



POSNA

The Core Curriculum

Child abuse

Objectives

1. Discuss the factors contributing to susceptibility to child abuse
2. Describe fracture patterns considered suggestive of abuse as an etiology
3. Discuss the differential diagnosis of child abuse
4. Describe the physical and imaging assessment of a child with suspected abuse
5. Describe management of a child who sustained injuries possibly secondary to abuse
6. Discuss the skeletal radiographic features of child abuse

Discussion points

1. What is the most important factor affecting prognosis for abused children?
2. What are the laws in your state (country) regarding reporting of suspected abuse?
3. What are the consequences for the child of failing to establish abuse as a causative factor for injury?

Discussion

The unfortunately common phenomenon of child abuse powerfully drives home the dark side of human nature as little else can (although elder abuse and spouse abuse are also being increasingly reported, both helpless populations). The pioneering work in this field was performed by Caffey, a radiologist, who questioned the etiology of subdural hematomas associated with fractures in children. An enormous literature has followed. Estimates from the early 90's indicated that 42 children/1000 were victims of abuse or neglect. If anything, such estimates are probably low. Risk factors include low income, first born, premature, stepchildren, handicapped, single parent, drug using parents, parents who were themselves abused, and unemployed parents. Children of no socioeconomic strata or demographic status, however, are immune from abuse.

Abuse comprises neglect, physical abuse, sexual abuse, and emotional abuse. The orthopaedist is primarily involved with physical abuse that involves the musculoskeletal system. It is obviously difficult to obtain accurate numbers about the incidence of fractures in abuse; estimates have been quoted from 9 to over 50%, probably 15-20% is a reasonable guess. Younger children, especially less than age 1, are particularly vulnerable. A specific type of fracture, the "corner fracture" or metaphyseal "bucket handle" fracture is characteristic of abuse. These lesions are predominately medial, and extend through the primary spongiosa toward the cortex, with a thicker section of metaphysis attached to the epiphyseal fragment at the periphery of the bone. These lesions have been extensively studied by Kleinman in autopsied infants. Extensive injury can occur without external evidence from shaking, recently reviewed by Saternus. Humeral and/or femoral fractures

in children < 1 year of age should arouse the possibility of abuse regardless of pattern of fracture. A growing number of spinal injuries have also recently been reported. Rib fractures are pathognomic of shaking.

If abuse is suspected, the child should be admitted or transferred to a hospital with child protection services. A team approach is most effective, and most helpful in meeting the legal obligations that often follow. The parents or caretakers should be informed that it is the obligation of the treating physician under law to manage the child in this way. This obviously creates a tense interaction, and parents who are wrongfully suspected of abusing their children suffer considerably. A number of conditions can present with findings similar to abuse, most notable are mild osteogenesis imperfecta and hemophilia. Skin biopsy is sometimes necessary to rule out osteogenesis imperfecta, and clotting studies can rule out hemophilia. Screening should include CBC, platelet count, prothrombin time, partial thromboplastin time, and bleeding time. Caffey's disease, leukemia, and most importantly, truly accidental injury are other differential diagnoses. Considerable judgment is often necessary in assessing whether the history given is compatible with the injury, a cardinal point in the diagnosis of possible abuse. A fall from a short distance can rarely produce significant skeletal injury, but not subdural hematoma. Failure to identify abuse as a causative factor in a child is risky for the child. It has been estimated that the risk of recurrent abuse is 30-50%, the risk of death 5-10%. Brain injury is a poor prognostic factor in abused children.

There are now federal and state laws mandating reporting of suspected abuse. Each state is responsible for providing definitions of child abuse and neglect within the civil and criminal context. The review by Kocher and Kasser is an excellent recent comprehensive review.

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