

LETTER TO THE EDITOR

Acute small bowel perforation following preoperative radiotherapy and abdominoperineal resection: A case report

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To the Editor

A 63-year old man was referred to our hospital in March 2005. Digital rectal examination, pelvic CT and transrectal ultrasound revealed a low-lying cT3N1 rectal tumour pronounced on pathological analysis of the bioptic specimen as mucinous adenocarcinoma. The patient had no previous history of abdominal surgery, reporting only medically controlled arterial hypertension and postoperative hypothyroidism following surgical treatment of struma nodosa. Results of basic laboratory analyses, chest X-ray, abdominal ultrasound and abdominal CT were all normal. The patient received preoperative radiation therapy using the three-field (two lateral with wedges and posterior) 2D simulator-based technique with 15 MV photon beams to a total dose of 25 Gy administered over five consecutive days. Irradiation was performed in the prone position, on a belly board. The patient was advised to undergo irradiation with the urinary bladder distended. The cranial border of the fields was placed 1 cm above the sacral promontory, with the caudal border 1 cm below the anorectal ring. The lateral borders of posterior field extended 1.5 cm beyond the pelvic brim. The anterior border of the lateral fields was placed at the posterior edge of the pubic symphysis, with the posterior border 1 cm beyond the anterior bony sacral margin. No acute complications were observed during irradiation and within the 5-day interval between irradiation and surgery. Surgical treatment consisted of abdominoperineal resection using the total mesorectal excision technique. Intraoperative inspection of the

intra-abdominal organs did not reveal any injuries. The perineal phase of the excision was performed with the patient lying in the prone position. Four days after surgery, the patient developed symptoms of subileus. On Day 13 after surgery we observed discharge of intestinal content from the perineal wound and on Day 14 the patient underwent re-laparotomy, in the course of which a 4 mm perforation of a small bowel loop fixed to the pelvic bottom was found. There was no evidence of bowel necrosis. The patient underwent resection of the distal ileum and of the right colon, as the cecum was also showing signs of injury. Microbiological cultures from the peritoneal fluid were negative. On pathological examination the surgical specimen revealed signs of epithelial atrophy of the villi and crypts, with teleangiectasiae in the submucosa and inflammatory infiltrations. These lesions were interpreted as radiation damage. Further recovery was uneventful and on follow-up three months after surgery the patient was in good overall condition and free of recurrence. We made an attempt to investigate the aetiology of this complication. The dose distribution was evaluated at the central plane and in additional CT scan taken at 1 cm below the cranial border of the fields. The maximal dose within the small bowel volume was 102.3%. Portal images taken on Day 1 and Day 3 of treatment showed good accuracy of irradiation. No errors were found in the dose calculations and in the dose delivered, as noted in the documentation of our record and verification system. Since the perineal stage of surgery was performed with the patient lying in the prone position, the possibility of

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inadvertent bowel damage during perineal suturing was extremely unlikely. The pathological slides were reviewed excluding mechanical damage, diverticulosis and non-specific inflammatory bowel diseases.

Discussion

Approximately 1 000 patients have been treated with short-course preoperative irradiation for rectal cancer at our institution, of whom only one has developed acute small bowel perforation. Since we have found no errors in the irradiation technique and in the surgical technique, we are led to assume that the reason for this complication may have been acute radiation damage. Another reason could be the presence of the so-called Richter's hernia, i.e. the

hole in the bowel wall may have resulted from ischemia brought on by the herniation of a small part of the entire circumference of the bowel into the pelvis [1]. However, it has to be admitted that such a complication may occur after surgery alone, without any evident detectable causes [2,3].

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