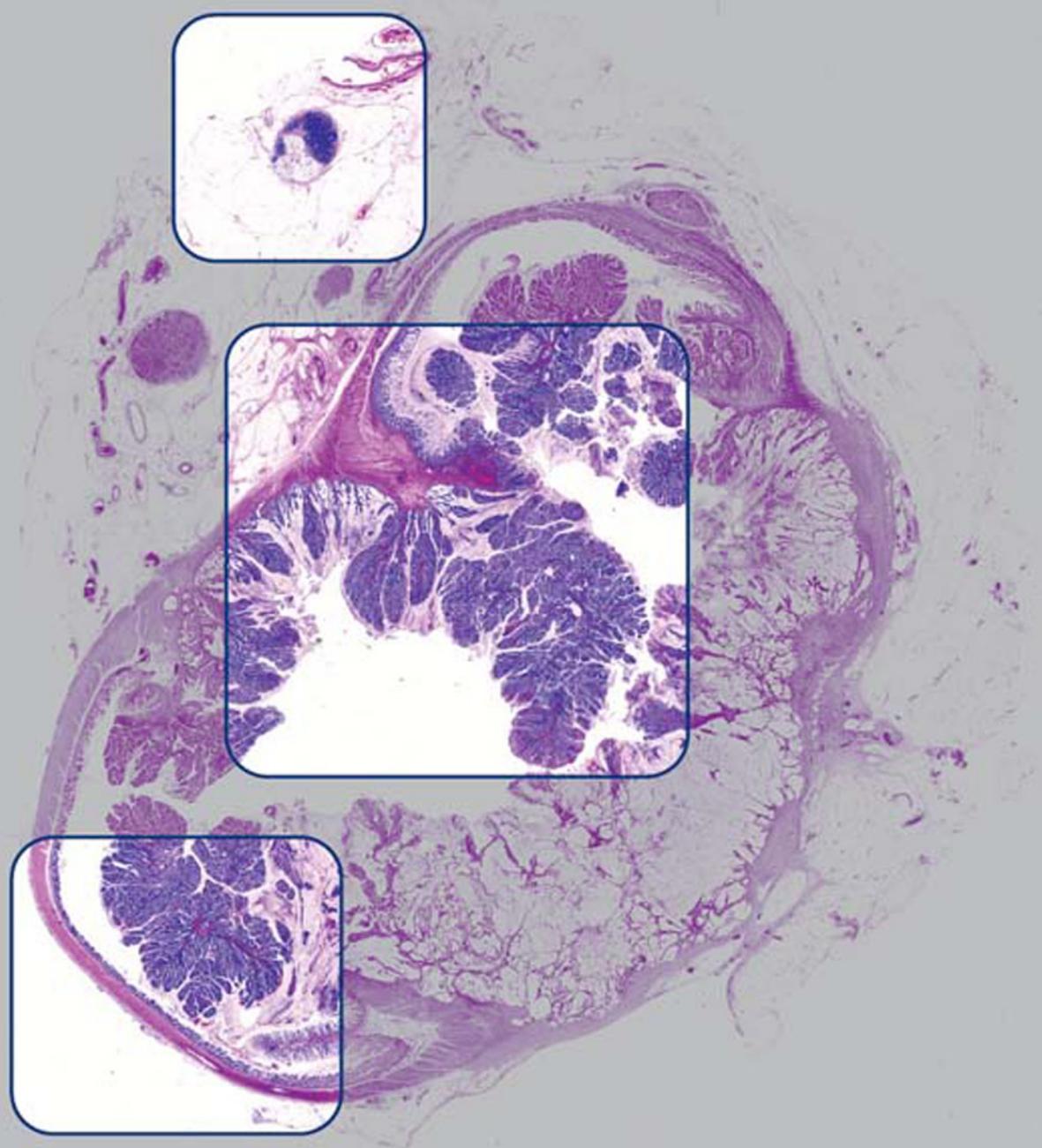


Colorectal Tumors

Atlas of Large Section Histopathology

Tibor Tot



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Acknowledgement

To produce a high-quality large histological section is a complex and difficult task. The most important factor in this applied art is the skillful and ambitious laboratory technician. I wish to thank all my co-workers involved in producing large histological sections for the pleasure of looking at their artistic masterpieces and to dedicate this

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Introduction

Intestinal and, especially, colorectal diseases represent one of the most common medical problems of humankind, with colorectal carcinoma being one of the most frequently occurring malignancies in Europe and America (Parkin et al. 1992). General practitioners, gastroenterologists, oncologists, radiologists, surgeons, and nurses treat thousands of patients with intestinal diseases every day all over the world. The correct diagnosis is essential for administering the proper therapy. In spite of the rapid developments that have taken place in many fields of modern medical science, histopathology remains essential in making or confirming a diagnosis in a substantial proportion of intestinal diseases.

The attention of the medical community has gradually shifted from morphology towards molecules and genes, which has led to significant progress in many fields of modern medicine, pathology included. However, this shift also risks replacing knowledge about diseases with knowledge about numbers, expressed in a language made up of hardly understandable abbreviations. In addition, in the minds of many medical students and medical doctors, digital images generated by modern radiology have replaced the „gold standard“ of autopsy findings. As a result, knowledge derived from advanced technology is gradually replacing knowledge that has been diligently collected over a period of hundreds of years. The danger of this process is that not only will information be lost, but, more importantly, it will be replaced with something less accurate. Physicians who regularly correlate their endoscopic and radiological images with pathoanatomical and histopathological findings may avoid this mistake. Unfortunately, in this era of unacceptably low autopsy rates, such a physician has less and less opportunity to do so.

Although it is hardly possible to offer equally valuable alternatives to information obtained from autopsy findings, pathologists must try to help clinicians in correlating clinical, radiological and endoscopic findings with morphology. Today, there are many different options that can be explored, such as clinical pathology conferences, telepathology and publishing macroscopic and histologic photographs digitally or on the World Wide Web.

In addition to the clinical picture, the macroscopic appearance of the colorectal mucosa and the nature of the lesions on it, as seen with an endoscope, represent the basis for clinical diagnosis. Endoscopists regularly take biopsies of the mucosa and/or endoscopically evident lesions for histopathological analysis in order to confirm the clinical diagnosis or to detect alterations not visible endoscopically. However, the histologic details cannot be directly compared with the endoscopic appearance of the lesions. For this reason, the pathology report most often provides descriptive information, which the endoscopist cannot directly connect to the image seen *in vivo*. Large histologic sections, by preserving the contiguity of the tissue in a representative transection of the bowel lesion, bridge the gap between the endoscopic and the histologic appearance. Projected as an overhead, the large section not only resembles the endoscopic findings but at the same time also magnifies them, allowing the clinician to analyze the relief and the details of the lesions on the gross and subgross levels. Placing the same large histologic section under the microscope, the pathologist can demonstrate the histo-

logic and cellular details behind the subgross findings. This makes large histologic sections an ideal approach to educating and training residents as well as specialists performing gastrointestinal endoscopy.

The advantages of using large histologic sections are not exclusively educational. This technique has been routinely used in our laboratory for every operative breast specimen since 1984, and convincing evidence about its suitability in routine diagnostic procedures has been collected. While the resolution of the cellular details are on the level of those obtained with the conventional small block technique, large histologic sections reveal much more useful information than derived from small section, since they usually include a representative transection of the entire tumor together with its environment and the circumferential surgical margins. This technique has proven to be more reliable in documenting the size of the tumor and the extent and distribution of the disease in the breast. It is also superior in demonstrating the multifocal nature of the tumor and intertumoral heterogeneity, compared to the traditional techniques of tissue sampling (Jackson et al. 1994; Tot et al. 2000). In fact, some prognostically important parameters of certain types of breast carcinoma can only be reliably assessed using large histologic sections (Tot 2003).

Surgery remains fundamental in treating patients with gastrointestinal tumors, and it is the best option for cure in patients with rectal cancer, provided that the procedure is radical. During the last two decades, a modified surgical intervention, called total mesorectal resection, has been introduced as a procedure of choice, since it has been shown to lower the rate of local recurrences from 30–40% to less than 10% (Heald and Ryall 1986; Leong 2003; Cecil et al. 2004). The procedure is based on removal of the tumor together with the mesorectal fat. Assessment of the radicality of surgical intervention has always been an important task of the pathologist. In the technique of total mesorectal resection, it has become increasingly important since 2 mm or more of free tissue in the circumferential margin may assure local control of the disease (Nagtegaal et al. 2002). By integrating the gross and subgross appearances with the details of the histologic examination, the technique of large-section histology is an ideal tool for assessing the circumferential margin in total mesorectal resection specimens. It may also influence the content of the histopathology report, which varies considerably from institution to institution (Wei et al. 2004).

With the support of our gastrointestinal surgeons, in 1997, it was decided to include large-section histology in the routine histologic work-up of total mesorectal resection specimens. Based on our experience regarding the advantages of including this technique in the pathology work-up and in demonstrating and interpreting the findings in clinical conferences, the use of large-section histology was soon widened to every operated case of colorectal neoplasm and to some non-neoplastic intestinal lesions. During the last 7 years, almost 2000 cases of colorectal carcinoma and other intestinal lesions have been documented on large histologic sections, a collection that represents the basis for the present atlas.

