



Successful endoscopic repair of an unusual colonic perforation following polypectomy using an endoclip device

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Abstract

Colonic perforation during endoscopic diagnostic or therapeutic procedures, represents an uncommon occurrence even if, together with haemorrhage, it is still the most common complication of colonoscopy, with an incidence ranging between 0.1% and 2% of all colonoscopic procedures. The ideal treatment in these cases remains elusive as the endoscopist and the surgeon have to make a choice case by case, depending on many factors such as how promptly the rupture is identified, the condition of the patient, the degree of contamination and the evidence of peritoneal irritation. Surgical interventions both laparotomic and laparoscopic, and other medical non-operative solutions are described in the literature. Only three cases have been reported in the literature in which the endoscopic apposition of endoclips was used to repair a colonic perforation during colonoscopy. Ours is the first case that the perforation itself was caused by the improper functioning of a therapeutic device.

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Key words: Polypectomy; Colonic perforation; Endoscopic device; Pneumoperitoneum

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INTRODUCTION

Colonic perforation, together with haemorrhage, represents the most common complication of therapeutic colonoscopy, although its incidence is very low and ranges between 0.1% and 2% of all colonoscopic procedure^[1]. The occurrence of colonic perforations during polypectomy can depend on several factors alone or in association with each other. Some of these risk factors are from physicians, and others depend on the polyp and the shape of its peduncle. There are few cases in which the main risk factor is represented by a malfunctioning therapeutic device. We report a case of a perforation of the colonic wall during an endoscopic polypectomy, caused by a defective device, which was promptly treated endoscopically by the apposition of endoclips.

CASE REPORT

A 48-year-old male patient was admitted complaining of rectal bleeding for the past two months accompanied with frequent episodes of constipation and diarrhoea. The patient underwent colonoscopy after preparation with 4 L PEG-Electrolyte solution. Endoscopy was performed after light sedation with intravenous 10 mg benzodiazepine (Valium®). The procedure showed a 1 cm in diameter sigmoid polyp with a short peduncle, and two other polyps of about 3 cm in diameter. One of these was larger with a 1.5 cm peduncle on the left flexure of the colon and the other was a sessile polyp on the right flexure. Endoscopic resection was started with the polyp at the right flexure after a submucosal injection of 12 mL 0.9% saline. Using an oval diathermic loop and electrocautery Olympus EUS 30®, the peduncle was sectioned with a mixed current (cutting 40W, coagulating 35W). During the initial section of the peduncle, the diathermy loop broke at one of its roots because of a manufacturing defect (Figure 1) so that its elastic tension was discharged on the colonic wall producing a transmural perforation. This was about 2 cm long and 3 cm away from the polyp and not bleeding possibly because of the high temperature of the device (Figure 2). The perforation was immediately noticed and promptly closed using two endoclips Olympus® (Figure 3). As the closure seemed stable and resistant, the patient was in good condition. Considering the bleeding risk of the partially excised polyp, the polypectomy was successfully and easily completed with a new diathermy loop as the



Figure 1 Defective device captured after the offending procedure.

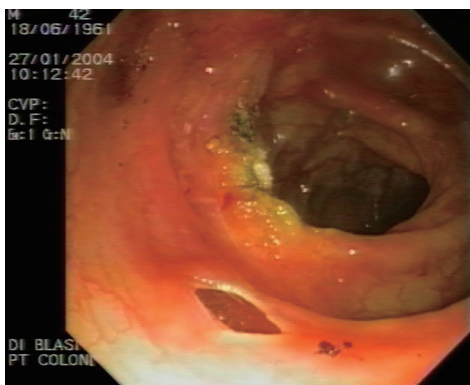


Figure 2 Transmural perforation of the colon, about 2 cm long and 3 cm from the polyp.

other two polypectomies, simpler and more distal, not needing further air insufflations. After the procedure, the patient reported modest right hypochondria pain, with no signs of shock, or peritonism. An abdominal X-ray examination was performed (Figure 4) and showed bilateral sub-diaphragmatic free air. Based on the stable general condition of the patient, his age and the very good colonic preparation, we decided to adopt a conservative attitude. The patient was kept with fluids and peripheral parenteral nutrition, and two doses of metronidazole 500 mg and amoxycillin-clavulonic acid 1 g were administered. The general condition of the patient consistently remained good without any increase of temperature, variation of haemodynamic parameters, or increase of WBC count. A second abdominal X-ray examination three days after the procedure showed a significant resorption of the sub-diaphragmatic air. Since there were no sufficient experiences in literature, we preferred to extend the hospital stay of the patient even if she was already dischargeable. The modest abdominal pain disappeared slowly and intestinal motility became normal after the 4th post-procedural day so that a light diet was introduced. The patient was finally discharged in good condition eight days after the procedure. A further X-ray examination 18 d later showed the complete resorption of the intra-peritoneal air and the patient was completely asymptomatic. The histopathological examination of

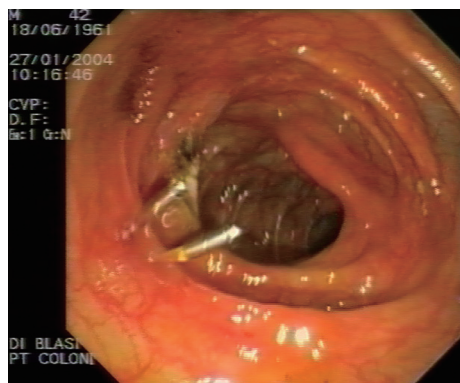


Figure 3 Two endoclips Olympus® are endoscopically positioned to repair the perforation of the colonic wall.

