

Surgical Resection for Hemorrhagic Duodenal Lipoma: A Case Report

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Case presentation: The patient was a 72-year-old man who consulted with his previous physician for chief complaints of palpitations, fatigue, and blackish feces persisting for 1 month. After confirming the presence of anemia, the patient was referred to our hospital. Blood test findings upon hospital arrival revealed a hemoglobin (Hb) level of 6.0 g/dL. Computed tomography revealed a tumor of 32 mm × 30 mm with a low-density area extending from the bulb to the second part of the duodenum. Magnetic resonance imaging revealed high signal intensity on T1- and T2-weighted imaging and low signal intensity on fat-suppressed T2-weighted imaging, findings consistent with lipoma. Upper gastrointestinal endoscopy revealed a yellowish submucosal tumor that had perforated into the intestinal tract from the external wall extending from the upper corner to the second part of the duodenum. After determining that the tumor was sessile, laparoscopic partial duodenectomy with Roux-en-Y reconstruction was planned and performed. Pathology revealed a yellowish tumor 4 cm × 4 cm in size extending from the pyloric area to the duodenal bulb arising from the tunica muscularis. The present case report details our experience involving a patient who underwent surgical resection for hemorrhagic duodenal lipoma.

Key words: Duodenum, lipoma, bleeding, laparoscopy

INTRODUCTION

Duodenal lipomas are rare benign tumors, wherein follow-up observation is performed only when patients remain asymptomatic. However, those who exhibit symptoms may need endoscopic or surgical resection. The present report describes a patient who underwent surgical resection for hemorrhagic duodenal lipoma.

Case presentation

Case patient: 72 years of age, Male

Chief complaints: blackish feces

History of present illness: The patient consulted with his previous physician for chief complaints of palpitations, fatigue, and blackish feces persisting for 1 month. After determining the presence of anemia, the patient was referred to our hospital.

Past medical history: Pituitary adenoma

Blood test findings: The patient had a hemoglobin (Hb) level of 6.0 g/dL and a hematocrit value of 20.1%, indicating anemia. No elevation in tumor markers was observed (carcinoembryonic antigen: 2.6 ng/mL and CA19-9: 5.3 U/mL).

Abdominal contrast-enhanced computed tomography (CT): A tumor of 32 mm × 30 mm with a low-density area extending from the bulb to the second part of the duodenum was observed. A CT value of -86.2 Hounsfield Unit(HU) indicated a hypodense mass (Fig. 1).

Abdominal magnetic resonance imaging (MRI): MRI of the same site revealed high signal intensity on

T1- and T2-weighted imaging and low signal intensity on fat-suppressed T2-weighted imaging, findings consistent with lipoma (Fig. 2).

Upper gastrointestinal endoscopy: A yellowish, sessile, submucosal tumor that had perforated into the intestinal tract from the external wall extending from the upper corner to the second part of the duodenum was observed. The tumor did not reach the papilla of Vater. Some depressions were observed in portions of the tumor mucosa; however, no ulceration, blood vessel edges, or clear bleeding was observed (Fig. 3).

Upper gastrointestinal series: A tumor 30.6 mm × 29.0 mm was observed in the duodenal bulb extending beyond the pyloric ring (Fig. 4).

Based on the aforementioned findings, a diagnosis of hemorrhagic duodenal lipoma was established. Surgical resection was planned, given that endoscopic resection was deemed difficult because the tumor was sessile.

Surgical procedure: Laparoscopic partial duodenectomy + Roux-en-Y reconstruction

Surgical findings: Surgery was commenced with the patient positioned with his legs apart. A 5-mm port was inserted into the umbilical region, after which pneumoperitoneum was created. Ports were placed in an inverse trapezoid formation. Accordingly, 12-mm ports were inserted into the upper left and lower right regions, whereas 5-mm ports were inserted into the remaining regions. After releasing the gastrocolic ligament, the right gastroepiploic blood vessels and right blood vessels were managed through clipping. The en-

