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Massive lower gastrointestinal bleeding after low anterior resection for middle rectal cancer - case report

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ABSTRACT

Objective: To emphasize the value of emergency diagnostic angiography and angioembolization in massive postoperative bleeding. **Methods:** A case report was presented and electronic search of U.S. National Library of Medicine National Institutes of Health PubMed/MEDLINE, EMBASE, Google Scholar, ISI Web of Knowledge, to identify original articles and reviews about the subject. **Results:** A 55 year-old male patient was addmited for rectal bleeding. ECOG index=2, digital rectal examination revealed the inferior pole of a middle rectal tumor. Colonoscopy exam validated the presence of a middle rectal tumor, 8 cm from the anal verge. CT scan showed rectal wall thickening up to 3 cm, that extends 9 cm proximally, whit infiltration of the perirectal fatty tissue and multiple enlarged lymph nodes up to 12 mm in dimension. There was a laparoscopic converted to open approach, with low anterior resection of the rectum and total mesorectal excision, an end to end stapled colorectal anastomosis and protective loop ileostomy. In the 5th postoperative day a massive lower gastrointestinal bleeding occured, with hypovolemic shock and a decrease in hemoglobin. Emergency angiography was performed. This revealed active bleeding from an internal iliac branch that was successfully angioembolized. **Conclusions:** Angiography with angioembolization is an effective tool in emergency setting, avoiding the morbidity and associated mortality of a surgical reinervention. In early postoperative hemorrhages, only a rapid clinical recognition, a personalized diagnostic workup and an agressive intervention may offer the patient the best chances for cure.

1. Introduction

Colorectal cancer represents the fourth most frequently diagnosed type of cancer and almost 20% of colorectal cancer are associated with familial clustering[1]. Low anterior resection of the rectum represents the standard operation for rectal cancer and allows an anastomosis to be created at a lower level, thereby preserving the anal sphincter. The rectum is about 12 cm long, but there are disagreements between terminologia anatomica and surgical practice. While in surgical practice the rectum is defined as starting at the level of the sacral promontory, the anatomists define the rectosigmoid junction at the level of the third sacral vertebra. The arterial supply of the rectum is realized by the superior, middle, and inferior rectal arteries. There are many controversies regarding the presence and clinical significance of the middle rectal artery[2]. The NCCN guideline defines rectal cancer as cancer located within 12 cm of the anal verge by rigid proctoscopy and definition that was developed by the Dutch Colorectal Cancer Group study, which found that the risk of recurrence of rectal cancer depends on the location of the cancer. The treatment effect of surgery alone versus neoadjuvant radiotherapy plus surgery was not significant in patients whose cancer was located between 10.1 cm and 15 cm from the anal verge[3].

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There is a complex decision-making process in order to determine the optimal treatment plan for patients diagnosed with rectal cancer. Strong considerations should be given to the intent of surgery, to possible functional outcomes, and last but not least preservation of anal continence and genitourinary functions. Sphincter-saving procedures for rectal cancer are now considered the standard of care[4]. Patients diagnosed with rectal cancer which are appropriate for surgical excision must complete staging evaluation, including total colonscopy to evaluate for synchronous lesions or other pathologic conditions of the colon and rectum, and rigid proctoscopy to identify the location of the tumor (measurement of the distance of the tumor from the anal verge). After neoadjuvant therapy advance MRI techniques allow for the measurement of microcirculation, vascular permeability, and tissue cellularity; useful data may be needed to determine the response to neoadjuvant treatment and restaging patients with rectal cancer. Transabdominal resection techniques with total mesoractal excision are highly recommended for patients with rectal cancer who do not have operative indication for local excision. Techniques that maintain sphincter function such as organ preserving procedures are preferable but not possible in all cases. Preoperative chemoradiation with tumor downsizing and downstaging may become very helpful when trying to adopt an organ preserving treatment maneuver[1]. Total mesoractal excision involves an en bloc removal of the mesorectum, including associated vascular and lymphatic structures, fatty tissue and mesorectal fascia. As far as the lymphatic drainage is concerned distal tumors are more likely to be characterized by both upward and lateral lymphatic drainage, whereas the likelihood of only upward mesorectal drainage is much higher for more proximal tumors[1].

