

13 Non-Neoplastic Intestinal Disease

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Small Biopsies

Proper tissue orientation is a critical part of the histologic evaluation of biopsies of the gastrointestinal tract. Tissue orientation is a two-step process that involves the coordinated actions of the endoscopist and the histotechnologist. The endoscopist should mount the biopsy mucosal-side up on an appropriate solid surface (e.g., filter paper) and place it in fixative. This first step should be done immediately, in the endoscopy suite, so that the specimen does not dry out en route to the surgical pathology laboratory. The histotechnologist can then embed and cut the biopsy specimen perpendicular to the mounting surface. If the specimen is free-floating, great care must be taken to identify the mucosal surface for proper embedding. Multiple sections should be cut from each tissue block for histologic evaluation. Step sections are preferred to serial sections so that intervening unstained sections are available for special stains as needed.

Resections of Small and Large Intestine for Inflammatory Bowel Disease

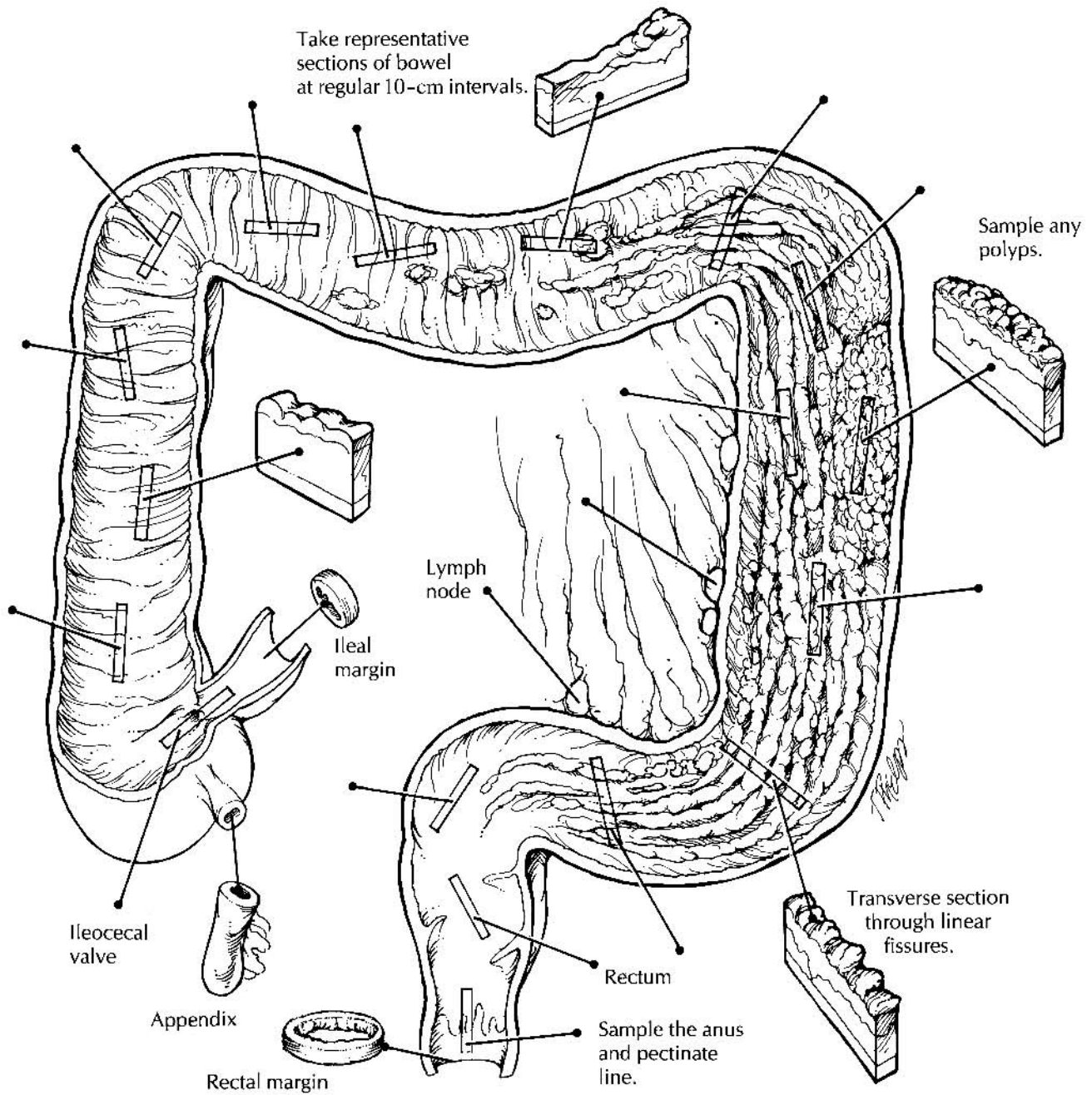
Given the structural simplicity of the intestinal tract and the ease with which the bowel can be opened, there is a strong tendency to rush into these dissections without thinking ahead. The approach to the non-neoplastic bowel specimen requires an effective strategy that gives careful consideration to an organized gross description, specimen photography and fixation, and details of dissection and tissue sampling.

