

Richard O. Davila, MD<sup>1</sup>; Shumon I. Dhar, MD<sup>1</sup>; Mark F. Marzouk, MD<sup>1</sup>; Ramsay S. Farah, MD<sup>1</sup>; Amar C. Suryadevara, MD<sup>1</sup>  
<sup>1</sup>SUNY Upstate Medical University  
Department of Otolaryngology and Communication Sciences

## Introduction

Synthetic deoxycholic acid (DCA, brand name “Kybella”) is the first pharmacological intervention approved by the FDA for the reduction of submental fat. Since its approval in 2015, Kybella injections have gained popularity as a minimally invasive alternative for submental fat reduction when compared to surgery (platysmaplasty with or without facelift and/or liposuction of the neck and chin)<sup>1</sup>.

DCA acts as an endogenous bile acid which emulsifies and solubilizes dietary fats in the intestines. As an exogenous injection, DCA causes disruption of cell membranes in fat cells causing adipocytolysis<sup>1,2</sup>.

*Pyoderma gangrenosum* (PG) is a rare, non-infectious ulcerative cutaneous pathology of uncertain etiology<sup>3</sup>. It is often rapidly progressive and can be easily misdiagnosed, thus causing delay in diagnosis and treatment. Patients with PG usually describe an initial presenting lesion as a bite reaction or minor local injury which progresses to a larger ulcerative wound. There are several subtypes of PG but the classic “ulcerating type” is characterized by a deep ulcerative cavity with a violaceous undermined border and surrounding erythema. Presentation of PG in the head and neck region is extremely rare with rates of 5% being reported in the literature<sup>4,5</sup>.

We describe a case of *Pyoderma gangrenosum* presenting as a ulcerating wound following an injection of deoxycholic acid (“Kybella”) for submental fat reduction.



Figure 1. Hospital day 4, POD#1 following first debridement



Figure 2. Hospital day #10



Figure 3. Hospital day #20 (day #7 of immunosuppressive therapy)



Figure 4. One month after discharge from the hospital



Figure 5. Three months after discharge from the hospital

HOSPITAL DAY	CLINICAL STATUS	INTERVENTION
1	4 days post Kybella injection, local edema/ erythema	Oral antibiotic (Augmentin)
3-5	Skin blanching and central necrosis, vancomycin- induced renal failure	Broad spec IV Abx , 1 <sup>st</sup> surgical debridement
6-8	Continued wound expansion and necrosis, hemodynamic instability and respiratory failure	Continued surgical debridements, ventilator and pressure support
8-10	Continued wound expansion and necrosis	ID expanded antibiotic and fungal coverage, HBOT x2, additional debridements
12-13	Satellite chest ulcerative wound	Punch biopsies sent for dermatopathologic evaluation
14	Diagnosis made	Immunosuppressive therapy initiated
21	Wound contracture and resolution	Discharged from the hospital
3 months after discharge	Anemic, diagnosed with acute myelogenous leukemia (AML)	Chemotherapy initiated

## Case Presentation

Our patient is a 44 year-old white female status post Kybella injection to the submental region for treatment of a double chin. She presented with tenderness, swelling and erythema to the site of injection 4 days after the procedure. She was initially placed on a course of oral Augmentin, but returned to the emergency department 3 days later with significantly worsened erythema, edema and pain. A CT scan of her neck revealed fat stranding and edema within the submental compartment but with no evidence of abscess formation. She was admitted and placed on broad spectrum antibiotics.

## Case Presentation – con’t

In-house, the patient’s condition failed to improve, and the wound began demonstrating skin blanching and central ulceration. The decision was made to take her to the OR for a debridement and washout. In the OR, she was found to have extensive non-viable tissue and subcutaneous purulence but no frank abscess. A 6x8cm wound was left open following debridement (Fig.1). Cultures were sent and these resulted positive for *Pseudomonas* species.

In the coming days, the wound continued to expand in spite of negative pressure wound therapy, subsequent OR debridements and hyperbaric oxygen therapy. Her overall condition deteriorated with expanding ulceration and necrosis of the surrounding tissues with concurrent hemodynamic instability requiring ventilator and pressure support (Fig. 2) Given the lack of improvement on antibiotics and repeated debridements, it became evident that further surgical interventions would be futile. Furthermore, new ulcerative lesions began to develop along the patient’s chest. Looking to consolidate a pathologic process, biopsies were obtained from both sites. These revealed histological characteristics of dense neutrophilic infiltrate within the dermis, endothelial swelling but without evidence of vasculitis, consistent with *Pyoderma Gangrenosum*.

She was started on corticosteroid therapy (40mg/daily of methylprednisolone) and local wound care with immunosuppressive ointment (Tacrolimus 0.1%). She had rapid and significant improvement and was discharged home 7 days after initial treatment with a steroid taper and topical immunosuppressive ointment ( Fig.3). In the following months, her wound completely healed. (Fig. 4 & 5)

Unfortunately, 3 months after her original presentation she was found to be anemic on routine blood testing and subsequently diagnosed with acute myelogenous leukemia (AML). She was treated with chemotherapy and is currently in remission.

## Discussion

PG is an inflammatory, neutrophilic ulcerative condition first described by Brocq<sup>6</sup> in 1916. Its diagnosis is based on clinical presentation and exclusion of infectious and/or neoplastic processes. There is no specific histological or laboratory criteria for PG<sup>4,5,7</sup>. In our patient’s case, her elevated white blood cell count, fevers and aggressive behavior initially favored an infectious etiology, a misdiagnosis often made.

Furthermore, PG has been shown to exhibit “pathergy”, a process not fully understood in which minor trauma to local tissue can propagate development of ulceration. In many cases, PG have presented as post operative complications after surgery<sup>5</sup>. In our case, this is likely the mechanism by which the injection of Kybella initiated this inflammatory cascade, as well as the reason surgical debridements failed to result in improvement.

It is postulated that PG may be an autoimmune process, particularly given its response to corticosteroids and immunosuppressants<sup>4-8</sup>. Moreover, there has been close association between PG and hematological malignancies/myelodysplastic syndrome and there is thought that PG may be a paraneoplastic presentation of another hematopoietic malignancy<sup>9</sup>. Our case may support this argument, as our patient presented with acute myelogenous leukemia (AML) 3 months after her initial diagnosis.

## Conclusions

***Pyoderma gangrenosum* is rare in the head and neck region and is often misdiagnosed. Apparent wound infections and non-healing wounds not responsive to antibiotic treatment should prompt suspicion towards a non-infectious etiology such as PG. Systemic corticosteroid therapy is the cornerstone of treatment, while immunosuppressant medications may serve as useful adjuncts.**

**PG has also has been associated with latent immunohematological diseases. Therefore, prompt rheumatologic and hematologic evaluations are essential to rule out any underlying malignant disorders. To our knowledge, this is the first case of PG presenting after an injectable cosmetic procedure, and the second case of ulcerative-type PG presenting with possible latent leukemia.**

## Contact

Amar Suryadevara, MD  
Program Director & Associate Professor, Department of Otolaryngology and Communication Sciences  
SUNY Upstate Medical University  
Email: SuryadeA@upstate.edu  
Website: <http://www.upstate.edu/ent>  
Phone: 315-464-4636

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