Nasal septal perforation associated with pyoderma gangrenosum

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ABSTRACT

Background: *Pyoderma gangrenosum (PG) is a skin condition characterized by necrotic ulcers and most commonly occurs on the legs in association with inflammatory bowel disease and rheumatoid arthritis; however, PG rarely involves the head and neck, and very rarely causes nasal septal perforation.*

Objective: *Here, we describe a case report of PG causing nasal septal perforation in a 71-year-old male with truncal lesions in the absence of either inflammatory bowel disease or autoimmune arthritis.*

Methods: *Case report with histologic description.*

Results: *Histology from nasal mucosal biopsies showed chronic inflammation and reactive change without evidence of malignancy. Together with serologic and nonserologic testing, as well as clinical evaluation, we were able to rule out other causes of septal perforation including Wegener's granulomatosis, lymphoma, and vasculitis, and concluded that the cause of nasal septal perforation was most likely PG.*

Conclusion: *Septal perforation etiology should include a complete history and physical to evaluate for systemic etiologies, including rare ones such as PG.*

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Pyoderma gangrenosum (PG) was first described in 1930 by Drs. Brunsting, Goeckerman, and O'Leary, who described the typical lesions as enlarging necrotic ulcers with erythematous to bluish undermined borders surrounded by spreading erythema.[1] Six major variants of the skin condition have since been outlined, including (1) ulcerative or classic, (2) pustular, (3) bullous or atypical, (4) vegetative, (5) peristomal, and (6) drug-induced PG.[2] Classic PG most commonly affects the lower limbs and usually is associated with inflammatory bowel disease (IBD) and rheumatoid arthritis, whereas the pustular variety, although similarly associated with IBD, is more commonly encountered on the limbs or the trunk. Bullous PG presents with vesicles, which rapidly enlarge to bullae, and is associated with hematologic malignancies. Vegetative PG typically presents as single truncal erosions. The peristomal variant, as the name suggests, develops around the area of an abdominal stoma in a patient with IBD, and, drug-induced PG occurs secondary to medications.[2]

PG of the head and neck is a rare entity, with an estimated incidence of 5% of all PG cases.[3] To date, only three cases of nasal septal involvement have been reported in the literature, one of which was associated with IBD. The following report details a case of PG that caused nasal septal perforation in the absence of IBD, autoimmune disease, or hematologic malignancy.

CASE REPORT

A 71-year-old white man with more than 1 year of headache and rhinorrhea was initially treated by his primary care provider for chronic sinusitis, which proved resistant to medical therapies, including a 6-week course of antibiotics, nasal saline solution rinses, and topical nasal steroid sprays. Initially, a computed tomography of the sinuses showed widening of the maxillary antrum and near-total loss of the nasal septum; however, the patient stated that he had no history of sinusitis, sinus surgery, trauma, cocaine use, intranasal medication use, or oxygen use by nasal cannula. His medical history included coronary artery disease and chronic obstructive pulmonary disease. He had no personal history of industrial exposures or recent international travel.

The patient was then referred to an otolaryngologist who noted complete erosion of the cartilaginous nasal septum and severe crusting throughout the nasal cavity on nasal endoscopy. At that time, a nasal mucosal biopsy specimen was obtained, which showed focal acute and mixed chronic inflammatory changes but no evidence of necrotizing vasculitis or granulomatous disease suggestive of Wegener granulomatosis (WG). In addition, cytoplasmic antineutrophil cytoplasmic antibody (C-ANCA) and perinuclear antineurtophil cytoplasmic antibody (P-ANCA), antimyeloperoxidase

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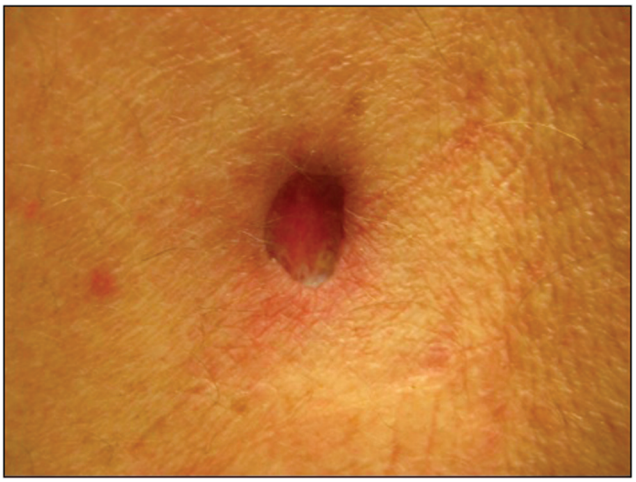

