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Intestinal neoplasia reveals intestinal malrotation

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CASE REPORT

A 77-year-old female, partially dependent, with a past medical history of hypertension, ischemic cardiomyopathy from multiple previous myocardial infarctions, type 2 diabetes mellitus, and chronic renal disease was referred to a colorectal appointment. Following recent symptoms of abdominal cramping, she had undertaken a colonoscopy revealing an adenocarcinoma occupying more than half the lumen circumference, 60 cm from the anal verge. Staging computed tomography (CT) showed no evidence of metastatic lesions but revealed signs of intestinal non-rotation.

The radiographical signs included an inverted lateral positioning of the mesenteric vessels, specifically the mesenteric artery was on the right and the vein was on the left (Figure 1). The Treitz ligament was located to the right of the midline (Figure 2). All small bowel loops were located to the right of the midline and the colonic segments on the left quadrants, with the cecum and ileocecal valve in front of the midline (Figure 3).

The patient underwent an extended left hemicolectomy. Intraoperatively no fibrous peritoneal bands (Ladd's bands) between the colon and the right abdominal wall were found (Figure 4); there were adhesions over the mesentery between the left and right colon which had to be divided, and the cecum and ileocecal valve were anchored to the midline by dense adhesive bands. The procedure was uneventful, with a successful latero-lateral mechanical anastomosis. The patient was discharged after five days.

Regarding the tumor, histopathology showed a moderately differentiated adenocarcinoma, pT3 N1b (2/18) M0. The patient subsequently received adjuvant capecitabine chemotherapy, without disease progression or recurrence thus far.

Figure 1: Transversal CT scan showing the abnormal relationship between the superior mesenteric artery (red arrow) and superior mesenteric vein (blue arrow), with SMA on the right side of SMV.

Figure 2: Coronal CT scan showing the Ligament of Treiz to the right of the midline (white arrow).

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Figure 3: Coronal CT scan showing the small bowel loops to the right of the midline and the colon left quadrants, with the cecum and ileocecal valve in front of the midline (white arrow).

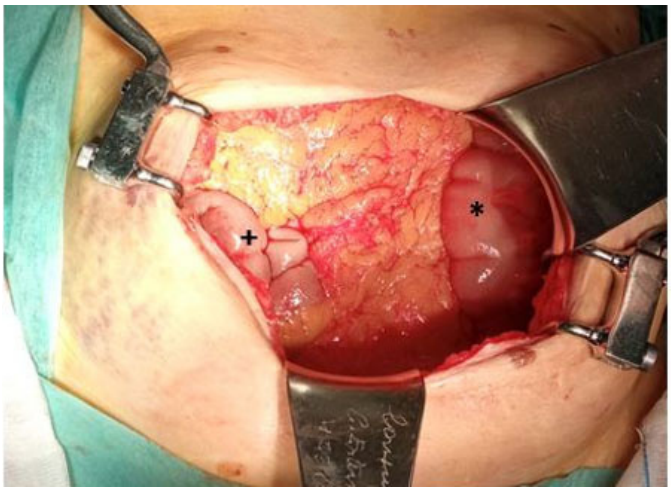

Figure 4: Photograph at median laparotomy showing the absence of Ladd Bands, and the colon on the left (asterisk) and the small bowel on the right (plus sign).

DISCUSSION

Intestinal malrotation is a congenital abnormality that occurs during embryogenesis [1, 2]. Between the 5th and 11th week, failure of the midgut to complete a 270° rotation around the axis of the superior mesenteric artery (SMA) results in intestinal malrotation [1, 3–5]. This term includes several types of malrotation dependent on the embryologic stage of development [3–5].

Our case is an intestinal non-rotation as it involves the entire midgut with the small bowel located on the right side and the colon on the left side of the peritoneal cavity [3, 4]. According to Xiong et al. [5], a right-sided jejunum is a consistent feature of intestinal malrotation, presenting in 98.2% of cases.

Interestingly, an association between malrotation and malignancy has been hypothesized, based on reports such as our own. Genetic factors crucial to the development and rotation of the dorsal mesentery play a role on the physiopathology of malrotation. However, specific mutations and their relation to cancer have not been identified [4]. Moreover, despite the need for further evidence, it is possible that the chronic bowel obstruction observed in some patients may lead to inflammation, and that altered enterohepatic circulation might change bile composition contributing to carcinogenesis [4].

Intestinal malrotation usually manifests with acute bowel obstruction and midgut volvulus during the first month of life, with an estimated prevalence between 1:200 and 1:6000 of live births [1–5]. In adults, its real incidence is unclear as it is usually asymptomatic and, as in the case presented, detected during investigations motivated by a different clinical scenario [2, 4, 5]. When present, symptoms include chronic or intermittent nonspecific abdominal pain, nausea with emesis, weight loss, and even volvulus [1–5].

Regardless of symptom presence, coexisting diseases or changes in physical condition can contribute for the development of serious complications, as intestinal occlusion with irreversible ischemia and sepsis [5]. It follows that correct identification of radiographical signs of intestinal malrotation can raise the index of suspicion for its diagnosis and prevent operative morbidity from mis-identification of important anatomical structures.

CONCLUSION

Our images bring attention to intestinal malrotation. An entity with a rare symptomatic presentation in adults, so careful CT image review is warranted. Association with malignancy needs to be investigated. Surgical intervention related to colorectal cancer diagnosis; its place as correction of malrotation in asymptomatic adults should be debated.

Keywords: Computed tomography, Intestinal obstruction, Malrotation

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Author Contributions

Joana Pimenta – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Conflict of Interest
Authors declare no conflict of interest.

Data Availability
All relevant data are within the paper and its Supporting Information files.