Post-zoster fibroelastolytic papulosis: an example of Wolf isotopic response

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Abstract

Wolf isotopic response describes the onset of a new dermatosis at the site of a previous, healed dermatosis, which is usually a herpes zoster infection. Fibroelastolytic papulosis is a poorly understood elastolytic condition defined by a loss of elastic fibers specific to the papillary dermis. The present report describes a case of fibroelastolytic papulosis with onset following herpes zoster infection. This association provides new evidence for an immunopathogenic origin for fibroelastolytic papulosis and further supports current theories of the pathogenesis of Wolf isotopic response.

Keywords: dermal elastolysis, fibroelastolytic papulosis, herpes zoster, isotopic response, papillary, Wolf

Introduction

First described by Wyburn-Mason in 1955 as the presence of a new dermatosis at the site of a resolved dermatosis, the phenomenon was coined "isotopic response" by Wolf in 1995 [1,2]. Shortly thereafter, Ruocco et al., 2002 renamed it "Wolf's isotopic response" [3]. A poorly understood and likely underreported phenomenon, cases typically present as a herpes zoster infection followed by a secondary dermatosis such as a granulomatous reaction, malignancy, or infection [4].

Fibroelastolytic papulosis is an extremely rare, progressive, fibroelastolytic condition with an unknown pathogenesis. Defined by a histopathologic absence of papillary dermal elastic fibers, it typically presents clinically with asymptomatic or pruritic, soft, white-yellow papules which converge, forming cobblestone-like plaques [5]. Treatment options are limited, with minimal evidence suggesting topical tretinoin, fractional CO_2 laser, and 1550nm Erbium glass laser may be beneficial [6–9].

Although herpes zoster infection may result in scarring or Wolf isotopic response, to our knowledge, no case of Wolf isotopic response with fibroelastolytic papulosis as the secondary dermatosis has been reported. Thus, we herein present the first case of post-zoster fibroelastolytic papulosis.

Case Synopsis

A man in his 60s presented to the dermatology department with a 5-year history of an asymptomatic discoloration on his right lower back. The patient reported a herpes zoster infection at the same site about 5 months prior. Dermatologic examination revealed 2-5mm fleshy white papules coalescing into cobblestone-like plaques on the right lower back from midline to flank in a zosteriform distribution. Although papular in appearance, the lesions were soft, atrophic, and able to be pushed back into the skin. (**Figure 1**). A 4mm punch biopsy revealed no abnormalities on hematoxylin and eosin stain (**Figure 2A**). However, an elastic stain showed complete absence of elastic fibers in the superficial dermis with their preservation in the underlying reticular dermis (**Figure 2B**). Thus, the clinical and histopathological findings confirmed the diagnosis

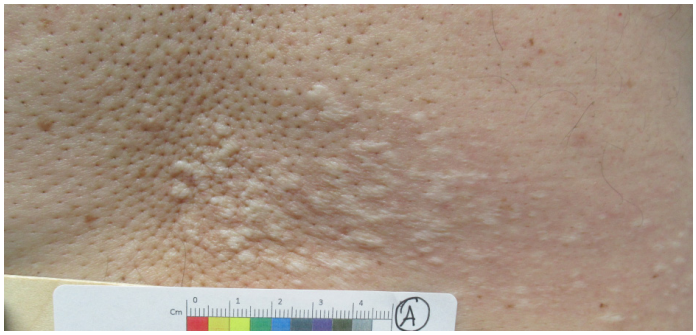

Figure 1. *Fleshy white papules coalescing into cobblestone-like plaques in dermatomal pattern on the right lower back from midline to flank.*

of fibroelastolytic papulosis or papillary dermal elastolysis. The patient, after being reassured of the benign nature of the condition, declined treatment with both topical tretinoin and CO_2 laser resurfacing.

Case Discussion

Fibroelastolytic papulosis, also known as papillary dermal elastolysis, is a rare, benign condition which may also lie on a spectrum with papillary dermal elastosis and white fibrous papules of the neck [10]. Although the pathophysiology is incompletely understood, there is an association with aging. Additionally, ultraviolet radiation and genetic, endocrine, and immune factors have been implicated [11-13]. Interestingly, there have been cases associated with concurrent vacuolar interface dermatitis [13] and following local chronic relapsing folliculitis [11]. Taken together with these previous cases, onset following a herpes zoster infection strengthens the argument for an immunopathogenic origin of fibroelastolytic papulosis.