Figure 1. *Ulcerated lesion noted on the flank of this patient.*

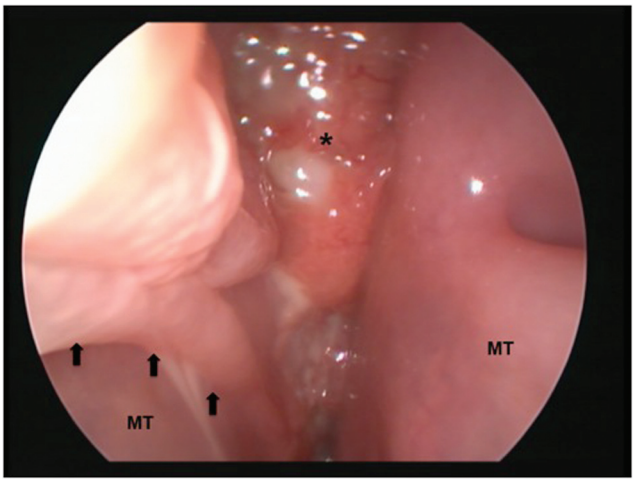

Figure 2. *Nasal endoscopy demonstrating a near total septal perforation (arrows) and irregular tissue at the cribriform plate (*). The right and left middle turbinates are visible and appear normal (MT).*

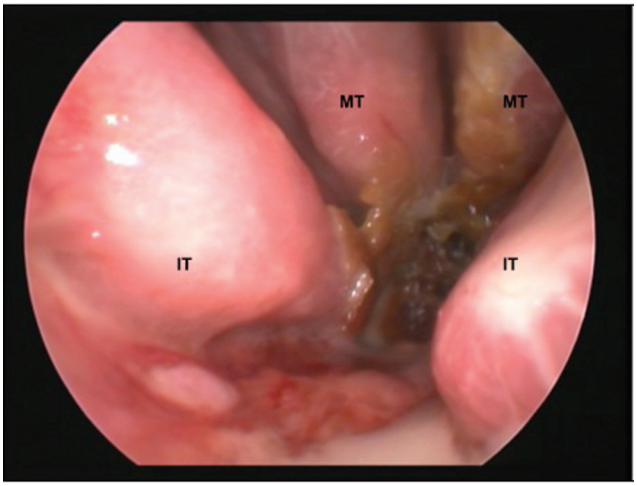

Figure 3. *Nasal endoscopy of the lower nasal cavity demonstrates and absent nasal septum with friable tissue and crusting. Both sets of inferior turbinates (IT) and middle turbinates (MT) are visible.*

antibody, and antiprotaminase 3 antibody serologies were negative. A biopsy was repeated, and tissue was sent for mycobacterial and fungal culture, which, likewise, was negative. Further histologic examination of the mucosal specimen again showed mixed inflammatory cells, without evidence to suggest vasculitis or granulomatous disease. Additional immunostains, including CD3, CD5, CD20, CD43, and CD79a, ruled out lymphoma.

Further questioning regarding the patient's medical history revealed that he was recently diagnosed with PG. The patient described the development of the lesions as small pustules on the abdomen, which later progressed to small, poorly healing ulcers. A biopsy of these lesions was performed, and, coupled with the history, he was given a diagnosis of pustular variant of PG. The lesions initially responded well to intralesional steroid injections with triamcinolone, but, more recently, the lesions were resistant to this treatment modality.

On physical examination, the patient was noted to have a 2.0 × 3.0-cm ulcerative lesion with undermined edges over the left flank region (Fig. 1). External nasal examination showed poor tip support, and anterior rhinoscopy demonstrated a large septal perforation. Nasal endoscopy showed near-total loss of the nasal septum with the exception of the most superior and inferior portions, and irregular soft tissue at the cribriform skull base as well as partial destruction of the inferior turbinates (Fig. 2). The nasal mucosa was edematous and friable, and dense crusting was noted throughout, most notably on the nasal floor (Fig. 3). Previous pathology slides were obtained for repeated evaluation and additional immunostaining for CD56, EBER, Melan A, S-100, and MAA to explore additional causes of septal perforation. These additional tests were negative, and, again, a histologic examination revealed the presence of dense acute and chronic inflammation as well as focal necrosis and focal lymphocyte extravasation but an absence of granuloma formation, malignancy, or vasculitis (Fig. 4). Hemosiderin deposition was also noted.

