

## Petechiae of the Baby's Skin as Differentiation Symptom of Infanticide Versus SIDS

**REFERENCE:** Oehmichen M, Gerling I, Meißner C. Petechiae of the baby's skin as differentiation symptom of infanticide versus SIDS. *J Forensic Sci* 2000;45(3):602–607.

**ABSTRACT:** The successive killing of three siblings by their biological mother at two-year intervals is described. The children were 367 days, 75 days and 3 years old. Although sudden infant death syndrome (SIDS) or interstitial pneumonia could not be ruled out as the cause of death in the two younger children, who were killed first, the third child exhibited discrete signs of violence in the mouth and throat area which were interpreted as proof of infanticide. All three children had petechiae of the skin of the face and throat, the upper thorax, the shoulders and the mucous membranes of the mouth. None of the children exhibited signs of a disease-related hemorrhagic tendency. After the mother was convicted of murdering the three-year-old boy by smothering in combination with compression of the thorax, she confessed to having killed the other two children in a similar manner. In the absence of hemostatic disease, the presence of petechiae of the skin extending over the entire drainage area of the Vena cava superior can be regarded as evidence of an increase in pressure in the thoracic cavity secondary to obstruction of the airways with simultaneous chest compression.

**KEYWORDS:** forensic science, petechiae, skin, infanticide, chest compression, suffocation, sudden infant death syndrome

Diagnosis of sudden infant death syndrome (SIDS) at autopsy requires the exclusion of death from disease (1,2) or non-natural causes, e.g., infanticide or fatal child abuse involving physical violence or poisoning (3,4). In recent years several cases have been described in which a child or several siblings under one year of age were intentionally smothered, usually with fatal results. Proof of the violent act in these cases was obtained in part by video tapes and confessions (5–14). Of special note in this regard is the 1972 description by Steinschneider of multiple cases of SIDS in a single family (15). At that time the report was taken to indicate a danger of repeated SIDS events in a single family. In 1994, however, it was proved that the case actually involved multiple infanticides by the children's mother (15). Had the cause of death been correctly diagnosed as infanticide and not as SIDS in the first child, the death of the other children could have been prevented.

Could the initial infanticide in this family have been discovered by morphological diagnosis at autopsy, thus sparing the lives of the siblings of the supposed SIDS victim (cf. 16)? And how reliable is autopsy in proving infanticides involving no external signs of violence (17)?

These questions are especially timely in light of the recent comprehensive study by Meadow (18) according to which the consec-

utive death of infant siblings is highly suspicious of infanticide in the absence of other explanations (cf. also editorial: *Lancet*, 353, 1999, p. 161). The same study points out that "petechiae" can result from smothering, although it also mentions that 57% of the 81 murdered infants had neither bruises, petechiae, nor a finding of bleeding. Also important in this regard is the 1998 paper by Overpeck et al. (19) placing the total number of infants murdered in the United States between 1983 and 1991 at 2776, half of the infanticides occurring within the victims' first four months of life.

In the following we describe the cases of three siblings killed by their biological mother at intervals of approximately two years. The petechial bleeding in the upper thorax of all three children can be regarded as a reliable criterion of infanticide, confirmed in the present case by the post-conviction confession of the mother.

### Case History

#### *Psychopathological Findings on the Children's Mother*

Examination of the children's 28-year-old mother by a psychiatric expert revealed psychopathological clinical findings such as a neurosis with a considerable degree of demoralization. The neurotic defective development was based on the relation of the parents to each other and on a remarkable internal developmental disturbance being characterized by retarded learning how to walk and to speak. Furthermore, there existed enuresis until adulthood and a low IQ, varying from 82 to 94. The consequence of all these circumstances was reduced self-respect and self-confidence. It was only the homicide of the third child which had been brought to accusation and condemnation. Concerning this crime, there had been supposed that the mother had shown a remarkably reduced self-control due to severe mental abnormality.

#### *Course of Events*

At age 19 the children's mother was forced by her own mother to sleep with a man 16 years her senior. She subsequently lived with this man and bore him a daughter in April 1991 at age 22. That same year she separated from this partner and began sharing a one-bedroom apartment with a man 19 years older. During this time she received supplementary social benefits and appears to have provided adequate care for her children.

