

A fatal outcome of pica: an unusual case of delayed mortality

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ABSTRACT

We present the case of a 42-year-old man, with a medical history of schizophrenic psychosis, who was found dead on the floor of his bedroom. At the autopsy, a bottle lid with a notched edge was found in the lower pharynx, partially obstructing the larynx and thus keeping the epiglottis in an open position. Airway obstruction was caused by edema and inflammation of the surrounding tissue. After removal of the foreign body, the tissue of the larynx was left with an impression of the bottle lid. The adjacent mucosa was swollen, hyperemic, partly necrotic, and covered with fibrin deposits. Also, foreign bodies were found in the stomach. The histological analysis of the hypopharynx showed severe nonspecific inflammation and necrosis of epithelium. The cause of death was a complication of subacute laryngeal obstruction caused by a foreign body.

Keywords: delayed mortality, pica, forensic science

Introduction

The pica syndrome represents a craving for and compulsive consumption of nonfood substances over a period of time. It has been an enigma ever since it was first documented by Hippocrates in the 4th century BC [1]. Types of substances that are ingested vary with age, but the essential feature of pica is persistent eating of non-nutritive substances for a period of at least 1 month, at an age for which this behavior is developmentally inappropriate (minimum age of 2 years is suggested for diagnosis) [2].

The name derives from the Latin word for magpie (*pica pica*), a bird that collects and/or ingests a wide variety of objects. In the medical literature of the sixteenth century, pica was defined as an “unnatural appetite”, while in the eighteenth century it was described according to the names of affected individuals: wax-nibblers, trash-eaters, chalk-lickers, and gravel-diggers [3].

Despite the well-known complications of pica that include intestinal obstruction and perforation, followed by peritonitis and generalized sepsis, airway obstruction, heavy metal poisoning and parasitic infestation, its etiology remains uncertain and little has been written on the lethal or potentially lethal manifestations [4]. Herein, we describe a case of airway obstruction followed by delayed asphyxia – an extremely rare lethal complication of the pica syndrome, and, thus, not previously mentioned in the literature.

Case Report

A forty-two-year-old man, with a medical history of schizophrenic psychosis, was found dead on the floor of his bedroom. He had been treated in a psychiatric hospital for fifteen years and his last treatment dated three years before his death. He had been hospitalized several times but had mostly received outpatient treatment. In the medical records of the psychiatric hospital, there are data about previous episodes of eating plastic. The deceased was underweight, and at 181 cm tall, weighed only 60 kg (BMI 18, 34 kg/m²). External examination revealed a few longitudinal scratches on the upper lip. Conjunctival hemorrhages were noticed on the upper and lower eyelids, bilaterally. At the place of death, no suicide notes or blood traces were found. The autopsy was performed the next day.

The autopsy revealed a bottle lid with a notched edge in the lower pharynx, partially obstructing the larynx and thus keeping the epiglottis in an open position. Airway obstruction was caused by edema and inflammation of the surrounding tissue. After removal of the foreign body, the tissue of the larynx was left with an impression of the bottle lid. The adjacent mucosa was swollen, hyperemic, partly necrotic, and covered with fibrin deposits (Fig. 1). The trachea had no foreign content. At the bottom edge of the epiglottis, there was also a mucosal defect covered with fibrin deposits. A folded PVC bag was found in his stomach together with a folded PVC foil from a Coca-Cola bottle (Fig.2). There was no erosion or hemorrhage of the gastric wall. All internal organs showed signs of congestion. The cause of death was subacute asphyxia due to airway obstruction by a foreign body.

The histological analysis of the hypopharynx showed a severe nonspecific inflammation with massive granulocyte, eosinophilic and mononuclear infiltrates. Also, it showed necrosis of epithelium toward the basal membrane, with a loss of surface layer and fibrin deposits in some places. The lungs showed passive hyperemia with occasional areas of fresh bleeding in the interstitial tissue. The alveoli were filled with edematous fluid and sporadically with fresh erythrocytes, while the alveolar septa were ripped (acute emphysema). Some cuttings showed multiplied monocytes and polymorphonuclear cells (early bronchopneumonia). Findings in other organs correlated with the macroscopic appearance, without significant pathological changes.

Chemical analyses performed on peripheral femoral blood, urine and vitreous humor show neither the presence of alcohol nor drugs.

