

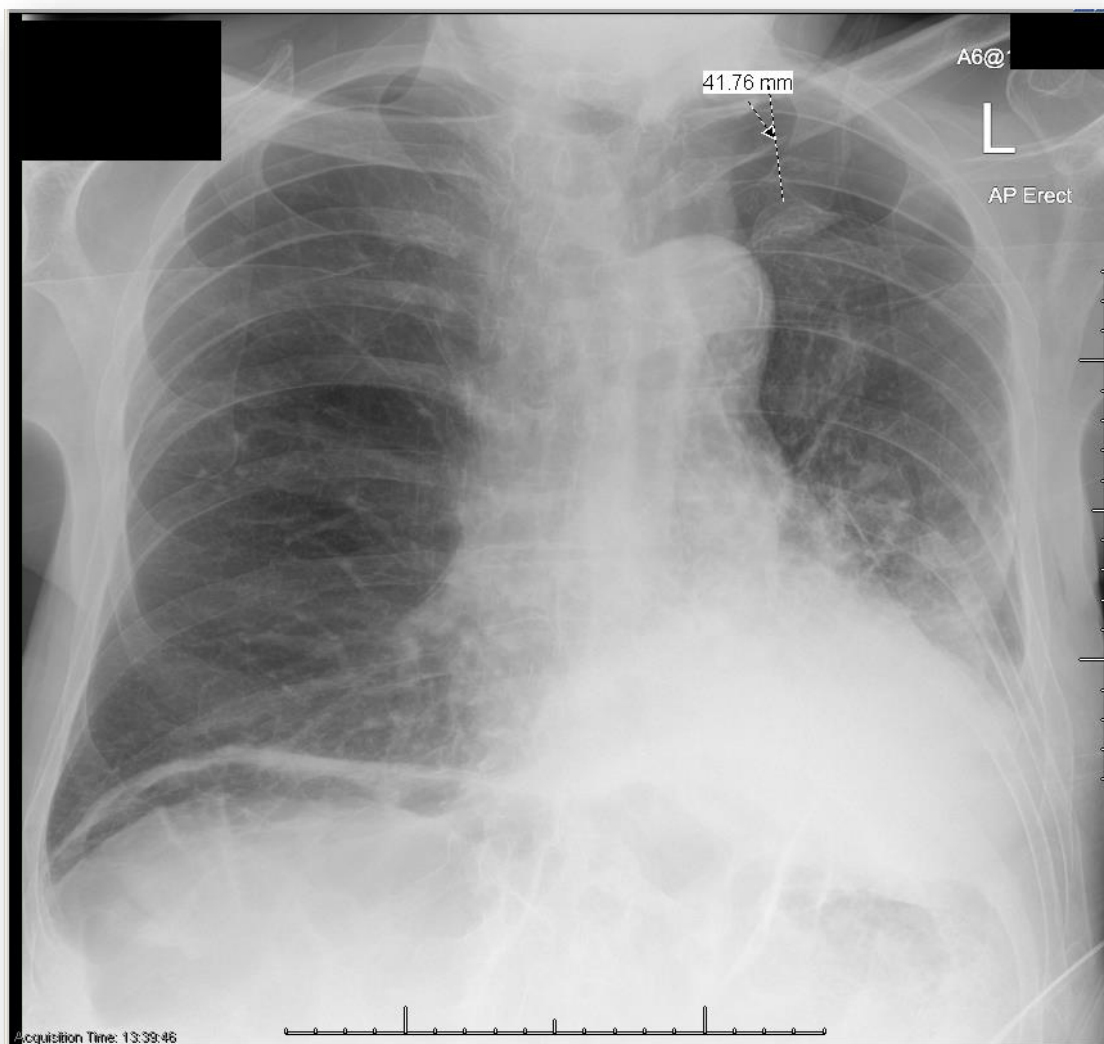
CPD - Radiology Quiz

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A 74-year-old man with a recent Covid-19 infection presented to the hospital with new onset of breathlessness and left sided chest pain. His Chest XR is given below.



