

Multiple skin ulceration and itch–scratch cycle in a diabetic patient

Diabetic patients sometimes present generalized pruritus and could complicate chronic nodular prurigo, a chronic skin lesion characterized by intense pruritic nodular lesions^{1,2}. Severe itching can cause an itch–scratch cycle, resulting in distress and an impaired quality of life, but skin ulceration is a rare manifestation.

A 46-year-old diabetic man presented with widespread multiple itchy nodules predominantly on the back. He complained of intractable systemic itching and pain caused by scratching. He developed diabetes mellitus at 36 years old. His body mass index was 28.6 kg/m², negative for glutamic acid decarboxylase autoantibody, and his mother also had type 2 diabetes. He had been prescribed metformin, glimepiride, and pioglitazone, but his A1c level had remained around 10% for years. He had simple diabetic retinopathy, numbness of both feet, macroalbuminuria, and the serum creatinine level was 0.87 mg/dL. The coefficient variant of the R-R interval of the electrocardiogram was reduced to 1.17%, the motor nerve conduction velocity of the right and left tibial nerve had declined to 30.8 and 33.6 meters per second (normal range \leq 44.9), respectively, and the amplitude of the sensory nerve action potential of bilateral sural nerves were below 5 μ V. Although a skin biopsy was not performed, chronic nodular prurigo, in some part accompanied with the characteristics of reactive perforating collagenosis, was clinically suspected. To ameliorate itching, an oral antihistamine (50 mg per day hydroxyzine) and twice daily highly potent topical steroids (0.05% betamethasone butyrate

propionate) were prescribed for 4 months but resulted in minimal improvement. Most nodules were ulcerated because of vigorous scratching (Figure 1a,b). An anxiolytic such as etizolam also could not relieve the itching. But additional therapy with oral steroids (0.75 mg per day of betamethasone) and occlusive dressing with dimethyl isopropylazulene ointment, effectively induced symptomatic relief. The ulcerated nodules regressed with scarring over 2 months (Figure 1c,d). After healing of the ulceration, A1c was decreased from 10.1 to 8.4%.

Our case is peculiar in that numerous large ulcerative nodules were observed as a consequence of the vicious itch–scratch cycle. Reduced nociception associated

with diabetic neuropathy might exacerbate scratching. Sudomotor dysfunction accompanied by autonomic neuropathy, as suggested by the presence of xerosis, also could augment the itch sensation through asteatosis and interfere with wound healing. Disrupting the itch–scratch cycle is crucial to allow healing of skin lesions but is challenging for several topical or systemic antipruritic therapies². Oral corticosteroid seems to have alleviated the itch sensation in this case, although it is not described in the treatment algorithm². Azulene is an extract of the herb *Matricaria chamomilla*, and its derivative, dimethyl isopropylazulene, has been reported to have anti-inflammatory or anti-ulcer activities³. Its ointment is used in skin erosion or ulceration in some

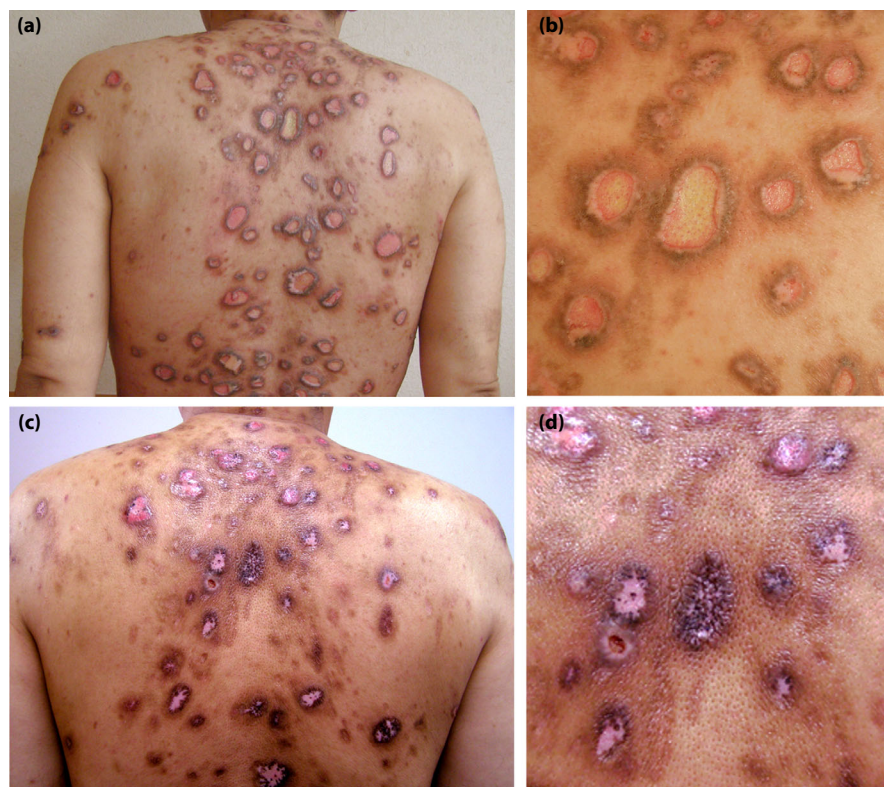


Figure 1 | (a,b) Multiple ulceration on the back caused by vigorous scratching. (c,d) Ulcers were regressed with scarring after oral corticosteroid administration and ointment treatment with an occlusive dressing.


*Corresponding author. Satoshi Murao
 Tel: +81-87-861-3261
 Fax: +81-87-835-079
 E-mail addresses: sat.murao@gmail.com, s-murao@umina-cj
 Received 14 March 2021; revised 7 April 2021;
 accepted 9 April 2021

countries including Japan. An occlusive dressing has been reported to enhance the efficacy of topical ointment treatment in prurigo nodularis through skin hydration and palliating the tissue damage caused by scratching⁴.

In conclusion, we present a patient with diabetes who had neuropathy and developed multiple skin ulcers by self-scratching. Oral steroid and occlusive dressing would be worth trying in those in whom it is difficult to break the itch-scratch cycle.

DISCLOSURE

The authors declare no conflict of interest.

Satoshi Murao^{1*} , Kazutoshi Murao²
¹Department of Diabetes and Endocrinology, Takamatsu Hospital, Takamatsu, Japan, ²Department of Dermatology, Tokushima University Graduate School of Medical Science, Tokushima, Japan

REFERENCES

1. Lima AL, Illing T, Schliemann S, *et al*. Cutaneous manifestations of diabetes mellitus: a review. *Am J Clin Dermatol* 2017; 18: 541–553.
2. Stander HF, Elmariah S, Zeidler C, *et al*. Diagnostic and treatment algorithm for chronic nodular prurigo. *J Am Acad Dermatol* 2020; 82: 460–468.
3. Yanagisawa T, Kosakai K, Tomiyama T, *et al*. Studies on anti-ulcer agents. II. Synthesis and anti-ulcer activities of 6-isopropylazulene-1-sodium sulfonate derivatives. *Chem Pharm Bull* 1990; 38: 3355–3358.
4. Saraceno R, Chiricozzi A, Nistico SP, *et al*. An occlusive dressing containing betamethasone valerate 0.1% for the treatment of prurigo nodularis. *J Dermatolog Treat* 2010; 21: 363–366.

Doi: 10.1111/jdi.13560