



# Short bowel disease after emergency surgery for massive intestinal infarction.

## A case report and review of the literature



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### Short bowel disease after emergency surgery for massive intestinal infarction. A case report and review of the literature

*Mesenteric ischemia is an infrequent diagnosis, although it carries substantial morbidity and mortality. In adults, the massive resection of small bowel leaving less than 150 cm of intestine results in malabsorption and diarrhoea and defines the short bowel syndrome (SBS).*

*In this report, we present a case of emergency surgery with a near total enterectomy due to superior mesenteric ischemia with a long time of survival.*

KEY WORDS: Case report, General surgery, Mesenteric ischemia, Small intestine

#### Introduction

The general factors affecting the prognosis of bowel infarction seem to be advanced age (> 75 years), extent of necrosis, and recent major cardiovascular surgery. The etiology is embolic or thrombotic arterial occlusion in 60-70% of cases, non-occlusive ischemia and infarction in 20-30%, and mesenteric venous thrombosis in 5-10%<sup>1</sup>. The excellent results obtained with interventional radiology are not always applicable to all cases and it is sometimes necessary, although fortunately not frequently, to resort to intestinal resection<sup>2</sup>.

Mesenteric ischemia is an infrequent diagnosis, although it carries substantial morbidity and mortality.

The extent of necrosis and diagnostic delay seem to be the most important prognostic factors even after adjusting for confounding due to age, presence of comorbidities, and laboratory tests (LDH and WBC) as reported by Paladino et al.<sup>1</sup>.

Whether it is from a thromboembolic event, hypoperfusion or mesenteric vein thrombosis, the length of the bowel, the segment resected (i.e., proximal vs. distal small bowel), overall health of bowel, presence or absence of ileo-cecal valve, history of prior radiation therapy, and ability to maintain adequate oral nutrition remain the most important aspects for the long-term outcome of such patients<sup>3</sup>.

In adults, the massive resection of small bowel leaving less than 150 cm of intestine results in malabsorption and diarrhoea and defines the short bowel syndrome (SBS), while a small bowel length inferior to 100 cm is highly predictive of permanent intestinal failure and total parenteral nutrition (TPN) definitive dependence. Thus, maintenance of sufficient bowel to prevent intestinal failure leading to TPN dependency is a major concern in patients who require significant enterectomies. In most patients, entire loss of the jejunum and ileum might also be associated with septic or cardiogenic shock, which deem these procedures nonsurvivable events<sup>4</sup>.

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In this report, we present the case of a patient who underwent a near total enterectomy due to superior mesenteric ischemia, but was successfully maintained on enteral nutrition for almost three years.

The systematic literature review was conducted using the PubMed search engine employing the terms: “short bowel syndrome” used in combination with the following other search terms: “surgery”, “massive intestinal resection”, and “adults”. To minimize retrieval bias, a manual search method including Google Scholar databases was performed.

When multiple articles were published from a single study group and overlapping study periods were reported, only the most recent article was considered as to avoid duplication of data. The literature search was performed using the English language restriction. The final decision on eligibility was reached by consensus between the two screening authors.

## Case Report

A 53-year-old man presented to the Emergency Department in September 2016 with an acute abdomen. His past medical history was significant for hepatitis C, alcohol abuse, and heavy smoking. Physical examination revealed abdominal bloating, tenderness and rebound tenderness, abdominal guarding, and absent bowel sounds. A contrast enhanced computerized tomography (CT) scan of the abdomen revealed intestinal pneu-

matosis throughout the small bowel, enteric necrosis, and massive ascites (Fig. 1). At emergent exploratory laparotomy, frank necrosis of almost the entire bowel with bowel adhesions and obstruction. Viscerolysis followed by resection of the necrotic bowel (300 cm) leaving 15 cm proximally, from the Treitz ligament, and 10 cm distally, from the ileo-cecal valve, with temporary abdominal closure (TAC) was then performed and the patient was transferred to the intensive care unit (ICU) for resuscitation.

