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Traumatic asphyxia: An autopsy case

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SUMMARY

Traumatic asphyxia is a form of asphyxia where respiration is prevented by external pressure on the body. A 19-year-old man was found by relatives compressed by motorboat in the garage. The death was investigated by the prosecutor; body was taken to the Morgue Department for performing autopsy. On gross physical examination; the face, neck and upper part of the chest were congested and many petechiae were observed on the conjunctivae, but not in low extremities. Autopsy macroscopic examination of lungs revealed congestion, sub pleural superficial bleeding areas. In the presented case death was reported as traumatic asphyxia by thorax compression without other lethal factors.

Keywords: traumatic asphyxia – death – autopsy

Traumatická asfyxie: Autoptická kazuistika

SÚHRN

Traumatická asphyxia je druh dusenia, pri ktorom je vonkajšie dýchanie obmedzené externým tlakom na hrudník alebo brucho. Autori predkladajú prípad 19-ročného muža, ktorý bol nájdený príbuznými pritlačený medzi motorový čln a stenu garáže. Nakoľko smrť vzbudila podozrenie dozorujúceho prokurátora (štátneho zástupcu), bola následne vykonaná pitva obete. Pri vonkajšej obhliadke bola zistená výrazná stáza krvi na tvári, krku a hornej časti hrudníka spolu s pretechiami v spojivkovom vaku. Dolné končatiny podobné známky nevykazovali. Taktiež boli nájdené bodkovité krvné výrony na hornej časti brucha, vpravo na krku a krvné výrony tiahnuce sa na pravú dolnú časť hrudníka k rebrovému oblúku. Na pľúcach bolo zistené výrazné prekrvenie a plošné bodkové krvácania. V predkladanom prípade bol náraz spôsobujúci stlačenie hrudníka detailne potvrdený až pitvou a policajným vyšetrovaním – smrť bola následne stanovená v intenciách úrazovej asfyxie pri stlačení hrudníka.

Kľúčové slová: traumatická asphyxia – smrť – pitva

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The form of asphyxia where respiration is prevented by external pressure on the body: a heavy weight compressing the chest or abdomen, wedging of the body within a narrow space death in large crowds is traumatic asphyxia (1,2). Facial congestion and swelling with petechiae of the conjunctivae, face and upper chest are common described findings and is named as Perthe's syndrome (1-9). In the presented case the force causing the chest compression was distinctly determined by the autopsy and crime scene investigation.

CASE REPORT

A 19-year-old man was found by relatives, compressed by motorboat in the garage while he was working for installation of the boat. The death was suspected by the prosecutor and victim was taken to the Forensic Council Bursa Morgue Department for further examination. The victim was 184 cm in height and 85 kg in weight man. On gross physical examination; the face, neck and upper part of the chest were congested and many petechiae were observed on the conjunctivae, but not in low extremities. 10x8 cm ecchymotic bruises on upper abdominal region, 5x2 cm ecchymosis on right cervical region and ecchymotic bruises spreading to the right lower part of the chest and arcus costae, (Fig. 1), 8x4 cm ecchymotic abrasion on right anterior superior iliac spine line were detected. Minimal subcutaneous haemorrhages were observed in the chest wall during autopsy (Fig. 2). Bleeding without subcutaneous haemorrhage was observed in the inferior part of the right sternocleidomastoid region. Macroscopic examination of lungs revealed congestion, widespread sub pleural superficial bleeding areas (Fig. 3) and histopathological examination showed hemorrhagic alveolar oedema. Tracheal mucosa was hyperaemic. Toxicological analysis revealed none of the substances screened for in systematic toxicological methods. Death was reported as traumatic asphixia by thorax compression without other lethal factors.

DISCUSSION

Traumatic asphyxia is caused by compression of the chest by heavy objects, preventing respiratory movements, restricting venous return from the head (1). Causes of crush asphyxia have varied and have included entrapment beneath or within motor vehicles, heavy machinery, also deaths in large crowds, wedging

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Fig. 1. Ecchymotic bruises on the chest wall and arcus costae.

