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CASE REPORTS

Ulcerative colitis: the role of elective and emergency surgery

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Abstract

Inflammatory bowel disease (IBD) is a group of auto-inflammatory conditions characterized by chronic, remitting, and relapsing inflammation of the alimentary tract. It is comprised of two phenotypically different entities: Crohn's disease, and ulcerative colitis (UC). The aim of this article is to explore the role of the general surgeon regarding the treatment of patients suffering from UC while presenting a case of a 55-year-old woman with low-differentiated colon adenocarcinoma associated with ulcerative colitis. Patients with UC have a high-risk of developing colorectal cancer. While medical treatment is commonly the initial approach to UC, surgery constitutes a major contributor in dealing with UC.

Case report. A 55-year-old female with hypertension and iron deficiency anemia presented to our emergency department with fever, diarrhea, and epigastric pain for 24 hours which was not associated with heartburn, vomiting, melena, or hematemesis. On examination, the patient's temperature was 39°C, heart rate was 104 beats per minute, blood pressure was 108/65 and the respiratory rate was 20 breaths per minute. Her abdomen was soft, without distension, and with no evidence of palpable mass...

Keywords: ulcerative colitis, colorectal cancer, colorectal surgery

Introduction:

Inflammatory bowel disease (IBD) is a group of auto-inflammatory conditions characterised by chronic, remitting and relapsing inflammation of the alimentary tract [1]. It is comprised of two phenotypically different entities: Crohn's disease -which is capable of affecting the entire length of the digestive tract, causing focal, segmental and transmural inflammation- and ulcerative colitis (UC) -which causes superficial, diffuse inflammation, extending in a continuous manner from the rectum to the proximal colonic segments [2]. More specifically, Ulcerative Colitis is a chronic disease that involves the colonic mucosa and causes inflammation and ulcers [3-4]. The frequency of UC is increasing among the population per year, but the most worrying fact is that universal findings indicate that patients with UC have a high-risk for developing Colorectal Cancer (CRC) [5]. UC-related CRC represents 1-2% of all cancers and it is considered a serious complication of UC resulting in 10-15% of all deaths of patients with IBD. However, it should be noted that some recent studies estimate a much lower UC-related CRC frequency (approximately 1/500-1/1600 patients annually) [5]. Except for the duration of UC, other risk factors are primary sclerosing cholangitis (PSC), a long-term disease that affects the bile ducts, family history, smoking, severity of inflammation, and medical therapy used [4-5]. The mechanism behind the initiation and the development of cancer is widely studied and it mainly focuses on inflammation. More specifically, chronic inflammation and repeated stimulation of epithelial cells for proliferation is considered as an excellent environment for tumor formation and results in low-grade dysplasia which can easily be transformed into high-grade dysplasia [3, 6]. Inflammation also leads to reactive oxygen species (ROS) production, which cause cellular damage and can affect processes like DNA synthesis and repair [3]. Moreover, IBD is associated with abnormal intestinal mucosal barrier function, permitting bacterial invasion, thus bacterial microbiome is involved in the pathogenesis, as well as inflammatory cytokines [3, 6]. Regarding the molecular

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mechanism, several signaling pathways and particularly their regulation by miRNAs is involved [4, 7]. UC-CRC can be highly aggressive and leads to metastases, therefore, patients with UC need to proceed with regular screenings for cancer [3]. Surveillance colonoscopy is proposed to be conducted regularly, usually annually, since the diagnosis of UC. During a colonoscopy, the doctor uses a long and flexible tool to examine the colon and detect dysplasia. If any alterations are observed, a biopsy can also follow. The treatment of CRC that is usually used is the total colectomy which involves removing the entire colon. In some cases, however, a polypectomy, polyps' removal from the inside of the colon, or a proctocolectomy, removal of both colon and rectum, can be applied. This option is mainly dependent on the type of malignancy, its distribution, and the characteristics of dysplasia [4]. It should also be noted that in presence of an IBD disease, like ulcerative colitis, chemoprevention which includes the use of an anti-inflammatory therapy can decrease the risk for cancer development. Among the agents that can be used are 5-aminosalicylic acid (5-ASA), ursodeoxycholic acid (UDCA), mesalazine, and sulfasalazine. All these agents are safe, inexpensive and they inhibit inflammation pathways, that as we have already seen, play an important role in pathogenesis and malignant transformation of cells [4-5].

