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CASE REPORT

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Laparoscopic subtotal colectomy for synchronous colon high-grade dysplasia adenomas in intestinal malrotation: A case report and literature review

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Abstract

Intestinal malrotation is an embryologic anomaly rarely presenting in adults especially in association with colon cancer. Fully laparoscopic colonic resection has not yet described in literature for adenomas in malrotation. Preoperative assessment of vascular anatomy by computed tomography is considered mandatory to perform safely laparoscopic surgery.

KEYWORDS

colon cancer, intestinal malrotation, laparoscopy

1 | INTRODUCTION

Intestinal malrotation is an embryological anomaly that generally presents with obstruction in the first months of life.[1,2]

Adult presentation is rare, and many patients are asymptomatic for this condition.[3]

The association between colon carcinoma and midgut malrotation is extremely rare, so this anomaly could be discovered incidentally during cancer studies.

Historically, colon cancer in patients with midgut malrotation has been treated with a laparotomic approach due to different and complex anatomy. The laparoscopic approach has been proposed in recent years.

We report a case of laparoscopic subtotal colectomy for two high-grade dysplasia adenomas in patient with asymptomatic intestinal malrotation detected during the diagnostic workup.

2 | CASE REPORT

A 70-year-old man was admitted to our emergency department for left flank pain arisen a few days after an outpatient colonoscopy carried out to investigate mucous stool. Colonoscopy showed a wide ileocecal mass histologically proven as a moderately differentiated adenocarcinoma, and a polyp of the descending colon considered unsuitable for endoscopic removal (Figure 1). For this reason, the latter was not biopsied but just India ink tattooed in view of a future colectomy once diagnostic workup had been completed. The patient underwent abdominal computed tomography (CT) both with intravenous and rectal contrast administration. A 34 × 36 mm cecal mass was confirmed. Descending colon wall thickening with retroperitoneal 4 cm fluid collection containing air microbubbles was detected (Figure 2). This was considered a consequence of colonic perforation at India

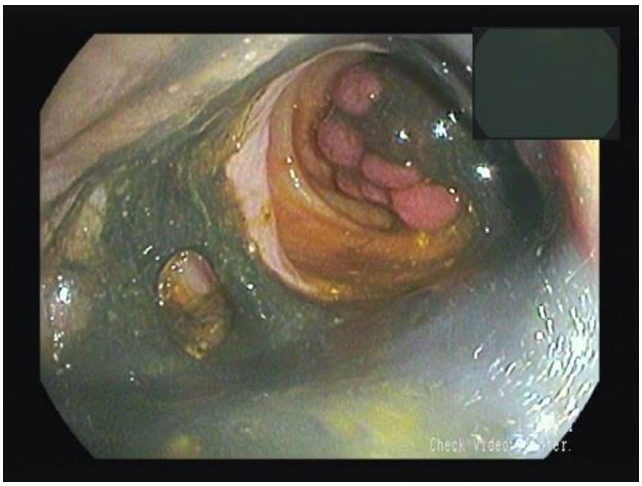

FIGURE 1 Colonscopic view of a big polyp of the descending colon considered unsuitable for endoscopic removal

ink-tattoing site. Moreover, an intestinal malrotation was incidentally found. Small bowel and colon were, respectively, on the right and on the left side of the abdomen (Figure 3). Furthermore, superior mesenteric vein (SMV) was located on the left side of the superior mesenteric artery (SMA) known as the SMV rotation sign (Figure 4). Small bowel and colonic vascularization originated from SMA and IMA as usual (Figure 5A-C).

The patient reported no previous history of abdominal pain related to malrotation. The retroperitoneal perforation was closely monitored and treated in a conservative manner. Diagnostic workup was completed by chest CT to exclude tumor metastasis. Carcinogenic Embryonic Antigen (CEA) and Ca 19.9 were within normal limits. Once colonic inflammation was subsided, a laparoscopic subtotal colectomy was scheduled.

Abdominal cavity was reached through a right flank 12-mm optical trocar on the transverse umbilical line. Three additional 5-mm trocars were placed in right iliac fossa, right and left hypocondrium, respectively. Exploratory laparoscopy confirmed midgut malrotation and a fresh flogistic area at the descending colon perforation site. Cecum and ascending colon were on midline and attached due to adhesions to sacral promontory. Ileocolic artery (ICA), middle colic artery (MCA), and IMA were selectively ligated but not at their origins due to aberrant anatomy. Laparoscopic subtotal colectomy with intracorporeal stapled ileosigmoid anastomosis was carried out (EndoGIA 45 mm, double layer