Proper staging of colorectal carcinomas is essential for treatment and prognosis. The most widely used staging

systems are the Dukes' classification (Dukes 1940) and the TNM classification (AJCC cancer staging handbook. TNM classification of malignant tumors, 6th edn. 2002). Despite the numerous attempts to modify the Dukes system, it has remained simple and easy to apply, although somewhat limited in its ability to stratify patients for proper therapy. The TNM classification system, by contrast, offers a more sensitive prognostic categorization due to the larger number of combinations of parameters for describing both the primary tumor and the presence or absence of metastasis in the examined lymph nodes or distant organs. However, new editions of the TNM system have become increasingly complicated and difficult to reproducibly apply. Large histologic sections, by showing the deepest level of invasion of the primary tumor together with the peritumoral tissue, which may contain isolated tumor foci and several lymph nodes, can help in proper tumor classification and staging. This technique brings the so-called pTNM (pathological TNM classification), based on histologic parameters, much closer to the clinical TNM classification. Thus, in this atlas, the term pTNM is not used.

Recent advances in modern radiology have resulted in more detailed imaging of the colorectum (Koh et al 2004). So-called virtual endoscopy may revolutionize gastroenterology as it offers a non-invasive method as an alternative to endoscopy. The technique is based on computer-tomography-produced images of horizontal transections of the bowel wall at different levels. As this approach is iden-

tical to that offered by the histopathologic technique of large sections, described in this atlas, it opens the way to new, previously unexplored perspectives in radiopathological correlation of intestinal lesions. Testing the accuracy of this new radiological method is obligatory, and large sections represent the ideal basis for correlation.

Although large histologic sections provide an advantageous alternative to the conventional small block technique, it is infrequently used in routine pathology laboratories. Many pathologists have criticized the technique of large histologic sections as being too expensive, unacceptably prolonging the technical procedure, causing problems in archiving of the slides, and adding nothing more than obtained with the traditional method of tissue sampling. However, our surgeons, gastroenterologists, oncologists, radiologists, pathologists, residents, medical students, and technicians, including those who have been more or less regularly involved in producing and interpreting large histologic sections and correlating them with their own clinical findings, as well as those who have only sporadically seen such sections, are enthusiastic. The usual feedback I get from them is that the information obtained from viewing large histologic slides has positively influenced their everyday practice. Several of them suggested that I share some of the large-section images of colorectal tumors with a wider professional audience. Thus, this atlas is as much a result of their support as of my own efforts.

1 Adenomas

Case 1.1 Villous Adenoma of the Rectum

Patient data: 63-year-old woman presenting with rectal bleeding. Endoscopically, a large, broad-based, soft and exophytic tumor was seen in her rectum, diagnosed on pre-operative biopsy as adenoma.

Surgical treatment: Rectosigmoidal resection, no pre-operative irradiation.

Specimen: 35-cm-long rectosigmoideum with an 8 × 6-cm soft exophytic tumor, 3 cm from the distal margin.

Histopathologic diagnosis: Villous adenoma of the rectum with moderate dysplasia. No signs of severe dysplasia or invasion.

Follow-up: 81 months, without signs of disease recurrence.

Villous adenoma of the rectum is often a large non-pedunculated tumor, covering the rectal mucosa over an area of several centimeters. Endoscopic biopsies usually reach only the superficial part of the tumor, the delicate long villous structures covered by dysplastic epithelium. The large histologic section (Fig. 1.1) also demonstrates the intact lamina muscularis mucosae: no signs of invasion are present. It is easy to compare the structures of the normal bowel wall (indicated by the red arrow in the schematic image, Fig. 1.1 d) to the structures of the adenoma (the left side of the image, green arrows in Fig. 1.1 d). Adenomas exhibit a dysplastic epithelium. The transition from normal to dysplastic epithelium is illustrated in Figure 1.1 a (corresponding to the area marked with a red rectangle in Fig. 1.1 d). Figure 1.1 b represents a microscopic image of the delicate villous structures of the adenoma (corresponding to the blue rectangle in Fig. 1.1 d). Figure 1.1 c is a magnified detail of Figure 1.1 b, illustrating the moderately dysplastic epithelium of this adenoma exhibiting elongated, stratified and crowded cell nuclei and a reduced number of goblet cells.

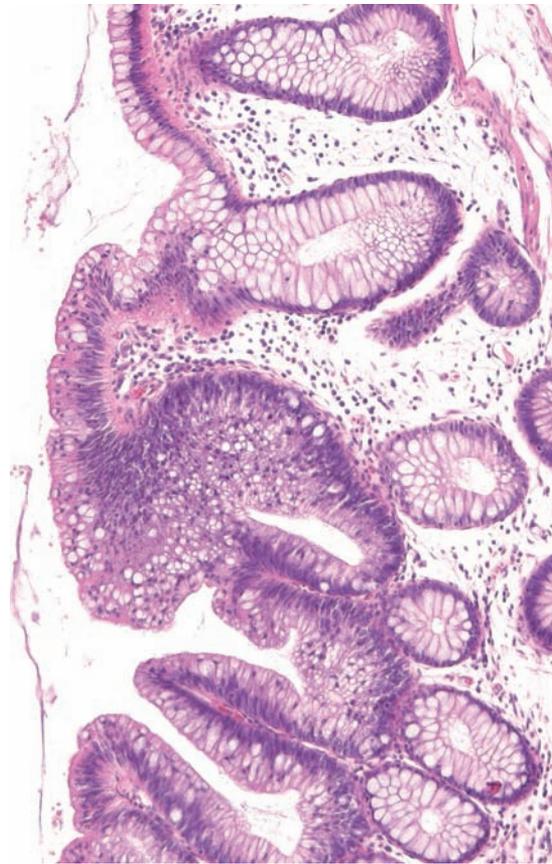


Fig. 1.1 a



Fig. 1.1 b

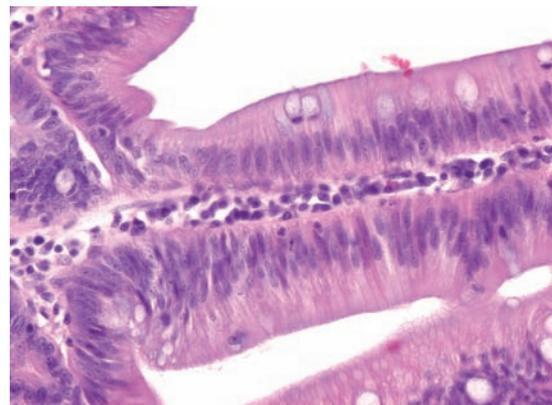


Fig. 1.1 c

Practical points

- Villous adenomas are usually non-pedunculated, soft tumors covering a large area of the surface of the bowel wall. Large histologic sections are needed to visualize the entire lesion in one transection.
- The large histologic section is an ideal tool for assessing and demonstrating invasive tumor foci in such a large lesion, as these can be easily missed during the macroscopic examination and sampling of standard small blocks.