2. Method

We presented a case report of a patient with low anterior resection of the rectum with total mesorectal excision for a middle rectal cancer. For literature review we have undertaken an electronic search of U.S. National Library of Medicine National Institutes of Health PubMed/MEDLINE, EMBASE, Google Scholar, and ISI Web of Knowledge, to identify original articles and reviews about the subject. The terms "rectum", "cancer", "low anterior rresection" and "heorrhage" were used in various combinations for search. The key words were identified as truncated words in the title, abstract or in medical subject heading (MeSH).

3. Case report

A 55 year-old male patient was addmited for rectal bleeding and weight loss (12 kg in the last 3 months). Clinical examination showed pale skin, Karnofsky index 70%, ECOG index=2, without other relevant abdominal findings. Digital rectal examination revealed the inferior pole of a middle rectal tumor, with hard consistency, well delimited, and feces with blood. On admission, blood tests showed severe anemia (Haemoglobin B 5.2 g/dL) and elevated CEA (7.61 ng/dL). Colonoscopy exam validated the presence of a middle rectal tumor, 8 cm from the anal verge. CT scan showed rectal wall thickening up to 3 cm, that extends 9 cm proximally, whit infiltration of the perirectal fatty tissue and multiple enlarged lymph nodes up to 12 mm in dimension (Figures 1-3).

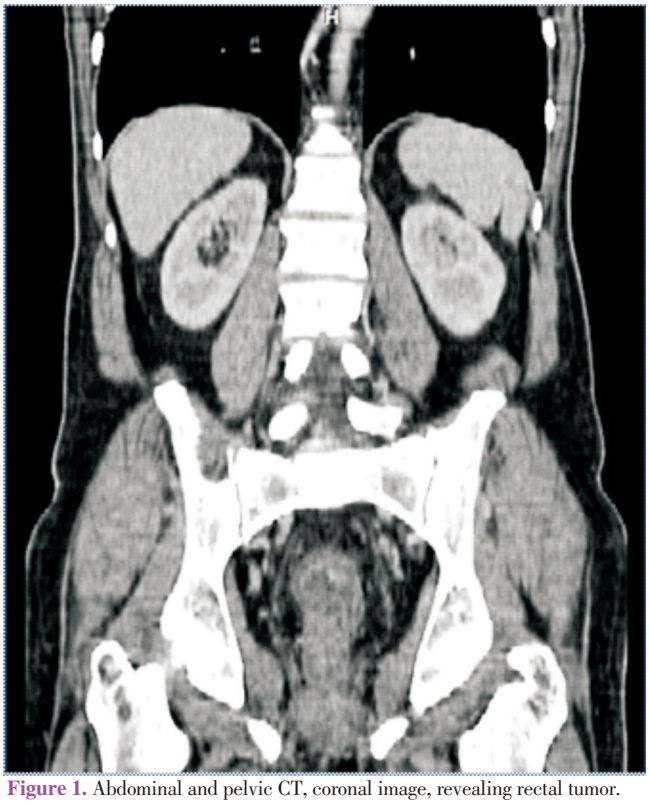

Figure 1. Abdominal and pelvic CT, coronal image, revealing rectal tumor.

