Nasal septal and mucosal disease associated with pyoderma gangrenosum in a cocaine user

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INTRODUCTION

The manifestations of habitual cocaine use can mimic tumors, infections, and immunologic diseases and can affect multiple organs, causing nasal septal perforation, cutaneous vasculitis, vasculopathic skin necrosis, pyoderma gangrenosum (PG),[1] and lung disease.[2] Levamisole is a veterinary antiparasitic drug often added to cocaine in the United States to cheaply enhance or extend cocaine's euphoric effects. It is present in about 70% of seized cocaine in the United States, and it is believed to play a direct role in induction of vasculopathy, vasculitis, and PG.[1] Early distinction of these disorders can be challenging. Here we present a case of cocaine abuse disorder manifesting as cutaneous and nasal mucosal PG, perforated nasal septum, and pneumonitis.

CASE REPORT

A 53-year-old white woman with history of type 1 diabetes mellitus and recreational drug abuse presented to the dermatology department with a 6-month history of a painful, nonhealing ulcerated lesion on the back. The lesion was initially diagnosed as an abscess, and repeat incision and drainage, oral antibiotics, and supportive wound care failed (Fig 1). Tissue cultures for bacteria and fungus were negative. The patient underwent excision and repair. Histopathologic examination found ulceration with undermining of adjacent skin and acute suppurative and plasma cell–rich inflammatory infiltrates (Fig 2). The repair began to dehisce centrally, resulting in an 8.5- × 1.0-cm linear, focally ulcerating, and violaceous plaque with several areas of focal suppurative discharge (Fig 3).

Abbreviations used:

GPA: granulomatosis with polyangiitis
MP: malignant pyoderma
PG: pyoderma gangrenosum

The patient was also found to have beefy red friable and focally pustular soft tissue swelling of the nasal mucosa (Fig 4). Results of a nasal swab culture were consistent with secondary colonization. Punch biopsy found an acute suppurative folliculitis, with follicular rupture and destruction (Fig 5). Nasoendoscopy found mucosal edema, ulceration of bilateral nasal passages, and a large nasal septum perforation. The changes of skin on the back were diagnosed as PG and those of the nasal mucosa as early lesions of PG.[3]

Our patient's home medications included insulin and lisinopril. Test results for rheumatoid factor, antinuclear antibody, antistreptococcal antibody, DNase B antibody, and cryoglobulin were normal. Complete blood count, serum and urine immunofixation, and colonoscopy were normal. Nasal septal perforation workup was negative for antineutrophil cytoplasmic antibodies measured by indirect immunofluorescence and enzyme linked immunosorbent assay. Anticardiolipin, $\beta 2$ glycoprotein, and lupus anticoagulant test results were normal. Evaluations for hepatitis A, B, and C infection were negative.

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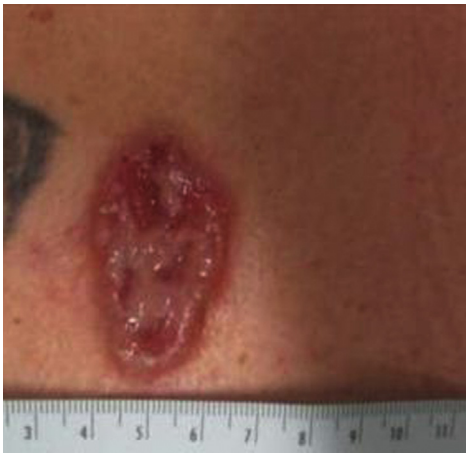

Fig 1. Original 4-cm (L) × 2.2-cm (W) ulcerated plaque, pre-excision (left upper back).

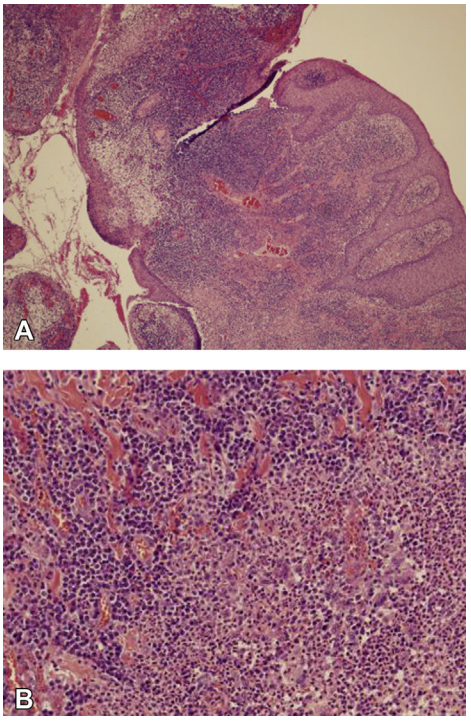

Fig 2. Skin of back. **A**, The periphery of the ulcer undermines adjacent skin and is partially re-epithelialized. **B**, The ulcer bed harbors acute suppurative and plasma cell–rich inflammatory components. The histologic features are consistent with pyoderma gangrenosum. (Hematoxylin-eosin stain.)