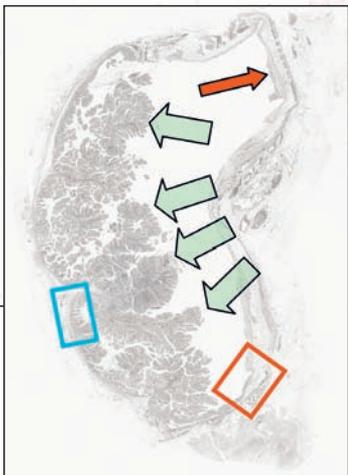
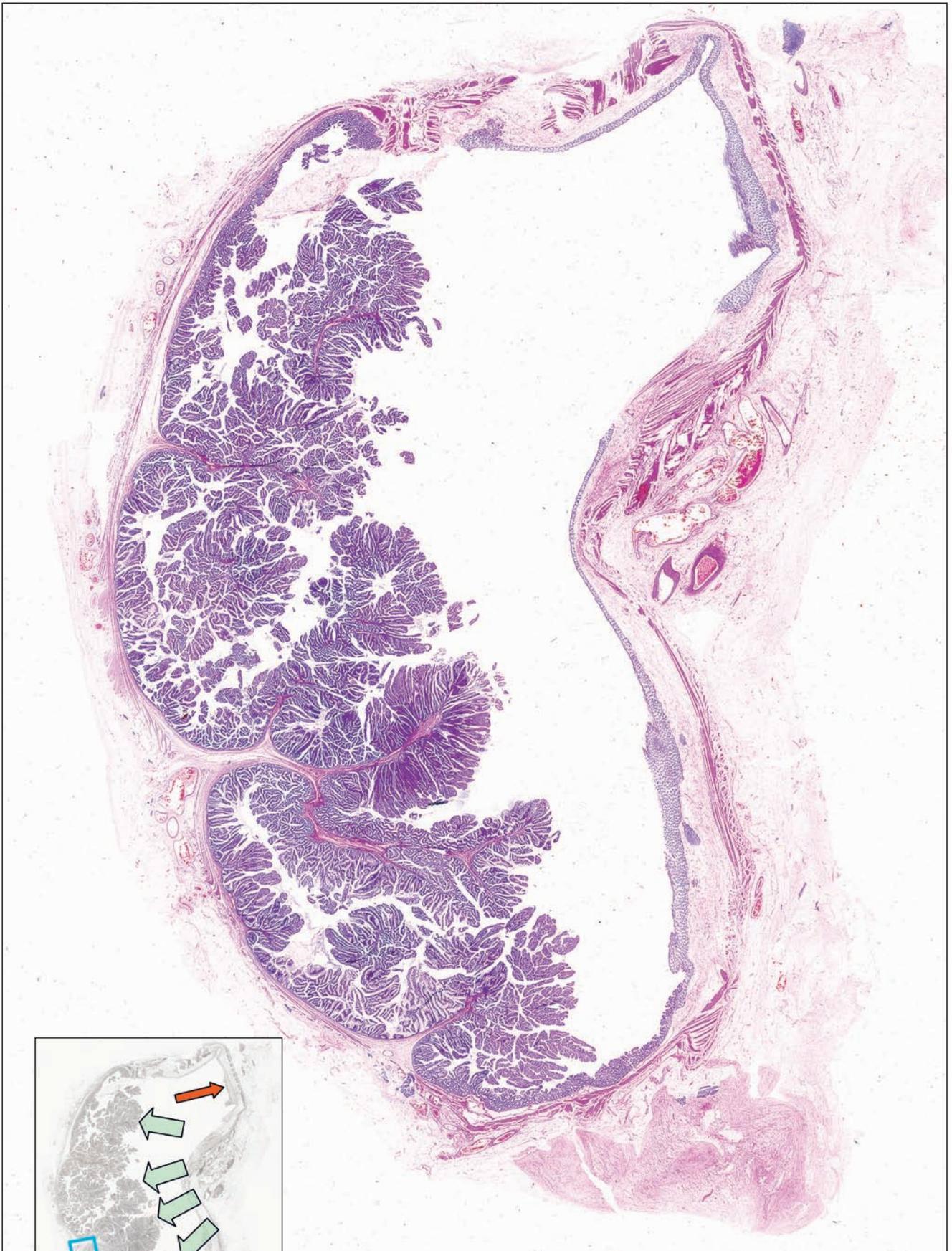


Fig. 1.1 Large-section histology image of a villous adenoma of the rectum.

Fig. 1.1d Schematic guide to the morphologic details in the large section in Fig. 1.1.

Case 1.2 Villous Adenoma of the Rectum

Patient data: 84-year-old woman with intermittent rectal bleeding and a long history of recurrent adenomas in her rectum.

Surgical treatment: Rectosigmoidal resection, no pre-operative irradiation.

Specimen: 33-cm-long rectosigmoideum with a 9-cm segment containing a circumferential exophytic tumor, 6 cm from the distal margin.

Histopathologic diagnosis: Villous adenoma of the rectum with low-grade, partly moderate dysplasia. No signs of invasion.

Follow-up: 6 months, without signs of disease recurrence.

The large section in Figure 1.2 demonstrates another case of villous adenoma, which covers the entire circumference of the inner surface of the rectum. No signs of invasion are seen. The architecture of villous adenomas is complex, as they consist of primary finger-like processes extending outward from the bowel wall and containing fibromuscular stroma (indicated with blue arrows in Fig. 1.2 c). Secondary finger-like processes, consisting of loose fibrous stroma with delicate vasculature and a surface covered by dysplastic epithelium, cover these structures. Figure 1.2 a, b illustrate the complexity of these structures (corresponding to the red rectangle in the schematic image, Fig. 1.2 c).

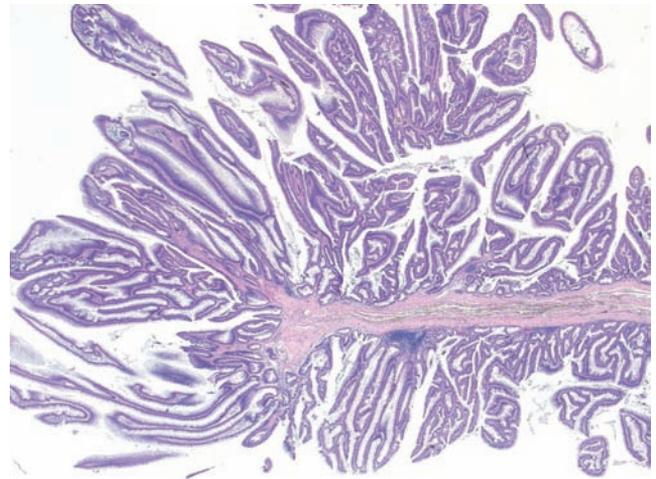


Fig. 1.2a

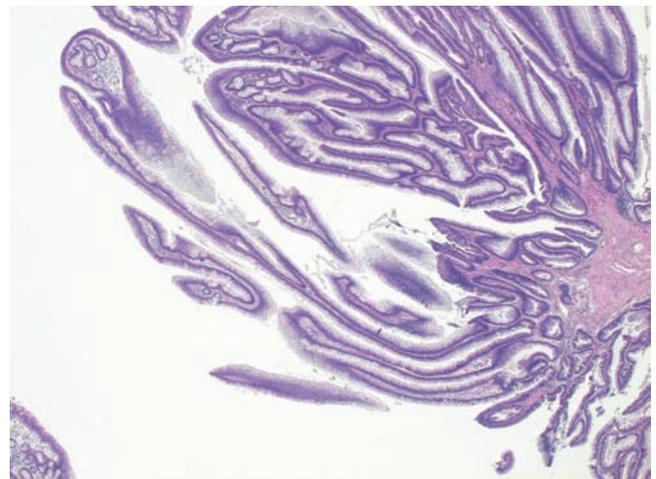


Fig. 1.2b

Practical points

- Villous adenomas may cover large areas of the entire circumference of the bowel wall. Large histologic sections are needed to visualize the entire lesion in one transection.
- Large histologic sections are also an ideal tool for analyzing the subgross architecture of complex lesions like adenomas.

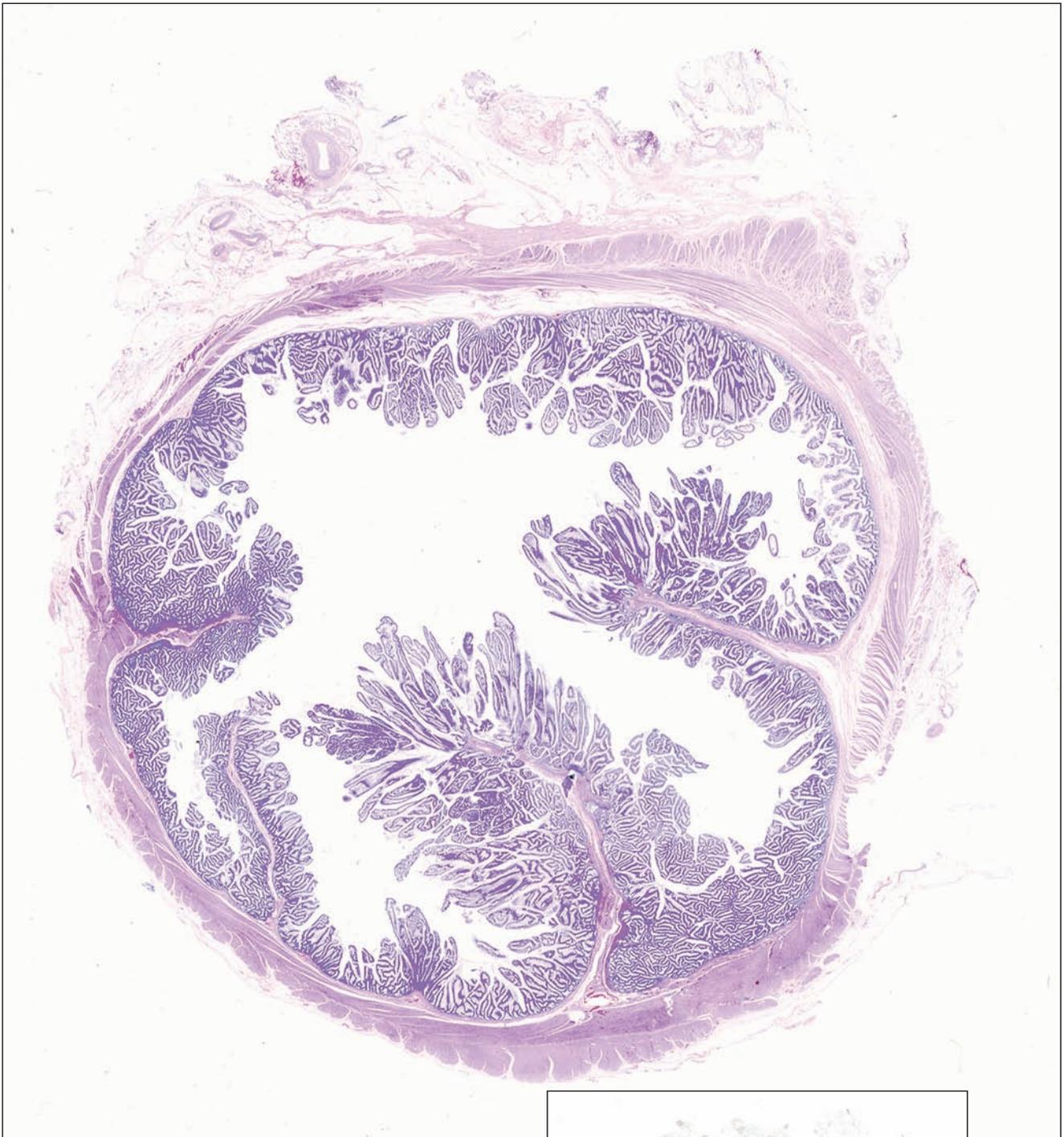


Fig. 1.2 Large-section histology image of a villous adenoma of the rectum.

