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## Minimally invasive surgery with adenocarcinoma of jejunum diagnosed pathologically before surgery: A case report

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## ABSTRACT

**INTRODUCTION AND IMPORTANCE:** We report a rare case of a patient diagnosed with adenocarcinoma of the jejunum.

**PRESENTATION OF CASE:** The patient was a 58-year-old female patient who was tested for vomiting and dyspeptic symptoms at a local hospital and visited the hospital due to suspected small bowel obstruction. CT enteroscopy performed at our clinic revealed “progression of focal wall thickening in small bowel with proximal bowel dilatation”, and it was necessary to differentiate between malignant and infectious lesions. Balloon enteroscopy was planned for endoscopic observation up to the small bowel. The biopsy result was confirmed as adenocarcinoma with moderated differentiated. The patient underwent small bowel resection and anastomosis using standard laparoscopic surgery. Jejunum resection was performed by securing a safety margin of 10 cm or more, and sufficient LN dissection was also performed. The patient was discharged from the hospital without any specific complications, and as a result of pathology examination, it was confirmed as a stage 2 high risk group, and further treatment is in progress.

**CLINICAL DISCUSSION:** There are few reports of patients diagnosed with adenocarcinoma of the jejunum through symptoms of obstruction of the small intestine.

**CONCLUSIONS:** We report on a case of laparoscopic surgery for a rare jejunal cancer confirmed histologically before surgery.

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## 1. Introduction

The small bowel occupies approximately 90% of the mucosal surface of the gastrointestinal (GI) tract. However, jejunal cancer is very rare and accounts for only 1% of all GI malignancies [1,2]. Despite this historical rarity, the incidence rate is increasing rapidly by more than 3% per year. In the United States in 2020, there were approximately 11,110 new diagnoses and 1,700 reported deaths from jejunal cancer, which represents 1–3% of all digestive tumors [3].

There are few reports of patients diagnosed with adenocarcinoma of the jejunum based on symptoms of obstruction of the small intestine [4,5]. We review the relevant literature and discuss possible treatment options in this case.

This case report has been reported in line with the SCARE Criteria [6].

## 2. Presentation of case

A 58-year-old female patient was admitted to the hospital through a local clinic due to vomiting and dyspepsia that had started several days prior. Symptoms of epigastric discomfort were common after meals, though no weight loss was observed. The patient had no history of hypertension or diabetes, and had no history of taking medication. The patient reported no family history of malignancy, hypertension, or diabetes, though she has a personal history of laparoscopic surgery to remove uterine myomas. Abdomino-pelvic computed tomography (CT) and esophago-gastro-duodenoscopy (EGD) were performed at a local hospital and revealed “focal enhancing wall thickening at jejunum with proximal small bowel dilation.” Blood tests showed no specific inflammatory or abnormal findings. Tests for tumor markers of carcinoembryonic antigen (CEA) and cancer antigen (CA) 19-9 showed normal findings. No specific abnormalities were observed on EGD.

A simple abdominal X-ray confirmed a “nonspecific bowel gas pattern.” This initially was regarded as a symptom of intestinal obstruction due to a small bowel tumor or postoperative adhesions, and CT enterography was performed in the outpatient clinic. The lesions seen on CT can be seen in [Fig. 1](#).

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Fig. 1. Computed tomography enteroscopy performed before surgery.

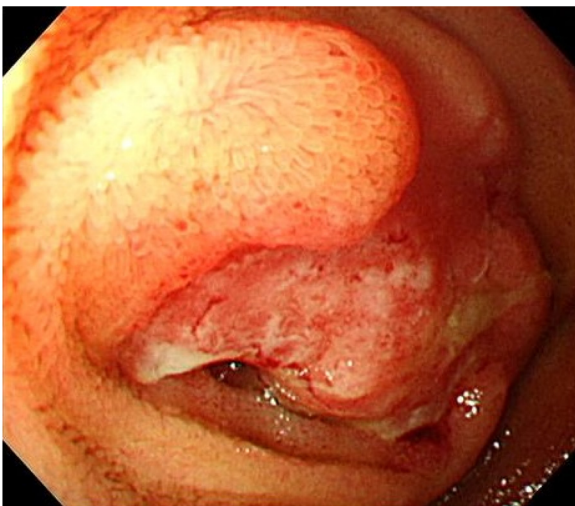


Fig. 2. Jejunal cancer seen in balloon enteroscopy performed before surgery.

Imaging revealed “progression of focal wall thickening in small bowel with proximal bowel dilatation,” for which it was necessary to differentiate between malignant and infectious lesion. The patient was admitted to the gastroenterology department of our hospital to undergo enteroscopy to confirm the pathology of the lesion. Balloon enteroscopy was planned for endoscopic observation up to the small bowel. Endoscopy to the distal jejunum showed an eccentrically growing ulceroinfiltrative mass into the lumen. A narrow central hole was observed, even with air inflation. Tissue biopsy was performed, and a hemoclip was used to mark the proximal 2–3 cm of the lesion for ease of identification in possible future surgery. A picture of the lesion confirmed by an endoscope can be seen in Fig. 2.

