

Characteristic imaging findings of duodenal perforation

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Abstract

Two patients were admitted to emergency room with complaint of abdominal pain with abrupt onset and retroperitoneal free air was detected in pararenal area on CT. In this paper, characteristic CT findings of patients diagnosed with duodenal perforation are presented under the light of literature data. (*Acta gastroenterol. belg.*, 2015, 78, 248-249).

Key words : duodenal perforation, computed tomography, retroperitoneal free air.

To the Editor,

Retro-intraperitoneal free air was detected on multi-detector-row computed tomography (MDCT) performed in 2 patients who were admitted to emergency room with abdominal pain. Our diagnosis was verified after urgent surgery performed with prediagnosis of duodenal perforation. We aimed to present radiologic and clinical find-

ings of 2 patients with duodenal perforation under the light of literature data.

Case 1

The 46-year-old male patient was admitted to emergency room with complaint of abdominal pain with abrupt onset. On admission, his vital signs were normal. On physical examination, significant tenderness was detected on epigastrium. Laboratory analysis disclosed an elevated white blood cell count (15600/ll). Free air was detected in the right pararenal area, neighbouring to psoas and subdiaphragmatic area on direct abdominal graphy. IV-contrasted MDCT revealed significant air density in the right pararenal area on axial and coronal images. Free air was seen in subdiaphragmatic area, the space of omentum minus and hilus of the liver (Fig. 1). A prediagnosis of duodenal perforation was made radiologically. The patient underwent an urgent surgery and

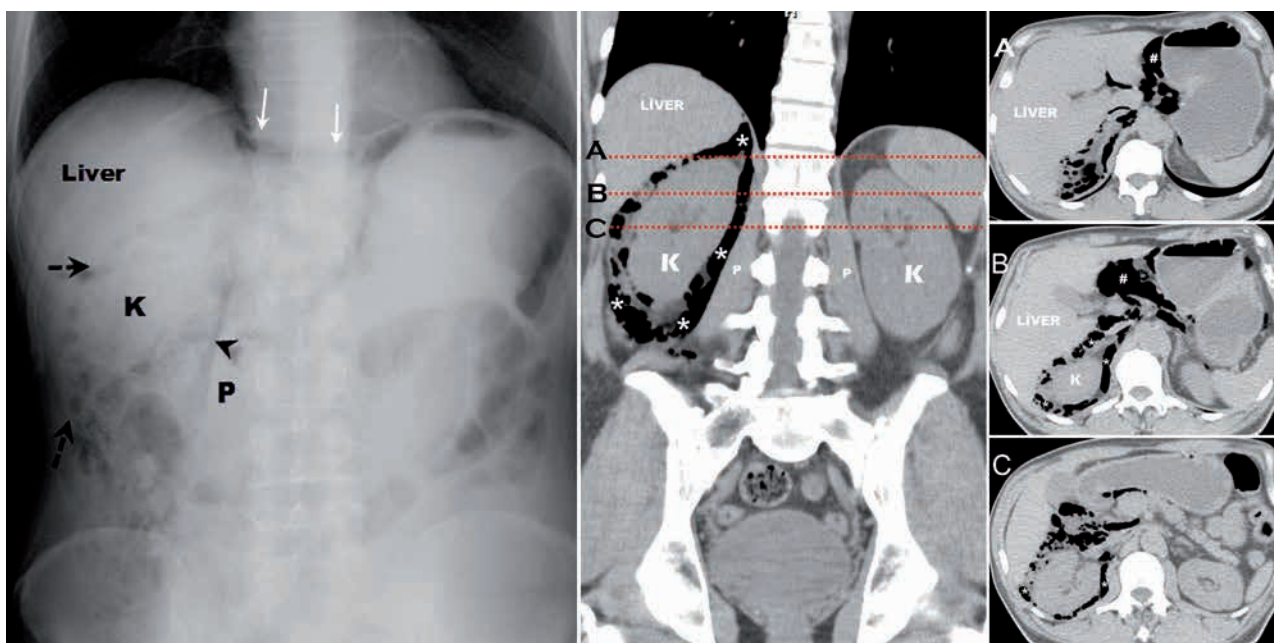


Fig. 1. — The 46-year-old male patient. Retroperitoneal free air is seen around the kidney (K) (black arrow) and neighbouring to psoas (P) (arrowhead) in the patient diagnosed with perforated duodenal ulcer. Free intraperitoneal (white arrow) is seen in subdiaphragmatic area. On contrasted axial and coronal MDCT images ; retroperitoneal free air (*) is seen around the kidney (K) and neighbouring to psoas (P). Intraperitoneal free air is seen in lesser sac (#).