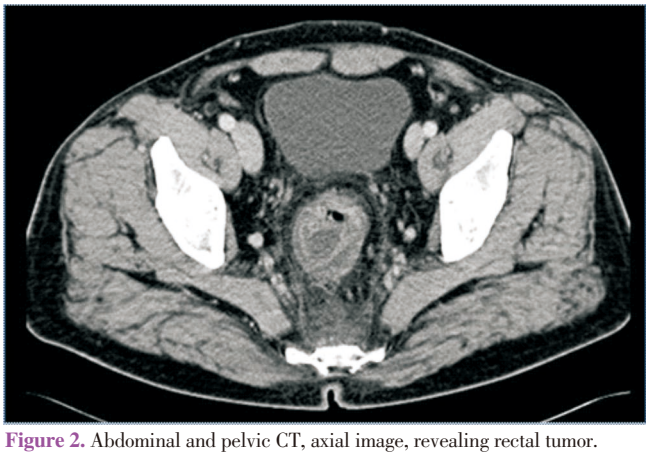

Figure 2. Abdominal and pelvic CT, axial image, revealing rectal tumor.

Due to ongoing severe bleeding, surgical resection was decided, without neoadjuvant radiochimiotherapy. The exploratory laparoscopy showed no signs of liver or peritoneal metastasis, and confirmed the middle rectal tumor that extends beyond the serosa. The laparoscopic approach was continued with a medial to lateral dissection

at the level of the Toldt II fascia, with clipping and division of the Inferior Mesenteric Artery, near it's origin (Figure 4). Due to difficult dissection of the rectum at the level of the "holly plane" because of the tumoral infiltration, we have converted to laparotomy (Figure 5).

Figure 3. Abdominal and pelvic CT, sagital image, revealing rectal tumor.

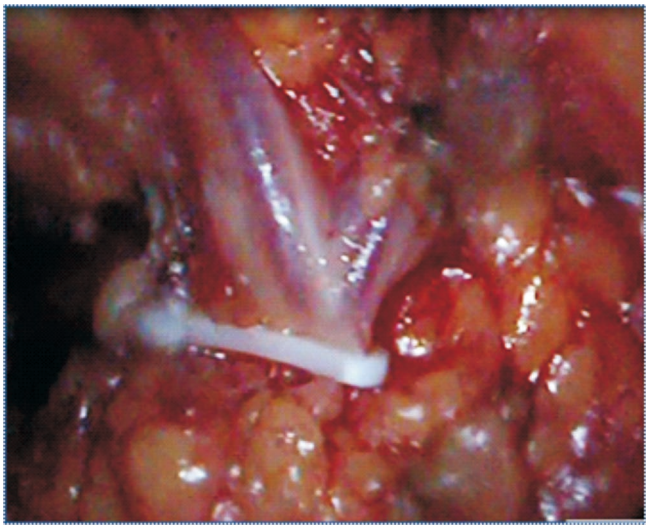

Figure 4. Intraoperative laparoscopic view of the inferior mesenteric artery, being clipped right above the emergence of the left colic artery.

By open approach, low anterior resection of the rectum with total mesorectal excision, end to end stapled colorectal anastomosis and protective loop ileostomy were finished. The postoperative course was uneventful, till the 5th postoperative day, when massive lower gastrointestinal bleeding occured, with hypovolemic shock and a decrease in hemoglobin of 2 g/dL. Emergency angiography was performed. This revealed active bleeding from an internal iliac branch that was successfully angioembolized (Figures 6 and 7). Judgging the angiographic images we assumed that the arterial branch was the stump of the left middle rectal artery, sectioned with the electrocautery and leaking inside colorectal anastomosis.

The postprocedural evolution was favorable with no consecutive bleding. The patient received 5 units of packed red blood cells. The patient was discharged 7 d later, without any further morbidities, and Hb level of 8.1 g/dL. Patology exam showed moderate differentiated rectal adenocarcinoma, infiltrating the mesorectum, and negative circumferential resection margins (T4aN2M0–Stage III C, G2).

