



E-QUID: ANSWER / *Gastrointestinal imaging*

## Internal hernia through the omental foramen. Answer to the e-quid “Epigastric pain with sudden onset”<sup>☆</sup>

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### Observation

A 29-year-old man, with no known history, came to the emergency department with sudden onset of abdominal pain and vomiting. He was afebrile and continued to pass solid faeces and gases.

On clinical examination, there was specific pain and guarding on epigastric palpation.

Laboratory results were normal. An antero posterior (AP) erect plain abdominal X-ray (Fig. 1) was taken and an abdominal CT undertaken with acquisition after intravenous injection of an iodinated contrast agent in the portal phase (Figs. 2 and 3).

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<sup>☆</sup> Here is the answer to the case “Epigastric pain with sudden onset” previously published in the n° 4/2013. As a reminder we publish again the entire case with the response following.

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**Figure 1.** Plain AP erect abdominal X-ray.



**Figure 2.** Abdominal CT scan: axial slice after injection of an iodinated contrast agent in the portal phase.



**Figure 3.** Abdominal CT scan: axial slice after injection of an iodinated contrast agent in the portal phase (level of slice lower than in Fig. 2).

## What is your diagnosis?

From the observations, what, from among the following, would your diagnosis be:

- obstruction of the small intestine due to adhesion;
- right paraduodenal internal hernia;
- cystic lymphangioma;
- blocked perforated ulcer;
- internal hernia through the omental foramen.

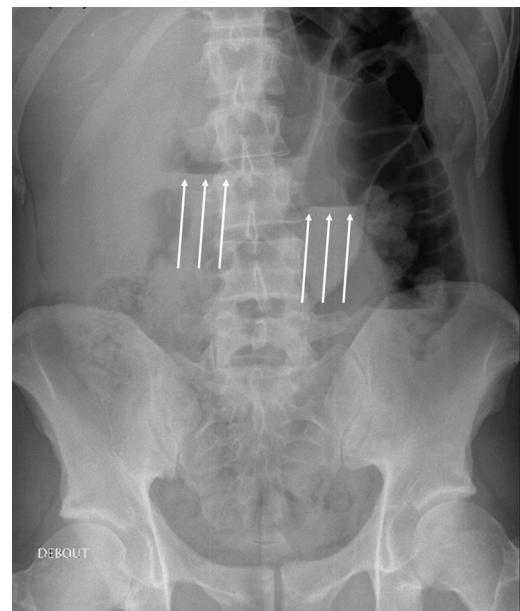
## Diagnosis

Proximal obstruction of the small intestine secondary to an internal hernia through the omental foramen.

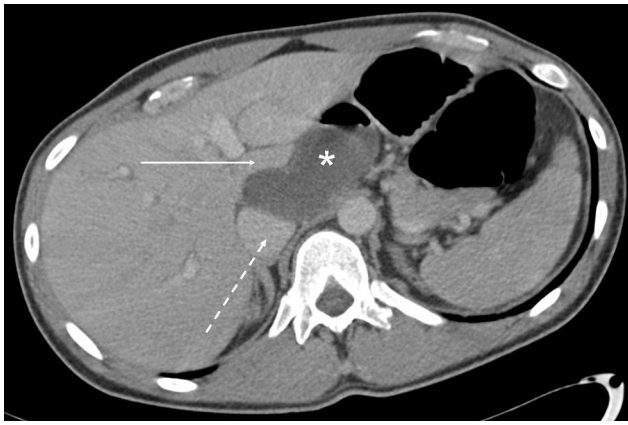
## Comments

The plain abdominal X-ray showed two small intestine air-fluid levels, projecting from the epigastric region (Fig. 4). There was no air-fluid level in the distal small intestine or colon. There was no pneumoperitoneum or urinary calculus. From reading the plain abdominal X-ray, the diagnosis suggested is one of obstruction of the proximal small intestine.

The abdominal CT scan confirmed obstruction of the small intestine, showing a distended small intestinal loop containing purely liquid. This small intestine loop was in an abnormal position, behind the posterior surface of the left lobe of the liver (Fig. 5). The mesenteric vascular pedicle of this loop of small intestine was located between the portal vein and the inferior vena cava. This space, which was clearly enlarged, is known as the omental foramen (Figs. 6 and 7). The diagnosis was therefore an acute internal intestinal hernia through the omental foramen.



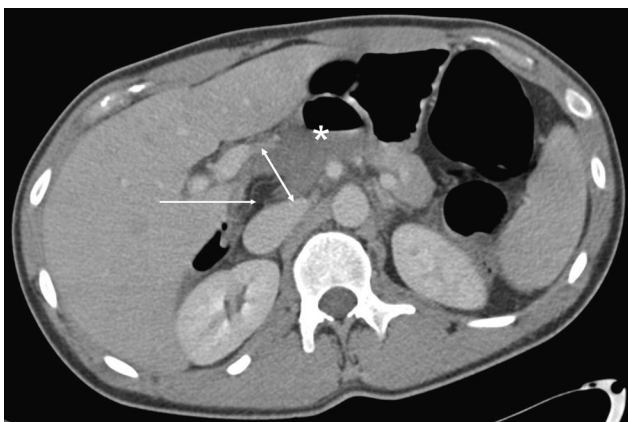
**Figure 4.** Plain AP erect abdominal X-ray. Two central air-fluid levels in the epigastric region, marked by white arrows.



