

# Ingested chicken bone leading to aorto-esophageal fistula

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## ABSTRACT

We report a 38-year-old male patient who was referred to King Abdullah University Hospital, Irbid, Jordan with massive upper gastrointestinal bleeding. The bleeding proved to be due to aorto-esophageal fistula caused by accidental ingestion of a chicken wing bone 10 days earlier. The patient died during a salvage thoraco-laparotomy. Primary aorto-esophageal fistula is a very rare but catastrophic condition that is frequently missed preoperatively. A high index of suspicion is needed for early diagnosis, which might improve the chance of survival.

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Accidental ingestion of foreign bodies is a common problem; once ingested they may stick at an area of esophageal constriction. Most of the esophageal foreign bodies (EFB) can cause dysphagia, odynophagia or the sensation of something sticking retrosternally. If they do not pass, most EFB can be retrieved by esophagoscopy.<sup>1</sup> Retained EFB, particularly sharp ones, can lead to catastrophic free mediastinal perforation and subsequent mediastinitis.<sup>2</sup> Confined perforation is the exception.<sup>3</sup> Aorto-esophageal fistula (AEF) is a rare and catastrophic condition; it may be primary without prior aortic surgery or secondary complicating aortic surgery.<sup>4,5</sup> The predisposing factors for primary AEF can be atherosclerotic thoracic aortic aneurysm, foreign body ingestion, esophageal stenting for malignancy and trauma.<sup>6,7</sup> An AEF is a rare cause of upper gastrointestinal bleeding.<sup>5</sup> Usually the patient presents with a triad of midthoracic pain, small sentinel (herald) bleeding, followed by massive hemorrhage after a variable interval.<sup>4,6</sup> The case fatality rate of a primary AEF is extremely high with a few reported survivors.<sup>5,8,9</sup>

**Case Report.** A 38-year-old male patient presented to a peripheral district hospital with a one-day history of upper gastrointestinal bleeding as coffee-ground vomitus and melena. Initially, he was found to be hemodynamically stable, and therefore, was managed conservatively. Upper gastrointestinal endoscopy was booked for the patient to be performed at our hospital the next morning. Eight hours later, the patient started to vomit large amounts of fresh blood and rapidly collapsed. He was given 4 units of blood and referred urgently to our hospital, which is a 20 minute drive from the district hospital. On arrival, he was found in shock despite receiving an additional one unit of blood during transportation. His hemoglobin on admission to our hospital was found to be 5.5 g/dl. Plain chest x-ray was not requested due to the grave condition of the patient. Endoscopy was deferred due to continuous bleeding and rapid destabilization. After initial resuscitation with 4 units of blood with a large volume of crystalloid, as part of his resuscitation, he was taken to the operating theater. Cardiac arrest occurred during anesthetic induction, but he was successfully resuscitated. After

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gastroduodenostomy, the stomach was evacuated; no source of bleeding could be found in the antrum or duodenum. Therefore, the gastrostomy was extended proximally, for inspection of the entire stomach, and there was no evidence of esophageal varices. The only finding was blood trickling from the gastroesophageal junction, so a decision was made to convert to thoracotomy. Thoracotomy revealed an inflammatory mass at the mid-esophagus. Dissection of the mass showed a piece of sharp chicken bone projecting from the esophageal wall and eroding into the antero-medial wall of the descending part of the thoracic aorta leading to a direct communication (**Figure 1**). Cardiac arrest occurred again, and efforts at resuscitation failed. History from his family revealed that he had accidentally swallowed a piece of chicken bone 10 days earlier, and he had retrosternal pain and dysphagia following the incident, but he did not seek medical advice until the onset of bleeding.

**Discussion.** Swallowed EFB can range from a coin to sharp objects. Examples of sharp objects include: bone pieces, pins and needles.<sup>1-4</sup> Free perforation of the esophagus can follow foreign body ingestion, a catastrophic complication with high mortality. The perforation tends to be free due to lack of confinement.<sup>3</sup> An AEF as a result of confined perforation was found in one out of 400 patients with EFB.<sup>1</sup> Our patient had a confined perforation in which, the sharp piece of bone penetrated the wall of the esophagus leading to a minimal leak and localized inflammation, and eroding the wall of the pulsating aorta resulting in spread of infection to the aortic wall and later fistulization. A wide spectrum of FBs had been reported to cause AEF, such as, fish bone,<sup>3,4</sup> esophageal stent,<sup>7</sup> endoluminal stent,<sup>8</sup> and nasogastric tubes,<sup>10</sup> however, chicken bone as a cause of AEF could not be traced performing an internet based literature review. The interval between foreign body ingestion and erosion of the aortic wall can take days, or months.<sup>2</sup> Our patient had erosion within 10 days. The erosion and fistulization lead to minor (herald) bleeding, which is reported to occur in most, but not all patients with AEF.<sup>4,6</sup> The AEF are mainly secondary to thoracic aortic surgery. Atherosclerotic thoracic aortic aneurysm is the most common cause of primary AEF.<sup>9</sup> Upper gastrointestinal bleeding secondary to AEF, whether primary or secondary, follows a classical triad of retrosternal chest pain and odynophagia, herald bleeding, and a free interval followed by massive catastrophic upper gastrointestinal bleeding (Chiari's triad).<sup>6,11</sup> The presentation of our patient is highly consistent with such a triad.



**Figure 1** - A piece of sharp chicken bone retrieved from the esophageal wall, which has eroded into the antero-medial wall of the aorta and caused an aorto-esophageal fistula.

The diagnosis of AEF as a cause of upper gastrointestinal bleeding should be suspected in any patient with previous thoracic aortic surgery, thoracic aortic aneurysm or history of foreign body ingestion. A high index of suspicion coupled with appropriate timing of endoscopy, CT scanning and aortography<sup>6,11</sup> can offer the best chance of early diagnosis and might help in saving the life of the patient. Endoscopy may help in diagnosis by excluding other common causes, and may demonstrate the presence of foreign bodies, esophageal wall granulation tissue, intramural mass, submucosal hematoma or bulge, or clots.<sup>6,12</sup> However, there is a limitation of endoscopy in the face of massive bleeding in unstable patients.<sup>12</sup> Upper gastrointestinal endoscopy performed on the operating table is difficult to evaluate if performed by inexperienced physician. However, if the condition were suspected, esophageal balloon inflation could have stopped the bleeding if esophagoscopy were carried out. There are promising reports on the role of endoscopic ultrasonography in the diagnosis of this condition.<sup>13</sup> A CT scan could demonstrate the presence of aneurysm or mass.<sup>14</sup> Aortography can be used in suspected cases provided that the patient is stable.<sup>6</sup> Once the diagnosis is suspected, Sengstake Blakemore tube, or embolization can help in the process of resuscitation and patient stabilization.<sup>11</sup> Aortic replacement, as well as, esophageal replacement is to be considered in the process of management. However, aortic stent grafting may be an appropriate alternative.<sup>15</sup> The prognosis for AEF is still poor, even if successfully managed.<sup>16</sup> Unless, the patient is diagnosed and managed in the early herald stage, survival is very unlikely.

In conclusion, aorto-esophageal fistula is a rare and catastrophic cause of upper gastrointestinal bleeding. Proper history and a high index of

suspicion are necessary to initiate rapid investigation and early intervention to avoid a fatal outcome.

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