The Organized Gross Description

A good gross description not only describes all the relevant gross findings but presents these findings in an organized fashion. This can be a difficult task in bowel resections, where the specimen may consist of more than one structure (e.g., ileum, appendix, cecum, and colon). Organize your gross description. First, describe the specimen after it has been examined and at least partially dissected. This will make it possible to collect all of the gross findings and integrate them into an organized statement. Second, always describe each component of the resection as an individual unit. For example, describe the mucosa, wall, and serosa of the ileum and then move on to the appendix, cecum, and finally the colon. Third, focus on the mucosa. Begin by describing the distribution of mucosal alterations (e.g., diffuse, discontinuous) and then describe the specific characteristics of these changes (e.g., ulcerated, granular). Of course, no gross description is complete without a description of the wall, serosa, and mesentery; but for inflammatory bowel disease, a less detailed description of these layers will generally suffice.

Specimen Dissection

Given the structural simplicity of the bowel, opening these specimens is generally straightforward. When possible, the small intestine should be opened adjacent to the mesentery. In contrast, the large intestine should be opened on the anti-mesenteric border along the anterior (free) teniae coli. Remove the mesentery before fixing the bowel. Treat the mesenteric soft tissues as though



Resections for Inflammatory Bowel Disease

1. Orient the specimen. The large intestine can be distinguished from the small intestine by its larger diameter and by the presence of longitudinal muscle bands (teniae coli), sacculations, and the appendices epiploicae.
2. Identify and measure all components of the specimen (do not forget to look for the appendix).
3. Remove the mesentery. Open the small bowel along its mesenteric border, and open the large bowel along the anterior teniae coli. Rinse the bowel, pin it flat on a cork or wax tablet, and submerge it in formalin until well fixed.
4. Describe the specimen in a systematic fashion. Include a description of the mucosa, wall, and serosa of each component of the specimen.
5. Sample all areas of the bowel by submitting sections at regular 10-cm intervals. Also include sections of the appendix, ileocecal valve, margins, mesenteric vessels, any focal lesions, and representative lymph nodes from all regions of the bowel.

a carcinoma will be discovered in the bowel resection, keeping in mind that carcinomas may arise in the setting of long-standing inflammatory bowel disease. For total colectomies, remove the mesentery as six separate portions, and designate these as proximal ascending, distal ascending, proximal transverse, distal transverse, proximal descending, and distal descending. Although only representative lymph nodes need to be submitted, the six portions should be clearly labeled and saved for easy retrieval if more extensive lymph node sampling is later required.

Specimen Fixation

In general, the bowel should be fixed before it is photographed, described, and sectioned. Subtle mucosal alterations (e.g., erosions, ulcerations, areas of hemorrhage) that may not be apparent in the fresh specimen are often well defined once the specimen is fixed. In most cases, the specimen can be opened and pinned on a solid surface as a flat sheet and then submerged in formalin. Some specimens may be so distorted that they cannot be easily opened and pinned flat without the risk of cutting across structures (e.g., fistulae, diverticula) and disrupting important relationships. These distorted specimens may be best handled by infusing formalin into the lumen of the bowel and then clamping both ends of the specimen. Whether the bowel is submerged or infused, fecal material should first be rinsed from the mucosal surface (a more formidable challenge in the unopened specimen) using a gentle stream of an isotonic solution.