While medical treatment is commonly the initial approach to UC, surgery constitutes a major contributor in dealing with UC [8]. The aim of this article is to explore the role of the general surgeon regarding the treatment of patients suffering from UC, while presenting a case of a 55-year-old woman with low-differentiated colon adenocarcinoma associated with ulcerative colitis.

Case Presentation:

A 55-year-old female with hypertension and iron deficiency anemia presented to our emergency department with fever, diarrhea and epigastric pain for 24 hours which was not associated with heartburn, vomiting, melena or hematemesis. On examination, the patient's temperature was 39^{o}C, heart rate was 104 beats per minute, blood pressure was 108/65 and respiratory rate was 20 breaths per minute. Her abdomen was soft, without distension and with no evidence of palpable mass. Rectal examination was performed and was negative for blood. Her routine blood tests revealed hemoglobin of 9.1 g/dL, 16890 leukocytes and 112000 platelets. Liver and renal function test, serum amylase and lipase were normal, while serum level of butyrylcholinesterase was low [9]. Chest and abdominal radiography showed no abnormalities. A further computed tomography (CT) scan of the abdomen was performed and revealed an approximately 7-cm tumor in the sigmoid colon. There was no evidence of free air, abscess formation or metastases. The patient was hospitalized for 3 days in the surgical clinic and underwent exploratory laparotomy the 3th day of her hospitalization, as symptoms of pain and fever were persistent. In the operating room following general anesthesia, midline incision was performed. The small and large bowel was inspected from the ligament of Treitz till the rectum. During the running of the large bowel a visible mass was recognized in the sigmoid colon as well as inflammation of the inner lining of the ascending, transverse, and descending colon (Figure 1). Subtotal colectomy with temporary end ileostomy was performed. The patient did not have any postoperative complication and she was mobilized 12 hours postoperatively. She was started on oral diet on postoperative day three and was discharged on postoperative day six. Her final histopathology report was suggestive of low-differentiated adenocarcinoma associated with ulcerative colitis.

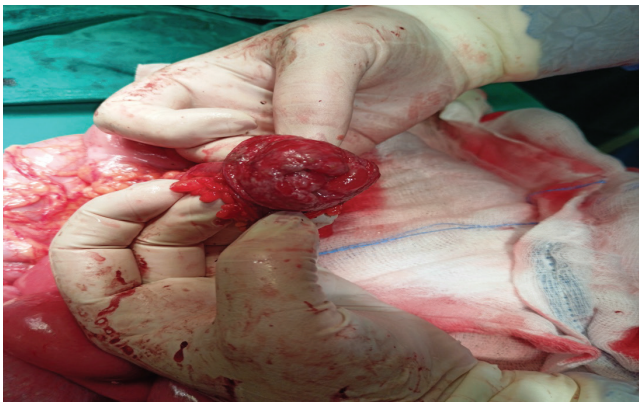


Figure1. Inflammation of the inner lining of the descending colon

Discussion:

Ulcerative Colitis and Elective Surgery

As a principle, surgical intervention, encompassing the dissection of the colon and the rectum, is curative for ulcerative colitis [10]. Patients suffering from this condition have an overall 25-35 % chance of undergoing surgery during their lifetime [11]. Surgical intervention in UC can provide treatment options in elective as well as emergent situations.

Chronic continuous ulcerative colitis refractory to immunosuppressive treatment, high grade dysplasia and malignant transformation constitute indications for elective surgery [12]. Colectomy offers a number of benefits to patients with severe refractory UC that is unresponsive or only partially responsive to medications as it entails complete removal of the colon, thus abolishing its associated risks (toxic megacolon, hemorrhage, dysplasia, carcinoma) as well as avoiding potent medications and their potential side effects [13]. Regarding the incidence of colorectal cancer in UC, it is approximately 4/1000 per person per year with an average prevalence of 3.5% [14]. The risk for colorectal cancer increases as time progresses and is 2%, 8% and 18% after 10, 20 and 30 years of disease [15]. Moreover, 45-50% of patients diagnosed with high grade dysplasia or non-adenoma dysplasia associated lesion or mass (DALM) have developed colorectal cancer at the time of colectomy [16]. These data

clearly demonstrate the importance of surgery when dealing with ulcerative colitis in non-emergency settings.

Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the procedure of choice [17]. It consists of the complete removal of the colon from the cecum down to the dentate line and the consequent restoration of the continuity of the gastrointestinal tract with the creation of an ileal reservoir, most commonly in the form of a J-pouch [12, 18]. The advantages of this technique include markedly decreased risk of UC-associated neoplasia as the entirety of the target organ is excised, reduced to no need of immunosuppressive medication while it also offers patients an unchanged body image with no stoma and a preserved anal route of defecation safeguarding the patients' quality of life [17, 19-21].

Ulcerative Colitis and Emergency Surgery

The indications for emergent surgery include perforation, uncontrolled haemorrhage, fulminant disease, and toxic megacolon [22].

Fulminant colitis and toxic megacolon represent acute exacerbations of UC associated with high morbidity [23]. Their overall incidence in UC is approximately 10% [15, 24]. The clinical presentation of both of these clinical entities includes acute onset of bloody diarrhoea, anorexia, abdominal tenderness, and colicky pain [25]. In order for a patient to be considered as toxic at least two of the following must be present: fever greater than 38.6°C, tachycardia, leucocytosis greater than 10.500/L and hypoalbuminemia (<3.0 g/100 mL), however the distinguishing feature of toxic megacolon is a total or segmental non-obstructive dilatation of the colon (>5.5 cm) [24-26]. Subtotal colectomy with temporary end ileostomy is considered to be the operation of choice, as the preservation of the rectum safeguards the possibility of restoring the continuity of the intestinal tract with an ileal-pouch rectal anastomosis [23]. The initial treatment should be medical, support with fluids, electrolytes, albumin and blood transfusion are necessary for the adequate resuscitation of the patient, whereas steroids and immunomodulators such as cyclosporin and infliximab are recruited in order to control the inflammatory response. Postoperative pain control can be achieved by administration of paracetamol and parecoxib in order to avoid side effects of opioid analgesics [27-28]. Surgery is reserved for patients not responding to medical treatment, though early surgical intervention is entailed with decreased morbidity and mortality [23, 29].

Up to 3% of ulcerative colitis patients, mainly those with pan-colonic disease and in the setting of an acute flare, may develop acute severe lower gastrointestinal bleeding – usually attributed to diffuse mucosal ulceration [30]. Although it is an uncommon complication, it accounts for approximately 10% of all urgent colectomies for ulcerative colitis [31]. The presence of an endoscopically treatable lesion is uncommon, and surgery is required in less than half of cases during the initial hospitalization. Indication for surgery is considered either a massive initial bleeding with hemodynamic instability and need for catecholamines or if a patient requires more than 4 red blood cell concentrates per 24 h [12]. Recurrent hemorrhage is not rare, and for these cases surgery may be the most appropriate treatment [32].

Free perforation is a rare occurrence complicating ulcerative colitis in approximately 2% of cases. Perforation typically takes place in the setting of toxic megacolon but also may occur as a result of surveillance colonoscopy. Diagnosis of perforation in this setting may be delayed if the patient is on high-dose steroids or other immunosuppressants. In these settings, the appropriate management involves urgent resuscitation, administration of broad-spectrum antibiotics, and emergent surgical intervention [33].

In emergent situations the recommended operation is colectomy and ileostomy, leaving the rectum intact, since reconstruction is not an option in the acute setting [34-35]. A total proctocolectomy should be avoided because it is associated with greater postoperative morbidity and mortality due to increased operative time, risk of blood loss, pelvic sepsis, pelvic nerve damage, and small bowel obstruction greater postoperative morbidity and mortality due to increased operative time, risk of blood loss, pelvic sepsis, pelvic nerve damage, and small bowel obstruction [33]. A three-stage procedure is conducted in patients with a considerably reduced general health condition, or in patients depending on high doses of steroid therapy as avoidance of proctectomy and ileal pouch formation avoids pelvic sepsis and higher risk of pouch failure [35]. The first step includes subtotal colectomy and terminal ileostomy with Hartmann stump formation. Secondly, after stabilization of the patient, a proctectomy with IPAA and protective ileostomy is performed. The loop ileostomy is then taken down in the third step finally restoring the continuity of the gastrointestinal tract [12, 15]. Some of these surgical operations can also be performed laparoscopically having the advantages of laparoscopic procedures, such as lower hospital stays and earlier return to activities [36-38].

Conclusion:

To summarize, the treatment of inflammatory bowel disease necessitates a multidisciplinary approach by a team of specialized gastroenterologists and general surgeons. It is apparent that the contribution of both specialties is catalytic in both elective and emergency situations, in order to safeguard both the safety and the quality of life of the patient.

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