Discussing the reliability of segmental resections for distal duodenal tumors: a case report

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Duodenal tumors are rare neoplasias of the gastrointestinal tract. Despite segmental resections being proposed for tumors located at the distal duodenal segments, there are few studies in recent literature discussing its efficacy with regard to long-term outcomes. The main objective is to put forward the clinical efficacy of segmental resections performed for duodenal tumors with regard to clinical outcomes. Two consecutive adult male patients had been admitted with complaints of abdominal pain, nausea, and upper gastrointestinal bleeding to the Department of General Surgery. After detailed evaluations, they had been diagnosed with obstructing distal duodenal (third and fourth segments) tumors and had undergone segmental resections including lymph node dissections accordingly. Getting benefit from the medical archives of the department, radiological reports, endoscopic evaluations with per-operative findings had been discussed in terms of long-term outcomes. Two patients had undergone (R_0) segmental duodenal resections successfully, as they had been diagnosed with adenocarcinoma. The median length of stay at the hospital was 10.5 days. Two patients who had been diagnosed with adenocarcinoma had taken adjuvant chemotherapy. During 29 months of average follow-up time, no evidence of recurrences had been noted so far. Distal tumors of the duodenum may present with vague symptoms so that there is a delay in diagnosis, unlike the proximally located lesions. Nonetheless, when the diagnosis had been made at an early stage, segmental resections with accurate lymph node dissections are reliable in terms of overall survival.

Keywords:
adenocarcinoma, distal duodenal tumor, pancreaticoduodenectomy, segmental resection, small-bowel tumor

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Introduction

Duodenal tumors are infrequent neoplasias of the gastrointestinal (GI) tract with an incidence between 33 and 45% [1,2]. Despite comprising 75% of the GI tract, small-bowel tumors give rise to ∼4–5% of all GI neoplasias [3,4]. This low frequency is mostly attributed to the short transit time of nutrients within the lumen, low bacterial count and protective immune balance as well [5].

There are four histological subtypes that constitute most common malignant tumors of the small bowel in decreasing frequency, such as adenocarcinoma, neuroendocrine tumor, lymphoma, and sarcoma [6]. Primary duodenal neoplasias arise mostly in the third and fourth segments, followed by the second (ampullary), and are found to have the least occurrence within the first part [7].

Symptoms of duodenal tumors are mostly nonspecific and insidious, in which most patients present with abdominal pain, vomiting, and sometimes with periods of GI bleeding. Despite current advanced imaging techniques, there is still difficulty in terms of diagnosis due to lack of evidence in most cases [8]. This is related to the detection of the disease at an advanced stage mostly [9].

Because of its anatomical position, surgical preference involves the resection of the pancreas and bile duct (pancreaticoduodenectomy) even when the primary tumor origins are from the duodenum, mostly for the supra-ampullary and periampullary portions. In the recent literature, segmental duodenal resections (SDR) avoiding pancreatic and bile duct resections had been described for tumors located at the distal duodenal segments (third and fourth). It has been claimed to cause less morbidity by performing the simpler surgical technique as well as providing long-term disease-free survival [10,11].

In the present study, we wanted to share our clinical results with SDR performed for distal duodenal tumors with regard to long-term outcomes.

Case presentation

Medical records of two consecutive patients with duodenal tumors and who had been treated in the General Surgery Department between March 2014 and October 2018 were retrospectively studied. Specifically, the present study was conducted on patients who had undergone SDRs due to distal duodenal tumors.

Data collected from the medical database included features of symptoms (chief complaints that were present at admission), length of stay, radiological evaluations, endoscopic findings, pathological assessments (according to TNM-American Joint Committee on Cancer Staging Manual, 8th Edition; 2017), and long-term outcomes.

Treatment had consisted of SDRs including lymph node dissections and adjuvant therapy in case of necessity.

Two adult male patients having tumors in the third and fourth segments of the duodenal tract were included in the study (mean age, 79.5 years). The average length of stay at the hospital was found to be 10.5 days. Patients' chief complaints at admission were acute intestinal obstruction mimicking symptoms such as abdominal tenderness in the epigastric region, nausea and vomiting, and intermittent episodes of upper GI bleeding.

Both patients had a history of essential hypertension, and one of them had been under medication for known diabetes mellitus. The older patient, who was 87 years old, had a history of coronary artery by-pass for three vessels, and the other patient had been using a prescribed drug for advanced-stage chronic obstructive pulmonary disease (Table 1).

Radiological evaluations had been carried out by oral/intravenous contrast-enhanced computed tomography (CT), and locations of the tumors had been confirmed with upper GI endoscopy. According to preoperative data, pancreas-preserving segmental duodenum resections (PPSDRs) had been planned for the procedure. PPSDRs had been performed for two patients successfully, including lymph node dissections. For the younger patient who was 72 years old, partial pancreatectomy with both superior mesenteric artery and vein dissections had to be performed due to its close proximity.

Common histopathological type of the study was adenocarcinoma (one with well-moderately differentiated, and the other one was moderately differentiated).

Double-layer, end-to-end hand-sewn technique had been preferred for bowel anastomosis for both patients. All of the operations had been performed by R_0 resections, and the average number of lymph nodes retrieved had been found to be 10.5 (range, 2–21) (Tables 2 and 3).

Two patients diagnosed with adenocarcinoma had been referred for adjuvant chemotherapy due to poor prognostic factors with regard to lymphovascular and perineural invasion (T3N1, T3N0). The average follow-up time of the study was 29 months (range, 2–56). Since then, clinical and radiological controls had

Table 1 Characteristics of patients with distal duodenal tumors

N	Sex	Age	Comorbidity	Hospital stay (days)	Follow-up time (months)
1	M	87	CAD, CABG, HT	11	2
2	M	72	DM, HT, COPD	10	56

CABG, coronary artery by-pass graft; CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; HT, hypertension; M, male.

