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Neoplastic Intestinal Disease

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Polypectomies

Polyps of the gastrointestinal tract are usually removed endoscopically by a single incision at the base of the polyp stalk. Although these specimens lack the size and complexity of more extended bowel resections, they are delicate structures that require meticulous processing. First, obtain relevant clinical information such as the patient's history, the endoscopic findings, and the anatomic site from which the polyp was removed. Next, turn your attention to the specimen itself. The polypectomy specimen poses three important questions to the surgical pathologist: (1) Are adenomatous changes present? (2) Is infiltrating carcinoma present, and if it is does it infiltrate into the stalk? (3) Do any of the neoplastic changes extend to the resection margin at the base of the stalk? Clearly, the polypectomy specimen must be carefully oriented and processed so that these issues can be addressed.

The key to orienting the polyp is to find its stalk. This may require careful inspection, since a short stalk is often overshadowed by the much larger head of the polyp. After finding the stalk, mark its base (i.e., the resection margin) with either ink or colored tattoo powder. Measure the height and diameter of the polyp. Next, place the specimen in formalin for fixation. Given the soft and spongy consistency of the fresh polyp, sectioning the polyp is greatly facilitated if it is well fixed.

Once fixed, the specimen should be sectioned in a way to show the relationship of the stalk to the head of the polyp. As illustrated, this relationship is usually best demonstrated by trisecting the polyp into two lateral caps and one median section that includes the stalk and the center of

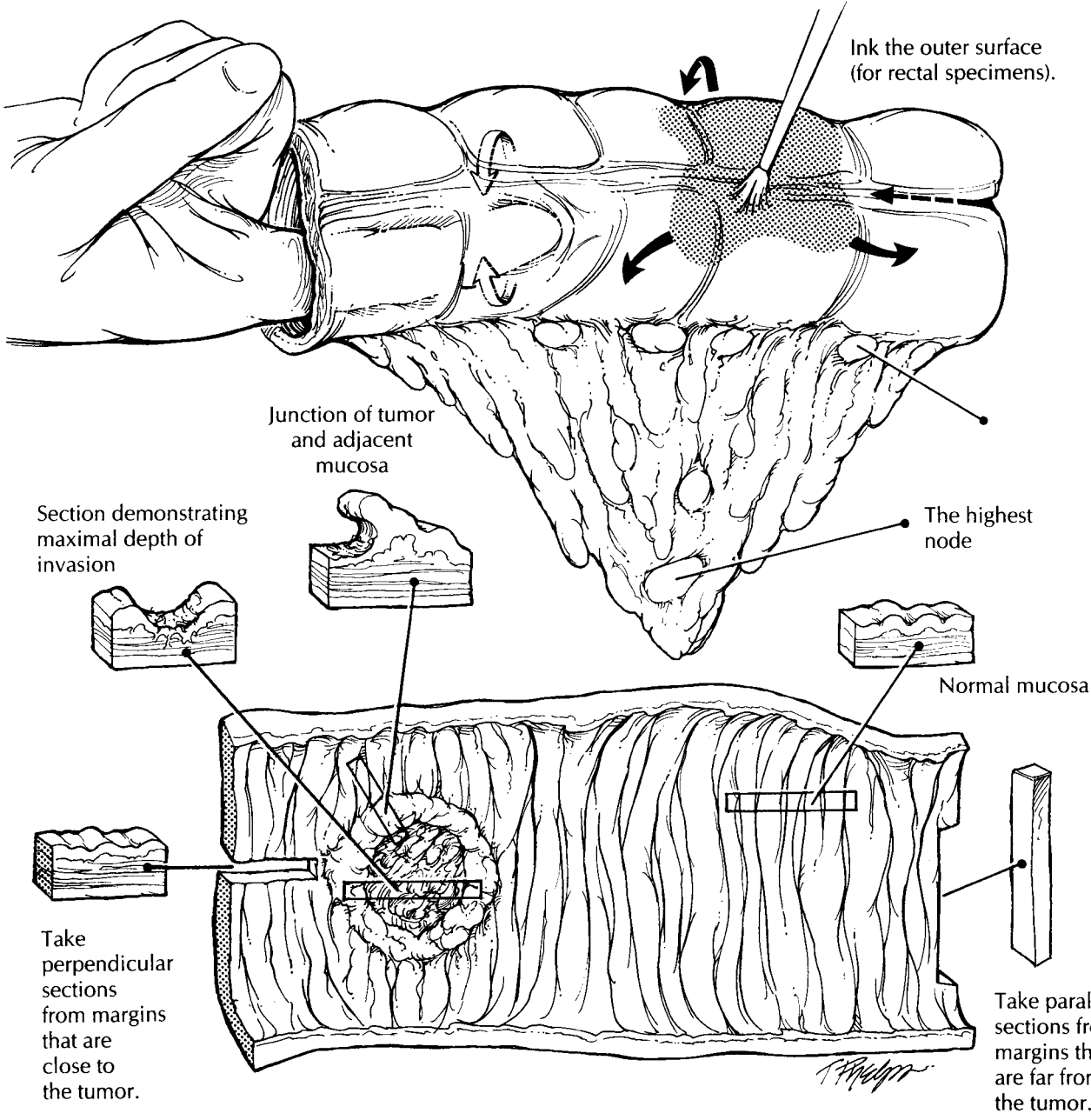
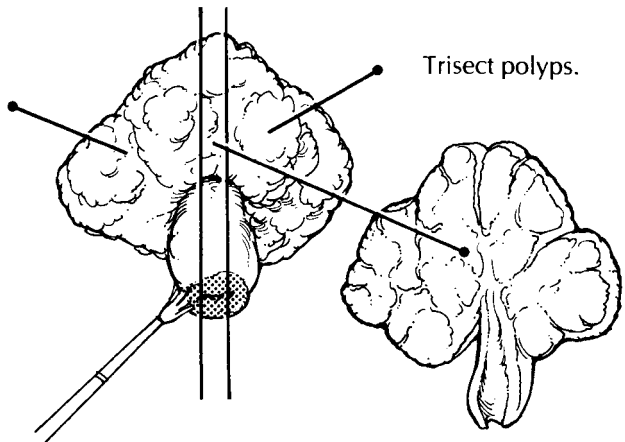
the head. The median section should demonstrate the largest cross-sectional area of the head of the polyp, its interface with the stalk, and the surgical margin. The importance of trisecting the polyp is readily apparent if one pauses to consider the impact of this method on the histologic sections. Serial sections into the median section of a trisected polyp will approach the point of interest, the center of the polyp. To avoid missing a small focus of carcinoma, submit the entire specimen for histologic evaluation.

