

CASE REPORT

A Case of Jejunal Adenocarcinoma Diagnosed by Preoperative Double Balloon Enteroscopy

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Despite a thorough history, physical examination, and complete diagnostic workup, the correct diagnosis of small-intestinal malignancy is established preoperatively in only 50% of cases; an exploratory laparotomy is often required. However, recent advances in endoscopic technologies, such as double-balloon enteroscopy (DBE), have been shown to facilitate the preoperative diagnosis of these tumors. Confirmation of malignancy using DBE in equivocal cases may greatly increase both patients' acceptance of surgery and the confidence of the physician planning a surgical resection. We describe herein the case of a 53-year-old woman with a stage I jejunal adenocarcinoma that was diagnosed by DBE and treated by laparoscopic jejunectomy. Histopathological examination revealed a stage I jejunal adenocarcinoma (T2N0M0) without muscularis propria invasion, lymphovascular invasion, or lymph-node metastasis. (*Gut and Liver* 2009;3:311-314)

Key Words: Adenocarcinoma; Double balloon enteroscopy; Jejunum

INTRODUCTION

Small intestinal malignancies have been diagnosed in advanced stages due to their non-specific clinical presentations as well as difficulties with endoscopic examinations of the small intestine. In recent years, the preoperative diagnosis for small intestinal malignancy has been dramatically improved due to the advance in endoscopic technologies such as double-balloon enteroscopy (DBE).^{1,2} Here, we describe a 53-year-old woman with a stage I jejunal adenocarcinoma diagnosed by DBE with a

review of the relevant English literature with specific reference to their diagnostic modalities.

CASE REPORT

A 53-year-old woman presented to our hospital with a 13-month history of recurrent vomiting, which aggravated in frequency 10 days ago. Other complaints included anorexia, epigastric pain, and weight loss of 3 kg over 3 months. Findings of upper endoscopy performed at a primary clinic 5 days ago were normal. Her diet, medication, and past medical history were unremarkable. She appeared well, and physical examinations showed no abnormalities. Laboratory findings revealed a white cell count of 8,900/mm³, hemoglobin of 14.1 g/dL, and hematocrit



Fig. 1. Computed tomography of the abdomen revealing significant thickening (arrow) of the jejunal wall.

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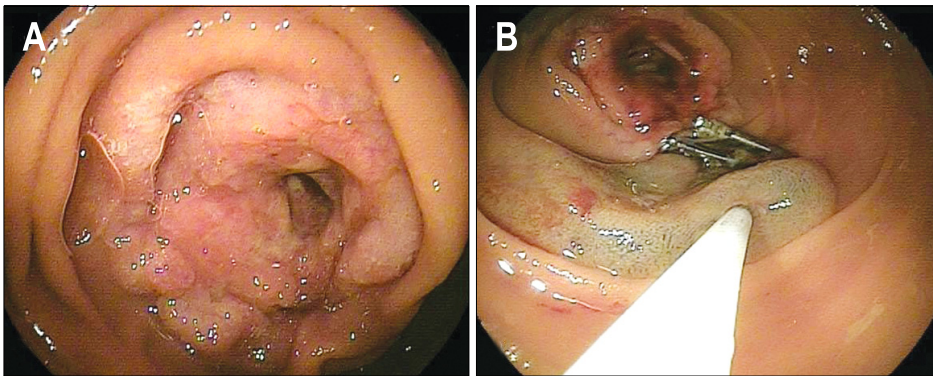


Fig. 2. (A) Double-balloon enteroscopy revealed a circumferential infiltrative mass in the proximal jejunum. (B) Note the submucosal India ink injection that was used to mark the tumor location to facilitate subsequent laparoscopic surgery.

