

April 4, 2022

Re: Cain Layman, DOB 10.28.2021

I was asked to review medical records and view x rays and consult on the case of what were thought to be multiple "unexplained fractures" on infant Cain Layman.

I reviewed the medical history and personally viewed the x ray images. I am providing this report of my findings on April 4, 2022 because I am certain this is a case of a very serious medical misdiagnosis which is unsupportable and actually contradicted by the findings I found in reviewing this material.

Cain was taken in for a medical evaluation by his parents at three weeks of age after they noticed brown or reddish emesis and were concerned. Because He had several bruises a skeletal survey was done which showed abnormal bone findings that were thought to possibly be healing fractures. Based on these bone findings allegations of child abuse were made and he was removed from his parents care. It should be noted that he had previously had G I problems had been evaluated just the day before at the ED and was thought to have acid reflux. Parents had previously noted his unexplained bruising which continued even while hospitalized.

I do not know the patient, her parents, any of the attorneys, treating physicians or social workers involved.

I am an Orthopedic Surgeon, board certified by the American Academy of Orthopedic Surgeons October 5, 1980. I have traveled and worked abroad in Fuji, Afghanistan, Nepal, the DR, Haiti, Mexico and China. I did not appreciate nor recognize Rickets and the effects of malnutrition or inadequate nutrition before working abroad.

I served as the Director of Orthopedic Trauma at the regional trauma center for Northern California from 2008 through 2014.

I have been responsible for the consultation, care and treatment of a large number of fractures, from minor undisplaced fractures to the most complex fractures in patients with life threatening injuries because of their multiple fractures, some with traumatic amputations. My patients include survivors of serious accidents which resulted in death to others involved. They include a patient who survived being mutilated by an airplane propeller, many pedestrians, failed suicide

attempts, bicycle and motorcycle riders, the only survivor of a deadly mid-air plane crash, a hang glider pilot, patients run over by cars, a train, trucks and heavy equipment. I saw a man who survived a failed parachute opening.

I have taken care of and consulted on many many patients with pathologic fractures and Metabolic Bone Disease from a variety of causes. There are more than 100 causes of “brittle bones” or conditions that make the bones vulnerable to fracture with minimal external force, even during normal care and handling. Some of the cases I have reviewed have been for infants still hospitalized from birth.

I am a practicing Orthopedic surgeon licensed in California.

I founded the Foundation for the Study of Metabolic Bone Disorders which financially supports research and the study of Metabolic Bone Disorders. I support this but do not benefit from it.

I have and do continue to report any concerns about possible abuse of patients with fractures or other injuries.

My review of this material is Pro Bono.

I personally reviewed the medical history and x ray images provided me. They show me: C.L. was the second child of his parents. There is no history of mistreatment of their first child.

It is known that subsequent births are at greater risk of having metabolic bone disease because the mothers body has had insufficient time to replenish her own stores of calcium which was used during the development of the first infant.

The records reflect that at no time were his parents anything but concerned, loving and appropriate parents until bruising, which his parents had complained about previously, was noted and x rays were ordered to “rule out” non accidental fractures.

It is unfortunate that the unexplained bruising and bone findings were used to make allegations against the parents as perpetrators of child abuse. Spontaneous bruising occurs in infants with collagen abnormalities, as in this case, even when under continuous observation in a hospital. I have seen this previously.

Rib x rays showed multiple sites of significant periosteal elevation, but no actual fracture lines. Fractures of the 2, 3 and 11 th right ribs were noted. The parents were accused of child abuse on the basis of the rib fractures and other bone findings that were mistakenly thought to be fractures.

The x ray images clearly show C.L. had evidence of inadequate bone mineralization at multiple sites.

The Chest x ray shows multiple posterior rib fractures. Lateral x ray show perfect alignment and looser's line are clearly seen. The ribs show marked flaring of the anterior margins. This is neonatal Rickets.

The absence any chest wall injury, internal organ injury, bruising or bleeding, should have alerted those evaluating this infant that these were insufficiency fractures and were compelling evidence of metabolic bone disease and should NOT have been confused with rib fractures due to trauma.

The bone findings, multiple rib posterior rib fractures are from the birthing process. The other bone findings show clear compelling evidence of metabolic bone disease which would result in and explain the birth related rib fractures and periosteal elevation at multiple sites, metaphyseal changes and delayed development of the primary teeth. Together these findings should have been recognized as the results of early inadequate mineralization during fetal development. Combined with the other bone findings the diagnosis of inadequate bone mineralization is certain. The most likely cause of the rib fractures seen here was from the birthing process. The x rays of the extremities show cupping of the radius and ulna distally. There is periosteal elevation at multiple sites in both lower extremities at the knees and ankles. The skull is thin, the teeth are hollow or shell like in appearance and the angle of the mandible is poorly ossified.

After personally reviewing the medical records provided me and the x ray images provided me, I have come to the following conclusion:

C.L., a three week old male infant, had concerned parents who took him in for appropriate medical evaluations. When evaluating bruising, which his parents had previously noted, he was incidentally found to have multiple rib fractures on a chest x ray and periosteal elevation which was thought to possibly represent healing fractures. His parents were accused of child abuse.

