

# Continuous Testing Method for Contact Allergy to Topical Therapies in the Management of Chronic and Postoperative Wounds

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Infection and allergic contact dermatitis may be encountered in postoperative and chronic wounds. Since symptoms overlap, differentiating these complications in real time could help guide management. We propose applying potentially allergenic wound care agents to an area of healthy skin while managing postoperative and chronic wounds. This method can help identify allergic contact dermatitis rapidly, thereby reducing misdiagnosis and improving patient care.

Patients who undergo cutaneous surgery and chronic wound care often are exposed to various topical agents that carry allergenic potential, including antiseptic rinses, bandage adhesives, mineral pastes, and antibiotic ointments.<sup>1</sup> Allergic contact dermatitis (ACD) in postoperative or chronic wounds can lead to considerable morbidity, particularly when the diagnosis is unclear. Differentiating between ACD and wound infection is paramount because the treatments for these conditions often are mutually exclusive.<sup>2</sup> While patch testing for contact allergy could be considered for postoperative patients or those with chronic wounds who exhibit concerning symptoms such as erythema or pruritus, these scenarios require prompt diagnosis and treatment. Herein, we describe a technique that involves secondary application of potentially allergenic topical components to a small area of normal skin during wound management to facilitate early detection of ACD and differentiation from wound infection.

## Practice Gap

Contact allergies are common in patients with postoperative or chronic wounds. When patch tested, approximately

80% of patients with chronic venous ulcers demonstrated at least 1 positive allergic reaction based on a Canadian study.<sup>3</sup> Similarly, postoperative ACD in dermatologic surgery occurs in more than 1.6% of cases in North America and Europe, a rate that is similar to or higher than the rate of postoperative infection, approximately 1% to 2%.<sup>4</sup> Postoperative patients and those with chronic wounds have multiple risk factors for ACD. Firstly, applying topical therapies to inflamed or compromised skin increases the risk for contact sensitization.<sup>5</sup> Additionally, multiple topical therapies containing known allergenic components may be recommended for wound care, including impregnated or organic dressings, antibiotic ointments, adhesives, antiseptic washes, and topical therapies containing inactive ingredients such as lanolin derivatives.<sup>6</sup> Contact with numerous compounds at the same time increases the risk for a contact allergy as well as co-sensitization.<sup>7</sup> Similarly, the longer topical agents are applied, the greater the risk for a contact allergy, with sensitization liable to occur at any point during treatment.

Preventive topical antibiotics have garnered a negative reputation among dermatologists, often due to varying data on their efficacy and the overuse of highly allergenic over-the-counter topical antibiotics such as neomycin.<sup>8</sup> However, data also have suggested that topical antibiotics can reduce postoperative infections in higher risk surgical cases, specifically certain head and neck surgeries.<sup>9</sup> Likewise, topical antibiotics are useful for wound colonization with *Pseudomonas*, which can remain superficial and slow down healing without progressing to a systemic infection.<sup>10</sup> Such cases can be successfully treated or prevented with topical therapies, thereby bypassing the

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more concerning adverse effects of systemic antibiotics. In particular, systemic fluoroquinolones often are used to treat *Pseudomonas* and can have many serious adverse effects, including tendon rupture, drug interactions, and arrhythmias.<sup>11</sup> Therefore, it is worth implementing topical treatments for wounds colonized with *Pseudomonas* to spare patients these potential complications.

When a postoperative patient develops a rash at the surgical site, it is critical to differentiate between wound infection and contact allergy, as the treatments for these two conditions may be mutually exclusive and treating the wrong condition may exacerbate the other, such as mistakenly using topical corticosteroids for a wound infection.<sup>7</sup> Prompt treatment is necessary for wound infections, as time is limited for patch testing when a rash is already present and the diagnosis is questionable. Allergic contact dermatitis typically erupts 48 to 96 hours following exposure to a contact allergen, often manifesting as intensely pruritic erythematous patches or vesicles.<sup>6</sup> Wound infections are characterized by pain and warmth, with erythema and edema present in both conditions. Postoperative infections manifest usually 4 to 7 days following surgery.<sup>12</sup> Despite these differences, pruritus and pain are common in the wound healing process; thus, differentiating an infection from ACD on a clinical basis alone is not always possible. Furthermore, presentation of a contact allergy may be delayed beyond the typical 96-hour timeframe if a patient is newly sensitized to an allergen, causing the timeline of rash development to appear similar to that of a wound infection. In such cases, systemic antibiotics often are prescribed empirically; hence, clearer and timelier differentiation between contact allergy and wound infection reduces unnecessary antibiotic prescriptions, thereby avoiding systemic adverse effects and promoting responsible antibiotic stewardship.<sup>12</sup>

## The Technique

Since potentially allergenic topical therapies often are indicated in wound management, we propose that patients serve as internal controls to test continuously for contact allergy sensitization. We recommend that patients apply a small amount of the topical agent, product, or dressing to the inner forearm each time they apply it to the wound. If the patient is sensitized to the product initially or becomes sensitized during treatment, evidence of ACD will be visible not only at the site of the wound but also in the area of secondary application. The inner forearm is recommended for convenience and reproducibility, but a patient may choose a different site as long as it remains consistent. Although certain contact allergens

rarely may react solely at a site of inflamed skin, our team has quickly identified ACD and avoided misdiagnosis of chronic or postsurgical wound infection using this approach.<sup>13</sup> Subsequent patch testing is indicated when a contact allergy is detected.

## Practice Implications

Topical therapies including ointments, washes, and dressing components have the potential to cause sensitization and contact allergy. Despite the concern for development of ACD, topical antibiotics play a useful role in cutaneous surgery.<sup>7</sup> Synchronous testing for contact allergy when managing wounds with topical therapies could improve diagnostic accuracy when an allergic reaction occurs. This technique provides a means of harnessing the benefits of topical agents while monitoring the risk for ACD in postoperative and chronic wound care settings.

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