In May of 1992 her daughter died at age 367 days (1—Code: S 77/92). The mother had fed and changed the child and laid it down for its midday nap. Shortly after 3 p.m. she ran into a nearby pub and informed her live-in companion that the child was lying lifeless in bed. Emergency medical technicians and the police were called to the apartment and transported the child in a lifeless state to hospital, where all efforts at resuscitation were unsuccessful.

The main findings at autopsy (Fig. 1) were massive signs of up-

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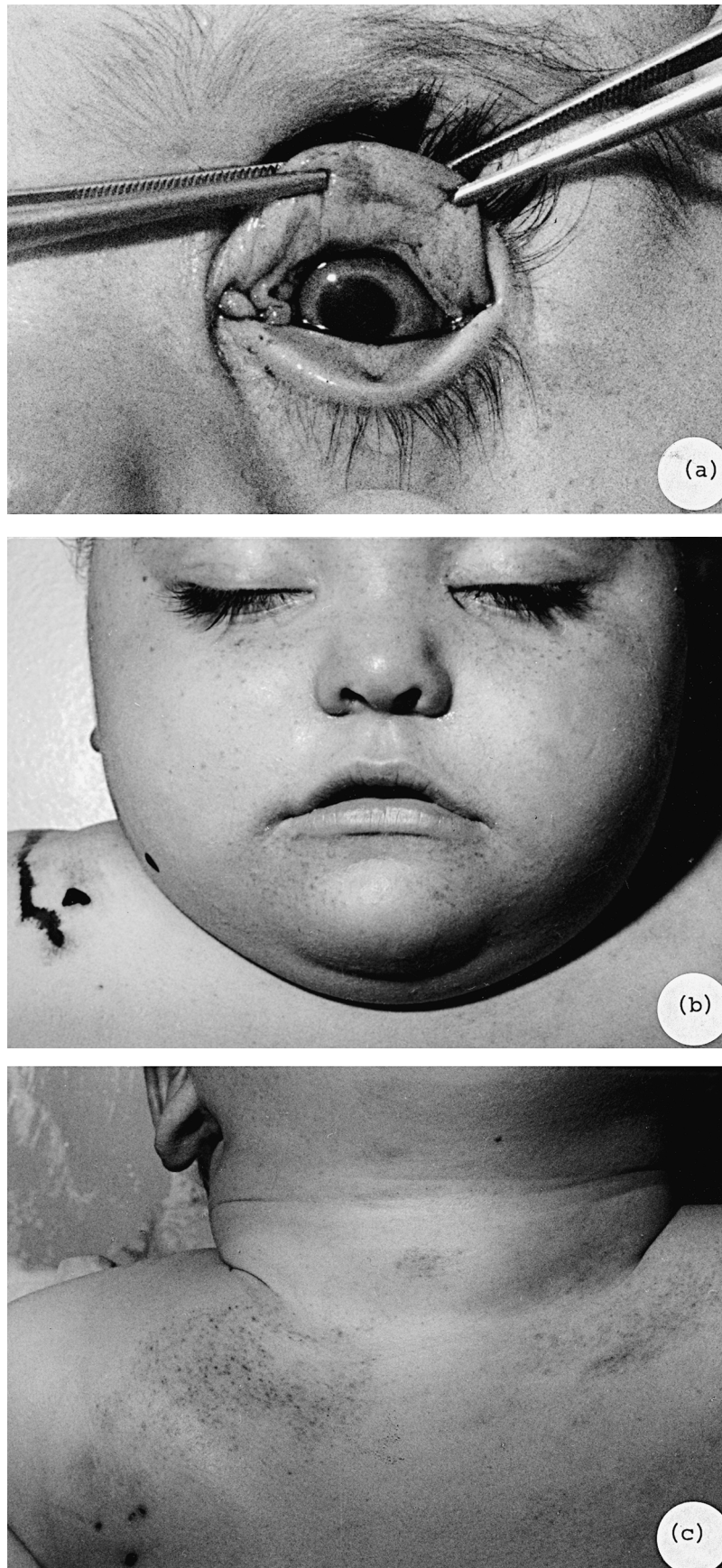


