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(CASE REPORT)

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Pneumomediastinum complicating accidental ingestion of HCl: A case study

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Abstract

Accidental ingestion of hydrochloric acid (HCl) is a medical emergency associated with significant morbidity due to its corrosive effects on the upper digestive tract. Pneumomediastinum, although rare, is one of its potentially severe complications. It is defined as the presence of air within the mediastinum and typically results from esophageal or gastric perforation caused by caustic injury. Clinical manifestations may include chest pain, dyspnea, dysphagia, and subcutaneous emphysema. Diagnosis relies on imaging, with computed tomography (CT) being the most sensitive modality. Management requires urgent multidisciplinary care, including stabilization, early endoscopic assessment, broad-spectrum antibiotics, and surgical intervention when perforation is identified. Prognosis is largely dependent on early diagnosis and timely therapeutic intervention. We report a rare case of pneumomediastinum complicating accidental HCl ingestion.

Keywords: Pneumomediastinum; HCl; Ingestion; Tracheal Perforation; Esophagitis; Subcutaneous Emphysema

1. Introduction

Accidental ingestion of hydrochloric acid (HCl) represents a rare but potentially life-threatening medical emergency. This chemical, widely used in domestic and industrial settings, can cause extensive upper digestive tract injury, ranging from superficial burns to full-thickness necrosis and perforation. Among the most serious complications associated with caustic ingestion is pneumomediastinum, which occurs when air leaks into the mediastinal space, most commonly secondary to esophageal perforation. Although uncommon, pneumomediastinum significantly increases morbidity and can rapidly lead to mediastinitis or septic shock. Early clinical recognition combined with appropriate radiological assessment is essential for guiding management.

This report describes a case of pneumomediastinum following accidental HCl ingestion and discusses its clinical presentation, pathophysiology, diagnostic approach, and management.

2. Patient and Observation

This is an 18-year-old patient, originally from and residing in Marrakech, a high school student with no significant past medical history, he presented – following the accidental ingestion of a caustic substance: HCL – the progressive onset of aphagia, retrosternal chest pain, productive cough with whitish sputum, and a notion of an episode of moderate hematemesis, all evolving in an apyretic context and with a deterioration in general condition: asthenia, anorexia, weight loss (14kg in 1 month). General examination: Subcutaneous emphysema at the supraclavicular and bilateral cervical levels. Pleuropulmonary examination: unremarkable . Chest X-ray was performed: hyper lucency along the cardiac contours On the biological level, the NFS had shown laboratery findings leukocytosis with a predominance of neutrophils: WBC: 12430, neutrophils: 11280, without lymphopenia or anemia: Lym: 1549 Hb: 15.6, an increase in CRP

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to 94.28 was noted, the rest of the hepatic, renal, and electrolyte tests were without anomalies. CT : Subcutaneous emphysema in the supraclavicular and cervical regions, extending to the deep spaces of the face, at the level of the anterior thoracic wall, intramedullary, and posterior perivertebral regions. Mediastinal pneumothorax of moderate abundance, identification of a posterior wall defect of the trachea at the level of D4 measuring 1mm. Oeso-gastro-duodenal endoscopy on day 1: Esophagitis classified as stage IIIb + gastritis classified as stage Ia Esophagogastroduodenoscopy on Day 21: Unpassable esophageal stricture Exploratory bronchoscopy of the bronchial tree: Normal endoscopic appearance of the trachea; no visible fistula, fine carina, and at the level of the right and left bronchi: Appearance without particularities, no necrosis, no visible fistula, fine spurs, free orifices, apart from a whitish secretion, an aspiration for cytobacterial study was performed: returned sterile.

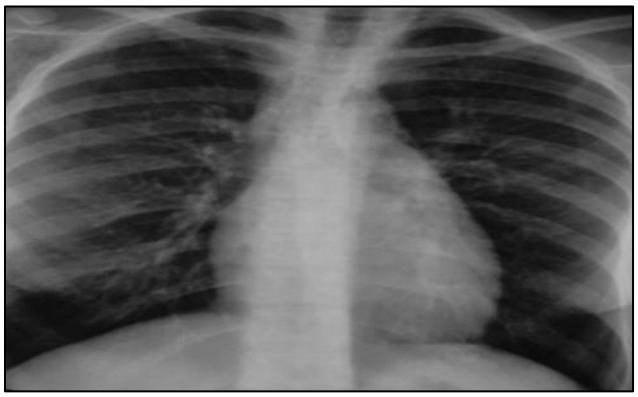

Figure 1 Hyperlinear clarity along the cardiac contours

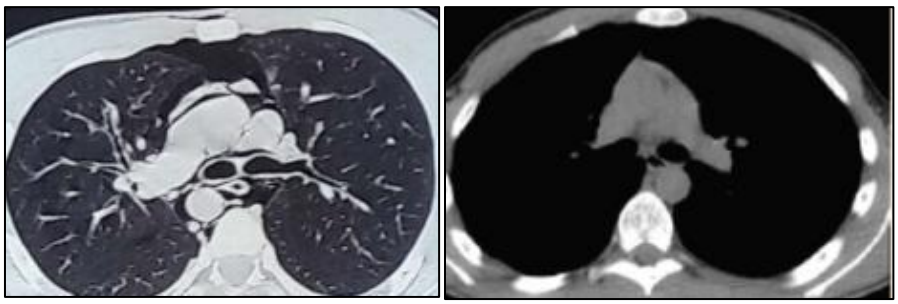

Figure 2 Moderate pneumomediastinum

The diagnosis of pneumomediastinum secondary to HCl ingestion was confirmed.

