

Contact Dermatitis / Early View

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Severe irritant contact dermatitis from olanexidine gluconate and subsequent skin sensitization

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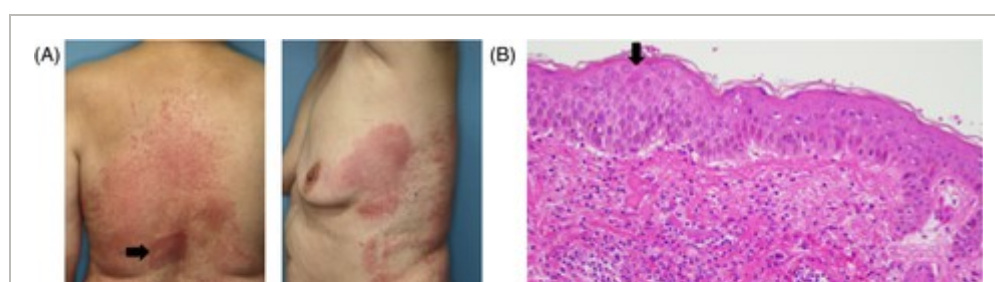
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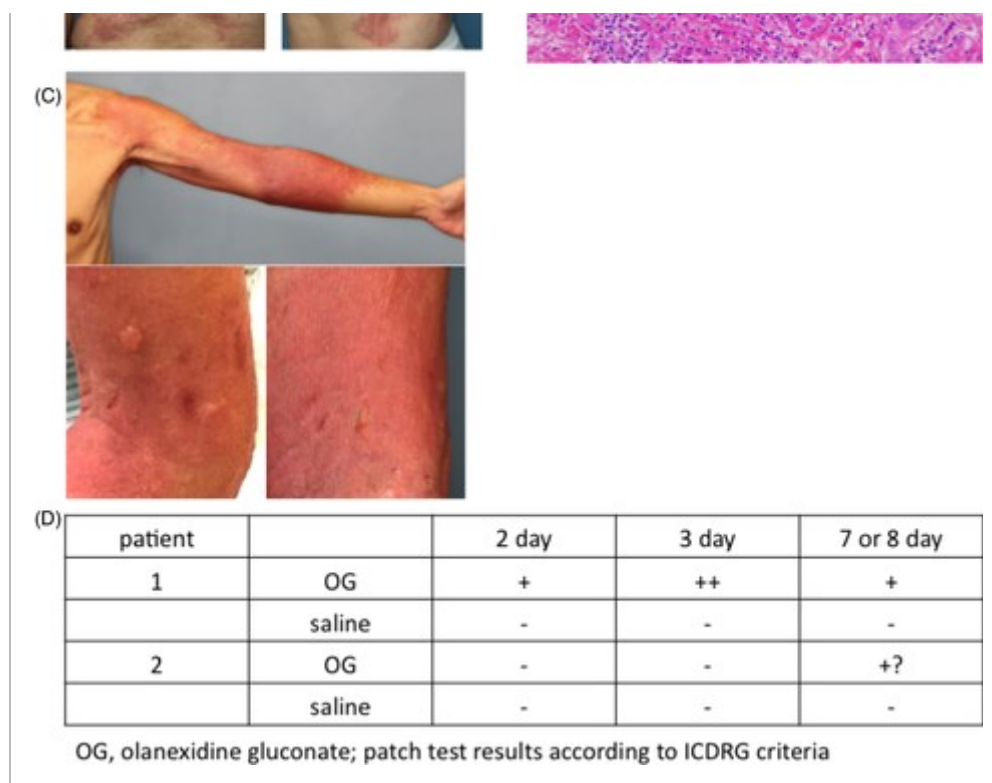
The first two authors contributed equally to this work.

Olanexidine gluconate (Olanedine, Otsuka Pharmaceutical Factory, Tokushima, Japan) is a new biguanide antiseptic used for preoperative skin preparation. It has marked bactericidal effects against a wide range of bacteria, including methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant enterococci.¹ Several cases of contact dermatitis caused by olanexidine gluconate have been reported since 2018.²⁻⁴ Here, we report two cases of olanexidine gluconate-induced irritant contact dermatitis (ICD) with subsequent skin sensitization.