Table 2 Operative findings

N	Age	Length of procedure (h)	Procedure	Anastomosis
1	87	2	SDR	End-to-end
2	72	2.5	SDR+partial pancreatectomy	End-to-side

SDR, segmental duodenal resection.

Table 3 Histopathological features

N	Location (duodenum)	Tumor size (cm)	LVI/PNI	TNM	Lymph node dissection	Diagnosis
1	D3	2×1.5	+/+	T3N1	2/2	Well-moderately differentiated Adenocarcinoma
2	D3	2×1.3	+/+	T3N0	19/0	Moderately differentiated Adenocarcinoma

D3, third segment; LVI, lymphovascular invasion; N0, no regional lymph node involvement; N1, metastasis to one to three regional lymph nodes; NX, regional lymph nodes cannot be assessed; PNI, perineural invasion; T3, tumor invades through the muscularis propria into the subserosa.

shown no locoregional recurrence or distant metastasis for any patient included in the study up until then.

Discussion

As mentioned previously, having a low incidence with presentation of vague symptoms can cause a delay in the diagnosis of distal duodenal tumors. Common symptoms during admission are mostly intermittent colic abdominal pain, vomiting, weight loss, and upper GI bleeding [12]. The GI lumen may be obstructed due to an advanced-stage lesion located in the third and/or fourth segment of the duodenum; in which case, acute mechanical intestinal obstruction may be the dominant picture. An experienced clinician should be alert in case of dealing with a patient presenting especially with these types of symptoms.

Presenting symptoms considering our present study were chiefly colic abdominal pain and vomiting, which were due to tumoral lesions leading to obstruction in the GI lumen.

Contrast-enhanced CT is an alternative screening method for the investigation of diagnosis, which helps to evaluate vascular anatomy, degree of local invasion, and lymph node status, and for possible distant organ metastasis considering advanced-stage tumors. Other than its usefulness in certain cases, it is not superior compared with endoscopy. Upper GI endoscopy is the preferred diagnostic modality considering the evaluation of duodenal lesions, which allows simultaneous visualization and chance of biopsy if needed.All patients in our study were screened by oral/intravenous contrast-enhanced CT at admission, and then they were evaluated by upper GI endoscopy later on (Figs 1 and 2).

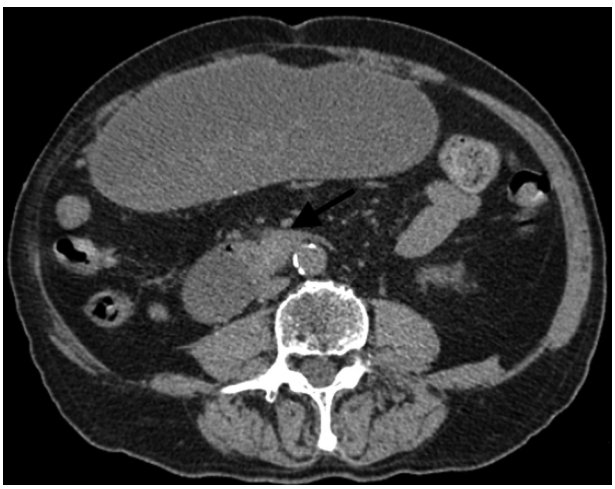
Figure 1

The narrowing of the duodenal passage under endoscopic view.

There is a limited amount of data with regard to PPSDRs performed for third and fourth portion duodenal tumors, especially for long-term outcomes considering relapses. Recent literature claims that there is no statistically significant difference with regard to overall survival when the clinical results of pancreaticoduodenectomies and SDRs were compared with each other. In a cohort study reported by Cloyd *et al.* [13], which had been conducted on 1611 patients from 1988 to 2010, pancreaticoduodenectomies were associated with a higher rate of lymph nodes excised compared with SDRs, but there had been found no difference in terms of survey. Generally, pancreaticoduodenectomies are technically more challenging compared with SDRs, as there are more numbers of anastomosis carried out, and, eventually, the rates of pancreatic or bilioenteric fistulas become higher compared with the limited resections performed with single anastomosis. On the contrary, segmental resections may be bound by technical difficulties such as possible anastomosis tension due to the fixed position of the distal duodenum while performing wide resections and also the abundant vascular network surrounding the neighboring organs. Independent from the location of the lesion, the mainstay of treatment for duodenal tumors is surgery, and the chief goal is to achieve R_0 resection. There is no certain consensus yet about how many lymph nodes should be excised at the least, or whether it should be radical or not for proper dissection.

We had performed SDRs successfully for our patients with accurate lymph node dissections without

Figure 2



Tip of the arrow showing a tumoral lesion located on the third duodenal segment causing obstruction seen on axial computed tomographic scan.

disturbing the vascular supply of adjacent organs and including partial pancreas resection for one of them due to tumor invasion of the uncinate process.

Two patients who had been diagnosed with adenocarcinoma had taken 5-Fluorouracil-based adjuvant therapy (BIOSYN Arzneimittel GmbH, Germany). There is no recurrence during the postoperative period reported for these two patients during an average follow-up of 29 months.

Conclusion

Pancreaticoduodenectomy is mainly indicated for tumors involving the pancreatic head, periampullary region or distal common bile duct. The existing literature supports segmental R_0 resections for distal duodenal tumors. On the basis of our clinical findings so far, segmental resections for third and fourth segment duodenal tumors can be a more conservative option and thus may prevent the burden of higher morbidity and mortality of more radical resections.

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Conflicts of interest

There are no conflicts of interest.

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