

Laptop-induced erythema ab igne: a case report and review of the literature

Abstract

Erythema ab igne (EAI) or “*toasted skin syndrome*”, is a skin reaction manifested by a reticulate hypermelanosis on body areas submitted to prolonged exposure to infrared radiation (IRR) in the form of moderate heat insufficient to produce a skin burn. This reaction is probably as old as civilization and accompanies the use of fire for heating icy environments or the body directly. Currently, several cases due to bodily contact with laptops have been reported and makes EAI an old condition new again.

Here, we present a case of a male patient with continuous use of a laptop computer placed on abdominal area in reclining position and the consequent formation of EAI on exposed site.

Comment [jk1]: Include some more scientific information on hypermelanosis due to IRR

Keywords: *Erythema-ab-igne, Hot temperature; Hyperpigmentation; Infrared rays*

1. INTRODUCTION

EAI is probably as ancient as civilization, dated from the time when sitting close to a fire was the only way to withstand icy environments. A variety of heat sources have been reported as causative factors dependent on existing habits and thermal equipment used at each epoch. IRR damages superficial skin vessels leading to vasodilatation and leakage of blood, resulting in hemosiderin deposition presenting in a net mode[1]. A transient reticular erythema comes first and the absence of symptoms allows continued exposure to infrared heat source. After some weeks, an eruption displaying reticulate hyperpigmentation, and erythema presents in a poikiloderma-like picture.

Comment [jk2]: Include some more references regarding prevalence studies

2. Presentation of Case

An otherwise healthy 27 years old Russian male, information-technology specialist, presented for the evaluation of a dusky hyperpigmentation on the abdominal area. Upon further questioning, he reported that due to the COVID-19 pandemic, he had been isolating and doing remote work for at least 10 hours a day. He did this by lying down with a laptop on his abdomen Figure 1. In the last three months, he noticed a persistent “dark spot” gradually increasing in size correspondent to the area where he placed his laptop. The patient was otherwise healthy and was not taking any medications. On physical examination, we observed a reticulated pattern of erythema and brownish hyperpigmentation over the abdomen (Figure 2) and he was diagnosed with erythema-ab-igne due to his habit of placing the laptop on his abdomen in reclining position.



Figure 1: patient's body position on home-office work during the pandemic.



Figure 2. erythema ab igne in patients abdomen.

3. Discussion

Erythema ab igne (meaning: redness from fire) was once common in Europe at a time when the only option to keep the body warm in the coldest days was to stand very close to a fire, but it has become rather uncommon since the introduction of central heating. Anyway, it is still seen in rural areas and, historically, it has been reported among elderly residents who sit near fireplaces, coal stoves or after long repeated application of hot water bottles, use of infrared lamps or heated pads for chronic low back pain. More susceptible body surfaces are lower limbs, lower back and abdomen[2].

The age of information-technology has brought the use of portable computers as an unexpected source of cutaneous contact with radiant heat. Laptops have several

energy-generating components: the battery and the ventilation-fan exhaust, optical drives and the central processing units. Occlusion of the cooling vents by positioning it on body areas allows direct exposure to the heating elements of the notebook. The lesion typically corresponds to the left side of the body, as it is the side where the warm parts of portable computers are located. The reaching temperatures can range between 43 and 47°C [3].

EAI predisposes to skin cancers, providing that exposure to heat persists. Thermally induced cancers, especially squamous cell carcinoma (the most common thermally induced cancer), have been reported in relation to previous skin areas of EAI. Besides, Merkel cell carcinoma may rarely arise. A histological pattern showing squamous atypia similar to actinic keratoses may arise after long latent periods. In remote communities of Asian countries, ancient and traditional customs linked to the use of heat still persist and EAI progresses, giving rise to rare forms of skin cancers. These include the Kang cancer from Tibet and Northern China, which is a squamous-cell carcinoma, due to the high cost of sleeping in beds with heated bricks; the Kangri cancer, affecting the lower abdomen and inner thighs found in Kashmir, induced by the use of pots with hot coals; and finally, the Kairo cancer from Japan, as a result of charging braziers with burning benzene.

4. Conclusion

EAI is usually a benign reaction with an excellent prognosis, improving readily with topical corticosteroids and especially avoidance of radiant heat. Our patient was advised to avoid the habit of placing the laptop on abdomen and his reticulate hyperpigmentation gradually disappeared over next four months with only a topical corticosteroid prescription.

Diagnostic recognition in the case of our patient was essentially clinical, which resulted in exams or biopsy being unnecessary. We must keep in mind that, in some cases, EAI arises due to the application of heat to treat chronic pain, which may indicate an underlying malignancy.

Frankly speaking, this case may broaden our horizons and will undoubtedly help the readers to get familiar with such condition. Patients with EAI do not require any thorough additional work-up and correct diagnosis may help to reduce a number of needless procedures.

CONSENT (WHEREEVER APPLICABLE)All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.'

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