



Original communication

An unusual and fatal case of upper gastrointestinal perforation and bleeding secondary to foreign body ingestion



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ARTICLE INFO

Article history:

Received 1 February 2016

Received in revised form

18 April 2016

Accepted 24 April 2016

Available online 1 May 2016

Keywords:

Gastrointestinal bleeding

Gastric perforation

Foreign body reaction

ABSTRACT

We report a fatal case of gastrointestinal perforation and hemorrhage secondary to the ingestion of a foreign body. While engaged in an amateur futsal competition, an apparently healthy young man suddenly collapsed and his respiration ceased. Autopsy revealed a 3-mm circular perforation on the gastric wall fundus with a significant amount of clotted blood within the gastric lumen. On inspection, a foreign body consisting of a bristle-like hair, later identified via electron microscopy to be a cat vibrissa, i.e. a whisker, was found along the perforation margin. Thus, the inadvertent ingestion of fine, sharp objects (even a cat whisker) can lead to gastric perforation and bleeding, which might prove fatal under given circumstances.

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1. Introduction

Foreign body ingestion constitutes a common clinical occurrence. The majority of such cases occur in the pediatric population, with peak incidences between the ages of 6 months and 6 years.^{1–3} In adults, cases result mainly from unintentional ingestion, often in the presence of contributory factors such as mental disorder, bulimia and alcoholism, whereas deliberate foreign body ingestion is common amongst prison inmates and psychiatric patients.^{4–6} In many cases, ingested foreign bodies will pass spontaneously without any consequences.⁷ However, when objects fail to pass through the gastrointestinal tract, inflammatory reaction and reactive fibrosis may result. Any foreign body remaining in the gastrointestinal tract may give rise to impaction and severe complications.⁸ On the other hand, gastric perforation secondary to foreign body ingestion is quite uncommon⁹ and typically involves the ileo-cecum and sigmoid colon.^{10,11} Other critical sites are areas of anatomical narrowing, such as the duodeno-jejunal flexure, appendix, colonic flexure, diverticulae and the anal sphincter. These are often complicated by peritonitis, but in some cases they may spontaneously seal off and remain asymptomatic. Gastrointestinal bleeding is a rare and severe

complication, in the event that the foreign body lesions one or more blood vessels.

Herein, the Authors report a fatal case of gastrointestinal perforation and bleeding secondary to (cat whisker) foreign body ingestion. To our knowledge, no fatalities involving animal vibrissae have previously been reported in the literature.

2. Case report

We report the case of a 20-year-old man with no significant medical history and in apparently in good health, who suddenly collapsed and whose respiration ceased after approximately 10 min of partaking in an amateur futsal match.

Emergency medical service workers arriving at the scene performed CPR for 30 min, yet to no avail. After being rushed to a nearby hospital the victim was pronounced dead on arrival.

2.1. Autopsy and histological findings

An autopsy was performed 24 h later to ascertain the cause of death. The youth's weight and height were 78 kg and 175 cm, respectively. The external examination was unremarkable. Lividity was evident on the dependent regions of his back and was partially fixed. The coronary arteries appeared pervious and elastic. The weight of the heart was 315 g and, macroscopically, both myocardium and heart valves revealed no significant findings.

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However, the content of blood within the cardiac chambers was reduced.

Upon macroscopic examination, major organs appeared pale, as typically occurs with internal bleeding, but there was no evidence of hemoperitoneum or other peritoneal alterations and in particular no trace of digestive tract bleeding in either the small- or large bowels.

In contrast, examination of the stomach revealed a significant amount of clotted blood (approximately 450 cm³) as well as a single 3-mm circular perforation located on the posterior wall of the gastric fundus. Along the margin of the lesion, one end of a bristle-like foreign body was embedded in the gastric wall (Fig. 1). Moreover, autopsy showed signs of pulmonary edema and brain congestion. Histological examination demonstrated the presence of a scant inflammatory reaction with fibrosis and only a few scattered histiocytes engulfed with basophilic material. No histological signs of gastric ulcer were detected (Figs. 2 and 3). There were no signs of myocardial infarction or any microscopic findings indicative of cardiac disease.

The toxicological analysis of blood and urine excluded the presence of ethanol, amphetamine–methamphetamines, 3,4-methylenedioxy-methamphetamine, tetrahydrocannabinol, cocaine, opiates, methadone, barbiturates, benzodiazepines, neuroleptics or tricyclic antidepressants.

2.2. Electron microscopy findings and dispersive spectrometry

The analysis of a specimen, 4.6 mm in length, of the foreign body was performed via a Leica 440 Stereoscan scanning electron microscope and revealed a compact filament which appeared elliptical in cross-section and whose major and minor axes measured roughly 0.17 mm and 0.08 mm, respectively (Fig. 4).

