

CASE REPORT

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Mucus plugging problem in patients treated in the intensive care unit: A case report

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Abstract

In this paper, we will present a case who died in ICU during treatment for suicidal organophosphate intoxication. It is aimed to draw attention to the importance of regular tracheal aspiration and bronchoscopy, especially in intubated patients during treatment in ICU. In the medical documents of the case, it was learned that a 67-year-old male case was brought to a private hospital with a history of suicidal Jestis 2.5 EC, Alban EC4 (organophosphate) intake. The case died after being treated in the ICU for a total of 15 days following organophosphate intake. At autopsy, during an internal examination, approximately 5x2x1,5 cm in size, with brown-black color, organized, hardened paste consistency mucus plug was observed which was localized in the bifurcation of the trachea. It is considered to be useful to evaluate the indication of bronchoscopy in cases with better general conditions and hope for recovery.

Keywords: Mechanical ventilator, intubated patients, intensive care unit, mucus plug, fiberoptic bronchoscopy

Introduction

Poisoning may have serious consequences depending on the causative agent and time to an application to the health institution. Mortality is known to be high in taking pesticides to commit suicide [1]. Although mechanical ventilation is life-saving in critically patients in the intensive care unit (ICU), it can sometimes lead to very serious life-threatening complications [2]. In this paper, we will present a case who died in ICU during treatment for suicidal organophosphate intoxication and an organized mucus plug in the tracheal bifurcation was revealed at autopsy. Thus, it is aimed to draw attention to the importance of regular tracheal aspiration and bronchoscopy especially in intubated patients during treatment in ICU.

Case Report

In the medical documents of the case; It was learned that a 67-year-old male case was brought to a private hospital with a history of

suicidal Jestis 2.5 EC, Alban EC4 (organophosphate) intake. Gastric lavage with 2500 cc and 50 g of activated charcoal were applied. On admission to the other hospital, he was confused, and secretion was increased.

Because apnea developed, he intubated and connected to a mechanical ventilator in a short time. During the treatment in ICU, poor general condition, unconsciousness, secretion increases, GCS-3 and intermittent seizures were detected. Atropinization was applied. The case died after being treated in the ICU for a total of 15 days following organophosphate intake.

At autopsy, during the external examination, needle marks with ecchymosis on the forearm due to treatment in ICU and abrasions with ecchymosis on the chest due to cardiopulmonary resuscitation were observed.

In the internal examination, there was intense hyperemia and edema in the brain. Both lungs have a hard consistency and arthroscopic appearance and brown-yellow purulent fluid was present in the sections. The trachea was plastered with abundant mucoid fluid. Approximately 5x2x1,5 cm in size, with brown-black color, organized, hardened paste consistency mucus plug was observed which was localized in the bifurcation of the trachea

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and completely covering both main bronchial lumens (Figure).

Histopathological examination of internal organ samples taken from the body; fresh lobular pneumonia in the lungs, atelectasis; congestion in the heart, calcified atheroma plaques in the coronary arteries, which were narrowing lumen slightly; congestion in the brain-cerebellum-brain stem, liver and kidneys were detected. In the mucus plug described in the bifurcation of the trachea, a structure consisting of blood, fibrin, inflammatory cells and mucoid material was observed.

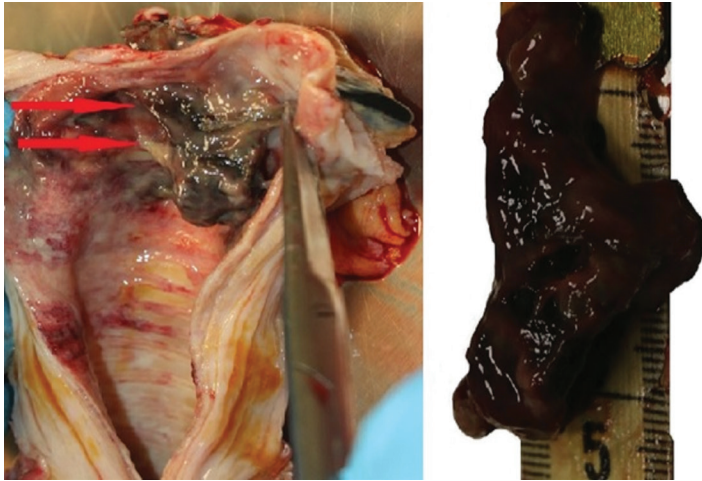


Figure. Approximately 5x2x1,5 cm in size, with brown-black color, organized, hardened paste consistency mucus plug

Discussion

It is reported that 5 to 30% of ICU is used for cases of poisoning [3,4]. In intubated cases, it is stated that hospitalization day, number and the probability of death are high, rapid detection of the agent in intoxications, follow-up of the patients in intensive care by performing the necessary intervention without delay are very important in reducing mortality. In a study about 245 intoxication cases followed in the ICU, it was reported that 13 (5.3%) of the cases were intubated due to respiratory failure [4]. Sepsis, arrest, pneumonia and arrhythmias are the most common causes of death in the ICU [5]. It is stated that the most important reason for morbidity and mortality in ICU is hospital infections and which increase the length of hospital stay and treatment cost [6].