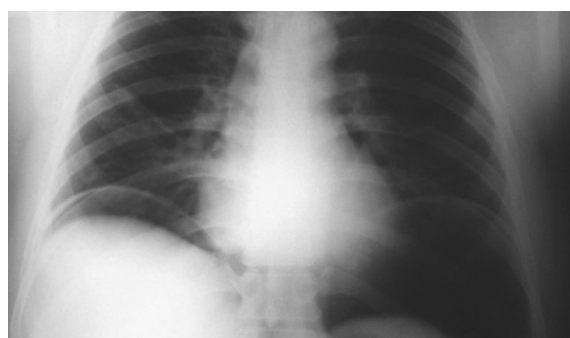


Figure 4 Abdominal X-ray examination performed soon after the successful conclusion of the endoscopic procedure, showing bilateral sub-diaphragmatic free air.

all the resected polyps were classified as tubulo-villous adenomas with moderate dysplasia and free peduncles, requiring no more surgical procedure.

DISCUSSION

The ideal management of colonic perforation following colonoscopic polypectomy remains elusive because its incidence is very low and estimated to be between 0.1% and 2% of all colonoscopic procedures^[1]. The possibility of such a rare occurrence can be related to several factors, some depending on the experience and the training of the endoscopist. Colonic perforation can be due to technical errors with consequent direct perforation of the colonic wall, or to the use of the wrong cutting current causing extensive necrotic damage of the wall. Other important risk factors are related to the pathology, the polyp itself, its shape and dimensions, and the type and size of its peduncle. Sessile polyps and polyps with short and thick peduncle are certainly associated with a higher risk of colonic perforation, as the procedures required for the endoscopic excision are not always simple. Rare but still possible, there are cases of perforation resulting from the improper functioning of a therapeutic device which is not related to the type of the polyp or the experience of the endoscopist. The treatment of colonic perforation during polypectomy is still controversial and

there are different treatment options to evaluate: the surgical treatment, either laparoscopic or laparotomic, the conservative non-operative treatment, and the endoscopic treatment. An endoscopist must maintain a high index of suspicion despite minimal or atypical symptoms and negative radiological studies, because perforation can be a complication with a high morbidity and mortality^[2]. The research of the best possible management is mandatory in all cases and immediate surgical consultation should always be sought. The trend is to be less invasive, using no surgery given the advantages in ICU care and antibiotics. Laparoscopically or laparoscopically assisted (minilaparotomy) surgery is also being increasingly used, with outcomes comparable to conventional laparotomy. Moreover, experience and advantages in accessories have enabled the endoscopic repair of iatrogenic perforation in recent years^[2]. There are only three cases in the English literature (PubMed) which report the endoscopic apposition of endoclips to repair a colonic perforation^[3-5], and all of them obtained as good results as ours. In our opinion, an individualized approach must be taken to manage the patient with an iatrogenic perforation, and several factors should be taken into consideration before making a choice of the treatment. Local factors such as the suspected septic contamination, the localization of the polyp, the dimensions of the lesion and the quality of colonic preparation before the procedure, are important in order to make the right treatment choice. Other factors are the general condition of the patient, the symptoms and the eventual peritoneal irritation. In case of a risk of peritoneal septic contamination, especially in a patient with uncertain conditions, the surgical treatment on an emergency basis has to be considered the only reasonable choice. In these cases, according to the literature, a laparoscopic repair, other than minimally invasive, can be also safe, effective and fast^[6], while a delayed surgery may sometimes prove fatal^[7]. The main benefit of the laparoscopic approach, compared to the traditional laparotomy, is seen in a more favourable postoperative status and in the possibility of definitive injury management^[8]. The possibility of a conservative or endoscopic solution by apposition of endoclips should also be considered in the patient in good general condition and when colonic preparation before the procedure is performed properly to minimize the risk of septic contamination. The case we reported is the fourth case described in the English literature of perforation following colonoscopy treated endoscopically

as a definitive treatment. There are also a few cases of endoclip apposition to treat duodenal perforation^[9,10] and colcutaneous fistula^[11]. To our knowledge, ours is the first case due to the improper functioning of a therapeutic device. Although a very careful consideration of the case is required, endoscopic repair may represent a feasible, simple, fast and successful procedure, which meets with the satisfaction of both patient and surgeon, with a high favorable cost-benefit ratio and a relatively short hospital stay of the patients when compared to an urgent surgical procedure after colonic perforation. The reported procedure is clearly considered to be neither always feasible nor a gold standard. In our opinion, a non-surgical endoscopic repair of iatrogenic rupture of the colonic wall during endoscopic manoeuvres in this case should be taken into high consideration.

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