FIG. 1—Distribution of the petechiae in case 1 (Code S 77/92): (a) Petechiae of the connective tissues, (b) the face, and (c) the throat and shoulder. Note the traces of a puncture of the jugular vein on the anterior right side of the chest made during the resuscitation efforts.

per thorax congestion with petechiae of the mucous membranes and skin of the face, throat, shoulders, as well as of the thyroid capsule, thymus, pericardium, and pulmonary pleura. The child appeared pasty and overfed, but had evidently been well cared for. Microscopically, a discrete inflammation with lymphocytic cell infiltration was found in the lungs. Although the forensic pathologists suspected a SIDS, "death from asphyxia . . . could not be ruled out in light of the extensive petechiae." The department of criminal investigation told the mother that her child had died of SIDS.

The mother gave birth one year later to a boy (May 1993) and the year after that to a girl (March 1994). The one-bedroom apartment became too small for the growing family, but the mother's companion did nothing to find better accommodations.

The baby girl died 75 days after she was born (2—Code: S 81/94). The mother had made an appointment with a fellow tenant to go to a pub for a drink. When the tenant arrived at the apartment to pick her up, he noticed the lifeless child. An emergency medical technician called to the scene could only confirm the death of the child.

Autopsy disclosed petechiae of the mucous membranes and skin of the face, head, shoulders, and arms, as well as of the right thigh and calf (Fig. 2). Diagonally across the middle of the throat a 2 cm by 1 cm epidermal abrasion was found. Microscopically there were signs of a slight inflammatory reaction in the lung. The larynx, cervical vertebral column, and brain were normal. Death by suffocation was suspected, but without supporting evidence the morphological findings (petechiae, epidermal abrasion on the throat) were insufficient to prove external violence. Again, the mother was told that the child had died of SIDS.

In the period following the death of the second child the mother became panic-stricken. Fearing she would do harm to her remaining son, she asked a woman's shelter to take the child in. The district court and youth welfare department were notified and provisions were made for her to move with the child into a two-bedroom apartment. There she received regular visits from the youth welfare department. In September 1995 she bore a second son.

In April 1996 her now almost three-year-old eldest son underwent a medical examination preparatory to a tonsillectomy. Coag-

