

Butterfly-shaped keloid as a rare case of Wolf's isotopic response

Pragati Chhikara¹, Jaykumar Jakasaniya², Kashyap Patel²

From ¹Medical Doctor, Department of Dermatology, Batumi Shota Rustaveli State University, Batumi, Georgia, ²Intern Doctor, Department of Dermatology, GMERS Medical College and Hospital, Morbi, Gujarat, India

ABSTRACT

Wolf's isotopic response is defined as the appearance of a new dermatosis at the site of a previously healed, unrelated skin disorder. We describe a rare case of a 64-year-old immune-competent female who developed a butterfly-shaped keloid at the site of an insect bite 3 years prior. This case highlights the unusual presentation of keloids as a result of insect bite, emphasizing the importance of early diagnosis and treatment. Treatment with intralesional triamcinolone acetonide injections began, with plans for ongoing monitoring to prevent recurrence. This report contributes to a better understanding of keloid pathogenesis by emphasizing the importance of taking into account atypical triggers and the psychosocial impact such lesions have on patients.

Key words: Intralesionalsteroids, Keloid, Wolf's isotopic response

Wolf's isotopic response (WIR), first described in 1955, refers to the development of a new skin condition at the same location where a previous, unrelated skin disorder had healed [1]. The initial description of this type was in 1929. Gougerot and Filliot described a case of lichen planus that arose from a scar made weeks after a 2-week herpes zoster eruption [2]. In most cases, the underlying skin condition is herpes zoster. However, similar cases have also been reported following infections such as herpes simplex, varicella, and even after thrombophlebitis [3]. The hypothesis of immunocompromised skin is one of such mechanisms.

We described a case of an immune-competent patient with a butterfly-shaped keloid arising 3 years ago, on the former site of an insect sting, with no past history of trauma in that location. To our knowledge, there is no report in the literature up to now.


CASE HISTORY

A 64-year-old female presented to the clinic with a slowly enlarging, butterfly-shaped lesion on her upper back, which had been present for 3 years. She attributed the origin of the lesion to an insect bite that initially caused pain, pruritus, and erythema. The acute episode resolved spontaneously without complications such as abscess formation, generalized symptoms, or secondary infection. She self-managed the initial symptoms using herbal ointments. However, over time, the lesion gradually

increased in size, forming a raised, hyperpigmented plaque with irregular edges. The lesion was symmetrically distributed across the midline of the upper back, with well-defined margins. Her primary concern was the lesion's impact on her appearance and self-image, which had begun affecting her social interactions and quality of life. She reported no history of local trauma, fever, or malaise. Her medical history included type 2 diabetes mellitus, diagnosed 9 years ago, and hypertension, diagnosed 16 years ago – both well controlled with medication. She had not changed any medications. She had no history of chronic illnesses beyond these conditions and had not undergone any back surgeries. There was no history of allergies, contact dermatitis, or other dermatologic conditions. Her vaccination history was uncertain. She followed a vegetarian diet. Her obstetric history included three uncomplicated term pregnancies, and she had reached menopause at the age of 44.

On examination, her vital signs were within normal limits, with a blood pressure of 128/72 mmHg, pulse rate of 68 beats/min, and oxygen saturation of 97% on room air. Physical examination revealed a firm, raised, hyperpigmented plaque with irregular edges, symmetrically extending across the upper back in a butterfly-shaped pattern (Fig. 1). The lesion had well-defined margins, and palpation revealed a soft and non-tender consistency.

Given the progressive nature of the lesion and its impact on the patient's quality of life, intralesional triamcinolone acetonide injections were initiated at a dose of 0.2 mL/cm², administered 3 times weekly. The treatment plan included injections every 4–6 weeks until resolution.

Access this article online	
Received - 10 January 2025 Initial Review - 05 February 2025 Accepted - 13 February 2025	Quick Response code 
DOI: 10.32677/ijcr.v11i3.4999	

Correspondence to: Jaykumar Jakasaniya, 101, Pavansut Apart., Shakti Park-Society, Avani Chokdi, Morbi, Gujarat, India. E-mail: jayjaka12555@gmail.com

© 2025 Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC-ND 4.0).



Figure 1: Butterfly-shaped keloid on the back, demonstrating a unique and symmetrical pattern consistent with Wolf's isotopic response

A biopsy was advised to confirm the diagnosis and rule out other underlying conditions, but the patient refused the procedure. She was counseled regarding the importance of follow-up visits to monitor treatment response and the potential risk of recurrence. This case highlights an atypical presentation of a butterfly-shaped keloid following an insect bite and underscores the importance of early diagnosis and intervention, not only for the physical and esthetic aspects but also for the psychological and social impact of such lesions.

DISCUSSION

Keloids and hypertrophic scars are skin disorders resulting from irregular wound healing, marked by an overproduction of collagen in the dermis. Pain, hyperesthesia, and itching are common symptoms that can have a major negative influence on a patient's quality of life, especially in cases of keloids [4]. According to research, multiple host variables such as vascular, immunological, and neurological components can also affect keloid formation and WIR in addition to viral components [5]. Despite the rise in case reports of WIR, the exact incidence and mechanism remain unclear due to the absence of large population-based studies on isotopic responses [6]. Keloid scars usually appear as firm, broad, and shiny nodules that are frequently reddish in color. Differentiating keloid scars from other benign or malignant tumors is essential because of their common and non-specific look as well as the difficulties they present in treatment [4, 5].