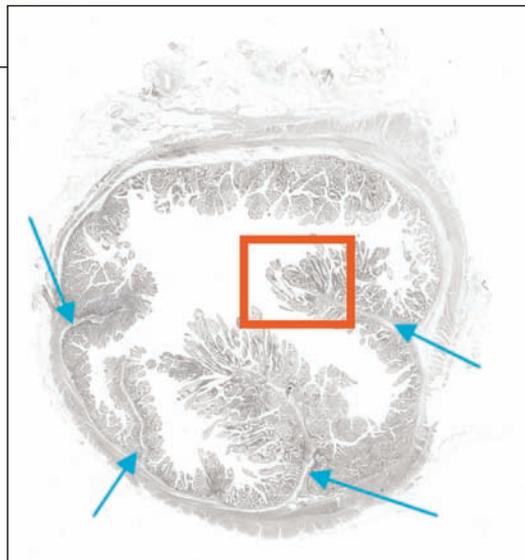


Fig. 1.2c Schematic guide to the morphologic details in the large section in Fig. 1.2.

Case 1.3 Villous Adenoma of the Colon

Patient data: 55-year-old male examined for weight loss. Colonoscopy detected a polypoid lesion in the sigmoid colon, diagnosed as adenoma on preoperative biopsy.

Surgical treatment: Sigmoidal resection, no preoperative irradiation.

Specimen: 15-cm-long segment of the sigmoid colon containing a 3 × 3-cm exophytic tumor, 3 cm from the distal margin.

Histopathologic diagnosis: Villous adenoma with moderate dysplasia. No signs of invasion.

Follow-up: 31 months, no signs of disease recurrence. The patient developed prostate cancer 12 months after the sigmoidectomy resection.

The large section (Fig. 1.3) in the present case contains a transection of a villous adenoma of the sigmoid colon with long villous structures (magnified in Fig. 1.3a; the corresponding area is indicated by the yellow rectangle in Fig. 1.3d). Structures from the mesocolon are also seen in the same large section: a lymph node (indicated by the green arrow in Fig. 1.3d and magnified in Fig. 1.3b) and mesenteric blood vessels (indicated by the red rectangle in Fig. 1.3d and magnified in Fig. 1.3c). The large sections regularly include structures from the mesocolon, which is advantageous when assessing the extent of tumor growth.

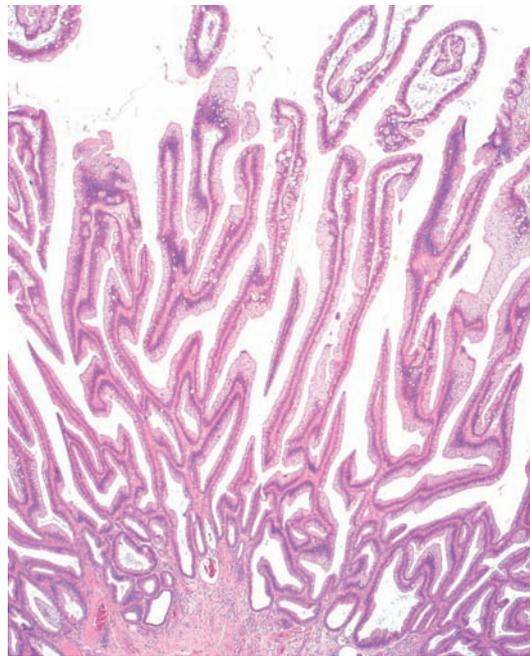


Fig. 1.3a

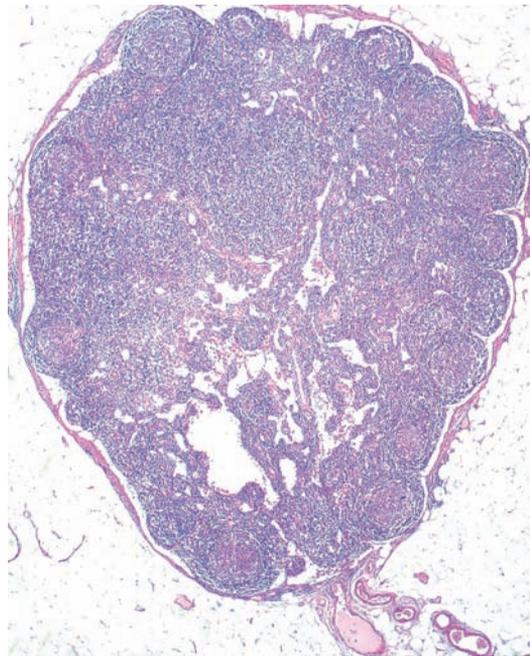


Fig. 1.3b

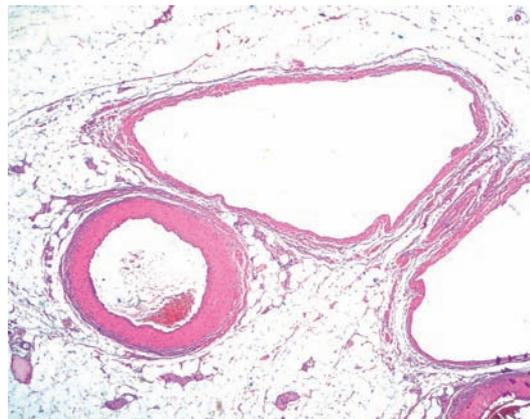


Fig. 1.3c

Practical points

- Large histologic sections include a continuous tissue containing a transection of the bowel wall, a transection of the pathologic lesion(s), and a part of the mesenteric/periintestinal tissue. This non-fragmented image allows assessment of the relation of the lesion(s) to the surrounding structures.
- Lymph nodes and vascular structures, together with the intestinal lesion(s), can easily be analyzed in the large sections.

