7.1 Benign Tumors

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Definition. Benign tumors of the small intestine consist of various entities such as tumorlike inflammatory or hyperplastic lesions, hamartomas (organoid malformations), ectopic tissues, and true neoplasms of epithelial or mesenchymal origin.

Benign small bowel tumors

Inflammatory lesions
- Inflammatory polyps
- Suture granulomas

Hyperplasias
- Hyperplastic polyps (Fig. 2.3-5)
- Brunneromas

Hamartomas
- Hamartomatous polyps (Peutz-Jeghers polyps)
- Juvenile polyps (Fig. 7.3-1)

Ectopic tissues
- Ectopic pancreatic tissue
- Ectopic gastric mucosa
- Endometriosis

Epithelial tumors
- Adenomas

Mesenchymal tumors
- Hemangiomas
- Lymphangiomas
- Leiomyomas
- Lipomas
- Neurofibromas

Clinical Features. Benign tumors of the small intestine often remain asymptomatic for years. They may be manifested clinically by bleeding, iron deficiency anemia, or abdominal pain. Possible complications are obstruction, intussusception, and perforation.

Endoscopy. Hyperplasias, hamartomas, ectopic gastric mucosa, foci of endometriosis, and adenomas may appear as flat or raised lesions on the mucosal surface. Ectopic pancreatic tissue and mesenchymal tumors are usually located beneath normal mucosa, have smooth margins, and are raised. The surface may show a generally circumscribed ulceration that can cause bleeding. Vascular tumors often have a reddish or bluish appearance.

Benign and malignant small intestinal tumors cannot be reliably differentiated by endoscopic examination.

Inflammatory Lesions

Suture Granuloma
Granulomas may develop as an inflammatory reaction caused by suture material. These granulomas rarely cause symptoms, but may be confused with neoplastic lesions.

Endoscopy. Polypoid lesions can be visible at an anastomosis; the suture itself may be hidden by the granuloma (Fig. 7.1-1).

Inflammatory Polyps
Inflammatory fibroid polyps are a rare finding in the gastrointestinal tract, occasionally involving the small intestine. Histologically, they show a fibroblast proliferation and eosinophilia (Santos et al. 2004). They can cause intussusception or bleeding.

Endoscopy. Sessile or pedunculated polyps (Fig. 7.1-2) may be seen, sometimes with ulceration, hemorrhage, or hematoma.
Ectopic Tissues

Definition. Ectopic tissues are structurally normal but occur at an abnormal location in the body.

Ectopic Pancreatic Tissue

Occurrence. Ectopic pancreatic tissue is rare, but it is the most common tumorlike lesion in the jejunum and ileum (Matsuo et al. 1994).

Endoscopy. Endoscopy demonstrates a submucosal mass (Figs. 7.1-3 and 7.1-4). Histologic examination establishes the diagnosis.

Fig. 7.1-3a, b. Small, submucosal tumor in the jejunum (a). Histology of the resected specimen (b) shows normal pancreatic tissue with glands and excretory ducts (H&E, courtesy of Jürgen Schmoll, M.D.). The patient presented with obscure gastrointestinal bleeding years after undergoing a small intestine resection for carcinoid.

Fig. 7.1-4. Ectopic pancreatic tissue in the terminal ileum (courtesy of Ingo Franke, M.D.). The patient presented with intermittent bowel obstruction.
Ectopic Gastric Mucosa

**Occurrence.** Though relatively rare, ectopic gastric mucosa is the most common polyp in the duodenal bulb besides inflammatory polyps (each comprise 35%) (Stolte and Lux 1983). Ectopic gastric mucosa is a common finding in Meckel’s diverticula.

**Endoscopy.** A typical raised, brightly colored mosaic pattern of gastric mucosa with no villi is seen at endoscopy. Sometimes the tissue is found to be in contact with the distal, duodenal aspect of the pylorus (Fig. 7.1-5).

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Endometriosis

Ectopic endometrial tissue is rarely found in the small intestine. In women of childbearing age, these lesions may cause obstructive symptoms caused by subserosal, rather than by transmural involvement (Ridha and Cassaro 2003).

