A vascular naevus can mimic bruising in an infant

Forensic investigations into suspected inflicted injury of children can distress children and their parents. Forensic Paediatricians and paediatric social workers have the unenviable role of investigating the possible causes of injury, assessing families’ psychosocial circumstances and making recommendations to statutory child protection authorities which are likely to have long lasting impacts. Diagnostic accuracy is paramount.

We present a case of a two month old baby referred for forensic medical assessment in relation to suspected bruising that repeated skin examinations over time revealed to be a reticular vascular malformation.

Case

A 2 month-old baby was brought to a paediatric hospital by her parents who observed an area of red-blue discolouration on her left postero-lateral calf (Figure 1). Her parents reported that they were unaware of any event that might have resulted in bruising.

On day two of life developmental hip dysplasia was diagnosed and the baby was referred for a brace which was fitted one week prior to her leg discolouration being detected. In the Emergency Department, the discolouration was attributed to bruising and photographs were taken. Because of concerns around a possible inflicted cause, referral was made to the paediatric forensic service. Additional forensic quality photographs were taken the following day. A skeletal survey, MRI brain and spine, tests for coagulation disturbances and eye examination were all reported as unremarkable and an assessment by a social worker did not identify any significant psychosocial risk issues.

Forensic medical assessments are conducted in conjunction with medical social work in our service both as part of the risk assessment and to support to families through the diagnostic process (irrespective of the likelihood of abuse). Examination of the baby wearing her hip brace while in two infant carriers being worn by both parents did not suggest prolonged pressure points on her outer lower legs. She was not examined in her car seat because an interval of several days intervened between her last car-trip and detection of discolouration.

Any bruise to a young infant should raise suspicion of abuse because accidental bruising in non-mobile children is very uncommon1. As per hospital protocols around early reporting to statutory authorities when concerns arise around child abuse, a report was made to Child
Protection and the child’s parents were informed of the notification and the investigative process that would follow and were supported through this process. The authors acknowledge that involvement with statutory child protection services is stressful.

The baby was re-examined by a senior member of the forensic medical service in hospital two days after presentation. The discolouration on the baby’s leg appeared essentially the same size, shape and hue as it did upon presentation to hospital; a finding confirmed by examination of serial photographs. Upon close inspection it appeared that the lesion blanched with firm pressure and small thin red branching lines were visible when the skin was gently stretched, suggesting a vascular origin. A plan was made to review the baby in one week with additional clinical photographs to be taken for the purpose of additional comparisons over time. A safety plan was developed for the baby to be discharged into the care of her parents with in-home supervision by a family member while risk assessments were completed.

One week later the mark on the leg had not changed significantly in size, shape or hue although the intensity of the colour varied slightly, possibly associated with day-to-day fluctuations in blood flow through the lesion (Figure 2). Narrow branching red lines were evident in some of the areas of discolouration, suggesting a vascular malformation likely to be a reticular vascular naevus (angiokeratoma circumscriptum). Subsequently, the treating orthopaedic specialist commented that he had seen similar marks on other babies placed in rigid braces to treat hip dysplasia.

When suspicions of inflicted trauma were allayed, the child protection agency closed their investigation.

Discussion
Skin examination should form part of the routine examination of all young children presenting for routine medical care even in the absence of concerns for abuse. Detailed skin examination includes the scalp and mucosa. Cutaneous signs are not only important in the evaluation for suspected child abuse and neglect but also in the evaluation of multiple systemic diseases.

Much like a cardiovascular or abdominal examination, skin examination should be undertaken with a systematic approach to ensure important findings are not missed. Inspection to determine the distribution, grouping, pattern, colour, shape and size of any skin findings is key to diagnosis. When forensic assessments are undertaken, high quality clinical
photographs and detailed body diagrams are desirable adjuncts to the medical record. Particular attention is given to features such as blanching under pressure and the presence of visible blood vessels or palpable venous lakes. Palpation should occur for heat, texture, tenderness, scaling, elevation and thickness.

In this case clinical photographs enabled peer review of clinical findings and comparisons to be made over time. In some situations, repeated skin examinations over time are the key to diagnosis. Medical mimics of bruising such as congenital dermal melanocytosis in atypical locations and post inflammatory hyperpigmentation can challenge the clinical acumen of experienced paediatricians. Serial examinations should also be considered to assess and photograph positioning within infant carriers or slings if these carriers are hypothesized as a possible cause of impact or sustained pressure.

Reticular vascular naevi (angiokeratoma circumscriptum) are red-purple lesions commonly found on the lower leg or feet. The appearance is caused by dilated dermal papillary blood vessels. These lesions are usually harmless and require no treatment. Hyperkeratosis is commonly reported in older patients but was not a feature in our patient.

The firm brace used to treat hip dysplasia in this infant was implicated by the treating orthopaedic surgeon as a possible cause of a vascular marking on the infant’s outer lower calf. However the mark could not be approximated to the brace in any way and infant carriers did not apply pressure to this location. It would be of interest to know if other practitioners have observed vascular malformations in infants who have hip dysplasia treated with rigid braces as no other case reports have been found. If such vascular malformations are the consequence of such treatment then parents could be forewarned and medical practitioners could refrain from subjecting infants to forensic medical investigations.

Learning Points

1. High quality photographs can provide a valuable resource when skin markings are evaluated for forensic purposes.

2. Repeated examinations over time can differentiate medical mimics from inflicted skin injury.

3. When forensic investigations of skin injury are undertaken and consideration is given to possible impact or sustained pressure from equipment, infants and young children
should be examined in their infant-carriers, car seat and other equipment.

4. Reticular vascular naevi can mimic bruises. Repeated observations over time can demonstrate persistence of size, shape and hue which aid correct diagnosis.

5. Vascular naevi may not blanch under light pressure. This creates challenges for practitioners who aim to differentiate mimics from bruises.

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References


Figure 1. Photograph taken on admission to hospital taken one week later

Figure 2. Photograph
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