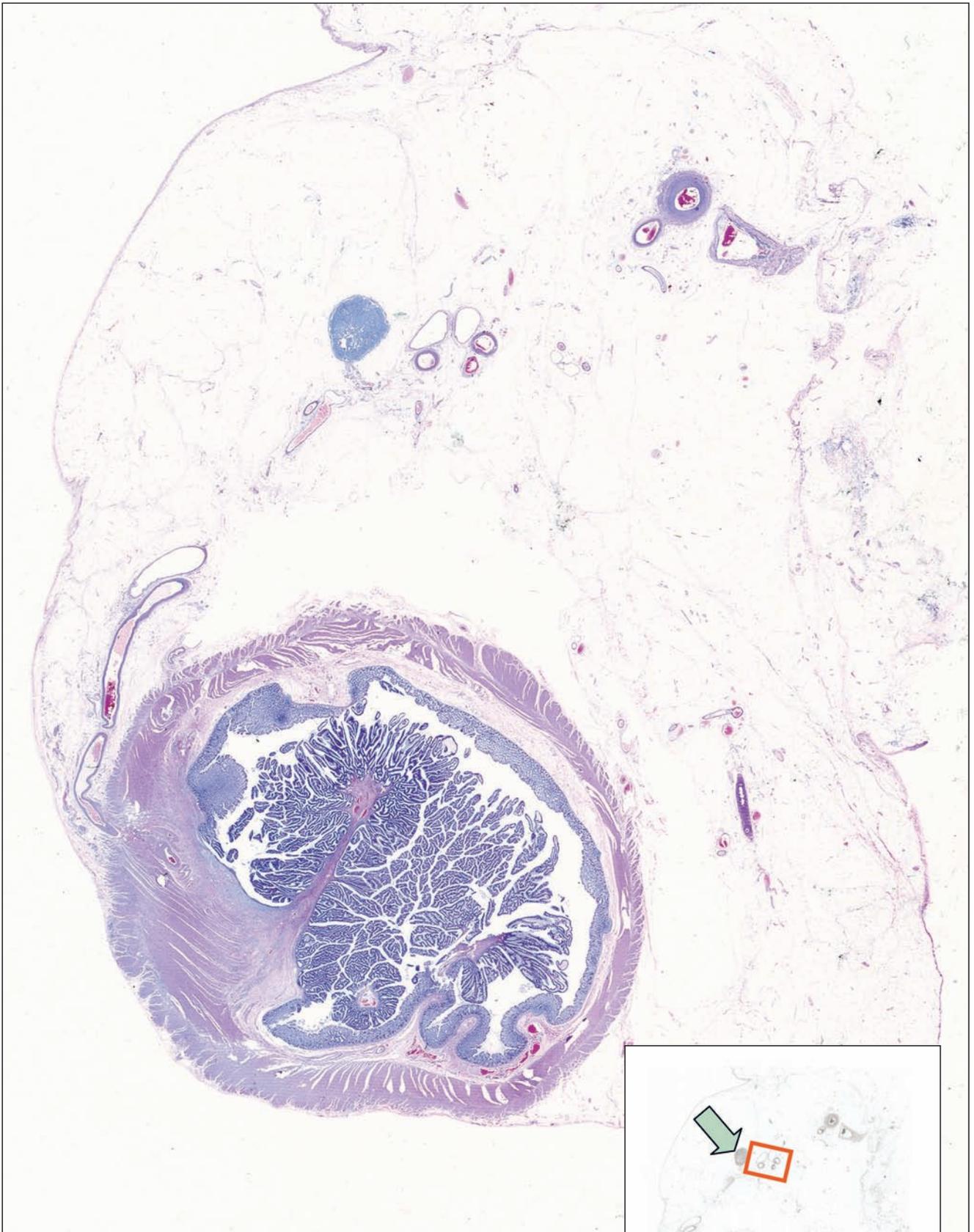


Fig. 1.3 Large-section histology image of a villous adenoma of the sigmoid colon.

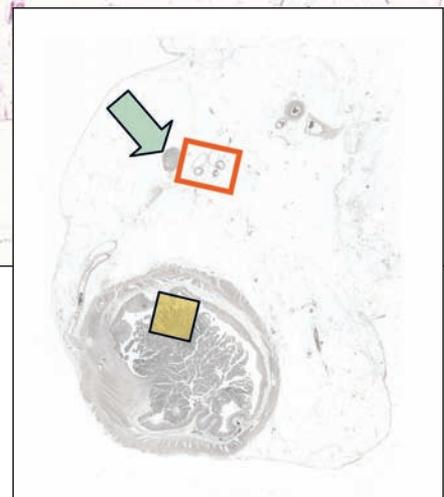


Fig. 1.3d Schematic guide to the morphologic details in the large section in Fig. 1.3.

Case 1.4 Mucinous Carcinoma of the Rectum That Developed in a Villous Adenoma

Patient data: 88-year-old woman presenting with rectal bleeding. Endoscopically, an exophytic lesion was seen in her rectum. The preoperative endoscopic biopsy contained exclusively structures of adenoma.

Surgical treatment: Rectosigmoidal resection, no preoperative irradiation.

Specimen: 20-cm-long rectosigmoideum with a 6 × 5-cm exophytic tumor, 5 cm from the distal margin.

Histopathologic diagnosis: Mucinous carcinoma, low grade, infiltrating in but not beyond the lamina muscularis propria, 23 lymph nodes without signs of metastasis, radical excision, mesorectal margin 20 mm.

TNM stage: I (T2N0M0), Dukes A.

Follow-up: 36 months, without signs of disease recurrence.

Mucinous carcinoma may develop in villous adenomas. The large histologic section in Figure 1.4 demonstrates not only the mucinous carcinoma (green-colored area in the schematic image, Fig. 1.4c), but also the structures of the rests of the adenoma (orange arrows) as well as their relation to the cancer. To obtain a representative endoscopic biopsy, one has to reach the invasive part of the tumor, which is partly covered by the villous structures of the adenoma. Figure 1.4a, a microscopic magnification of the area indicated by the white rectangle in Figure 1.4c, shows the interface of the villous adenoma and the mucinous carcinoma. The large section offers proper documentation of the level of tumor invasion and, at the same time, reliably demonstrates the circumferential margin, including the mesorectal surgical resection margin. The mesorectal resection margin is easily assessed and its distance to the deepest invasive tumor structures is easy to measure, as indicated by the red double arrow in Figure 1.4c. The deepest level of invasion is indicated by the yellow rectangle in Figure 1.4c and is microscopically magnified in Figure 1.4b. Note also the four small reactive lymph nodes in the fatty tissue (encircled in Fig. 1.4c).

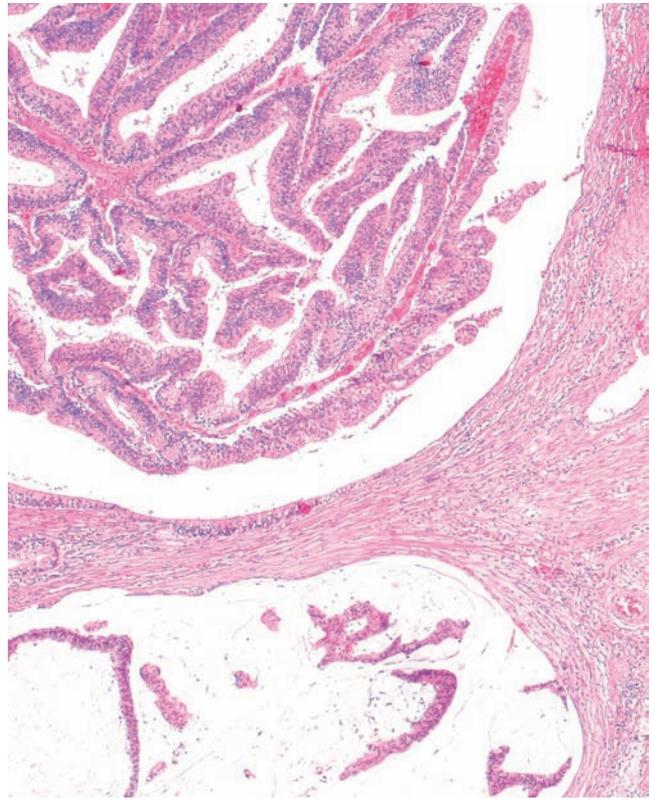


Fig. 1.4a

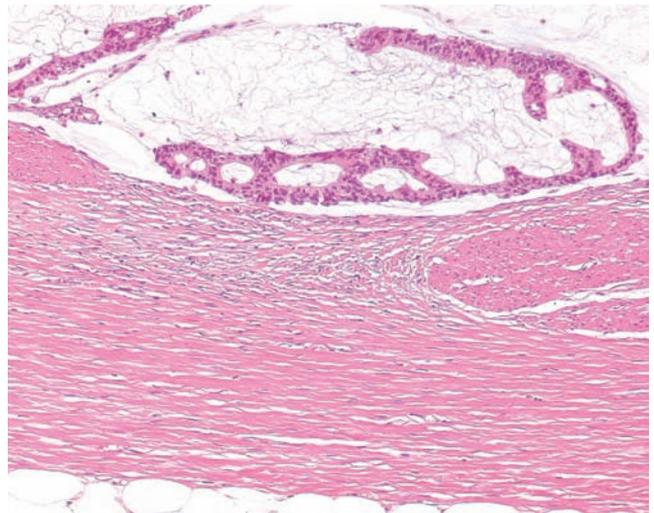


Fig. 1.4b

Practical points

- In order to obtain a representative biopsy, the endoscopist has to reach the invasive cancer, which is often covered by the rests of the adenoma.
- Taken in the plane of the deepest invasion, the large histologic sections reliably document the level of tumor growth.
- Large histologic sections are an ideal tool for assessing and demonstrating the circumferential surgical margin and its relation to the invasive tumor.

