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The Medico-Legal Aspects of Non-Traumatic Subdural Haemorrhage: A Case Report

الجوانب الطبية القانونية للنزيف غير الاصابي تحت الام الجافية: تقرير حالة

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Abstract

In this case study, we describe a case of a subdural haemorrhage in an acutely severe asthmatic patient in a suspicious circumstance.

A woman in her early 40s came to the emergency department with an acute asthmatic exacerbation.

The autopsy showed subdural hemorrhage in the parieto-temporal area and slightly congested, overinflated lungs with mucus plugs and a thickened bronchiolar wall.

This case report emphasizes the medicolegal aspect of the presence of subdural haemorrhage in an asthmatic patient who died in a suspicious circumstance.

Keywords: Forensic science; Forensic pathology; Autopsy; Asthma; Subdural haemorrhage.

المستخلص

قمنا في هذه الدراسة بوصف حالة نزيف تحت الجافية لمريض مصاب بمرض الربو الشديد الخطورة في ظروف مشبوهة.

فقد حضرت امرأة في أوائل الأربعينيات من عمرها إلى قسم الطوارئ مصابة بتفاقم حاد بمرض الربو.

وقد أظهر تشريح الجثة نزيفًا تحت الجافية في المنطقة الجدارية الصدغية واحتقاناً طفيفًا، وتضخم في الرئتين مع انسداد بالمخاط وجدار قصبة هوائية سميك.

يؤكد تقرير الحالة هذا على الجانب الطبي القانوني لوجود نزيف تحت الجافية في مريض الربو الذي توفي في ظروف مشبوهة.

الكلمات المفتاحية: علوم الأدلة الجنائية، علم الأمراض الجنائي، تشريح الجثة، الربو، نزيف تحت الجافية.

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1. Introduction

Intracranial bleeding may result from traumatic or non-traumatic (spontaneous) sources, although it is always assumed to be traumatic unless proven otherwise.

Trauma falls, automobile accidents, sporting accidents, or other sorts of hits to the head can result in traumatic intracranial haemorrhage [1]. While underlying vascular malformations, therapeutic anticoagulation, bleeding disorders, hypertension, cerebral amyloid angiopathy, aneurysms, and hemorrhagic infarcts (both venous and arterial) are known to cause spontaneous intracranial haemorrhage [2]. Eclampsia, postpartum vasculopathy, and newborn intraventricular haemorrhage are disorders related to pregnancy or childbirth [3].

As a subtype of intracranial haemorrhage, acute subdural hematoma (SDH) is regarded as a complication of a head injury, and bleeding is commonly associated with laceration of the bridging vein in the subdural space. However, reports of acute SDH without a history of trauma are rare. Acute subdural haemorrhage (SDH) caused by non-traumatic conditions may occur directly into the subdural space or as an extension from an intracerebral haemorrhage (which may be caused by neoplasms, hematologic disorders, anticoagulant and thrombolytic therapy, cerebral amyloid angiopathy, dural arteriovenous fistulas, and acquired immune deficiency syndrome.) [4,5,6].

Specifically, from the entity of acute subdural hematoma, isolated Subdural hematoma is rarely found and reported. Similarly, it was most commonly found to be of a traumatic source, while isolated SDH of a non-traumatic source (spontaneous isolated SDH) is a much rarer entity, and with the traumatic causes constituting the vast majority of cases, many pathological causes may be missed and presumed to be traumatic, which emphasizes the importance of this study.

Non-traumatic (spontaneous) SDH may or may not be due to a known underlying cause or disease. Spontaneous SDH was reported in elderly people and only rarely in children. In the elderly, past histories of medical chronic diseases were frequently reported, but no clear correlation was made between any of these diseases and spontaneous SDH. According to a report, the patients had a mean age of 53.0 years and included 5 men and 1 woman (range 32–82). Two of the six patients had histories of head injuries with onsets dating back more than ten years. Additionally, one patient had a history of hepatitis C, dementia, alcoholism, and hypertension [7].

Moreover, young patients had no correlation to an injury. For instance, a reported case of a 31-year-old male who presented to the emergency department with a severe headache for 3 weeks and the presence of oculomotor disorders without any history of trauma. Also, there was no history of hypertension or haematological diseases. Magnetic resonance imaging (MRI) showed a bilateral subdural hematoma [8]. Moreover, males were predominantly affected in cases of isolated spontaneous SDH, regardless of age.

All of the reported cases were of a clinical nature. Here we present the case of a woman in her early 40s who died in the hospital after she had left the house she used to work in. She was a known case of asthma and presented with an acute asthma exacerbation picture that did not respond to management and passed away. The autopsy showed a non-traumatic subdural haemorrhage. This case emphasizes the medicolegal aspects of the presence of a subdural haemorrhage in asthmatic patients who might die in suspicious circumstances.