At 24-hour second look, a viable 15-cm proximal jejunum and 10-cm distal ileum was confirmed and an end-to-end jejunoileostomy was performed leaving 25 cm of small intestine. Postoperatively, the patient recovered from the septic shock and he was started on total parenteral nutrition (TPN). When postoperative ileus resolved, enteral feedings were begun; however, he tolerated clear liquids very poorly, with severe gastroesophageal reflux and profuse diarrhoea (3-4 times a day). The patient was discharged home on the thirty-third postoperative day.

During the initial four-month postoperative period, total nutritional needs were met by TPN and the patient was followed by the dietician and gastroenterologist specialist. After discharge, the patient then maintained an exclusively oral diet and support with vitamin and high calorie supplements (1.5 Kcal, 2 bottles per day). Two years afterwards, an endoluminal gastrointestinal stromal tumor (GIST) was endoscopically removed.

Although the patient had a long-term malabsorption sin-

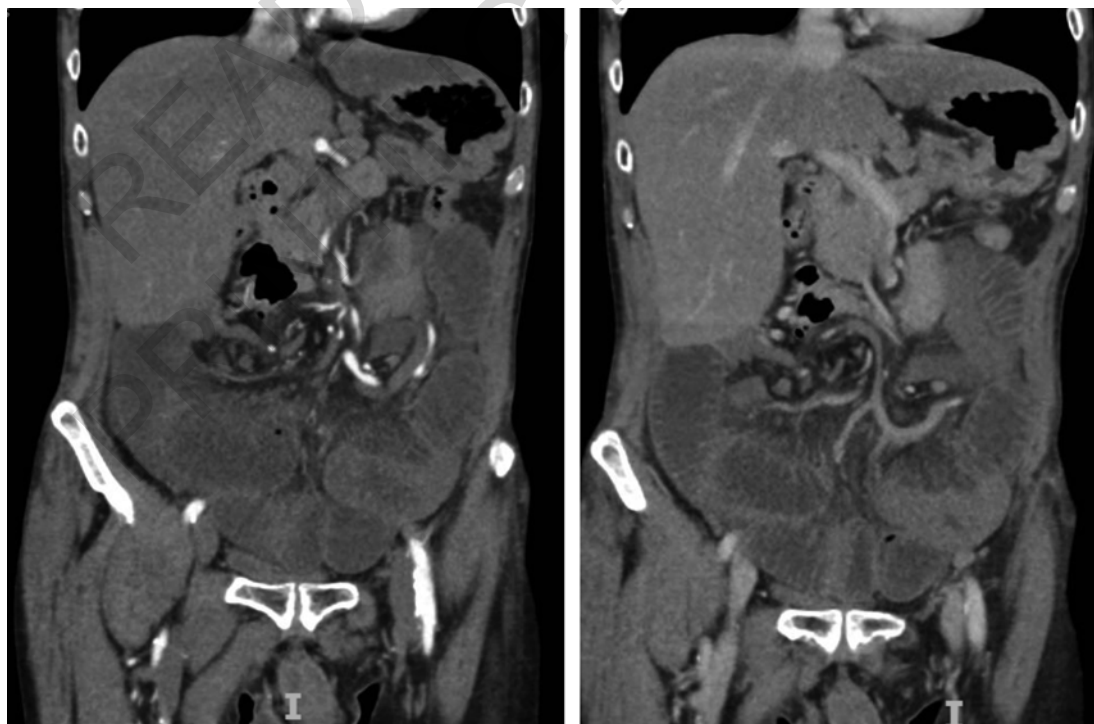


Fig. 1: 2016: preoperative CT scan, ischemic small bowel.



Fig. 2: 2018 CT scan 20 month after operation: abdomen inhabited by colon.

