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Blue Toe Syndrome as an Early Sign of Disseminated Intravascular Coagulation

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Dear Editor:

Blue toe syndrome (BTS) is often described as painful digits with blue or purple discoloration without direct trauma[1]. Also it can lead to the amputation of toes and feet and be life threatening. Atheromatous embolism caused by vascular wall injuries from invasive percutaneous procedures or from anticoagulant or fibrinolytic therapy is reported as a common cause of BTS[2]. However, other causes of decreased blood flow are thrombosis, vasoconstrictive disorders, infectious and noninfectious inflammation, and other vascular obstruction[2]. The conditions which lead to thrombotic state such as disseminated intravascular coagulation (DIC) can also give rise to BTS. Herein, we report a rare case of BTS that occurred as an early sign of DIC.

In our institute, a 69-year-old male complained of non-palpable bluish discoloration on both feet after he was admitted to the ICU ward due to pneumonia (Fig. 1). The physical examination demonstrates symmetric color change with petechiae that had lasted 1 month. The toes felt cold, and the sensation of toes was uncheckable because of his semi-coma status. Also the patient has been treated for pneumonia with history of diabetes mellitus, hypertension, and cerebral infarct. On histological examination from his foot, ischemic necrosis of epidermis and tons of red blood cell extravasation were found (Fig. 2A, B). Also, there were eosinophilic fibrinoid thrombi in the medium-sized vessels and leukocytoclasis (Fig. 2C). The laboratory results were as follows: white blood cell 28,470/mm^3, hemoglobin 9.4 g/dl, platelet 37,000/mm^3, prothrombin time/activated partial thromboplastin time 18.4/91.7 s, fibrinogen 71 mg/dl, D-dimer 3.75 mg/L. Hence, we could confirm that the causative disease might be DIC. After then, we obtained the result of multi drug resistant acinetobacter baumannii bacteremia from the blood culture. Gram stain and bacterial culture of the skin tissue were not conducted. We concluded that DIC resulted from severe infectious bacteremia. Henceforward, the patient was treated with vancomycin and conservative care for DIC. However, the patient died after 1 month. The possibility of purpura fulminans was ruled out because the patient's lesion was limited to the toes.

Some conditions that might lead to the slow blood flow or vascular damage that causes BTS are: 1) decreased arterial

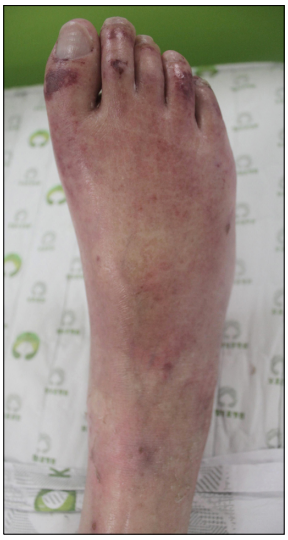

Fig. 1. Blue to purple discoloration with petechiae on the right foot.

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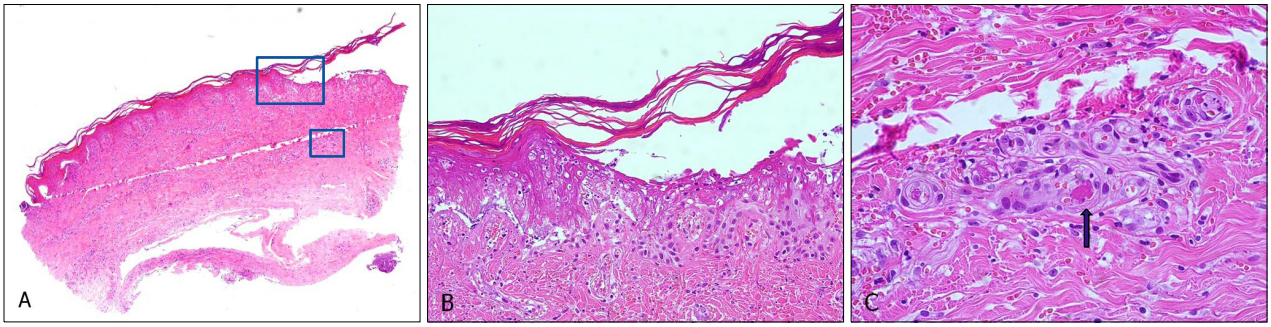

Fig. 2. (A) Scanning view (H&E, ×40). (B) Ischemic necrosis of epidermis, and red blood cell extravasation (H&E, ×200). (C) Eosinophilic fibrinoid thrombi in medium-sized vessels (arrow) and leukocytoslasis (H&E, ×400).

perfusion, 2) impaired venous outflow, and 3) abnormal circulating blood[2,3]. Our case corresponds with decreased arterial flow, by thrombosis, not by embolism[2]. Histologically intravascular fibrin thrombi proved this thrombosis in our case. Besides, this hypercoagulable states can developed diverse cutaneous findings other than BTS[2]. But if the patient's underlying disease is unclear, we should commit several kinds of work-up such as complete blood count, blood chemistry, urinalysis, culture, antibody, X-ray as well as computerized tomography angio[2].

DIC is a process which describes widespread abnormal activation of the clotting pathway and generation of excess thrombin[2,4]. It results in intravascular fibrin formation and thrombotic occlusion of small and larger vessels. Although DIC has to be managed in internal medicine, there are some needs for dermatologists to know it. Because most initial signs of DIC begin with cutaneous findings like BTS, petechiae, purpura fulminans, peripheral gangrene[5]. In conclusion, we report an instructive case of BTS as an early sign of DIC.

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