

## Case Report

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# Fatal aspiration of iodine oral contrast

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### Abstract:

We report on a case of massive iodine oral contrast aspiration with consequential cardiorespiratory arrest. The patient was successfully resuscitated and treated with mechanical ventilatory support and an urgent bronchoscopy toilet with only modest success. Instead of esophagography, the X-ray image showed an almost classical "bronchography." A few hours later, the chest X-ray was indicative of acute noncardiogenic pulmonary edema. Respiratory status additionally deteriorated due to bilateral pleural effusions, severe exacerbation of chronic obstructive pulmonary disease, and heart failure, and the patient died of multiorgan failure 8 days after admission to the Intensive Care Unit. The incidence of fatal complications of oral iodine contrast aspiration is very rare but can be even lower if fully cooperative, and well-instructed patients are selected. Special attention should be paid to those with any kind of swallowing difficulties.

### Keywords:

Contrast aspiration, diatrizoate meglumine, noncardiogenic pulmonary edema

## Introduction

In the general population, accidental aspirations of small amounts of liquid, food, or foreign bodies happen frequently. However, most of the healthy people are quite capable of solving such incidents with the usual self-defending mechanisms. Further complications, such as infection, airway obstruction, or acute respiratory distress syndrome, are much more common in elderly people with reduced organism reactivity or in patients with tracheostomy, swallowing difficulties, upper gastrointestinal bleedings episodes, and vomiting, or in near-drowning victims. Accidental aspirations related to medical procedures described in literature mainly refer to aspirations of oral liquid contrast during attempts of gastrointestinal examination.<sup>[1,2]</sup> Most aspirations of the contrast media have no serious consequences, and some even may go clinically unnoticed, and exceptionally rare the outcome is fatal.<sup>[3]</sup> We report on a case of massive iodine oral

contrast aspiration with consequential cardiorespiratory arrest and lethal outcome.

## Case Report

A 67-year-old man was electively admitted to the Department of Gastroenterology for clinical and laboratory signs of chronic malnutrition due to advanced esophageal stenosis following accidental caustic ingestion in early childhood. Other aspects of the patient's medical history were indicative of chronic ischemic and ethylic cardiomyopathy and of chronic obstructive pulmonary disease (COPD), both of which he refused to treat. In the beginning of diagnostic evaluation, an esophagoscopy examination revealed severe stenosis 25 cm from the lower incisors with the food bolus obstruction which was successfully washed off. A pediatric endoscope had to be used to pass through the stricture. Apart from vulnerable esophageal mucosa of the narrowed esophageal segment, and moderate stomach deformation, everything else seemed to be normal. The next day a double-contrast esophagography was ordered to delineate the morphologic

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features of the esophagus and for the assessment of the total extent of esophageal stenosis.

The contrast used was Gastrografin, an iodinated radiopaque contrast medium for oral or rectal administration. The patient was instructed to take a small contrast amount, and keep it in the mouth for a few seconds before swallowing. Unfortunately, when asked to swallow, he aspirated the whole amount. Immediately, an acute respiratory insufficiency occurred followed by respiratory and cardiac arrest. The patient was resuscitated, transferred to the Intensive Care Unit (ICU), and put to mechanical ventilatory support. On arrival, he was unconscious, hypotensive, in sinus rhythm with a heart rate of 130/min. Arterial blood gas analysis taken shortly after initiation of oxygenation and mechanical ventilation was as follows: pH 7.39 pCO<sub>2</sub> 6.2 kPa (46.5 mmHg) BE (base excess) +2.0 mmol/L bicarbonates 27.6 mmol/L total CO<sub>2</sub> 29.1 mmol/L pO<sub>2</sub> 8.56 kPa (64.5 mmHg) saturation O<sub>2</sub> 92.2%.

In the moment of aspiration, instead of expected esophagography, the X-ray image showed an almost classical "bronchography" [Figure 1].

An urgent toilet bronchoscopy was applied to aspirate retained contrast but with only modest success. Just a few hours later, the control X-ray chest (taken in a semi-Fowler's position) was indicative of noncardiogenic pulmonary edema [Figure 2].

Bilateral pleural effusions occurred 3 days after aspiration [Figure 3, also taken in a semi-Fowler's position], and the respiratory status further deteriorated due to severe exacerbation of COPD and heart failure. The state of consciousness slightly improved but the patient remained dependent on mechanical ventilation and died of multiorgan failure 8 days after admission to the ICU.

