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Pseudoabuse—The Misdiagnosis of Child Abuse

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ABSTRACT: When a patient's problem is judged to be the result of child abuse and it is not, considerable harm may be done to the child, his parents, and the doctor-parent relationship. The case histories of 15 children who were thought to be abused are reviewed and their correct diagnoses are presented. Overdiagnosing the battered child syndrome can be as harmful as failing to consider it.

KEYWORDS: psychiatry, child abuse

Since 1960, when Kempe wrote his classic description of the battered child syndrome (BCS) [1], there have been numerous articles describing the many ways in which children can purposely be harmed by others. Physicians have been encouraged to recognize and report incidents of child abuse. There are, however, dangers in regarding every unusual injury as abuse.

Among the damaging effects of such diagnostic shortsightedness is the failure to consider other causes of the patient's signs and symptoms—particularly when the child suffers from a treatable condition. Fractures, for instance, may be secondary to rickets, a disease that is frequently overlooked, but which is still very much with us [2-4]. Inappropriate reporting may also do irreparable harm to the patient-physician relationship, once the possibility of abuse is raised. Regaining a parent's confidence may be impossible even when an organic cause can later be found [5-8].

Similarly, it is naive to assume that reporting a child's injuries as suspicious of parental abuse will have no repercussions even if this diagnosis is not established. In Pennsylvania, suspicion of battering is reported to the Childline in Harrisburg. The report is then forwarded to the county in which the child resides. A social worker investigates the circumstances surrounding the injury to determine if abuse occurred. If the injury is of a sufficiently serious nature, the District Attorney's office may become involved. Depending on the circumstances, a parent may not only be at risk of losing custody of the child, but may also face criminal charges. The author has had personal experience with two children who had major developmental problems related to birth injuries and whose parents were criminally charged with having caused the patients' congenital neurologic deficits [9].

Even if criminal charges are not filed, a parent might lose custody of a child if the matter is brought to Family Court and the judge believes that the parents have harmed the child. If abuse has not been committed, this would indeed be a disaster. In addition to losing the care of his mother and father, the patient may be placed in a foster care system which leaves much to be desired [10, 11]. Children can be shuffled from household to household without receiving the love and nurturing that they require. It would be especially tragic if such events

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were to involve a child whose injuries resembled, but were not caused by, abuse. In addition to these miscarriages of justice, the physician who reports as abuse an incident which is later proved to be accidental can and has been accused of malpractice.² The physician may suffer considerable distress during the legal proceeding, and even after the case is ultimately dismissed.

To avoid such unfortunate consequences, the physician should be aware of those findings that resemble battering but are due to an innocent cause. This article will describe several patients who were referred to the author because of suspected abuse and were later found not to have been intentionally maltreated. The cases are summarized in Table 1. A review of the pitfalls that can lead to the inappropriate diagnosis of BCS will be presented.

In Patient 1, the primary difficulty was that his physician was unfamiliar with Vietnamese medicine and failed to recognize a folk remedy, Cao Gio, which is commonly practiced in that country. There are many varieties of this dermal abrasion with various shapes and patterns involving different parts of the body [12,13]. Less we think that such practices are relegated to primitive societies, we should consider how a Vietnamese physician would re-

TABLE 1—Cases misdiagnosed as child abuse syndrome.

Age, Sex, Race	Presenting Findings	Additional Information	Outcome Interpretation
1. 18 months/male Vietnamese	multiple burns on thorax in a triangular pattern	hot coins applied to skin for the treatment of respiratory infection	Vietnamese folk medical treatment
2. 1 year/male white	generalized bruises	prolonged prothrombin time	sweat test confirmed cystic fibrosis
3. 3 months/male black	large bruises on back	diagnosis by an inexperienced resident	consultant identified the lesion as mongolian spots
4. 4 year/male black	bullae with black centers on trunk	...	staphylococcal impetigo
5. 5 years/male black	failure to thrive	severe cerebral palsy; difficult to feed	gastrostomy feeding improved nutrition
6. 1 year/male	finger lacerated by brother's knife	tourniquet applied for 18 h by mentally retarded mother	unintentional injury
7. 9 years/female white	apneic, 5- to 7-cm laceration on the neck	child swinging on curtain rod of shower stall which over- turned and crushed the trachea	history corroborated by police investigation and autopsy
8. 4 months/male black	sibling pulled off bed, unable to move leg	X-ray; midshaft fracture of femur, epiphyseal, and metaphyseal changes	Vitamin D deficiency rickets
9. 3 months/male black	rash for two months; poor hygiene	X-ray revealed periosteal calcification	lesions caused by congenital syphilis
10. 4 years/female black	repaired myelomeningocele; fall from wheelchair	X-ray; callous formation of tibias and femurs	osteoporosis with disuse atrophy
11. 2 years/female white	bone "snapped" while playing with father	X-ray; spiral fracture of tibia	toddler's fracture, injury unintentional
12. 2 years/female black	vaginal discharge positive for Neisseria gonorrhea	mother had same findings	accidental infection
13. 2 years/male black	bilateral purulent conjunctivitis, chemosis	N. gonorrhea on culture	parents not cultured; prob- ably accidental infection
14. 1 month/male	bulging fontanelle	repeat CAT scan showed subdural fluid	benign subdural effusion
15. 10 years/female white	child presented as brain dead	CAT scan showed intracere- bral hemorrhage	brain tumor noted at autopsy

