

Available online at www.sciencedirect.com

journal homepage: www.elsevier.com/locate/radcr

Case Report

An unusual cause of peritonitis: Perforation of a gastric carcinoma ☆,☆☆

Hind Sahli*, Jihane El Mandour, Romeo Thierry Yehouenou Tessi, Hounayda Jerguigue, Rachida Latib, Youssef Omor

Radiology Department, National Institute of Oncology "Sidi Mohammed Ben Abdellah", Ibn Sina Hospital, Mohamed V University, Rabat-Morocco

ARTICLE INFO

Article history:

Received 8 November 2021

Revised 19 November 2021

Accepted 21 November 2021

Keywords:

Perforation
Gastric cancer
Peritonitis
CT scan

ABSTRACT

Gastric carcinoma perforation is an uncommon consequence that is often missed during the preoperative stage. Perforation may occur at any stage of cancer, but it is more common in late stages. It can also happen early in the illness. Because of the spilled stomach contents, it produces an acute abdominal syndrome. The goal of treatment should be to strike a balance between the emergency situation of peritonitis and oncological surgical techniques. A case of stomach cancer perforation with typical imaging findings is presented.

© 2021 The Authors. Published by Elsevier Inc. on behalf of University of Washington.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Introduction

Gastric cancer is the world's fifth most prevalent cancer and the leading cause of cancer death mortality. Iatrogenic, traumatic, and tumoral events can all lead to gastric perforation. Gastric cancer perforation occurs in less than 5% of patients, primarily in those with late disease stages, although it can also happen at any time [1]. As a result, an underlying cancer should always be suspected, prompting gastric ulcer biopsies. One of the causes of acute abdomen is gastric perforation, which is suspected in the presence of clinical symptoms dominated by peritonitis and verified by imaging modalities, primarily abdominal computed tomography (CT) [2].

Case report

A 56-year-old female was referred to the emergency room with peritonitis-like symptoms as well as three-day history of stomach discomfort, vomiting, and constipation. She has been followed up for her gastric metastatic cancer at the peritoneum, lymph node with ovarian metastases (Krukenberg tumour) (Fig. 1). A physical examination revealed a 37.2°C body temperature, an 84/min heart rate, and a blood pressure of 110/80 mmHg. The abdomen was moderately distended, with scattered discomfort and hypointense bowel sounds. White blood cell count was 11 109/L; haemoglobin was 10 g/dL; aspartate aminotransferase was 24 U/L; alanine

☆ GUARANTOR OF SUBMISSION: The corresponding author is the guarantor of submission.

☆☆ Competing Interests: The authors have declared that no competing interests exist.

* Corresponding author.

E-mail address: hind91sahli@gmail.com (H. Sahli).