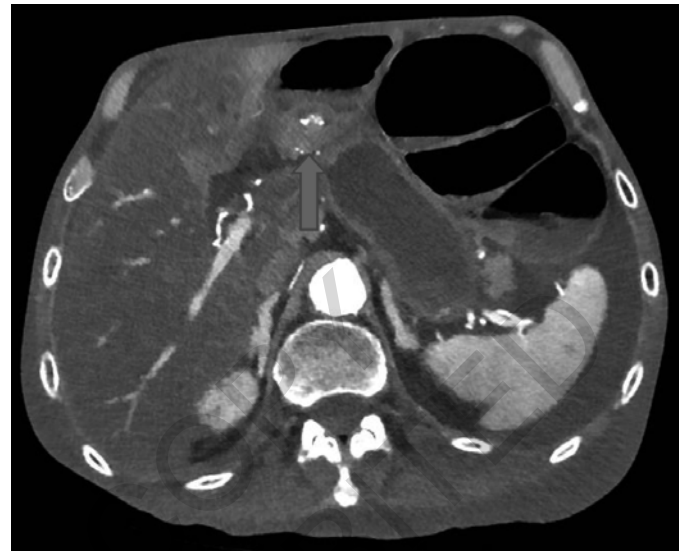


Fig. 3: Endophytic vascular neoplasm (red arrow) of the stomach. Histological diagnosis of GIST (gastrointestinal stromal tumor)

drome due to SBS (Figs. 2, 3) with interstitial edema secondary to internal systemic problems, blood dyscrasias, and thinness from systemic malnutrition, he did not require further hospitalizations (gastroenterological follow-up only) and died 20 months after the small bowel resection because of heart attack.

## Discussion

Intestinal infarction is a condition carrying a high mortality and surgery represents the only curative option. Nowadays, massive intestinal infarction remains a real challenge for the surgeon due to the limited success of extensive intestinal resections, which are at risk of fatal complications in the short term as well as for long-term malabsorption due to SBS.

However, when faced with an extensive intestinal infarction, the surgical approach is also conditioned by the surgeon's experience, and must take into account the patient's age and comorbidities. In fact, it is a widespread opinion that people of advanced age with radiological and clinical diagnosis of massive intestinal infarction often do not undergo surgery due to the high probability of failure, due to the disease itself and a supportive medical therapy is rather preferred, for palliative purposes.

To date, no guidelines are available that can clearly guide this decision, which therefore always depends on the individual case and on the choice of doctors and in particular of the surgeon.

In adults, massive intestinal infarction is very rare. As a consequence, this makes it even more difficult to express unambiguously on its treatment in emergency conditions. There is considerable debate as to the optimum management of patients with extensive infarction of the small bowel caused by massive vascular thrombosis as, given the relative rarity of the condition, there is no real evidence-base on which decisions can be made. In a case report, Thomas et al. performed a gastrocolic anastomosis following an extensive bowel resection with restoration of intestinal continuity and a successful outcome<sup>5</sup>.

Other Authors report better survival rates in cases of ultra short bowel disease with sparing of the ileocecal valve<sup>6</sup>.

In a single centre experience, Lauro et al. report that after a minimum period of one year of intestinal rehabilitation in near 70% of adult patients, a restoration of colonic continuity after small bowel massive resection seems to lead to a TPN independence without autologous gastrointestinal reconstruction. These data seem to be confirmed by a systematic review, showing a parenteral nutrition independence ranging from 40% to 90% in 116 adult patients with SBS < 100 cm reconnected to the colon without autologous gastrointestinal reconstruction on a long term follow up (minimum > 1 year)<sup>7</sup>.

In our case the subject was a young patient therefore, despite the extent of the intestinal infarction already proposed by the preoperative clinic, it was decided for a heroic surgery that had a favorable outcome, with a

recovery of intestinal function and a recovery of refeeding, without a long-term dependence on total parenteral nutrition.

At about two-year follow-up, the patient reported intestinal problems of long-term malabsorption which, however, did not require further hospitalization until death occurred 20 months after the operation.

Given the rarity of massive intestinal infarction in relatively young subjects and the lack of currently available guidelines, the experience of our clinical case and other anecdotal cases published in the literature suggest attempting surgery, even in cases of extensive subtotal resections. Further studies, however, are needed to confirm such data.

### Riassunto

L'ischemia mesenterica è di rara diagnosi, sebbene comporti una sostanziale morbilità e mortalità. Negli adulti la resezione di un tratto di tenue, lasciando meno di 150 cm, determina malassorbimento, diarrea nel complesso della sindrome da intestino corto (SBS).

Riferiamo qui il caso di chirurgia d'urgenza che ha comportato la quasi totale enterectomia per ischemia dell'arteria mesenterica superiore, seguita da una lunga sopravvivenza.

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