

What's happening under the diaphragm?

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CASE REPORT

A 73-year-old woman with no relevant medical history besides progressive dyspnoea on exertion for four months was admitted to the intensive care unit with cardiogenic shock due to severe mitral valve stenosis. Cardiac failure was provoked by new-onset high-frequency atrial fibrillation. She developed multiorgan failure including ischaemic hepatitis, disseminated intravascular coagulation and acute kidney injury. The patient received mechanical ventilation, support of the circulation and continuous venovenous haemofiltration. Mitral valve replacement would only be considered if the multiorgan failure phase were to improve substantially.

After slight clinical improvement in the first ten days, she deteriorated due to hypovolaemic shock caused by a haemothorax, a complication of pleural fluid drainage under heparin therapy. Coagulation was corrected and the bleeding stopped. However, five days later the patient became hypotensive for which vasopressor therapy was started. On physical examination the abdomen was tender. *Figure 1* shows the chest X-ray taken on that day.

Figure 1. Chest X-ray showing air configuration under left hemi-diaphragm (arrow)



WHAT IS YOUR DIAGNOSIS?

See page 143 for the answer to this photo quiz.

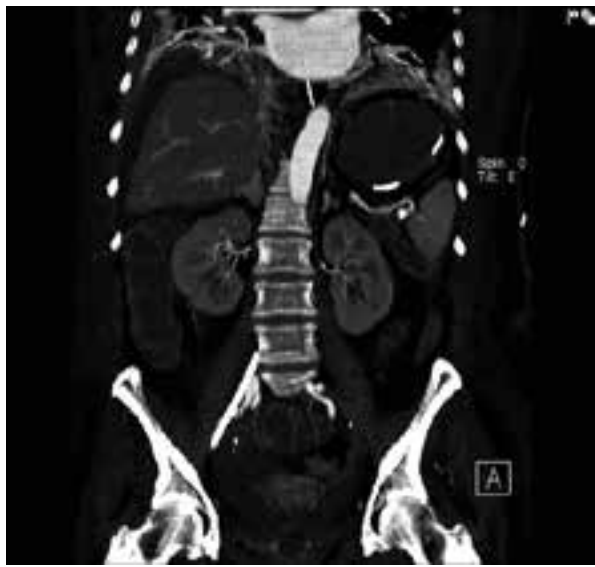
DIAGNOSIS

The chest X-ray suggests free air under the left diaphragm. However, the abdominal CT scan (*figure 2*) showed pneumatosis of the oesophagus and stomach, and non-enhancement after intravenous contrast, indicating ischaemia of the wall. There was no abdominal free air. The superior mesenteric and celiac artery were patent. The CT scan was suggestive for ischaemia of the stomach and distal part of oesophagus, in this case most likely caused by the hypovolaemic shock. Oesophagogastroscopy confirmed the diagnosis of severe diffuse ischaemia of the distal oesophagus and stomach. Due to her cardiovascular status surgical intervention was not possible. Because of the poor prognosis, treatment was withdrawn and the patient died. Gastric pneumatosis is rare and the least common location for intramural gas. There are a wide range of causes,

from life-threatening to self-limiting, with mortality ranging from 21-68%.^{1,2} Besides ischaemia (occlusive or non-occlusive), trauma, vomiting, nasogastric tube placement gastroparesis, malignancy, gastric ulcer, phytobezoar, infection, excessive soda drink ingestion are all causes of gastric pneumatosis. Treatment of gastric pneumatosis is subordinated to the cause, but in benign causes often conservative.¹⁻⁴

This case report illustrates the known low sensitivity and specificity of plain upright chest X-rays for diagnosing free intra-abdominal air.⁵ The CT scan following the conventional imaging illustrates this by showing pneumatosis of the stomach. It also showed patency of the superior mesenteric and celiac artery, suggesting the cause was a low-flow state. The hypovolaemic shock due to the thoracic haemorrhage in combination with the severe mitral valve stenosis caused the low-flow state which led to gastric and oesophageal ischaemia, four days later.

Figure 2. Coronal CT image showing gastric pneumatosis (arrow)



Diagnosis: gastric pneumatosis due to ischaemia caused by low-flow state, masquerading as free abdominal air.

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