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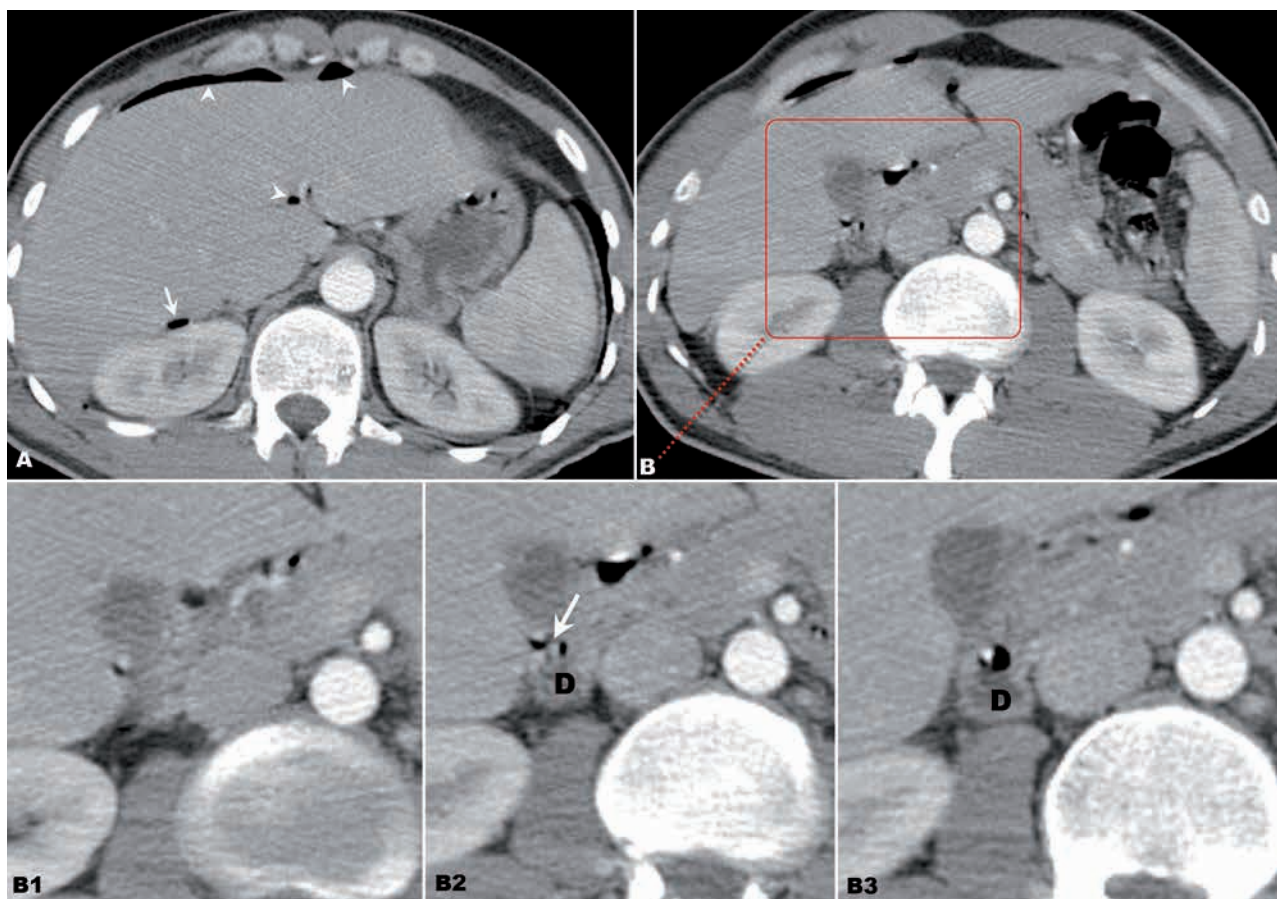


Fig. 2. — There was retroperitoneal (arrow) and intraperitoneal (arrowhead) free air neighbouring to kidney (A). A defect in anterior wall of duodenum (D) (arrow) and air passing to extraluminal area (B1-B3).

perforation was detected in the second part of duodenum and surgical repair was performed.

Case 2

The 32-year-old male patient was admitted to emergency room with complaint of acute abdominal pain, nausea, vomiting. His physical examination revealed tenderness in epigastrium. Laboratory analysis disclosed an elevated white blood cell count (14300/l). There was a millimetric free air in pararenal area on IV contrasted multidetector computed tomography (MDCT). Intraperitoneal free air was observed in liver hilus and anterior wall of abdomen. Defect of perforation on intestinal wall on anterior of second part of duodenum was directly detected on MDCT (Fig. 2). The patient underwent an urgent operation, perforation described on MDCT was verified and surgical repair was performed.

Direct graphy, ultrasonography (USG) and CT are used in diagnosis of gastrointestinal tract perforation however diagnostic value of direct graphy and USG is low compared to CT. Although the first step is direct radiography in diagnosis of perforation, its sensitivity is

between 50-70% (1). In literature, CT findings of gastrointestinal tract perforation is divided into two as direct and indirect findings. Extraluminal free air in the right anterior pararenal area is a reliable CT finding in diagnosis of duodenal perforation out of bulbar segment (3). Our both patients had retroperitoneal free air in pararenal area.

In conclusion, retroperitoneal free air in pararenal area on CT should primarily suggest duodenal perforation, perforation site should be tried to be directly detect through thin sections and reformatted images if MDCT was performed.

References

1. GHEKIERE O., LESNIK A., HOA D. *et al.* Value of computed tomography in the diagnosis of the cause of nontraumatic gastrointestinal tract perforation. *J. Comput. Assist. Tomogr.*, 2007, **31** : 169-176.
2. FURUKAWA A., SAKODA M., YAMASAKI M. *et al.* Gastrointestinal tract perforation : CT diagnosis of presence, site, and cause. *Abdom. Imaging*, 2005, **30** : 524-534.
3. KUNIN J.R., KOROBKIN M., ELLIS J.H. *et al.* Duodenal injuries caused by blunt abdominal trauma : value of CT in differentiating perforation from hematoma. *AJR Am J Roentgenol.*, 1993, **160** : 1221-1223.