Cocaine-induced pemphigus vulgaris

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INTRODUCTION

Pemphigus vulgaris (PV) is an autoimmune, blistering dermatosis caused by autoantibodies to desmoglein (Dsg)1 and Dsg3 targeting keratinocyte desmosomes. There are many inciting factors for PV development, including idiopathic, molecular mimicry, medications, and underlying neoplasm; cocaine has rarely been reported as an inciting cause of PV and pemphigus vegetans.[1-4] In this report, we discuss a severe case of PV developing one day after intranasal cocaine administration.

Abbreviations used:

HSV: herpes simplex virus
Dsg: desmoglein
Ig: immunoglobulin
PV: pemphigus vulgaris

CASE REPORT

A 31-year-old man with a past medical history of cocaine abuse presented to the emergency department with flaccid bullae and erosions for the past 1.5 months. The lesions started on the buttocks and spread to the head, oral mucosa, neck, trunk, and all extremities, covering more than 70% of his body surface area (Fig 1). He had no recent new medication exposures prior to lesion development, but he did administer a new supply of cocaine intranasally the day before lesions appeared. One month prior to presentation, the patient was admitted to an outside hospital and was treated with intravenous antibiotics, including vancomycin, for possible soft-tissue infection.

On presentation, the patient was afebrile, and vital signs were stable. Laboratory tests were significant for leukocytosis (22.7×10^9/L), mild anemia (12.5 g/dL), hypoalbuminemia (1.9 g/dL), and elevated inflammatory markers (erythrocyte sedimentation rate, C-reactive protein). Urine toxicology screen was negative on admission. Initial investigations for infectious diseases included blood cultures, human immunodeficiency virus screen, herpes simplex virus (HSV)-1 and 2 nucleic acid amplification, and varicella zoster virus direct fluorescent antibody, all of which were negative. HSV-1, HSV-2, Epstein-Barr virus, cytomegalovirus, human herpes virus-6, human herpes virus-7, and *Mycoplasma pneumoniae* immunoglobulin (Ig) G were elevated suggesting prior exposure. Imaging studies, including chest X-ray, were normal. The primary team started the patient on empiric intravenous vancomycin and piperacillin-tazobactam for possible soft-tissue infection.

Dermatology was consulted to evaluate the patient for toxic epidermal necrolysis. After clinical morphologic assessment, there was a strong concern for PV rather than toxic epidermal necrolysis, and the patient was started on intravenous Ig 2 g/kg divided over 4 days, with doses repeated on a monthly basis, as well as systemic prednisone 1 mg/kg/day (70 mg daily), mycophenolate mofetil 1000 mg twice daily, niacinamide 500 mg three times daily, doxycycline 100 mg twice daily, and topical clobetasol 0.05% ointment with dressing changes. Subsequent histologic examination of a skin biopsy obtained from the edge of a blister revealed suprabasilar acantholysis, while a second perilesional biopsy for direct immunofluorescence demonstrated granular deposition of IgG throughout epithelial cell surfaces and the lower two-thirds of the epithelial strata (Fig 2). Indirect immunofluorescence showed IgG toward Dsg1 elevated to 6100 units and IgG to Dsg3 elevated to 4600 units, thus confirming the diagnosis of PV.

A swab for tissue culture from lesional skin revealed coagulase-negative *Staphylococcus*, *Proteus species*, and yeast forms, and the patient was given one dose of oral fluconazole 150 mg,

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Fig 1. Clinical presentation of a 31-year-old man with flaccid bullae covering more than 70% of his body surface area, including his (**A**) face, and (**B**) chest and abdomen with concern for cocaine-induced pemphigus vulgaris.

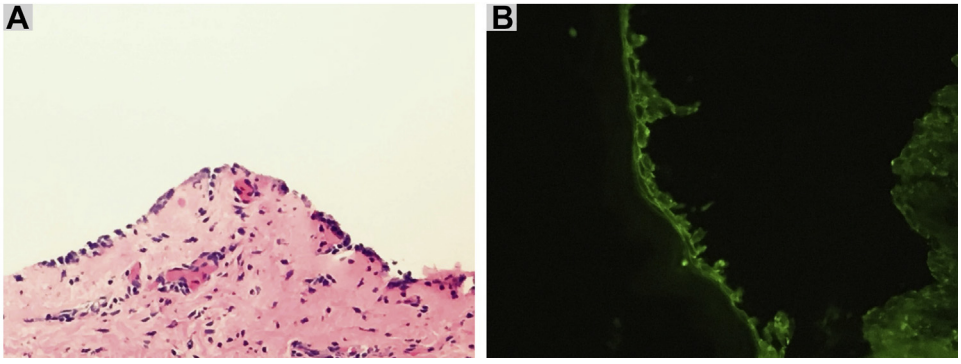

Fig 2. **A**, Histology demonstrated suprabasilar acantholysis; **B**, direct immunofluorescence was significant for intercellular, granular deposition of IgG.

while continuing empiric antibiotic treatment with piperacillin-tazobactam only. One week after admission, it was decided that the patient would benefit from Burn Intensive Care Unit admission for full body dressing changes and hydrotherapy. The patient's hospital course was complicated by superinfection with *Pseudomonas aeruginosa*, and he was treated with oral levofloxacin, as well as topical gentamicin and sulfamylon.

Six weeks after admission, the patient's skin was significantly improved with Dsg1 and Dsg3 antibodies decreased to 335 units and 610 units, respectively. The patient was discharged home with dermatology follow-up, home intravenous Ig infusions, continued oral and topical medications, and counseled not to use cocaine again. He presented to the dermatology clinic 2 weeks after hospital discharge and remained substantially improved; however, he has been unable to follow-up again due to loss of medical insurance.

DISCUSSION

Cocaine-induced PV and pemphigus vegetans are extremely rare and can occur after intranasal administration.[1-4] The first clinical discussion of cocaine inducing bullous disease occurred in the 1980s; however, this resulted after ingestion rather than intranasal exposure.[1-4] Although it is unknown how intranasal cocaine induces autoimmunity to Dsg proteins, possible explanations include effects of unknown adulterants, such as levamisole, quinine, procaine, or amphetamines, as well as

cocaine-induced vasospasm leading to ischemia, which has been implicated in the development of granulomatous polyangiitis with eosinophilia, IgA vasculitis, and urticarial vasculitis.[3]

The treatment of cocaine-induced PV mirrors that for idiopathic PV. Based on recent studies, patients with severe PV often require a combination of intravenous Ig, oral immunosuppressive medications such as corticosteroids, mycophenolate mofetil or azathioprine, and topical corticosteroids.[1-5] Other treatments that have been trialed for cocaine-induced PV include plasmapheresis and granulocyte colony-stimulating factor.[1] In multiple reports, cocaine re-challenge resulted in a relapse of PV.[1-3]

Conflicts of interest

None disclosed.

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