Allergic contact reaction mimicking poor wound healing caused by Iodophor-impregnated surgical drape

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ABSTRACT:

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Contact dermatitis due to povidone-iodine is rare, and a small number of cases has been reported over the years. We present a case of allergic contact dermatitis on traumatic abrasion wound due to iodophor-impregnated surgical incise drape. The diagnosis was based on clinical manifestations, sites of the lesions, history of substance exposure, and patch test results. Allergic contact reactions developed in the traumatic wound should be suspected as one of the differential diagnoses when inflammation occurs restrictively on the area occluded by dressing garment or covered by drapes. The reactions might resemble secondary bacterial infection or delayed wound healing. We recommend sending the patients for patch tests or performing repeat open application tests to confirm the diagnosis in suspected cases for the best patient care.

Key words: allergic contact dermatitis, iodophor-impregnated surgical drape, iodine allergy, dressing materials

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Introduction

Abrasion wounds normally heal within a few weeks by suitable wound care. Delayed wound healing may arise from local and systemic factors, such as impaired tissue oxygenation, infection, advanced age, stress, diabetes, obesity, alcoholism, smoking, and poor nutritional status[1]. Antiseptic agents are commonly used to prevent and treat superimposed infection, especially in traumatic wounds[2]. Nowadays, povidone-iodine (polyvinylpyrrolidone iodine, PVP-I) is the most common iodophor used in clinical practice as an antibacterial and antiseptic agent because of its broad antimicrobial spectrum activity[3]. It has replaced other iodine compounds, including iodoform or iodine tincture from its low irritating rate and less toxic potential due to its sustained release properties[4]. PVP-I, a compound consisting of polyvinylpyrrolidone, elemental iodine and additives such as glycerine and nonoxynol-9, is available in various formulations, for example, solutions, tincture of alcohol, creams, ointments, sprays, or dressing medicaments[3, 5]. However, contact reactions caused by PVP-I are relatively uncommon[4, 6]. Only a small number of cases with allergic contact dermatitis due to PVP-I solution have been reported, and systemic reactions to PVP-I are also rare, for instance, urticaria and anaphylactic shock[7, 8]. Therefore, we report a case of allergic contact dermatitis caused by PVP-I solution and iodophor-impregnated surgical drape.

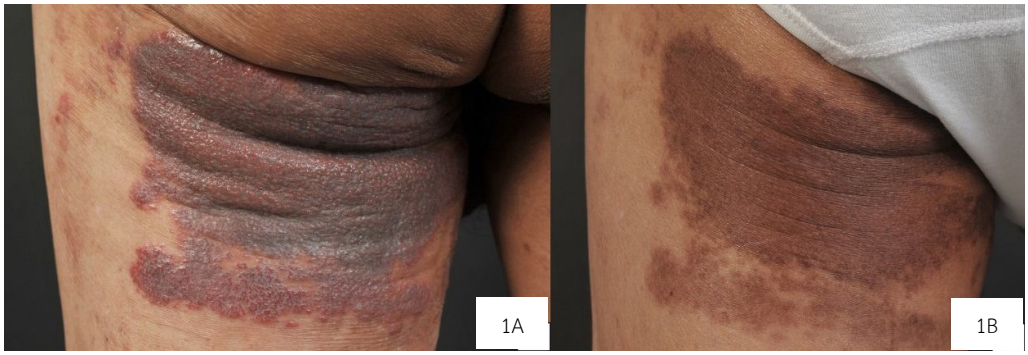

Figure 1 A) A well-demarcated erythematous plaque surrounded by multiple erythematous papules on the left buttock and posterior thigh. B) Postinflammatory hyperpigmentation after one month of treatment and discontinuation of iodophor-impregnated surgical drape use.