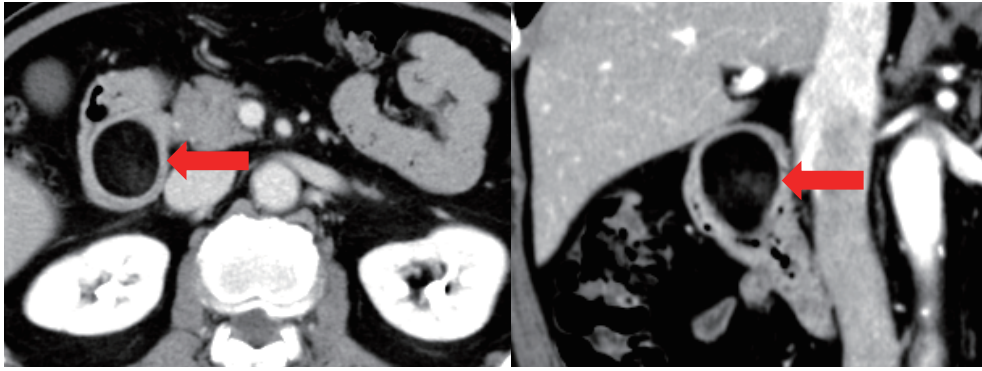


Fig. 1 Abdominal contrast-enhanced computed tomography
A tumor of 32 mm × 30 mm in the low-density area extending from the bulb to the second part of the duodenum (Red arrow).
Computed tomography value: -86.2 HU

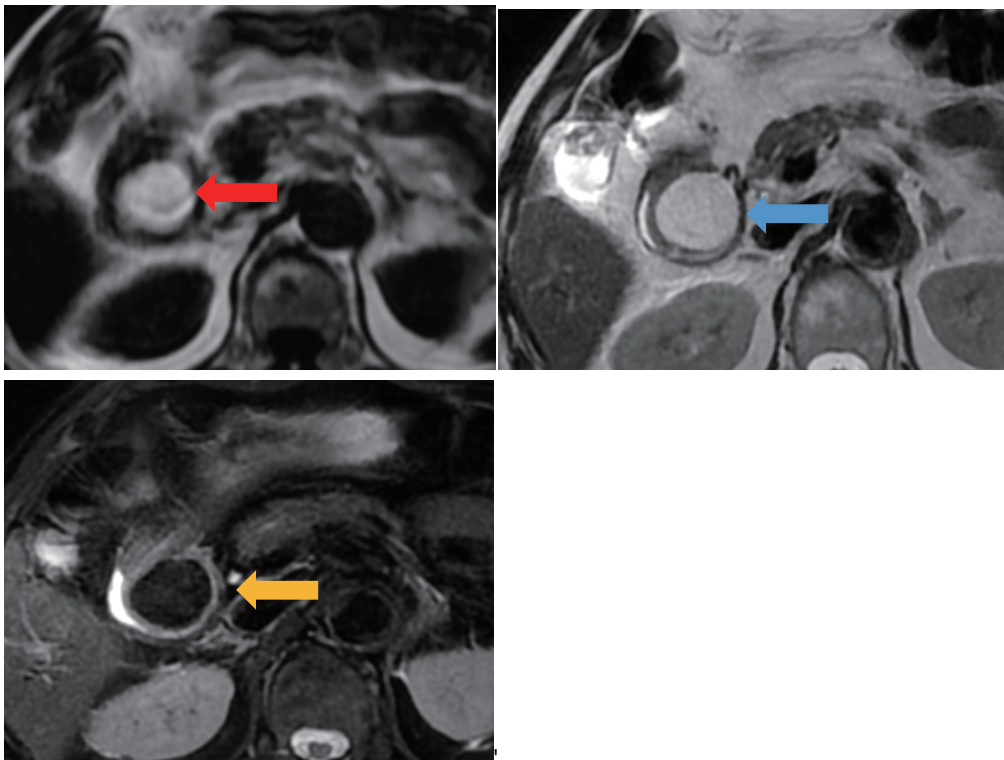


Fig. 2 Abdominal magnetic resonance imaging
High signal intensity on T1 (Red arrow)- and T2-(Blue arrow) weighted imaging with low signal intensity on fat-suppressed T2-weighted imaging (Yellow arrow).

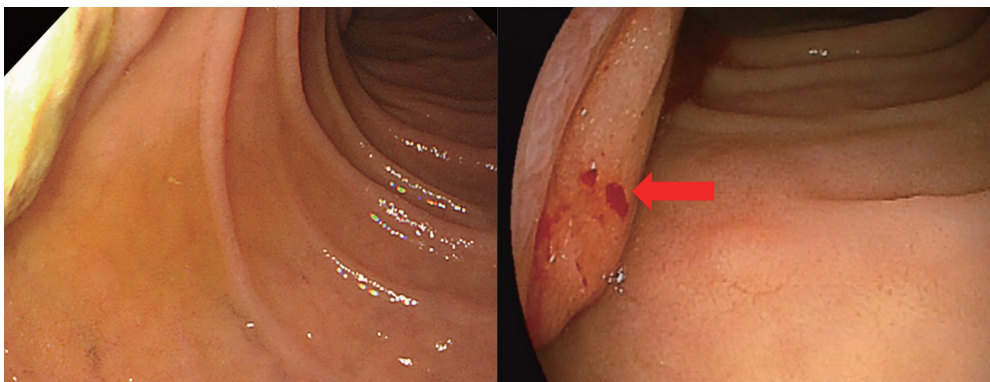


Fig. 3 Upper gastrointestinal endoscopy
A sessile submucosal tumor can be seen from the upper corner to the second part of the duodenum. Some depressions were observed in portions of the tumor mucosa (Red arrow).
The tumor did not reach the papilla of Vater.
No active bleeding was noted.