<https://doi.org/10.1016/j.radcr.2021.11.055>

1930-0433/© 2021 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

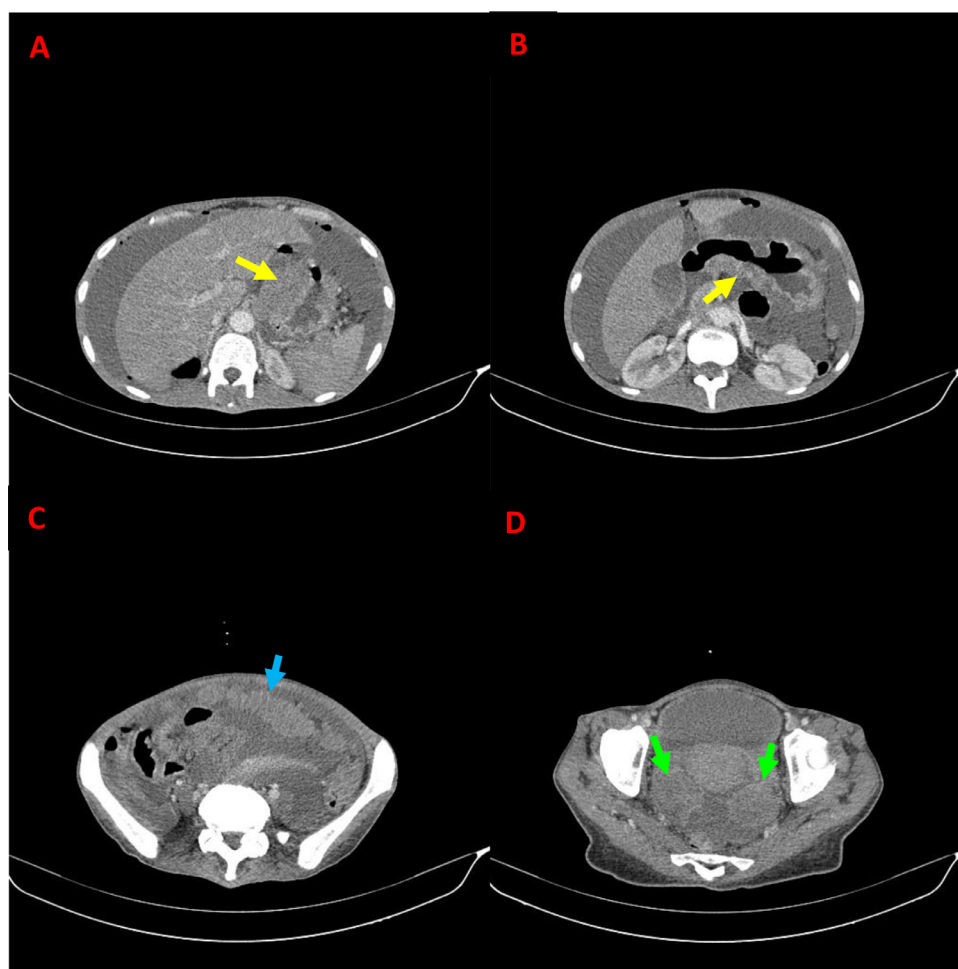


Fig. 1 – axial CT scan images showing thickening of the stomach wall (yellow arrows) with omental cake (blue arrow) and ovarian metastasis (green arrow). Color version of figure is available online.

aminotransferase was 26 U/L; urea was 17 mg/dL; creatinine was 1 mg/dL; sodium was 140 mmol/L; potassium was 4 mmol/L; blood amylase was 92 U/L; blood lipase was 240 U/L. Pneumoperitoneum predominating in the supra-mesocolic region (Fig. 2), a focal wall defect at the gastric body (Fig. 2), omental cake development, and lymph node enlargement with ovarian metastases were all seen on abdominal computed tomography (CT). Because she was already in peritoneal carcinosis, the patient was referred to the operating room for a straightforward closure of the gastric parietal defect. The patient died in the postoperative care unit.

Discussion

Gastric adenocarcinoma perforation is an uncommon occurrence, with a reported frequency of 0.4%–6.0 % [3]. It is more common in the elderly (mean age 65 years) and is only observed in advanced stages of malignancy [3]. The clinical appearance is quite similar to that of peptic ulcers or other hollow viscus perforations, and making an accurate diagnosis before surgery is often difficult [4].

Ischaemia and necrosis are the processes that cause spontaneous perforation [3]. Necrotic degeneration of the stomach wall may occur as a result of the invasion of neoplastic cells, resulting in some vulnerability to perforation [3]. Furthermore, vascular obstruction caused by tumor cell infiltration and direct tumor embolization may cause or exacerbate stomach wall ischaemia [3].

CT is a very sensitive imaging technique that makes diagnosing gastrointestinal tract perforation relatively straightforward [5]. When using a multidetector row CT, the whole abdomen must be scanned with the collimation of 1 to 2.5 mm [5]. Axial continuous images with a thickness of 5 to 7 mm are produced, and if necessary, further thin sections or multiplanar reconstruction can be utilised [5]. Oral contrast administration before the scan is a suggested technique, although extraluminal contrast leakage is not a frequent feature of the CT scan [5]. Intravenous contrast injection is required in order to examine the location and origin of the perforation [5]. The presence of a substantial quantity of additional luminal air, as well as perigastric fat stranding with or without fluid, are all direct signs of gastric perforation [3] (Fig. 2). Extra luminal air is generally present in high quantities and can be seen all over the liver and stomach [5]. It's quite usual to have air in the

