Pyoderma Gangrenosum as the Initial Manifestation of Small Cell Lung Cancer with Dermatomyositis

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To the Editor: A 54-year-old man developed painful ulcers on the neck one month ago, followed by periorbital edema. The ulcers then spread to his trunk, back, and upper arms. He had muscle weakness, mild muscle soreness with activity, and dysphagia for foods for the past three weeks. He was diagnosed as drug eruption in a local hospital and received irregular corticosteroids therapy for two weeks. Thereafter, the ulcers started to heal. He had a 40 years’ history of smoking. The patient was emaciation, and physical examination revealed heliotrope sign, poikiloderma involving the face, “V” sign of the chest, and the upper arm, nail fold telangiectasia, and large well-defined ulcers on the abdomen, back, and upper arms, there was no Gottron sign [Figure 1]. It was hard for him to raise his arms and squat. The triceps and quadriceps were tender to palpation. Investigation revealed elevated levels of antinuclear antibodies (1:40; normal range, <1:40), creatin kinase (382 U/L; normal range, 56–244 U/L), lactic dehydrogenase (254 U/L; normal range, 109–245 U/L), white blood cell (19.71 × 10⁹/L; normal range, 3.5–9.5 × 10⁹/L), erythrocyte sedimentation rate (78 mm/h; normal range, 0–15 mm/h), C-reactive protein (117.52 mg/L; normal range, <8 mg/L), neurospecific enolase (25.03 ng/ml; normal range, 0–16.30 ng/ml), and electromyography showed muscle damage. Chest computed tomography plain and enhanced scan suggested possible malignant tumor in left upper lobe [Figure 1]. The biopsy of axillary lymph node showed “small cell lung cancer”. Histopathology of ulcer edge revealed ulceration of the epidermis with a dense neutrophils infiltration. There was no organisms or vasculitis [Figure 1].

Small cell lung cancer with dermatomyositis (DM) and classic pyoderma gangrenosum (PG) was diagnosed. The patient was treated with methylprednisolone 40 mg/d and minocycline 100 mg/d. A topical strong-potent corticosteroid and antibiotics were applied to the ulcers daily. After 4 weeks’ treatment, the weakness relieved and ulcers healed [Figure 1]. Now, the patient is receiving chemotherapy targeted to the lung cancer with methylprednisolone 40 mg/d and methotrexate 15 mg/week.

DM and PG are both paraneoplastic dermatoses. DM-associated ulcers were generally caused by calcification,¹ vasculitis, and panniculitis.¹ The ulcers are usually small, deep, and resistant to drug therapy. Some ulcers occur at the site of Gottron sign, and some occur on the buttocks and thighs, calcinosis in adults with DM was associated with fingertip ulcers.¹

The pathogenesis of PG involves neutrophilic dysfunction, inflammatory mediators, and genetic predisposition. Interleukin-1β (IL-1β) and its receptor are found to increase in PG lesions, suggesting the role of autoinflammation through inflammasome creation. The inflammasome is critical to activating IL-1β to ward off pathogenic infection, dysfunction, or activation in the absence of infection can trigger an inflammatory cascade and the onset of PG.³

Tumor-associated or tumor-elicited inflammation is dependent on cytokine and chemokine production by tumor cells and other...
cellular components of tumor microenvironment. Various tumors, such as lung and breast cancer were reported to overexpress IL-1β. IL-1β produced by tumor cell may lead to granulocyte colony-stimulating factor-dependent neutrophil expansion due to IL-17 expression by γδT cells.[4] At the early stage of lung cancer, recruited neutrophils can present antigens to anti-cancer T cell.[5] Hence, it can be probably suggested that the overactive immune response to the cancer results in PG, and abnormal immune response to cancer leads to DM.

In conclusion, we reported a case of malignancy with concurrent DM and PG, and raise a hypothesis of pathogenesis, the patient responded well to corticosteroids combined with minocycline therapy.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**
There are no conflicts of interest.

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