Discussion

American Psychiatric Association defines pica as a persistent eating of non-nutritive substances for a period of at least a month. Additionally, by definition, eating behavior must be inappropriate to the developmental level of the affected individual and not culturally permitted [6]. Although many theories were used to explain the etiology of this syndrome, its pathophysiology still remains insufficiently understood [2]. Pica has been associated with mineral deficiency, parasitic infestation, obsessive compulsive disorders, etc. [7].

This disorder is usually diagnosed in children with developmental disturbances and in women during pregnancy, with the incidence decreasing with increasing age and IQ [8]. Some literature reports the point prevalence of the pica syndrome of about 28% during pregnancy and the postpartum period [9]. The importance of the previously mention syndrome is even greater when bearing in mind the fact that ingestion of foreign objects is a common clinical problem and frequent reason for admission to emergency departments. It is also common among

prisoners, as well as alcohol abusers [10]. While children most commonly accidentally ingest foreign objects, among prisoners the ingestion is in most cases intentional, as they hope to achieve hospitalization [11]. Additionally, pica has been associated with obsessive compulsive spectrum disorders and generally represents a diagnostic challenge in patients with psychiatric disease [6].

From the forensic aspect, the low recognition incidence, along with the subtle presentation of symptoms and signs, especially in cases with lethal complications, could make this syndrome very difficult to diagnose [8]. Generally, fatalities following pica depend on the type and amount of material ingested. The most common lethal complications of pica include intestinal obstruction and perforation with peritonitis and generalized sepsis. Other autopsy findings may include airway obstruction, heavy metal poisoning and parasitic infestation [4, 5].

In our opinion, this case represents an extraordinary form of subacute airway obstruction followed by delayed mortality. The indentation of the pharyngeal mucosa, as well as the presence of inflammation and fibrin deposits, are indicators of prolonged or subacute partial obstruction. The reduction in the size of the airway led to the development of acute bronchopneumonia. Subacute lethal complications of the pica syndrome, such as airway obstruction following the ingestion of foreign bodies, are extremely rare. Literature describes cases of subacute asphyxia caused by the obturation of upper respiratory tract by parasites, paper, delayed asphyxia due to inhalation injury, etc. [12-16]. In cases of delayed death after suffocation, histological findings may range from being totally negative to expressing signs of brain death, dependent on the duration of the disruption of oxygen supply. The most common gross pathologic finding in cases with anoxic ischemic encephalopathy is the loss of gray-white matter differentiation, with effacement of sulci and cisterns, hemorrhagic infarction of the basal ganglia and focal areas of edema in the cerebral cortex or basal ganglia [17]. In our case, autopsy revealed obvious local signs of prolonged persistence of the foreign object in the upper airways. The mixed cellular infiltrate (granulocytic, eosinophilic and monocytic) is the evidence of a subacute time course for the obstruction. Fibrin deposition usually occurs after minimum 4 to 8 hours and persists with the duration of the inflammation. Also, its formation requires activation of the contact system or tissue thromboplastin, which participates in the late phase of the inflammatory response [18]. In this case the inflammatory process resulted in complete airway obstruction and death.

In summary, this case report demonstrates an exceptionally rare complication of the pica syndrome – subacute asphyxia due to partial obstruction of the airways by a foreign body. The significance of this report is even greater considering the fact that, in our review of the literature, 4 out of 5 case reports of pica syndrome fatalities indicate that the patient had no prior history of pica, and the diagnose was made only at the autopsy [4, 5, 8, 15, 16]. Pica syndrome may be difficult to diagnose in an outpatient clinical setting, since patients may not voluntarily admit to it and their behaviors are not being as closely monitored as in an inpatient setting, where staff or other patients may notice them ingesting foreign objects. The reason may also be the fact that the clinical presentation of this syndrome may be discrete and/or nonspecific, and, along with possible communication issues (primarily seen in psychiatric patients and persons with developmental disorders) a fatal outcome is more certain. On the other hand, although diagnosing of the pica syndrome may be challenging in everyday clinical practice it is necessary to keep

this potentially lethal syndrome in mind during clinical evaluation of a patient with recent onset of respiratory symptoms. In cases of sudden death in psychiatric patients careful evaluation of medical history in search of evidence of the pica syndrome may also be a useful guide to the autopsy examination.

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Figure 1. A) Bottle lid in the pharynx B) Impression of the bottle lid on the mucosa with fibrin deposits

Figure 2. Foreign bodies in the stomach