Case Report

A 70-year-old male without a history of food and drug allergy visited the trauma center at Siriraj hospital, Bangkok, Thailand with laceration and abrasion wounds on his left buttock and posterior thigh from a motorcycle accident. The lacerated

wound had been thoroughly cleaned and underwent primary closure. Initially, povidone-iodine solution was used as an antimicrobial agent for wound dressing. However, the wound was not improved despite treated for a few weeks. Infected wound was suspected due to the progressive signs and symptoms. Consequently, the patient was treated with clindamycin 900 mg. per day orally for ten consecutive days. The sutures were stitched off, and the wound was dressed with a hydrofiber dressing with silver (Aquacel Ag) and iodophor-impregnated surgical drape (Ioban) once daily. Granulation tissue and serum oozing, resembling poor wound healing, developed after a week of treatment. Skin examination revealed a well-demarcated scaly erythematous to purplish plaque with scales and crusts precisely on the wound edge enclosed by dressing garments (Fig. 1A). Allergic reaction on the wound due to the dressing materials was suspected. In this patient, patch testing with baseline and dressing material, including transparent film dressing (Tegaderm), hypoallergenic paper tape (Micropore), hypoallergenic plastic tape (Transpore), hydrofiber dressing with silver (Aquacel Ag), and 10% povidone-iodine in water (Germidine) was performed. The results showed positive patch test reaction (++) to 10% povidone-iodine solution in water, containing 1% releasable iodine and 0.001% free-iodine; and povidone at 48 hours and 96 hours after patches application (Fig. 2)[9]. Unfortunately, a repeat open application test was not performed due to the patient's discomfort. The diagnosis was allergic contact dermatitis caused by iodophor-impregnated surgical drape. The principle management included avoiding PVP-I and iodophor-impregnated surgical drape. Oral prednisolone 30 mg. per day and topical betamethasone valerate 0.1% cream were prescribed. One week after treatment, the clinical appearances demonstrated significant improvement. Eventually, the wound healed with post-inflammatory hyperpigmentation after one month of treatment (Fig. 1B).

Figure 2 Patch test reactions at 48 hours after allergens application.

Discussion

The iodophor-impregnated antimicrobial surgical adhesive drape is generally used as a

cover on surgical site during several types of surgical procedures[10]. It continuously provides antimicrobial activity which its effect reached within minutes after application as the iodide ion interacts with the microbial cell membrane and lasts for hours under the drape[10, 11]. Furthermore, it is clinically proven to reduce the risks of wound contamination and bacterial migration by providing a physical barrier to skin flora[10, 11].

Currently, there have been some cases of allergic contact dermatitis due to povidone-iodine reported in the literature[3, 6, 9-12]; however, it may be underestimated because only patients with severe manifestations are referred to a dermatologist for a definite diagnosis. Moreover, allergic contact reactions on traumatic or surgical wounds might be much more difficult to diagnose because it might not be easily detected, unlike the reactions on normal skin. Allergic contact reactions should be suspected when the inflammation is restricted on the sites of occlusion by the dressings or drapes[12]. Therefore, it is important for the physicians to be aware of the possibility of allergic reactions and early detect any surrounding dermatitis following wound dressings in order to avoid the risk of severe clinical manifestation. Additionally, physicians also have acknowledged that PVP-I can be found in many different forms; not only in aqueous solution but also in other preparations, including surgical drapes[3, 5].

Nevertheless, there is a limitation of patch testing in the assessment of allergic contact dermatitis, especially when substances, like PVP-I, have both irritant and allergenic properties, so the results of patch testing can show false positive results[4,6]. Accordingly, we strongly recommend sending the patient for a patch test when the allergic reaction to PVP-I is suspected. A repeat open application test has been advocated as a proper tool to confirm a positive allergic response in case of unavailable patch testing[9]. Dried 10% povidone-iodine solution or 10% povidone-iodine gel may be used as alternatives to avoid irritant reactions[13].

In conclusion, this is a rare case of allergic contact dermatitis caused by iodophor-impregnated surgical incise drape confirmed by patch testing with 10% povidone-iodine solution in water that the wound manifestations misled the diagnosis as superimposed bacterial wound infection and delayed wound healing. Allergic contact reactions due to dressing materials should be considered and referring for a patch test is recommended for the definite diagnosis in such patients.

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