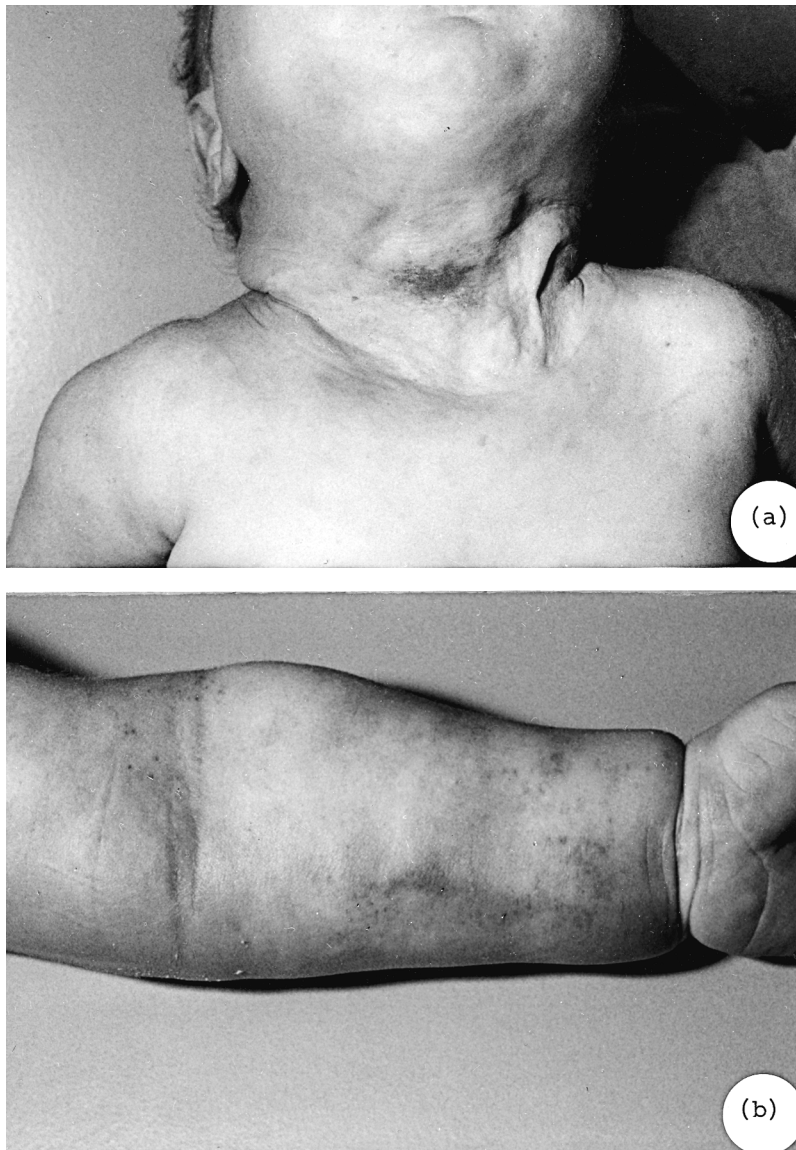


FIG. 2—Macroscopic changes in case 2 (Code S 81/94): (a) Drying of the skin in the center of the throat; (b) petechiae of the skin of the left forearm.

ulation factors were in the normal range. According to the mother's subsequent confession on 18 June 1996 she put the boy to bed at about 7:20 p.m.. At 10:00 p.m. she heard him wake up and gave him something to drink. She then placed him on her lap. In this position she used her left hand to press his upper body against her upper body, at the same time placing her right hand on the back of his head and holding his face against the juncture of her left arm and shoulder. This compressed the boy's thorax and obstructed his mouth and nose so that he could not breathe. The entire process is estimated to have lasted 5 to 10 minutes.

At about 11:00 p.m. the mother's companion entered the bedroom to check on the children and found the boy lying lifeless in bed (3—Code: S 107/96). He immediately tried to resuscitate the child and had an emergency medical technician sent for. All efforts to revive the child were futile.

At autopsy petechiae were again found (Fig. 3), mostly of the face, throat and anterior aspect of the shoulder and chest. Imprints of the teeth were found in the mucous membrane of the lips and imprints of the pajama collar were evident on the skin of the throat. The tonsils were bilaterally clearly enlarged and were free of abscesses.

The autopsy findings indicated that pressure had been exerted on the mouth and throat. These findings together with the petechial bleeding led to the diagnosis of death by suffocation brought about by closure of the external airways and compression of the thorax. This diagnosis was confirmed by the description of the act later revealed by the mother. The final autopsy report pointed out that an identical pathomechanism may have caused the death of the first two children.

Based on the autopsy findings in the death of the third child the mother was arrested on suspicion of infanticide. Under interrogation she described the aforementioned course of events leading to the death of her son; at this time, however, she denied killing the other two children.

A charge of manslaughter was brought against the mother and she was subsequently sentenced to serve four years and six months behind bars. During an interrogation six months later she briefly confessed to having placed the first and second child under the bedcovers and held them tight until they died. A legal decision is still pending in those two cases.

## Discussion

The forensic findings in the death of the three children were based on autopsies conducted according to the International Standardized Autopsy Protocol for Sudden Unexpected Infant Death (20), including complete histological, neuropathological and toxicological investigations. Account was also taken of the criminal investigation report containing a description of the crime scene and portrayals of the course of events by the victim's mother and witnesses.

None of the three children whose deaths are described here suffered from a potentially fatal disease. The recognizable injuries were superficial and nonspecific and could not account for the deaths. They did, however, make sense as signs of physical force applied to close the airways during an act of smothering.

The main finding in all three children was the variably extensive petechiae not only of the face, but also of the shoulders and upper extremities. Hemorrhages of the skin may result from abnormalities in any of the three components of hemostasis: platelets, plasma coagulation factors, and blood vessels (21). If all of these possibilities can be excluded, as well as birth trauma (22,23) or fever (24),

then the sole remaining explanation for the petechiae are hemodynamic factors, in particular congestion of veins and capillaries. In the present cases petechiae occurred within the drainage area of the superior Vena cava due to the pressure exerted on the right side of the heart as a result of chest compression. Indicative of such an event in all three children was the extent and distribution of the petechiae as well as the lack of extensive cutaneous and visceral hemorrhages. Petechiae have been described in adults with no damage to the heart or lung in cases involving compression of the thorax (25–28), but to our knowledge they have not been described in victims of infanticide.

Petechiae are in fact a common finding in SIDS victims. They are encountered, however, almost exclusively in the pleura, pericardium and in the thymus capsule (visceral petechiae) and are thought to result from intrathoracic pressure; indirectly they support the hypothesis that the terminal mechanism in SIDS is an obstruction of the upper airway (29,30).

To differentiate between death from SIDS and death from intentional suffocation in the present cases, additional microscopic studies were performed on the reactivity of nerve cells in the hippocampal area using the monoclonal antibody Alz-50 (cf. 31). In all three children the number of reactive nerve cells was markedly lower than is common in SIDS victims. This finding constitutes a second argument against the diagnosis of SIDS in the first two victims.

In the first two victims, the compression of the thorax together with the suffocation—and possibly compression of the soft tissue of the throat in case 2—was thought by the forensic pathologists to constitute strong evidence of the application of physical force. Taken alone, however, the findings did not provide conclusive forensic proof of violence since no comparable cases of infants with similar patterns of petechial distribution were known. Moreover, in both children resuscitation measures could have accounted for the skin abrasions. The present authors have since learned of a child under one year old who died of chest compression in an accident and exhibited petechial hemorrhages on the face and nape of the neck (T. Bajanowsky, personal communication).

In summary it can be said that in infants petechiae in the drainage area of the superior Vena cava must be interpreted as proof that physical force has been applied to the chest, an act pointing to intentional suffocation by smothering.

The question arises whether this symptom—and thus other instances of intentional infanticide by suffocation—has been overlooked in the past. Such changes would certainly have been noticed in cases involving a legal autopsy. Regarding the literature on SIDS in general, Asche (32) wrote that intentional suffocation had probably occurred in most cases of SIDS. By contrast, an epidemiological analysis by Kukull and Peterson (33), subsequently confirmed by empirical investigations (24), determined that fatal child abuse may account for only 0.6% of SIDS cases (Massachusetts Study 1982–1990). Emery and Taylor (35) estimated that active suffocation occurred in no more than 10% of SIDS cases. More recent studies, however, report markedly lower rates (3,36).

Whatever the incidence, repeat or serial killings involving the siblings of victims of infanticide can be prevented only if correct diagnosis is made following the death of the first child.

In conclusion it should be pointed out that the diagnosis of SIDS in the first two children was based on the original 1969 definition of SIDS: "The sudden death of any infant or young child, which is unexpected by history, and in which a thorough postmortem examination fails to demonstrate an adequate cause of death" (37). This definition is notable for its failure to take into account the circum-

