Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index *eISSN: 2079-1224*

Case report

Nagashima Disease Following Bariatric Surgery: A Case Report

Tarik Enaairi[1]*, Fathi Elzowawi[2]

[1]Department of Dermatology, National Cancer Institute, Misrata, Libya
[2]Department of General and Bariatric Surgery, Misrata Medical Center, Misrata, Libya
Corresponding Email: *tariq5254@yahoo.com*

Keywords. *Bariatric surgery, Prurigo pigmentosa, Libyan male, Ketogenic diet.*
.

A B S T R A C T

Bariatric surgery is an effective intervention for severe obesity and related comorbidities. The global increase in obesity has led to a rise in bariatric procedures, highlighting the need for the evaluation and management of postoperative complications. These complications vary from minor issues to life-threatening events. Prurigo pigmentosa (PP), also known as Nagashima disease, is an acquired dermatological condition characterized by a markedly pruritic eruption of erythematous papules and papulovesicles on the back, neck, and chest and improved leaving macular reticulated hyperpigmentation. First described in 1971 by Japanese dermatologist Masaji Nagashima, the condition was initially observed among eight patients of Asian descent. PP has been strongly associated with ketosis and a ketogenic diet; however, its precise etiology remains unclear. The condition predominantly affects young women of Asian descent. Here, we report a case of PP in a Libyan male, which developed 13 days post-bariatric surgery. This presentation could be suggestive of a stronger relationship between PP and the metabolic state of the body. It also outlines the effectiveness of treatment options currently in use for treating PP.

Introduction

Bariatric surgery is widely recognized as an effective intervention for managing severe obesity and its associated comorbidities, including type 2 diabetes mellitus, hypertension, and obstructive sleep apnea [1]. The global rise in obesity has led to an increase in bariatric procedures, underscoring the importance of comprehensively understanding and managing postoperative complications [1,2]. These complications can range from minor issues to life-threatening events, significantly impacting patient outcomes and recovery [2].

Prurigo pigmentosa (PP), also referred to as Nagashima disease or "keto rash," is a rare inflammatory dermatological disorder first described by Nagashima et al. in 1971 [3,4]. The clinical presentation of PP varies according to the disease stage [5]. In the early stage, the condition is characterized by the development of urticarial papules and plaques exhibiting a gross reticular pattern [5,6]. Histopathologically, this stage is defined by a perivascular infiltrate of polymorphonuclear cells [5,7]. As the disease progresses, vesicular lesions emerge, leading to a papulovesicular rash [5]. The histopathological features of this intermediate stage include spongiosis and necrotic keratinocytes [7,8]. In the final stage, the disease presents with pigmented macules arranged in a reticular configuration [5]. At this stage, histological findings reveal a lymphocytic infiltrate and melanophages in the papillary dermis [8,9]. The rash ultimately resolves, often leaving post-inflammatory hyperpigmentation [10,11].

PP predominantly affects the trunk, neck, and chest. Initially believed to be confined to individuals of Asian descent, particularly those of Japanese origin, the condition has now been reported globally. Additionally, a notable female predominance has been observed in documented cases [12, 13]. PP has been strongly linked to ketosis, with several ketosis-inducing factors identified, including adherence to a ketogenic diet, primary biliary cirrhosis, and bariatric surgery [5,14,15]. Despite the precise pathogenesis and etiology of PP remaining unclear, one proposed hypothesis suggests that it is a reactive inflammatory response potentially associated with bacterial folliculitis [5,16].

The primary treatment for PP is minocycline, while alternative therapeutic options include macrolides, doxycycline, dapsone, and dietary modifications to mitigate ketosis [7,17,18].

Case presentation

A 19-year-old Libyan male with morbid obesity (weight: 130 kg; BMI: 45.1, class III obesity) presented with a 3-day history of an intensely pruritic cutaneous eruption. Notably, the eruption began 13 days after he underwent a laparoscopic gastric sleeve procedure for bariatric intervention. The patient had no prior