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**Fig. 7.1-5.**
a Typical gastric mucosa extends through the pylorus into the duodenal bulb (capsule in the duodenum).
b, c Raised, pseudopolypous gastric mucosa with irregular marginal extensions, appearing on normal small intestine mucosa with villi.
d Histology: corpus-type gastric mucosa (PAS, courtesy of Martin Bergmann, M.D.).
**Hyperplasias**

**Brunneroma**

**Definition.** A brunneroma is a mass formed by hyperplasia of the mucus-forming Brunner’s glands in the duodenum. It often has an inflammatory etiology (Merine et al. 1991).

**Prevalence.** Brunneromas account for 7% of all tumorlike lesions in the duodenum (Stolte and Lux 1983).

**Clinical Features.** Brunneromas are usually asymptomatic. Rarely, they can be large, known as Brunner’s gland adenoma, and can result in bleeding or obstruction.

**Endoscopy.** Endoscopy reveals a polypoid bulge of mucosa in the duodenal bulb with normal-appearing villi (Fig. 7.1-6). Large lesions are usually found on the posterior wall at the junction of the first and second parts of the duodenum (Fig. 7.1-7) and can be removed endoscopically (Gao et al. 2004).

![Fig. 7.1-6a, b. Biopsy-confirmed hyperplasia of Brunner’s glands in the duodenal bulb with superficial villi. a VCE, b side-viewing duodenoscopy.](image)

![Fig. 7.1-7. Endoscopic view of a large pedunculated duodenal Brunner’s gland adenoma.](image)
Hyperplastic Polyps

Hyperplastic polyps are rare in the small intestine (Fig. 2.3-5); they are mostly found in the duodenum (Matsuura et al. 1990).

Lymphoid Hyperplasia

Some degree of hyperplasia of lymphoid tissue in the terminal ileum is not uncommon, especially in children (Chap. 11).

Endoscopy. Nodular or polypoid lesions, sometimes aggregated, are typically found in the terminal ileum (Fig. 7.1-8).

Fig. 7.1-8 a, b. Lymphoid hyperplasia in the terminal ileum. a VCE, b ileoscopic view.
**Hamartomas**

**Definition.** Hamartomas are tumorlike developmental anomalies in which different tissue components are abnormally combined.

**Juvenile Polyps**

**Occurrence.** Juvenile polyps occur predominantly in the colon and less commonly in the stomach and small intestine (Fig. 7.3-1). They may be a manifestation of familial juvenile polyposis (see Chap. 7.3).

**Histology.** The term «juvenile» refers to the histologic type with inflammatory infiltrate and mucus-filled glands of the lamina propria.

**Endoscopy.** Endoscopy sometimes shows inflammatory surface changes in the polyps.

**Hamartomatous Polyps**

**Clinical Features.** Hamartomatous polyps may occur as sporadic or multiple manifestations in patients with Peutz-Jeghers syndrome (► Chap. 7.3). Polyps of sufficient size may produce symptoms of intestinal obstruction or may bleed (Fig. 7.1-9).

**Histology.** The lesions have a characteristic histologic appearance marked by an arborizing pattern of the muscular layer of the polyps (Fig. 7.1-10c).

**Endoscopy.** Endoscopy demonstrates reddish polyps, often pedunculated, that may completely occupy the intestine lumen (Figs. 7.1-10 and 7.3-2–7.3-4).

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**Fig. 7.1-9a–d.** Hamartomatous polyp (15x15 mm in size) in the proximal jejunum. a VCE finding, b intraoperative view, c resected surgical specimen, d histology of benign hamartomatous polyp (courtesy of Otto Ljungberg, M.D.). Patient with a 1-year history of persistent iron deficiency anemia (lowest hemoglobin level 60 g/l). Normal preoperative enteroclysis. After 2 years of follow-up the patient is symptom-free, with normal laboratory tests.
Epithelial Neoplasms

Adenomas

**Definition.** An adenoma is a benign neoplasm that arises from the crypt epithelium.

**Occurrence.** Adenomas occur sporadically in rare cases. Their incidence is increased in patients with polyposis syndromes (Chap. 7.3).

**Location.** Adenomas occur predominantly in the duodenum, often in the peripapillary region.

**Endoscopy.** Adenomas in the duodenum often appear as flat lesions with a typical whitish surface (Fig. 7.1-11). Adenomatous polyps of the small intestine occur in all sizes and may be sessile, broad-based, or pedunculated (Fig. 7.3-6 and 7.3-7).