

Jun Haeng Lee

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Duodenal polyps are found quite often in the routine upper endoscopies. Although inflammatory polyps are the most common entity, other lesions such as Brunner's gland hyperplasia, gastrointestinal stromal tumor, neuroendocrine tumor, and ectopic pancreas can be seen as elevated lesions. Malignant tumors of the duodenum are uncommon. Most malignant duodenal tumors are adenocarcinomas and lymphomas. Pain, obstruction, bleeding, jaundice, and an abdominal mass are the usual symptoms and signs. Duodenal adenocarcinomas in the third and fourth portions of the duodenum are often missed on the routine upper endoscopy. High index of suspicion is very important.

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16.1 Duodenal Polyps

Duodenal polyps are usually found incidentally in up to 2–4 % of patients. The majority of patients are asymptomatic. Symptoms related to the duodenal polyps can be non-specific discomfort, abdominal pain, obstruction, intussusception, and bleeding. The histological subtype of polyps is sometimes difficult to determine by endoscopic appearance alone, and biopsy is necessary.

Inflammatory hyperplastic polyps (Figs. 16.1 and 16.2) are the most common histologic type. At endoscopy, inflammatory hyperplastic polyps are small, sessile polyps. They are

located at the bulbar and postbulbar duodenum. They are small and quite commonly multiple. In the endoscopy, the surface may be normal or erythematous, eroded, or ulcerated.

Gastric heterotopia is usually located in the duodenal bulb. It may be single sessile polyp (Fig. 16.3) or multiple variable-sized flat elevated lesions with unclear margin (Figs. 16.4 and 16.5). The surface may be hyperemic and reticular. Historically, the relationship between gastric heterotopia and peptic ulcer disease has been proposed without relevant evidences. Lymphoid hyperplasia is typically multiple small pale sessile polyps in the duodenal bulb (Fig. 16.6).

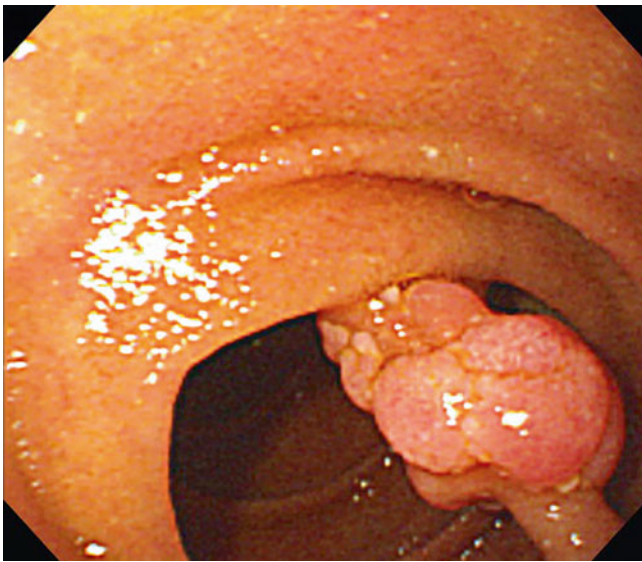


Fig. 16.1 Inflammatory hyperplastic polyp

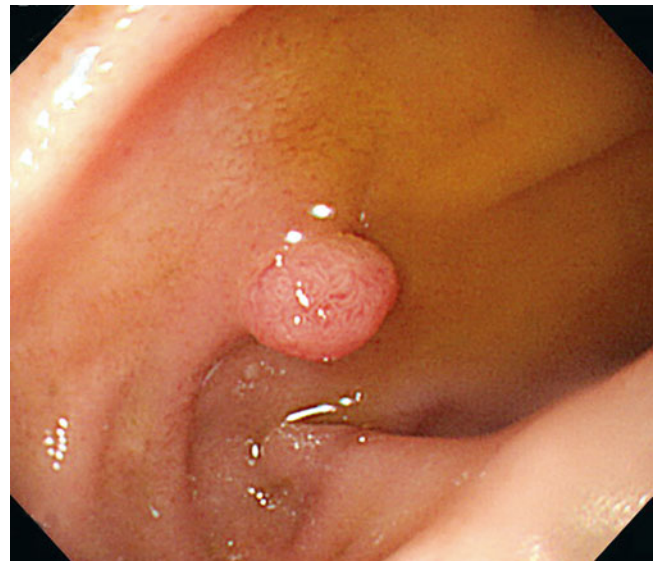


Fig. 16.3 Gastric heterotopia, polypoid type



Fig. 16.2 Inflammatory hyperplastic polyp

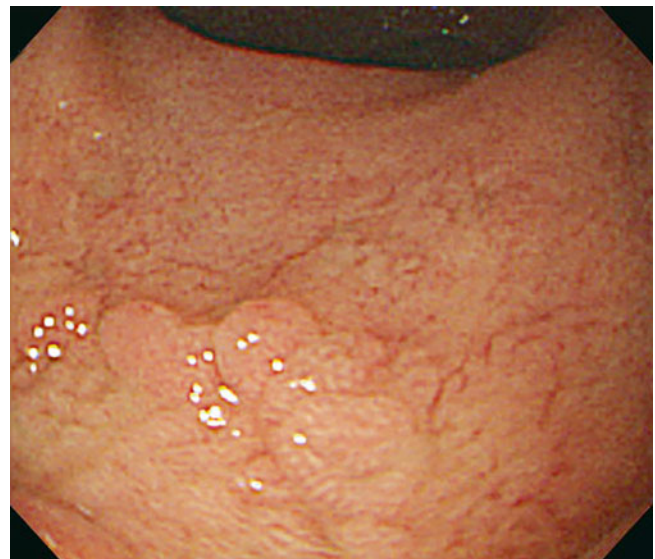


Fig. 16.4 Gastric heterotopia, flat elevated type



Fig. 16.5 Gastric heterotopia, flat elevated type

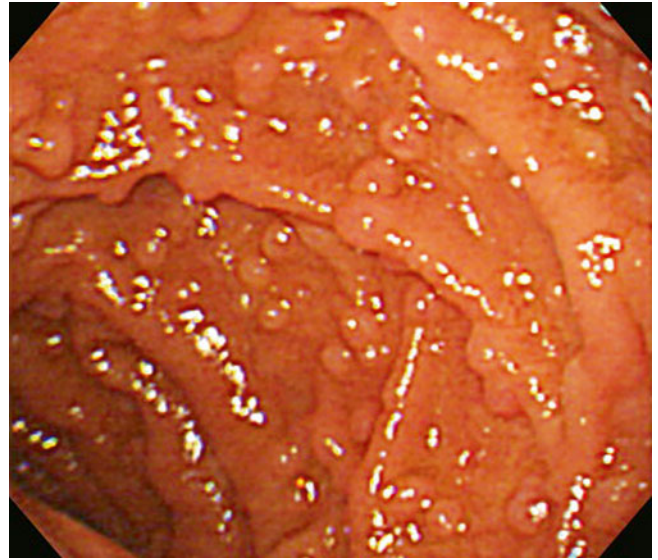


Fig. 16.6 Lymphoid hyperplasia

16.2 Duodenal Gastrointestinal Stromal Tumor (GIST)

GISTs are spindle cell tumors with CD117 (c-kit protein) positivity in most cases. Duodenal GISTs represent about 6–21 % of surgically resected GISTs [1]. Clinical presentations may be gastrointestinal bleeding, pain, and rarely

intestinal obstruction. The most common location is the second part of the duodenum. In endoscopy, the characteristics of the duodenal GISTs are the same with gastric GISTs. It is usually a mass with normal-looking surface (Fig. 16.7). There may be central ulcerations (Figs. 16.8 and 16.9). In some cases, it is difficult to differentiate from the more common duodenal adenocarcinoma (Fig. 16.10).