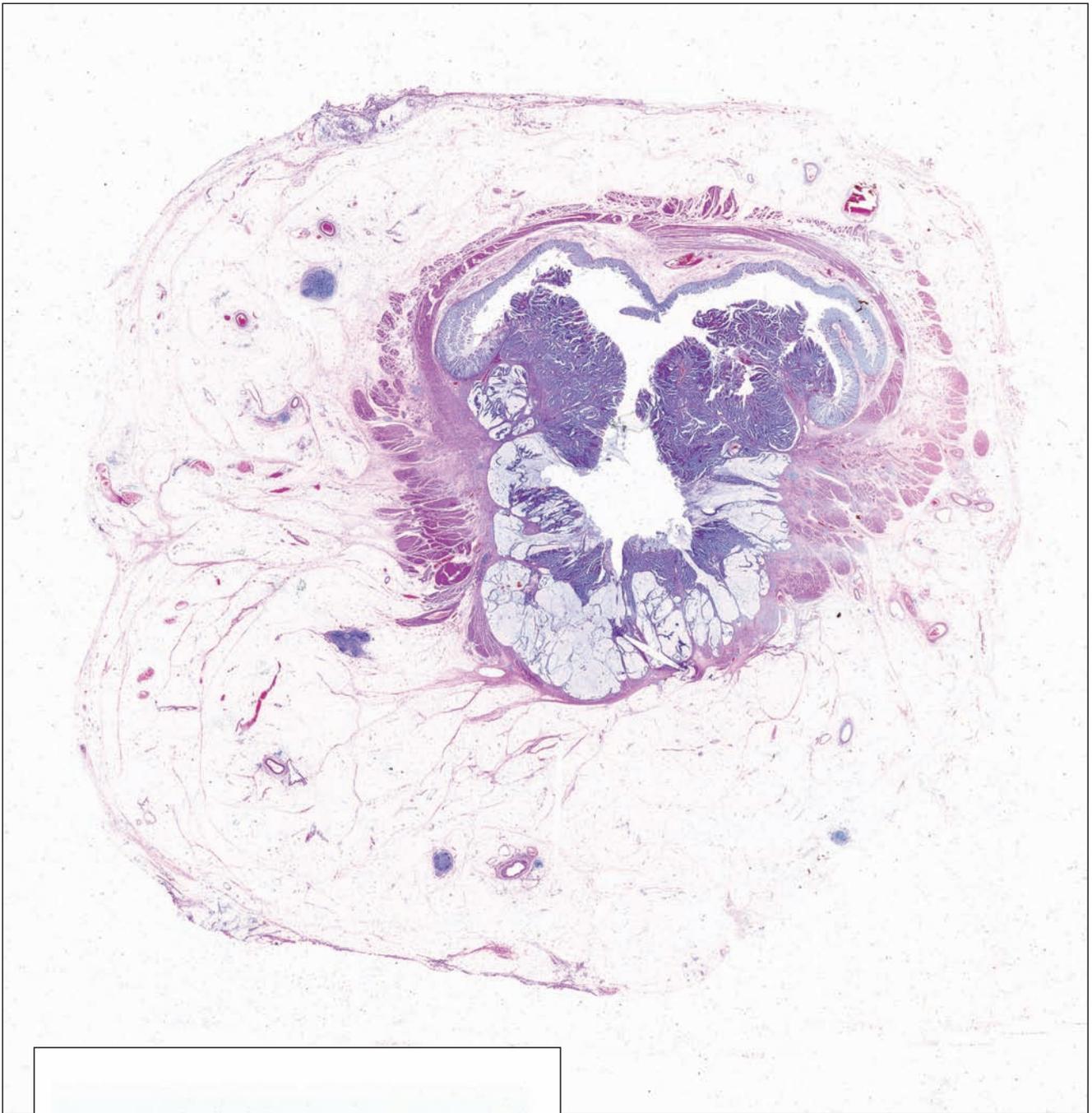


Fig. 1.4 Large-section histology image of a mucinous rectal carcinoma that developed in a villous adenoma.

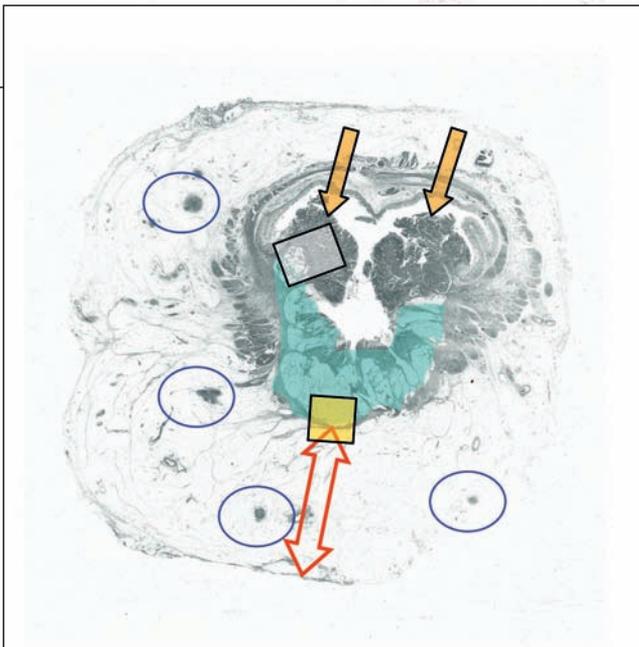


Fig. 1.4c Schematic guide to the morphologic details in the large section in Fig. 1.4.

Case 1.5 Rectal Carcinoma That Developed in a Villous Adenoma

Patient data: 78-year-old man presenting with rectal bleeding. Endoscopically, a large exophytic tumor was seen in his rectum. The preoperative biopsy contained only structures of an adenoma with high-grade dysplasia.

Surgical treatment: Mesorectal resection, no preoperative irradiation.

Specimen: 20-cm-long rectum with a 7 × 4-cm exophytic tumor, 10 cm from the distal margin.

Histopathologic diagnosis: Well-differentiated infiltrating adenocarcinoma, partly with mucinous differentiation, 7 of 8 examined lymph nodes containing metastasis. Radical excision, mesorectal margin 15 mm.

TNM stage: IIIc (T2N2M0), Dukes C.

Follow-up: 29 months, without signs of disease recurrence.

The partly mucinous rectal carcinoma demonstrated in the large histologic section in Figure 1.5 has developed in a villous adenoma. The deepest level of invasion in the bowel wall (corresponding to the area of the green rectangle in the schematic image, Fig. 1.5 d) is microscopically magnified in Figure 1.5 a. Although the cancer was relatively small and well differentiated, it metastasized to the regional lymph nodes, one of which was present in the large section and is indicated by the blue arrow in Figure 1.5. The lymph node metastasis is microscopically magnified in Figure 1.5 b. The cancer also infiltrated the tissue around the blood vessels of the mesocolon in the form of isolated invasive tumor foci, as demonstrated in Figure 1.5 c (corresponding to the encircled area in Fig. 1.5 d). Obtaining an endoscopic biopsy representing the invasive part of the lesion may be a very difficult task in such a case.

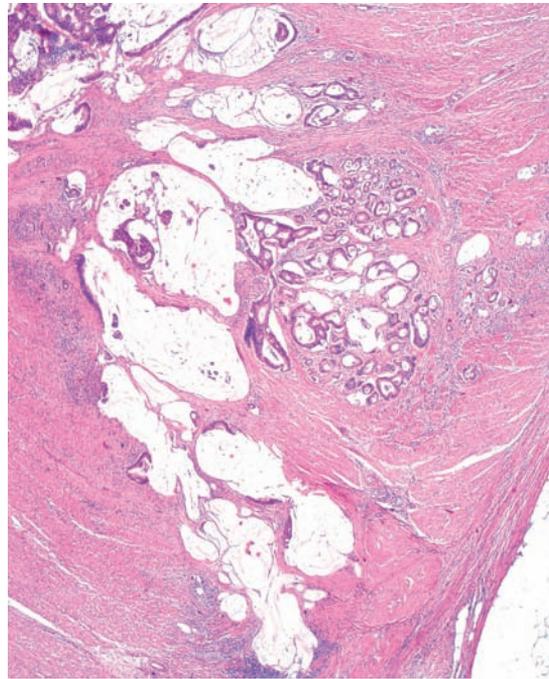


Fig. 1.5a

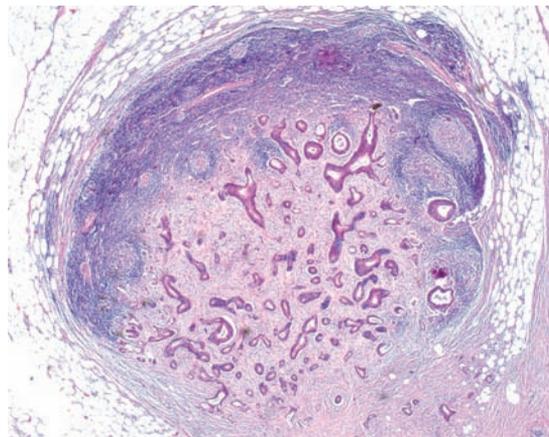


Fig. 1.5b

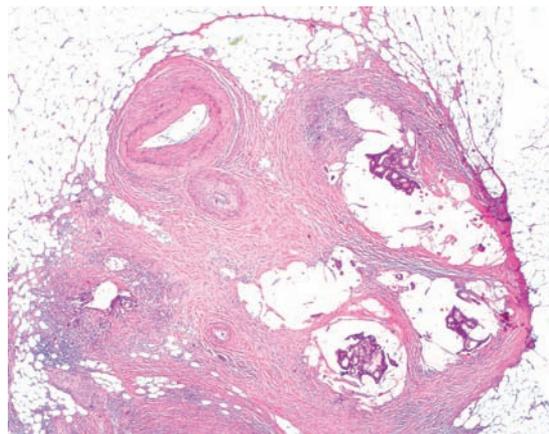


Fig. 1.5c

Practical points

- In order to obtain a representative biopsy, the endoscopist has to reach the invasive cancer, which is often covered by the rests of the adenoma.
- By including a part of the mesorectal tissue that is continuous with the transection of the rectum, the large histologic section facilitates assessment of perirectal tumor dissemination in relation to the primary tumor.