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gard the circumcision ritual [14,15]. Nor is Cao Gio the only ritual which involves application of hot objects to the skin. Japanese practice moxibustion, a healing art that involves the burning of moxa leaves on a patient's body [16]. Feldman has recently reviewed the subject of dermabrasion [17]. Another example of the use of folk remedies which may lead to injury is the treatment of gastroenteritis with medicines that contain lead [18]. Plumbism, resulting from such treatment, is not uncommon among Mexican-Hispanic and Hmong children [19]. Because of the frequent use of such folk remedies, a person's background requires investigation before his intentions are labeled as destructive. This subject, the cross-cultural definition of abuse has recently been reviewed and commented on by several authors [20,21].

Another example of a cultural practice in which there is no abuse intended is to be found among the Amish of Pennsylvania. Because this sect does not immunize its followers, several cases of poliomyelitis have occurred among its members, as well as among people in surrounding areas who come in contact with Amish communities [22]. Leaders of this religious group, upon realizing that the lack of immunization was a threat to others, changed their policy and accepted polio vaccines [23]. There was and should be no consideration of abuse by the elders of this community.

The history of Patient 2 illustrates the change in diagnostic attitudes that has occurred in the last 20 years. Currently, when a child with bruises is examined, BCS is likely to be the primary diagnosis considered. Indeed, in our experience, abuse is far more common than a defect in coagulation. However, a negative family history of a bleeding disorder should not rule out the diagnosis. Among patients with hemophilia A, one third may not have knowledge of maternal relatives with the disease [24]. A partial thromboplastin time, prothrombin time, platelet count, and bleeding time should be determined in children with multiple bruises [25]. As with Patient 2, it would have been a tragedy to miss a potentially treatable disease [26,27].

Patient 3 exhibited an alteration in skin pigmentation. The original diagnosis of abuse was made by a physician who had had less than one month of residency training. In this case, a more experienced physician's knowledge proved to be sufficient treatment for this kind of nondisease. Mistaking mongolian spots for bruises is not uncommon [28,29]. A partial list of conditions that may lead to similar findings is to be found in Table 2.

Patient 4 was thought to have had burns inflicted by a burning cigarette, when he was in fact suffering from bullous impetigo. When these lesions heal, there is often a tissue-thin epidermis which may be darkly colored. It can be very difficult, even for experienced observers, to distinguish these lesions from cigarette burns [40]. Toxic epidermal necrolysis has also been mistaken for intentional scalding [5]. Patients with sensory losses from congenital [41] or acquired diseases [42] will not pull away from sufficiently hot objects and may have multiple straight-edge scars caused by burns. The author has seen a child with familial dy-

TABLE 2—*Causes of petechial and purpuric lesions that may resemble those of the BCS.*

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1. Vigorous crying, coughing, or vomiting
 2. Streptococcal pharyngitis [30]
 3. Atypical measles [31]
 4. Meningococcemia [32]
 5. Rocky Mountain Spotted Fever [33]
 6. Disseminated intravascular coagulation [34]
 7. Other coagulopathies [35]
 8. Thrombocytopenia [36]
 9. Qualitative disorders of platelets [37]
 10. Sucking on hard candy [38]
 11. The adolescent "hickey" [38]
 12. Subgaleal hemorrhages caused by vigorous combing [39]
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sautonomia and a young man with leprosy [42] who were initially thought to be abused until the underlying disease was discovered. Children may also be accidentally burned as a result of the parents' lack of awareness of the temperature at which an infant's skin can be scalded. Bath water at a temperature greater than 125°F (52°C) can severely burn a child, while the parent's keratinized skin fails to register the potential danger [43,44].

Patient 5 is representative of a group of children who have multiple physical handicaps and whose parents were not capable of utilizing the appropriate social and medical agencies which might have improved the child's care [9]. Because of neurologic damage caused by hypoxia, the child did not suck effectively on a nipple. Insertion of a gastrostomy tube would have permitted the patient to receive sufficient nutrition to correct the malnourished state, which should not have been attributed to the mother's neglect. The parents could have obtained better care for the child if they had been familiar with public systems that provide medical services and financial aid. The inability to deal with the welfare apparatus does not constitute abuse.