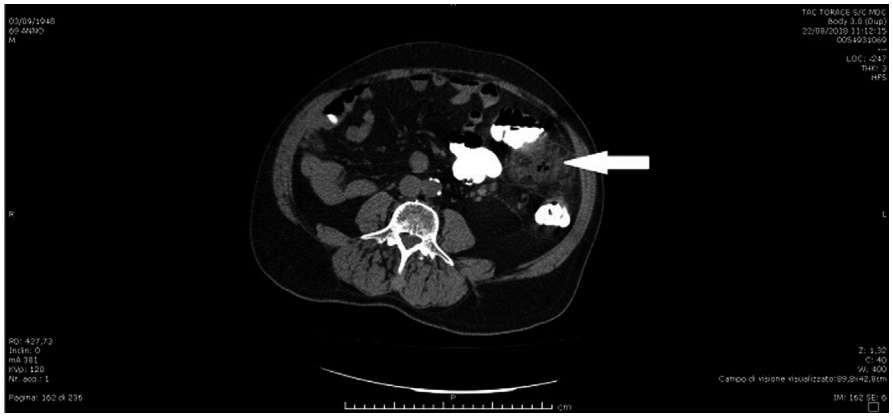

FIGURE 2 Abdominal computed tomography (CT) enema demonstrated the descending colon walls thickening with retroperitoneal 4 cm fluid collection containing air microbubbles (white arrow)

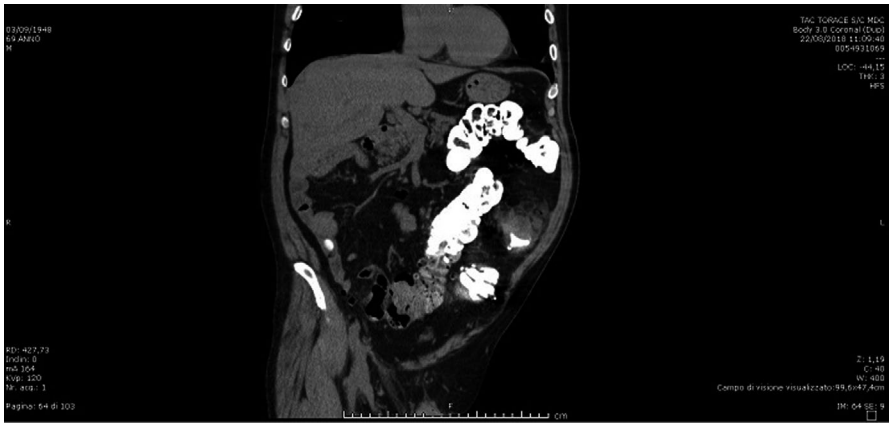

FIGURE 3 Abdominal computed tomography (CT) enema revealed the colon entirely placed on the left side of the abdomen

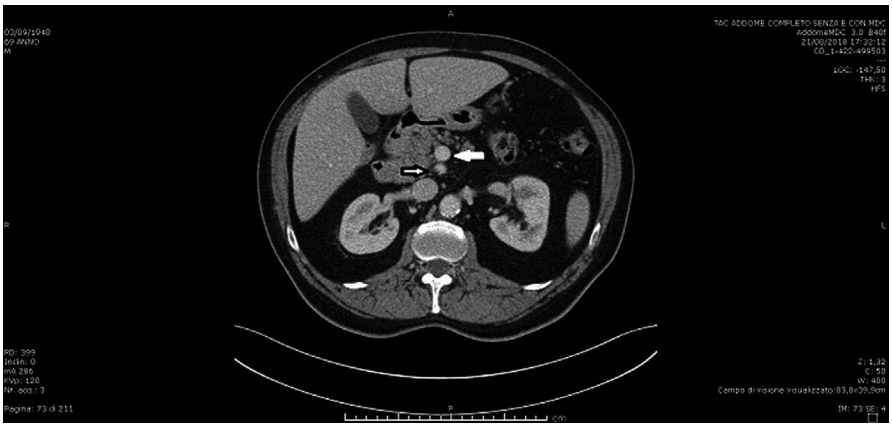

FIGURE 4 Superior mesenteric vein (SMV) rotation sign: SMV (white arrow) was located on the left side of the superior mesenteric artery (white arrow with black border)

3/0 Polyglicolic Acid suturing of the breech). The anisoperistaltic nature of the anastomosis was due to the disposition of the mesenterium which did not allow an isoperistalting orientation of the two resected stumps (Figure 6). The surgical specimen was pulled out through a Pfannestiel incision.

Postoperative course was complicated by intestinal obstruction conservatively treated with slow bowel function's restoration. The patient was discharged from the hospital in 15th postoperative day.

Unexpectedly, histology of the surgical specimen revealed two villous adenomas with high-grade dysplasia. 17 lymph nodes were retrieved from the specimen.