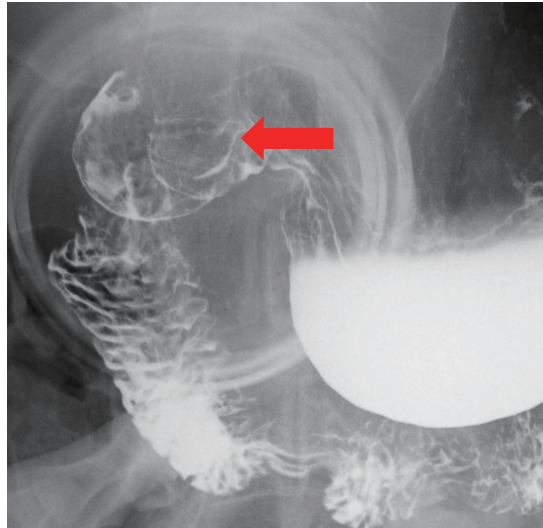


Fig. 4 Upper gastrointestinal contrast series
A tumor of 30.6 mm × 29.0 mm in the duodenal bulb (Red arrow).

tire circumference of the duodenum was exposed from the second part of the duodenum to the pyloric ring. Thereafter, the tumor was moved to the pyloric ring and resected the second part of the duodenum using a powered Echelon 60 mm leaving the pancreas head. The oral side was similarly resected 3 cm to the pyloric ring. Roux-en-Y reconstruction was then performed *in vivo*. Subsequently, a 4-cm midline incision was made in the upper abdomen through which the tumor was removed.

Resected specimen: A yellowish tumor was resected. mucosal ulceration was observed (Fig. 5).

Histopathological findings: A yellowish tumor 4 cm × 4 cm in size and arising from the duodenum tunica muscularis was observed from the pyloric region to the second part of the duodenum, with some mucosal ulceration (Fig. 6).

The final diagnosis: hemorrhagic duodenal lipoma.

Postoperative progress: The patient resumed having meals on day 3 of hospitalization, underwent drain removal on day 4, and was able to walk independently on day 7, at which point he was discharged from the hospital.

DISCUSSION

Duodenal lipoma is a relatively rare benign tumor of the gastrointestinal tract. In fact, a report by Mayo *et al.* found that among 4000 cases of benign gastrointestinal tumors, only 164 cases (4%) were lipomas, with the most common site affected being the colon (64%), followed by the small intestine (26%), duodenum (4%), stomach (3%), and esophagus (2%) [1]. Moreover, Mao Wei Pei *et al.* reported that Duodenal lipoma is a tumor originating from the duodenum tend to primarily develop in the second part of the duodenum. Furthermore, although most tumors develop within the submucosal layer, some do develop in the proper muscular layer and subserosa [2].

Duodenal lipomas remain asymptomatic when small and are often diagnosed accidentally during endoscopic examination and surgery. However, larger, symptomatic tumors would be subject to treatment. Reports have shown that 80% of symptomatic duo-

denal lipomas have a diameter exceeding 2 cm [2]. Reported symptoms include gastrointestinal symptoms (e.g., pain caused by intestinal obstruction and intussusception [3, 4]), ulceration, anemia, bloody discharge, [5] and acute bleeding [6, 7]. On rare occasions, however, some patients develop unusual symptoms, such as obstructive jaundice and pancreatitis [8]. In this case, Histopathological findings revealed an ulcer in the duodenal lipoma, which was considered a bleeding source.