Patient 6 presents a complicated problem. The mother recognized that the child's bleeding, probably from an arterial laceration, required a pressure dressing. She did not understand that the resulting discoloration represented tissue hypoxia. It became evident, after the infant was admitted, that the mother was mentally retarded. Although the child was not intentionally harmed, he was not brought to medical attention in time for the finger to be saved. Following a trial in Family Court, the child was placed in the custody of the maternal grandmother. A criminal suit was not filed against the mother, as her actions were well intended.

Patient 7 was thought to have been abused because the mother's story of what had transpired did not seem plausible. In the author's experience, the more bizarre a history appears, as in this episode, the more likely it is to be factual. Not all violent deaths are caused by abusive adults, and no one can or should supervise a child so closely that all accidents are avoided.

Certain bony changes are often associated with BCS. These include metaphyseal-epiphyseal lesions, including epiphyseal dislocations, and bucket handle and chip fractures [45]. Periosteal calcifications and diaphyseal breaks are also noted [45]. The metaphyseal epiphyseal changes, especially when associated with fractures, are thought to be highly suggestive of BCS [46,47]. Rickets, as in Patient 8, may cause similar radiologic manifestations [2,48]. Table 3 lists several other conditions that are associated with X-ray findings in the metaphyseal-epiphyseal region or periosteal calcification or both, which can be mistaken for abuse.

Cases 9 and 10 represent children with disorders other than abuse which manifest periosteal calcifications, namely congenital syphilis [55] and myelomenigele [1]. Diaphyseal frac-

TABLE 3—*Differential diagnosis of bony changes associated with BCS.*

	Diseases Associated With		
	Metaphyseal-Epiphyseal Lesions	Periosteal Calcifications	Diaphyseal Fracture
Scurvy [49]		syphilis [54]	osteogenesis imperfecta [58]
Menke's Syndrome [50]		myelomenigele [1]	leukemia [59]
Congenital insensitivity to pain [51]		scurvy [49]	osteopetrosis [60]
Breach deliveries [52,53]		hypervitaminosis A [55]	polyostotic fibrous dysplasia [61]
Rickets [2-4]		infantile cortical hyperostosis [56]	
Congenital metaphyseal-epiphyseal dysplasia [52,53]		normal neonates [57]	

tures are the least specific for BCS and can be caused by multiple diseases, several of which are included on Table 3.

Two concepts relating to the osseous manifestations deserve further consideration. It has been suggested that infants are less prone to fractures because their osseous structures can withstand greater stress than those of an adult [62]. However, because of the rapidly growing skeleton, limited musculoskeletal coordination, and the strong attachment of the periosteum at metaphyseal-epiphyseal junctions, accidental fractures, particularly in the last mentioned zone, are not uncommon [63]. Helfer et al. reviewed the X-rays of 245 children who fell out of bed. Three of them, none of whom were felt to be abused, sustained a cranial fracture [64]. In older children, such as Patient 11, diaphyseal breaks known as toddler fractures may occur with seemingly minor stress, for example, a child jumping out of a car. The stress of swimming or skating may also result in osseous breaks [65,66].

Because such fractures can occur accidentally or be purposely inflicted, careful interviews with the parents and the child abuse team revealed that Patient 11 had an intact family and caring parents. Serum calcium, phosphorous alkaline phosphatase, and radiographs of other bones were normal. It is only after the results of these investigations were available that the injury was judged to be accidental.

Physicians have been made acutely aware of the connection between infant fractures and nonaccidental trauma [1,45]. However, when McClelland and Heiple reviewed fractures in children less than one year old, they found almost 50% to be accidental [62]. Approximately half of the infants in this study were noted to have an underlying condition that predisposed to fractures. Furthermore, many findings that may be abnormal in older children may be seen in the normal neonate. Periosteal calcification and metaphyseal changes have already been mentioned [62]. Moreover, rib fractures are not uncommon immediately after birth [67].

During the period beginning with the sixth month of infancy and ending with puberty, sexually transmitted diseases (STD) are unusual [68,69]. In those infrequent instances when it does occur, gonorrhea is most common [69]. There are differences of opinion as to whether or not the isolation of the gonococcus from a perpubertal child always establishes sexual molestation or whether it can be acquired innocently. Several lines of evidence suggest that the latter may occur. Contrary to popular belief, the gonococcus can survive outside the human body for periods of up to 24 h [70]. A child coming in contact with a fomite contaminated by this microbe may then transfer it to one of his mucous membranes and acquire the disease. This is likely to have been the scenario for Patient 12, as the organism was also recovered from the mother. Interviews conducted by the medical, nursing, and social service staffs suggested that the child's mother, a single parent, was devoted to the infant's well-being and would not have knowingly transmitted the infection. No evidence could be elicited as to the presence of other people who were in contact with the child and would have sexually abused the infant. Patient 12 did not have genital involvement; this absence suggests that the disease was acquired in an accidental fashion. Transmission by fomites is supported by Cooperman [71], who reported several newborns in the same nursery with systemic gonococcal infection in which the organism was believed to have been introduced via thermometers. Finally, there are many reports of children with gonococcal disease in which a thorough investigation failed to reveal any evidence of abuse [72-75].