Chest radiography followed by computed tomography found right-sided multifocal pneumonitis and mild reactive lymphadenopathy. Bronchoalveolar lavage was negative for fungal, bacterial, *Pneumocystis jiroveci*, and mycobacterial organisms; no malignant cells were identified.

Urinalysis was negative for both protein and red blood cells, and renal function remained normal throughout follow-up. A urine toxicology screen was positive for cocaine, whereas results of serum levamisole testing performed 2 weeks later were negative.

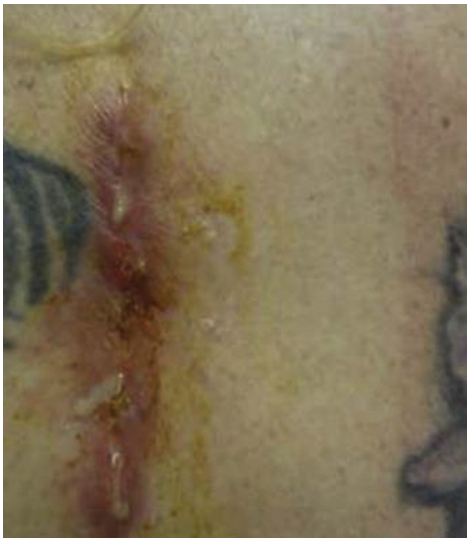

Fig 3. Ulcerating postexcision wound.

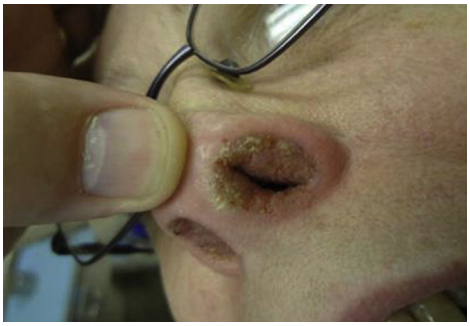

Fig 4. Pretreatment. Nasal mucosal tissue with beefy, friable, slightly erythematous and edematous tissue.

Treatment with intralesional triamcinolone injection, local wound care, oral prednisone, dapsone, and topical tacrolimus was unsuccessful (Fig 6, *A*). A repeat urine toxicology screen confirmed continued use of cocaine at this time. Treatment of refractory PG was instituted with oral cyclosporine combined with oral prednisone and topical tacrolimus and cocaine discontinuation, resulting in gradual improvement (Fig 6, *B*).The nasal mucosal overgrowth rapidly responded as well (Fig 7). She successfully discontinued cyclosporine treatment without recurrence of skin or nasal PG lesions.

DISCUSSION

Our patient had unusual sites of PG—nose and upper back—and poor response to standard treatment. Head and neck involvement in PG occurs in 5% of all PG cases.[4] Nasal involvement with PG is rarely reported and can involve the nasal septum and bridge of the nose leading to septal perforation

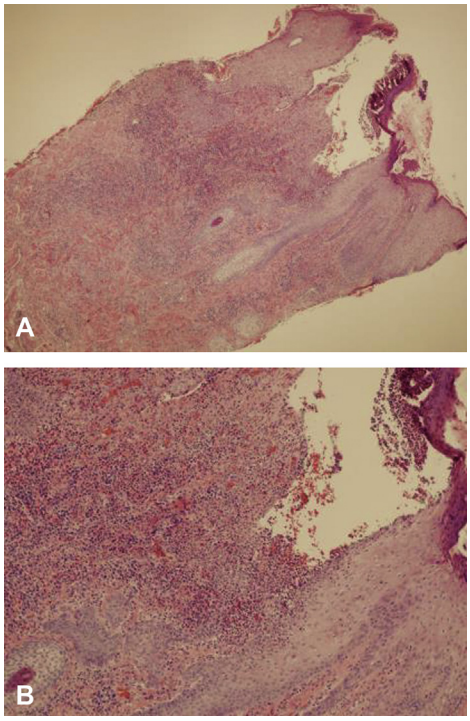

Fig 5. Naris lesion. **A**, Acute suppurative folliculitis with rupture and destruction of a follicular infundibulum. **B**, In the context of the skin of back lesion, the acute suppurative folliculitis at the naris probably denotes an early lesion of pyoderma gangrenosum. (Hematoxylin-eosin stain.)

and saddle nose deformity.[5] After excluding infections, inflammatory bowel disease, hematological malignancy, and medications associated with PG,[6] granulomatosis with polyangiitis (GPA) was considered.

