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Laptop-Induced Erythema *ab igne*: A Case Report and Review of the Literature

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Authors' contributions

This work was carried out in collaboration between both authors. Author CB wrote the first draft of the manuscript. Author AK diagnosed the condition examined and the proposed the treatment of the patient. Both authors read and approved the final manuscript.

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Case Report

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

Keywords: Erythema-ab-igne; hot temperature; hyperpigmentation; infrared rays.

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1. INTRODUCTION

EAI is probably as ancient as civilization, dating 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]. Transient reticular erythema comes first and the absence of symptoms allows continued exposure to the infrared heat source. After some weeks, an eruption displaying reticulate hyperpigmentation, and erythema present in a poikiloderma-like picture.

2. PRESENTATION OF CASE

An otherwise healthy 27 years old Russian male, an information technologist, presented for the evaluation of dusky hyperpigmentation in the abdominal area. Upon further questioning, he reported that due to the COVID-19 pandemic, he had been isolating himself and doing remote work for at least 10 hours a day. He did this by lying down with a laptop on his abdomen (Fig. 1). In the last three months, he noticed a persistent “dark spot” gradually increasing in size corresponding 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 (Fig. 2) and he was diagnosed with erythema-ab-igne due to his habit of placing the laptop on his abdomen in the reclining position.

Fig. 1. Patient´s body position on home-office work during the pandemic

3. DISCUSSION

Erythema ab igne (meaning: redness from fire) [2] was once common in Europe at a time when the only option to keep the body warm on the coldest days was to stand very close to a fire, but it has become rather uncommon since the introduction of central heating [3]. 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 the lower limbs, lower back, and abdomen [4,5].

Fig. 2. Erythema *ab igne* in patients abdomen more proeminent on the left side

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 °C and 47 °C [6].

EAI predisposes to skin cancers, providing that exposure to heat persists. Thermally-induced cancers, especially squamous cell carcinoma [7] (the most common thermally induced cancer), have been reported concerning previous skin areas of EAI. Besides, Merkel cell carcinoma [8] 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

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 his abdomen and his reticulate hyperpigmentation gradually disappeared over the 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 biopsies 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 [9,10] or a sign of chronic pancreatic pain [11].

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

CONSENT

All authors declare that 'written informed consent was obtained from the patient'.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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