Colon polyps

Colon polyps are one of the most frequently examined biopsy specimens in pathological practice. Differential diagnosis of individual polyps is of great importance for further patient care, as different types of polyps may differ in clinical behavior.

Polyps can roughly be divided into three groups:

- sporadic epithelial polyps (neoplastic polyps),
- sporadic mesenchymal polyps,
- polyps associated with syndromes.

Neoplastic colorectal polyps

Colorectal adenoma

Colorectal adenoma is a benign epithelial tumor of the large intestine, which represents the most common basis of intestinal polyps. It represents a classic precursor lesion that can develop into colorectal cancer after malignant transformation . Macroscopically, it is usually a lesion protruding above the surrounding mucosa. Histologically, colorectal adenomas are divided into the following three groups according to the prevailing architecture:

- tubular adenoma,
- tubvillous adenoma,
- villous adenoma.

Adenoma is formed by abundant dysplastic epithelium of the colonic mucosa. Nuclei are elongated to brush-like, enlarged, and pseudostratification and hyperchromasia of the nuclei are evident. Adenoma can also be classified as low-grade and high-grade, where in high-grade adenomas nuclear pleomorphism appears, architecture becomes more complex and cell polarity is blurred.

Molecularly, the formation of adenomas is linked to the APC/β-catenin pathway, i.e. the key event is the loss mutation of the APC gene. This mutation is also common to some syndromes, the fundamental difference is that in sporadic adenomas there must be a loss mutation of both originally functional copies of the gene.

Although this type of polyp usually occurs sporadically, it can also be associated with a hereditary occurrence in autosomal dominant familial adenomatous polyposis . In this syndrome, patients gradually develop hundreds to thousands of polyps, which have the potential to become malignant. Morphologically, these polyps are indistinguishable from sporadic polyps.

Seratous lesions

Serate lesions are a relatively newly defined group of polyps of the large intestine, which derives its name from the arrangement of the "sawtooth" epithelium. They include three groups of polyps:

- Sessile serous adenoma,
- Hyperplastic polyp,
- Traditional serous adenoma.

Sessile serrate adenoma

Sessile serrate adenoma is a benign epithelial tumor of the colon, which represents a lesion capable of malignant transformation into colorectal carcinoma, which is molecularly distinct from classic colorectal carcinoma.

Sessile serrate adenoma usually grows in the right colon, macroscopically it is usually a sessile lesion with a diameter larger than 1 cm. Microscopically, the branching of the crypts and serrations, i.e. the characteristic growth of the epithelium caused by the apoptosis disorder, are visible. Nuclei are moderately enlarged and have small nucleoli. In general, dysplastic changes at the cellular level are only very subtle, so sometimes crypt changes are emphasized as dysplasia of histological architecture as a diagnostic clue. Sometimes cellular dysplasias are also evident, then it is a subtype of sessile serous adenoma with cellular (cytological) dysplasias.

Sessile serous adenoma without cellular dysplasia has a risk of malignant transformation comparable to colorectal adenoma, sessile serous adenoma with dysplasias probably has a higher risk, although due to its relatively small frequency and difficult follow-up, the published data are not very strong for now.

Molecularly, sessile serous adenomas are associated with a different pathway, which will most likely be further dissected in the future. Changes in the methylation phenotype, changes in the expression of the repair gene MLH1 and BRAF mutations are demonstrated.

Traditional serous adenoma

A traditional serous adenoma is a rare variant of a serous lesion that also has the potential to become malignant.

Hyperplastic polyp

Hyperplastic represents the majority of serous lesions. The risk of malignant transformation of a hyperplastic polyp is low, especially small hyperplastic polyps seem to have a risk of malignant transformation comparable to an intact intestinal mucosa.

Hyperplastic polyps usually appear as small sessile to flat lesions located most often in the rectosigmum. Three types can be distinguished histologically:

- microvesicular hyperplastic polyp,
- goblet cell hyperplastic polyp,
- mucin-poor hyperplastic polyp.

Microscopic distinction from sessile serous adenoma is difficult, there are quite complicated diagnostic criteria.

Seratous lesions are generally sporadic, rarely occurs seratous polyposis syndrome , where seratous lesions with a risk of malignant transformation are significantly more common.

Polyps associated with syndromes

Peutz-Jeghers syndrome

In patients with Peutz-Jeghers syndrome, hamartomatous polyps can occur along the entire alimentary canal, except for the esophagus. Macroscopically, these are large lobulated pendulous polyps. Histologically, they are formed by a core of branching smooth muscle cells, along which the mucous membrane also spreads.

Peutz-Jeghers syndrome poses a risk for the development of a number of malignancies.

Juvenile polyp

Juvenile polyp (retention polyp) is the most common intestinal polyp in children. It is usually a sporadically occurring polyp, but it can also appear as part of the juvenile polyposis syndrome, which is characterized by the appearance of a larger number of polyps.