The biopsy confirmed adenocarcinoma with moderate differentiation. The patient consulted a gastrointestinal surgeon due to inevitable curative surgery for cancer and relief of intestinal obstruction that caused dietary restrictions.

The patient underwent laparoscopy with a standard procedure. The operator was junior trainee with 4 years of university hospital. Intraoperative observation showed no evidence of peritoneal metastasis. In addition, lesions of the small intestine were observed in the distal jejunum about 80 cm below the treitz ligament, and the intestine above the lesion was enlarged. In addition, edematous bowel wall was observed due to numerous cycles of obstruction and improvement. The proximal resection margin was at least 10 cm around the lesion. In the distal part of the lesion, mesentery lymph node (LN) enlargement was observed, and an additional 20 cm

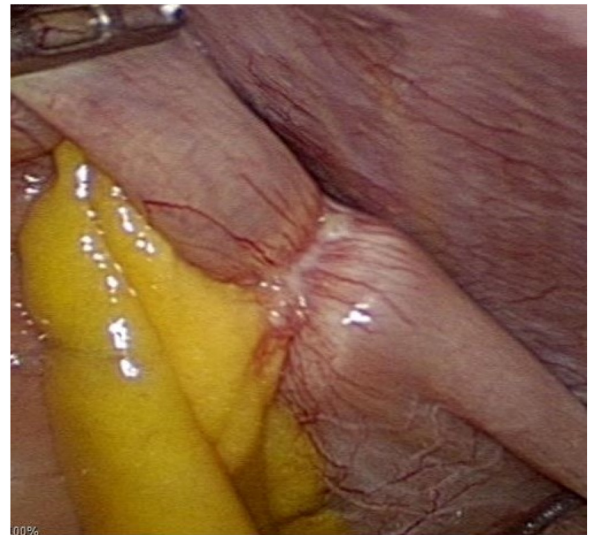


Fig. 3. Jejunal cancer lesion observed as extraluminal by laparoscopy during surgery.

resection was performed. The LN in the mesentery was dissected by approaching the superior mesentery artery origin as closely as possible. There were no specific events during surgery. Pictures of the surgical findings can be seen in Figs. 3 and 4.

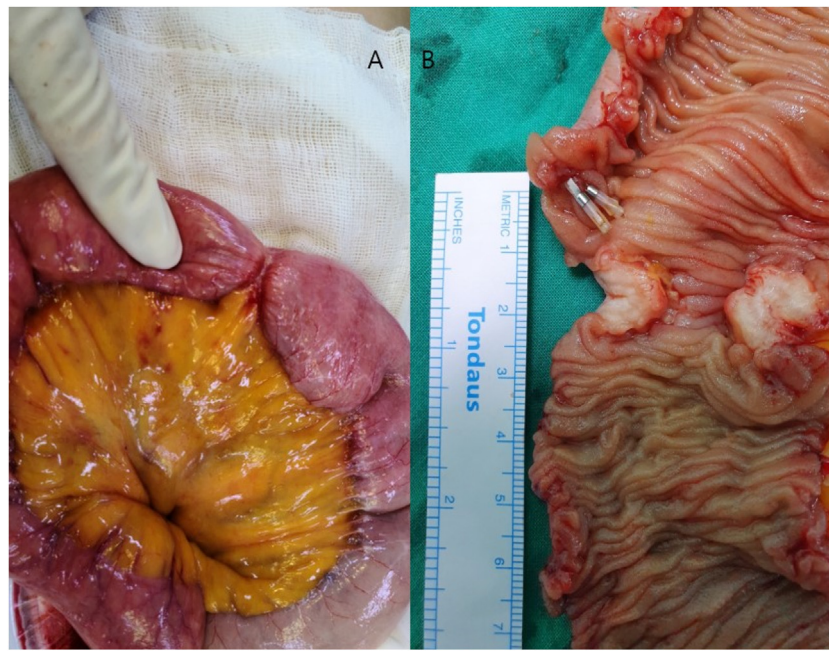
Final biopsy confirmed moderately to poorly differentiated adenocarcinoma, and the depth of the lesion was such that serosal perforation was suspected. The resected side was identified as tumor negative, and none of the 22 lymph nodes obtained showed metastasis. Additionally, tumor lymphatic invasion, vessel invasion, and perineural invasion were confirmed. In immunostaining, CD56 and chromogranin-A were negative, while P53 was positive. According to the AJCC 8th edition, the tumor stage was T4 N0 M0, or IIb.

At outpatient follow up, stage 2 disease was confirmed. Jejunal cancer itself is aggressive, and the need for chemotherapy was explained according to the NCCN guidelines. Chemotherapy is in progress without recurrence after surgery.

