

NON-TRAUMATIC RIB INJURIES

A Logical and Statistical Conclusion in the Case of Alan Yurko

At first blush, a superficial review of the case of Alan Yurko might lead to the conclusion that the rib callus formations resulted from non-accidental trauma. However, a deeper review of the facts in the case, as will be shown here, will lead to an opposite conclusion. A simple knowledge of physics and minimal knowledge of anatomy will be utilized to demonstrate that, from a statistical standpoint, the probability of non-accidental trauma (child abuse) in this case approaches the vanishing point. The true etiology of the callus formation may never be known with certainty due to inadequacies in the medical records, but whatever the cause, it was not traumatic.

Post-mortem findings revealed callus formations in the 5th, 6th, 7th, and 10th ribs, all posterior on the left. Chest X-rays showed callus formations in the 6th and 7th ribs. Also, upon autopsy, a pale ovoid bruise noted laterally on the left over the lower ribs. Other bruises were also noted. No internal thoracic injuries were found or reported from the autopsy. During the trial the medical examiner testified that the 10th rib had "been broken while handling," something to be kept in mind, as will be explained later.

Bruises and Internal Thoracic Injuries: an Analysis:

The bruising is of special importance. Bruising would normally suggest trauma. According to a study by V.F. Garcia et al, (1990) titled, "Rib fractures in children: a marker for severe trauma," *Journal of Trauma*, 30:695-700, of the 2080 children studied, 33 had multiple rib fractures. Among these 33, the injuries were accompanied by **severe** (emphasis mine) internal thoracic injuries in 85% of the cases. (Remember, no thoracic injuries were reported in the present case). This leaves a 15% margin for internal thoracic injuries **not** to have happened.

Bruising and cutaneous injuries occur with a similar statistical frequency in traumatic fractures, especially in child abuse cases. My son had a bruise over callus rib formations in various stages of healing or growth. Does this indicate trauma at home, prior to the terminal hospital admission? Not so for the following reasons:

The bruises could hardly have occurred during the six or seven weeks between hospitalizations save for the bruise under the right lower eyelid, which will be discussed. Baby Alan had weekly visits to a pediatrician during the intervening weeks when he was at home. During these visits he was given reflexive tests, pokes, pushes, and other forms of routine examinations by pediatricians trained to watch for signs of

abuse. Not only did these weekly visits fail to reveal bruising, but there was a similar lack of such when examined during an emergency room visit. Not only did doctors and nurses fail to find and report cutaneous evidence of trauma, but Grandma and Grandpa, who lived not 10 doors away and who cared for, doted over, and changed diapers every single day, failed to note any bruises. His mother never noted them, nor did the baby's older sister, Devry. The same can be said of frequent visits from doting relatives, neighbors, neighbor's children, and friends.

The bruise under the right eyelid occurred when the sister lost control of a feeding bottle. I was holding Alan in my lap when Devry, then age four, now seven, lost her grip on the bottle, the edge of which "doinked" him on the eye. The testimony of the mother, Francine, confirms this. Even more convincing is the written opinion of Horace B Gardner, M.D., J.D., an ophthalmologist who, after review of the records and the photographs of the post-mortem slides, states that the lineality of and constricted scale of this bruise would not be indicative of abuse, in that a blow by a hand or a fist would cause a "shiner" or much more diffuse ecchymoses. Dr. Gardner also pointed out that the causes for all other bruises reported at autopsy must have been iatrogenic, possibly caused by procedures such as resuscitation or handling **after** Alan was brought to the hospital.

Upon terminal admission, quite a few nurses, doctors, and members of child protection teams did thorough examinations in which evidence of trauma, such as bruises, cuts, etc., were avidly sought. This is standard protocol when children are brought in with unexplained injuries. All reports on initial day of hospitalization failed to mention bruises or cutaneous injury except that involving the lower eyelid. Dr. Ben Guedes, the attending (terminal) physician, testified that the only bruise noted at admission and before autopsy was the eyelid. Thus the other bruises over the ribs and temporal area of the head had to have been iatrogenic, occurring while under the care of hospital staff.

