Rectal Perforation after Anorectal Manometry Following Preoperative Chemoradiotherapy and Low Anterior Resection – Report of a Case –

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Anorectal manometry is widely used to evaluate anorectal function. Few reports have described complications resulting from this procedure. A 47-year-old male underwent preoperative chemoradiotherapy and a low anterior resection for rectal cancer. The patient underwent anorectal manometry at postoperative 8 months. A rectal perforation was diagnosed shortly thereafter. The patient was initially managed conservatively using percutaneous drainage and parenteral antibiotics and then discharged on day 60 after the event. One month later, a colo-cutaneous fistula and expanding abdominal fasciitis developed. The patient underwent surgical exploration, drainage, resection of the rectum including the fistula, and redo-coloanal anastomosis with a diverting ileostomy. The patient discharged without complications on postoperative day 25. Anorectal manometry should be performed with particular care in patients who have undergone radiotherapy and anastomosis at the rectum.

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INTRODUCTION

Anorectal manometry is widely used to evaluate anorectal function. Anorectal manometry can allow objective evaluation of internal and external anal sphincter function and is helpful in assessing the level and severity of obstetric, surgical, or traumatic anal sphincter injury. Sphincter-saving surgery for mid and lower rectal cancer has become more common, and while anorectal manometry is used to assess anorectal function, there have been few reports detailing the complications resulting from this procedure. The present report describes a case of rectal perforation caused by anorectal manometry.

CASE REPORT

A 47-year-old male with rectal cancer received preoperative chemoradiotherapy (2 cycles 5-FU/5,040 cGy) and underwent a low anterior resection and diverting loop ileostomy at the 7th week after completion of the radiotherapy. The patient received postoperative adjuvant chemotherapy (4 cycles 5-FU). The loop ileostomy was taken down at the postoperative 5th month. To determine the effect of surgery on the function of the anal sphincter, we performed anorectal manometry both prior to surgery and again at the postoperative 8th month in the outpatient clinic.

The anorectal manometer consisted of an 8-channel water perfusion pump system (PIP-4-8, Mui Scientific, Ontario, Canada) and a balloon-attached catheter (Zinetics Manometric Catheter, Medtronic, Copenhagen, Denmark). During the measurement of the rectal sensory volume, the balloon was not smoothly decompressed, resulting in the...
balloon catheter being withdrawn forcefully under tension. At that time the patient did not mention being in any pain or discomfort. The patient returned home following the manometry session. However, immediately upon arriving at home, the patient experienced severe abdominal pain and returned to the outpatient clinic. The patient was admitted showing the following vital signs: blood pressure, 94/53 mm/Hg; pulse rate, 80 beats/minute; respiration rate, 22 breaths/minute; body temperature, 36°C. The patient complained of chilling. A physical examination revealed tenderness, rebound tenderness, and abdominal muscle guarding in the lower abdomen. A complete blood count showed the following: white blood cell count, 1,120/μl (absolute neutrophil count, 820/μl); hemoglobin level, 10.6 g/dl; platelet count, 110,000/μl. A plain abdominal radiograph showed free air beneath the diaphragm (Fig. 1). A computed tomography (CT) scan of the pelvic cavity showed free air around the rectal anastomosis (Fig. 2). The diagnosis was an iatrogenic rectal perforation following the anorectal manometry. Stable vital signs were maintained, abdominal pain was controlled with analgesics, and the peritoneal irritation signs improved with conservative treatment consisting of NPO, fluid therapy, and parenteral antibiotics. On this basis, a conservative approach was maintained.

On the 6th day of admission, a follow-up CT scan showed an abscess in the pelvic cavity, resulting in a percutaneous drain being established. Further follow-up CT scans revealed that the pelvic abscess was gradually resolving. A CT scan on the 41st day of admission showed that the abscess had resolved, so the percutaneous drain was removed. By the 60th day of admission, the patient was able to tolerate a regular diet and pass stools via the anus, and was therefore discharged. Fifteen days after discharge, the patient was readmitted with an intra-abdominal abscess. Conservative treatment, including parenteral antibiotics, did not prevent development of a colo-cutaneous fistula and expanding abdominal fasciitis. On the 14th day after readmission, an exploratory laparotomy

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Fig. 1. Simple abdominal radiograph showing free air beneath the diaphragm.