Specimen Photography

Photographs of the specimen should be liberally taken to document further the gross findings, especially the distribution and nature of the mucosal alterations. Photograph the specimen after it has been opened and fixed. Photographs of the unopened bowel are generally useless. Fixation tends to both accentuate the mucosal alterations and reduce the amount of reflected light. Always position the specimen anatomically on the photography table. Total colectomies, for example, should be positioned so that the ascending colon is to the anatomic right, the descending colon is to the left, and the transverse colon is

to the top and center. Finally, include close-up photographs to illustrate the details of the mucosal pathology.

Tissue Sampling

To evaluate the distribution of inflammatory changes in the specimen, all areas of the bowel should be sampled for histologic evaluation. One method that consistently ensures adequate sampling is to submit representative sections at 10-cm intervals, beginning at the distal end of the specimen and proceeding proximally in a step-wise fashion. This not only will ensure that the mucosa is well sampled but will also provide information on the distribution of the disease process. Of course, sections of any focal lesions such as ulcers or polyps should be submitted in addition to these interval sections. Sections should also be taken of the appendix and the ileocecal valve when these structures are present. When no tumor is grossly apparent, the resection margins may be taken as shave sections. In addition to sampling the mesentery for lymph nodes, submit sections of mesenteric blood vessels and of any focal lesions such as fistula tracts or areas of fat necrosis. Indicate the site from which all sections were taken on the Polaroid or digital photographs. Take longitudinal sections (i.e., parallel to the teniae coli). Exceptions are permitted when, for example, a linear ulcer is best demonstrated by a transverse section through the bowel.

Once these principles regarding gross description, fixation, dissection, and sampling are mastered, the inflammatory bowel specimen can be handled with relative ease. The initial step is to identify the structures that are present in the resected specimen. 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 mucosal folds of the large intestine are discontinuous. Several features may be helpful in appreciating the various regions of the large intestine. The cecum is usually quite apparent, and it can be used to identify the origin of the ascending colon. The transverse colon can be recognized by its large mesenteric pedicle attachment, while the sigmoid colon has a relatively short mesenteric pedicle. When a portion

of rectum is included in the specimen, it can be distinguished from the sigmoid colon by the absence of a peritoneal surface lining.

The initial description should be limited to a list of the structures present and the dimensions of each. Further handling of the bowel is facilitated by removing the mesenteric fat. As described previously, these soft tissues should be removed according to their anatomic location, and each portion should be clearly labeled so it can be easily identified and retrieved. Most prosectors have an easier time finding mesenteric lymph nodes while these tissues are still in the fresh state. Remember, most of the lymph nodes are found at the junction of the bowel and mesenteric fat. Open the bowel along its entire length, cutting the small bowel along its mesenteric attachment and the large bowel along the anterior teniae. Gently rinse any fecal material from the mucosal surface using a stream of isotonic solution. Pin the opened bowel flat on a solid surface, and submerge it in formalin.

Once the specimen is fixed, complete the examination of the mucosa, noting in the gross description the distribution and characteristics of the mucosal alterations. Place the bowel in its correct anatomic position, and photograph it. Take a Polaroid or digital photograph of the entire specimen, so that the sites from which histologic sections were taken can be indicated on the image, and take close-up views of focal lesions.

Remember to section all regions of the bowel by using a method of stepwise sectioning at regular (i.e., 10-cm) intervals. Specific bowel sections should include the proximal and distal resection margins, the ileocecal valve, the appendix, and any focal lesions. If a neoplasm is not found, sampling of representative lymph nodes from each level will suffice. Sampling of the mesentery should also include a section of the mesenteric blood vessels and sections of any focal lesions.

Important Issues to Address in Your Surgical Pathology Report on Non-Neoplastic Intestinal Disease

- What procedure was performed, and what structures/organs are present?
- What disease processes are present, and what is their location?
- For inflammatory processes, are any diverticula, strictures, fistulae, or perforations present?
- Does the mucosa show any preneoplastic or neoplastic changes? (See Chapter 14.)
- Do the lymph nodes show any evidence of an inflammatory process or metastatic disease? Record the number of lymph nodes examined and the presence or absence of lymph node metastases.
- What is the status of the mesenteric vessels?