In all cases of head and neck involvement in PG, GPA must be excluded, as necrotizing ulcerations occur in both diseases.[7] In a series of 244 patients with GPA, prevalence of cutaneous manifestations varied from 4.4% in limited form of the disease to 40% in the generalized form.[8] Skin manifestations can also be an initial presentation of GPA in approximately 10% of patients. Histopathologically, findings of granulomatous vasculitis, palisading granuloma, and abscess with granuloma formation have been described in GPA.[8] In our case, distinction from GPA was aided by the absence of histologic features and a negative anti-neutrophil cytoplasmic antibody test result.

We then hypothesized malignant pyoderma (MP) as a diagnostic consideration. The term *MP* is used to describe an idiopathic necrotizing ulceration with predilection for the face and preauricular area. MP further differs from classic PG by the absence of undermining borders, poor responsiveness to treatment, and higher tendency to relapse.[9] Some authors consider MP a cutaneous manifestation of GPA.[10]

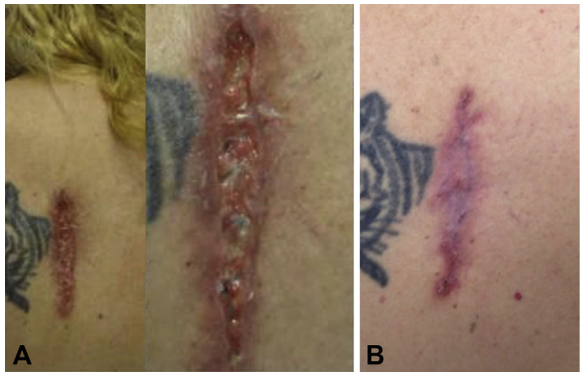

Fig 6. **A**, Progression of ulceration despite treatment. **B**, Improvement after treatment with prednisone and cyclosporine.

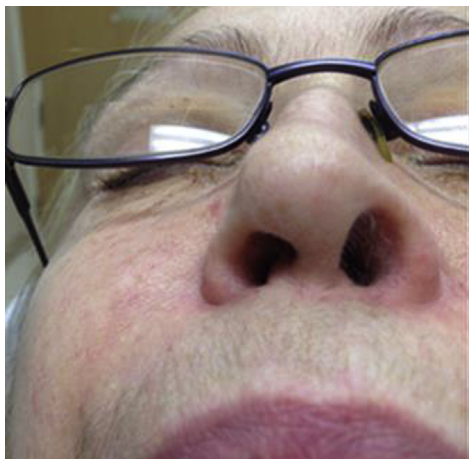

Fig 7. Improvement in nasal PG lesion after systemic treatment.

Although, our case could be considered as MP because of facial distribution and poor responsiveness to treatment, the presence of an undermining border on the upper back lesion argued against MP. Based on our patient's clinical presentation, history of drug use, and exclusion of systemic diseases associated with PG, we finally concluded that levamisole-tainted cocaine use was the etiology of PG and nasal septum perforation.

PG was recently recognized as a complication of levamisole-contaminated cocaine use.[1] Cocaine and levamisole enhance inflammation and autoimmunity by promoting release of neutrophil extracellular traps, whereas levamisole also increases neutrophil chemotaxis response.[11] Levamisole-tainted cocaine use may result in PG lesions refractory to treatment and occurring in unusual sites such as the face, neck, and trunk.[1] Detection of serum levamisole is helpful, although the estimated mean half-life of levamisole in the blood is only 5.6 hours,[12] which can result in a negative test if the drug exposure occurred more than 24 hours before testing, as in our patient.

We report this case to highlight unusual sites of PG and recognition of early lesions of PG as a complication of habitual cocaine use. The case raises awareness of the broad differential diagnoses of head and neck PG and systemic manifestations of cocaine use disorder. Counselling on cocaine cessation with local wound care and short courses of systemic corticosteroids can help control inflammation. In refractory cases, alternatives to corticosteroid such as cyclosporine, cyclophosphamide, azathioprine, mycophenolate mofetil, and anti−tumor necrosis factor-α drugs can be considered.

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