## Discussion

Gastrografin (Diatrizoate Meglumine and Diatrizoate Sodium Solution, Manufacturer: BerliMed S.A., Madrid, Spain) is a high-osmolarity water-soluble iodinated radiopaque contrast medium for oral or rectal administration only. Bronchial entry of any oral contrast medium causes a copious osmotic effusion.<sup>[4]</sup>

Low-osmolar barium sulfate is better tolerated in the bronchial tree than high-osmolar Gastrografin although the severity of pulmonary damage also correlates with the amount aspirated and contrast density.<sup>[5]</sup>

Barium sulfate within alveolar spaces causes alveolar shunting as well as ventilation/perfusion distribution

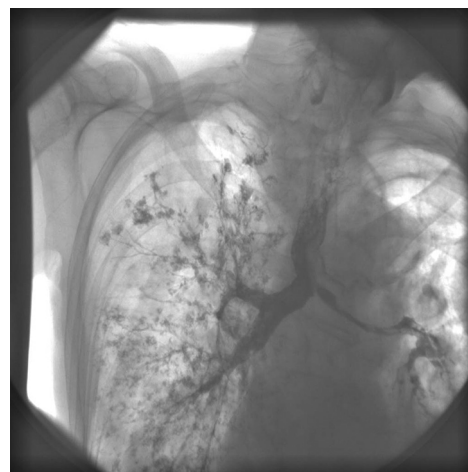


Figure 1: "Bronchography" as a consequence of accidental iodine contrast aspiration



Figure 2: Noncardiogenic pulmonary edema as an early consequence of contrast aspiration

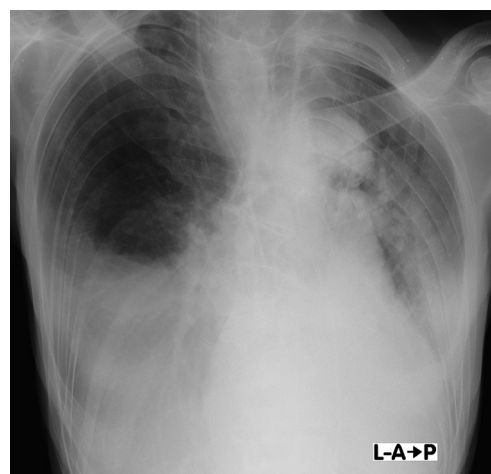


Figure 3: Bilateral pleural effusions due to Gastrografin high osmolarity effect on visceral pleura

abnormalities. However, fatal outcomes of contrast aspiration are very rare and are usually due to the lack of specific therapy, elderly age, and serious comorbidities.<sup>[6]</sup>

Although rapidly absorbed, intrabronchial presence of any high-osmolar water-soluble radiographic contrast media is extremely toxic and can induce severe bronchial irritation, immediate pulmonary edema, and delayed mild-to-moderate pleural effusions.<sup>[7,8]</sup>

The therapy and prognosis vary depending on the amount and the concentration of the contrast aspirated. There is no evidence of which treatment is most indicated or appropriate. In cases of life threatening, abundant contrast aspiration, it seems reasonable to try toilet bronchoscopy to eliminate as much of the contrast as possible.<sup>[1]</sup>

Bronchoalveolar lavage does not seem to be indicated since it could cause the contrast to spread to other lung areas that were not initially affected.<sup>[9]</sup>

In case of severe respiratory insufficiency due to acute respiratory distress syndrome or due to respiratory arrest, mechanical ventilatory support remains the only option. If bacterial respiratory infections are suspected, antibiotic therapy should be introduced.<sup>[10]</sup> Volume replacement and inotropic medications are advised in hypotensive patients.

### Conclusion

Massive oral contrast media aspirations are very rare but can be fatal since only supportive therapeutic measures are available. Therefore, all the efforts should be focused to prevent such incidents. Special cause is needed when swallowing problems are present or in poorly cooperative patients. Only well-trained personnel should be involved in the procedure and prepared to treat any possible complications.

### Consent

Written informed consent was obtained from the patient for both endoscopic and radiological examinations.

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### Conflicts of interest

There are no conflicts of interest.

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