

Erythema ab igne in a paediatric patient: an unexpected cause

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SUMMARY

Erythema ab igne (EAI) is a reticulated, erythematous rash resulting from repeated exposure to low-grade heat, commonly from heating devices. Although historically more common in adults, EAI is increasingly recognised in children due to the growing use of electronic devices. We describe a boy in mid-childhood presenting with an abdominal rash, initially suspected of having a liver injury following minor trauma. Blood tests and abdominal imaging were unremarkable. On re-presentation with rash progression and skin breakdown, targeted history identified prolonged laptop-to-skin contact, leading to a diagnosis of EAI.

This case emphasises the importance of considering laptop-induced EAI in children presenting with reticulated rashes, as early recognition can prevent misdiagnosis, unnecessary investigations and avoidable radiation exposure.

BACKGROUND

Erythema ab igne (EAI) is a dermatological condition characterised by a reticulated, hyperpigmented rash resulting from repeated exposure to low-grade heat, below the threshold required to cause thermal burns.¹ As more commonly reported in adults, EAI may be overlooked in children, especially when the source of heat is less obvious than the traditional sources such as hot water bottles and heating pads. The increasing use of electronic devices, particularly during home schooling, has emerged as an under-recognised cause of EAI in paediatric populations.²

EAI may be misdiagnosed as livedo reticularis or other dermatological or vasculitic conditions, potentially leading to unnecessary investigations, including blood tests and imaging. Diagnosis is clinical, based on characteristic rash appearance and a history of repeated heat exposure. Management is conservative, focusing on removal of the heat source, after which lesions usually resolve. Rarely, chronic exposure may result in persistent pigmentation or, in longstanding cases, malignant transformation.¹

We report a case of a boy in mid-childhood with an abdominal rash initially investigated as traumatic injury, later diagnosed as EAI secondary to prolonged laptop use. This case highlights diagnostic challenges and the importance of targeted history-taking in avoiding unnecessary investigations.

CASE PRESENTATION

A boy in mid-childhood presented to the Children's Emergency Department with 'spontaneous bruising', as triaged by the nursing team. History

revealed a 1 week history of skin changes over the right upper quadrant of the abdomen, initially thought to be a bruise. The lesion was non-tender, non-pruritic and unchanged in size or appearance since first noticed. He did not inform his parents until the rash became darker and failed to improve. At presentation, neither the patient nor his parents could identify a cause. He was otherwise well, with no history of trauma, illness or systemic symptoms, such as fever, weight loss or fatigue. There were no associated abdominal or urinary symptoms. He was up to date with immunisations, had normal growth and development and no significant past medical history.

On examination, he was clinically stable. A 15 centimetre flat, reticulated, reddish-brown patch was noted over the right upper quadrant of the abdomen. The lesion exhibited a distinct pattern, with interlacing lines forming irregular circles and a lace-like morphology. The borders were ill-defined and faded into the surrounding skin. There was no evidence of scaling or elevation (figure 1). There were no other areas of skin changes, rashes, lymphadenopathy or bruising noted. A systematic examination was otherwise unremarkable, with no abdominal tenderness or organomegaly. Baseline investigations were normal. A chest X-ray was performed, and it demonstrated a small area of consolidation over the left lower lobe of his lung.

During venepuncture, the patient disclosed that he and his sibling had been playfighting 1 week earlier, during which he was pushed into a chair. He had not disclosed this earlier as he was concerned that his sibling would get into trouble. This history prompted consideration of an underlying traumatic injury. CT imaging showed no evidence of intra-abdominal injury, with an incidental small area of lung consolidation, consistent with the X-ray findings. In the context of otherwise normal investigations and examination, the patient was discharged with a 5-day course of Co-amoxiclav and safety-netting advice.

The patient re-attended several weeks later with progression of the rash and increasing tenderness. Examination revealed increased erythema and a focal area within the brown patch exhibiting a pink hue, consistent with skin breakdown (figure 2). These changes prompted reconsideration of the initial diagnosis of bruising. Although initial enquiry about common heat sources was negative, further questioning revealed that the patient was being home-schooled and routinely used a laptop for educational activities. He reported resting his laptop on his abdomen for up to 8 hours daily, often



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Case report



Figure 1 Abdominal markings seen during first presentation.

while charging. These findings supported a clinical diagnosis of EAI.

OUTCOME AND FOLLOW-UP

Following explanation of the diagnosis, the family was reassured of its benign nature. He was discharged after application of a dressing and counselled to avoid further direct heat exposure. Telephone follow-up with the patient's father several months later confirmed gradual improvement and complete resolution of the rash after removal of the heat source.

DISCUSSION

The initial differential diagnoses included livedo reticularis, vasculitic rash and trauma. Livedo reticularis was considered due to the reticular pattern; however, the absence of systemic features and the localised distribution made it unlikely. Vasculitis was suspected due to concern for purpura, yet lack of associated symptoms or biochemical abnormalities argued against this. Trauma was considered after the patient disclosed an abdominal injury. However, normal investigations, absence of pain and rash progression were inconsistent with a traumatic aetiology. The diagnosis of EAI was established at the second presentation, approximately 2 weeks after the initial assessment, following rash progression and targeted questioning that identified prolonged heat exposure.

Published literature suggests that laptop-induced EAI is well recognised in adults but remains less frequently reported in children. Most cases involve prolonged heat exposure over weeks to months, commonly affecting the thighs.³ Similar to our case, diagnostic delay and misclassification have been described. Reports published during the COVID-19 pandemic highlight an increase in paediatric EAI associated with remote learning and prolonged device use, reinforcing the importance of enquiring about modern heat sources.^{4 5} Compared with previously reported cases, our patient's presentation is similar in appearance and trigger; however, it differs in the anatomical location and in the initial presentation mimicking traumatic injury, which led to further imaging.

EAI is generally benign and reversible, with lesions usually improving over weeks to months following removal of the



Figure 2 Abdominal markings seen during second presentation.

heat source. Persistent hyperpigmentation may occur, particularly with prolonged exposure. Further investigations should be considered if lesions fail to resolve after elimination of the trigger or if there are atypical features suggestive of alternative diagnoses. There are currently no formal paediatric guidelines for EAI, and diagnosis remains clinical, based on history and characteristic findings. A limitation of this case is the lack of in-person follow-up, with resolution confirmed by the patient's family via telephone call.

This case highlights the importance of considering EAI in children presenting with reticulated rashes, particularly in the context of increasing electronic device use. Early recognition through targeted history-taking can prevent misdiagnosis and avoid unnecessary investigations.

Learning points

- ▶ Erythema ab igne should be considered in children presenting with a reticulated, hyperpigmented rash on heat-exposed areas.
- ▶ Prolonged laptop use can cause EAI, particularly during home schooling or remote learning.
- ▶ Diagnosis is clinical, based on characteristic skin changes, and a targeted history of heat exposure can avoid unnecessary investigations.
- ▶ Early recognition is important to prevent misdiagnosis and avoidable radiation exposure.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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