3 | DISCUSSION

Intestinal malrotation is a congenital disorder resulting from a less than normal 270° counterclockwise rotation of the midgut around the SMA occurring in gestational week 11. Its classification includes nonrotation, malrotation, reversed rotation, and paraduodenal hernias.[4] This pathologic condition occurs in about 1 out of 500 of all lives birth,[1] 85% of malrotation presents in the first 2 weeks of life.[5] Adults' presentation is extremely rare because generally they have an asymptomatic nonrotation type. Symptoms may present with chronic and unexplained abdominal discomfort [4] making diagnosis extremely difficult.

Diagnosis is generally made by upper gastrointestinal series with a sensitivity of 80%.[6] Typically, duodenum has a vertical path not crossing the midline, and the small bowel is in the right half of the abdomen. Barium enema shows the entire colon in the left half of the abdomen. Today abdominal CT is a useful diagnostic tool for intestinal malrotation in adults also determining its variants.

Typical signs are right-sided small bowel, a left-sided colon, and abnormal relationship of the superior mesenteric vessels with the SMV to the left of the SMA instead of on the right.[7] Anyway, many radiologists do not describe these findings in their reports if the patients are asymptomatic.[8]

Synchronous colon cancer in midgut malrotation is extremely rare. Apart a recent paper describing 49 cases in Japanese literature from 1974 to 2017,[9] only other 8 cases are reported in the English literature.[5,10-16]

Historically, laparotomy has been the preferred method to treat this condition due to the difficult and anomalous anatomy making open surgery safer and more reliable.[12]

In the last few years, laparoscopy is gaining wide diffusion in colorectal cancer treatment, and it can be considered a safe and reliable technique both for short-term results and for long-term cancer outcomes.

The laparoscopic approach was reported in 15 out of 49 cases (30.6%) in Japanese series especially from 2012.[9]

In non-Japanese series, laparoscopy was considered only in one patient but converted to open surgery due to adhesions and difficult anatomy.[14] Anyway, in Japanese series mesenteric excision was performed outside the abdominal cavity in 8 of 15 cases (53.3%) since vascular anomalies in intestinal malrotation make it difficult to safely perform laparoscopic lymph node dissection into the abdominal cavity.[9] The authors conclude that laparoscopic lymphadenectomy for colon cancer with intestinal rotation is not feasible unless preoperative diagnosis of malrotation and vascular anatomy are made by 3D-CT angiography.

In our case, intestinal malrotation was incidentally found during a CT performed for an endoscopic complication in a patient with suspected cancer of the caecum. We had a preoperative CT study of vascular anatomy demonstrating standard bowel vascularization coming from SMA and IMA. No common vascular channel branching directly from the abdominal aorta was found, as recently reported in literature.[17]

As recently reported, a complete presurgical radiological evaluation of intestinal malrotation is necessary to prevent possible complications during operation especially if laparoscopically or robotic performed.[8]