DISCUSSION

There are many causes of nasal septal perforation, but PG remains a diagnosis of exclusion despite attempts at developing diagnostic criteria; therefore, other causes of perforation must be ruled out before such a diagnosis can be made. Correlation with the patient's other clinical findings and tests, including serologic studies, is essential for the final diagnosis.[4] The differential diagnosis in this case includes WG, infection, malignancy, iatrogenic causes, and local irri-

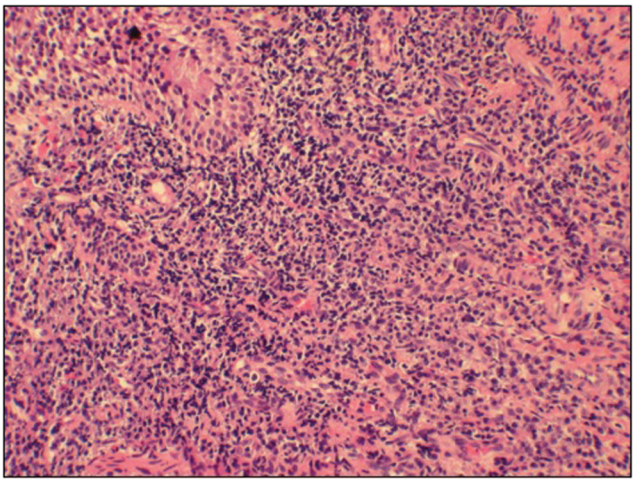

Figure 4. *Biopsy of the irregular tissue revealed acute and chronic inflammation with necrosis and lymphocytic extravasation, without evidence of vasculitis, granuloma, or neoplasm.*

tation from substances such as cocaine and even of topical corticosteroid use.

WG can be associated with necrotic skin lesions, which appear very similar to those of PG; hence, it is important to distinguish between PG and WG.[5] In early or localized WG, serologic testing is less useful and biopsy is often more accurate in making a diagnosis. Alternatively, in generalized disease, including pulmonary and renal involvement, ANCA testing is often more useful.[6] In our patient, the serologic marker cytoplasmic ANCA was negative, and there was an absence of pulmonary and renal findings with chest radiography and urinalysis. In addition, histology from two nasal biopsy specimens failed to show granuloma formation or vasculitis. Together, negative serologic testing and incompatible histologic findings make even localized WGs highly improbable.[6]

Malignancy is another important possible diagnosis, more specifically, nasal NK/T-cell lymphoma. Common immunohistochemical markers of this lymphoma include CD2, CD56, CD3, and T-cell receptors.[7] Typically, the histology of these lymphomas are characterized by monomorphic inflammatory cellular infiltrates, which may be diffuse or show angiocentricity and angiodestruction as well as tissue destruction.[7] Lymphoid markers from the nasal mucosal biopsy from this patient were negative for CD56 and EBER. The lymphoid population was a polymorphic T- and B-cell population with plasma cells but without cells suspicious for malignancy. Based on these findings, NK/T-cell lymphoma was also excluded as a possible cause of septal perforation.

Histologic findings associated with PG are generally nonspecific and include dense polymorphonuclear leukocyte infiltrates, perivascular lymphocytes, and thrombosis of vessels with extravasated erythrocytes.[2] This description is consistent with the description of the mucosal biopsy specimen taken from the patient of this case report, which included findings of dense acute and chronic inflammation; perivascular lymphocytes; focal necrosis; and reactive changes, including focal blood extravasation with hemosiderin deposition.

The patient's lack of previous sinonasal surgery, trauma, or cocaine use, combined with serologic testing, histology, microbiology, and immunohistochemical analysis eliminate the above possible causes of nasal septal perforation and point to PG as the most likely cause. Although many are considered idiopathic, it is important to make efforts to identify the etiology of septal perforation, and a thorough history and physical examination may aid the workup and help establish the diagnosis.

REFERENCES

1. Brunsting LA, Goeckerman WH, and O'Leary PA. Pyoderma gangrenosum: Clinical and experimental observations in five cases occurring in adults. Arch Dermatol 22:655–680, 1930.
2. Cohen PR. Neutorphilic dermatoses. Am J Clin Dermatol 10: 301–312, 2009.
3. Wittekindt C, Luers JC, Klussmann JP, and Huttenbrink KB. Pyoderma gangrenosum in the head and neck. Arch Otolaryngol Head Neck Surg 133:83–85, 2007.
4. Callen JP, and Jackson JM. Pyoderma gangrenosum: An update. Rheum Dis Clin North Am 33:787–802, vi, 2007.
5. Daoud MS, Gibson LE, DeRemee RA, et al. Cutaneous Wegener's granulomatosis: Clinical, histopathologic, and immunopathologic features of thirty patients. J Am Acad Dermatol 31:605–612, 1994.
6. Borner U, Landis BN, Banz Y, et al. Diagnostic value of biopsies in identifying cytoplasmic antineutrophil cytoplasmic antibody-negative localized Wegner's granulomatosis presenting primarily with sinonasal disease. Am J Rhinol Allergy 26:475–480, 2012.
7. Kwong YL. Natural killer-cell malignancies: Diagnosis and treatment. Leukemia 19:2186–2194, 2005. □