NEGLECT, ABUSE OR PATHOLOGY – CASE STUDY OF AN INTRACRANIAL HEMATOMA

Feodor Odzhakov[1], AleksandrinaVlahova[2], DiyanaBelezhanska[3], Aleksandar Apostolov[1]

[1]Department of Forensic Medicine and Deontology – Medical Faculty – Medical University - Sofia

[2]Department of General and Clinical Pathology – Medical Faculty – Medical University - Sofia

[3]Department of Neurology – Medical Faculty – Medical University – Sofia

Corresponding author: Feodor Odzhakov, MD, PhD. Department of Forensic Medicine and Deontology, Medical University, Faculty of Medicine, 2 Zdrave St., Sofia 1431, Bulgaria, e-mail: feodor.odzhakov@gmail.com

Abstract

Introduction

Establishing the mechanism and time of trauma is of paramount importance in forensic medical practice. Intracranial hematomas are usually difficult to interpret, especially when they are isolated.

Materials and Methods

The study presents a case of forensic autopsy on the body of a 5-month-old baby in the Department of Forensic Medicine and Deontology at University Hospital Aleksandrovska – Sofia. Samples from the internal organs have been obtained for additional histological examination. All relevant medical documents since birth have been examined and compared to the morphological findings.

Results

On external examination signs for hypotrophy and a head trauma have been established. Histological findings have been persuasive for acute inflammatory response in both lungs and myocardium. Upon examination of the medical documentation, data for epileptic seizure during treatment in another hospital 2 days prior to death has been registered. Even though the social background of the child has been controversial for both abuse and neglect, it has been concluded that the epileptic seizure has caused the head trauma and the cause of death is not related to it.

Discussion

This case study focuses on the importance of preliminary information in forensic medical practice and the variety of possible interpretations of trauma if such is scarce or lacking.

Conclusion

Interpretation of mechanism and time of any trauma in forensic medicine should be performed only after all the necessary information is present, not only based on its morphological appearance.

Key words: *head trauma, abuse, neglect*

Introduction

Pediatric abusive head trauma most often consists of injury to the brain of infants and young children, resulting from a blunt impact or combination of such and results in sever neurological disorders (1, 2, 3). Usually it is very difficult to diagnose the condition properly, due to: the possibility of misleading history, given from relatives (4); the wide variety of mechanisms through which the trauma occurred (5, 6); lack of consistent physical signs of injury (7). More than 40 percent of deaths from child abuse occur among children younger than 12 months of age (8). Abusive head injury is the most common cause of death and long-term disability resulting from physical child abuse. Infants frequently present with nonspecific clinical features without a history of trauma. As a result, as many as 30 percent of children with abusive head injury may be misdiagnosed at the initial evaluation (9, 10). In forensic medical practice, it is of paramount importance to establish the mechanism and time of the abusive head

trauma (11). In that sense, intracranial hematomas are usually difficult to interpret, especially when they are isolated (12).

Materials and Methods

The study presents a case of forensic autopsy on the body of a 5-month-old baby in the Department of Forensic Medicine and Deontology at University Hospital Aleksandrovska – Sofia. Samples from the brain, heart, lungs, kidneys, liver, spleen and trachea have been obtained for additional histological examination. The materials were placed in formalin containers and stored at room temperature for 72 hours. Permanent histological specimens stained according to the standard technique for the hematoxylin-eosin protocol have been prepared. Digital photographs of the established histological findings were taken using an Hp Photosmart E337 camera. Examination of the prepared histological specimens was performed on a NU-2 microscope (CARL ZEISS) using magnifications 10X10. All relevant medical documents since birth have been examined and compared to the morphological findings.

Results

On external examination signs for hypotrophy have been established – body mass of about 2500gr. and extremely reduced subcutaneous fat tissue. In right temporal area of the head, above the superior margin of the ear, a linear abrasion has been registered, which is perpendicular to the mid-line of the head and with total length of 1cm. In left parietal area, an irregular bruise of total 8/6cm has been detected. The internal surface of the scalp has shown an intensive bruise of total 6/4cm parietally to the left. All bones of the cranium have been found intact, however, the sutures between them have appeared widened. In left parietal lobe of the brain a subarachnoid hemorrhage has been registered, which appeared to be directly under the bruise of the scalp. Within the hemorrhage, fibrous components have been examined.

Histological findings in the heart have been conclusive for acute inflammation accompanied by necrosis of cardiomyocytes (fig 1.). Additionally lobular pneumonia in the lungs has been observed with focuses of necrosis and fibrosis (fig. 2), adjacent bronchiolitis with acute emphysema and desquamation of respiratory epithelium. The observed macroscopical morphological finding of subarachnoid hemorrhage has been confirmed (fig. 3).