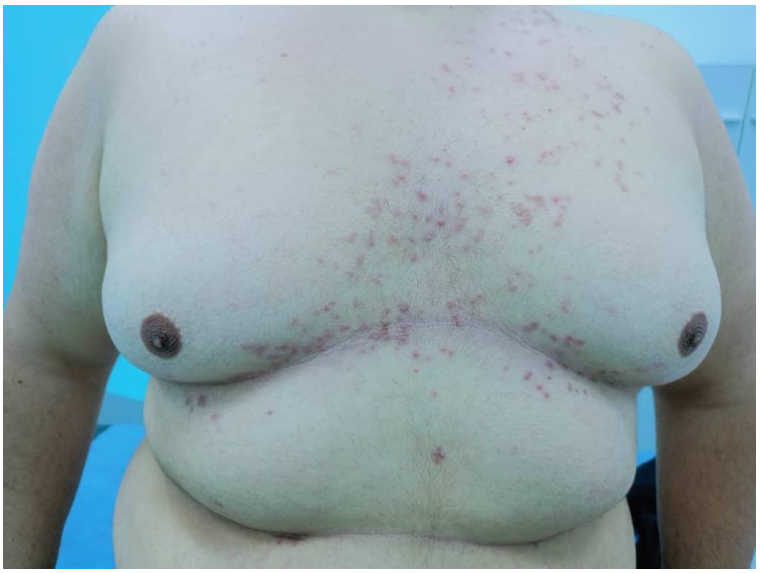
Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*

Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index *eISSN: 2079-1224*

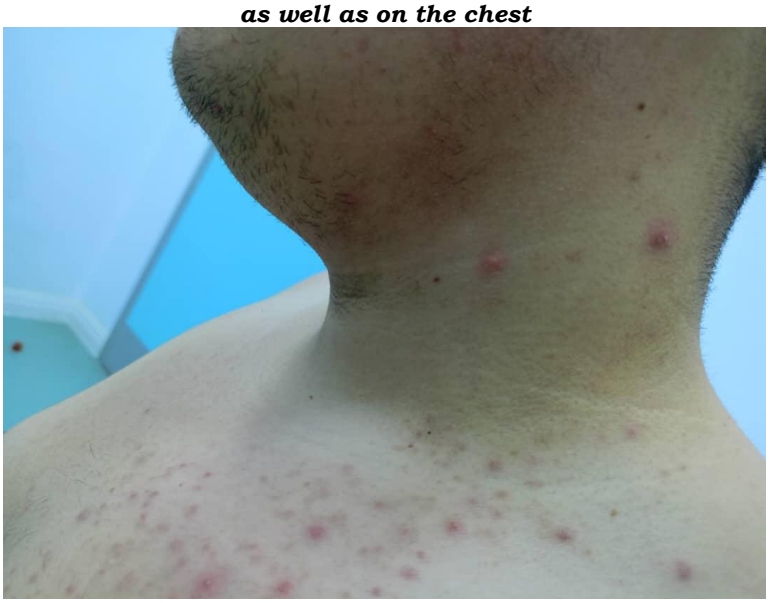
dermatological history, and, aside from his current smoking habit, his past medical and surgical histories were unremarkable. No history of the same rash in his family

On examination, multiple erythematous papulovesicles were observed that coalesced into reticulated plaques. The lesions were predominantly distributed in the intermammary and submammary regions as well as on the left chest (Figures 1), with further extension to the neck and upper back (Figures 2&3). No scaling or excoriations were noted. Although the pruritus was severe, it did not interfere significantly with his daily activities, and he denied any systemic symptoms such as fever. The patient refused a skin biopsy. Preoperative laboratory studies revealed a hemoglobin level of 16.5 g/dL, a white blood cell count of 10×10^9/L, and a platelet count of 225×10^9/L; his blood group was A^+. Postoperatively, the patient was managed with the following medications: Esomeprazole 40 mg twice daily, Centrum Advance multivitamin once daily, and calcium carbonate 120 mg once daily. Administer enoxaparin 0.2 ml once daily.

Patients were treated with doxycycline 100 mg twice daily for 4 weeks and topical tacrolimus 0.1% ointment applied twice daily to the affected areas. At the 2-week follow-up, he reported strict adherence to the regimen with complete resolution of pruritus and cutaneous lesions. Physical examination confirmed the absence of active inflammation, with residual post-inflammatory hyperpigmentation arranged in a reticulated pattern (Figures 4, 5). No new lesions or systemic symptoms were noted. Hydroquinone 4% cream was prescribed to treat the post-inflammatory hyperpigmentation.



