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Prurigo pigmentosa following laparoscopic gastric sleeve

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Abstract

Prurigo pigmentosa is an uncommon inflammatory skin disease predominately affecting young women. Clinically the disease presents with erythematous and urticarial papules arranged in a reticular pattern. Lesions heal with reticulated hyperpigmentation. Strict ketogenic diet is one of many factors that might trigger the disease. In this article, we present a case of prurigo pigmentosa following a complicated laparoscopic gastric sleeve with the resolution of the rash after improvement of the patient's diet.

Keywords: bariatric surgery, prurigo, reticulated erythema

Introduction

Prurigo pigmentosa, which was first described by Nagashima et al, is an inflammatory skin disease characterized by lesions that present as erythematous or urticarial pruritic papules grouped in a reticulated pattern with occasional vesicles and pustules. The disease is commonly seen in the Japanese population. However, more cases are reported worldwide, perhaps because of increased knowledge of the disease. The disease predominantly effect young females with a ratio to 4-6:1. It has not been reported in children or the elderly [1, 2].

Case Synopsis

A 37-year-old woman who underwent a laparoscopic gastric sleeve complicated by splenic infarction and gastric leak developed an intensely pruritic rash twelve days post-operatively. The patient noticed multiple erythematous pruritic papules on the back

(**Figure 1A**). Four days later, the papules gradually progressed into multiple reticulated erythematous plaques all over the upper two thirds of the back (**Figure 1B**). She presented to the dermatology clinic two months after surgery with multiple reticulated erythematous plaques and reticulated hyperpigmented patches involving the mid back (**Figure 2**). She also had a few reticulated erythematous plaques of the mid chest and scattered urticarial plaques on the right lateral back.

Skin biopsy was performed on one of the urticarial back lesions. Histopathological examination showed superficial and mid dermal perivascular cuffing by lymphocytes with rare eosinophils. There was no interstitial inflammation. The epidermis showed focal parakeratosis and minimal spongiosis (**Figure 3**). Special stains for fungus were negative (not shown). Urine ketones were positive; however, the patient had a concomitant urinary tract infection.

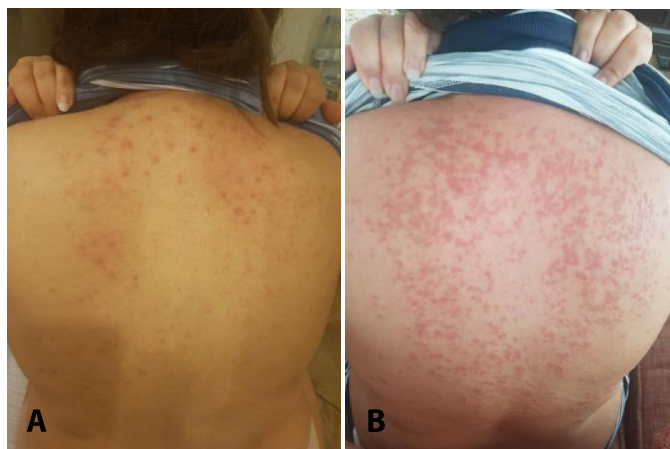


Figure 1. A) Multiple erythematous pruritic papules on the back twelve days post-operative. **B)** Multiple reticulated erythematous plaques all over the back sixteen days post-operative.