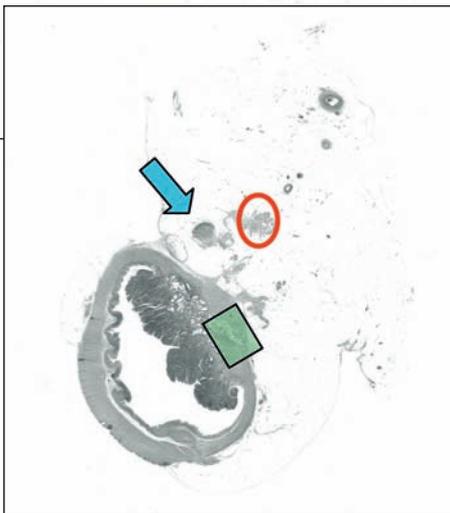
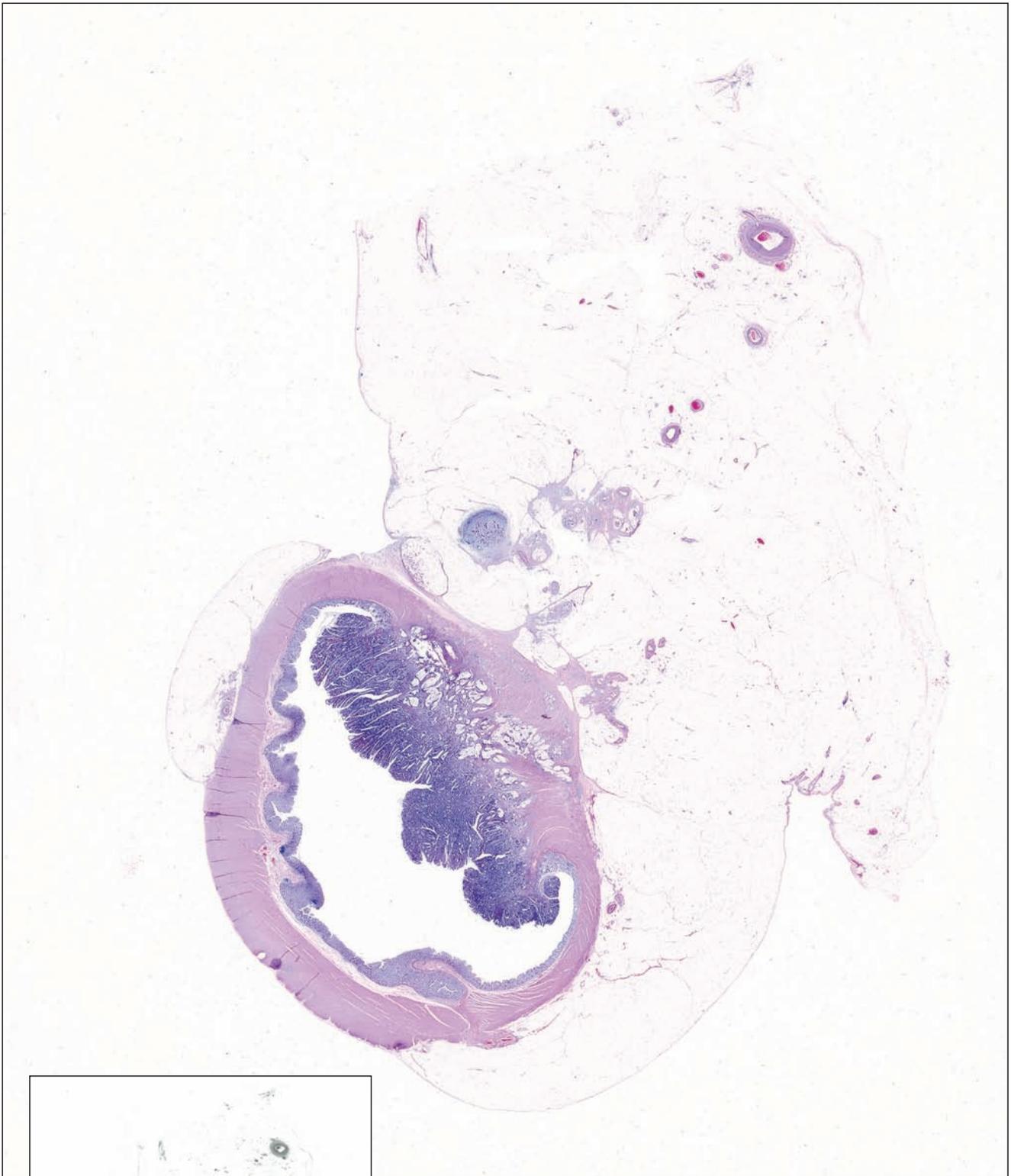


Fig. 1.5 Large-section histology image of a rectal carcinoma that developed in a villous adenoma.

Fig. 1.5d Schematic guide to the morphologic details in the large section in Fig. 1.5.

Case 1.6 Tubulovillous Adenoma of the Cecum

Patient data: 81-year-old man presenting with bloody diarrhea. Endoscopically, two separate polypoid lesions were seen, one in the colon ascendens and the other in the cecum.

Surgical treatment: Right hemicolectomy.

Specimen: 40-cm-long part of the colon with a 3 × 3-cm exophytic tumor 18 cm from the distal margin and, 10 cm from it, a separate polypoid lesion in the cecum.

Histopathologic diagnosis: Infiltrating adenocarcinoma, partly with signet-ring cell differentiation, developed in an adenoma. No metastasis in 17 examined lymph nodes. Radical excision. A separate tubulovillous adenoma with moderate dysplasia in the cecum.

TNM stage: I (T2N0M0), Dukes A.

Follow-up: Died of leukemia 8 months later.

This patient had a carcinoma in his colon ascendens (not presented here) and an additional separate large polypoid lesion in his cecum. The histology of the lesion presented in Figure 1.6 shows the structures of a tubulovillous adenoma, partly with finger-like excrescences, but mainly with tubular gland-like spaces (magnified in Fig. 1.6a, corresponding to the area marked with the blue arrow in the schematic image, Fig. 1.6e). The difference between the normal mucosa (lower-left part of the image) and the dysplastic epithelium of the adenoma (upper-right part of the image) is well seen in Figure 1.6b, which represents a histologic magnification of the area of the green rectangle in Figure 1.6e. The large-section image (Fig. 1.6) demonstrates well that the lesion has a branching fibrous core, free of tumor structures; no signs of invasion could be evidenced. Details of the fibrous core are magnified in Figure 1.6c, d (corresponding to the orange circle and to the yellow rectangle in Fig. 1.6e, respectively). This adenoma is somewhat pedunculated, exhibiting a relatively narrow stalk (as compared to the tumor in the patient described in Case 1.7).

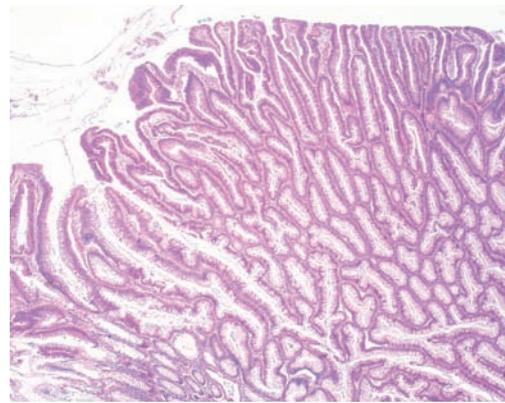


Fig. 1.6a

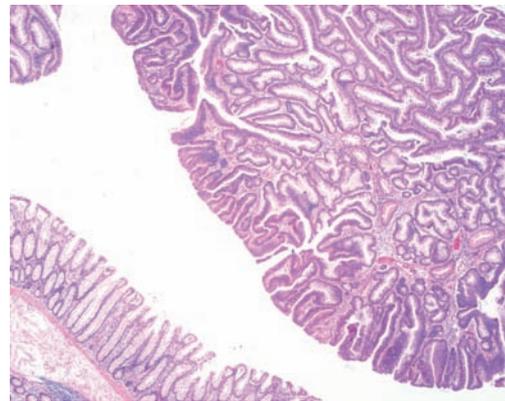


Fig. 1.6b

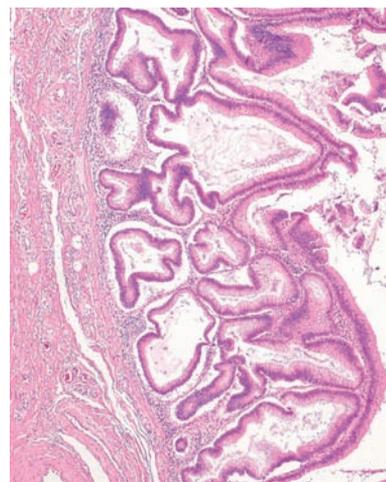


Fig. 1.6c

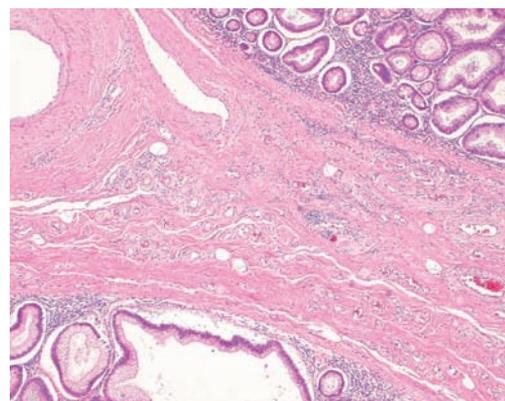


Fig. 1.6d

Practical points

- As a large histologic section can demonstrate a transection of an entire adenoma, it allows assessment of both a contiguous tissue of the stromal core and the epithelial structures. Detailed analysis of the stroma is especially important in larger adenomas, as malignant transformation and invasion occur more frequently at these sites.

