Retrograde Colonic Stent Implantation Assisted by Percutaneous Colostomy: A Case Report

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We present a patient with disseminated pancreatic cancer who presented with symptoms of acute obstruction of the sigmoid colon. It was not possible to pass the region of the obstruction with a guide wire under colonoscopy and fluoroscopy. Consequently retrograde implantation of stents was performed successfully with the assistance of a minimally-sized colostomy when compared with a previously described procedure in the literature.

Index words: Colorectal neoplasms
Stents
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Palliative treatments for malignant stenosis or obstruction of the colon include surgical and interventional therapy options. With an acceptable risk level, palliative tumor resection is the treatment of choice depending on tumor location, tumor extension, and others. If surgical therapy is not a reasonable option, an alternative option would be the implantation of a stent.

Unfortunately, the implantation of a stent through the anus can often be difficult or impossible because of factors such as the inability to pass a guide wire through the lesion due to complete obstruction or obstruction over a long segment, as well as anatomic difficulties such as a severely angulated and "fixed" sigmoid, which prevents advancement to the site of the lesion (1). Although some of these factors can be surmounted, it is not always the case. In this case, inability to pass a guide wire through the lesion was due to a long segmental obstruction, which made stent implantation impossible.

However, it was made possible through the anus with the assistance of percutaneous colostomy. This strategy was allowed with the permission of the patient and his family prior to the procedure.

The use of percutaneous colostomy for the implantation of a stent has been described in a prior study (2). But, in our case, the use of percutaneous colostomy assisted the implantation of a stent through the anus, with several advantages.

Case Report

A 52-year-old man with progressive abdominal bloating and constipation was referred to our interventional radiology department. The patient had a history of pancreatic cancer with invasion in the celiac trunk and splenic artery and had been treated with radiation and chemotherapy. On contrast material-enhanced computed tomography (CT) of the abdomen, luminal narrowing of the sigmoid colon accompanying distention of proximal colon was observed. A sigmoidoscopy performed after two weeks showed poor bowel preparation, rectal hemorrhage without a definite bleeding focus or mass. A barium enema, performed 2 days after the sigmoi-
doscopy, showed complete obstruction of the sigmoid colon (Fig. 1). Because of the patient’s clinical situation (inoperable tumor at an advanced stage), a decision was made to implant a colonic stent as a final palliative treatment.

A first attempt to implant a stent through the anus under fluoroscopic guidance, performed 2 days after barium enema, resulted in failure because of complete obstruction.

The patient strongly favored the implantation of the stent to improve his aggravating abdominal bloating and deteriorating quality of life. One day later, the decision was made to perform a retrograde stent implantation assisted by an antegrade percutaneous colostomy of the descending colon. The colon proximal to the obstruction remained dilated due to the obstruction and was thus clearly visualized under fluoroscopy and sonography. A percutaneous colostomy of the descending colon was performed using a gastrointestinal anchor suture set (Cope Gastrointestinal Suture Anchor Set; Cook, Bloomington, MA, USA), such as is used for percutaneous gastrostomy and cecostomy. The descending colon was anchored to the lateral abdominal wall using two anchor suture sets (Fig. 2), and a stiff angled 260-cm-long, 0.035-inch exchange guide wire, which was inserted through an 18 G Angiocath needle directed toward the obstruction. A 6 Fr introducer sheath (Super Arrow-Flex Percutaneous Sheath Introducer Set; Arrow International Inc., Reading, PA, USA) and a 5 Fr Angled Taper angiographic catheter (Radifocus Glidecath; Terumo, Tokyo, Japan) were used to negotiate the guide wire past the obstruction (Fig. 3). The flexible guide wire was advanced past the anus. A 24 mm – 10 cm dual type, expandable nitinol stent (Hercules SP Colorectal Stent; S & G Biotech, Seoul, Korea) was inserted over the guide wire via the anus. The stent was short when compared to the lesion length and showed little expansion. Hence, an additional 24 mm – 10 cm dual type ex-

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**Fig. 1.** A barium enema, performed 2 days after the sigmoidoscopy, showed complete obstruction of the sigmoid colon (black arrow). Also, extrinsic compression of the proximal rectum was observed due to a known rectovesical mass.

**Fig. 2.** The descending colon was anchored to the lateral abdominal wall using two anchor suture sets (arrow heads).

**Fig. 3.** After anchoring the descending colon to the lateral abdominal wall, the colon was punctured with an 18 G Angiocath needle. Next, a 6 Fr introducer sheath and 5 Fr Angled Taper catheter (black arrow) were used to negotiate the guide wire past the obstruction.
A 6 Fr sheath was left in place through the stents and the colostomy to allow the tract to mature without losing access to the colon and the drainage of colon gas before the expected expansion of the stents.