Macroscopically, they are usually large pedunculated polyps with a red granular surface. Histologically, the polyp is formed by an edematous inflammatory stroma, in which mucus-filled dilated glands lined with epithelium are embedded. The epithelium is usually intact, but dysplastic changes can also appear in it, more often in juvenile polyposis syndrome. Erosions are common on the surface of the polyp, which may be filled with granulation tissue.

Juvenile polyposis syndrome is a risk factor for the development of adenocarcinomas of the gastrointestinal and hepatobiliary tract.

Cronkhite-Canada syndrome

Cronkhite-Canada syndrome is a rare non-hereditary syndrome, which also includes multiple occurrence of juvenile polyps-like intestinal polyps. In this case, however, the polyps are macroscopically sessile on a broad base, the dilated glands are not only on the polyp but also in the macroscopically intact mucosa, and dysplasia never appears.

Due to the small number of cases, it is unclear whether these polyps have malignant potential.

Cowden syndrome

Cowden syndrome is an autosomal dominant disorder associated with multiple occurrence of colonic hamartomas. Cowden syndrome is a risk factor for some malignancies, but not for colonic malignancies.

Mesenchymal polyps

Fibroblastic polyp (Perineuroma)

Fibroblastic polyp, or intestinal perineuroma is a benign lesion occurring anywhere in the intestine, most often in the large intestine. Macroscopically, it is a small, flat, sessile polyp, histologically composed of fine spindle cells with oval nuclei and clear cytoplasm. Cell atypia and mitoses are not demonstrable. There is no remission after removal.

Ganglioneuroma

Ganglioneuroma is usually a solitary, sporadically occurring benign tumor. Macroscopically, it is a small nodule in the lamina propria, which elevates the adjacent epithelium in the form of a sessile polyp, sometimes even a pendulous polyp. Histologically, it consists of spindle cells (Schwann cells), a fibrillar matrix and irregularly

scattered nests of ganglion cells. Tumor growth disrupts the architecture of the crypts, which tend to be twisted. Ganglioneuroma can spread in a plexiform arrangement to the submucosa, where nerves can also be involved in the tumor.

In addition to sporadic occurrence, they can also occur in some hereditary syndromes:

- multiple endocrine neoplasia syndrome 2B ,
- Neurofibromatosis type 1,
- familial adenomatous polyposis .

Ganglioneuromas occurring as part of hereditary syndromes tend to be larger, more ganglion cells are present, and a filiform arrangement is more common. Sometimes there may be an extensive ill-defined transmural process referred to as ganglioneuromatosis.

Schwannoma

Schwannomas occurring in the large intestine differ from schwannomas in peripheral tissues primarily in that they are not encapsulated and that they have a relatively distinct lymphoid cuff. A less common variant is psammomatous melanotic schwannoma. They probably also differ genetically from conventional schwannomas, as they show strong immunochemical positivity in S100 and negativity in KIT .

Schwann cell mucosal hamartoma

Mucosal Schwann cell hamartoma is usually a small nodule that is picked up accidentally during colonoscopy. It is more common in the sigmoid and rectum, but can appear anywhere in the colon. Histologically, it is an ill-defined proliferation of spindle cells without apparent proliferation or atypia in the lamina propria surrounding the crypts.

Benign epithelioid tumor of nerve sheaths

Benign epithelioid tumor from nerve sheaths is occasionally a small polyp accidentally caught in elderly patients. Histologically, it is made up of infiltratively growing spindle to predominantly epithelioid cells. The tumor arises from the lamina propria and usually spreads towards the superficial submucosa. Pseudoinclusions are often visible in the nuclei, the cytoplasm is eosinophilic fibrillar. Proliferation is low, mitoses are not detected, Ki67 positivity is low.

Leiomyoma

Colonic leiomyomas are rare benign mesenchymal tumors. They usually present as small flat whitish sessile polyps of the colon and rectum covered by an epithelium that may be intact, subject to pressure atrophy, or rarely exulsed. These are well-defined nodules of proliferating smooth muscle cells of the submucosa, usually neither mitoses nor necrosis are demonstrable. Sometimes it may show marked nuclear atypia with nuclear hyperchromasia.

Gastrointestinal stromal tumor

Gastrointestinal stromal tumor is a mesenchymal tumor arising from cells of Cajal . It can occur anywhere in the digestive tract, but is not common in the large intestine. Biologically, its behavior is uncertain, in localities where it is more numerous, the malignant potential can be inferred mainly from the size of the tumor and from the mitotic activity.

Macroscopically, it usually presents as a nodule in the intestinal wall covered with intact or even ulcerated epithelium. It occurs in several histological variants, spindle cell types predominate in the intestine. Gastrointestinal stromal tumors are characterized by immunochemically demonstrable expression of KIT , however, when growing from the colon, it is often negative.