The idea of immune-compromised skin is one theory put forth to explain WIR. WIR may explain the keloid formation occurring in this patient, whereby any prior injury to the skin has led to neural and immune dysregulation, rendering the same area spear-headed for new dermatologic conditions [1, 2]. There may be some nerve damage due to the insect bite, with alteration of neuropeptide signaling leading to activation of fibroblasts and excessive collagen deposition [3,7-10]. This immune dysregulation in WIR again could result in overexpression of transforming growth factor- β 1 and interleukin-6, thereby supporting a scenario of chronic inflammation, fibroblast proliferation, and extracellular matrix deposition [11]. The most common locations for keloids are the earlobes, shoulders, back of the neck, and sternum [6]. Although they seldom occur after insect bites, keloids and hypertrophic scars are usually the result of surgical incisions, burns, or severe injuries. A thorough medical history is essential to the diagnosis, which is mostly clinical. When required, a histopathological analysis may be carried out to validate the diagnosis [7]. Intralesional steroid injections, cryotherapy, laser therapy, radiation, and silicone gel sheets are among the frequently used treatment techniques. Topical medications such as imiquimod and antimetabolites such as 5-fluorouracil are used less commonly [8].

New methods of tackling keloids appear to be promising. The use of lasers in conjunction with drugs, for example, increases the effectiveness of the drugs penetrating into the keloid tissue when used with corticosteroid injections [12]. Photodynamic therapy is another option in which light is used to remove other substances from the keloid tissue, thus inhibiting collagen synthesis as well as fibroblast activity [13]. Type A botulinum toxin (botox) injections have also been studied to reduce keloid symptoms by inhibiting fibroblast activity and collagen formation [14]. Moreover, therapies based on nucleic acids, especially RNA interference, are enabling the more exact treatment of keloids by targeting genes associated with keloid formation [13]. These techniques are quite promising, but more studies are necessary to determine their safety and effectiveness in the long term. Excision alone has a 55–100% recurrence chance, and in certain situations, it might result in scarring that is worse than previously [9].

This case demonstrates how WIR encompasses a wider variety of novel dermatoses rather than simply a few distinct skin disorders. It emphasizes how crucial it is to pinpoint odd keloid development triggers, including insect bites, and develop individualized therapy regimens. We aim to learn more about the formation of keloids, especially the role of WIR, by presenting this uncommon example. In addition, it serves as a reminder of the profound emotional and psychological effects that keloids may have on people, which emphasizes the importance of patient-centered, holistic care.

CONCLUSION

This case describes the unusual development of a butterfly-shaped keloid caused by an insect bite, which may be linked to WIR. Its unique presentation emphasizes the importance

of identifying uncommon triggers and tailoring treatment approaches accordingly. Prompt diagnosis and management are critical for addressing the physical, cosmetic, and emotional challenges that keloids can present. Sharing rare cases like this helps us better understand keloid formation and improve treatment strategies.

REFERENCES

1. Wang T, Zhang M, Zhang Y, Zhang Y, Zhang S, Qu T, *et al.* Wolf's isotopic response after herpes zoster infection: A study of 24 new cases and literature review. *Acta Derm Venereol* 2019;99:953-9.
2. Wolf R, Wolf D, Ruocco V, Ruocco E. Wolf's isotopic response: The first attempt to introduce the concept of vulnerable areas in dermatology. *Clin Dermatol* 2014;32:557-60.
3. Jaka-Moreno A, López-Pestaña A, López-Núñez M, Ormaechea-Pérez N, Vildosola-Esturo S, Tuneu-Valls A, *et al.* Wolf's isotopic response: A series of 9 cases. *Actas Dermosifiliogr* 2012;103:798-805.
4. Tsai CH, Ogawa R. Keloid research: current status and future directions. *Scars Burn Heal* 2019;5:1-8.
5. Wang J, Shen H. Keloids after herpes zoster: Report of Wolf's isotopic phenomenon and literature review. *Clin Cosmet Investig Dermatol* 2023;16:2129-33.
6. Tiong WH, Basiron NH. Challenging diagnosis of a rare case of spontaneous keloid scar. *J Med Cases* 2014;5:466-9.
7. Elsaie ML. Update on management of keloid and hypertrophic scars: A systemic review. *J Cosmet Dermatol* 2021;20:2729-38.
8. Lee YI, Kim J, Yang CE, Hong JW, Lee WJ, Lee JH. Combined therapeutic strategies for keloid treatment. *Dermatol Surg* 2019;45:802-10.
9. Limandjaja GC, Niessen FB, Scheper RJ, Gibbs S. The keloid disorder: Heterogeneity, histopathology, mechanisms and models. *Front Cell Dev Biol* 2020;8:360.
10. Ruocco V, Sangiuliano S, Brunetti G, Ruocco E. Beyond zoster: Sensory and immune changes in zoster-affected dermatomes: A review*. *Acta Derm Venereol* 2012;92:378-82.
11. Kapoor R, Piris A, Saavedra AP, Duncan LM, Nazarian RM. Wolf isotopic response manifesting as postherpetic granuloma annulare: A case series. *Arch Pathol Lab Med* 2013;137:255-8.
12. Walsh LA, Wu E, Pontes D, Kwan KR, Poondru S, Miller CH, *et al.* Keloid treatments: An evidence-based systematic review of recent advances. *Syst Rev* 2023;12:42.
13. Qi W, Xiao X, Tong J, Guo N. Progress in the clinical treatment of keloids. *Front Med (Lausanne)* 2023;10:1284109.
14. Ojeh N, Bharatha A, Gaur U, Forde AL. Keloids: Current and emerging therapies. *Scars Burn Heal* 2020;6:1-18. doi: 10.1177/2059513120940499.

Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Chhikara P, Jakasaniya J, Patel K. Butterfly-shaped keloid as a rare case of Wolf's isotopic response. *Indian J Case Reports*. 2025; 11(3):117-119.