CPD – Radiology Quiz Answers

The main Chest XR findings are:

1. *Left pneumothorax*
2. *Left collapse - consolidation*
3. *Chilaiditi sign*

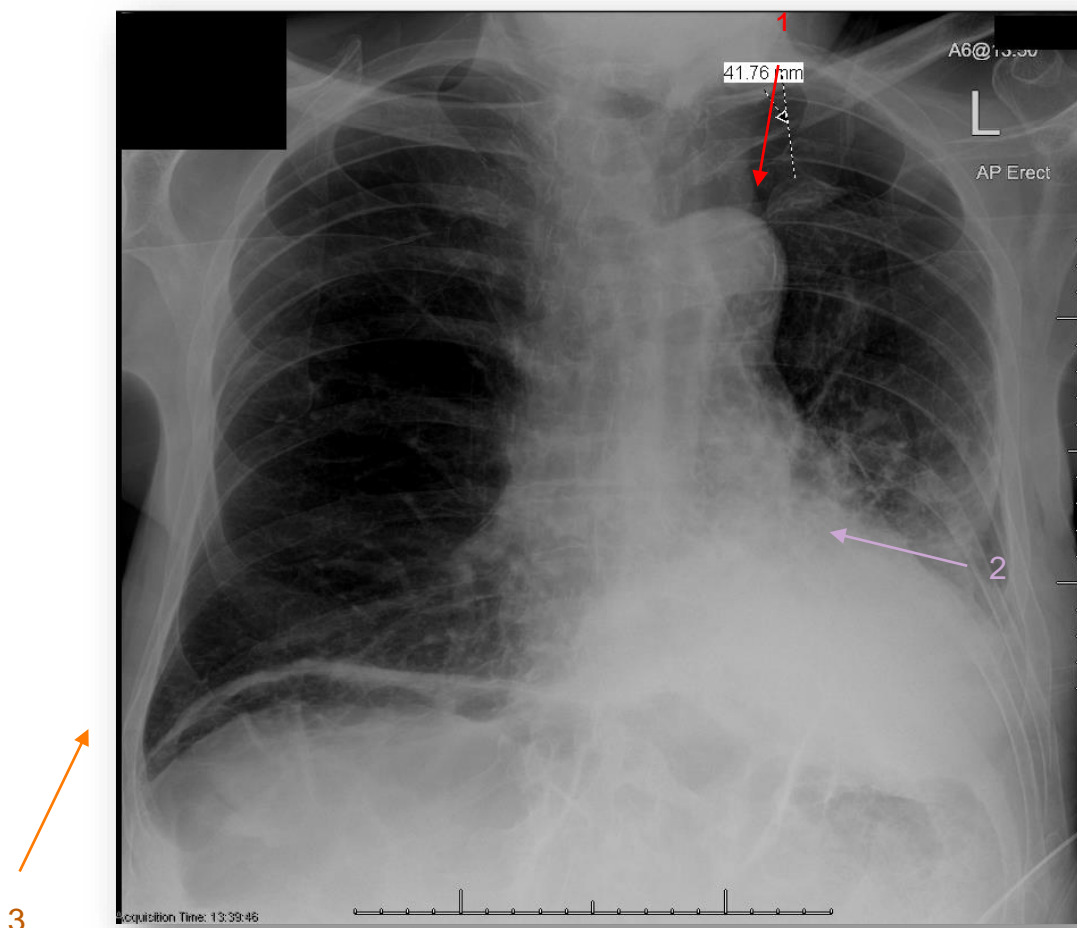
The symptoms were attributed to the pneumothorax and he underwent therapeutic thoracentesis (pleural aspiration).

Pneumothorax (1)

A **pneumothorax** is the abnormal presence of gas (air) in the pleural space.

Collapse - Consolidation (2)

A **collapse or atelectasis** refers to the loss of normal aeration and associated loss of volume. The term **consolidation** refers to the displacement of the air in the alveoli, smaller bronchi, or bronchioles, by exudate or oedematous fluid.



Chilaiditi sign (3)

(*interpositio hepatodiaphragmatica, subphrenic displacement of the colon, subphrenic interposition syndrome*)

Chilaiditi sign is a cause of pseudopneumoperitoneum, a term used to describe any gas within the abdominal cavity that masquerades as free intraperitoneal gas. This sign refers to the interposition of the bowel, between the inferior surface of the right hemidiaphragm and the superior surface of the liver. Usually, the part of the bowel seen is the transverse colon. Normally, the person is asymptomatic, and the sign is an incidental finding. Its presence can be permanent or sporadic.