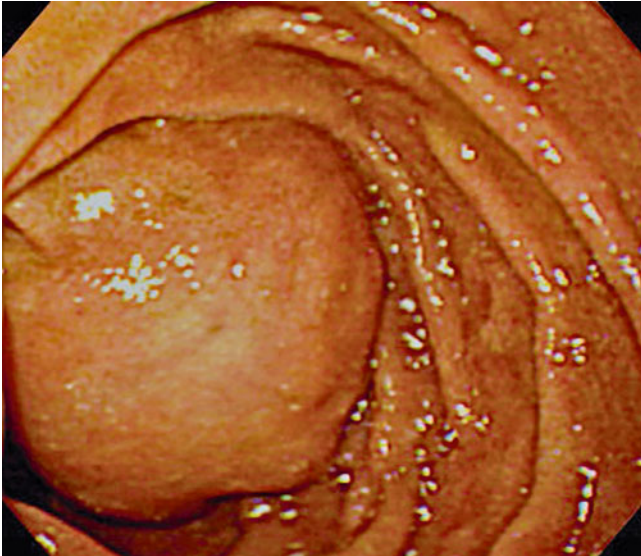


Fig. 16.7 Duodenal GIST with no ulceration in the second part of the duodenum

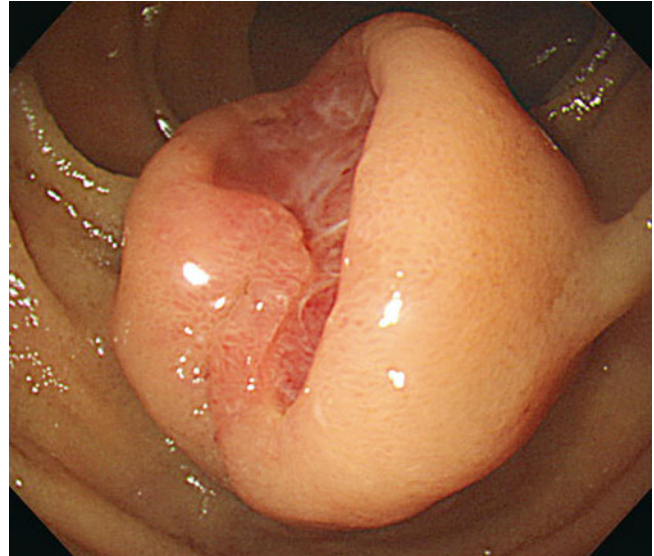


Fig. 16.9 Duodenal GIST with deep central ulceration in the second part

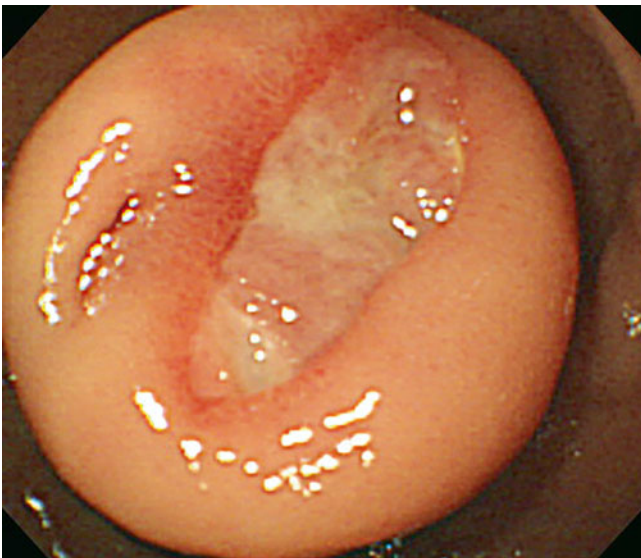


Fig. 16.8 Duodenal GIST with deep central ulceration in the duodenal bulb

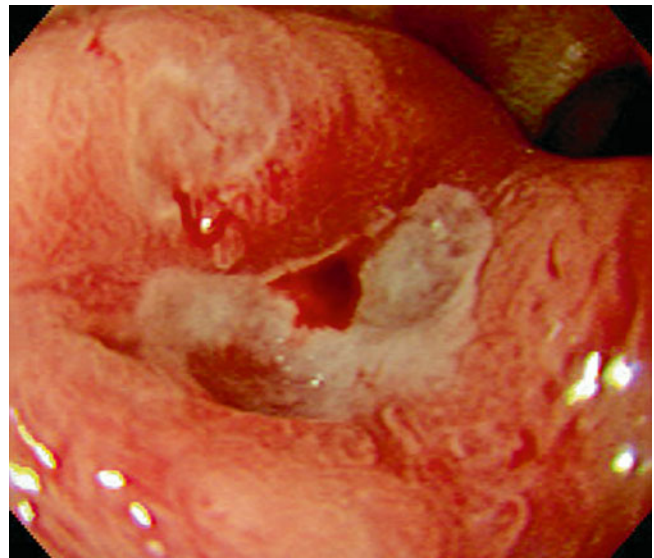


Fig. 16.10 Duodenal GIST with multiple hepatic metastasis

16.3 Duodenal Carcinoids

Recently, small duodenal carcinoid tumors are increasingly recognized with the more widespread use of upper gastrointestinal endoscopy. They are more common in men. Some of the carcinoids are functional tumors like gastrinomas or somatostatinomas. Gastrinomas tend to be smaller than somatostatinomas. Duodenal carcinoids are typically small polypoid lesions with smooth slightly yellow overlying mucosa (Figs. 16.11 and 16.12). Forceps

biopsy is very effective for histological diagnosis. There may be top ulcerations (Fig. 16.13). The standard treatment for small duodenal carcinoids is endoscopic resection, but the rate of perforation may be very high up to 30%. Given the risks associated with EMR and the likely favorable natural history of small duodenal carcinoid tumors, conservative management with close follow-up may represent a viable alternative to endoscopic treatment, especially in patients with a high risk of perioperative complications [2].

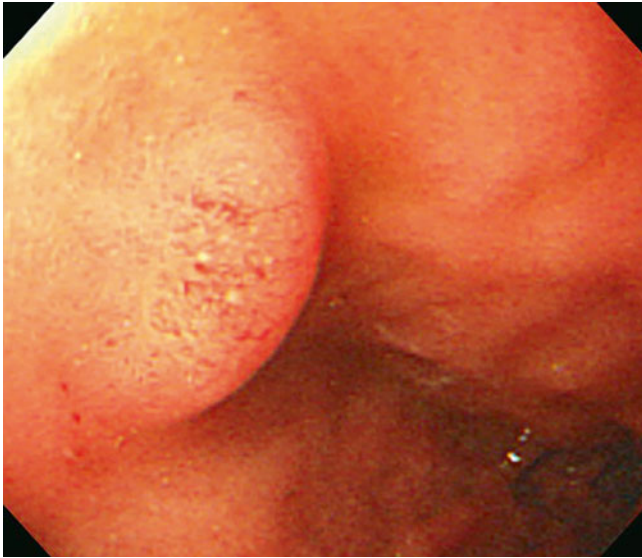


Fig. 16.11 Carcinoid of the duodenal bulb



Fig. 16.13 Carcinoid of the duodenal bulb with top ulceration

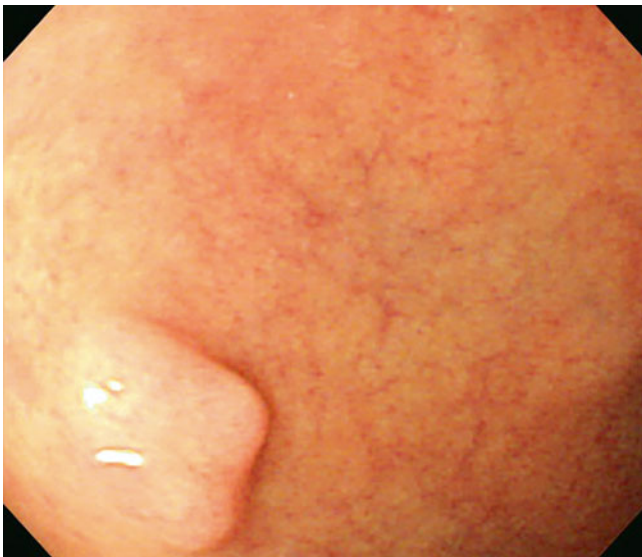


Fig. 16.12 Carcinoid of the duodenal bulb

16.4 Other Duodenal Submucosal Tumors (SMTs)

There are many different kinds of SMTs in the duodenum, such as ectopic pancreas (Figs. 16.14 and 16.15), submucosal cysts (Fig. 16.16), lipoma (Figs. 16.17 and 16.18), and lymphangioma (Figs. 16.19 and 16.20).