Fig. 2. Computed tomography scan of the pelvic cavity showing free air around the rectal anastomosis.

Fig. 3. Resected specimen showing a fistula opening (white arrow) proximal to the anastomosis.
was performed. The peritoneal cavity contained fecal material and abscesses, and a fistula was observed between 5 cm proximal to the anastomosis and the insertion site of the previously positioned percutaneous drainage tube (Fig. 3). The patient underwent a segmental resection of the colon and neorectum involved with the fistula, a redo-coloanal anastomosis, copious intraabdominal irrigation, and a diverting ileostomy. At postoperative day 25, the patient discharged without any complications.

DISCUSSION

There are few reports regarding complications following anorectal manometry.1,2 Lee et al.1 reported two cases of colorectal rupture during measurement of the maximal tolerable volume in the early postoperative period; one case at one month after a low anterior resection due to rectal cancer, and the other at three months after Delorme’s procedure due to rectal prolapse. Those authors suggested that it might be best to avoid measurement of the maximal tolerable volume in the early postoperative period. Cho et al.2 reported a case of perforation at the level of the rectosigmoid junction following anorectal manometry in a 63-year-old male with grade III hemorrhoids and partial mucosal prolapse. In that case, the patient was not in a postoperative state. The authors surmised that the perforation might have been caused by penetration of the colonic wall by the catheter. They suggested that manometry should be performed with great care, especially in the early postoperative period or in young and old patients who may not express or feel sensation during the examination.

In the present case, the patient had undergone preoperative chemoradiotherapy and a low anterior resection. Anorectal manometry was performed twice, just prior to the resection and at three months after the ileostomy take-down (eight months after resection). The pre- and the postoperative manometry procedures were identical. The rectal perforation was likely the result of a balloon expansion that placed too much pressure on a neorectal wall that was in a state of decreased distensibility and elasticity due to radiotherapy and postoperative changes.

Radiation injury to the gastrointestinal tract occurs as a biphasic process. Early injury occurs 4~5 weeks after radiotherapy and involves mucosal cell damage, which results in enterocolitis, including diarrhea. Late injury involves damage to vascular and connective tissue, which leads to vasculitis, diffuse collagen deposition, and fibrosis. This late injury causes complications such as bleeding, stricture, obstruction, and perforation and sometimes requires surgical treatment. These complications can occur between a few months to over 30 years after radiotherapy.3 As a result of the present case, we no longer measure maximal tolerable volume in the postoperative period.

The rectum is not a closed space. The balloon at the end of the catheter can be expanded in both the transverse and the longitudinal directions. Also, decreased distensibility of the rectum could make the balloon expand more in the longitudinal direction than in the transverse direction. Because the volume of the balloon may not be an exact barometer for measuring the rectal volume, anorectal manometry may not be a necessary examination to evaluate the function of the rectum after surgery or radiotherapy. In conclusion, anorectal manometry should be performed with particular care in patients who have undergone surgery and/or radiotherapy due to rectal cancer.

REFERENCES

항문직장내압검사(anorectal manometry)는 항문직장의 기능을 평가하는 데 널리 사용되고 있다. 하지만 이 시술로 인해 발생하는 합병증에 대한 보고는 매우 드물다. 직장암을 진단받은 47세 남자 환자로, 수술 전 방사선화학요법 및 저위전방절제술을 시행 받았다. 수술 후 8개월째 항문직장내압검사를 시행 받은 직후 직장 천공이 발생하였다. 환자는 초기에 경피적 배액술 및 비경구 항생제를 이용한 보존적 치료를 받고 직장 천공 60일째 퇴원하였다. 1개월 후, 대장-외부 누공과 광범위한 복막 근막염이 발생하였다. 개복술을 시행해 배액술, 누공을 포함한 직장 절제, 그리고 결장항문 문합술과 환상형 회장루 조성술을 시행 받았다. 수술 후 25일째 합병증 없이 퇴원하였다. 저위 직장암으로 수술 전 방사선치료를 받은 경우 항문직장내압검사를 시행할 때에는 각별한 주의가 요구된다.

중심단어: 항문직장내압검사, 직장 천공, 방사선치료