The patient underwent resection of the oesophageal stricture with digestive and tracheal reconstruction, antibiotic therapy, and enteral feeding via a gastrotomy tube. Clincal parameters, including oxygen saturation, heart rate, respiratory rate and blood pressure, were closely monitored.

3. Discussion

Mediastinal emphysema is a rare but serious medical emergency that can result from the ingestion of caustic substances, such as hydrochloric acid (HCl) [1]. This condition primarily occurs due to the perforation of the esophagus or stomach, allowing air to spread into the mediastinum. During the ingestion of HCl, tissue necrosis caused by the acid can lead to deep mucosal lesions that, if not treated promptly, can progress to perforations [2]. Once these perforations occur, the air contained in the respiratory tract can migrate to the mediastinum, resulting in pneumomediastinum [3]. The ingestion of HCl causes a chemical burn of the tissues, with destruction of the esophageal mucosa and sometimes the gastric wall [4]. If these lesions lead to perforation, air can escape into the mediastinal cavity, which is observed in about 1 to 3% of cases of caustic ingestion [2]. Patients exhibiting symptoms of pneumomediastinum after ingestion of caustic acids, particularly HCl, may suffer from acute chest pain, hypotension, and dyspnea [2]. In some cases, subcutaneous emphysema is also noted [3].

The diagnosis of pneumomediastinum is often made using chest X-rays and computed tomography (CT). X-rays can show a radiolucent space in the mediastinal region, while CT scans are more sensitive for detecting small amounts of air in the mediastinum and can identify complications such as fluid collections, mediastinitis, or the presence of gas in the tissues [3]. CT scans also allow for the assessment of the extent of the lesions and guide therapeutic management [4,5]. Endoscopy: Performed cautiously, it allows for the visualization of caustic lesions and the assessment of perforation risk [4]. Management is based on initial stabilization: Immediate measures include hydration, airway management if necessary, and strict fasting to limit digestive stress [5]. Antibiotic therapy: Early antibiotic coverage is recommended to prevent secondary mediastinitis [5].Surgical intervention: In cases of massive perforation, surgery may be necessary to repair the lesions and drain the mediastinum [6]. Nutritional support: Parenteral or enteral nutrition via a post-pyloric tube is essential to prevent malnutrition [6]. The prognosis for patients with pneumomediastinum secondary to HCl ingestion largely depends on the speed of diagnosis and management. Patients with esophageal perforation and pneumomediastinum require early treatment to avoid serious complications such as mediastinitis, mediastinal abscess, or septic shock [7]. Deaths can occur if treatment is delayed or inadequate, particularly in the present.

Pneumomediastinum can progress to mediastinitis, a condition associated with a high mortality rate. Other complications include esophageal fistulas, mediastinal abscesses, and secondary esophageal strictures [8, 9].

4. Conclusion

Pneumomediastinum is a rare but potentially fatal complication of hydrochloric acid ingestion. Early recognition combined with rapid multidisciplinary management is crucial to improving patient outcomes**.** Surgical intervention, endoscopic management, and antibiotic follow-up are key elements of this care. Rigorous monitoring and appropriate treatment increase the chances of survival for these patients.

Compliance with ethical standards

Disclosure of Conflict of Interest

The authors declare that they have no conflict of interest.

Statement of Informed Consent

Written informed consent was obtained from the patient.

References

[1] Chirica M et al. “Management of caustic ingestion in adults.” Annals of Surgery, 2015. → https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4609064/

[2] Contini S et al. “Severe caustic injuries of the upper gastrointestinal tract.” World Journal of Emergency Surgery, 2007 (ou 2013 selon version). → https://pmc.ncbi.nlm.nih.gov/articles/PMC3703178/

[3] Bonavina L et al. “Foregut caustic injuries: results of the World Society of Emergency Surgery consensus conference.” World Journal of Emergency Surgery, 2015. → https://wjes.biomedcentral.com/articles/10.1186/s13017-015-0039-0

[4] Rollin M. “Caustic ingestion injury of the upper aerodigestive tract in adults.” The Royal College of Surgeons’ journal, 2015. → https://publishing.rcseng.ac.uk/doi/10.1308/003588415X14181254789286

[5] EMedicine article: “Caustic Ingestions Treatment & Management.” (utile pour synthèse) → https://emedicine.medscape.com/article/813772-treatment

[6] Lahoti D, et al. Endoscopy in the management of caustic ingestion. Journal of Clinical Gastroenterology, 1994. Doi : World J Emerg Surg. 2015 Nov 19;10:56.

[7] Zargar SA, et al. The role of antibiotics in caustic ingestion. Gastrointestinal Endoscopy Clinics of North America, 2003. doi: 10.1186/1471-230X-8-31

[8] Kim JK, et al. Management of esophageal injuries in caustic ingestion. Journal of Gastrointestinal Surgery, 2019. doi: 10.4292/wjgpt.v8.i2.90

[9] Vial T, et al. Clinical and diagnostic challenges in caustic injuries. Emergency Medicine Journal, 2011. doi: 10.5946/ce.2014.47.4.301

[10] de Jong AL, et al. Late complications of caustic ingestion. Journal of Pediatric Surgery, 2001. DOI: 10.1016/s0165-5876(00)00440-7