Applied Statistics:

Returning now to the matter of internal thoracic injuries, there were no findings of internal injuries in the lungs or any of the remaining internal organs, (a number of organs had been "harvested" as donor organs before death). It is here that the previously quoted Garcia article comes into play.

If these rib callus formations, indicative of healing fractures at various stages of healing, denoted multiple incidents occurring at different times, were traumatic or non-accidental, then I, the convicted, would have been very lucky after a single traumatic event to have hit the 15% margin previously discussed, without causing severe internal thoracic injury. However, the state experts at trial testified that these

alleged fractures happened at different times. If these assertions are accepted, it would mean that I had to hit that 15% margin four times in a row! That carries the statistical probability of a traumatic etiology to considerably LESS than 1%, or the same probability of hitting 1 through 15 on a roulette wheel four times in a row.

The 15% margin is narrowed considerably when one considers that infants have great osseous plasticity and that their bones are extremely pliable due to immature ossification. If, as alleged by state witnesses, I caused the alleged fractures by squeezing, a great deal of pressure would be required. This same pressure, in all likelihood, would have caused damage to the lungs or other internal organs. This did not happen. It did not

happen four times in a row. Also, if the ribs were fractured at different times, as contended by the state witnesses, when a second rib was fractured, it would have been a virtual certainty that rib fracture #1, already weakened, would have been re-fractured a second time. If each of the four ribs was fractured sequentially, then almost certainly, rib fractures #1 would have been re-re-re-fractured three times, rib fracture # 2 re-re-fractured two times, and so on. In the re-fracturing, it is highly probable that the fractured fragments in at least one instance would have taken on dagger-like dimensions pointed into the internal vital organs. This also narrows the less than 1% margin for abuse-type trauma even further, exponentially so. Surely such a pattern of fractures would have caused internal thoracic injury and/or cutaneous injury, BUT THIS DID NOT TAKE PLACE.

Remember, Alan was a tiny baby, premature, only 48 centimeters long. If I squeezed him, why are all of the fractures only on the left side? Did I squeeze him only on one side? That in itself is a physical improbability, I would venture to say. I have doctors who agree that it would take a team of super-orthopedic surgeons to reproduce those fractures in model and not cause thoracic or cutaneous injury. I doubt that any trauma could reproduce these alleged fractures without bruising or internal injuries, especially not four times in a row, not even once.

Pain:

Rib fractures are attributed to be among the most painful of fractures, with no sure means of stabilization, and with constant moving and breathing. Once again, doctors, nurses, child-protection team members, grandmother, grandfather, mother, sister, neighbors, neighbors' children, relatives, and friends never reported any indication of pain in the baby. If these had been traumatic rib fractures, surely there would have been some indication during feedings, diaper-changes, bathing, holding, swaddling, and so on.

It could not have gone unnoticed. Surely pediatric examinations, with all the proddings and pokings would have elicited pain. THEY DIDN'T. On the whole, Alan was a tranquil baby. He took his feedings quietly and seemed content aside from problems of alternating constipation and diarrhea, and excluding the irritability which followed immunizations.

A Metabolic Explanation for rib Fractures:

We now come to an anomaly in the alleged rib fractures, in that they occurred near the posterior costochondral junctions between ribs and spine, sometimes also referred to as metaphyseal plates. This is an unusual location for traumatic fractures, as reviewed in a study by H.G. Hiller, M.D., entitled: "Battered or Not – a Reappraisal of Metaphyseal Fragility, (*American Journal of Roentgenology, Radio-therapy, and Nuclear Medicine*, February, 1972, Vol 114(2):241-246) In this study, a group of 145 children admitted to a pediatric trauma center for traumatic fractures were reviewed. Not one case

of metaphyseal plate (costochondral junction) type was found. The study also looked at five cases of metaphyseal plate fractures from another hospital, where in all five cases the bones had a chalky appearance on X-rays. Of the two cases available for microscopic evaluation and bone scan, both revealed abnormal bone formation and were ruled non-traumatic. In his discussion the author observed that this type of trauma is common in scurvy without undue trauma to the child, and that green-stick fractures are equally common in rickets. Hiller interpreted these findings as casting doubt on the advisability of accepting multiple epiphyseal plate fractures as definite roentgenologic evidence of battering, and that they are in need of close reappraisal.

