Bruising in Infants

Those With a Bruise May Be Abused

Mary Clyde Pierce, MD,†‡ Stacey Smith, MD,* and Kim Kaczor, MS*‡*

Abstract: Bruising in the young infant is rare, and if present, this may be a manifestation of physical child abuse. Early signs of abuse, such as bruising, are often overlooked or their significance goes unrecognized resulting in poor patient outcomes. In such cases, the opportunity to intervene and potentially prevent repeat injury is lost, and the child is placed back in harm's way. This brief report presents 3 cases of nonmobile infants who presented to health care providers with bruising before a subsequent fatal or near-fatal event. These cases emphasize the importance of including abusive trauma in the differential diagnosis of an infant with a bruise or a history of easy bruising and the importance of initiating a thorough trauma evaluation immediately and concomitantly with any other workup for the causes of bruising in the noncruising infant.

Key Words: contusions, physical abuse, inflicted trauma

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"Bruises are a very much neglected branch of injuries." These words were originally delivered in a 1938 address to the Medico-Legal Society of Great Britain by Sir Bernard Spilsbury.[1,2] More than half a century later in 1991, Langlois and Gresham[3] quoted these same words and observed that "little has changed since then." Remarkably, in 2008, the words of Sir Spilsbury continue to be true; bruises remain a very much neglected branch of injuries. This is important, especially, in the case of the physically abused child; bruising may be the only warning before a fatal or near-fatal outcome. Medical recognition of these (sometimes subtle) warning signs coupled with appropriate action is critical in the prevention of recurrent abusive events.[4]

Bruising in the young infant is rare. This point is well established in the landmark article of Sugar et al[5] titled, "Bruises in infants and toddlers: those who don't cruise rarely bruise," where only 0.6% of infants younger than 6 months presenting for well-child care visits were found to have bruising. Yet, bruises are the most common manifestation of physical abuse and often the first sign.[6] More than 150,000 children each year sustain serious or even fatal injuries from physical abuse. Many of these children present initially with bruising which often goes unnoticed, or its significance is not recognized.[7] This may be because bruising is usually a benign form of trauma without need for evaluation or intervention. When a bruise is identified on an infant, the health care professional may be uncertain of the etiology and/or whether any workup is required. This is problematic because the abused infant or child with bruising may have no other signs or symptoms in the earliest stages of abuse. If an appropriate and timely evaluation for injury etiology does not occur, recurrent abusive events and continued exposure to a high-risk environment is likely to result.[8,9] To prevent repeat injuries in these high-risk patients, it is imperative that both primary and emergency care providers have a standardized approach when a bruise is identified on the noncruising infant.

This case report describes 3 cases of nonmobile infants who presented to a health care provider with bruising before their subsequent fatal and near-fatal injuries.

CASE 1: HOSPITAL SETTING

A 2-and-a-half-month-old infant was admitted to the hospital with respiratory distress. On the history and physical examination on admission, the mother reported easy bruising of the infant on the review of systems. On physical examination, the infant was noted to have faint bruising to the left shin and right hand. The patient was admitted and treated for bronchiolitis. Prothrombin time, partial thromboplastin time, and international normalized ratio were within reference range, and the infant was sent home for follow-up with the primary care physician regarding the easy bruising. Within 1 month, the child died of inflicted traumatic brain injury. The infant had both old and new fractures, as well as retinal hemorrhages.

CASE 2: EMERGENCY DEPARTMENT SETTING

A 3-month-old infant presented to an emergency department with vomiting and diarrhea. On physical examination, the physician noted a bruise on the lateral side of the right ankle. An explanation was offered that the infant's ankle *may* have gotten "hung up" in the car seat, causing the bruise. However, on further questioning, the caregiver was unable to provide details as to how or when the bruise occurred. The infant was eating well in the emergency department and was sent home with a diagnosis of acute gastroenteritis. No social evaluation or medical workup was done related to the bruise on the ankle. Within 5 days, the infant presented to the same emergency department with lethargy and agonal respirations and was subsequently diagnosed with traumatic brain injury, retinal hemorrhages, and both old and new skeletal fractures.

CASE 3: PRIMARY CARE SETTING

A 2-month-old infant presented to a primary care provider for a well-child care visit. On examination, a faint bruise was noted on the chest; the rest of the physical examination was normal, and the infant was noted to be active and alert. No history of trauma was present, but the parent reported that the infant seemed to bruise easily. Family history was negative for any bleeding disorders. The infant was sent for an outpatient

From the *Department of Pediatrics, University of Louisville, Louisville, KY; †Northwestern University's Feinberg School of Medicine, Chicago; and ‡Children's Memorial Hospital, Chicago, IL.

Reprints: Mary Clyde Pierce, MD, Northwestern University's Feinberg School of Medicine and Children's Memorial Hospital, 2300 Children's Plaza, Box 16, Chicago, IL 60614-3363 (e-mail: mpierce@childrensmemorial.org).