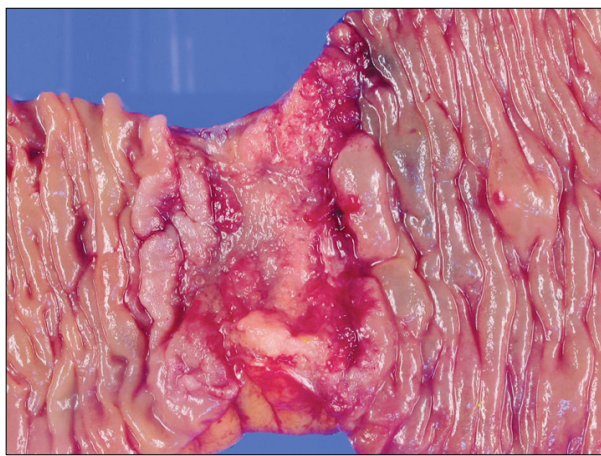


Fig. 3. Macroscopic examination of the lesion revealed it to be a circumferential, infiltrative tumor measuring 45×25×8 mm.

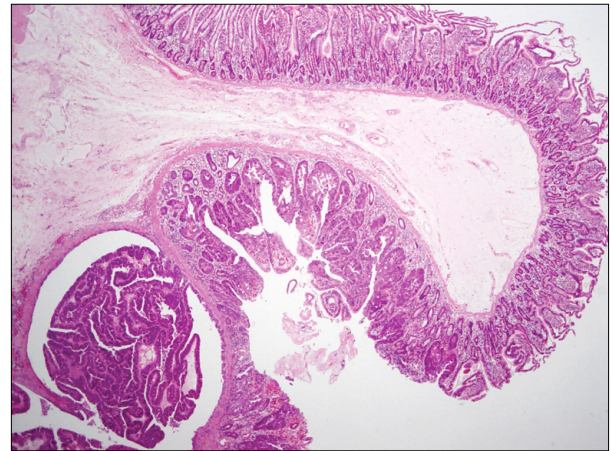


Fig. 4. Histological examination confirmed that the tumor was a moderately differentiated adenocarcinoma, without invasion through the muscularis propria (H&E stain, ×2). There was also no lymphovascular invasion or lymph-node metastasis.

of 40.6%. Findings of routine blood chemistry, serum carcinoembryonic antigen and serum carbohydrate antigen 19-9 were within normal limits. Abdominal computed tomography (CT) revealed significant localized thickening of the jejunal wall with marked dilatation proximal to the lesion (Fig. 1), but no mass lesions or abnormal findings in other organs. The radiological impression for these CT findings was a jejunal cancer or benign stricture. As there was no clue to differentiate these two diagnoses, we decided to perform an endoscopy for the direct visualization of the lesion and a preoperative histological diagnosis, if possible. Push enteroscopy was initially performed because the lesion was observed at proximal jejunum, however, visualization of the lesion by push enteroscopy was impossible because of the acute angulation of a bowel loop. For the next step, DBE using oral route was done under the conscious sedation with an intravenous bolus injection of midazolam 2 mg and propofol 20 mg. DBE of the proximal jejunum revealed an infiltrative tumor causing concentric luminal narrowing (Fig. 2A). Extensive biopsy samples were obtained, and the tumor location was

marked using a hemoclip and injecting India ink (Fig. 2B). No immediate or delayed complications occurred during DBE. Endoscopic biopsy demonstrated a moderately differentiated adenocarcinoma. Laparoscopic partial jejunectomy and removal of regional lymph nodes were performed, and a 45×25×8 mm, constricting tumor (Fig. 3) was identified at a site 20 cm distal to the ligament of Treitz. Histopathological examination revealed a stage I jejunal adenocarcinoma (T2N0M0; classified according to the American Joint Committee on Cancer staging system); without invasion through the muscularis propria, lymphovascular invasion or lymph node metastasis (Fig. 4).

Postoperatively, she was stable and discharged in satisfactory condition.