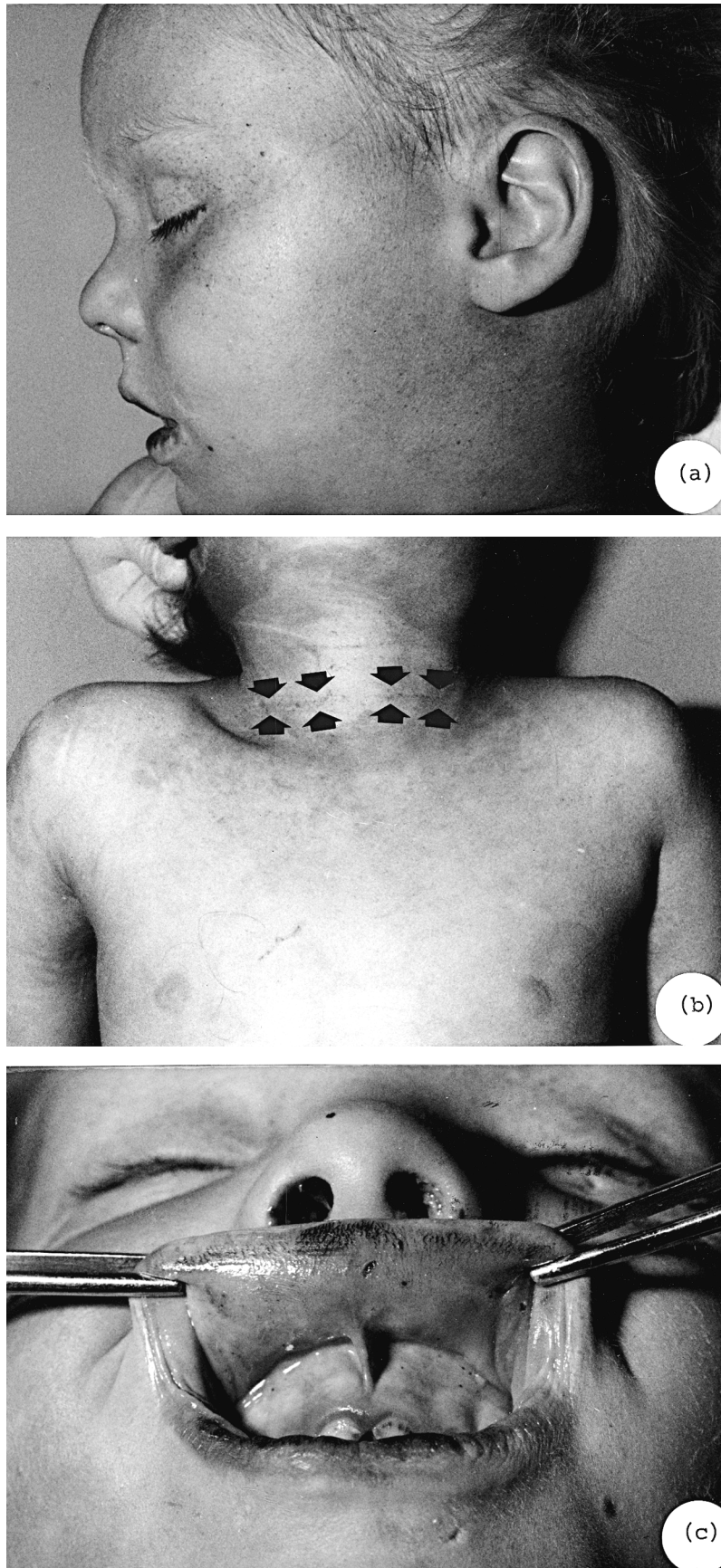


FIG. 3—Conspicuous findings in case 3 (Code S 107/96): (a) Petechiae of the face; (b) distribution of the petechiae and imprint of the pajama collar on the throat; (c) teeth imprints inside the upper lip.



stances of the death, a factor of sometimes decisive importance in determining the cause of unexpected deaths. This shortcoming has since been addressed by the Stavanger definition of SIDS: "Sudden death in infancy unexplained after review of the clinical history, examination of the circumstances of death and postmortem examination" (for an in-depth discussion see Rognum and Willinger (38)). Had the proposed new definition been applied in the first two cases described here, greater care may have been taken to include a detailed forensic-pathological analysis of the circumstances surrounding—and the mechanisms involved in—the children's deaths. As it was, the lack of a pathological-anatomic explanation of the deaths did not suffice for the prosecuting attorney to bring a charge of homicide against the mother.

In light of the family tragedy described here, a homicide should be suspected in every case of petechial bleeding in infants that can only be explained by hemodynamic factors. In explaining the deaths of children under one year of age, therefore, a thorough forensic-pathological autopsy must go hand-in-hand with examination of the circumstances of death in differentiating between infanticide and SIDS.

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