The surface showed long compressed bundles of keratin fibers, typical of the piliferous adnexa of mammals. As such, its electron microscopic appearance was uncharacteristic of any of the

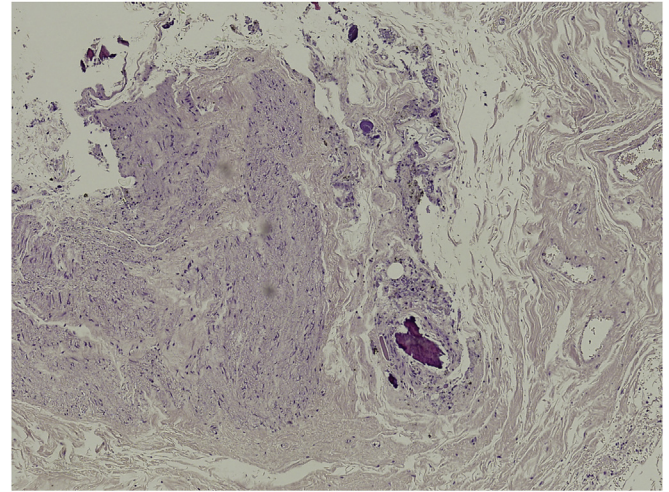


Fig. 2. Histological analysis. Histological examination showed residual traces of a foreign body with scant inflammatory reaction (H&E $\times 10$).

morphologic features of synthetic polymeric filaments, which were thus excluded.

The elemental composition of the specimen performed via EDS (Energy-Dispersive X-ray Spectrometry) revealed an organic substance made up of the following elements: C, O, N and S. The latter, i.e. sulfur, is typical of keratin, consistent with animal hair, as confirmed by microscopic analysis.

Had a piliferous bulb been present, a genetic analysis would have clinched the diagnosis. However, dimensions, morphology and the compact architecture of the keratin bundles were all quite suggestive of a cat whisker. In addition, our hypothesis was further corroborated by comparing the specimen's features to those of an actual cat whisker by electron microscopy. However, our

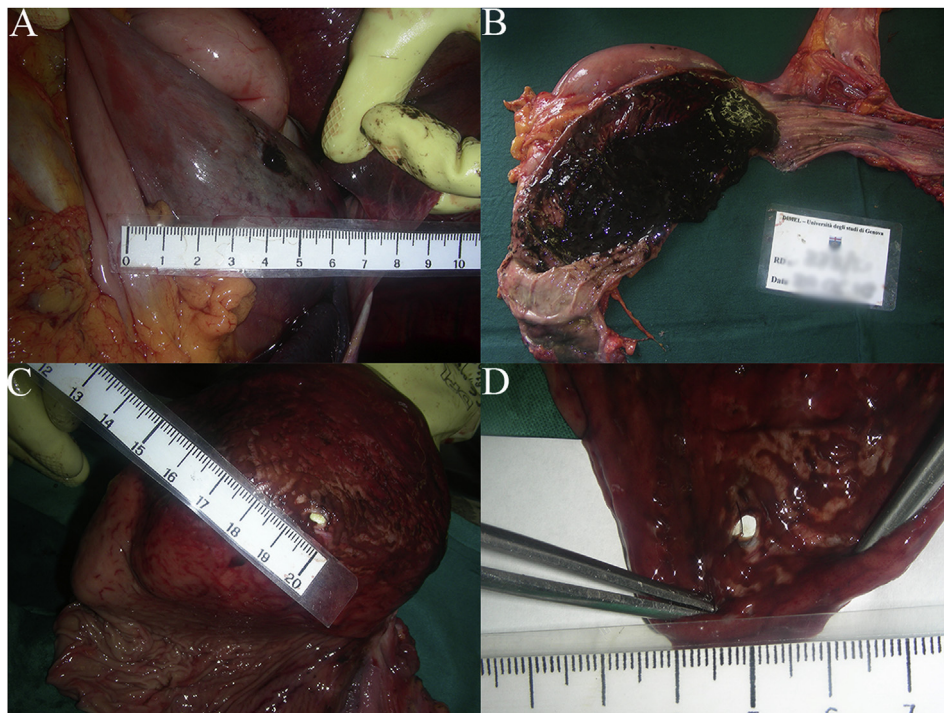


Fig. 1. Autopsy findings. A: Clotted blood on the perforated wall of the gastric fundus. B: Gastric examination revealed the presence of a significant amount of clotted blood (about 450 cc). C–D: The perforation of the gastric fundus with the foreign body partially extracted with forceps.

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