

# Barium Enema for Treatment for Diverticular Bleeding

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## ABSTRACT

Diverticula of the colon are the most common cause of lower gastrointestinal bleeding in adults. In cases of persistent loss of blood or severe acute hemorrhage, treatment is required. However, if these modern intervention techniques are inadequate, surgical resection of the colon may be required. Diverticular bleeding often concerns patients with a high surgical risk, so a less invasive treatment is preferable. A forgotten but excellent treatment, namely that of the obsolete barium contrast enema to staunch diverticular bleeding, is the focus of this case series. We describe 3 patients who were successfully treated with barium enema.

## INTRODUCTION

Diverticula of the colon are the most common cause of lower gastrointestinal bleeding in adults. In 75% of the cases, the bleeding ceases spontaneously. In cases of persistent loss of blood or severe acute hemorrhage, treatment is required. Endoscopic intervention is the first choice of treatment. If further intervention is required, the bleeding origin is identified by the interventional radiologist and embolization is performed. However, if these modern intervention techniques are inadequate, surgical resection of the colon may be required.<sup>1, 2</sup>

Diverticular bleeding often concerns patients of advanced age, frequently with extensive comorbidities and thus a high surgical risk. Given the risks of acute colectomy, a less invasive treatment is preferable. A forgotten but excellent treatment, namely that of the obsolete barium contrast enema to staunch diverticular bleeding, is the focus of this case series. The working mechanism of the enema in cases of hemorrhage is unknown; however, impaction seems to play an important role. Barium enema has no side effects and is not absorbed into the body.

## CASE REPORT

**Patient 1:** An 82-year-old man was seen in June 2012 at the emergency department with hypovolemic shock as a result of rectal bleeding. The patient had extensive comorbidity, with cardiac and pulmonary burdening and chronic renal disease. The patient was stabilized with fluid resuscitation and blood transfusions. At colonoscopy, substantial bleeding and thrombi were observed 35–40 cm from the anus, with no possibility of endoscopic intervention. The patient was referred to the interventional radiologist for coiling of the bleeding vessel. Computed tomography (CT) angiography revealed an arterial hemorrhage focus at the level of the distal descending colon. An attempt to embolize the inferior mesenteric artery was unsuccessful. Hemicolectomy could not be performed because the patient was judged unfit for surgery due to extensive comorbidities. Barium enema was given, and the bleeding immediately stopped. In February 2014, subsequent hemorrhage was successfully retreated with barium enema. During almost 3 years of follow-up, the patient experienced no further rectal bleedings until his death at the age of 85 from an unrelated cause.

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**Figure 1.** Abdominal X-ray with diverticula in the left colon filled with barium.

**Patient 2:** A 68-year-old man with no relevant medical history was admitted in September 2013 after suffering collapse due to substantial rectal bleeding. No active bleeding was found on either CT angiography or colonoscopy. However, extended diverticulosis was observed. The rectal bleeding was therefore ascribed to diverticular hemorrhage. Despite multiple blood transfusions, the hemoglobin level remained low (4.0–5.0 mmol/L). CT angiography was repeated 1 week later, and again no bleeding focus was found. The patient suffered hypovolemic shock on the same day. He was transferred to the intensive care department. The surgical consultant advised to administer a rectal barium enema to prevent acute colonic resection. The bleeding ceased, and the patient became hemodynamically stable with a rising hemoglobin level. Figure 1 shows the X-ray with diverticula in the left colon filled with barium enema. At his 6-month follow-up, he had not experienced any further rectal bleeding.

**Patient 3:** A 77-year-old man was brought to the hospital by ambulance in August 2015 after collapse due to a significant episode of painless rectal bleeding. The patient had a history of severe obstructive sleep syndrome and chronic myelomonocytic leukemia. Upon admission, he was stable, and his hemoglobin had dropped by 2.0 mmol/L in comparison with previous levels of 8.8 mmol/L, measured earlier that year. The

following day, his hemoglobin had decreased further to 4.5 mmol/L, and poly-transfusion was commenced. During the following days, several attempts to identify the bleeding using colonoscopy, CT angiography, and video capsule investigation were unsuccessful. When extensive diverticulosis was seen, colonoscopy was repeated. Even though no bleeding source could be located, barium enema was performed, and the bleeding ceased. The patient was discharged 3 days later. The patient was satisfied with the barium enema treatment, and he experienced no further rectal blood loss during 26 months of follow-up (length of follow-up due to other conditions).

## DISCUSSION

Although we have no strict statistical evidence that barium enema caused hemostasis of diverticular bleeding in our retrospective case series of 3 patients, our results are in line with favorable outcomes described in 2 recent studies.

In 1970, rectal barium treatment was first described by Adams et al.<sup>3</sup> This treatment causes hemostasis through local pressure, thrombosis, and compression of the arteries in the diverticulum.<sup>4</sup> In Japan, several retrospective studies have shown an increase of diverticular bleeding.<sup>5</sup> Recently, the barium enema method has reappeared, especially in Japan.

In 2011, a barium enema was used to treat patients in whom the location of the diverticular bleeding could not be identified when hemostasis could not be achieved with endoscopic intervention. Of the patients who were admitted with colonic diverticular bleeding, 69% continued to bleed despite conservative supportive treatment during the first 3 hours of hospitalization; perhaps long-term conservative treatment could have decreased this percentage.<sup>6</sup> Two patients needed surgery or angiography for hemostasis. Immediate endoscopic hemostasis was attempted in 46 patients, and 37 patients responded (group A). The non-responders also underwent therapeutic barium enema within the next 7 days (group C). In the 11 remaining patients (group B), the source of bleeding was undetectable by endoscopy, so barium enema was performed. This study reported no difference in the number of relapses between the endoscopic group A (48.6%) and the barium group B (54.5%). Group C, who received primary endoscopic hemostasis and barium enema, had a lower rate of rebleeding (22.2%), but this difference was not significant.<sup>6</sup>

A recent randomized, controlled trial from 2015 examined 54 patients in whom diverticular bleeding spontaneously ceased after admission; 27 patients were treated with high-dose barium impaction therapy and compared to 27 patients who received conservative treatment.<sup>7</sup> The follow-up period was 2 years. During the hospitalization period, 4 patients in the conservative group suffered a re-bleed; zero patients in the barium enema group experienced a re-bleed. After discharge, 12

recurrent bleeds were experienced by the patients who were treated conservatively. In the group that received barium treatment, 5 patients suffered a re-bleed, which is significantly lower than the conservative group. Length of hospital stay was significantly shorter in the group who received barium treatment. In addition, the barium group required fewer blood transfusions, although this difference was not significant.<sup>7</sup>

Although the barium enema is considered an obsolete treatment, it can be performed relatively safely and noninvasively. It should be considered before an invasive colon resection, if modern intervention techniques cannot arrest diverticular bleeding or when it concerns a high-risk patient.

## DISCLOSURES

Author contributions: All authors contributed equally to the manuscript. B. van Dijk is the article guarantor.

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