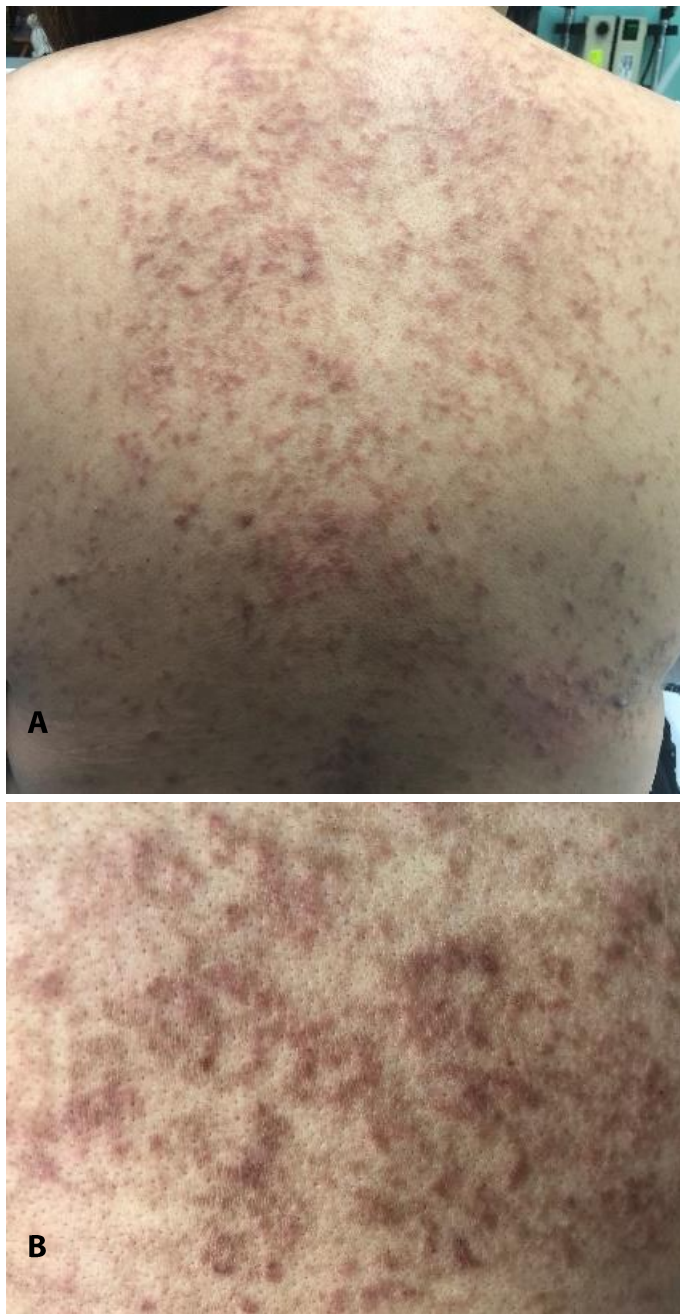


Figure 2. A) Multiple reticulated erythematous plaques and reticulated hyperpigmented patches 60 days post operatively. **B)** Close up of patches.

The patient was initially treated by the emergency services with intravenous and oral steroids with no response. Topical corticosteroids did not affect the pruritus. After presentation to the dermatology clinic the patient was started on minocycline, but could not tolerate the related epigastric pain and stopped it after 3 days. Almost 90 days after surgery the patient's rash improved spontaneously with improvement of her oral intake.

Case Discussion

Abbas et al. reported a case of a 40-year-old woman who developed a similar condition following gastric sleeve procedure. [Table 1](#) summarizes and compares features of that case and our patient [4].

Prurigo pigmentosa lesions are usually symmetrically distributed in the midline on the trunk. Bullous or vesicular lesions have been reported. Mucous membranes, nails, and hair are not affected. The disease duration range is one month to 7 years, with flares and remissions. There are no systemic symptoms.

There are many histopathological patterns for the disease. Such patterns depend on the stage of the disease. Early stages usually reveal epidermal spongiosis or intraepidermal vesicle formation along with scattered or grouped epidermal neutrophils. A few necrotic keratinocytes scattered superficial sparse perivascular lymphocytic, neutrophilic, and eosinophilic infiltrate along with papillary dermal edema have also been reported. On the other hand, fully developed cases, as in our patient, show a lymphocyte-predominant infiltrate in the dermis with occasional eosinophils. Neutrophils and necrotic keratinocytes can also be seen. Melanophages can be detected in the dermis once the hyperpigmentation starts to develop. Immunofluorescence is negative.

There are many etiological factors suggested in the pathogenesis prurigo pigmentosa. Such factors include diabetes mellitus, strict ketogenic diet, atopic dermatitis, and pregnancy. Trauma such as acupuncture and friction may be triggers for the appearance of the eruption. The disease is not known to be familial [1, 2, 4-7]. The drop in insulin levels and the possible elevation in urine and blood ketones in some patients post-bariatric surgery may cause collection of ketone bodies around blood vessels. It has been postulated that this leads to perivascular inflammation, explaining the role of ketones in some cases of prurigo pigmentosa [8, 9].

Topical and systemic corticosteroids are not usually effective. Dapsone and tetracycline antibiotics are the most helpful medications because of their effect on neutrophilic chemotaxis and activity. Macrolide

