Enteritis necroticans – megacolon with massive portal venous gas embolization in a patient after malabsorptive bariatric surgery

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Dear Editor,

A 70-year old male patient with a history of bariatric surgery performed at age 40 was admitted to our intensive care unit (ICU) in septic shock, with multiple organ failure and advanced abdominal compartment syndrome. Contrast-enhanced abdominal computed tomography demonstrated megacolon with extensive gas embolization in the portal venous system (Figure 1). Emergency laparotomy was performed with resection of the necrotic small intestine and colon (Figure 2). Intraoperative transection of small mesenteric veins showed massive gas leakage (video provided in supplement). Microbiological samples revealed *Clostridium perfringens* (CP) infection. This severe CP manifestation is referred to as enteritis necroticans (EN), in which CP exotoxins cause extensive intestinal and vascular necrosis, submucosal hemorrhage, as well as

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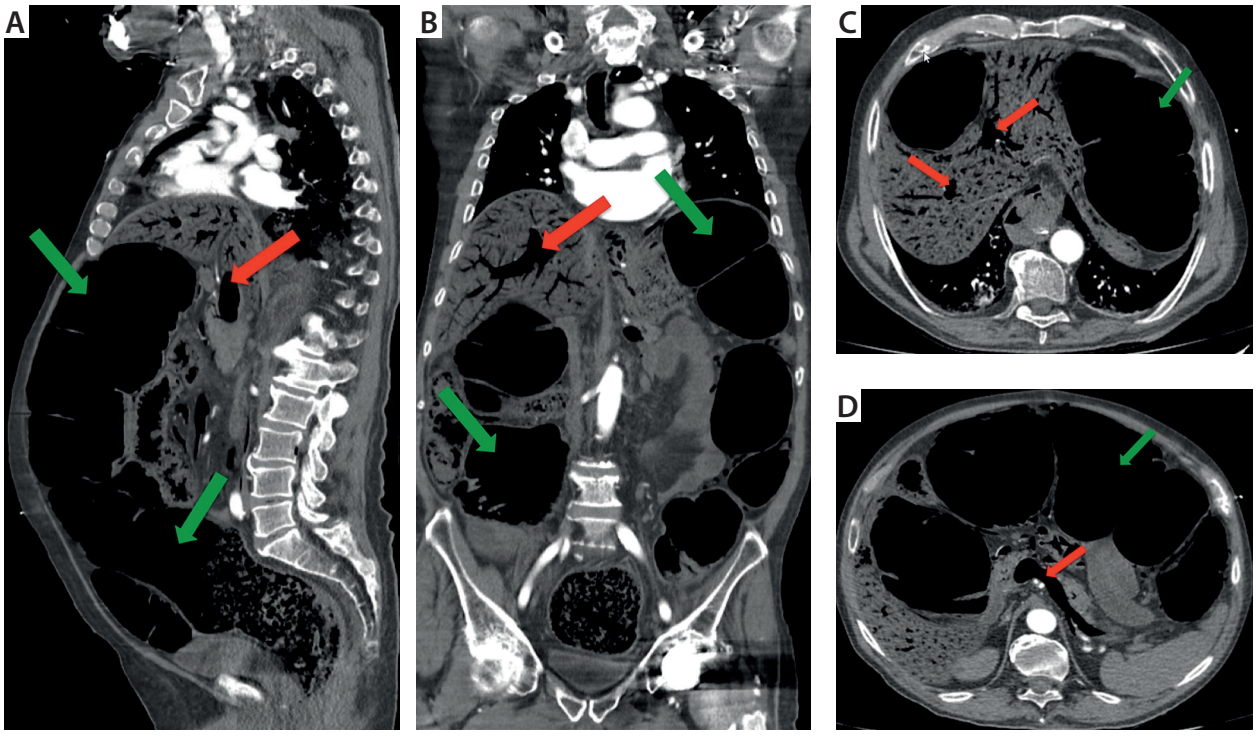