Fibrovascular polyp

Fibrovascular polyp of the rectum is extremely rare. Histologically, it is made up of spindle cells in fibrovascular tissue with only sparse chronic inflammatory infiltration.

Granular cell tumor

Granular cell tumor (Abrikossoff's tumor) is a benign tumor that rarely occurs in the colon. Macroscopically, it presents as a small submucosal nodule. It consists of polygonal cells with abundant eosinophilic granular cytoplasm and fine nuclei.

Lipoma

Lipomas occur in the intestine very rarely, more often in the right colon. They are usually small and asymptomatic, but sometimes they can grow to larger sizes and then they can manifest clinically. Histologically, they are formed by mature adipocytes. Exceptionally, a greater incidence of lipomas is associated with ganglioneuromatosis of the colon or with Cowden's syndrome .

An increase in fatty tissue in the ileocecal junction is sometimes described as a lipoma, but it is possible that in this case it is a pseudotumor caused by a prolapse of submucosal fatty tissue.

Hemangioma

Gastrointestinal hemangiomas are relatively uncommon benign tumors. Macroscopically, they appear as red to bluish polypoid lesions, clinically they manifest as bleeding. Histologically, they occur in two forms:

- capillary hemangioma,
- cavernous hemangioma.

They can occur as sporadic lesions or as part of hereditary syndromes, usually the following:

- Klippel-Trenaunay-Weber syndrome ,
- Bean syndrome (blue rubber bleb syndrome).

Lymphangioma

Lymphangioma is a rare benign tumor of the intestine. It usually presents as a submucosal polypoid lesion, which can sometimes present with bleeding and abdominal pain. Histologically, it can occur in three forms:

- capillary lymphangioma,
- cavernous lymphangioma,
- cystic lymphangioma.

It is usually solitary, but a few cases of intestinal lymphangiomatosis have been described.

Xanthoma

Colonic xanthoma is a rare incidental colonoscopic finding. Macroscopically, it appears as a papule to a polyp, microscopically numerous macrophages with foamy cytoplasm are visible. The surface epithelium is usually hyperplastic.

The occurrence is not associated with skin xanthomas, but it seems that it could be associated with diabetes, hyperlipidemia and chronic constipation. It is more often found together with other types of polyps.

Vanek's tumor

Vanek's tumor (inflammatory fibroid polyp) is a benign mesenchymal tumor that rarely occurs in the intestine. Macroscopically, it appears as a larger polypoid lesion with a broad base. Microscopically, it is characterized by the proliferation of fine spindle cells in a fibromyxoid stroma with an inflammatory infiltrate dominated by eosinophils. Mitoses may be seen, but nuclear pleomorphism is extremely unusual. The polyp grows out of the submucosa.

Inflammatory polyp

Inflammatory polyp (pseudopolyp) is actually a regenerative response to non-specific intestinal inflammation (IBD) and some intestinal infections, other conditions such as reaction to local trauma are also considered. The crypts are usually dilated or tortuous, and the lamina propria is widened by an inflammatory infiltrate. Depending on the inciting insult and the course, the inflammatory infiltrate can be acute or chronic. Adjacent epithelium is also infiltrated with inflammation, and erosions with granulation tissue at the base are not uncommon. In general, reactive changes are quite significant. To distinguish an inflammatory polyp from non-specific intestinal inflammation, a biopsy from a macroscopically unaffected section is sometimes necessary.

In particular, post-inflammatory filiform polyps may appear in places of previous mucosal ulceration. Macroscopically, they appear as long finger-like formations. Histologically, they are formed by cylindrical growths of submucosa surrounded on all sides by mucous membrane with thinned or absent muscularis mucosae.

Mucous prolapses

The mucosa can prolapse anywhere in the large intestine. The result of prolapse is a solitary, usually rather less noticeable polyp. Histologically, a polyp formed on the basis of a mucosal prolapse is characterized by hypertrophy of the muscularis mucosae, which can lead to the growth of smooth muscle into the lamina propria, and fibrosis also appears. These changes lead to distortion of the crypts, changes in the shape of the crypts can take on an appearance described as a diamond shape. Serrations of the epithelium, characteristic of serrate lesions, are also sometimes present, so diagnostic errors may occur. The surface epithelium may ulcerate and thus reparative changes may occur.

Several types of lesions associated with mucosal prolapse have been described that may underlie a polyp:

- Solitary Rectal Ulcer syndrome ,
- inflammatory cloacogenic polyp ,
- mucosal prolapse in diverticulosis .

Links

Related Articles

- Colorectal cancer
- Serous lesions
- Vienna Classification of Gastrointestinal Neoplasia (2002)
- Colonoscopy examination
- Intestinum crassum

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