The patient progressed well in the days following the placement of the stents, with both clinical symptoms and radiologic appearance resolving (Fig. 5). The patient was able to defecate without difficulty. No complications associated with a sheath were observed and the outflow of bowel contents through a sheath decreased continuously. The patient died 27 days after the implantation of the stents as a consequence of multi-organ failure secondary to advanced disease. The stents remained functional until the time of death.

**Discussion**

In addition to the lower morbidity and mortality than colonic surgical bypass, morbidity and mortality rates of which ranges from 9% to 39.5% and from 7.5% to 20.4%, respectively (3), stent implantation provides a comparable prognosis and a favorable advantage for avoiding a colostomy and retaining quality of life. In recent years a publication has confirmed the efficacy of stent implantation for the treatment of malignant colorectal obstruction, showing high technical and clinical success rates: 66.6% to 100% and 46 to 100%, respectively (4).

For a manifest obstruction, the implantation of a self-expandable metal stent is considered to be a suitable, minimally invasive therapeutic option. Unfortunately, it is often impossible, especially in the case of tumors accompanying complete colonic obstruction of a long segment. The intervention of an endoscopist often fails because it is not possible to reach or negotiate past the obstruction.

The use of percutaneous colostomy for the implantation of stent in the treatment of malignant obstruction of the colon has previously been described (2). The procedure was chosen due to intestinal perforation during the endoscopic intervention.

The antegrade stent implantation via antegrade percutaneous puncture of the colon required too large colostomy. On the contrary, the retrograde stent implantation assisted by antegrade percutaneous colostomy has some advantages, in that it requires a minimally-sized colostomy and the colostomy can serve as direct decompressor of the distended colon.

We put forward the antegrade percutaneous colostomy as an assistant in the case of a failed retrograde stent implantation along the colonic obstruction or as decompressor in the case where the antegrade passage through
the colonic obstruction is impossible.

Percutaneous puncture of the colon has been described in the literature in the treatment of various conditions. Nearly all reports have stressed the importance of anchoring the colon firmly to the anterior abdominal wall to avoid the danger of fecaloid peritonitis. In addition, different methods are described such as using a gastrointestinal anchor suture set and a retroperitoneal approach under CT-guidance [5]. The spontaneous closure of a fistulous tract following removal of the catheter has been reported in the literature [6]. Certain authors have estimated that the amount of time necessary to allow the tract to mature and preclude the occurrence of peritonitis on removal of the catheter is around 10 days [6]. However, in this case, we could not remove the catheter due to patient’s poor condition.

Two circumstances warranted the use of this approach in our patient. First, the obstruction was caused by malignant stenosis resulting from tumor spread during the course of metastatic disease, resulting in poor life expectancy; hence stent implantation was a final palliative treatment offered as the best hope of being able to avoid surgery while resolving symptoms and maintaining quality of life. Second, the obstruction could not be negotiated; even with the aid of sigmoidoscopy. Consequently, a decision was made to combine two therapeutic methods: percutaneous colostomy and implantation of a palliative colonic stent. In such cases it is extremely important to achieve good decompression of the descending colon through the stent, so that the catheter can be removed without risk of peritonitis or formation of an enterocutaneous fistula. In the case reported here, the procedure resolved the patient’s symptoms without causing complications.

The percutaneous approach route has previously been described in the literature for the implantation of colonic stents [2]. Our procedure has some differences and advantages compared to the previously described procedure in the literature. First, the retrograde passage through the obstruction failed under endoscopic and fluoroscopic guidance without complications such as perforation. Therefore, the percutaneous approach was the selected alternative method. Second, the guide wire was passed from sheath to the anus and then the stents were inserted over the guide wire via the anus. Hence, the retrograde insertion of stents did not require a large colostomy. In contrast, the antegrade insertion of the stents in the previous case requires a large colostomy. The delivery system of stents in this case had an outer diameter of 14 Fr.

In conclusion, the retrograde implantation of a stent, assisted by percutaneous colostomy, may offer an alternative method in cases of malignant obstruction that are inaccessible endoluminally through the anus. Also the 6 Fr colostomy has little chance of pericatheter leakage when the 8 Fr pigtail catheter should be inserted in the event of a failed stent placement.

References
피부경유 큰창자 창범술의 도움을 받고 시행한 역행성 큰창자 스텐트 삽입: 증례 보고

임 형 근・한 현 영・전 동 진

S-자 형 경장의 급성 폐색 증상으로 내원한 파종성 췌장암환자가 있다. 대장내시경과 투시하에서 유도선을 폐색부위로 통과시키는 것은 불가능하였다. 이번 역행성 스텐트 설치는 이전의 다른 문헌에서와는 달리 최소 직경의 스텐성 피부경유 큰창자 창범술의 도움을 받아 성공적으로 이루어졌다.