2. Case history

A migrant domestic worker in her early 40s having a history of asthma reported to the emergency room (ER) of a local hospital with a coworker. She presented with bradycardia, shortness of breath, and an altered level of consciousness. She had left the house she used to work in months back but there was no history of injury.

In Jordan, people who are looking for a housekeeper often apply for one in the domestic recruitment offices. Afterwards, the recruited housekeeper can work for these people for the period of time they applied for, or can work for other different houses on a daily basis and pay.

In judicial cases, information about housekeepers escaping from the houses they work in is taken from the police and it is mostly limited to available primary information about the antemortem case circumstances. In this case, there was no available information on whether this was her first escape or whether there are precedents for escape. Information about this case in general was very limited.

She was dealt with as an asthma exacerbation and then given the appropriate medical regimen (IV hydrocortisone 100 mg, dexamethasone nebulizer) with no response or improvement. Then she developed cardiac arrest. She was not administered oxygen and no mechanical ventilation was used.

3. Autopsy Findings

The external examination showed the absence of any signs of struggle or trauma, as the autopsy showed no injuries to the head and scalp, and no skull fractures, though the skull bones were thinner than usual. An oval, thin subdural hemorrhagic clot of 3 mm thickness (Figure 1), with a surface area of 10x10 cm2 in the left parietotemporal area, was noted. Also, haemorrhage was found in the parasagittal sulcus, with prominently engorged cerebral vessels in the contralateral hemisphere (Figure 2), while the ipsilateral hemisphere blood vessels were almost empty.

The neck muscles, bones, and cartilage were intact, including the hyoid bone and thyroid cartilage. The larynx and trachea were patent with thyroid gland enlargement (30 g). The intercostal muscles

Figure 1- Oval thin Left Subdural hemorrhage.

Figure 2- Prominent engorged cerebral vessels on the right hemisphere .

and ribs were all intact. The lungs were congested and overinflated (they weighed 1675 grams). Thick mucus plugs filled the bronchioles with severely thickened bronchi and bronchiolar walls. The heart was normal in weight and wasn't hypertrophied, with the presence of atherosclerotic plaques in the coronary arteries with a maximum thickness of 30%. The abdominal muscles were intact, the abdominal cavity was clear, and the abdominal viscera was congested with no changes, including both kidneys, which were completely normal except for the fatty liver.

A histopathological study shows that all organs were normal except for hypertrophied smooth muscles, eosinophilic inflammation, and mucus gland hyperplasia, which are all consistent with asthma. Toxicological screening showed the absence of any drugs or toxins.

4. Discussion

In this report, we present a case of subdural haemorrhage that was diagnosed at autopsy. An autopsy showed no signs of struggle or injury and confirmed the history of asthma. As there was no evidence of trauma in this case, and the subdural haemorrhage appeared to be related to asthma exacerbation.

In contrast to this case, clinically reported cases of living asthmatic patients have been diagnosed with intracranial haemorrhage. The first report described three cases of acute subdural hematoma without head injury; two of the three cases were associated with asthma or coughing [9]. The second report documented a case of acute subdural hematoma without head injury in a patient with chronic bronchitis [10].

Another reported case of an 83-year-old female who presented with signs of intracranial herniation due to a spontaneous subdural hematoma. She was also reported to have serious neurological symptoms and critical systemic conditions caused by an asthma attack [11].

Moreover, in a study of headache associated with cough, one out of nine symptomatic patients was found to have a subdural hematoma [12].

From a different perspective, all of the reported cases involved elderly patients who were mostly male, specifically 74 and 69-year-old males in the first report, a 58-year-old male in the second, and an 84-year-old female in the third, for a mean age of 70 years and a strong male predominance. This is in contrast with this case, which involved a female in her early 40s..

SDH is almost always considered traumatic, especially in medicolegal cases, but in this case we emphasize the fact that it can be pathological even in young people, not only because of hypertension or hematological causes but also because of other conditions like asthma or possibly due to other cough-inducing conditions like bronchitis.

We describe here an asthmatic patient who died after an episode of acute asthma exacerbation. A subdural hemorrhagic clot was found at the autopsy. The published data reviewed in this report shows some reported cases of non-traumatic subdural hemorrhage after an acute asthma exacerbation. We suggest that there might be a strong relationship between subdural hemorrhage and asthma exacerbation, as shown in this case report.

More research is required to establish a positive correlation of asthma and other cough-inducing conditions with non-traumatic SDH.

Conflict of interest

The authors declare no conflicts of interest.

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Ethical approval: The informed consent and ethical approval in this case was obtained from the prosecutor.

Author Contributions

Hasan A. Abder-Rahman: designed the study, and drafted the manuscript, Imad M. Al-Abdallat: conceptualization, helped in drafting and reviewing the manuscript, Ibrahim H. Habash: conceptualization, helped in drafting and reviewing the manuscript, Asma M. Alshaeb: conceptualization, helped in drafting and reviewing the manuscript, Tala A. Alzyood : conceptualization, helped in drafting and reviewing the manuscript.

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