Achalasia of the oesophagus
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Section: Chest imaging
Area of Interest: Mediastinum Oesophagus
Imaging Technique: Conventional radiography
Imaging Technique: CT
Case Type: Clinical Cases
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Patient: 87 years, male

Clinical History:
An 87 year old man was scheduled for a pacemaker implantation. A routine chest radiograph revealed widening of the upper mediastinum. A chest radiograph obtained two years before also showed a discrete widening of the mediastinum with an air-fluid level in the mediastinum.

Imaging Findings:
A chest radiograph in an 87 year old man revealed widening of the upper mediastinum. A chest radiograph obtained two years before also revealed a discrete widening of the mediastinum with an air-fluid level. A barium-swallow test (Fig 2-4) showed: 1) narrowing of the cardia with dilatation of the oesophagus, 2) severe motility disorder of the oesophagus with absent peristaltic waves of the body of the oesophagus and intermittent appearance of tertiary contractions and 3) delayed and incomplete emptying of the oesophagus with important stasis of the contrast fluid. The diagnosis of achalasia was established.

The present chest radiograph however showed marked widening of the upper mediastinum, with a right convex border (Fig 5). To exclude underlying pathology, a CT scan was made (Fig 6, 7). This excluded the presence of haemomediastinum, but revealed a pronounced dilatation of the oesophagus with food stasis as cause of the mediastinal widening.

Discussion:
Achalasia of oesophagus is an uncommon neuromuscular disorder in which oesophageal dilatation and hypertrophy of the circular muscle layer occur without organic stenosis. There is loss of peristalsis and the lower oesophageal sphincter fails to relax in response to swallowing. This impairs oesophageal emptying and causes functional obstruction of the oesophagus that persists until hydrostatic pressure of retained material exceeds the pressure generated by the sphincter muscle [1,2,3].

Chest radiograph is initially normal. According to disease progression, diagnosis of achalasia can be suggested on radiographic findings if there is one of the following features [2,3]: 1) an additional soft tissue density line parallel to the mediastinal contour with widening of the mediastinum representing the dilated oesophagus (Fig 1, 5). In figure 5, there is more food impaction compared to figure 1 causing more pronounced oesophageal dilatation. This additional density is mostly a right convex opacity projected behind the right heart border or in the upper part of the thorax. Occasionally dilatation of the oesophagus can also cause a left convex opacity (Fig 5); 2) the normal gastric air bubble is usually present in early stages, but is mostly absent in the later stages of the disease; 3) on a lateral chest radiograph, an air-fluid level within the oesophagus may be present (Fig 1), usually in a retrosternal location, but it
can also occur in the neck.

The classic CT features of achalasia are (Fig 6,7): 1) narrowing at the cardia; 2) oesophageal enlargement with air-fluid level or mottled food residue.

The most important role of CT is to exclude other causes of oesophageal dilatation.

A barium swallow test (barium oesophagram with fluoroscopy) is the best initial diagnostic test. Even in early achalasia, as in our patient (Fig 2-4), this examination can demonstrate the classic features of achalasia [2, 4]: 1) the narrowing at the cardia has a characteristic contour and the dilated body of oesophagus blends into a smooth cone-shaped area of narrowing (Fig 2,3); 2) on fluoroscopy the peristaltic waves are weak, simultaneous, irregular, uncoordinated, or absent (Fig 4). 3) as the disease progresses, the oesophagus dilates further and becomes tortuous and, in far-advanced cases, sigmoid in shape (Fig 3,5). This is called the "bird's beak"-sign. The lowermost segment retains the classic long, linear narrowing even in late stages of the disease. The column of barium is held up at the narrowed area because the sphincteric mechanism fails to relax normally.

**Differential Diagnosis List:** Achalasia, haemomediastinum, goiter

**Final Diagnosis:** Achalasia

**References:**

Description: Posteroanterior conventional chest radiograph shows an air-fluid level in the upper mediastinum. There is a discrete widening of the mediastinum. Origin:
Description: Lateral chest radiograph shows an air-fluid level in the upper mediastinum. The oesophagus is dilated. Origin:
Description: A barium swallow test shows narrowing of the cardia accompanied by a significantly dilated body of the esophagus. Origin:
Description: A barium swallow test shows progression of achalasia, the esophagus dilates further and becomes tortuous and sigmoid in shape. This is called the bird's beak-sign. Origin:
**Description:** A barium swallow test shows the mucosal folds at the narrowing of the cardia. **Origin:**
Description: Conventional chest radiograph shows widening of the mediastinum with a right convex opacity in the upper mediastinum. There is also an additional soft tissue density line projected behind the left heart border. Origin:
Description: A CT scan of the chest shows pronounced enlargement of the esophagus with stasis of food residue suggestive of marked progression of the achalasia. Origin:
Description: The CT scan of the chest shows the dilated esophagus causing the additional soft tissue density line behind the left heart border on chest radiograph. Origin: