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CASE REPORT

Unassisted smothering in a pillow

Andreas Schmeling · Tony Fracasso · Fritz Pragst · Michael Tsokos · Ingo Wirth

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Abstract We report the case of a 33-year-old man admitted to a psychiatric hospital because of paranoid schizophrenia. The man was found dead lying in his bed with the face pressed against a pillow and with elevated buttocks. The autopsy did not reveal a cause of death. The histological findings displayed the signs of the haemorrhagic–dysoric syndrome with acute emphysema; these findings are pathognomonic of obstructive asphyxia. The adverse effects of the neuroleptics demonstrated by the toxicological findings may have accelerated the loss of consciousness and facilitated the unusual position of the body. On the basis of the clinical history, the autopsy findings, the histological features and the toxicological results, asphyxia due to smothering was diagnosed as the cause of death.

Keywords Obstructive asphyxia · Smothering · Lung histology · Haemorrhagic–dysoric syndrome

Dedicated to Prof. Dr. Dr. h.c. B. Brinkmann on the occasion of his 70th birthday.

A. Schmeling (✉) · T. Fracasso
Institut für Rechtsmedizin,
Röntgenstraße 23,
48149 Münster, Germany
e-mail: andreas.schmeling@ukmuenster.de

F. Pragst · M. Tsokos
Institut für Rechtsmedizin, Charité–Universitätsmedizin Berlin,
Turmstraße 21,
10559 Berlin, Germany

I. Wirth
Fachhochschule der Polizei des Landes Brandenburg,
Bernauer Straße 146,
16515 Oranienburg, Germany

Introduction

Asphyxia by smothering involves the mechanical occlusion of the mouth and nose. Hicks et al. [14] described an unusual case whereby a mentally ill patient successfully committed suicide by smothering in a pillow, without additional assistance from other persons or mechanical devices. The diagnosis of the cause and manner of death was based on the scene investigation, on the lack of autopsy findings that could explain the death, on the police investigation excluding a homicide as well as on the psychiatric history.

We report on a similar case in which the diagnosis of smothering was confirmed by pathognomonic histological findings.

Case report

A 33-year-old man was admitted to a psychiatric hospital because of a paranoid schizophrenia. One day before his death, he had attacked a nurse and hit her. He was therefore put into an isolation room where he could be observed from an observation window. One day later, at 12:45 P.M., the nurses in charge of distributing the therapy pills found the man dead in the isolation room. The body lay face down in the bed in a kneeling position with the face pressed against the pillow. Shortly before, a nurse had observed him, obviously alive, in the same position with the buttocks still wobbling.

At autopsy, the blood was fluid, the organs were congested and the lungs were distended and oedematous. Few epicardial and numerous pleural petechial bleedings could also be observed. The gross pathology findings did not explain the death.

The histological findings revealed dystelectasia of the lungs with marked acute emphysema, and the alveolar spaces showed a moderate haemorrhagic oedema (Fig. 1). The alveolar septa were stretched or acutely lacerated. The semi-thin histological sections allowed for a better evaluation of the interstitial spaces where alveolar-septal oedema and activated macrophages were visible (Fig. 2). The liver showed minimal steatosis, and the heart displayed light perivascular fibrosis and lipomatosis.

The toxicological investigation detected the neuroleptics clozapine and chlorprothixene in venous blood, urine, gastric content and the liver. The analysis of the venous blood and the gastric content also allowed the detection of the metabolites desmethylclozapine and desmethylchlorprothixene. The blood concentrations were clozapine 1.96 µg/ml, desmethylclozapine 0.63 µg/ml, chlorprothixene 0.16 µg/ml and desmethylchlorprothixene 0.10 µg/ml.

Based on the histological findings in combination with the clinical history and the toxicological results, asphyxia due to smothering was diagnosed as cause of death.

Discussion

Among the different types of fatal mechanical asphyxia, smothering using a soft cover is one of the most difficult to diagnose. Death is caused by oxygen deficiency due to oronasal occlusion, but as no compression of the cervical vessels occurs, the classical signs of venous congestion, such as a bluish coloration and swelling of the face and petechial bleedings in the head and neck, are usually missing [20, 24].

In cases of homicide by smothering using soft covers, skin lesions in the face are usually minimal; only fine streaky abrasions and minor reddening and bleedings can be observed [2, 6, 10, 22].