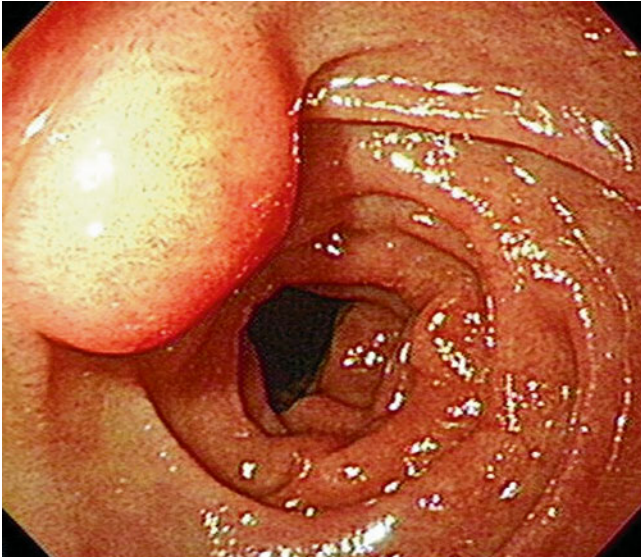


Fig. 16.14 SMT of the second part of the duodenum. The histology of the biopsy specimen was ectopic pancreas



Fig. 16.16 Multiple submucosal cysts

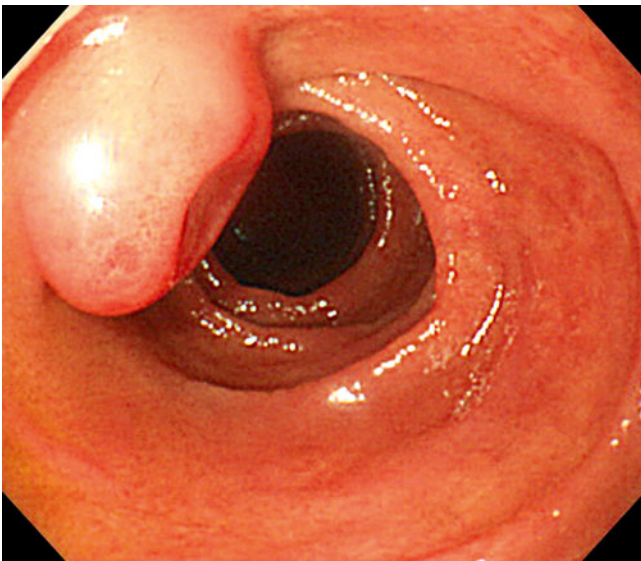


Fig. 16.15 Ectopic pancreas with central depression the second part of duodenum



Fig. 16.17 Duodenal lipoma

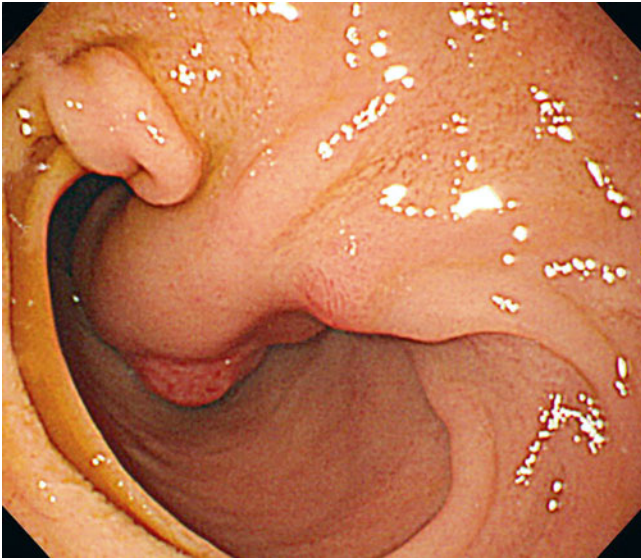


Fig. 16.18 Duodenal lipoma with bleeding

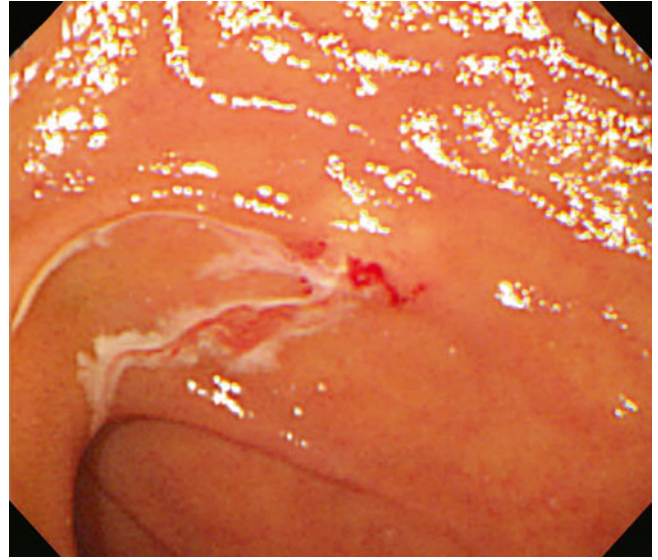


Fig. 16.20 Lymphangioma. After biopsies, milk juice comes out

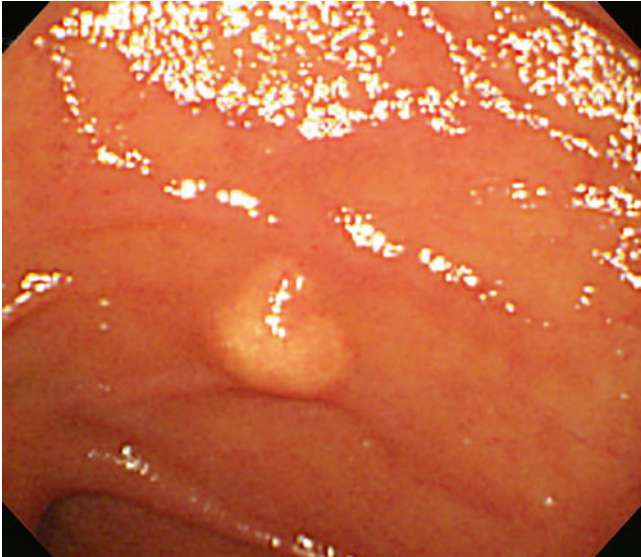


Fig. 16.19 Lymphangioma

16.5 Duodenal Adenocarcinoma

Adenocarcinoma is the most common malignant tumors in the duodenum but accounts for less than 0.4 % of all gastrointestinal cancers. The symptoms of duodenal adenocarcinoma are usually pain, bleeding, and biliary obstruction; symptoms of intestinal obstruction are possible but uncommon [3]. The endoscopic appearance of adenocarcinoma is not specific and cannot be differentiated from lymphoma or leiomyosarcoma. The lesion is usually nodular and

polypoid (Figs. 16.21, 16.22, 16.23, and 16.24) and flat wall-thickening (Figs. 16.25 and 16.26), but it may also be ulcerated or obstructed (Figs. 16.27, 16.28, 16.29, 16.30, 16.31, 16.32, 16.33, 16.34, and 16.35). Duodenal adenocarcinoma is most often confined to the second or third portion of the duodenum. Some cases with adenocarcinomas of the third or fourth part of the duodenum cannot be found in the routine upper endoscopy. In that situation, push enteroscopy or upper endoscopy with colonoscope may be useful.