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Mary Clyde Pierce and Kim Kaczor are now with the Northwestern University's Feinberg School of Medicine and Children's Memorial Hospital, Chicago, IL.

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workup for possible bleeding dyscrasias including a complete blood cell count and coagulation studies. However, the infant died of inflicted trauma within days before the results of the outpatient workup was completed.

DISCUSSION

These cases illustrate the importance of recognizing bruising as an early sign of physical child abuse. Failure to recognize the significance of such subtle and early findings *may* result in poor patient outcomes because abuse is an escalating form of trauma. Bruising is often the initial injury in abuse with subsequent and more severe trauma resulting in skeletal, brain, and abdominal injuries. Because the significance of bruising on these nonambulatory young infants was unrecognized, abusive trauma was not on the diagnostic differential, and further evaluation was not performed. Ultimately, the opportunity to intervene was lost, and more serious or fatal injuries were sustained by these children. If a trauma evaluation or abuse workup had been conducted at the time of the initial presentation, it is possible that additional evidence of abusive trauma would have been identified, potentially changing the health outcome of these infants. For example, cases 1 and 2 were found to have healing fractures (among other injuries) at the time of the sentinel event; it is possible that these fractures would have been detected on imaging at the time of initial presentation had abusive trauma been on the diagnostic differential and further evaluation been performed.

"The prudent physician should seriously consider the possibility of medical illness or inflicted injury when evaluating a young infant who has any bruises."[5] These 3 cases reinforce the findings of Sugar et al[5] who evaluated nearly 1000 patients to identify developmentally normal-bruising patterns in children younger than 3 years. Sugar et al concluded that bruises in infants younger than 6 months are extremely rare, and bruises in preambulatory infants younger than 9 months are also very uncommon. Although any bruise in an infant younger than 6 to 8 months should be cause for alarm, Maguire et al[10] looked for patterns of bruising that would be consistent with abusive injury in all young children. They concluded that the patterns of bruising most consistent with abuse include bruising in babies and children who are not independently mobile, bruises away from bony prominences, bruises to face, back, abdomen, arms, buttocks, ears and hands, bruises in clusters or of uniform shape, and bruises with an imprint of an implement.

It was documented in these cases that these noncruising infants had bruises on physical examination, yet no evaluation for trauma or child protective services report was filed. These physicians may not have considered child abuse in the differential diagnosis of an infant with a bruise. In general, some physicians who suspect child abuse do not report because they are uncertain of the diagnosis or they do not want to jeopardize their relationship with the family.[11,12] When an infant is found to have a bruise or the family reports "easy bruising," a bleeding disorder workup may be initiated, but because of the high-risk environment in cases of abuse, it is critical that the evaluation for abuse is not delayed. Repeat injury occurs most often within a short period, not allowing for a stepwise evaluation.[13] Organic causes and abusive trauma must be considered in these instances concomitantly. All 3 infants reported here experienced fatal or near-fatal repeated trauma soon after their initial presentation, not allowing time for further workup to rule out traumatic or organic causes.

Just as there is a pediatric protocol for the evaluation of sepsis in the febrile young infant to screen for occult serious bacterial infection, a standardized approach to the infant with bruising is warranted. A protocol for the evaluation of child abuse in the young infant with bruising to screen for social risk factors, and occult trauma such as fractures and traumatic brain injury could prove beneficial.

Evaluation for any infant with unexplained bruising and/or bruising without a clear and detailed accidental causation:

- Skeletal survey[14]
  - When evaluating for possible physical abuse, the American Academy of Pediatrics recommends a formal skeletal survey in children younger than 2 years.
- Head computed tomography[8,15,16]
  - Neuroimaging is required even when result of the neurological examination is normal; infants with significant brain injury can still exhibit a normal result in the neurological examination.
  - Infants with bruising to the head and neck regions, including the face, ear, and frenulum, or exhibiting a full fontanel may have an increased likelihood of brain injury.
  - Infants presenting with an apparent life-threatening event, lethargy, vomiting, or irritability may be displaying subtle signs of neurological impairment from head trauma.
- Trauma screening laboratory studies,[17,18] which may include liver function tests, complete blood cell count, prothrombin time, partial thromboplastin time, amylase, lipase, creatine kinase, and urinalysis
- Abdominal computed tomography[19]
  - If trauma laboratory results are positive, and/or
  - If the infant or child exhibits bruising on the abdomen or trunk, and/or
  - If bilious vomiting is present
- Retinal examination
  - If brain injury is identified

The goals of this case report are to:

1. raise awareness in the health care provider that bruising in the young infant can be an early sign of physical child abuse,
2. underline the importance of including abusive trauma in the differential diagnosis of an infant with a bruise or a history of easy bruising, and
3. emphasize the need to initiate a thorough trauma evaluation immediately and concomitantly with any other workup for the causes of bruising in the noncruising infant.

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