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# Synchronous mucinous colonic adenocarcinoma and multiple small intestinal adenocarcinomas: report of a case and review of literature

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ABSTRACT

With the wide use of diagnostic imaging modalities, multiple primary malignancies frequently occur; different associations of malignancies have been reported. We describe the case of a primary mucinous adenocarcinoma of large bowel synchronous with three primary poorly differentiated adenocarcinomas of ileum. This type of association has not been described yet; since computed tomography increasingly is proving to be highly accurate in detection of colon cancer, this technique is recommended in such patients.



## 1. Introduction

Synchronous cancers in the small and large bowel with different histological characteristics are rare. In this paper, we present their occurrence in a young patient who presented with vaginal bleeding and an iron-deficiency anemia and in which a rare association of malignancies was found; in fact, a primary adenocarcinoma of large bowel was simultaneous with three primary adenocarcinomas of small bowel (ileum), discovered at laparotomy and all treated in the same session.

The first report about multiple primary malignancies (MPMs) was on 1889 by Billroth which described a patient with a spinocellular epithelioma of the right ear and a gastric carcinoma [1,2]. Since that time, numerous series and case reports in the literature have cited similar occurrences involving a single organ or multiple organ systems. In particular, the technical innovation of diagnostic imaging has been employed in this setting, and thus, several cases have been described [3].

The majority of MPM involving multiple organs are metachronous lesions, with synchronous lesions occurring less frequently. More than two primary synchronous malignancies involving two or more organs are extremely rare [4].

## 2. Case report

A 29-years-old woman was admitted to our hospitals with a 2-month history of vaginal bleeding, changes in bowel habits, and moderate weight loss. Her past medical history was clear of any serious health problems. Regarding family history, her father died of colon cancer shortly after diagnosis at the age of 40. The other family members were healthy.

Physical examination revealed a fully alert patient with a soft and nontender abdomen and normal bowel sounds. The remaining of the physical examination was unremarkable. Laboratory studies revealed an iron-deficiency anemia (haemoglobin 7,40 g/dl, red blood cell 3,12×10 ^6/μl, hematocrit 24%, mean corpuscular volume 75 fl) and abnormal liver function tests (aspartate aminotransferase 108 IU/l, alanine aminotransferase 115 IU/l, total bilirubin 5.5 mg/dl, alkaline phosphatase 618 U/l). Tumor marker tests showed elevated serum Carcinoembryonic antigen (CEA) (228.5 ng/ml; normal range<5.0 ng/ml) and serum CA19-9 (6 U/ml; normal range<2.5 U/ml) values and normal serum CA125 values (33.6 U/ml; normal range<35 U/ml). His chest X-ray was normal, plain abdominal films were free of any pathology, and electrocardiogram was normal.

Ultrasound (US) scan of the abdomen showed the presence of bilateral adnexial complex masses measuring 9.5×5.5 and 5.5×4.5 cm. Ovarian masses were characterized by anechoic cystic portions and hypoechoic solid components with pronounced vascularity at Color-Doppler and Power-Doppler examination. In addition, multiple well-defined, relatively homogeneous, hyperechoic nodular lesions of variable size suggestive of liver metastases were found in in both lobes of liver.

Nevertheless, as a definite diagnosis had not been made, a liver biopsy was carried out. Pathological examination of a biopsy specimen revealed a well-differentiated adenocarcinoma with cells arranged in a glandular acinar pattern and focal mucin production; however, the morphologic pattern was not specific to define the site of metastases origin (liver metastases of primary ovarian mucinous tumor vs. liver

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metastases of tumor with a undefined primary localization). Immunohistochemical analysis, showing a citokeratin pattern CK20+/CK7−, was instead helpful to suggest a primary tumour localization in the gastrointestinal tract [colorectal cancer (CRC)].