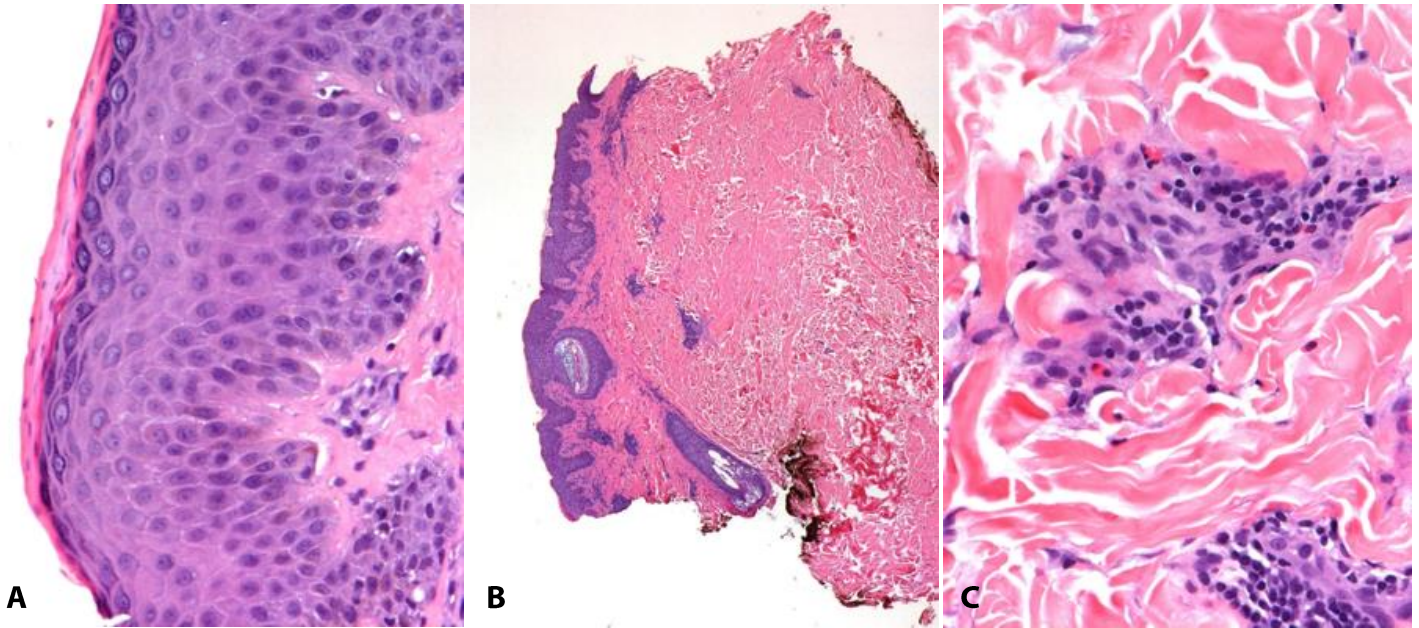


Figure 3. A) Epidermal hypertrophy with hyperkeratosis and parakeratosis. H&E, 400×. **B)** Superficial and mid dermis perivascular cuffing by lymphocytes. H&E, 40×. **C)** High power view exhibiting perivascular inflammation with eosinophils. H&E, 400×.

antibiotics and potassium *iodide* have also been found to be effective. Low dose isotretinoin was found to be effective in two cases reported in the literature [2, 10-12].

Conclusion

We describe a patient with prurigo pigmentosa in the setting of bariatric surgery. The poor oral intake

post-surgery could have induced ketosis, which is one of the possible etiologies postulated. Oral antibiotics were not tolerated by our patient; however, once oral intake was tolerated the condition markedly improved.

Potential conflicts of interest

The authors declare no conflicts of interests.

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Table 1. Our case compared with the case reported by Abbas et al. [3].

Cases of prurigo pigmentosa following gastric sleeve surgery	Abbas et al.	Our patient
Age	40 years	37 years
Sex	Female	Female
Race	Middle eastern	Middle eastern
Onset of rash post-surgery	One week	Twelve days
Location	Chest and Back	Chest and Back
Morphology	<ul style="list-style-type: none"> -Erythematous Papules and vesicles on chest and back -Reticulated hyperpigmented macules on chest and back 	<ul style="list-style-type: none"> -Erythematous pruritic papules on the back, that gradually progressed into multiple reticulated erythematous plaques on trunk. -Few urticarial plaques -Reticulated hyperpigmented patches
Pathology	<ul style="list-style-type: none"> -Focal epidermal parakeratosis and minimal spongiosis -Mild epidermal hyperplasia -Mild to moderate dense superficial and mid-dermal perivascular and interstitial lympho-neutrophilic infiltrate with scattered eosinophils 	<ul style="list-style-type: none"> -Focal epidermal parakeratosis and minimal spongiosis -Mild epidermal hyperplasia -Superficial and mid dermis perivascular cuffing by lymphocytes with rare eosinophils.
Labs	-Complete blood count, liver function tests, comprehensive metabolic panel, and autoimmune evaluation showed no abnormalities	-Urine ketones positive
Treatment	-Doxycycline (100mg,twice daily)	-Intravenous and oral steroids -Minocycline
Response to therapy	-Improved significantly	-No response to steroids -Minocycline not tolerated -Improved with improvement of diet