DISCUSSION

Small intestinal adenocarcinoma accounts for 0.3% of all malignancies of the gastrointestinal tract and 30% to

50% of all malignancies of the small intestine.³ Despite a thorough history, physical examination and complete diagnostic workup, the correct diagnosis of small intestinal malignancy has been established preoperatively in only 50 percent of cases, with the remainder diagnosed at exploratory laparotomy. Since clinical presentations of small intestinal adenocarcinoma are vague and non-specific, they are usually diagnosed in advanced stages. The rarity of this tumor and the difficulties with endoscopic examinations in small intestine may also attribute the delayed diagnosis. As a result, survival is generally poor, with most series reporting five-year survival rates of 20-30%.³

We reviewed reports of primary jejunal adenocarcinoma identified using a computerized search of PubMed database (articles in English between 2000 and 2009). Primary jejunal adenocarcinomas associated with Crohn's disease, celiac disease or duplication cyst were excluded in this analysis. Three cases of primary jejunal adenocarcinoma in children were also excluded. Under this definition, 20 of the cases identified by the computerized search were reviewed (Table 1).⁴⁻²² There were 10 men and 9 women with a median age of 55 years. Solitary bone metastasis and primary ovarian carcinoma was the first clinical manifestation in two of them.^{8,22} Seven of them were diagnosed without regional or distant metastasis, however, none of them were diagnosed in stage I

as in our case. Approximately 45% of cases were diagnosed by exploratory laparotomy (n=9) and 45% of cases were diagnosed by endoscopy (push enteroscopy, n=6; DBE, n=2; capsule endoscopy, n=1). Recent advances in DBE may facilitate preoperative histological diagnosis of small intestinal malignancy as in our case.

In the present case, the jejunal wall thickening could be attributed to the tumor, ischemic change, or inflammation as there were no symptoms, signs, and laboratory findings suggestive of a malignancy. Although some do recommend operation for a possible jejunal cancer without preoperative histological confirmation, confirming malignancy in equivocal cases may greatly increase both the compliance of patients for an operation and confidence of the physician planning a surgical resection. DBE successfully revealed an infiltrative mass with concentric luminal narrowing and facilitated correct histological diagnosis in this case. In addition, tumor marking using India ink for the exact location during DBE was helpful for the subsequent laparoscopic resection. As only DBE allows direct, controlled visualization of small bowel tumors and its histological confirmation preoperatively, it may be considered the gold standard for the diagnosis of such tumors.

In conclusion, DBE is a safe and accurate method to make a preoperative histological diagnosis of jejunal can-

Table 1. Summary of Cases with Primary Jejunal Adenocarcinoma in the English Literature between 2000 and 2009

References	Age/Sex	TNM stage	Diagnosis	Treatment
4	85/F	T3N1Mx	Exploratory laparotomy	Surgical resection
5	53/F	T3N1M1	Exploratory laparotomy	Surgical resection
	77/F	T3N0M0	Exploratory laparotomy	Surgical resection
6	35/M	T3N1M0	Push enteroscopy	Surgical resection
7	57/M	TxN1M0	Ultrasound guided FNA	Surgical resection
8	40/M	TxN1M1	Autopsy	Supportive care
9	63/M	T4N0M0	Capsule endoscopy	Surgical resection
10	50/F	NM*	Exploratory laparotomy	Surgical resection
11	58/M	TxN1M1	Push enteroscopy	Chemotherapy
12	55/M	T3N1M1	Exploratory laparotomy	Resection with IPC
13	39/M	T3N1M0	DBE	Surgical resection
14	54/F	T3N1M0	DBE	Surgical resection
15	61/F	T3N0M0	Exploratory laparoscopy	Surgical resection
16	NM*	TxN1M1	Push enteroscopy, PET	Partial resection
17	75/F	T4N0M0	Exploratory laparotomy	Surgical resection
18	45/NM*	T4N0M0	Push enteroscopy	Surgical resection
19	65/M	T3N0M0	Push enteroscopy	Surgical resection
20	50/M	T3N0M0	Push enteroscopy	Surgical resection
21	86/F	T4NxMx	Exploratory laparotomy	Surgical resection
22	53/F	T3N0M1	Exploratory laparotomy	Surgical resection
The present case		T2N0M0	DBE	Surgical resection

DBE, double balloon enteroscopy; FNA, fine needle aspiration; IPC, intraperitoneal chemotherapy; PET, positron emission tomography.

*Not mentioned.

cer. Confirming malignancy using DBE in equivocal cases may greatly increase both the compliance of patients for an operation and confidence of the physician planning a surgical resection.

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