Consequently, searching for the unknown primary tumor, an abdomino-pelvic computed tomography (CT) with a 16-detector row Multi-Slice Computed Tomography (MSCT) scanner was performed (Somatom Volume Zoom; Siemens Medical Solutions, Erlangen, Germany). Bowel preparation was not performed. No orally or rectally administrable contrast medium was used. A frontal 512-mm scout view was first obtained with 120 kVp and 50 mA. This was followed by helical scanning from the top of the liver to the symphysis pubis with 4×2.5 mm collimation, 120 kVp and 100 mAs (effective). The table feed was 15 mm per 0.5 s of scanner rotation (30 mm/s), resulting in a pitch of 1.5:1. From the raw data of the acquisition, 3-mm-thick transverse sections were reconstructed with 1.5-mm increments. Arterial, portal and late phase acquisitions were performed with fix scan delays of 35, 80, and 180 s after iv bolus injection (2,5 cc/s) of only 100 cc of nonionic iodinated contrast media (Ultravist 370; Bayer, Berlin, Germany) followed by 200 cc of saline solution with a dualhead injector (Stellant Injection System, Medrad Inc., United States).

Contrast-enhanced CT scan showed marked and asymmetric thickening of colonic wall with heterogeneous enhancement involving both the caecum and the proximal portion of ascending colon. A retrocecal appendix with cystic dilatation of appendiceal lumen "mucocele-like" was also noted (Figs. 1 and 2). In addition, CT images demostrated a moderate distension of terminal ileum with feces-like intestinal content (small bowel feces sign), suggesting an ileo-cecal junction involvement (Fig. 3).

Furthermore, CT views clearly depicted bilateral huge and oval-shaped ovarian masses with a complex internal structure and vivid enhancement of multiple intralesional solid portions (Fig. 4). In addition, CT confirmed the presence of multiple hypovascular liver metastases in the II, III, IV, and VI segments of liver (Fig. 5) and revealed a previously undiagnosed biliary dilatation of intrahepatic ducts of the left hepatic lobe due to compression by hepatic lesions (Fig. 5d). Peritoneal carcinomatosis appearing as nodular soft-tissue thickening of great omentum (omental cake sign) and a small amount of ascites were also found (Fig. 3).

Following that, a full-length colonoscopy was performed which showed a stenotic malignant tumor almost totally obstructing the lumen of caecum and the proximal tract of ascendent colon, infiltrating the colonic wall. The rest of the colon was clear of any pathology.

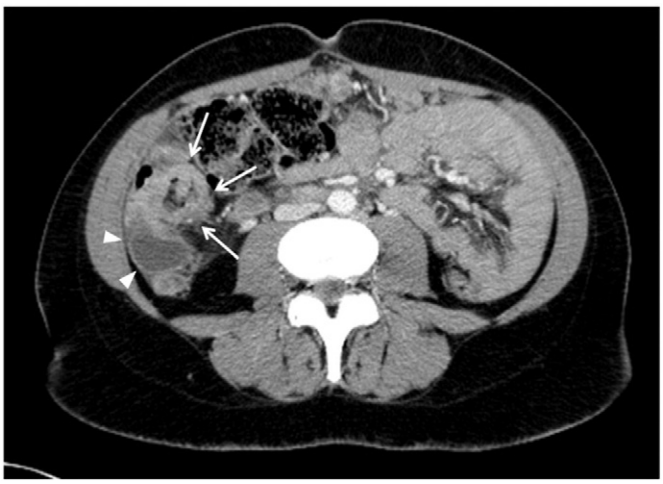

**Fig. 1.** Contrast-enhanced CT scan shows marked and asymmetric thickening of colonic wall with heterogeneous enhancement involving the cecum (arrows). CT view also demonstrates a retrocecal appendix with cystic dilatation of appendiceal lumen by mucin accumulation, nearly associated with the cecum (arrowheads). Surgical resection revealed a mucinous adenocarcinoma of right colon with mucinous lakes found to be more than 50%.

