylin and eosin stain, 8×). (c) High-power magnification reveals caseous necrosis surrounded by mononuclear cells and eosinophils accompanied by giant cells (haematoxylin and eosin stain, 100×). (d) Light pink erythema scattered on the patient's trunk.

such as *Nocardia*, *Pseudomonas*, and *Fusarium*, may be associated with EI (3, 4). To the best of our knowledge, there have been no previous reports of EI associated with *M. avium* infection. The negative results of the tuberculin skin test, QuantiFERON®-TB Gold test and the PCR analysis for *M. tuberculosis* excluded the possibility of a *M. tuberculosis* infection. The fact that the patient responded well to therapy for pulmonary *M. avium* infection also supports our diagnosis.

The histopathology of the trunk rash was the same as that of the lower legs. We speculate that EI might manifest as an id reaction to *M. avium* components in our patient. To confirm our hypothesis, an immunohistochemical study of *M. avium* antigens is warranted;

however, no appropriate *M. avium* antibody is currently available.

## REFERENCES

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