

UNUSUAL RECTAL PERFORATION – AN INDIVIDUALISED APPROACH TO MANAGEMENT

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ABSTRACT

The management of rectal perforations is controversial. Surgical repair or resection and anastomosis is usually undertaken with faecal diversion in the management of traumatic perforations. Primary repair without colostomy is less commonly employed.

Five cases of rectal perforation seen in the Department of Colorectal Surgery, three from penetrating foreign objects and two from barium enema examination, are presented. The principles of management of patients with rectal perforations include faecal diversion, primary repair of rectal perforation and sphincter muscles, presacral drainage, parenteral antibiotics and distal bowel irrigation. This approach was used in the management of these five cases and the results were very satisfying.

Keywords: rectal trauma, rectal injury, colostomy

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INTRODUCTION

Rectal perforation is uncommon in civilian practice and most surgeons are unlikely to have much experience with their management. Mortality and morbidity following rectal perforation remain considerable⁽¹⁾. A dramatic fall in mortality following rectal perforation from 67% in World War I to 5.4% in World War II was attributed to the use of colostomy, presacral drainage, availability of antibiotics and blood transfusion^(2,3). Abcarian et al in 1989 reported a mortality of 2.5% and a morbidity ranging from 2.5 to 6.3%⁽⁴⁾, attributing this low mortality and morbidity to adherence to conservative principles of 'no anastomosis' in the overwhelming majority of cases. However, despite this dramatic fall in mortality, controversies still remain in the management of rectal perforations. One of the current issues is the question of primary repair or resection and anastomosis with or without defunctioning colostomies. The other issue concerns the efficiency of the defunctioning loop colostomies versus total faecal diversion.

Rectal perforation following barium enema examination is uncommon although Terranova et al reported that this complication occurred in 1% of all barium enema examination patients⁽⁵⁾ and carried a 50% mortality⁽⁵⁻⁷⁾. Radiologists and surgeons must be able to recognise them as early diagnosis is essential if mortality is to be decreased.

This report reviews five cases of rectal perforation managed in the Department of Colorectal Surgery, Singapore General Hospital from April 1989 to December 1991; three were from penetrating foreign objects and two from barium enema examination.

CASE REPORTS

Case 1

A 24-year-old construction worker fell from a height of fifteen feet and landed on a metal rod which penetrated the anal canal and perforated the anterior rectal wall. Abdominal examination showed

signs of peritonitis. An erect plain film showed free gas in the peritoneal cavity. Rectal examination under anaesthesia revealed an intact anal sphincter with anal mucosa laceration and an entry point perforation of the anterior rectal wall 8 cm above the anal verge. At laparotomy, a 3 cm perforation was found in the anterior aspect of the middle third of the rectum. Primary repair of the perforation was performed and a sigmoid loop colostomy constructed. Postoperative recovery was uneventful and closure of the colostomy was performed three weeks later. Immediate postoperative anal function was good and anal continence was full on review at twelve months.

Case 2

A 17-year-old student was impaled by a wooden stick used to support his bicycle seat when the seat fell off whilst he was cycling. Abdominal examination showed no signs of peritonitis. Rectal examination under anaesthesia revealed a perforation of the post anal skin two centimetres from the anal verge lacerating the external anal sphincter at that point and an extraperitoneal perforation into the lower third of the rectum 4 cm from the anal verge creating a 2 cm ragged defect. Wound debridement was performed and the anal sphincter and mucosa repaired in layers with interrupted 2/0 polyglactin sutures. No colostomy was thought necessary. He was also started on a week's course of antibiotics. Postoperatively, anal sphincter function was complete and the patient was discharged from subsequent follow-up after clinical review three months later.