Important Issues to Address in Your Surgical Pathology Report on Polyps

- What procedure was performed, and what structures/organs are present?
- What is the histologic type of the polyp (e.g., adenomatous, hyperplastic, hamartomatous, inflammatory)?
- For adenomatous polyps, is the polyp architecturally tubular, villous, or tubulovillous?
- If a carcinoma is present, what is the depth of invasion of the tumor? (Specify the presence or absence of invasion of the stalk and of the submucosa at the base of the stalk or base of a sessile polyp.) Specify whether there are any poorly differentiated areas.
- Is there evidence of vascular invasion?
- What is the status of the resection margin at the base? Measure (in millimeters) the distance from the deepest part of the invasive carcinoma component to the nearest polyp margin. Does the adenomatous epithelium or the infiltrating carcinoma extend to this margin?

Resections of Intestinal Neoplasms

1. Orient the specimen. Record its length and diameter proximal and distal to the tumor. Describe the serosa.
2. Open the bowel on the side opposite the tumor. Record the size of the tumor and the distance to each margin. Section the tumor, and document its deepest gross penetration.
3. Remove the mesentery, and submit representative sections of each node by level. Look for vascular invasion.
4. Submit sections of tumor to demonstrate its deepest penetration and relationship to normal mucosa. Submit sections of the proximal and distal margins, other lesions, normal mucosa, all lymph nodes, and any attached structures or organs.



Resections of Intestinal Neoplasms

The pathologic evaluation of resected intestinal neoplasms plays an integral part in determining the patient's prognosis and in selecting the appropriate adjuvant therapy. As is true for other specimens, a systematic approach to your dissection is the best way to ensure that all of the appropriate information is included in your final report.

Start with the patient's history. This should include both the patient's clinical history (Crohn's disease, ulcerative colitis, polyps, family history) and the relevant endoscopic findings. Next, identify the segment of bowel that was resected, and orient the specimen. As described in Chapter 13, the large intestine is readily distinguished from the small intestine by its larger diameter and the presence of longitudinal muscle bands (the teniae coli), sacculations (the haustra), and the appendices epiploicae. In addition, the small intestine shows mucosal folds that stretch across the entire circumference of the bowel, whereas the large intestinal mucosal folds are discontinuous. The rectum can be distinguished from the colon by the absence of a peritoneal surface covering the rectum. Record the length and the diameter of the bowel. The diameter should be recorded both proximal and distal to any lesions. Look for and document the presence and appearance of any other structures, such as the appendix. Next, describe the serosa. Are any diverticula, gross perforations, or serosal nodules present?

As noted above, the rectum lacks a serosal lining. Therefore, the outer surface of the rectum represents a true soft tissue margin, and these soft tissues should be inked. Otherwise, only the proximal and distal margins need to be inked. When opening the bowel, make every effort not to cut through the tumor. First, localize the tumor by palpating the specimen and probing the lumen of the bowel with your finger, then open the bowel on the side opposite the tumor. If a tumor cannot be appreciated grossly, simply open the small intestine adjacent to the mesentery, the colon along the anterior (free) teniae, and the rectum along the midline anteriorly. Once the specimen has been opened, gently rinse off the intestinal contents using a stream of isotonic saline.