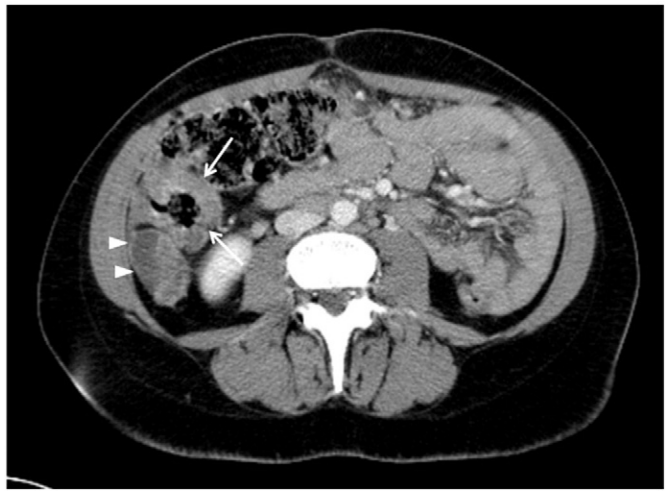

**Fig. 2.** Transverse multidetector row CT image obtained at lower level shows thickening of caecum wall (arrows). Dilatation of appendiceal lumen by mucin accumulation was also evident (arrowheads).

Surprisingly, at laparotomy, as well as the previously mentioned malignant growth in the large bowel, other three partially obstructing lesions in the ileum were discovered. At this time, the decision was taken to excise all tumors as radically as possible.

Consequently, an extended right hemicolectomy and an ileal resection incorporating the discovered tumors with an end-to side ileo-colic anastomosis were carried out. In total, the cecum, the ascending colon, the hepatic flexure, the first one third of the transverse colon, and 67 cm of small bowel were resected. In addition, an extended regional lymphadenectomy, hysterectomy with bilateral salpingoophorectomy, and a total omentectomy were performed.

Histological examination of the excised lesions revealed: (a) The colonic lesion was a mucinous adenocarcinoma of right colon with mucinous lakes found to be more than 50%. It was diffusely infiltrating full thickness the colonic wall with focal expansion into the surrounding mesenteric adipose tissue. The extended right hemicolectomy specimen included in total 14 regional lymph nodes, 7 of which were found to be occupied by metastatic mucinous adenocarcinoma. The surgical excisional margins were free of cancer. (b) The three ileal lesions, instead, were proved to be poorly differentiated adenocarcinomas of small bowel with extensive areas of necrosis. Histologically these tumors were clearly different from that seen in the large bowel which

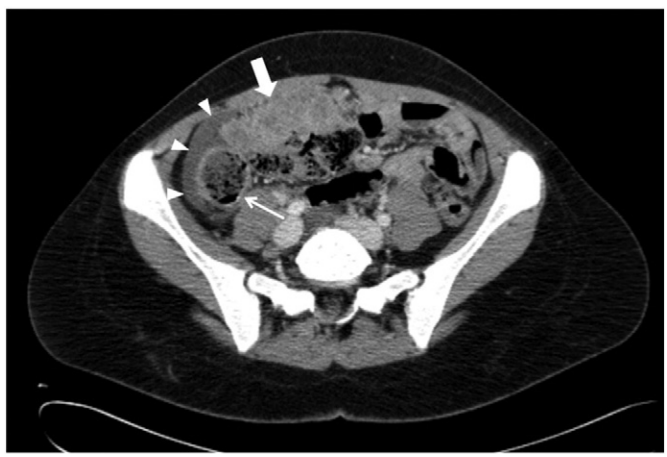

**Fig. 3.** Transverse CT scan shows a dilated loop of terminal ileum with internal feces-like material (small bowel feces sign) (arrow). CT reveals also a nodular soft-tissue thickening of great omentum (omental cake sign) (thick arrow). A small amount of free peritoneal fluid was evident (arrowheads).