Chilaiditi syndrome

Chilaiditi syndrome refers to the medical condition in which a Chilaiditi sign is accompanied by clinical symptoms. The most common symptoms are gastrointestinal (eg, abdominal pain, vomiting, constipation), followed by respiratory distress and rarely angina-like chest pain. Rare complications are volvulus, coecal perforation or perforated subdiaphragmatic appendicitis. 1, 2, 3

Causes

The exact cause is unclear. It can be seen in patients with dolichocolon, chronic lung or liver disease, diaphragmatic paralysis, causes of increased intra-abdominal pressure, chronic constipation, aerophagia. There is a relation to anatomical variations of the ligament suspending the transverse colon or the falciform ligament, congenital malpositions.

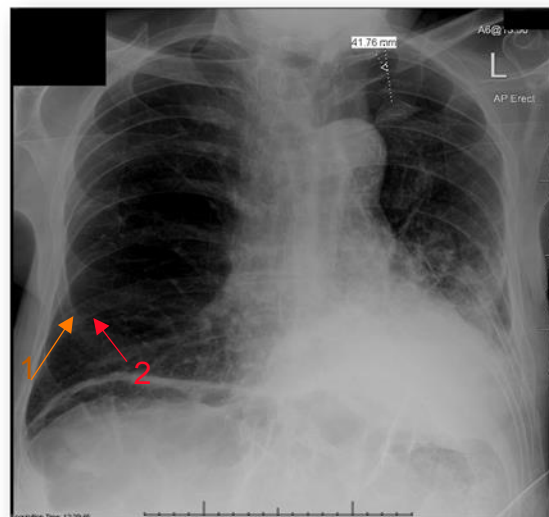
Radiographic features of Chilaiditi sign

Plain radiograph

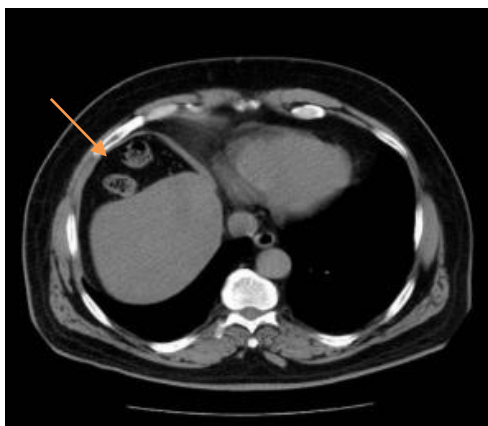
1. Gas between liver and diaphragm.
2. Haustra within the gas suggesting that it is within the bowel and not free
3. Changing the position of the patient will not change the position of the radiolucency

Computed Tomography

1. Interposed colonic loops between the right hemidiaphragm and liver
2. No free intraperitoneal air.



1. Gas between liver and diaphragm 2. Haustra within the gas



Differential diagnosis

True pneumoperitoneum (indicative of perforation), bowel ischaemia, subphrenic abscess are diagnoses to be excluded. The correct identification is crucial, since the misinterpretation may lead to unnecessary further investigations and surgical interventions. ⁴

Complications

Complications are rare but can be seen in Chilaiditi syndrome. These are volvulus, cecal perforation or perforated subdiaphragmatic appendicitis, intestinal obstruction of either the large or small bowel, colonic pseudo-obstruction (Ogilvie syndrome).⁵

Management

Asymptomatic patients do not require further imaging or intervention. It is important to be identified, if a percutaneous transhepatic procedure or liver biopsy is to be performed to avoid perforation. Colonoscopy should be performed cautiously, given the risk of perforation because of air entrapment in an acutely angulated bowel. In Chilaiditi syndrome, bowel decompression with enemas and laxatives is indicated. In the extremely rare case that there is no response to conservative management, then surgical intervention may be necessary. ⁶

Other causes of pseudopneumoperitoneum

- basal linear atelectasis
- pneumomediastinum
- pseudo-Rigler sign
- diaphragmatic undulation
- gas within skin folds
- fat within the subdiaphragmatic space
- properitoneal fat stripe
- biliary, portal vein or bowel wall gas
- benign post-traumatic pseudopneumoperitoneum

History

It is named after **Demetrius Chilaiditi** (1883-1975), Greek radiologist who described the radiographic findings in 1910 whilst working in Vienna, Austria.

Etymology of pseudopneumoperitoneum

pseudo- (from Greek ψευδής, "lying, false")

pneumo- (from Greek πνευμ-, "related to breath or spirit")

peri- (from Greek περι-, "around, about")

ton- (from Greek τόνος, "stretched, tension")

eum (Latin suffix)

References

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