

The 'Pull Test' Delineation of Irritant Patch Test Reactions

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Received date: June 6th, 2014, Accepted date: June 9th, 2014, Published date: June 16th, 2014

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Abstract

Patch testing is the gold standard for diagnosis of allergic contact dermatitis, though irritant reactions may be seen as well. 'Doubtful' reactions showing only macular erythema can at times be difficult to distinguish between irritant from allergic reactions, especially in patients with impaired skin barriers. We use the 'pull test' technique to help delineate irritant reactions.

Keywords: Contact Dermatitis; Allergic; Irritant; Atopic

Introduction

The clinical practice of patch testing is the vital diagnostic tool for studying contact hypersensitivity reactions. In general, most patch test centers in the United States utilize the patch test methodology that was established by the International Contact Dermatitis Research Group (ICDRG) [1]. This method includes application of the patch test and removal and performance of a preliminary reading at 48 hours, followed by an additional delayed reading at 72 to 120 hours. The accepted paradigm is that contact allergy reactions crescendo later during the course of the patch test procedure, while irritant contact reactions present earlier and decrescendo (or improve) with time [2]. Reactions presenting with homogenous macular erythema and minimal to no induration are designated as 'doubtful' reactions. These

reactions can be difficult to delineate between irritant and allergic, especially in the patients with chronic nonresponsive eczematous dermatitis (eg: atopic dermatitis, xerosis etc.). Besides the key factors that suggest irritant reactions, such as timing (earlier presentation) and clinical history, a technique which can be helpful to identify irritant reactions is the 'pull test', that can be used at the time of patch testing.

Technique

To perform the test, gentle pressure is applied against the skin tension lines and then released. Upon release, there can be enhancement of the epidermal wrinkling and accentuation of a confluent scaled patch, when there is an irritant reaction (Figure 1). Doubtful allergic reactions don't enhance the same way.

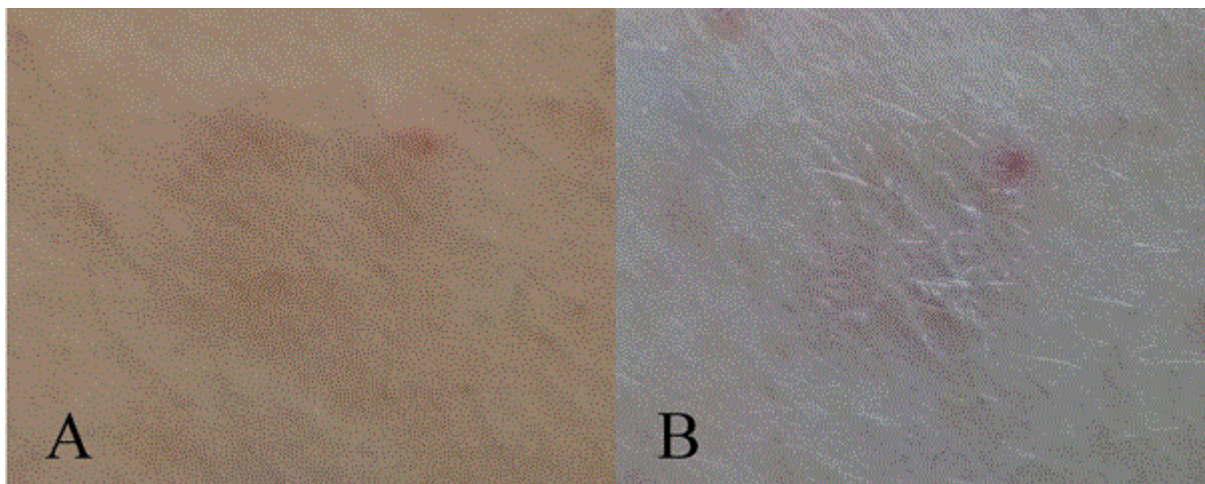


Figure 1: Irritant patch test reaction before and after the pull test

Discussion

Irritant reactions can be seen to a variety of personal care and industrial products. According to the North American Contact

Dermatitis Group (NACDG) data from 2009 to 2010, the most common sources of irritants include soaps/detergents not meant for skin use (18.6%), cosmetics (10.1%), soaps/cleansers made for skin use (2.8%) and moisturizers (2.8%) [3]. During patch testing, irritant

reactions can be seen to a number of chemicals, including metals (nickel, cobalt), vehicle ingredients propylene glycol (PG), formaldehyde releasing preservatives (FRPs) and surfactants [cocamidopropyl betaine (CAPB)]. Re-testing the patient with dilutions of the allergen on naïve skin and by open use testing are important tools to help delineate between 'doubtful' irritant and allergic reactions. That said, it is often difficult to schedule patients for re-patch testing, given loss of time for the child at school and loss of time at work; as a result, re-testing is often time-prohibitive. The 'pull test' tool may be helpful at the time of patch testing to help clarify the nature of early 'doubtful' reactions as irritant or further suggest the possibility of a clinically relevant allergen. Notably, the 'pull test' is most useful for compounds that cause homogenous erythema with fine surface epidermal enhancement (wrinkling) [namely, PG, CAPB, and FRPs], as opposed to those that create poral reactions [patchy follicular reactions (eg: cobalt)]. Correct diagnosis of a 'doubtful' (equivocal) reaction is especially important in patients with impaired barriers, as they have lower irritancy thresholds [4,5].

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