Case 3

A 25-year-old women presented with massive bleeding per rectum and severe perineal and left vulva pain. She denied any history of sexual abuse. Clinical examination showed severe left vulva bruising but the vulva skin integrity was intact. Examination of the perianal region showed an intact anal sphincter and mucosa. Per rectal examination was impossible because of anal spasm and pain. Examination under anaesthesia revealed a large 4 cm perforation of the anterior rectal wall 4 cm from the anal verge leading into a large cavity in the left vulva region containing clotted blood. Evacuation of the blood clot resulted in brisk arterial haemorrhage. An incision was made over the left vulva and the haemorrhage from the cut arteries arrested. The extraperitoneal rectal perforation was repaired in two layers with polyglactin 2/0 sutures through the vulva incision. Rectal mucosa apposition was performed per anum with polyglactin 2/0 sutures. The vulva incision was closed primarily without drainage after adequate wound debridement and washing. She was given a week's course of parenteral antibiotics. Post-operative recovery was uneventful and anal function was full.

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Case 4

A 79-year-old woman had a perforated sigmoid carcinoma for which an emergency resection of the tumour with terminal colostomy and oversewing of the distal stump was performed in April 1989. Two months later, a re-anastomosis was attempted but the patient became acutely obstructed postoperatively. A laparotomy was done which showed dense pelvic adhesions and thus a transverse loop colostomy was constructed for a suspected anastomotic leak. In August 1991, a barium enema examination was performed as the patient requested that the stoma be closed. During the procedure the radiologist noted that the patient was in severe pain and bleeding from the rectum. Clinical examination revealed a tender 4 cm extraperitoneal perforation of the posterior wall of the rectum at the level of the puborectalis. There were signs of left iliac fossa tenderness and peritonism. Review of the barium films demonstrated a barium leak into the post rectal space. Examination under anaesthesia showed a 4 cm diameter perforation of the posterior rectal wall with extensive barium contamination. The barium was flushed out and debridement performed per anum. A Foley's catheter was left to drain the perforation per anum. A week's course of parenteral antibiotics was commenced. One week later, further barium and pus was evacuated under anaesthesia. She made good progress and the perforation was found to be granulating well on outpatient assessment three weeks later.

Case 5

A 70-year-old woman presented with fever and signs of peritonism after a barium enema examination for left-sided abdominal pain. The barium enema showed a constricting sigmoid carcinoma 25 cm from the anal verge. In view of her fever, a thorough septic work-up was done. However no localised source of sepsis was evident. Vigorous fluid resuscitation and parenteral antibiotics was commenced. She however remained febrile after 48 hours of observation and with a worsening of her peritonism, a laparotomy was done. Intraoperatively, a 4 cm posterior perforation of the rectum was found 8 cm below the sigmoid carcinoma. The retroperitoneum was found to be oedematous and containing large amount of pus and barium. The rectum was mobilised and the pus and barium washed out. We proceeded to perform a Hartmann's procedure removing the sigmoid carcinoma with the necrotic rectum. Large tube drains were inserted into the presacral space transperineally. Parenteral antibiotics were continued for a week. Post-operatively, she recovered remarkably and was afebrile on the second postoperative day. She was subsequently discharged two weeks later. She was very well on follow-up and she subsequently underwent a reversal of her Hartmann's procedure six months later.

DISCUSSION

Rectal perforation resulting from intentional or accidental causes had been known for a long time. The Chinese used rectal impalement to execute criminals. King Edward II of England was killed in 1327 by a rectal perforation to avoid external injury. Such perforations are invariably fatal. It was through experience gathered over the two World Wars that surgeons were able to decrease the previously high mortality rate to the present 2.5-5.4%⁽²⁻⁴⁾. However controversies still remain in the management of these cases.

Rectal perforations may be either intraperitoneal or extraperitoneal. Intraperitoneal perforations occur when the perforation involves the intraperitoneal part of the rectum and usually presents rapidly with signs of peritonitis and collapse as seen in Case 1. Signs of free intra-abdominal gas may be evident on clinical examination and X-ray studies. There is no necessity for barium study as urgent laparotomy is always mandatory and

barium will only cause further abdominal irritation. Immediate fluid resuscitation, broad spectrum antibiotics and a laparotomy are indicated and must be instituted urgently without delay if further morbidity and mortality are to be avoided.