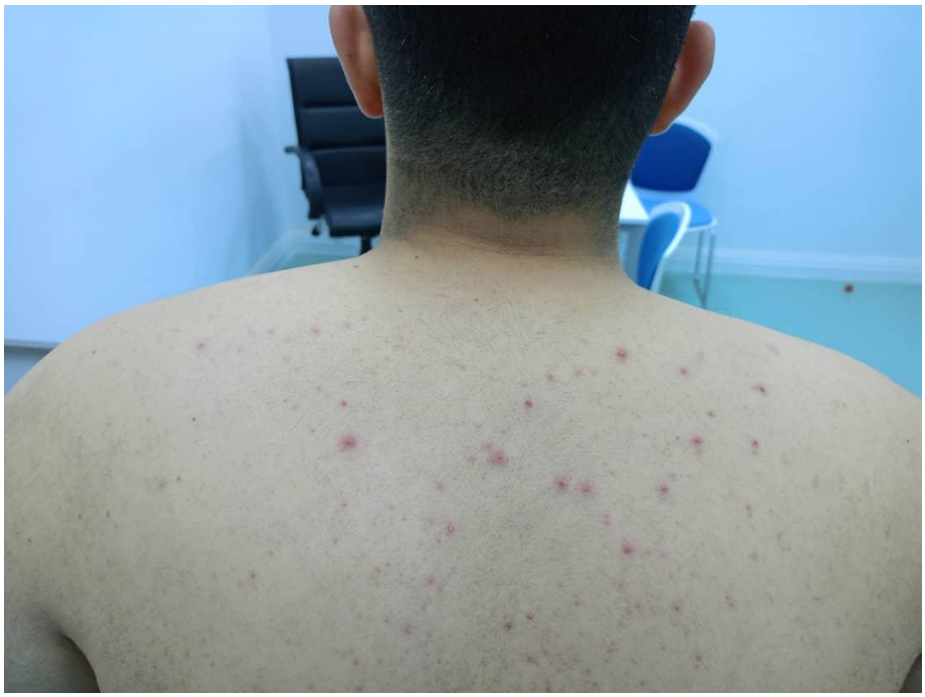
Figures 1: Erythematous papulovesicles in a reticulated pattern predominantly in the submammary regions as well as on the chest



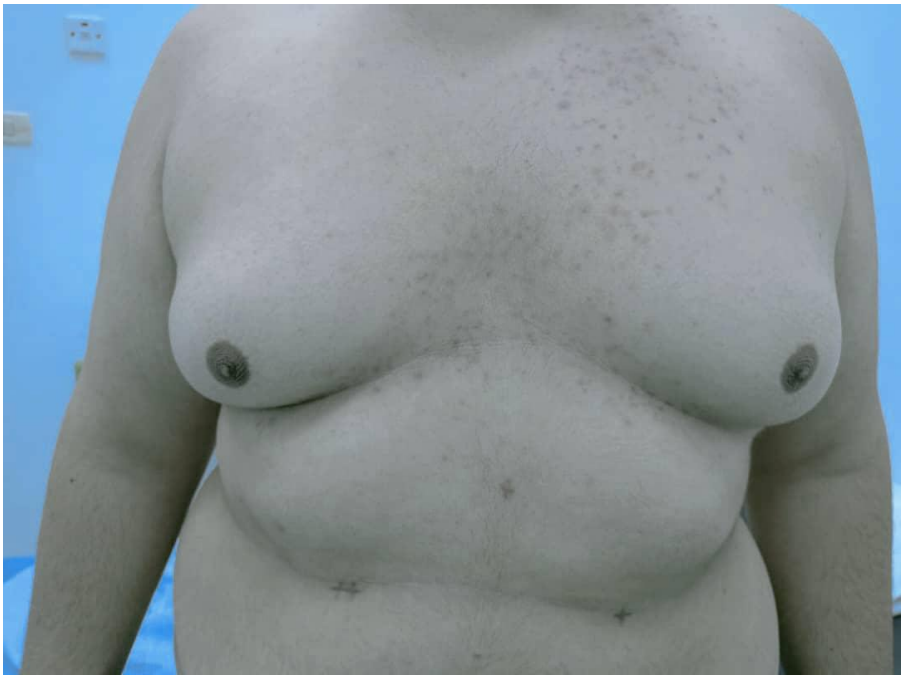
Figures 2. Extinction of erythematous papulovesicular rash to the neck

Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*

Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index *eISSN: 2079-1224*



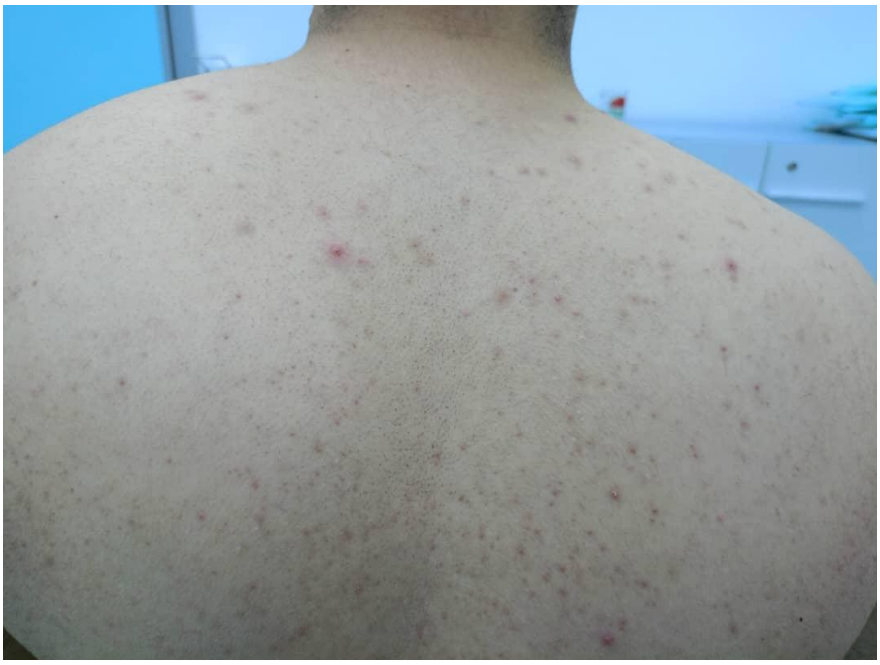
Figures 3. Erythematous papulovesicular rash on the upper back



Figures 4. At the 2-week follow-up, absence of active inflammation, with post-inflammatory hyperpigmentation (chest)

Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*

Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index *eISSN: 2079-1224*



Figures 5. At the 2-week follow-up, absence of active inflammation, with post-inflammatory hyperpigmentation (back)

Discussion

Prurigo pigmentosa (PP) is a rare inflammatory dermatosis first described by Nagashima et al. in 1971 [3]. Since then, more cases have been reported worldwide [7,19]. The condition demonstrates a female predominance, with a female-to-male ratio of 2:1 [9,20]. Although the precise etiology remains unclear, several well-defined triggering factors have been identified [7]. Notably, carbohydrate restriction and the subsequent induction of ketosis are recognized as primary precipitating factors [8,11].

PP has been associated with various underlying conditions, including atopy, pregnancy, diabetes mellitus, prolonged fasting, and post-bariatric surgery [14]. Additional triggers include excessive sweating, friction from clothing, mechanical irritation, and contact dermatitis [14, 20]. Moreover, PP has been linked to infectious agents such as Helicobacter pylori (H. pylori) and autoimmune and inflammatory disorders, including Still's disease and Sjögren's syndrome [9, 13]. While no genetic predisposition has been established, the condition appears to be more frequently reported in individuals of Asian descent [7, 18].

Theoretically, the typical PP patient is a young adult female from Eastern Asia who has been adherent to a ketogenic diet [4, 12]. Our case is a young Libyan male who developed a pruritic papulovesicular rash characteristic of prurigo pigmentosa (PP) 13 days post-bariatric surgery. Although the patient did not follow a specific dietary regimen, maintaining a well-balanced diet during the early postoperative period may have predisposed him to ketosis.

Prurigo pigmentosa (PP) has been suggested to have a genetic predisposition, particularly associated with increased expression of ICAM-1 and HLA-DR4 [19,21,22]. However, genetic testing was not performed in this case. In our case, there was no documented family history of prurigo pigmentosa (PP). Nevertheless, previous reports have highlighted familial occurrences of PP, including a case described by Houriet et al., 2025 in monozygotic twin females [23]. Furthermore, Danielsen et al., 2023 and Al-Zahawi et al., 2025 reported cases of PP in sibling couples, supporting the hypothesis of an underlying genetic susceptibility [21,22].