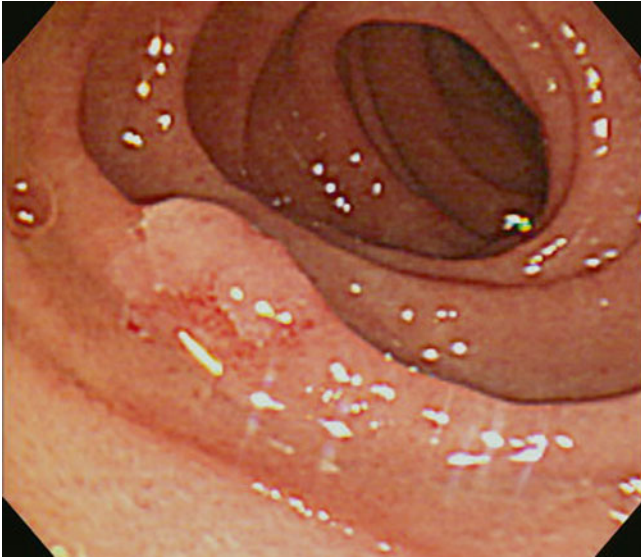


Fig. 16.21 A small sessile polyp-like adenocarcinoma of the duodenum

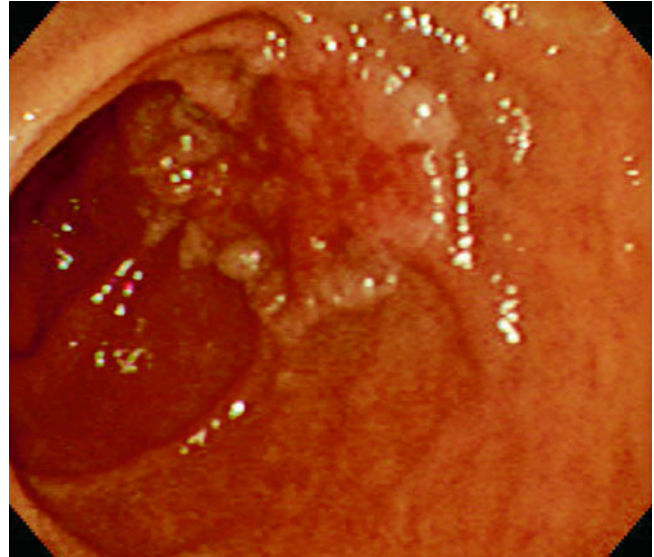


Fig. 16.23 Flat nodular elevated type of duodenal adenocarcinoma

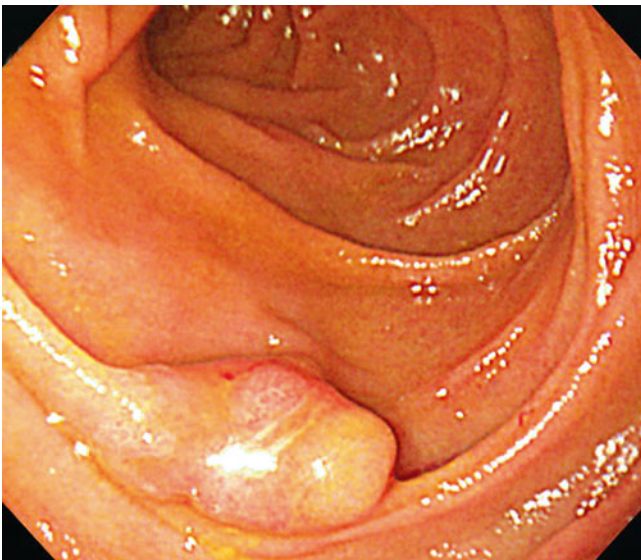


Fig. 16.22 A 1.5-cm polypoid adenocarcinoma in the duodenum

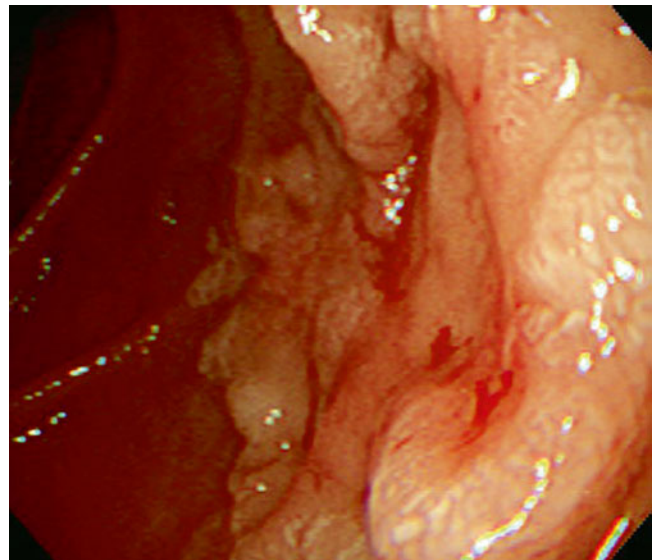


Fig. 16.24 Flat nodular elevated type of duodenal adenocarcinoma

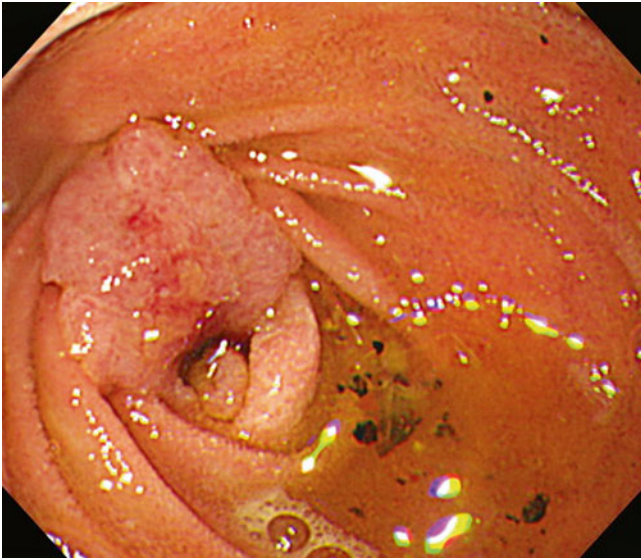


Fig. 16.25 A 3×2-cm-sized luminal narrowing adenocarcinoma with pale, flat, friable surface at the third portion of the duodenum

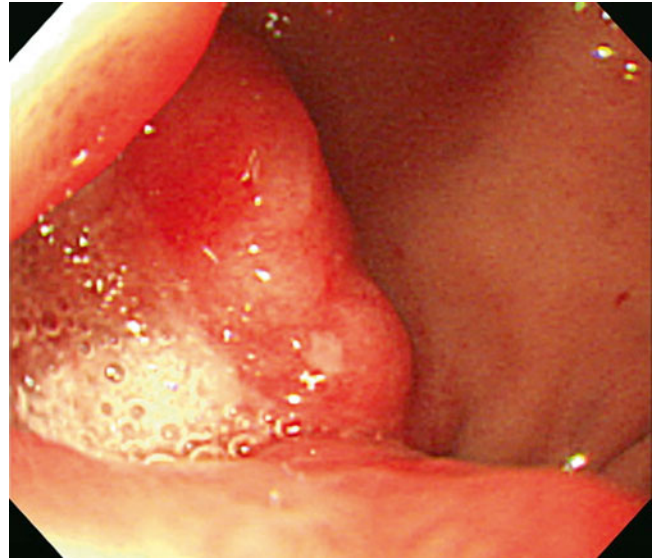


Fig. 16.27 Duodenal adenocarcinoma with deep ulceration

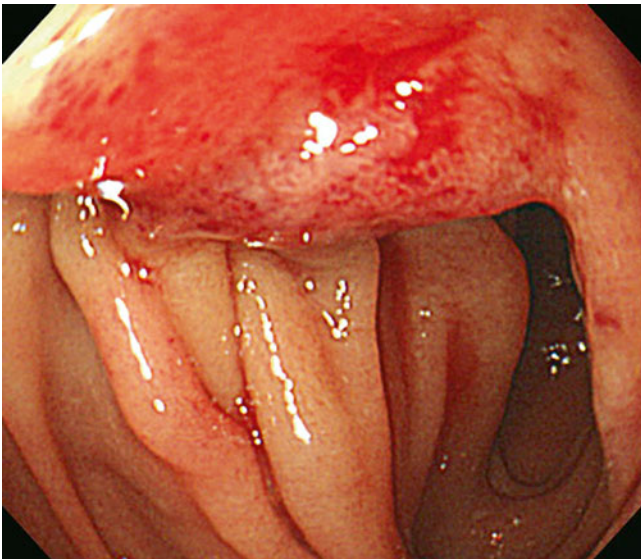


Fig. 16.26 A 3-cm ovoid-shaped flat elevated mass adenocarcinoma encircling the duodenal wall

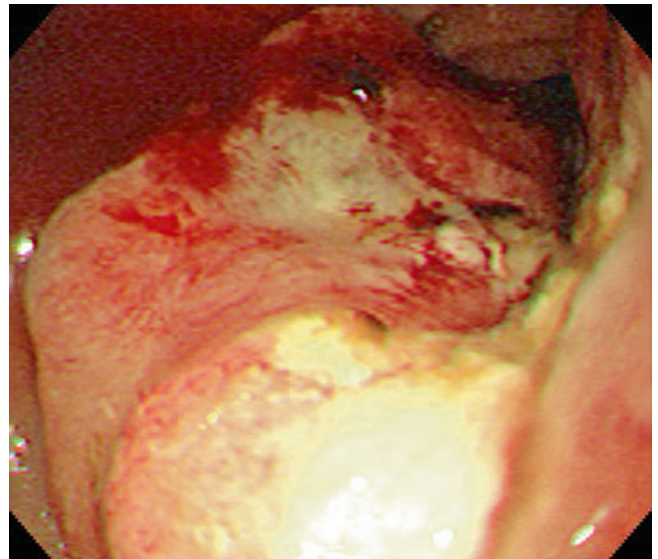


Fig. 16.28 A large duodenal adenocarcinoma with large mass with central ulceration and spontaneous bleeding at the distal duodenal bulb. The mass partially obstructed the lumen, but the scope could be passed into the second part of the duodenum



