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Cutaneous sign of abuse: Kids are not just little people

Sphoorthi Jinna, MD[a,*], Nina Livingston, MD[b], Rebecca Moles, MD[b]

[a]*Department of Dermatology, University of Connecticut Health Sciences, Farmington, CT*
[b]*Department of Pediatrics, University of Connecticut School of Medicine, Connecticut Children's Medical Center, Hartford, CT*

Abstract Skin injury is the most common form of child physical abuse. Although the pattern and visual appearance of skin injury and the treatment needed for the injury is similar in children and adults, characteristics of infant and childhood skin may complicate the diagnosis of injury. A good understanding of normal developmental presentation of accidental injury from infancy to adulthood, locations for injury that should trigger consideration of abuse, and cutaneous mimics of abuse across the lifespan are critical to the identification of suspected abuse. Adults and older children can provide a history directly to providers, though it should be noted that abused adults and children may not always disclose the true cause of their injuries. In infants and very young children, a history from the patient is lacking due to the verbal abilities of the child, and a parent or other caregiver may provide a false or misleading history that can complicate the diagnosis and treatment. The approach to taking the history, when abuse is suspected, is a critical part of the evaluation, and best practice will vary depending on whether your patient is a child or an adult.

Skin in infancy

How is the skin of infants different from the skin of adults?

The skin of an infant differs from that of an adult in that it is thinner by 40-60%, is less hairy, and has a weaker attachment between the epidermis and dermis.[1] Despite this, however, infants are at lower risk for accidental skin injury than children and adults due to their low mobility. Normal handling should not cause injury in a healthy infant or child despite the skin differences between infants and adults.

Several changes also occur in the skin of elderly adults. There are fewer epidermal cell layers compared with younger individuals, and because keratinocytes are slower to turn over, there is increased time for wound repair.[2] There is also a reduction and disintegration of collagen and elastic fibers, as well as atrophy of the subcutaneous fat, which decreases support of the skin from underlying bony structures. This increases injury susceptibility from external trauma.

Bruising

What are normal bruising patterns seen from childhood play and activity?

Bruises are common in healthy and active children. Multiple studies have evaluated normal bruising by age and found that the presence of bruises increases significantly with mobility. In studies of normal children, those who are precruising (not yet mobile upright) have rates of accidental bruising,

* Corresponding author.
E-mail address: jinna@uchc.edu (S. Jinna).

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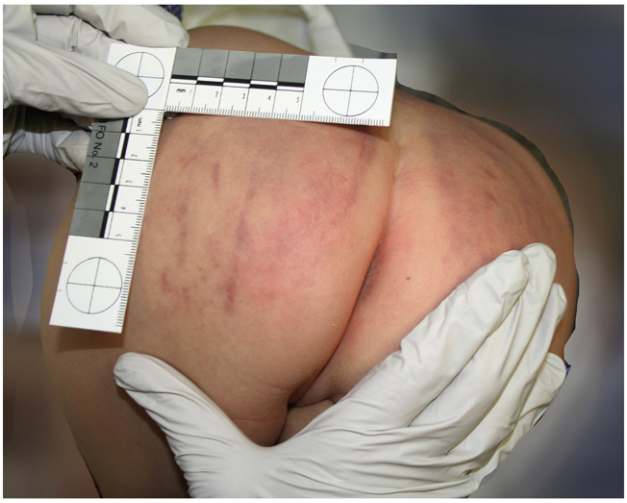

Fig. 1 This 4-year-old girl reported being spanked by a caregiver and had bruising over the buttocks with some patterned elements. Note typical sparing in the gluteal cleft.

between 1% and 4%, whereas cruisers range around 17%.[3-5] Walking significantly increases the rates of normal bruising seen in children, with rates of 35-50%.[3-5] The majority of these bruises are noted on the front of the body along bony prominences, such as the forehead and shins.[6] These injuries are noted to be more common in the summer months, presumably due to increased activity level in children at that time.

What are features of bruising that should raise suspicion for abuse in children?

Bruises are the most common type of injury in abused children.[7] Differentiating inflicted from accidental bruises in children can be challenging. Age, location, and pattern of the lesion can help determine etiology. Given their immobility, any bruise on a precruising infant should be evaluated emergently, with consideration of child abuse in addition to medical causes.[8,9] The likelihood of having an accidental bruise in a child who is not independently mobile is less than 1%.