Of the STDs transmitted between six months old and puberty, syphilis is rare. When diagnosed during this period, it has usually been the result of a transplacentally acquired disease that was previously undiagnosed or inadequately treated. Recently, Ginsberg described three prepubertal children who had acquired the disease after birth [68]. In each instance, sexual abuse was a distinct possibility. However, nonvenereal transmission has been noted in up to 10% of all cases of syphilis [76,77]. The subject of STDs in childhood has been recently reviewed [69].

Patient 14 had bilateral subdural effusions. The cerebral ventricles were of normal size

with fluid present over the frontal lobes and in the intrahemispheric fissure. Over a period of six months, the subdural collections which originally had the density of water were changed. The patient's head size remained in the fiftieth percentile. There was no external sign of abuse in the six month's follow-up. The child's mother kept all medical appointments. She was devoted to his well-being. Visits to the infant's home suggested a healthy, nurturing environment. Were the subdural collections the results of trauma or is there an entity of benign subdural effusions as reported by Robertson et al. [78]? In a child with normal growth and development and no evidence of abuse, it would seem reasonable to assume that the latter diagnosis is appropriate.

Patient 15 was diagnosed as abused because, among other reasons, bilateral retinal hemorrhages were seen [79-81]. These findings may be observed in normal neonates and following chest compression [82,83]. This patient was treated, in part, by cardiopulmonary resuscitation. Such retinal injuries can also be seen with increased intracranial pressure of any etiology, coagulation deficiencies, and in up to 50% of normal newborns [84]. The findings on CAT scanning in Patient 15 included subarachnoid hemorrhages which were felt to be highly suggestive of the BCS. Silverman states that "concussions and hematomas . . . are not specific for child abuse of themselves, so that interpretations of CAT scans must be very circumspect" [45]. Patient 15 is an example of such overdiagnosis. This case history also focuses on the unfortunate consequences which may follow after the filing of a child abuse report. Because the parents had no explanation for the intracerebral bleeding, several officers of the law were quick to judge the mother and father as the most likely culprits. The parents were cruelly treated by the social workers who came to their house, demanded to see the patient's siblings, and requested that the parents leave the room. The mother attempted suicide and was hospitalized. The father, who had slapped the patient good-naturedly on the arm earlier in the day, was certain he had caused the injury and became severely depressed. The stress was so great that the finding of a neoplasm actually brought comfort to the parents and the medical staff.

Finally, there have been reports that document a child's false accusation of neglect and emotional abuse [85,86]. Several prepubertal females reported that their stepmother was treating them poorly and favored her own offspring. Further investigation showed that this was not the case. The articles point out that not all of a child's allegations are necessarily true [87,88]. The term "Cinderella Syndrome" [88] was coined for the cases mentioned above.

The injuries that some of these children suffered might also be compatible with abuse, as well as having been acquired in an innocent fashion. The point to be stressed is that the finding of bruises, fractures, and the like do not, per se, represent abuse. They should serve as a lead-in to a careful history and physical examination, which should be followed by an appropriate laboratory investigation and social service interviews. Consideration should be given to factors such as stability of the family, and parenting skills. Only after these factors are known can a reasonable conclusion be drawn as to the probability of abuse.

In conclusion, histories have been presented from a number of patients who were thought to have been abused, but who were later determined to have acquired their injuries in an innocent manner. Some of these patients had lesions that were acquired through the practice of cultural beliefs and folk medicine. Others suffered from an organic condition whose signs and symptoms resembled those of the BCS. In two instances, limitations in parental intellectual capacity led to inadequate treatment of diseases or injuries acquired in an innocent manner. Finally, there are some instances (Cases 13 and 14) where a clear-cut evaluation is not possible. Physicians have been asked to be on their guard for possible child abuse and they are required to report suspicious occurrences. It is not the purpose of this article to discourage the physician from this duty. The results of underreporting, that is, repeated abuse and even death, are well known [1,40]. It must be acknowledged, however, that the consequence of mistaking an innocently acquired lesion for abuse can also be devastating. In some instances, the misdiagnosis of abuse will allow treatable diseases to go unrecognized.

In other cases, unwarranted stress will be placed on parents who are struggling to care for a child with illness or injury unrelated to abuse.

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