During laparotomy, a careful search must be made for associated injuries to other organs especially the bladder and small intestine. Primary repair of the rectal perforation should be performed, if possible after sufficient debridement⁽⁸⁻¹¹⁾. Badly contaminated war injuries and large rectal defects however may make primary repair impossible. The use of a defunctioning stoma has been the subject of much discussion. Although loop colostomies have been shown to defunction the distal colon adequately in some studies⁽¹²⁻¹⁴⁾, other authors question its efficacy and argue for an end colostomy. Various modifications of this latter technique include the divided loop colostomy of Devine⁽¹⁵⁾, the Hartmann's type procedure and an end colostomy with a mucus fistula⁽⁸⁻¹⁰⁾. Another variation is the functional end colostomy which is constructed as a loop colostomy but with its distal end closed off. This allows for an easier colostomy closure without the need for a laparotomy as would be needed in the former alternatives.

Although faecal diversion is usually recommended in the management of rectal perforation complicated by extensive contamination or shock, this is not an absolute necessity if the patient is otherwise cardiovascularly stable and contamination minimal. Such cases can be treated by simple repair of the perforation and close post-operative monitoring.

Whether or not the rectal perforation is repaired primarily, irrigation of the distal colostomy limb is important as the distal limb contains faecal mater and a decrease in morbidity from 72% to 10% had been noted when the distal limb irrigation is practised^(16,17).

Transperitoneal drains are not necessary if peritoneal lavage is adequate and primary repair with a defunctioning colostomy constructed⁽¹⁸⁾. If perforation of the rectum occurs anteriorly, then primary repair with colostomy or total faecal diversion without drainage is sufficient. However the presacral space should be drained if posterior rectal perforation had taken place and this has been shown to decrease the incidence of pelvic infections by 50%⁽¹⁹⁾.

A more recent innovation had been the use of the Coloshield intracolonic bypass tube (ICBT) (Deknatel; Lake Success, NY) without a concomitant colostomy in the management of rectal perforation⁽²⁰⁾. A primary repair or resection and anastomosis is carried out for the rectal perforation and the anastomosis protected with the intracolonic bypass device. This diverts faecal stream without the use of colostomy.

Extraperitoneal rectal perforation involves the lower third of the rectum or anus. They present as perineal pain or bleeding per rectum. The management of such cases should include broad spectrum antibiotics as well as adequate surgical debridement, drainage and repair⁽²¹⁻²³⁾. A defunctioning colostomy is usually not required in these cases.

Rectal perforation as a result of barium enema examination is an unusual but recognised complication of the procedure. With perforation, barium leaks into the perirectal tissue or free peritoneum and causes severe inflammatory reaction and granuloma formation with fibrosis. Barium tends to stain the peritoneum and perirectal tissues and thus favours bacterial growth resulting in local suppuration and septicaemia.

Barium enema related rectal perforations are usually caused by pathological conditions weakening the rectal wall or poor technical execution of the procedure. Unfavourable prognostic factors include extensive extravasation of barium, delay in diagnosis and presence of faeces in the rectum⁽⁵⁾.

These patients require broad spectrum antibiotics and immediate surgical debridement. A defunctioning colostomy is usually necessary and mandatory in intraperitoneal rectal perforations. During the laparotomy, the rectum is dissected and according to the principles discussed earlier, the rectal perforation is either repaired or resection performed. Distal loop irrigation is important and must be carried out carefully. It is impossible to debride extensive areas of barium contamination and transperitoneal or transperineal drainage is usually employed to enable the discharge of barium and purulent collections from the presacral and pelvic space. Primary repair of the rectal perforation caused by barium enema examination may be harmful as this prevents drainage of barium and may therefore lead to a build up of pus and generalised septicaemia.

In conclusion, an individualised approach to the management of rectal perforation based on sound surgical principles would result in decreased morbidity and mortality in this uncommon form of trauma.

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