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Lichen striatus-like eruption in an adult following hepatitis B vaccination: a case report and review of the literature

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Abstract

Lichen striatus is a rare inflammatory dermatosis that follows the lines of Blaschko. This paper discusses an unusual presentation of lichen striatus following hepatitis B vaccination and reviews the literature of vaccine-induced lichen striatus.

Keywords: lichen striatus, vaccination, immunization, lichenoid, interface dermatitis, hepatitis B, Blaschkoid

Introduction

Lichen striatus (LS) is a relatively uncommon and self-limiting inflammatory dermatosis primarily affecting young children between the ages of 3 and 15, with a predilection for girls. It is rarely seen in adults. It is characterized by a benign, lichenoid eruption that follows the developmental lines of Blaschko. Lesions begin as small pink papules that are erythematous and with fine scale. The papules generally coalesce into small plaques and into either a continuous or interrupted band 1-3 cm wide. The bands are typically located on a proximal extremity but may also occur on the trunk and head [1]. LS is usually asymptomatic, but may be pruritic, especially in those with atopy. Diagnosis is made clinically; however, especially in adults, it can be difficult to differentiate from other linear dermatoses, such as linear lichen planus [2]. Histopathologically, it can be differentiated by the presence of appendageal involvement with perivascular lymphocytic infiltrate and may have hyperkeratosis, focal parakeratosis, and mild spongiosis [3]. The average duration of the

condition is 6 to 9 months and requires no specific treatment.

The exact etiology of LS remains unknown. Suggested precipitating factors include autoimmune response, atopy, viral infection, trauma, and vaccination. Of the latter, there are currently only five case reports in the literature involving four vaccines: Bacille Calmette-Guerin (BCG), yellow fever (YFV), hepatitis B virus (HBV), and measles, mumps and rubella (MMR), [4-8]. We describe a 63-year-old woman who developed LS on her upper left extremity after immunization with the HBV vaccine, and present a synthesis of the vaccine associated cases of LS in the literature.

Case Synopsis

A 63-year-old woman was seen for a rash on the left arm that had been present for 6 weeks. At the time of presentation, she reported no pain or pruritus. The patient reported an initial development of extremely pruritic red bumps from her left shoulder to her hand, which appeared 2 weeks after receiving an intramuscular hepatitis B vaccination in the left deltoid.

Her past medical history was unremarkable. The patient was not taking any medications at the time the rash developed. She was receiving the hepatitis B immunization series owing to negative hepatitis B core and surface antibodies.

On physical exam, she had violaceous papules and both hyperpigmented and hypopigmented macules



Figure 1. A) *Violaceous papules and hypopigmented macules on the left shoulder and upper arm.* B) *Violaceous papules and hyperpigmented macules on the left forearm and dorsal hand.*

along Blaschko lines. The lesions started on the left lateral shoulder and continued down the medial forearm to the dorsal hand (Figure 1).

A punch biopsy was performed on a violaceous papule on the distal forearm for hematoxylin and eosin (H&E) staining. Histologically, the H&E-stained sections were notable for lymphocytic infiltrate and pigment incontinence in the upper dermis and in a peri-eccrine distribution, consistent with the diagnosis of lichen striatus (Figure 2).

Given her lack of symptoms at the time of presentation, treatment was deferred. Interestingly, the patient was administered the second hepatitis B vaccine in the right deltoid without similar findings. Three months after initial onset, all lesions had resolved with only residual hyperpigmentation remaining.

Case Discussion

Lichen striatus remains an incompletely understood cutaneous eruption that occurs mostly in young children and very rarely in adults. Although the precise etiology of LS remains obscure, the distribution along the lines of Blaschko, the direction of growth of cutaneous cells during embryogenesis, suggests the role of cutaneous mosaicism. Somatic mutations that create abnormal keratinocyte clones during embryogenesis possibly remain silent until a triggering event, such as a vaccination [9]. In the case of vaccine-associated LS it has been proposed that the vaccine induces a cross-reactivity between shared epitopes on keratinocytes and viral proteins used in the vaccines. Thus, previous immune system tolerance is consequently broken in these mosaic epidermal cells distributed along the lines of Blaschko and a cell-mediated attack by cytotoxic T cells is triggered [8].