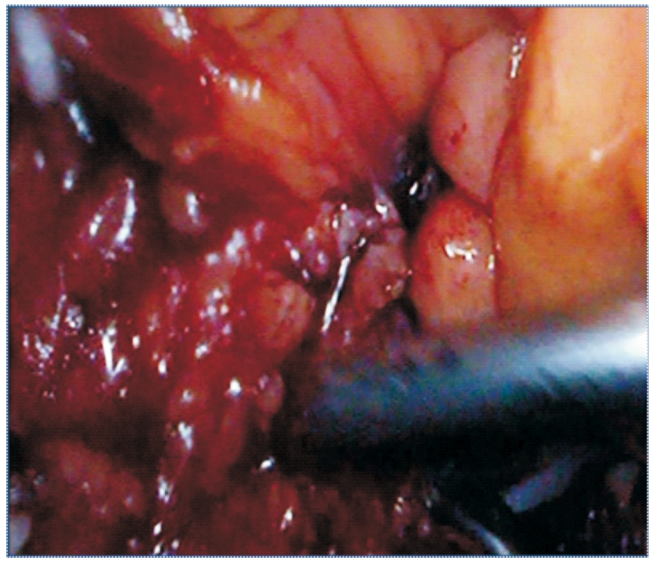

Figure 5. Intraoperative laparoscopic view of the tumor infiltration at the level of the left pararectal fossa.

Figure 6. Angiographic exploration of the left internal iliac artery revealing active contrast extravasation.

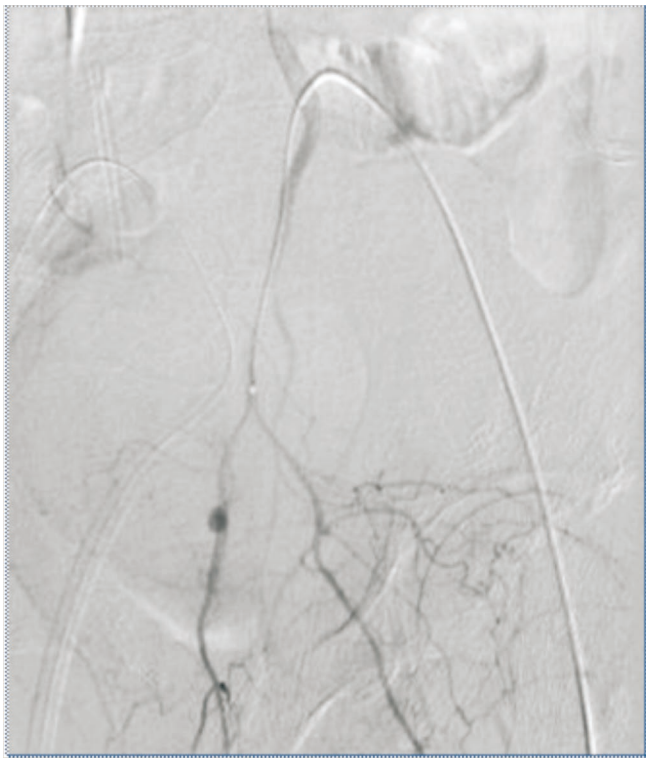

Figure 7. Angioembolization of the arterial branch with control of the hemorrhage.

4. Discussions

When it comes to rectal cancer, surgery has always proven to be the mainstay of the treatment and the outcome after surgery is influenced not only by the malignant potential of the tumor but also by the completeness of the primary resection. A complete microscopic resection with a histologically negative margin is considered a fundamental goal for the curative intent. However, achieving the complete resection of the tumor located in the middle and lower rectum is difficult, because procedures on the pelvic floor are disturbed by poor visualization, with a concomitant need to preserve the sphincter function. Resection of larger tumors (>5 cm) located in the lower rectum may be more commonly associated with impairment of the sphincter function[5]. Minimally invasive surgery for rectal cancer has been proven beneficial and is constantly expanding its approaches, but remains technically demanding.

In colorectal surgery it is believed that using stapled techniques to perform the anastomosis has better outcome with certain advantages such as lower percentage of complications (anastomotic leaks, infections and anastomotic line bleeding), better blood supply, reduced tissue manipulations, less edema, uniformity of sutures and shorter operation time and hospital stay[5,6]. Anastomotic bleeding is a problematic complication, with associated morbidity and mortality, in the early postoperative period of gastrointestinal anastomosis, and may apppear in colorectal surgery in 0.4%–4% of cases. This complication seems to be more frequent after stapled anastomosis[7,8]. Nevertheless uncommon important anastomotic bleeding after rectal resection can be severe enough to require re-operation, and the time interval from its appearance is reported to be from four hours to nine days[9].