Next, systematically describe the opened specimen. Start with the tumor. Document its location relative to the margins and to any landmarks, such as the ileocecal valve or the pectinate line.

Describe the size of the tumor in its longitudinal and transverse dimensions, as well as its gross configuration (endophytic, pedunculated, sessile, diffusely infiltrative, or annular). It is especially critical to document tumor size for anal carcinomas, since it is tumor size rather than depth of invasion that serves as the key feature for assessing "T" when staging the tumor. Multiple cancers should be looked for, described, and labeled separately. After the tumor has been described, make multiple parallel 2- to 3-mm sections through the tumor, and note its deepest gross penetration. It is also important to note if bowel perforation (a hole in the bowel wall) is associated with the tumor. Also note the distance from the tumor to the soft tissue or *radial margin*. This is the distance from the outermost part of the tumor to the lateral margin of resection along a radius drawn from the center of the lumen of the bowel through the deepest penetration of the tumor. The soft tissue margin is only important for rectal cancers and for colon cancers located on the mesenteric aspect of the bowel.

After the tumor has been described, turn your attention to the remainder of the bowel. Be systematic in your description. For example, begin with the mucosa, wall, and serosa of the proximal portion of the specimen and then proceed distally. When describing the mucosa, note diverticula, changes of inflammatory bowel disease, polyps, and ischemic changes. A systematic approach to your gross dictation will ensure that all important findings are included.

We like to examine the soft tissues for lymph nodes in the fresh state because the nodes are easier to palpate and because they retain their pink color, which contrasts to the yellow fat. The next step, therefore, is to dissect the mesentery. Look for and sample any lymph nodes adjacent to the point of ligation of the vascular pedicle, and designate these as the highest lymph nodes. Next, cut the mesentery close to the bowel, maintaining anatomic orientation. Do not remove any areas in which the tumor directly extends into the mesenteric fat. Sample these as a part of the deep margin after the specimen has been fixed. Then divide the detached mesenteric fat into groups: those proximal to the tumor, those at the level of the tumor, and those distal to the tumor. If any great vessels are present, identify and separately designate the nodes adjacent to them. Thinly section the mesenteric fat at each level, and examine and palpate each section for lymph

nodes. Submit for histology each identified node. When looking for the nodes, remember that they are frequently present at the junction of the bowel wall and the mesentery. When submitting the lymph nodes for histologic processing, remember to designate the level from which they were taken. Also examine the veins and arteries in the mesentery for thrombi. If any are present, submit a representative section of the involved vessel for histologic examination. After the mesentery has been examined, separately bundle each level for fixation and storage. Should you ever have to return to the mesentery, the orientation will be preserved. The specimen can now be pinned to a wax tablet and fixed overnight.

After the specimen is well fixed, it can be sampled. Start with the tumor. Submit at least two sections: one from the edge of the tumor to show the junction of tumor and normal bowel, and one from the point of deepest tumor penetration into the wall of the bowel. If the tumor does not grossly appear to involve the bowel wall, then submit the entire base of the lesion to demonstrate the presence or absence of invasion. Submit the proximal and distal margins. If the tumor is close to a margin, these sections should be perpendicular (longitudinal), and if the tumor is far from a margin, these sections can be parallel (transverse). Next, sample any other lesions. When sampling polyps, remember to include both the head and stalk in your sections. Submit representative sections of normal bowel mucosa and wall, and submit representative sections of all remaining structures/organs, such as the appendix and terminal ileum. Remember that longitudinal sections are better than transverse sections when sampling the colon wall.

Important Issues to Address in Your Surgical Pathology Report on Resections for Intestinal Neoplasms

- What procedure was performed, and what structures/organs are present?
- What is the location of the tumor?
- What are the dimensions of the tumor?
- What is the gross configuration of the tumor (endophytic, pedunculated, sessile, diffusely infiltrating, annular)?
- What are the histologic type and grade of the neoplasm?
- What is the maximum depth of invasion of the tumor? Is it *in situ* (high-grade dysplasia), or does it extend into the lamina propria, submucosa, muscularis propria, or through the muscularis propria into subserosa? Does the tumor extend into other organs, or does it extend into the visceral peritoneum?
- Is there bowel wall perforation?
- Is any vascular invasion identified?
- What is the status of the margins (proximal, distal, and radial)?
- How many lymph node metastases were identified, and how many lymph nodes were sampled at each level?
- Are there mesenteric deposits? For staging purposes, tumor nodules in the pericorectal fat without histologic evidence of residual lymph node are classified as regional node metastases if they have the form and smooth contour of a lymph node. Nodules with irregular contours are believed to reflect microscopic venous invasion using AJCC criteria.
- Are any other lesions noted (e.g., adenomas, intestinal inflammatory disease, dysplasia)?