The appearance of periosteal elevation is a known finding in infants that have metabolic bone disease as well as those with collagen abnormalities. The finding of undisplaced multiple rib fractures and the hollow shell like appearing teeth should have been noted as compelling evidence that the bone findings were NOT due to trauma of any sort but clear evidence of metabolic bone disease.

Mother has been evaluated and found to have hypermobility with a 9/9 Beighton score. This indicates a collagen anomaly.

Bone is composed of mineralization of a collagen matrix. Abnormalities of either the collagen or bone mineralization result in bones that are abnormal in appearance and can and do fail with minimal force, even normal care and handling by medical professionals.

In this case, there is a plethora of information that was unrecognized that resulted in unsupportable allegations of child abuse against the parents who were the care providers.

The difference between normal bone and bone such as was present here is profound, the difference between night and day.

C.L.'s x rays show clear evidence, irrefutable findings of Metabolic Bone Disease at --multiple sites. The skull, the teeth, the periosteal elevation, the multiple bilateral posterior rib fractures without any chest wall or internal organ injury, the multiple insufficiency fractures and findings of inadequate early bone mineralization should have made the diagnosis of metabolic bone disease certain. These findings combined with the multiple undisplaced rib fractures, which in the presence of inadequate early bone mineralization date them to birth, should have alerted her medical team that the fractures and bone abnormalities were a manifestation of metabolic bone disease.

There are multiple vertical lucent lines on the rib fractures. These are known as Looser's lines. The undisplaced nature and presence of Looser's lines on the rib fractures and the appearance of the callus itself, suggest these rib fractures are a reflection of underlying bone fragility and not due to significant external trauma. It should be noted that all of the several rib fractures are old. All of the rib fractures are completely undisplaced and the appearance of the healing with Looser's lines contradict the claim that these are due to child abuse.

Multiple rib fractures, in patients with normal bone, are usually considered a life threatening injury and virtually all patients with more than three traumatic rib fractures have associated chest wall injury, internal organ damage or significant bleeding. This was not present here because the cause of the multiple rib fractures was the fragility or pathologic bone rather than significant external force. Rib fractures from the birthing process are the most frequent fractures in infants that I have seen.

I am sure his rib fractures are birth related because of my experience is caring for infants and mothers post partum with pelvic injuries due to the birthing process.

The pressure of the birthing process is much underappreciated and is many times the strength of one's upper extremities. I have seen and treated multiple women with pelvic injuries from the birthing process - though this is not a common. It is not surprising that an infant would sustain posterior rib fractures during this same process. Those with a metabolic bone disease, as in this case, would be expected to have some.

The primary teeth develop during the 16th to 24th weeks of fetal development and the hollow, shell like teeth shown here should have been recognized as evidence of significant functional deficiencies during that period of early life.

The metaphyseal changes at the knees- bilaterally, and ankles-bilaterally, combined with the diffuse periosteal proliferation should have been recognized as evidence of the healing phase of

metabolic bone disease. This was recognized and noted a few years ago by Dr. David Ayoub in The Journal of Radiology.

I have seen x rays of infants who have had fractures sustained by normal routine examinations by medical professionals that were unaware of the underlying bone problems.

As in this case; the many bone findings present on virtually every x ray viewed, should have been a clue that this child has significant bone impairment.

The multiple rib fractures, without evidence of chest wall or internal organ damage and the appearance of the healing callus confirm that the parents history is true. Neither the parents nor anyone else intentionally harmed this child.

Except for the ribs, none of the bone findings are the result of fractures.

Metabolic bone disorders in the presence of a collagen abnormality is particularly destructive and I have personally seen infants, who appeared well but were found to have dozens of fractures because of the combination of a collagen disorder and metabolic bone disease. Unlike victims of trauma, there is no bruising, bleeding, minimal if any swelling and the difference should have been recognized.

This is in contrast to anyone with multiple fractures, which is a life threatening situation. If an infant had traumatic bilateral fractures of their femurs and tibias, there would be significant associated blood loss, swelling, bruising and it would not take an x ray to realize this was a very serious situation. As Dr. Ayoub demonstrated in his article, findings of the healing phase of metabolic bone disease should not be confused with trauma.

Having bilateral undisplaced fractures is unlikely and virtually never seen at multiple sites.

The medical evaluation this infant had was inadequate and failed to test for many known causes of "unexplained fractures", such as Vitamin C deficiency, Copper deficiency or any of many maternal causes passed onto her infant before offering the unsupportable allegations that the bone findings were due to abuse. In this case the mother's known Vit. D deficiency and a likely collagen disorder resulted in the inadequate mineralization which resulted in the pathologic fracture of the ribs and other bone findings discussed above.

There is no fracture that can be caused only by child abuse and the idea that any specific fracture is pathonomic of child abuse is outdated and unsupportable.

The skeletal x rays taken show a plethora of findings consistent with and diagnostic of the inadequate early bone mineralization of Metabolic Bone Disease.

The medical records and x ray images and findings strongly refute and contradict the allegations of abuse as being responsible for the bone findings discussed.

The medical records and history, lab values and x ray images are consistent and compelling contradictions to the allegations of abuse.

I am certain of this and would testify under oath to it.

Sincerely,

Doug Benson M.D.