Duodenal lipomas have been conclusively diagnosed through radiography, endoscopy, and surgery. Accordingly, CT depicts duodenal lipomas as a low-density mass with the same concentration range as fat (i.e., from -60 to -120 HU) [9], whereas MRI depicts lipomas as high signal intensity on T1-weighted imaging and iso-signal intensity on T2-weighted imaging. Tumors that show low signal intensity on fat-suppressed T2-weighted imaging can be diagnosed through MRI [10]. While CT and MRI are useful for diagnosis, endoscopic examination is needed to determine the site of lesion development. Furthermore, endoscopic examination provides information regarding tumor characteristics based on cushion signs. However, given that duodenal lipomas lie within the submucosal tissue, superficial biopsy is inadequate, and deeper biopsy is needed to achieve a definite diagnosis. Endoscopic ultrasonography (EUS) can also provide useful information, such as the onset layer and depth [11], with typical findings including a uniform hyperechoic mass arising from the submucosa and echo attenuation in the posterior region or internal portion [12].

For symptomatic duodenal lipomas requiring treatment, endoscopic or surgical resection is usually performed. Small pedunculated isolated lipomas can be safely and easily removed endoscopically either by “snare” polypectomy or “endoloop” [13]. For endoscopic resection, a pedunculated tumor and a tumor depth not reaching the tunica muscularis are considered more important than tumor size. Indeed, endoscopic fractional resection, even for large tumors 4 cm in size, have been reported [14]. Given the sessile tumor in the present case, endoscopic resection was deemed

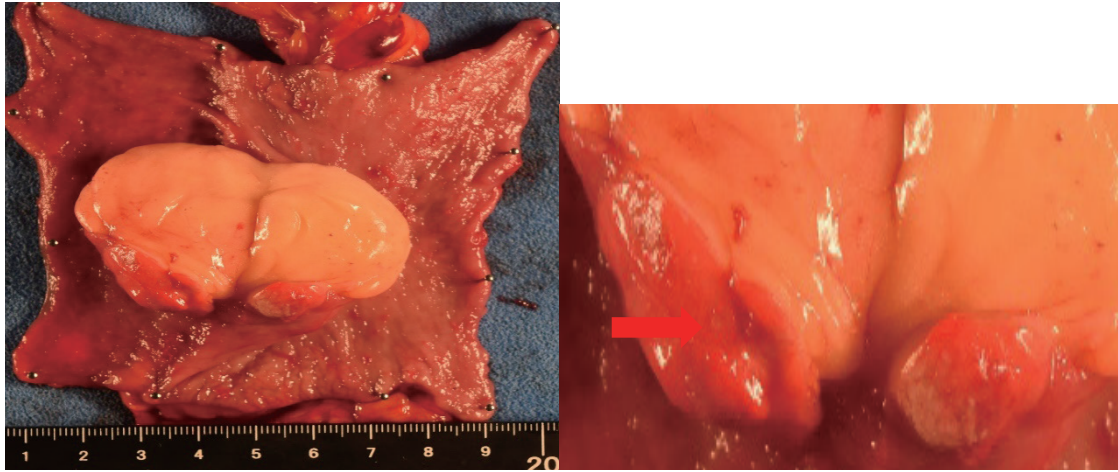


Fig. 5 Yellowish tumor in the resected specimen. ulceration in the mucosa. (Red arrow).

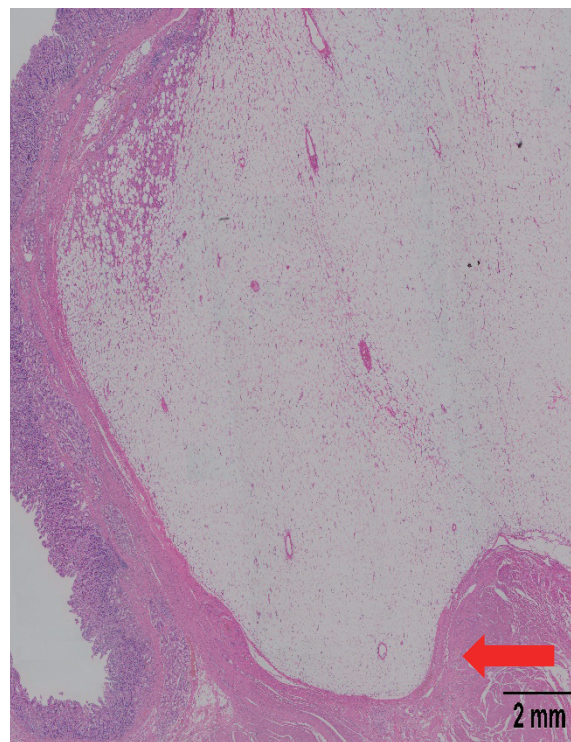


Fig. 6 Histopathological findings

A yellowish tumor of 4 cm × 4 cm extending from the pyloric region to the duodenal bulb
The tumor can be seen arising from the duodenum tunica muscularis (Red arrow), with some ulceration in the mucosa.

difficult. Moreover, histopathology revealed that tumor invasion had reached the tunica muscularis, thereby necessitating surgical resection. However, the absence of preoperative EUS evaluation, which should have been performed, warrants reflection.