CASE 1

A 71-year-old woman underwent computerized tomography (CT)-guided biopsy for uterine cancer metastasis. At the time of surgery olanexidine gluconate had been applied to her back and left chest, without any wash-off. On postoperative day (D) 3 she developed a sharply demarcated erythema on the lower back and diffusely distributed papules on the trunk (Figure 1A). The histology of the demarcated erythema on the lower back (arrow in left panel of Figure 1A) revealed dyskeratosis and nuclear pyknosis of basal cells in the epidermis, but no spongiosis or exocytosis, along with mild dermal papillary edema and perivascular lymphocyte infiltrates (Figure 1B), overall rather compatible with ICD.



**FIGURE 1**[Open in figure viewer](#)[↓ PowerPoint](#)

(A) Clinical findings of Case 1. Sharply demarcated erythema on the lower back, and diffusely distributed papules on the upper back, hip, and left chest. The arrow indicates the biopsy site. (B) Histopathology of the demarcated erythema on the lower back (hematoxylin and eosin (H&E) staining, original magnification $\times 200$). Dyskeratosis and nuclear pyknosis of basal cells in the epidermis, mild dermal papillary edema, and perivascular lymphocytic infiltrates are seen. The arrow indicates dyskeratotic cells. (C) Clinical findings of Case 2. Sharply demarcated, irregularly shaped erythema on the upper limb (top); serous papules, tense bullae (bottom left); and erosions on the forearm (bottom right). (D) Patch-test results of the two patients by the use of Patch Tester Torii (Torii Pharmaceutical, Tokyo, Japan) read according to ICDRG criteria

CASE 2

A 64-year-old man underwent central vascular access port implantation in his left arm to allow treatment with chemotherapy for pancreatic cancer. During surgery, olanexidine gluconate was applied on his left upper limb, again without any wash-off. Eight days later, a well-demarcated erythema, with serous papules, tense bullae, and erosions developed on the left forearm (Figure 1C). The histology of a bulla in the cubital fossa showed degeneration and dyskeratosis of the upper epidermis, but no spongiosis or exocytosis, again suggesting an ICD, similar to as for Case 1.

Both patients were treated with topical glucocorticoids and oral antihistamines, which relieved their symptoms in 10 days.

After the skin lesions had healed, 48-hour patch tests with olanexidine gluconate were

performed, “as is” dried on filter papers, according to a previously described method by Iijima, et al.,⁴ and the results were read, according to ICDRG criteria, on D2, D3, and D7 or D8 (Figure 1D). The previously used patch-test method regarding olanexidine gluconate was found to be reliable in demonstrating skin sensitization to this biguanide, and the patch-test reactions, which went crescendo in both cases, also had an allergic morphology: in Case 1 (+D2/++D3) and in Case 2 (–D2/–D3/?+D8). Although the overall clinical and histological picture of both patients suggested ICD, the latter can be sometimes difficult to distinguish from allergic contact dermatitis (ACD), and both may also coexist with the former, thereby facilitating the occurrence of skin sensitization and subsequent ACD. Although the aspect and course of the patch-test reactions in our patients were considered contact-allergic in nature, some irritants may occasionally also show crescendo patch-test reactions and/or patch-test reactions mimicking contact allergy. Additional investigations might then be helpful, such as patch testing with a dilution series (eg, in Case 1), or a repeated open application test (eg, in both cases), which, however, could not be performed. Nevertheless, it appears that both of our patients, who had not previously been exposed to olanexidine gluconate, first developed ICD to this strong skin irritant, and subsequently became sensitized to it, likely because of prolonged skin exposure without any wash-off following surgery, which should be avoided.

CONFLICT OF INTEREST

The authors declare no conflict of interests.

AUTHOR CONTRIBUTIONS

Natsuko Aoki: Data curation (lead); methodology (lead). **Hideki Nakajima:** Formal analysis (lead); investigation (lead); project administration (lead). **Kimiko Nakajima:** Conceptualization (lead). **Shigetoshi Sano:** Supervision (lead); validation (lead).

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