Fig. 16.29 A large duodenal adenocarcinoma with central ulceration was nearly obstructing the distal duodenal bulb and the second part

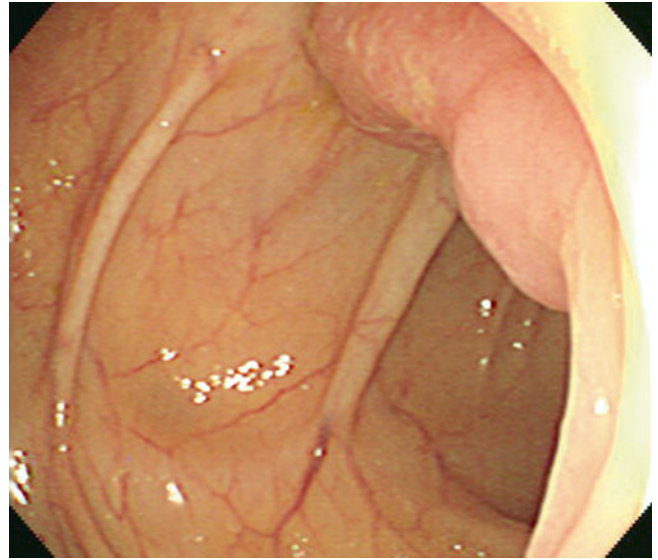


Fig. 16.31 Ascending colon cancer and duodenal cancer were found in a 49-year-old male. Right hemicolectomy and Whipple's operation were done simultaneously



Fig. 16.30 Ascending colon cancer and duodenal cancer were found in a 49-year-old male. Right hemicolectomy and Whipple's operation were done simultaneously

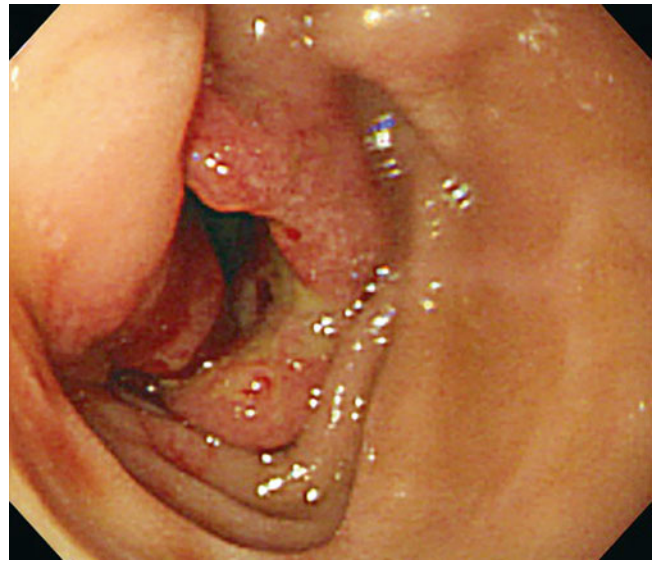


Fig. 16.32 A luminal narrowing mass was found at the third part of the duodenum. At hypotonic duodenography, it looks like an apple core



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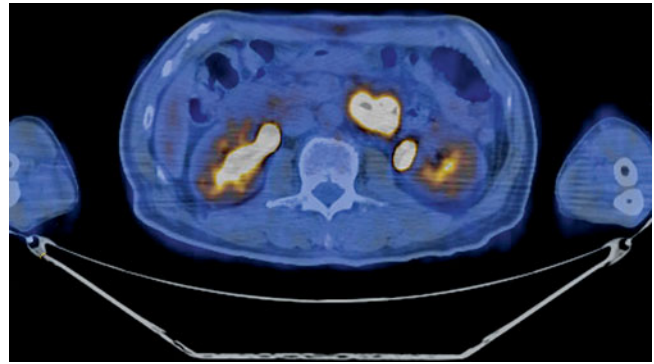


Fig. 16.35 On the 3rd portion, hyperemic luminal encircling mass with easy contact bleeding. Partial obstruction noticed. The scope could not pass through this lesion. At PET-CT, strong F-18 FDG uptake (SUV=13.3) was found

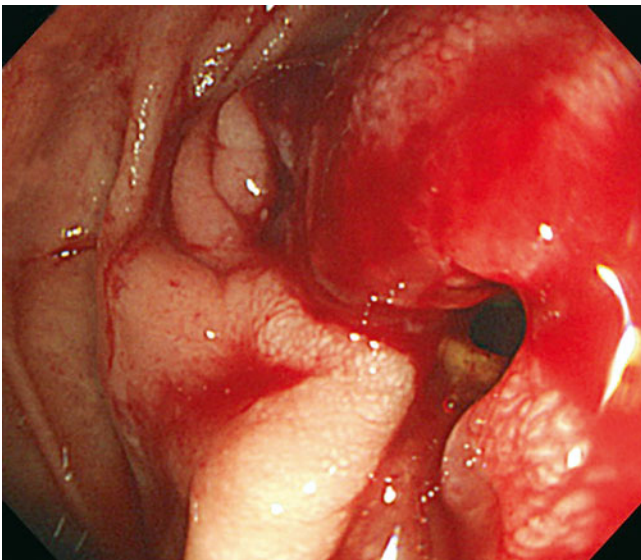


Fig. 16.34 On the 3rd portion, hyperemic luminal encircling mass with easy contact bleeding. Partial obstruction noticed. The scope could not pass through this lesion. At PET-CT, strong F-18 FDG uptake (SUV=13.3) was found

16.6 Duodenal Lymphomas

The most common site of extranodal lymphoma is the gastrointestinal tract. Gastrointestinal lymphomas make up approximately one-third to one-half of extranodal lymphomas, and approximately 1 % of all gastrointestinal neoplasms. The stomach (50–60 %) is the most common site of gastrointestinal lymphomas, followed by the small intestine (20–30 %) and the colon (10–20 %). The ileum is the most common site of small bowel lymphomas, followed by the jejunum and then the duodenum. Duodenal lymphomas make up only about 5 % of gastrointestinal lymphomas. In

endoscopy, duodenal lymphomas may have different appearances. They may be large exophytic masses, polypoid, ulcerative, or superficial nodular.

The most common histological type of duodenal lymphoma is diffuse large B cell lymphoma (DLBCL), which afflicts relatively young patients, is more likely to present with disseminated disease, and is more likely to require surgery (Figs. 16.36, 16.37, 16.38, 16.39, and 16.40). MALT lymphoma (Figs. 16.41 and 16.42) and follicular lymphomas (Figs. 16.43 and 16.44) are usually seen in older patients. Mantle cell lymphomas (Figs. 16.45, 16.46, and 16.47) and T/NK-cell lymphomas (Fig. 16.48) are rare but have worst prognosis.