Upon searching PubMed and Google Scholar search engines for reports on hemorrhagic duodenal lipomas published between 2000 and 2019, a total of 17 cases, including our report, were found [15–30], all of which are summarized in Table 1. The patients had a mean age of 37.2 years (45–85), a male-to-female ratio of 7:9, and a mean tumor diameter of 4.52 cm (1.7–12). The most commonly affected site was D2 (58.8%), followed by D3 (29.4%), D1 (17.6%), and D4 (5.9%). Bleeding was reported even in a small 1.7-cm lipoma. Furthermore, endoscopic resection was performed in 10 patients,

with resection being successful even for large tumors with a maximum diameter of 5.5 cm. Surgical resection was performed in seven patients, the reasons for which included (1) the presence of multiple lipomas, (2) giant lipoma exceeding 10 cm, (3) lipoma close to the papilla of Vater, (4) difficulty in achieving a visual field during endoscopy due to bleeding, (5) inability to determine the layer and difficulty in distinguishing between duodenal and gastrointestinal stromal tumors, and (6) sessile tumors. The surgical procedure performed included duodenectomy, transduodenal excision, laparoscopic distal gastrectomy, and laparoscopy-assisted partial duodenectomy. Laparoscopic surgery for hemorrhagic duodenal lipoma was performed in two patients, one of which was our patient. Reports can be found regarding laparoscopic surgery

Table 1 Reports regarding hemorrhagic duodenal lipoma (2000–2019)

No	Author	year	Age	Sex	Location	Maximum Dimension in cm	Management
1	GwakSY <i>et al.</i> [16]	2019	85	Female	D2	2	Endoscopic polypectomy
2	Lan <i>et al.</i> [17]	2018	65	Female	D3	2.7	Endoscopic polypectomy
3	Dinesh <i>et al.</i> [15]	2016	45	Male	D2/3/4	4	Duodectomy
4	Yaman <i>et al.</i> [18]	2014	59	Female	D2	4	Endoscopic polypectomy
5	Thorlaciuss <i>et al.</i> [19]	2013	66	Male	D2	3.5	Endoscopic polypectomy
6	Efe <i>et al.</i> [20]	2012	76	Male	D2	4	Endoscopic polypectomy
7	Kadaba <i>et al.</i> [21]	2011	60	Female	D1	6	transduodenal resection
8	Chang <i>et al.</i> [22]	2010	59	Female	D2	4	transduodenal resection
9	Ouwerkerk <i>et al.</i> [23]	2010	52	Female	D1	1.7	transduodenal resection
10	Mohamed <i>et al.</i> [24]	2008	70	Female	D2	5.5	Endoscopic polypectomy
11	Long <i>et al.</i> [25]	2008	NA	NA	D3	4	Endoscopic polypectomy
12	Murata <i>et al.</i> [26]	2008	67	Male	D2	4	Endoscopic polypectomy
13	Tsukamoto <i>et al.</i> [27]	2008	75	Female	D1	12	Laparoscopic distal gastrectomy
14	Menendez <i>et al.</i> [28]	2008	70	Male	D3	6	Duodenectomy
15	Sou <i>et al.</i> [29]	2006	81	Female	D3	5	Endoscopic polypectomy
16	Tung <i>et al.</i> [30]	2001	73	Male	D2	4.5	Endoscopic polypectomy
17	Our Case	2019	72	Male	D1	4	Laparoscopic partial duodectomy

for duodenal lipoma presenting symptoms such as intestinal obstruction [31]. In this case, the resection range did not include the Vater's papilla, and laparoscopic duodenal resection was considered possible. For reconstruction, we chose R-Y, which has less reflux of bile and pancreatic juice into the stomach. Considering that duodenal lipoma is a benign disease, minimally invasive endoscopic and laparoscopic surgeries should be recommended whenever possible.

CONCLUSION

When determining the need for surgical resection for hemorrhagic duodenal lipoma, important factors to consider include a sessile tumor, difficulty in establishing a visual field during endoscopy, the tumor site, and the number of tumors. Surgical resection may be considered if there is evidence of muscle layer development in EUS. There are reports that surgical resection is indicated for tumors with a size of 2 cm or more [14], but there are reports of endoscopic resection for tumors with a size of 2 cm or more (Table 1). If it is huge, it will be one of the judgments of surgical resection.

Regarding the operation method, it is a benign disease and minimally invasive laparoscopic surgery is desired.

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