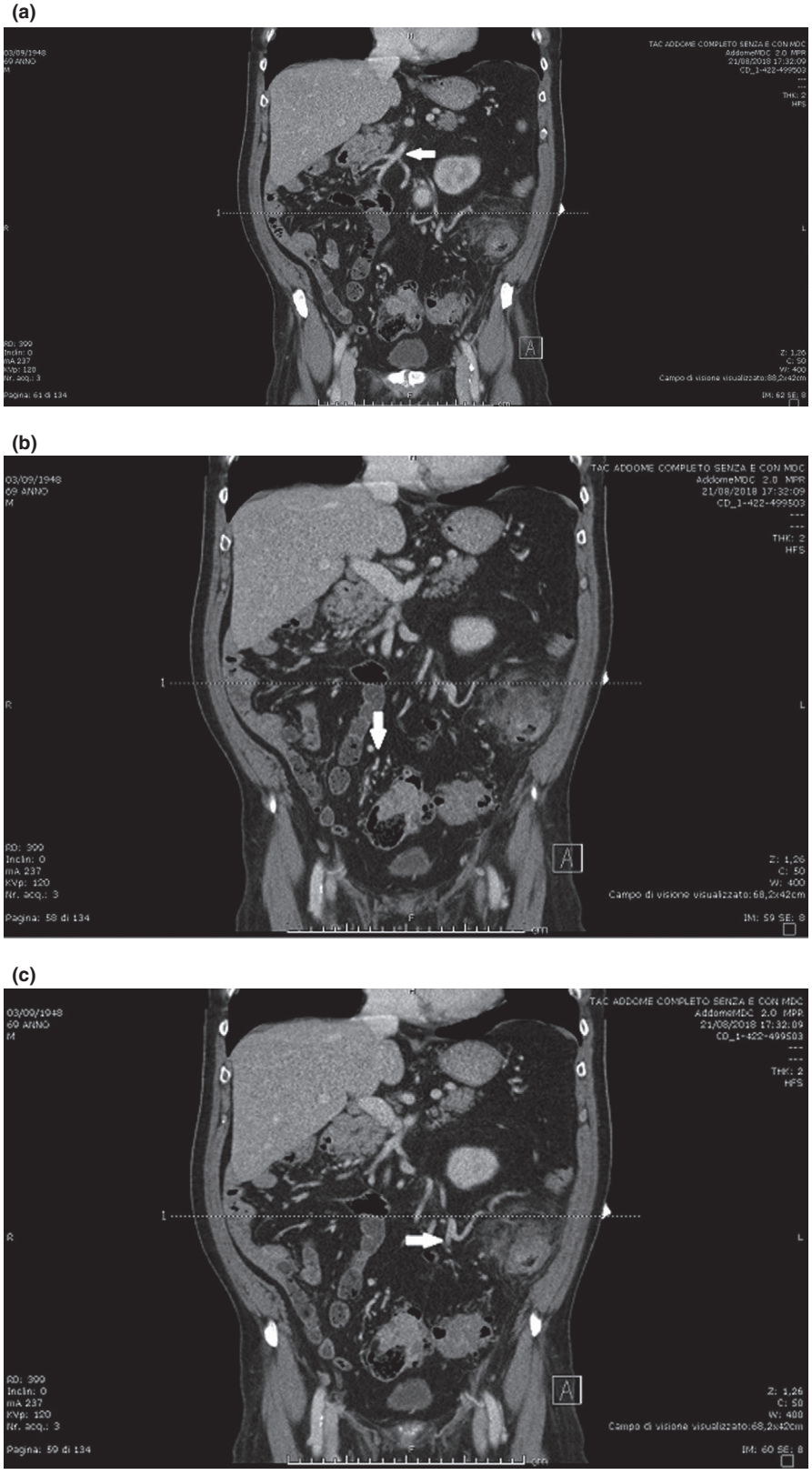

FIGURE 5 A, Computed tomography (CT) findings: coronal view of superior mesenteric artery (white arrow).B, Computed tomography (CT) findings: coronal view of ileocolic vessels (white arrows). C, Computed tomography (CT) findings: coronal view of inferior mesenteric artery (white arrows)

Preoperative vascular anatomic study allowed us to plan a laparoscopic approach safely also with adequate lymphadenectomy.

Surgical specimen did not confirm the preoperative biopsy as a cecal carcinoma probably due to histological reading by two pathologists from different institutions.

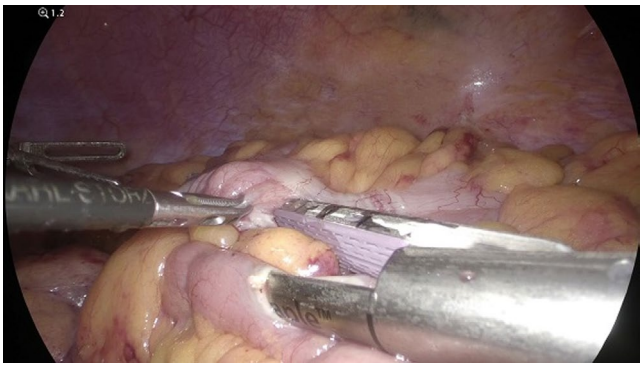

FIGURE 6 Intracorporeal stapled anisoperistaltic ileosigmoid anastomosis

Laparoscopic resection was adequate in terms of lymph nodes retrieval and margins of resections.

The intracorporeal stapled ileosigmoid anastomosis has to be considered the first report in literature. Indeed, anastomosis in laparoscopic right colectomy in intestinal malrotation has been performed only in an extracorporeal fashion.[9,18-20]

4 | CONCLUSION

Colon carcinoma associated with intestinal malrotation is a rare condition. Although this condition has been already described, our case represents the first full laparoscopic treatment of two colon high-grade dysplasia adenomas in an adult with intestinal malrotation.

Laparoscopic treatment of colon cancer in intestinal malrotation can be considered feasible in the experienced colorectal laparoscopic surgeon, after adequate preoperative evaluation of the anatomy of the patient.

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CONFLICT OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

MG: collected information of patient, revised the literature, and drafted the manuscript. ATMC: revised the manuscript. FB: performed radiological study. PFF: revised radiological study. GMM: revised the manuscript. UC: revised the manuscript. DM: performed the surgery and revised the manuscript.

CONSENT

Written informed consent was obtained from the patient for publication of this case report with accompanying images.

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