The fact that the 10th rib broke "while handling" during the autopsy, as testified to by the medical examiner, would tend to confirm an unusual fragility of the bones and a vulnerability to spontaneous fractures.

In the present case, considering that the fractures occurred at or near the epiphyseal plates, that there were no observations of bruising or cutaneous injury by trained experts, that a chalky appearance was indeed described by experts (but was attributed to overlay), and that it would be virtually impossible to bring about sequential rib fractures at different times without causing internal thoracic injury, as reflected in a statistical application of the Garcia study – in consideration of these things, the probability of a non-traumatic, metabolic etiology of the rib fractures becomes compelling.

Additional supporting evidence in the case for non-traumatic etiology of the bone fractures would be that of temporary brittle bone disease, as described by Marvin

Miller, M.D., Ph.D., in his publications, in which he showed that unusually close uterine confinement, which reduces fetal movement, resulted in increased fetal bone fragility and vulnerability to spontaneous fractures. As outlined by Patterson and cited by Miller, reduced movement in such instances delays fetal neo-ossification, which is controlled by a bone "mechanostat" mechanism. The history of the mother's pregnancy is suggestive of such a process, in that she was constantly sick, suffering from recurrent urinary (E coli) infections and other complications during her pregnancy. She gained only a net of two pounds, unable to take proper nourishment or even her prenatal vitamins.

Lastly, one of the strongest points in differential diagnosis is found in the work of the Australian, Archibide Kalokerinos, M.B., B.S., Ph.D., noted for his work among the Australian aborigines, in which he reduced an infant mortality rate approaching 50% to virtually zero. Noting features of scurvy among some of the infants and children, and observing that many deaths followed vaccinations, he hypothesized that the vaccinations provoked death by throwing the infants into fulminating scurvy. Based on these observations, he improved the nutrition of the children, provided generous amounts of vitamin C, and avoided vaccines when children were ill with colds or other minor infections. As a result of this work he was awarded the Australian Medal of Merit in 1978.

Dr. Kalokerinos also observed rib lesions attributed to scorbutic factors which healed with callus formations which could be mistaken (as in the present case) for healing rib fractures.

Conclusion:

Logic, science, clinical presentation, and history, combined with a statistical application, and above all, common sense, commands the conclusion of a non-traumatic etiology in the respect of callus rib formations found in the case of Alan Yurko. This fact lends great credence to the other issues of the case which have also been adjudged non-traumatic. I did not murder my baby.

Alan R Yurko

References:

Buttram, HE & Yazbak FE, Shaken-Baby Syndrome, or Vaccine-Induced Encephalitis?

The Story of Baby Alan, <http://www.woodmed.com>

Florida Hospital, (1997) Medical records of Alan Joseph Ream-Yurko.

Garcia VF et al, (1990), Rib fractures in children: a marker for severe trauma, *J Trauma*, 30:695-700.

Gardner HB, (2000) Preliminary draft report of analysis of the lid and other bruises found in the case of Alan Yurko.

Hiller HG, (1972) Battered or not: a reappraisal of metaphyseal fragility, *Amer J Roentgen Radiotherapy & Nucl Med*, 114(2):241-246.

Kalokerinos A, (2000) The case of Alan Yurko, an introduction and explanation

Kalokerinos A, 1981, *Every Second Child*, New Canaan, Conn, Keats Publ.

Kalokerinos A, an autobiography, publication pending

Miller ME, (1999) Temporary brittle bone disease, a true entity? *Sem in Perinatol*, 23(2):174-182.

Miller ME & Handgartner TN, (1999) Temporary brittle bone disease: associated with decreased fetal movement and osteopenia, *Calcif Tiss Int*, 64:137-143.

State of Florida vs Alan R Yurko (1999), complete trial transcripts, depositions, and court records.