

Letters

SPR Child Abuse Committee Response Regarding Classic Metaphyseal Lesion

The article by Ayoub et al. [1] in the January 2014 issue of the *American Journal of Roentgenology* presents daunting challenges to those caring for potentially abused children. Establishing this diagnosis is an important responsibility. An accurate assessment may save a child's life or avoid further injury. An incorrect assessment may lead to improper care and a child's removal from his or her own home. Either may wreak havoc on children and families and their relationships. The potential consequences weigh heavily on every radiologist. In our opinion, Ayoub et al. exacerbate these challenges by questioning the legitimacy of the classic metaphyseal lesion (CML) as a well-established and highly specific radiographic indicator of child abuse.

When presented with radiographs showing CMLs or when confronted by those who reference the article by Ayoub et al. [1], how should radiologists respond? We should be aware of several omissions in the article. For example, Ayoub et al. question the credentials of Sandy Marks, a major investigator in seminal CML research, identifying him as "a dentist with a PhD in biology" and adding later "the failure to incorporate a trained pathologist in the study design is a significant oversight in classic metaphyseal lesion research." Sandy C. Marks, DDS, PhD, was an internationally preeminent bone biologist and anatomist with excellent credentials. Another major mischaracterization is that Dr. John Caffey doubted the association between inflicted trauma and the metaphyseal abnormalities later called CMLs. In a key publication that Ayoub et al. omit, Dr. Caffey's opinion [2] was unequivocal and he stated: "These terminal (metaphyseal) fragments are early pathognomonic signs of trauma from which a conclusive diagnosis can be made because they are found in no

other disease." We believe other omissions in the article by Ayoub et al. are too numerous to address in this letter.

We assert that time and experience have proven Dr. Caffey correct. Exclusive of child abuse, CMLs are rare. Few radiologists ever encounter this feature outside of nonaccidental trauma. CMLs are not seen in conditions that predispose children to other types of fractures, including severe malnutrition, metaphyseal demineralization, or skeletal deformities. Such conditions include prematurity; restricted intrauterine growth or movement; cardiac, renal, or liver disease; skeletal dysplasias; spina bifida; chromosomal disorders; and cerebral palsy. CMLs do not occur with prenatal maternal endocrine, metabolic, cardiac, or renal disorders; hypertension; drug addiction disorders; or malnutrition. Vitamin D deficiency is not associated with fractures in young children [3]. CMLs are neither reported to occur associated with vitamin D deficiency nor found in children who have florid rickets with concomitant non-CML extremity fractures [4, 5]. Radiographic metaphyseal irregularities in severe metabolic bone diseases, such as rickets, scurvy, and Menkes syndrome, are rarely if ever isolated. Rather, the metaphyseal abnormalities are diffusely distributed and symmetric, even when healing. Furthermore, metaphyseal abnormalities from rickets will be accompanied by other radiographic manifestations of rickets. The editors of *Pediatric Radiology* have rejected contentions linking the high-specificity imaging findings of child abuse with rickets [6]. We reaffirm this position. CMLs are therefore highly specific for child abuse. To deny this fact is to disregard the extensive experience and research of generations of pediatric radiologists.

Scholarly critique of existing evidence is essential, but exclusion of key literature does not constitute healthy scholarship. Given the stakes involved, we think that the

approach of Ayoub et al. [1] is less "critical" than dangerous and that children and families deserve better.

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