Fig. 16.36 Diffuse large B cell lymphoma of the duodenum. From the bulb to the proximal second part of the duodenum, the wall was thickened and the lumen was expanded by air infusion. In the immunohistochemical staining of the biopsy specimen, CD3 was negative, CD20 was positive, and Ki-67 was strongly positive (95 %). Primary chemotherapy was done without surgery

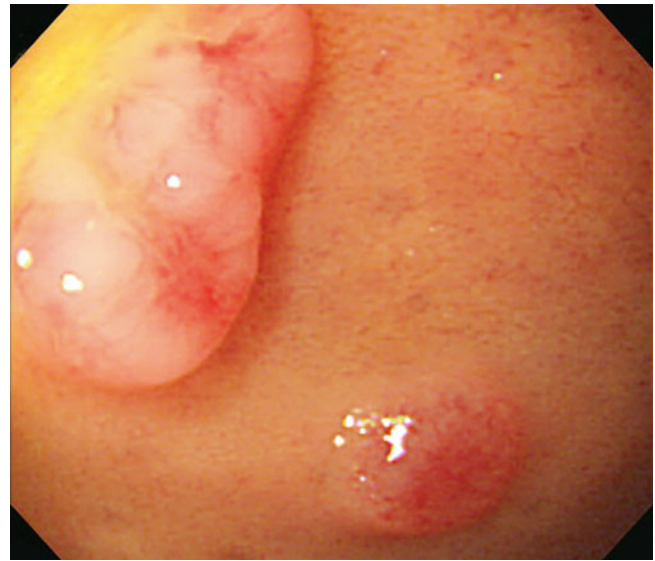


Fig. 16.37 Duodenal involvement of diffuse large B cell lymphoma. There are multiple variable-sized submucosal tumor-like elevated lesions on the duodenal bulb

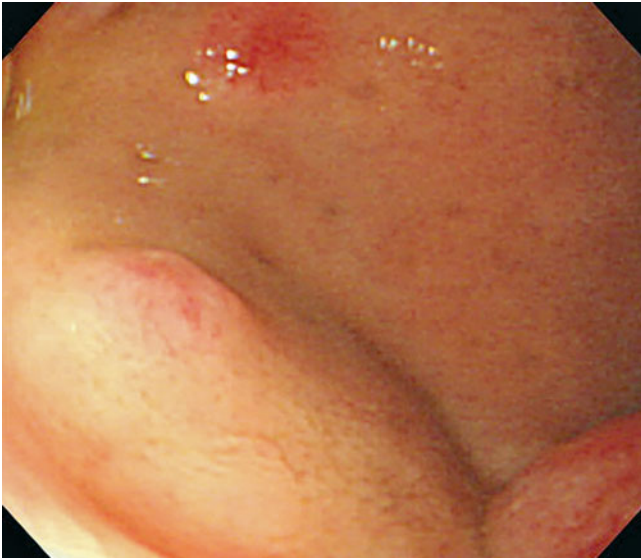


Fig. 16.38 Duodenal involvement of diffuse large B cell lymphoma. There are multiple variable-sized submucosal tumor-like elevated lesions on the duodenal bulb

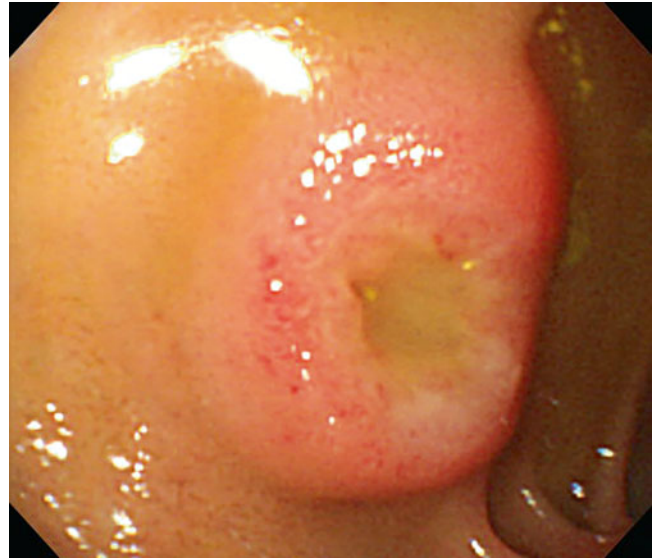


Fig. 16.40 Gastroduodenal involvement of nodal lymphoma. In the stomach, there were multiple flat and slightly depressed hyperemic areas (LJH024.jpg). In the duodenum, there was a single hyperemic elevated lesion with central ulceration. Biopsies from all these lesions showed diffuse large B cell lymphomas



Fig. 16.39 Gastroduodenal involvement of nodal lymphoma. In the stomach, there were multiple flat and slightly depressed hyperemic areas (LJH024.jpg). In the duodenum, there was a single hyperemic elevated lesion with central ulceration. Biopsies from all these lesions showed diffuse large B cell lymphomas

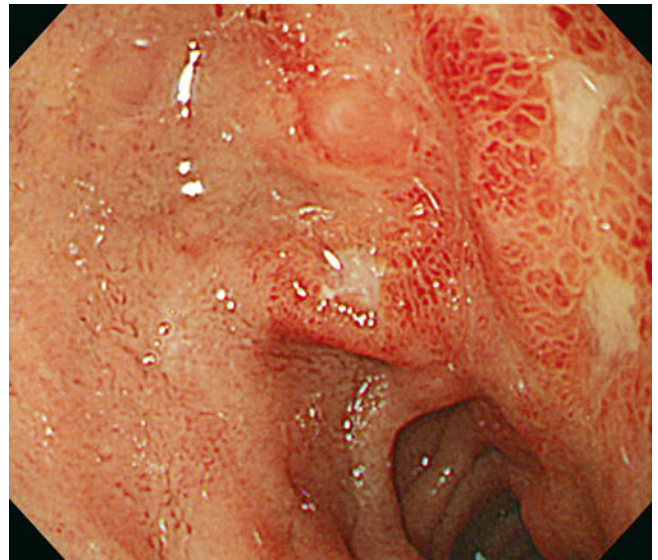


Fig. 16.41 Duodenal MALT lymphoma. There were multiple variable-sized ulcers with uneven hyperemic intervening mucosa seen at the second part of the duodenum. The patient experienced repeated episodes of duodenal bleeding for a couple of years. Radiation treatment was chosen as an initial treatment

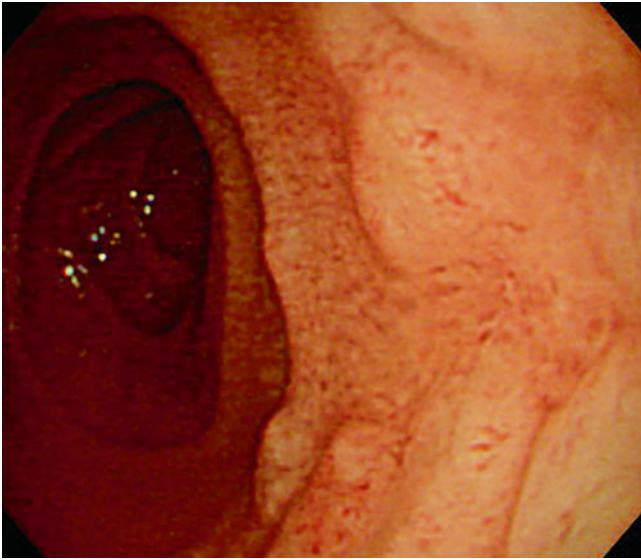


Fig. 16.42 Duodenal MALT lymphoma. The surface of the second part of the duodenum was diffusely nodular and pale. After the radiation treatment, the patient has been in remission for more than 7 years

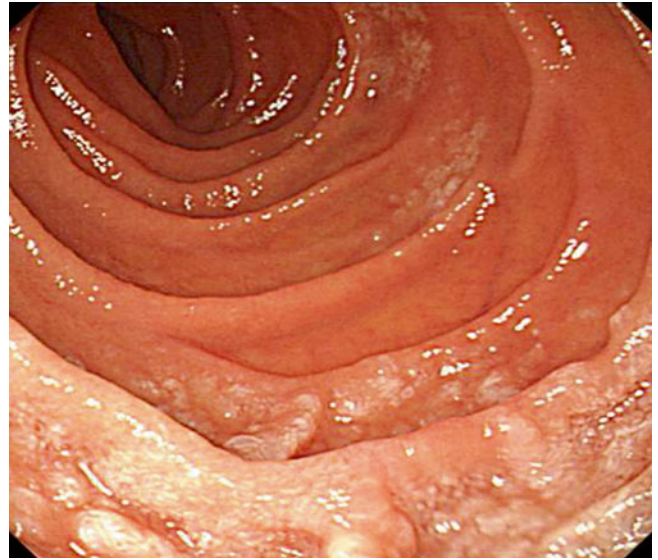


Fig. 16.44 Follicular lymphoma of the duodenum. This lesion was detected during the screening upper endoscopy