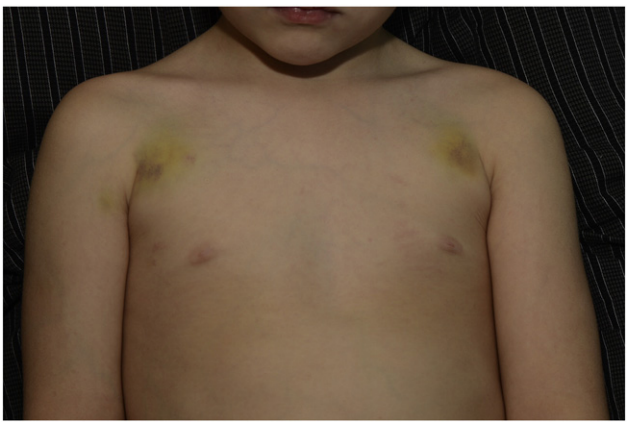

Fig. 2 This 5-year-old boy reported that his mother's boyfriend forcefully grabbed his torso.

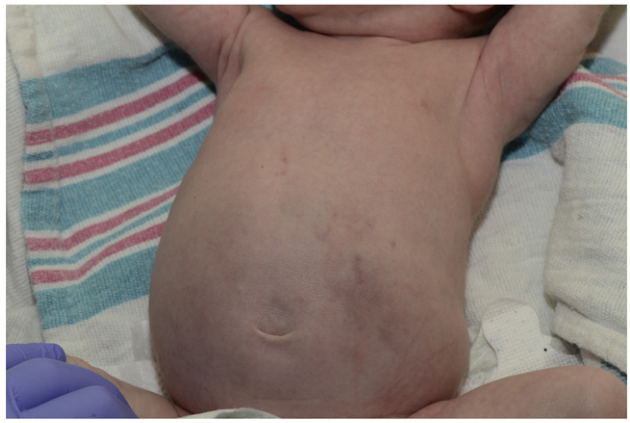

Fig. 3 This 1-month-old infant presented with unexplained bruising to multiple body areas. Evaluation for bleeding disorder was normal and injuries were thought to have been inflicted.

Ambulatory children acquiring bruises through normal play typically have fewer than three bruises, each of which measures less than 10 mm in size.[10] Multiple or large bruises on a child, especially in clusters, should raise suspicion for abuse.

Location is also an important consideration when evaluating abuse. Physicians must pay particular attention to children who have injuries in areas that are typically protected, such as buttocks (Figure 1), back, trunk (Figures 2 and 3), genitalia, inner thighs, cheeks (Figure 4), earlobes (Figure 5), neck, or philtrum.[11] Bruising away from bony prominences, or in a defined pattern, should also raise suspicion for abuse.[8] Patterned injuries, such as those from a hand, belt buckle, stick or whip, or looped cord, must be evaluated for possible abuse.

How do the cutaneous manifestations of bruising secondary to abuse differ in children compared with adults?

In many ways, the findings of elder or adult abuse are similar to those seen in child abuse, although the fragility of aging

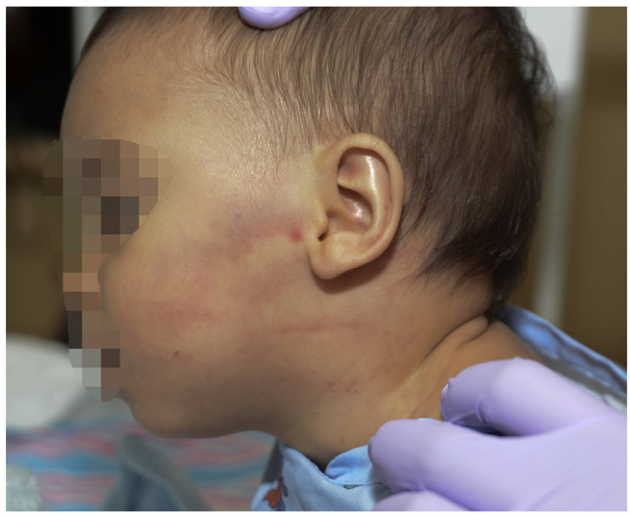

Fig. 4 This 10-month-old infant presented with injuries typical of a slap mark (linear bruising with areas of sparing).