### 3. Discussion

The most common histological types of small intestine tumors are adenocarcinoma, carcinoid tumor, lymphoma, and stromal cells. About one-third of malignant tumors in the small intestine are reported as adenocarcinoma, with a low 5-year overall survival rate (25%) [3–7,1–8]. In the absence of specific symptoms, more than 30% of small bowel adenocarcinoma (SBA) patients at the time of diagnosis are stage IV, contributing to the poor prognosis [9,10]. Diagnosis of SBA is often delayed due to nonspecific patient symptoms and the resulting difficulty in performing appropriate tests. This delay contributes to a poor prognosis despite surgery, adjuvant chemotherapy, and radiation therapy [7]. While some cancers, such as colorectal cancer, stomach cancer, and breast cancer, have well-established screening tests and well-established guidelines for treatment, such guidelines are poor for small intestine cancer. This results in many limitations in diagnosing small intestine cancer based on symptoms alone [11].

The jejunum is the second most frequent site of adenocarcinoma, although cases at the location are rare. In many cases, emergency surgery is performed due to symptoms of obstruction, and histological diagnosis is performed after surgery [12]. It is rare to histologically diagnose small intestine adenocarcinoma before surgery by endoscopy of the jejunum and a biopsy. Therefore, this report introduces a rare case of diagnosis of adenocarcinoma of



**Fig. 4.** A. Jejunal cancer lesion taken out of the abdominal cavity prior to resection. B. Cancer lesions seen in jejunum resected after surgery.

the small intestine based on CT and small intestine endoscopy in a patient suspicious of intestinal obstruction with no lesions in the stomach or colon [13].

Since the CT scan is a scan that confirms images, there is a limit to obtaining a histological diagnosis. However, it was possible to access the lesion in the small intestine through the balloon enteroscopy [14,15]. Thus, our patient is a rare case in which pre-operative biopsy confirmed malignant adenocarcinoma diagnosis and progression before surgery [4]. In such cases, it is important to employ a skilled endoscopist to access the small intestine lesion and to identify the need for small intestine endoscopy in cases of symptoms of small bowel obstruction.

After diagnosis of adenocarcinoma of the small intestine, the patient continued to demonstrate obstructive symptoms, leading to early surgical resection. In diagnosis of this patient, we conducted multidisciplinary treatment with gastroenterology, surgery, radiology, and hematology oncology. Close collaboration and multidisciplinary treatment are important in modern medicine and are increasingly necessary in patients with such rare cancers. In recent years, due to development of video conferencing and mobile phone applications, patients can obtain opinions of specialists and advice regarding treatment policy.

In surgical treatment of small bowel adenocarcinoma, it is necessary to perform resection with a safety margin of 10 cm or more and to perform lymph node dissection by resecting sufficient small bowel mesentery [8–16]. In this case, malignancy was confirmed before surgery, so it was possible to confirm peritoneal dissemination throughout the abdominal cavity or metastasis to other organs by laparoscopy before small bowel resection. The patient had no peritoneal or other organ metastasis, and small bowel resection was performed as scheduled. In addition, since the lesion was confirmed to be malignant, sufficient mesenteric resection was performed. In addition, LN enlargement was confirmed toward the distal part of the lesion, and additional bowel resection was performed due to the possibility of histological malignancy. The jejunum including the lesion was resected, and anastomosis was performed with a functional end-to-end technique. No specific event occurred during surgery. In most cancer surgery, histological diagnosis is made before surgery and determines the corresponding type of surgery performed.

The operation in this case was laparoscopy. Past laparotomy patients have shown many complications such as high postoperative pain, decrease in ambulation, and increase in hospital stay due to slow wound healing. Recently, laparoscopic surgery has been popularized due to factors such as development of laparoscopic instruments such as automatic linear stapler and 3D-camera and improvement of surgical skills [16,17]. In addition, since the most common purposes of laparoscopic small intestine surgery are to determine the location of the lesion and to confirm additional lesions in the abdominal cavity, conventional multiport surgery as well as single-port laparoscopic surgery are possible [16–18]. The present patient was discharged without complications seven days after conventional laparoscopic surgery.

There are few cases of adenocarcinoma of jejunum, so randomized control trials are lacking [10]. Therefore, there is a limitation in generalizing this case as a demonstration of reasonable treatment for adenocarcinoma of the small intestine. In addition, data on long-term follow up are insufficient, as is information on survival and recurrence rates. If such cases increase in number, further research needs to be conducted. Therefore, suspicion of adenocarcinoma of the small intestine should be based on proper work-up, and it is important to confirm histological diagnosis before surgery as it can affect the choice of surgical approach. Such conclusions require additional studies and will be important in prognosis of patients.

#### 4. Conclusion

We report a case of laparoscopic surgery for a rare jejunal cancer confirmed histologically before surgery. Preoperative diagnosis was possible through cooperation of internal medicine and gastroenterology departments.

#### Declaration of Competing Interest

The authors report no declarations of interest.

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There were no sponsors or support for this study.

## Ethical approval

Ethical Clearance was obtained from the Institutional Research and Ethics Review Committee (IRB) of Dankook university hospital for the publication of the case report (202101021 IRB no.).

## Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

## Author contribution

Sung chul Lee designed the report. Sung chul Lee wrote the paper. Author reads and approved the final manuscript.

## Registration of Research Studies

Not applicable.

## Guarantor

Sung Chul Lee.

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