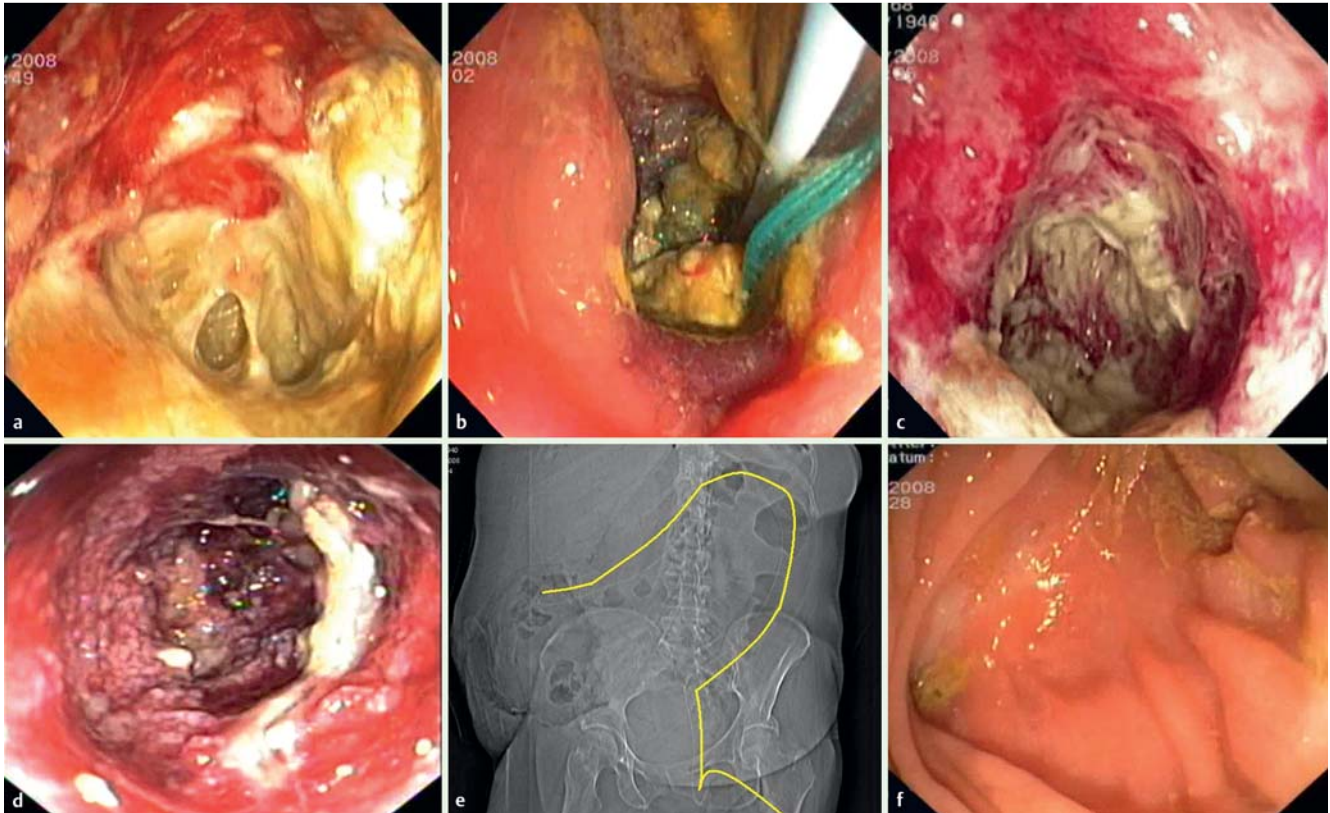


## Endoscopic intracavitary vacuum sponge therapy of anastomotic leakage in the proximal colon after right-sided colectomy



**Fig. 1** Endoscopic intracavitary vacuum sponge therapy of anastomotic leakage in the proximal colon after right-sided colectomy.  
**a** Endoscopic examination showed an anastomotic defect of 20 mm in diameter opening into an abscess cavity of 40 mm in diameter.  
**b** The sponge was placed through the anastomotic defect and into the abscess cavity.  
**c** The sponge was replaced on day 7 and the wound cavity showed developing granulation.  
**d** After 12 days of therapy the wound had reduced to the size of the sponge and showed developed granulation tissue.  
**e** Radiologic image of the vacuum sponge system in place; the drainage tube is marked by a yellow line.  
**f** Follow-up colonoscopy after 1 month showed complete healing of the anastomotic defect without stenosis.