The most used technique to evaluate and control bleeding at the level of the anastomosis is rectocolonoscopy. Often bleeding points are masked by blood and clots are reason why the first step of this procedure is to fill the intestinal lumen with cold water to make possible the identification of the bleeding points. There are two different haemostatic strategies for different anastomotic bleeding type. If a colonoscopy does reveal an active bleeding point with the origin in one artery clipping can be adopted, but if bleeding is caused by mucosal taxis, then electrocoagulation is preferred as haemostasis controlling technique. Active and continuous rectal anastomotic bleeding is rare, but in this case colonoscopic hemostasis in early postoperative period is highly recommended. Study results suggest that anastomotic bleeding are more likely to appear after anus-preserving surgery for low rectal cancer. Intraoperative colonoscopy in order to routinely secure stapling colorectal anastomosis has been suggested by some authors. However, in many hospitals it is usually impossible to adopt a routine colonoscopy procedure to check anastomosis perfection.

The middle rectal artery branched the anterior division of the internal iliac artery in 33.3% cases; in 22.2% cases it came separately from the internal iliac trunk; in 13.3% cases it had a common origin with the internal pudendal artrey; in 8.9% cases it has a common origin with the obturator artery; in 4.4% of cases it has a common origin with the inferior vesical; in 4.4% with the uterine, and in 2.2% with the superior vesical arteries[10]. Jiang *et al*. found the lateral ligaments of the rectum in all of the 58 hemipelvics, with a width of 3.1–3.2 cm[11]. The middle rectal artery was found in 83% of hemipelvics, and the inferior hypogastric plexus was inside the lateral ligament, dividing it in two parts. Bilhim *et al*. studied the middle rectal artery in 167 male patients, investigated by vomputed tomographic angiography and digital substraction angiography[2]. They found the middle rectal artery in 35.9% of patients, in 23.9% of pelvis sides. The middle rectal artery was bilateral in 12% of cases. In 30% of cases the middle rectal artery has its own origin from the internal iliac artery, and in 70% a common trunck with the prostatic arteries[2].

For active rectal bleeding, Pichon *et al*. embolized in two cases the middle rectal in patients with sustained bleeding and hemorhhagic shock[12]. Syed *et al*. have presented three cases of middle hemorrhoidal artery embolization, for life threating rectal bleeding[13]. An analysis of the factors that may indicate endoscopic therapy or interventional

radiology showed that more severe bleeding favoured radiological intervention. The logistical factors and the probability for a localized source indicate the necessity for colonoscopy[14]. Albeldawi *et al.* studied the utility of urgent colonoscopy in 57 patients with lower gastrointestinal bleeding[15]. The authors concluded that the use of urgent colonoscopy, as an initial approach to investigate acute lower gastrointestinal bleeding, did not result in significant differences in lenght of ICU stay, re-bleeding rate, the need for additional diagnostic or therapeutic interventions, or 30-day mortality compared with elective colonoscopy. The subgroup of patients with hemodynamic instability were more likely to re-bleed after initial colonoscopy, and to require angiography or surgery[15]. Green and Rockey concluded that in patients with agressive or recurrent lower gastrointestinal bleeding it is critical for the practitioner to judge when angiography and surgery are necessary[16].

5. Conclusions

Lower gastrointestinal bleeding is a life-threatening surgical emergency, especially in the early postoperative period. Angiography with angioembolization is an effective tool in emergency setting, avoiding the morbidity and associated mortality of a surgical reinervention. In early postoperative hemorrhages, only a rapid clinical recognition, a personalized diagnostic workup and an agressive intervention may offer the patient the best chances for cure.

Conflict of interest statement

The authors report no conflict of interest.

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