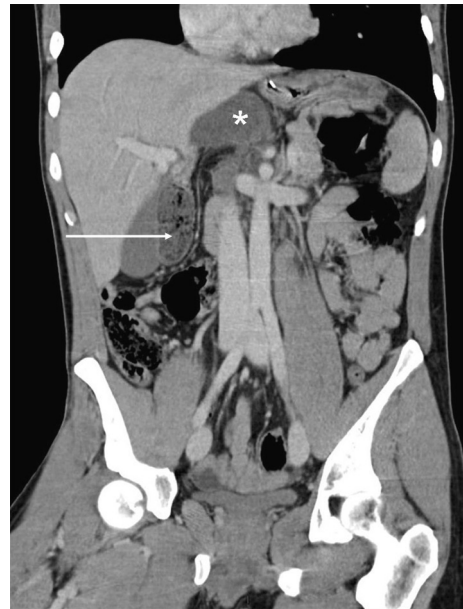
**Figure 5.** Abdominal CT scan: axial slice after injection of an iodinated contrast agent in the portal phase. Hernial sac containing loops of small intestine (asterisk), between segment I (white arrow) anteriorly and the inferior vena cava (dotted white arrow) posteriorly.

## Discussion

Internal hernias are rare, representing 0.5 to 5.8% of cases of intestinal obstruction; however, they are associated with mortality of up to 50% in certain series. Paraduodenal hernias, of which there are two types: left paraduodenal hernias (three out of four cases) and right paraduodenal hernias, account for 53% of internal hernias. An internal hernia through the omental foramen is the third most frequently occurring, representing 8% of internal hernias, after paraduodenal hernias and pericaecal hernias (13%) [1]. They should be distinguished from "iatrogenic" transmesenteric, transmesocolic or retro-anastomotic internal hernias after surgery [2,3]. The major risk of these internal abdominal hernias is intestinal obstruction by strangulation. The posterior cavities of the omenta and the peritoneal cavity communicate with each other via the omental foramen, a 3 cm high slit between the hepatoduodenal ligament (containing the portal vein, bile duct and hepatic artery) anteriorly and the inferior vena cava posteriorly. Omental



**Figure 6.** Abdominal CT scan: axial slice after injection of an iodinated contrast agent in the portal phase. Enlargement of the omental foramen (white double arrow), in which the hernial sac is trapped (asterisk), accompanied by the mesenteric vascular pedicle (white arrow) of the herniated loop of small intestine.



**Figure 7.** Abdominal CT scan: coronal slice after injection of an iodinated contrast agent in the portal phase. The herniated sac (asterisk) containing loops of small intestine is high, above the plane of the portal vein. Faeces sign in an upstream loop of the small intestine (white arrow).

foramen is the most frequently used term (and used here), but names such as the epiploic foramen, Winslow's foramen, Winslow's hiatus or the omental hiatus are synonyms. An internal hernia through the omental foramen was described for the first time in 1823 by Philippe-Frédéric Blandin (1798–1849), a French anatomist and surgeon [4].

The small intestine is the herniated digestive segment in 60 to 70% of cases, but herniation can occur of the caecum (20 to 30%) with or without the ileocaecal junction, the transverse colon or the gallbladder (2%) [5,6]. Factors favouring these hernias are an abnormally wide omental foramen, a long mesentery responsible for excessive mobility of intestinal loops, high intra-abdominal pressure, a common mesentery or lack of apposition of the right Toldt fascia.

Clinical signs are sudden epigastric pain with early vomiting and late or no stoppage of solid matter and gases. There is no abdominal distension on clinical examination.

X-ray signs indicating this diagnosis are obstruction of the small intestine associated with distension of loops of small intestine in the upper abdomen behind the stomach. CT signs are the presence of a mesenteric vascular pedicle of a small intestinal loop between the inferior vena cava and the portal vein, a hernial pseudosac (composed of walls of the posterior cavity of the omenta or a dehiscence of the lesser omentum), the apex of which is directed towards the omental foramen, the absence of the right colon in the right parietocolic gutter and the presence of two or more loops of the small intestine in the supra-hepatic space. It is important to point out that enlargement of the omental foramen by the hernial neck is pathognomonic of this type of internal hernia [7]. CT scans play a major role in the diagnosis of intestinal obstructions. Although internal hernias are rare, they must be included in the diagnostic possibilities where

there is obstruction, particularly in the absence of a history of abdominal surgery.

In this observation, the diagnosis was made by the duty radiologist given the hernial sac containing small intestine in an unusual position in a patient with a high obstruction who had no history of abdominal surgery. The patient underwent emergency surgery. There was no sign of damage to the trapped loops of small intestine.

### Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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