Prurigo pigmentosa (PP) typically presents with a symmetrical distribution, commonly affecting the nape of the neck, submammary regions, central chest, upper back, lumbosacral area, and abdomen [5, 7, 20] However, atypical asymmetric patterns have also been documented, including unilateral presentations [9, 12, 16] Additionally, Torrelo et al., 2014 reported a case of PP exhibiting a segmental distribution [19], which further supporting the genetic predisposition, possibly linked to genetic mosaicism. In the present case, the lesions predominantly involve the submammary regions and the left side of the chest, with further extension to the neck and upper back. The histopathological findings of prurigo pigmentosa (PP) can be nonspecific; however, distinct histological features are observed at various stages of the disease [6,10,18]. As demonstrated in the present case, in many reported cases, patients refuse to undergo a skin biopsy [11,16,20]. The diagnosis is often supported by a history of potential triggering factors, the characteristic

Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*

Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index *eISSN: 2079-1224*

presentation of a pruritic eruption, and subsequent clinical improvement with standard treatment for PP, followed by post-inflammatory reticulated hyperpigmentation.

Conclusions

Prurigo pigmentosa (PP) is classically observed in young adult females from Eastern Asia, often associated with adherence to a ketogenic diet. In contrast, we present a case of a young Libyan male who developed PP following bariatric surgery. Treatment with doxycycline led to the complete resolution of the condition. Given the largely nonspecific clinical and histopathological features of PP, a high index of suspicion is essential, as many cases may remain undiagnosed.

Conflicts of interest

The authors declare no conflicts of interest related to this case report.

References

1. Angrisani L, Santonicola A, Iovino P, Vitiello A, Higa K, Himpens J, Buchwald H, Scopinaro N. IFSO worldwide survey 2016: primary, endoluminal, and revisional procedures. Obesity surgery. 2018 Dec;28:3783-94.
2. Nimeri A, Oviedo R, Vosburg WR, Fam J, Blalock CA, Altieri MS, et al. ASMBS statement on metabolic and bariatric surgery for beneficiaries of Centers for Medicare and Medicaid Services with a review of the literature. Surgery for Obesity and Related Diseases. 2023 Dec 1;19(12):1331-8.
3. Nagashima M. A peculiar pruriginous dermatosis with gross reticular pigmentation. Jpn J Dermatol. 1971;81:38-9.
4. Nagashima M. Prurigo pigmentosa: clinical observations of our 14 cases. The Journal of Dermatology. 1978 Apr;5(2):61-7.
5. Beutler BD, Cohen PR, Lee RA. Prurigo pigmentosa: literature review. American journal of clinical dermatology. 2015 Dec;16:533-43.
6. Almaani N, Al-Tarawneh AH, Msallam H. Prurigo pigmentosa: a clinicopathological report of three Middle Eastern patients. Case Reports in Dermatological Medicine. 2018;2018(1):9406797.
7. Shen A, Cheng CE, Malik R, Mark E, Vecerek N, Maloney N, et al. Prurigo pigmentosa: A multi-institutional retrospective study. Journal of the American Academy of Dermatology. 2023 Aug 1;89(2):376-8.
8. Oba MC, Arican CD. Clinical features and follow-up of prurigo pigmentosa: a case series. Cureus. 2022 Apr;14(4).
9. Altalhi ER, Azhari MS, Aljuhani SS, Baltow BA, Al Hawsawi K, Altalhi E. Prurigo Pigmentosa: A Case Report With Unusual Presentation. Cureus. 2022 Dec 6;14(12).
10. Böer A, Misago N, Wolter M, Kiryu H, Wang XD, Ackerman AB. Prurigo pigmentosa: a distinctive inflammatory disease of the skin. The American journal of dermatopathology. 2003 Apr 1;25(2):117-29.
11. Oh YJ, Lee MH. Prurigo pigmentosa: a clinicopathologic study of 16 cases. Journal of the European Academy of Dermatology and Venereology. 2012 Sep;26(9):1149-53.
12. Mufti A, Mirali S, Abduelmula A, McDonald KA, Alabdulrazzaq S, Sachdeva M, et al. Clinical manifestations and treatment outcomes in prurigo pigmentosa (Nagashima disease): a systematic review of the literature. JAAD international. 2021 Jun 1;3:79-87.
13. Togawa Y, Shinkai H, Utani A. Prurigo pigmentosa in a patient with primary biliary cirrhosis and Sjögren syndrome. The Journal of Dermatology. 2004 Oct;31(10):815-9.
14. Alkhouri F, Alkhouri S, Potts GA. Prurigo pigmentosa following a keto diet and bariatric surgery. Cureus. 2022 Apr;14(4).
15. Alshaya MA, Turkmani MG, Alissa AM. Prurigo pigmentosa following ketogenic diet and bariatric surgery: A growing association. JAAD Case Reports. 2019 Jun 1;5(6):504-7.
16. Abbass M, Abiad F, Abbas O. Prurigo pigmentosa after bariatric surgery. JAMA dermatology. 2015 Jul 1;151(7):796-7.
17. Alsebayel MM, Ghobara YA, Al-Issa A. Facial prurigo pigmentosa after bariatric surgery. Cureus. 2020 Feb;12(2).
18. Kafle SU, Swe SM, Hsiao PF, Tsai YC, Wu YH. Folliculitis in prurigo pigmentosa: a proposed pathogenesis based on clinical and pathological observation. Journal of Cutaneous Pathology. 2017 Jan;44(1):20-7.
19. Torrelo A, Azorín D, Noguera L, Hernández-Martín A, Happle R, Requena L. Segmental prurigo pigmentosa. Pediatric Dermatology. 2014 Jul;31(4):523-5.
20. Liu Y, Li J, Zhou G, Wang J, Chen X, Chen S, et al. Prurigo pigmentosa: A retrospective study of 11 patients. Indian Journal of Dermatology, Venereology and Leprology. 2024 Sep 1:1-5.
21. Danielsen M, Pallesen K, Riber-Hansen R, Bregnhøj A. A Rare Case of Prurigo Pigmentosa in a Danish Sibling Couple. Case Reports in Dermatology. 2023 Jan 6;15(1):26-30.
22. Al-Zahawi S, Saberi F, Azhari V, Kamyab K, Balighi K. A Rare Case of Prurigo Pigmentosa in Iranian Sibling Couple. Clinical Case Reports. 2025 Jan;13(1):e70121.
23. Houriet C, Perruchoud DL, Beltraminelli H, Borradori L. Prurigo pigmentosa in white monozygotic twins. JAMA dermatology. 2017 Mar 1;153(3):353-4.

Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*

Libyan Med J. 2025;17(1):93-98
https://doi.org/10.69667/lmj.2517115
Libyan Medical Journal
https://lmj.ly/index.php/ojs/index eISSN: 2079-1224

المستخلص

تعتبر جراحة السمنة تدخلاً فعالاً للسمنة الشديدة والأمراض المصاحبة لها. وقد أدى الارتفاع العالمي في السمنة إلى زيادة في إجراءات السمنة، مما يسلط الضوء على الحاجة إلى تقييم وإدارة المضاعفات بعد الجراحة. وتتراوح هذه المضاعفات من مشاكل بسيطة إلى أحداث تهدد الحياة. الحكة الصباغية والمعروفة أيضًا باسم مرض ناغاشيما، هي حالة جلدية مكتسبة تتميز بطفح جلدي حاك بشكل ملحوظ من الحطاطات والحويصلات الحطاطية على الظهر والرقبة والصدر وتحسن تاركة فرط تصبغ شبكي بقعي. تم وصف الحالة لأول مرة في عام 1971 من قبل طبيب الأمراض الجلدية الياباني ماساجي ناغاشيما، وتمت ملاحظتها في البداية بين ثمانية مرضى من أصل آسيوي. ارتبطت الحكة الصباغية ارتباطًا وثيقًا بالكيتوزية والنظام الغذائي الكيتوني؛ ومع ذلك، لا يزال السبب الدقيق لها غير واضح. تؤثر الحالة بشكل أساسي على الشابات من أصل آسيوي. هنا، نبلغ عن حالة من الحكة الصباغية لدى رجل ليبي، تطورت بعد 13 يومًا من جراحة السمنة. قد يشير هذا العرض إلى وجود علاقة أقوى بين الحكة الصباغية والحالة الأيضية للجسم. كما يوضح أيضًا فعالية خيارات العلاج المستخدمة حاليًا لعلاج الحكة الصباغية.

Received*: 02-01-2025 -* ***Accepted****: 28-02-2025 -* ***Published****: 05-03-2025*