FIGURE 1. Contrast-enhanced computed tomography scans (sagittal, coronal plane) demonstrating massive megacolon (green arrows) and portal venous gas collection (red arrows) in the sagittal **(A)** coronal l **(B)**, and transversal plane **(C, D)**

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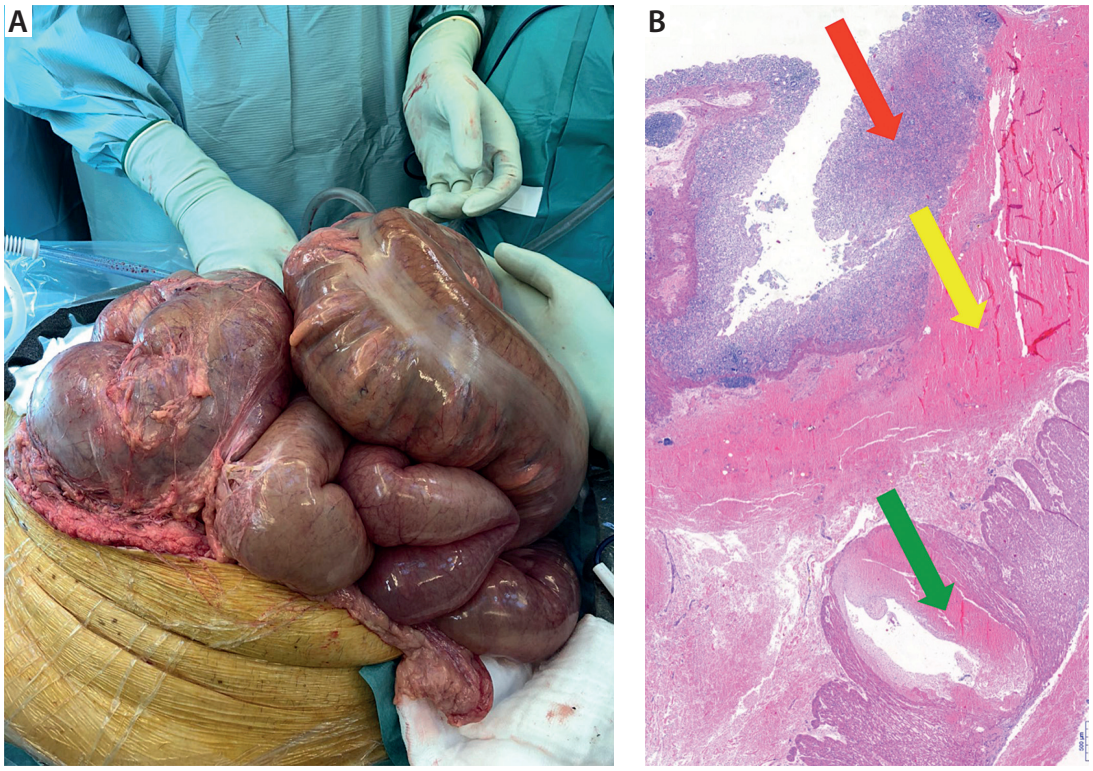

FIGURE 2. **A)** Intraoperative finding with massive small and large bowel distension. **B)** Resection of large intestine demonstrating bleeding into the muscularis propria (green arrow), submucosal hemorrhage and edema (yellow arrow), and extensive mucosal necrosis (red arrow). Hematoxylin-eosin staining

edema and bleeding in the muscularis propria [1]. Importantly, trypsin typically cleaves CP exotoxins into inactive products. Enteritis necroticans is mostly observed in protein-deprived populations in Papua New Guinea, in which trypsin inhibition is caused by extensive consumption of sweet potatoes with EN induced after ingestion of uncooked pork meat at ceremonial festivals (known as "pigbel disease") [2]. In our ICU patient, potential trypsin deficiency due to malabsorptive bariatric surgery (distal common channel 25 cm) [3] and a reported particularly high protein diet may have promoted development of this life-threatening clinical finding [4].

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