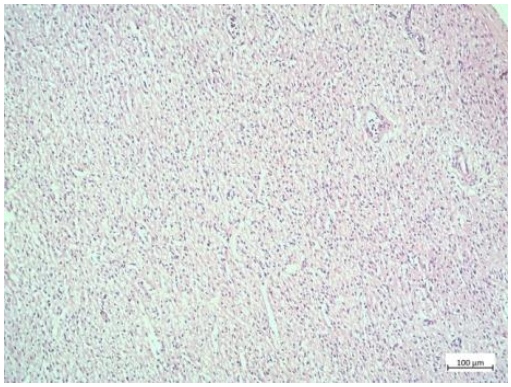

Fig. 1 Myocarditis and necrosis of cardiomyocytes, HE staining, magnification 10x10.

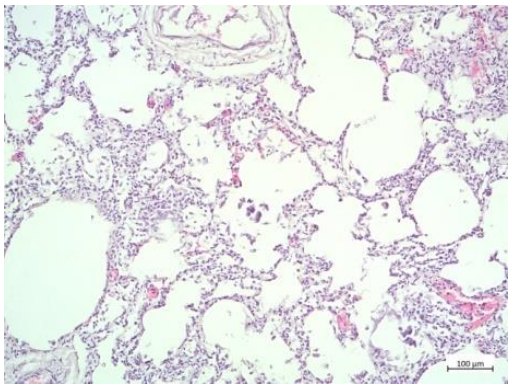

Fig. 2 Pneumonia with focuses of bronchiolitis, HE staining, magnification 10x10.

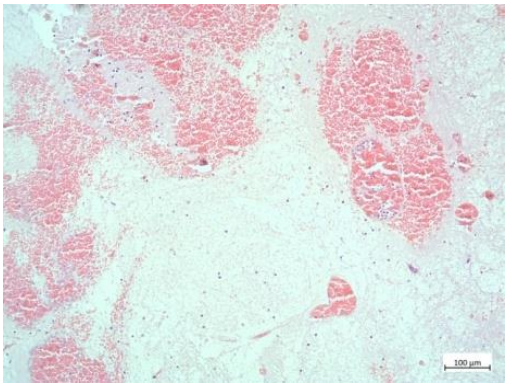

Fig. 3 Subarachnoid hemorrhage, HE staining, magnification 10x10.

Upon examination of the medical documentation, that has been provided through the investigation for the purpose of the expert report, has been established history of prolonged hospital treatment since birth. Recurring admittance due to respiratory failure have been documented, as well as lack of compliance to any treatment from the mother. Upon the last admittance to a district hospital, the mother appeared confused, not being able to provide any information, concerning neither the current problem, nor past medical history. It has been noted, though, that no trauma has been established. Due to the overall complication of the status, it has been decided for the baby to be transported to another hospital. Upon the initial examination in that hospital, the head trauma has been already present. After deeper analysis of the medical documentation, data for epileptic seizure during treatment in the first hospital, 2 days prior to death, has been registered. Even though the social background of the child has been controversial for both abuse and neglect, it has been concluded that the epileptic seizure has caused the head trauma and the cause of death is not related to it.

Discussion

The differentiation between intentional and unintentional causes of head trauma in infants and young children is a common medical and legal dilemma. Most often head trauma is caused by falls that rarely result in a significant intracranial pathologic condition; however, intentional injury is the most common cause of severe traumatic brain injury in infants. It is reported that more than half of infant head injuries are of sufficient severity to warrant hospital admission (excluding uncomplicated skull fractures) and nearly all of serious intracranial injuries are the result of child abuse. Accurate correlation of the computed tomographic (CT) findings with the reported mechanism of injury is an essential component of the care of the infant or young child with head trauma.

Results of studies based on surgical, radiological, and autopsy data suggest that different types of brain injuries tend to occur with intentional vs unintentional trauma. Most investigators believe this is caused by a predominance of inertial forces with intentional brain injury, resulting in movement of the brain to yield concussion, edema, subarachnoid hemorrhage or diffuse axonal injury. Unintentional head trauma more often involves contact forces, which tend to produce focal injuries such as laceration, fracture, contusion, or epidural hematoma.

This case study focuses on the importance of preliminary information in forensic medical practice and the variety of possible interpretations of trauma.

Conclusion

Interpretation of mechanism and time of any trauma in forensic medicine should be performed only after all the necessary information is present, not only based on its morphological appearance.

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