Anastomotic leakage is the most severe complication following colon resection. Surgical treatment includes resection of the anastomosis or fecal diversion via ileostomy or colostomy. Since 2006 we have adopted the principle of intracavitary vacuum therapy to treat patients with various intestinal defects [1–3]. This case report represents the first description of successful endoscopic treatment of anastomotic leakage in the proximal colon after right-sided colectomy using intracavitary vacuum sponge drainage. A 68-year-old female patient with inflammatory colon carcinoma (G2, pT4, pN0 0/20, M0) underwent right-sided colectomy with partial abdominal wall resection. Four revision operations were necessary

due to an infection of the median laparotomy wound. Computed tomography scanning showed no intra-abdominal abscess formation. At day 68 after colectomy, the patient underwent colonoscopy due to the development of diarrhea. Endoscopy showed an anastomotic defect of 20 mm in diameter opening into an abscess cavity of 40 mm in diameter (● Fig. 1a). A stomach tube (Ventrol, size 14; Covidien plc, Mansfield, Massachusetts, USA) was inserted into polyurethane foam (EndoSPONGE; B-Braun Medical Ltd, Sheffield, UK) and secured by suture. The sponge was size-adjusted to 1 × 1 × 2.5 cm and grasped with a tripod-equipped endoscope and hence brought to the ileotransversostomy under propofol sedation by

means of normal colonoscopy. After placing the sponge through the anastomotic defect and into the abscess cavity, a vacuum device (V.A.C. ATS; Kinetic Concepts Inc., San Antonio, Texas, USA) was connected and set to continuous, high-intensity 125-mm Hg subatmospheric pressure, resulting in the intracavitary fixation of the sponge and closure of the defect (● Fig. 1b). After 7 days the suction was discontinued, and the drain with the attached sponge was gently extracted and replaced as described above. Liquid oral nutrition was possible throughout the 12 days of therapy. The sponge was changed once on day 7 of therapy. The wound aspect had changed completely: necrosis adhesive to the

sponge was removed with the sponge, and showed developing granulation tissue (● Fig. 1c). The vacuum sponge therapy was completed after 12 days. The wound cavity had reduced to the sponge diameter and contained developed granulation tissue (● Fig. 1d). The sponge did not dislocate during therapy. ● Fig. 1e shows a radiologic image of the vacuum sponge system in place (the drainage tube is marked by a yellow line).

In the absence of any signs of inflammation in either clinical or laboratory examination the patient returned to full oral nutrition within days. Follow-up colonoscopy after 1 month showed complete healing of the anastomotic defect without stenosis (● Fig. 1f).

Anastomotic dehiscence following right colonic resection is rare and in general leads to revision laparotomy, often requiring deviation ileostomy. The diagnosis is achieved by colonoscopy, as this allows the determination of the location and size of an anastomotic defect, perfusion of the adjacent tissue components, as well as signs of local inflammation. The most important prerequisite for any kind of vacuum therapy is the compartmentalization of the perianastomotic wound cave. Anastomotic dehiscence with clinical signs of peritonitis has to be excluded from this therapeutic approach and requires surgical intervention. If the anastomotic defect is suitable for vacuum ther-

apy, it can be applied during the course of the diagnostic colonoscopy.

In the wound cavity, the sponge is fixed only with suction from the vacuum device. We used a continuous negative pressure of 125 mm Hg according to our experience in the therapy of surface wounds and anastomotic rupture following rectal, esophageal or gastric resection. In another patient with anastomotic leakage after right-sided colectomy who was treated likewise, healing was achieved after 5 days of therapy. Yet in that case, we observed dislocation of the sponge drainage twice, which was most probably due to insufficient negative pressure. A higher negative pressure might lead to better fixation of the sponge in the wound cavity and can be applied according to the local findings.

In selected patients, the vacuum sponge therapy offers the opportunity for treatment of anastomotic leakage after right-sided colon resection solely by means of endoscopy.

**Competing interests:** Dr. Loske and Prof. Dr. Müller have received honoraria from BBD Aesculap for organizing and delivering a workshop on vacuum therapy of anastomotic dehiscence following resections in the upper and lower gastrointestinal tract.

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**G. Loske, T. Schorsch, C. Müller**

Department for General, Abdominal, Thoracic, and Vascular Surgery, Katholisches Marienkrankenhaus Hamburg gGmbH, Hamburg, Germany

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## Corresponding author

**G. Loske, MD**

Department for General, Abdominal, Thoracic, and Vascular Surgery  
Katholisches Marienkrankenhaus Hamburg gGmbH  
Alfredstraße 9  
22087 Hamburg  
Germany  
Fax: +49-40-25461400  
loske.chir@marienkrankenhaus.org