Fibroelastolytic papulosis can be contrasted with two other elastolytic disorders involving the papillary dermis: white fibrous papules of the neck and papillary dermal elastosis. White fibrous papules of the neck is distinguished from fibroelastolytic papulosis by focal fibrosis with thickening of the collagen fibers located in the papillary dermis [10]. Papillary dermal elastosis, by contrast, demonstrates a papillary dermis with alternating areas of clumped, granular elastic tissue and areas of diminished, but normal-appearing, elastic fibers [14]. A variety of other conditions also entail loss or degradation of dermal elastic fibers, including anetoderma, mid-dermal elastolysis, and acquired cutis laxa. However, in these conditions, the alterations to elastic fibers are not strictly limited to the papillary dermis. Of note, in the current case, some elastic tissue loss in the superficial reticular dermis was identified, but this zone of elastolysis was restricted to the upper 0.5mm of the dermis, corresponding to the upper 10% of the total dermal thickness. As such, we favor classification as fibroelastolytic papulosis/papillary dermal elastolysis to reflect this limited zone of involvement and to distinguish from conditions with more extensive loss of dermal elastic fibers.

Although in some cases of Wolf isotopic response, the primary and secondary dermatoses may appear unrelated, microscopic evidence suggests that the

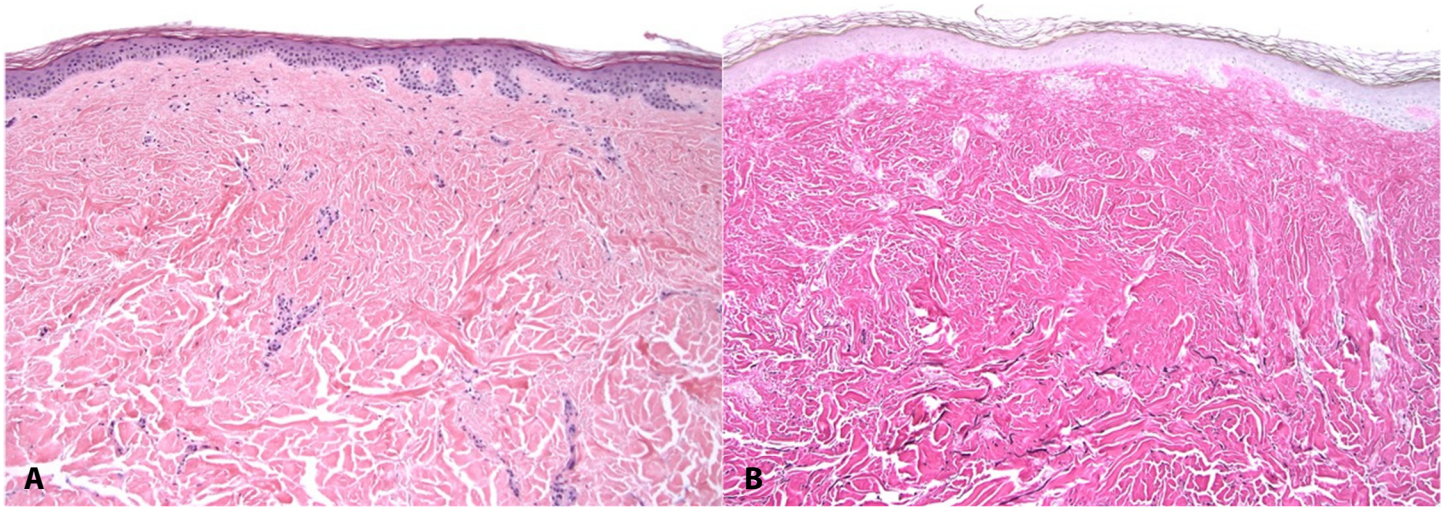

Figure 2. ***A)*** *Routine sections demonstrate microscopically normal skin. H&E, 100×.* ***B)*** *Verhoeff elastic stain highlights complete absence of elastic fibers in the superficial dermis, with preservation of elastic fibers in the underlying reticular dermis, 100×.*

primary dermatosis influences the secondary dermatosis [18]. However, other cases such as ours, clearly exhibit an intuitively causal mechanism, such as a focal inflammatory response resulting in the degradation of elastic fibers. Although the exact pathogenesis of Wolf isotopic response is unclear, it has been suggested that locus minoris resistentiae plays a role alongside a cascade of viral, neural, vascular, and immune factors resulting in a secondary dermatosis [4]. Given that the other elastolytic disorders may be preceded by inflammatory conditions [15-17], we hypothesize that the onset of other elastolytic disorders may also be due to Wolf isotopic response.

Conclusion

The current case provides a new example of a secondary dermatosis in Wolf isotopic response, fibroelastolytic papulosis. Additionally, it supports an inflammatory origin of fibroelastolytic papulosis and suggests that elastolytic dermatoses that follow an inflammatory lesion may be considered examples of an isotopic response.

Potential conflicts of interest

The authors declare no conflicts of interest.

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