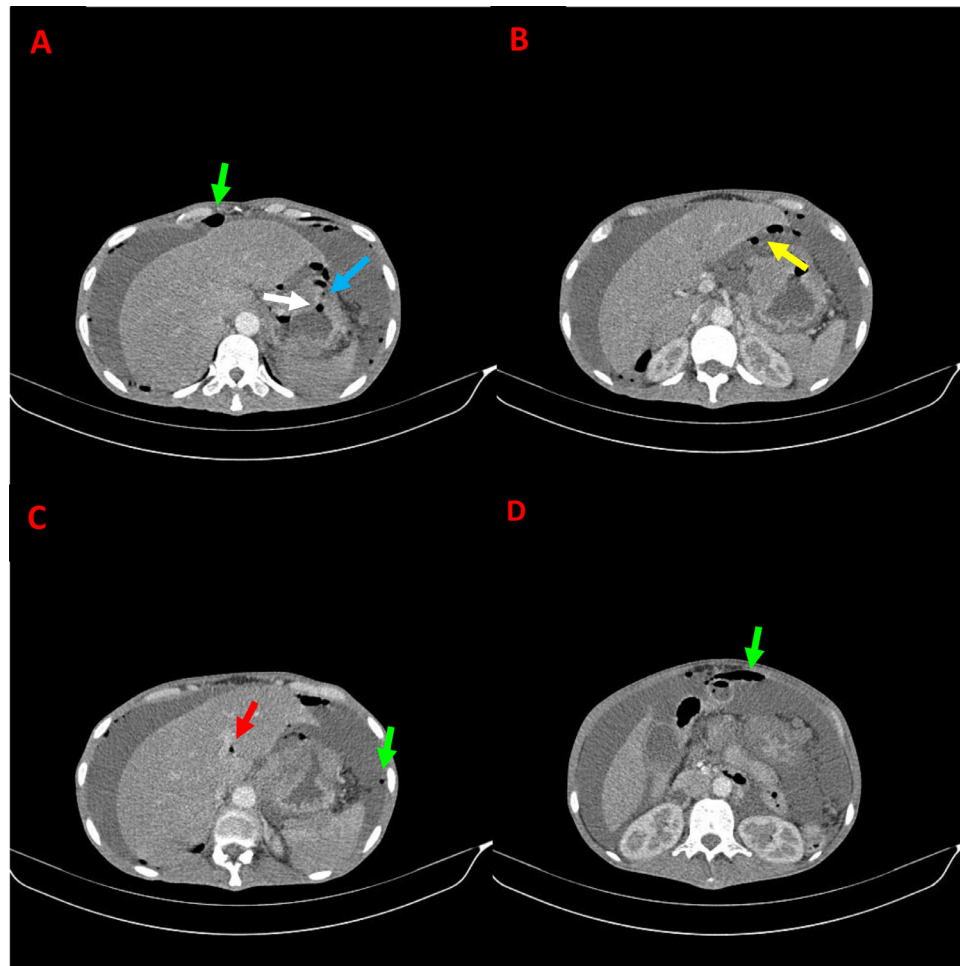


Fig. 2 – Axial CT scan images showing focal wall defect at the gastric body (blue arrow) with a small amount of air around the perforation site (white arrow), in the omental bursa (yellow arrow), at the fissure of the ligamentum teres (red arrow) and in the peritoneum (green arrows). Color version of figure is available online.

omental bursa and the ligamentum teres' intrahepatic fissure [5] (Fig. 2). Due to the spilling of stomach contents, phlegmon, abscesses, and peritonitis might worsen the perforation [5,6].

In addition, regardless of the tumor type, surgical therapy of stomach perforation is associated with a significant probability of death (10%-40%). [7]. The surgical method for perforation of gastric cancer (PGC) is determined by the diagnosis, the existence of comorbidities, the degree of peritoneal contamination, hemodynamic instability, the presence of continuous sepsis, and the presence of over metastases [1]. In the event of PGC, both the perforation and the peritonitis should be treated initially, which implies either immediate perforation closure or the use of an omental patch [7]. If a stomach perforation is determined to be nonresectable, the patient will only be treated with palliative surgery, as in our patient's case.

Conclusion

Finally, this event has made us aware of an uncommon but deadly consequence of stomach cancer. The most sensitive imaging modality for detecting malignancy, perforation, and

determining the severity of sepsis is a CT scan. Perforation is common in advanced stomach cancer, hence therapy is typically palliative.

Author's contributions

All authors contributed to this work. All authors have read and approved the final version of the manuscript.

Patient consent

Written informed consent for publication was obtained from patient.

REFERENCES

- [1] Melloni M, Bernardi D, Asti E, Bonavina L. Perforated gastric cancer: A systematic review. *J Laparoendosc Adv Surg Tech.* 1 févr 2020;30(2):156–62.

-
- [2] Hata T, Sakata N, Kudoh K, Shibata C, Unno M. The best surgical approach for perforated gastric cancer: one-stage vs. two-stage gastrectomy. *Gastric Cancer*. 1 juill 2014;17(3):578–87.
- [3] Kim SW, Kim HC, Yang DM. Perforated tumours in the gastrointestinal tract: CT findings and clinical implications. *Br J Radiol*. sept 2012;85(1017):1307–13.
- [4] Ozmen M, Zulfikaroglu B, Kece C, Aslar A, Ozalp N, Koc M. Factors influencing mortality in spontaneous gastric tumor perforations. *J Int Med Res*. avr 2002;30(2):180–4.
- [5] Furukawa A, Sakoda M, Yamasaki M, Kono N, Tanaka T, Nitta N. Gastrointestinal tract perforation: CT diagnosis of presence, site, and cause. *Abdom Imaging* 2005;30(5):524–34.
- [6] Roviello F, Rossi S, Marrelli D, De Manzoni G, Pedrazzani C, Morgagni P. Perforated gastric carcinoma: a report of 10 cases and review of the literature. *World J Surg Oncol*. 30 mars 2006;4:19.
- [7] Ignjatovic N, Stojanov D, Djordjevic M, Ignjatovic J, Stojanov DB, Milojkovic B. Perforation of gastric cancer - what should the surgeon do? *Bosn J Basic Med Sci*. août 2016;16(3):222–6.