Mucus is a soft (deformable) substance. Its consistency is like white parts of the egg. Mucus has the properties of an elastic solid and a viscous liquid, 97% consists of water and 3% consists of solid compounds (mucin, non-mucin proteins, salts, lipids and cellular residues). However, mucin hypersecretion or irregularity of surface fluid volume can increase the solids concentration by up to 15% [7]. If mucus hypersecretion is not associated with increased mucus clearance, it leads to the accumulation of mucus in the airway [8]. This leads to obstruction of many airway lumens, local atelectasis, linear and branched opacity appearance on direct chest X-rays, luminal filling in proximal airways or tree-bud opacities in peripheral airways on computed tomography [7]. Moreover, mucus hypersecretion increases morbidity and mortality by increasing susceptibility to respiratory infections as well as airway obstruction [8].

Mucus plugs are a serious problem in patients with intubation and patients with impaired lung mechanism due to stroke, immobilization or surgery. Atelectasis and pneumonia are common complications in these patients [7]. In other words, bronchospasm increased bronchial secretions, respiratory muscle paralysis and acute respiratory failure can be seen in organophosphate poisoning [9]. The most common complications of organophosphate poisoning are related to respiratory tract [10], and most deaths are due to respiratory complications [11]. In organophosphate poisoning, the need for mechanical ventilation is associated with mortality [12]. Our case was found to be at significant risk for the development of mucus plugs because of the hospitalization in the ICU for 15 days in the immobilized state, increased secretions due to organophosphate poisoning, and due to mechanical ventilator in the intubated state.

Fiberoptic bronchoscopy is known to be used in diagnosis and treatment in ICU. In a study, 102 bronchoscopies performed in the ICU were reviewed retrospectively. Authors told that the most common indications for fiberoptic bronchoscopy in these patients were focal or diffuse infiltration with unknown cause in 35 (34.3%) cases, pneumonia in 34 (33.3%) immunosuppressed cases, pneumonia developed in hospital in 24 (23.5%) cases, aspiration requirement in 19 (18.6%) cases and atelectasis in 18 (17.1%) cases. It was reported that the most common fiberoptic bronchoscopy findings were; infection in 58 (56.9%) cases, alveolar hemorrhage in 11 (10.9%) cases, plaque suggesting fungal infection in 10 (9.8%) cases and mucus plug in eight (7.8%) cases [13]. In another study including 4098 patients, in 5.8% of the flexible fiberoptic bronchoscopies performed for therapeutic purposes, airway patency was corrected due to respiratory failure and atelectasis from mucous plaques was treated [14]. In another study involving 208 flexible bronchoscopies in the ICU, it was found that the most common therapeutic indication was the resolution of atelectasis and its most common cause was mucus plugs [15]. Particularly in patients who are hospitalized in ICU for a long time and followed by a table that causes bronchial hypersecretion such as organophosphate poisoning, regular tracheal aspiration as well as flexible bronchoscopy is thought to be beneficial in preventing mucus plug formation.

The presented case was treated in ICU as intubated and connected to the mechanical ventilator and died in 15th days of treatment. The autopsy revealed mucus plugs that were localized in the bifurcation of the trachea and completely closed both main bronchial entrances. According to patient records, oxygen saturation during the hospitalization period of the case was found to be within normal limits. Although an autopsy showed that the mucus plug closes both bronchial entrances, oxygen saturations were in normal limits. It was thought that the presence of oxygen saturations in normal limits might be due to the gaps in the edges of the mucus during inspiration and expiration movements, thus providing air passage from here when he was living.

Bronchoscopy application for patients treated in ICU is not commonly used in our country. Therefore, bronchoscopy was not performed in the presented case. It was observed that the case was intubated because he had apnea shortly after he was admitted to the hospital. His general condition was continued as bad, unconscious, and GCS was low until his death. Therefore, it is observed that the

clinical table is severe from the beginning. It is considered to be useful to evaluate the indication of bronchoscopy in cases with better general condition and hope for recovery.

Competing interests

The authors declare that they have no competing interest.

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Ethical approval

Consent of Ethics was not received.

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