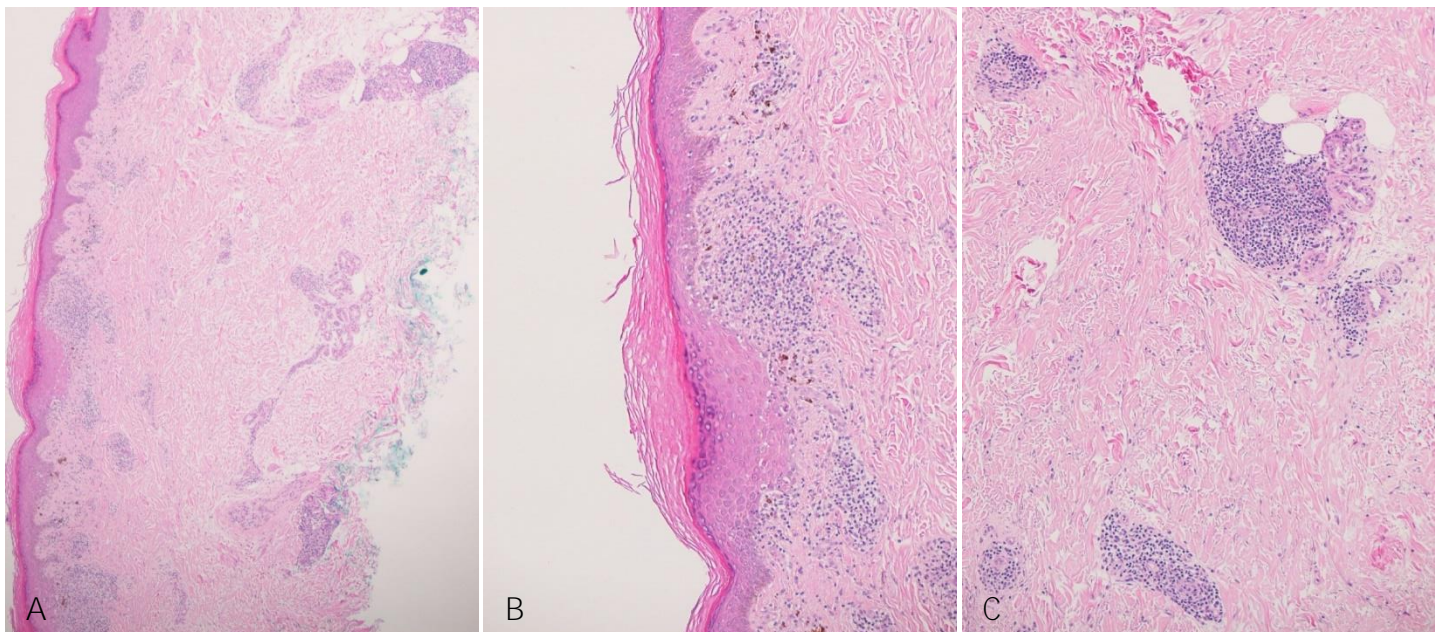


Figure 2. A) *Lichenoid dermatitis with eccrine extension. H&E, 40x.* B) *Lichenoid dermatitis with pigment incontinence and dyskeratotic cells. H&E, 100x.* C) *Lymphocytic infiltrate surround eccrine glands. H&E, 100x.*

Table 1. Reported cases of lichen striatus following vaccination.

Reference	Age	Gender	Vaccine	Distribution
Hwang, 1996 [4]	2-month-old	Female	Bacillus Calmette-Guérin (BCG)	Left arm and hand
Karakas, 2005 [5]	36-year-old	Male	Hepatitis B	Abdomen
Dragos, 2006 [6]	15-month-old	Female	Measles, mumps, and rubella	Right upper leg and side of trunk
Zaki, 2011 [7]	7-month-old	Female	BCG	Left lateral arm
Karouni, 2017 [8]	32-year-old	Female	Yellow fever vaccine	Left arm and hand

The HBV vaccine, available since 1982, is considered very safe and effective (95%) in protecting against hepatitis B infection [10]. The vaccine contains one of the viral envelope proteins, the hepatitis B surface antigen, and is thus classified as a subunit vaccine. The hepatitis B virus can attack the liver and cause both acute and chronic disease and is a major global health problem. It is recommended in the United States that all infants receive the vaccine in a three-shot series. Any adults at risk of contracting the bloodborne illness should also be vaccinated. Although rare, other dermatological adverse events previously been reported following HBV vaccination include lichen planus, granuloma annulare, erythema multiforme, polyarteritis nodosa, pityriasis rosea, Graham-Little-Piccardi-Lasseur syndrome, and childhood bullous pemphigoid [11-15]. In terms of cutaneous adverse events, HBV and BCG vaccines are the most frequently incriminated products.

A review of the literature found vaccine associated LS to be uncommon. Out of five case reports of LS following any vaccination, only one was associated with HBV vaccine. These case reports are synthesized

and presented in Table 1. Including the case presented here, three instances occurred in adults and three in children. Although the sample size is limited, this seems to contradict the typical epidemiological pattern for LS. However, five out of the six patients were female, which is consistent with the known pattern. Additionally, upon review of the case reports, we saw that the appearance of LS was typically two weeks after vaccination but up to eight weeks and began at the site of the vaccination. Most cases resolved within 6 months [4-8].

Conclusion

Lichen striatus is a benign, self-limited dermatosis that resolves without serious sequelae a few months following its onset. Our report, like earlier papers, appears to support vaccination as a rare, but likely trigger of LS. Eliciting a thorough history, including recent vaccinations, will therefore be critical when presented with a patient with a variety of dermatoses.

Conflicts of Interest: The authors have no conflicts of interest to declare.

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