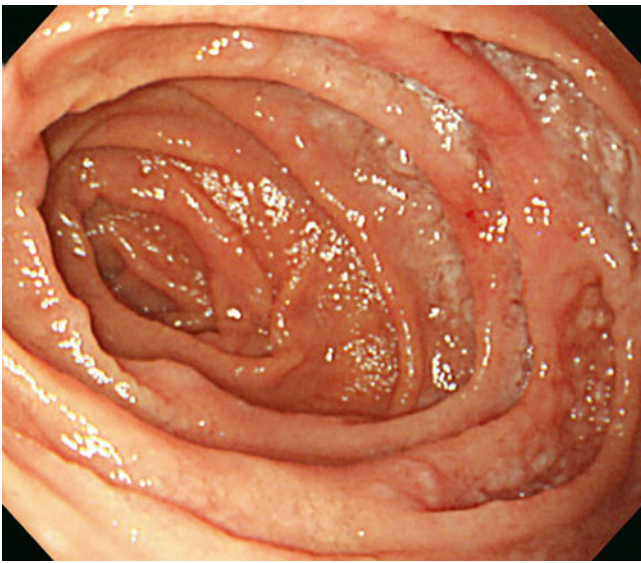


Fig. 16.43 Follicular lymphoma of the duodenum. The diffusely involved mucosal surface was pale and nodular

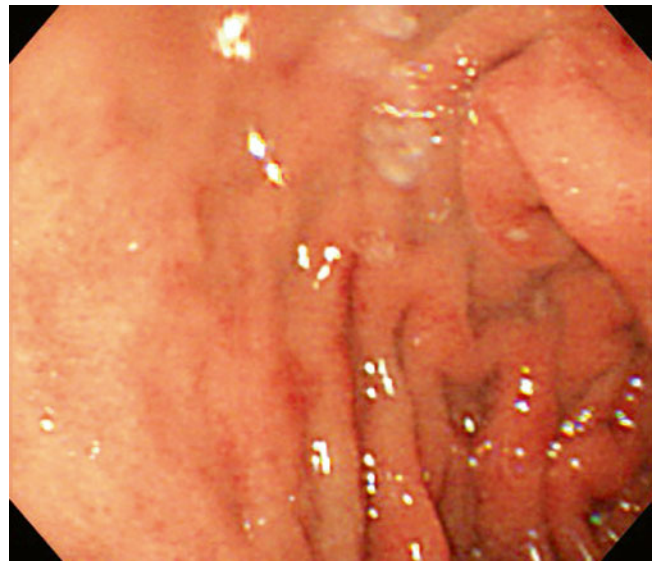


Fig. 16.45 Duodenal involvement of the mantle cell lymphoma. Some hyperemic patches were scattered in the duodenal bulb. In the closeup picture, the surface of the hyperemic area was relatively flat, but the margin was blurred



Fig. 16.46 Duodenal involvement of the mantle cell lymphoma. Some hyperemic patches were scattered in the duodenal bulb. In the closeup picture, the surface of the hyperemic area was relatively flat, but the margin was blurred

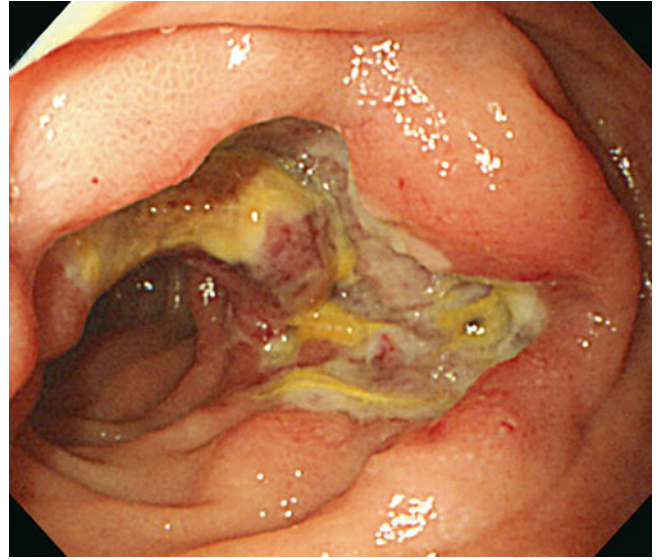


Fig. 16.48 NK/T-cell lymphoma of the duodenum. There was a huge ulcerative mass lesion. The base of the ulcer was very uneven

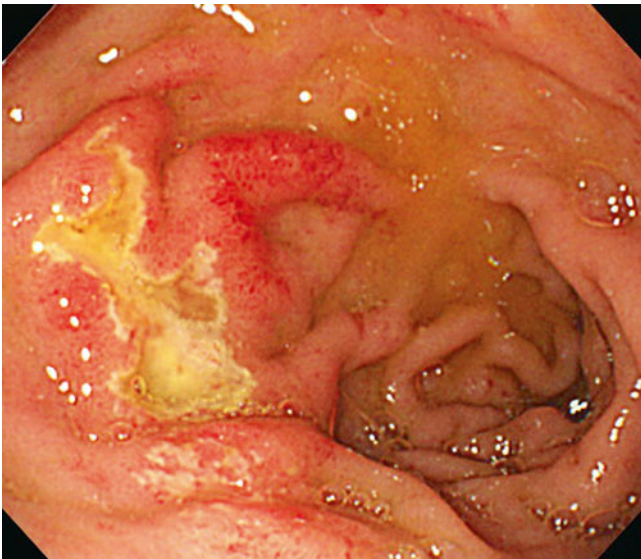


Fig. 16.47 Duodenal involvement of the mantle cell lymphoma. In this case, there was a shallow geographic ulcer with heaped-up margin seen in the proximal duodenum

16.7 Duodenal Involvement of Other Malignancies

Various types of malignancies of the liver and pancreas can directly invade the duodenal wall, which can cause bleeding or obstruction (Figs. 16.49, 16.50, 16.51, and 16.52).

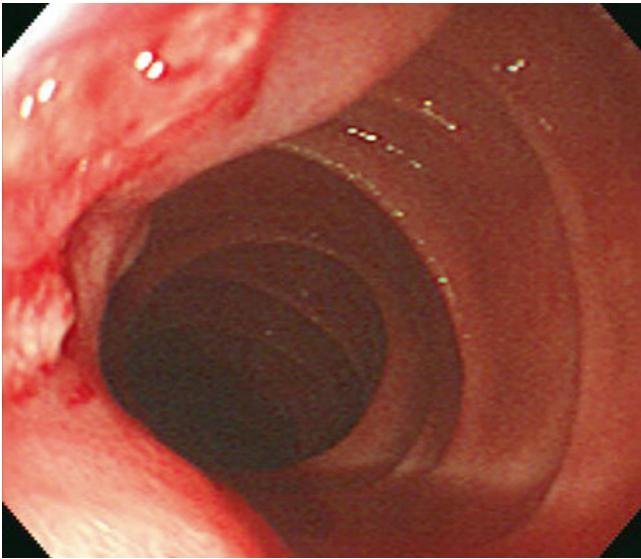


Fig. 16.49 Direct duodenal invasion of the pancreatic ductal adenocarcinoma

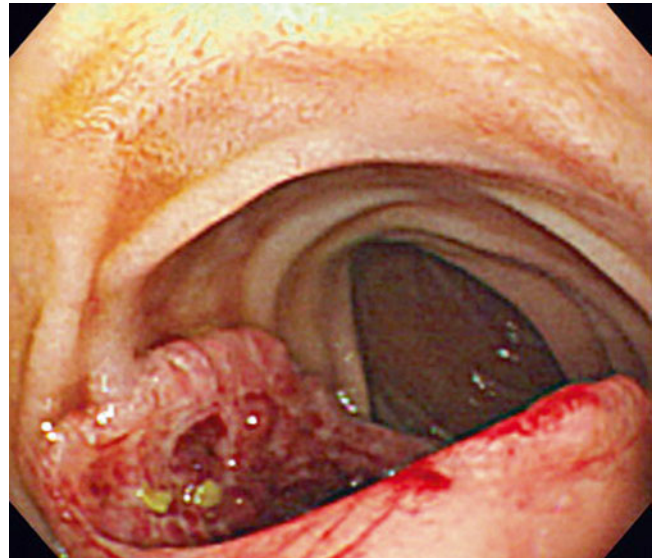


Fig. 16.51 Direct duodenal invasion of the hepatocellular carcinoma of the liver

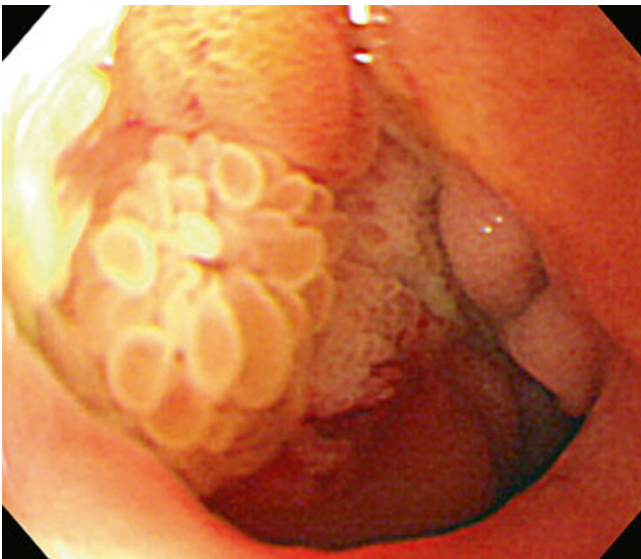


Fig. 16.50 Direct duodenal invasion of the mucinous adenocarcinoma of the pancreas

