

A reticular pigmented rash on the lower leg

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Quiz case

A 10-year-old boy presented to the dermatologist for a spider web-like pigmented rash on the lower right leg. On examination it was found that the rash was expanding medially from the lateral aspect of the leg to ventral part of the foot (Figure 1). The left leg was uninvolved.

Erythema was not elevated and disappeared on applying pressure to the area. His history revealed that, on advice of his parents, he had been using an electric heater for the past four winter months to keep his legs warm, prior to appearance of the rash. He had no leg pain, abdominal pain, or any history of recurrent fever. There was no history of systemic disease, and physical examination with CBC was within normal limits.



Figure 1. Reticular pigmented rash at the lower right leg. [Copyright: ©2013 Lal et al.]

A final diagnosis of heater-induced erythema ab igne was made. Keeping the leg in close proximity to the heater for prolonged periods of time was responsible for the reticulated lesion on his leg.

Discussion

Erythema ab igne is a reticular rash that is caused by prolonged close exposure to heat. It is more common in older

adults, females more than males, although cases in children have also been reported.

Recurrent exposure to various sources of heat, such as hot water bottles, heating pads, cell phones, radiators, sauna belts, and furniture with heating devices cause the appearance of lesions. The heat is in the range 45-47^o C, which is usually insufficient to cause a burn. In rural areas of the world, the lesion is traditionally caused by sitting or cooking near an open fire. Laptops are becoming one of the most frequent causes of this entity in the industrialized world [1]. Lesions caused by laptop exposure tend to be located on the anterior thighs. The age of patients with erythema ab igne caused by laptops is getting younger. So far, a 12-year-old patient has been the youngest described with laptop induced erythema ab igne [2]. Patients with chronic pain such as, for example in chronic pancreatitis, neuropathies or cancer, may use heating devices for pain relief [3]. Prolonged use of heat may also be seen in patients with certain personality disorders [4].

The rash tends to be erythematous at the beginning but becomes more pigmented over time. Pain or pruritus is not usually noted by the patients. Rare forms of bullous erythema ab igne have been described.

The pathophysiology of the erythema ab igne development is not completely understood, but it has some similarities with actinic skin damage. It results from damage to superficial blood vessels, which causes angiogenesis and hemosiderin deposition within the dermis. Finlayson et al hypothesized that the macroscopic and histological changes present in erythema ab igne are due to a process known as labilization of lysosomes within the dermal cells which is a result of heat rays entering the dermis and causing rupture of lysosomes, thereby allowing degradative enzymes to disperse within the dermis [5]. The released enzymes digest the various fibrous components of the dermis and facilitate accumulation and compacting of elastic fibers producing elastosis.

Histopathological examination of erythema ab igne in the early stages of the development may be nonspecific. Slight atrophic changes within the epidermis, apoptotic keratinocytes, increased melanin deposition, hyperkeratosis, and mononuclear infiltrate at the dermo-epidermal junction may be seen. It has also been proposed that changes in elastic fibers occur [6]. Ultrastructural studies have shown well-developed tonofilaments and increased number of melanosomes and melanophages within cells [5].

Although erythema ab igne is mainly a self-limited condition, some reports have shown possible development of

malignancies in longstanding lesions. Squamous cell carcinoma is one of the most common malignancies caused by thermal radiation. Its development after heat exposure has been described in different cultures. Examples are kang cancer (carcinoma caused by sleeping on hot bricks) and kengri cancer (seen only in the Kashmir region of India and caused by wearing a heater pot under the clothes). Cases of Merkel cell carcinoma and marginal zone lymphoma have also been described with these lesions [7, 8]. However there have been no cases of malignancy development reported in the pediatric population within these lesions.

The diagnosis of erythema ab igne is usually straightforward and is based on the carefully collected anamnesis. The differential diagnosis includes cutis marmorata, livedo vasculitis and poikiloderma. In problematic cases, biopsy may be recommended to exclude the underlying pathology. Treatment is usually based on avoiding the use of heating devices, although longstanding cases may be resistant to this avoidant therapy. Use of Q-switched laser has been described in a single case report [9]. Corticosteroids and photodynamic therapy are also described to be helpful.

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