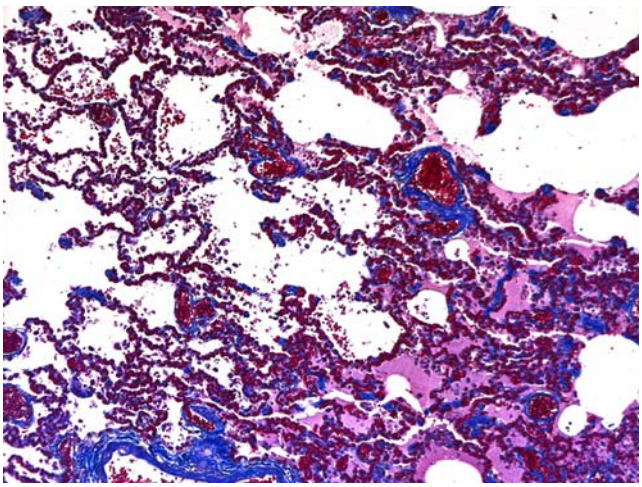

Fig. 1 Combination of emphysematous and dystelectatic regions with haemorrhagic oedema (Azan staining, ×100)

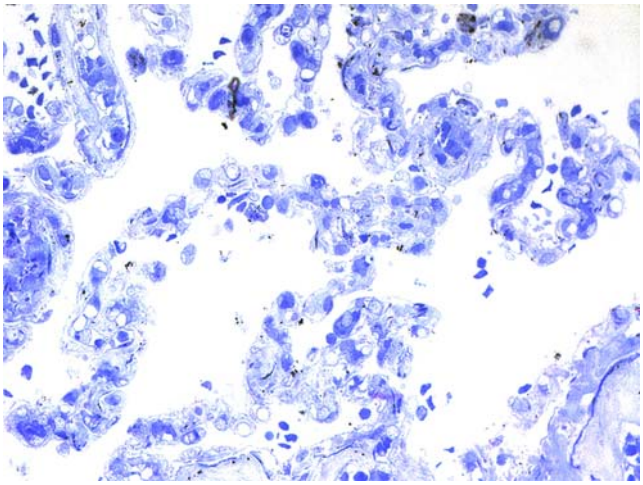

Fig. 2 Marked interstitial oedema and sparse intra-alveolar activated macrophages (semi-thin section, ×400)

In exceptional cases, fibres from the fabric of the soft cover could be identified in the mouth or airways of the deceased [6, 19].

In cases of asphyxia, typical histological signs are acute emphysema, atelectasis, alveolar haemorrhages, acute congestion, microthrombosis, margination of leucocytes, bronchial collapse and perivascular oedema; however, these signs are not specific [1, 4, 10].

Brinkmann's research team described, however, histomorphologic changes specific of obstructive asphyxia: haemorrhagic oedema of the intra-alveolar spaces and of the septal and axial connective tissues and marked oedema of the alveolar interstitium, oedematous swellings of the vascular walls. In samples collected shortly after death, a hydropic degeneration of the endothelial cells with enhanced and enlarged pinocytotic vesicles was additionally observed. The blood vessels showed various alterations of their contents, i.e. sporadically bone marrow fragments and more frequently aggregates or accumulations of immature bone marrow cells and/or mature myelocytes. The leucocyte aggregates were frequently mixed with extensive platelet aggregates that were also present without any further cells but sometimes showed contraction and incipient formation of fibrin networks. The complex pattern of emphysema, microembolism syndrome and haemorrhagic–dysoric syndrome and, in particular, the early manifestation of the alveolar-septal oedema was regarded as pathognomonic of obstructive asphyxia [5, 7, 9, 12].

In animal experiments, Brinkmann et al. [8] were able to demonstrate the effective pathomechanisms that are brought about in obstructive asphyxiation and that are causative for the rapid development of haemorrhagic–dysoric syndrome: In obstructive asphyxiation, a considerable inspiratory

intrapulmonary subpressure occurs, which continues in the pericapillary spaces considerably lowering the hydrostatic pressure. This effect combines with a marked elevation of the intracapillary hydrostatic pressure. The hydrostatic pressure gradient is, therefore, multiplied in obstructive asphyxiation, bringing about the rapid development of interstitial oedema particularly of the alveolar walls.

In the present case, a haemorrhagic–dysoric syndrome with acute emphysema was diagnosed by means of histology. According to Brinkmann, this finding is pathognomonic for an obstructive asphyxia.

In our case, the clozapine concentration was 1.96 µg/ml, which is above the therapeutic levels (0.1–1.0 µg/ml). In the literature, nine cases of fatal intoxication with concentrations of 1.2–13 µg/ml (mean, 5.2 µg/ml) were reported; however, in cases of survived clozapine intoxication, a blood concentration of 3.5–9.5 µg/ml has also been described [3, 13].

According to the medical file, the high dose was well tolerated by the victim without showing signs of hypotension, somnolence, cardiac arrhythmia or respiratory insufficiency, which are typical symptoms of an overdose [18].

The chlorprothixene concentration was within the therapeutic levels (0.02–0.2 µg/ml) [23]. The combined effect of both drugs certainly reduced the victim's capability to react. Furthermore, this could have increased the muscle tone [21].

The extraordinary position of the body, with the face pressed against the pillow, maintained the oronasal occlusion even after the loss of consciousness. The sedative effect of the neuroleptics associated with the increased muscular tone may have facilitated the occurrence of the loss of consciousness and the fixation of the unusual position of the body.

On the basis of the clinical history, the autopsy findings, the histological features and the toxicological results, we diagnosed asphyxia due to smothering as the cause of death. The available information does not allow a clear differentiation between a suicidal or accidental event.

Like other similar publications [11, 15–17], this article confirms the necessity of performing histological investigations in the forensic routine.

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