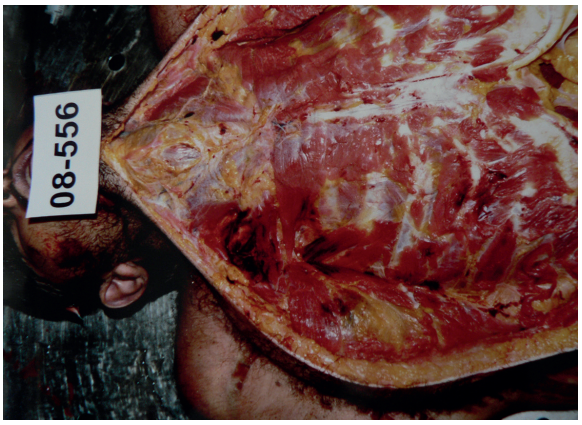

Fig. 2. Minimal subcutaneous haemorrhages in the chest wall.

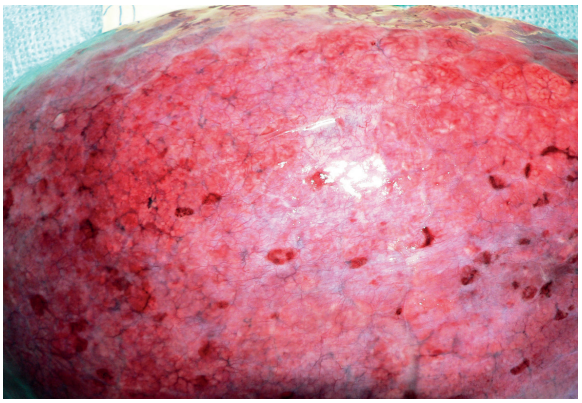

Fig. 3. Subpleural widespread bleeding areas.

of the body within a narrow space when there has been some reason to cause the members of the crowd to panic, surge or try to move quickly from a scene crush asphyxia has been described (1-9). It was reported that the outcome following traumatic asphyxia is a product of duration of compression and the weight involved, it was stated that considerable weight can be tolerated for a short period, whereas a comparatively modest weight applied for a longer period may result in death as observed in our case (9). The traumatic asphyxia or Perthes' syndrome is a condition characterized by a classic triad involving head and neck cyanosis, subconjunctival bleeding, and petechiae as described in our case (1-3). Perthes who described the characteristic features is responsible for the German term for crush asphyxia—"Perthes' pressure congestion" (4,5). Congestion of the conjunctivae may be so pronounced that the conjunctivae are bulging, diffusely hemorrhagic and oedematous (3). A Valsalva manoeuvre is suggested to be necessary before thoracic compression for the development of this syndrome(1,5-7), in traumatic asphyxia petechiae resulted from a 'fear response' with the victim realising that a problem was about to arise and reflexively taking a deep breath and closing the glottis just before the incident, and closure of the glottis with tightening of chest accessory muscles just before impact was thought to result in marked increase in intrathoracic pressure on compression, with transmission of this pressure into the valve less veins of the head and neck (1).

Although it has been suggested that the mortality in crush asphyxia may be influenced by the presence of other injuries, concomitant injuries may, however, be useful as markers for the severity of compression (1,6,8). Byard et al stated that the pattern of pathological findings of crush asphyxia was not influenced by the presence or absence of concomitant serious or lethal injuries (3), besides in different studies it was claimed that the prognosis is good but a prolonged thoracic compression could lead to cerebral anoxia and neurological squeals (8,9). Traumatic asphyxia has often been described as a rare syndrome with little prognostic significance; the signs of venous congestion of the face and anterior thorax are not always recognized in the emergency department (2,6,7). Increased awareness of this syndrome by emergency physicians will result in better reporting and understanding of its clinical implications, also will provide rapid chest decompression and cardiopulmonary resuscitation for treatment procedures (7,8). It has been also demonstrated that on occasion fatal crush asphyxia may have to be a diagnosis of exclusion, made only when there are characteristic death scene findings, and no evidence of lethal natural diseases or injuries at autopsy, with negative toxicological screening (3).

CONCLUSION

In the presented case the impact causing the chest compression was distinctly determined by the autopsy and criminal investigation, death was reported as asphyxia by thorax compression without other lethal factors.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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