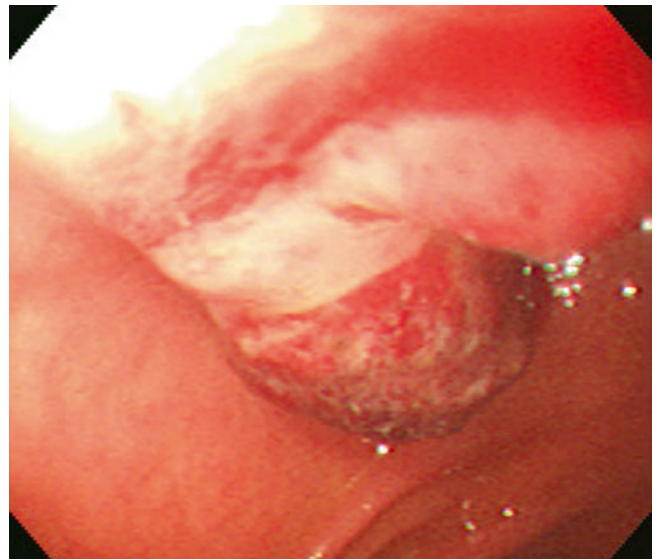


Fig. 16.52 Direct duodenal invasion of the hepatocellular carcinoma of the liver

Interesting Case

A 62-year-old woman presented with poor oral intake and loss of weight. In the usual upper endoscopy (Fig. 16.53), there was no lesion in the esophagus, the stomach, and the proximal half of the duodenum. On the abdominal CT scan (Fig. 16.54), a low attenuating mass lesion was found in the third to fourth portion of the duodenum. There were multiple enlarged lymph nodes around the tumor and aortocaval area. In the endoscopy examination (Fig. 16.55), a partial luminal

narrowing mass with pale friable surface was found, and the biopsy showed moderately differentiated adenocarcinoma. In the positron emission tomography scan (Figs. 16.56 and 16.57), a 4.5-cm-sized duodenal mass with high F-18 FDG uptake (SUV = 10.9) and multiple intra-abdominal and left supraclavicular lymph node uptakes were found. Palliative gastrointestinal stenting was done (Fig. 16.58).

Final diagnosis: adenocarcinoma of the distal duodenum

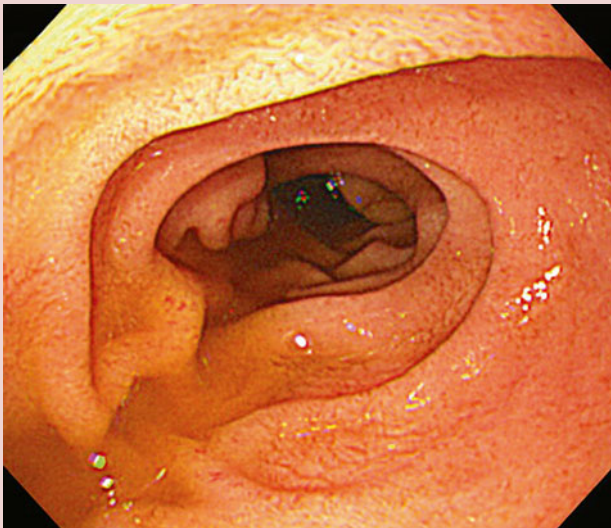


Fig. 16.53 No lesion was found in the proximal duodenum using the standard upper endoscope

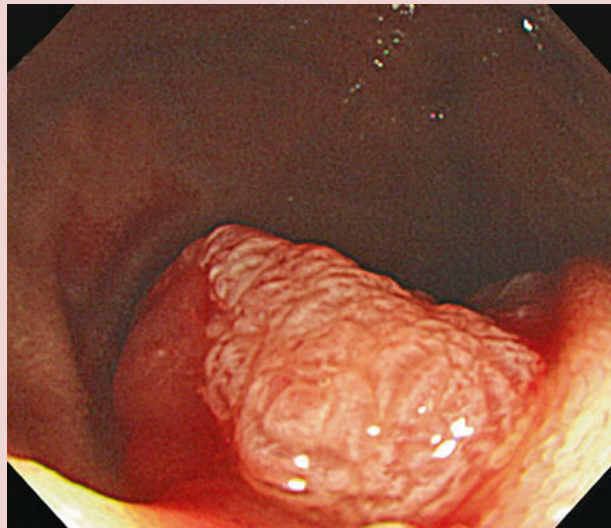


Fig. 16.55 A polypoid mass in the distal part of the duodenum. Colonoscope was used



Fig. 16.54 Low attenuation mass of the distal duodenum in CT

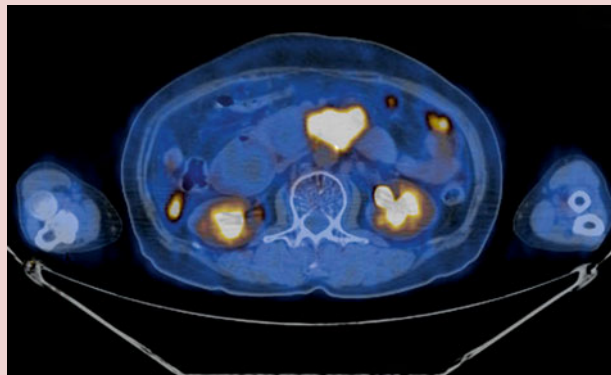


Fig. 16.56 Strong uptake in the distal part of the duodenum in PET/CT

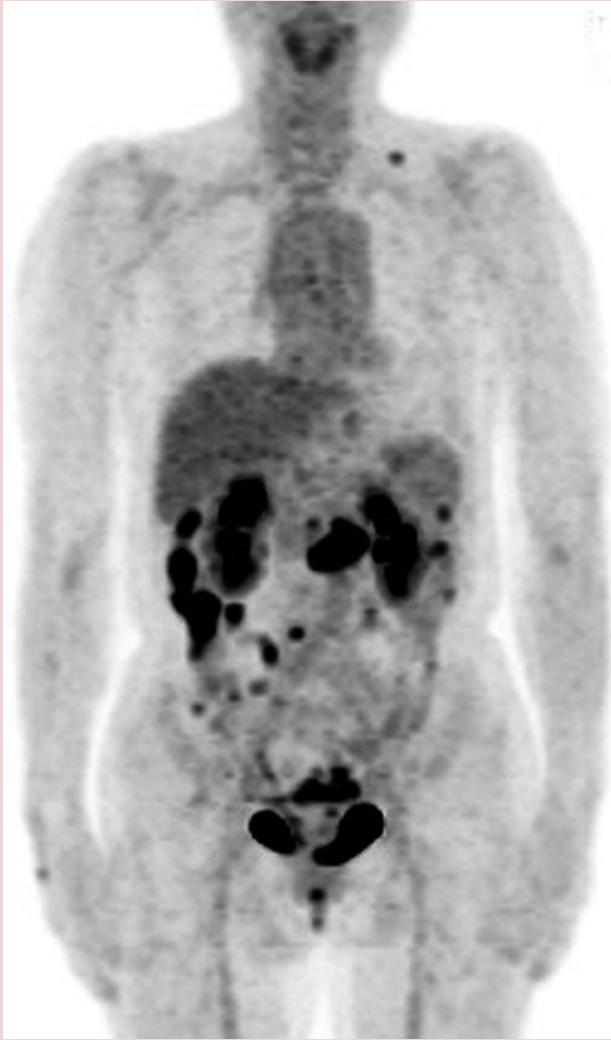


Fig. 16.57 Multiple metastatic lesions in PET



Fig. 16.58 Palliative stenting

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