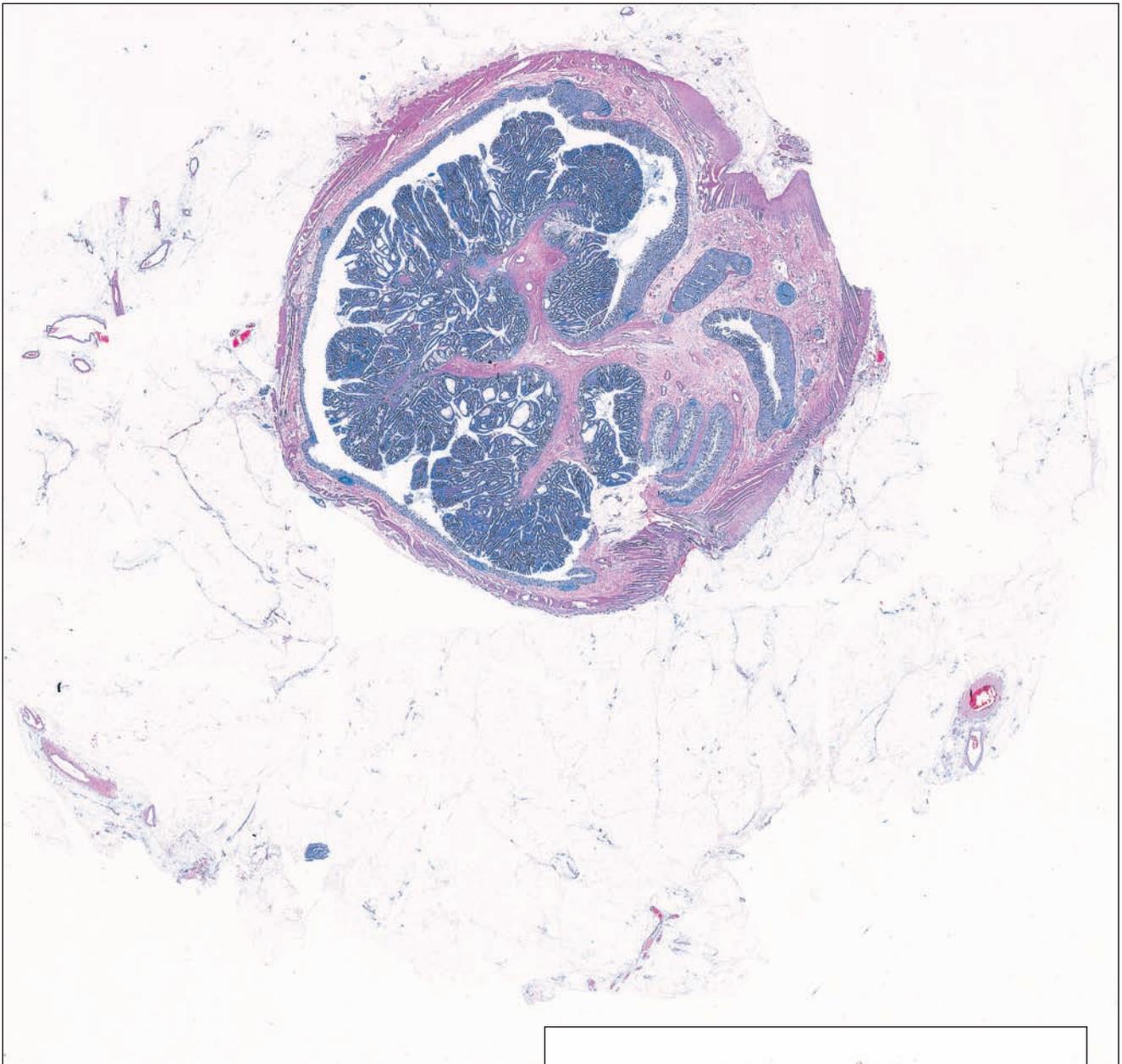


Fig. 1.6 Large-section histology image of a tubulovillous adenoma of the cecum.

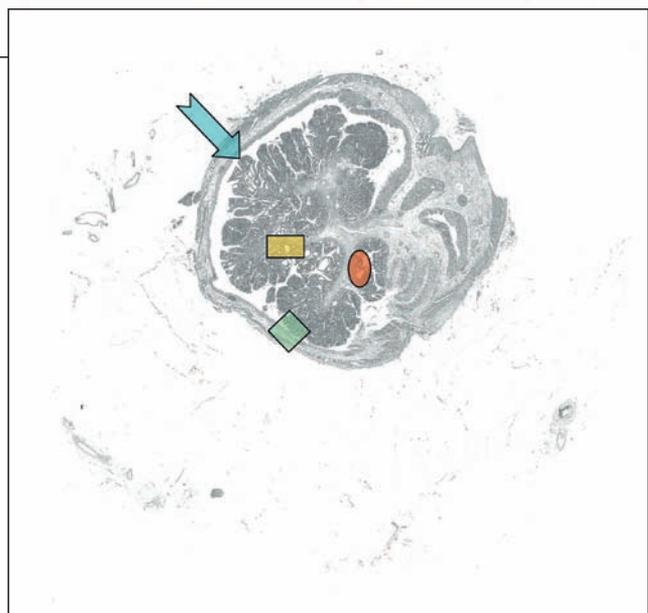


Fig. 1.6e Schematic guide to the morphologic details in the large section in Fig. 1.6.

Case 1.7 Tubulovillous Adenoma of the Rectum

Patient data: 82-year-old man with a history of rectal bleeding over several years. Endoscopically, a large broad-based polypoid mass was seen in his rectum. Although the preoperative histologic diagnosis was adenoma, the patient underwent surgery on the basis of the clinical and endoscopic picture.

Surgical treatment: Mesorectal resection, no preoperative irradiation.

Specimen: 30-cm-long rectosigmoideum with a 4 × 3-cm polypoid lesion, 4 cm from the distal margin.

Histopathologic diagnosis: Tubulovillous adenoma of the rectum with moderate to severe dysplasia. No signs of invasion.

Follow-up: 15 months, without signs of disease recurrence.

The large histologic section in this case (Fig. 1.7) demonstrates an adenoma with a broad base containing large blood vessels (indicated with an arrow in the schematic image, Fig. 1.7a). The stroma is free of tumor structures; no signs of infiltration are seen. Broad-based adenomas, especially if larger, may give an impression of malignancy when seen endoscopically. Compared to the adenoma discussed in the previous case (Case 1.6, a pedunculated adenoma with a narrow, delicate stalk), this adenoma is much more sessile, covering a larger area of the intestinal surface.

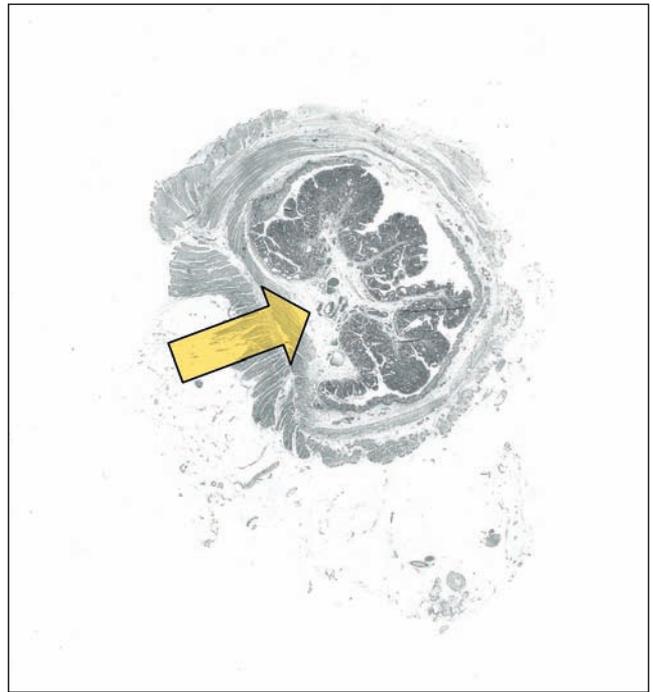


Fig. 1.7a Schematic guide to the morphologic details in the large section in Fig. 1.7.

Practical points

- When seen endoscopically, large sessile adenomas may give a false impression of malignancy.
- Large histologic sections represent an ideal tool for assessing such lesions, as the entire adenoma, with its dysplastic epithelium and broad stalk, together with the surrounding tissue, can be imaged.

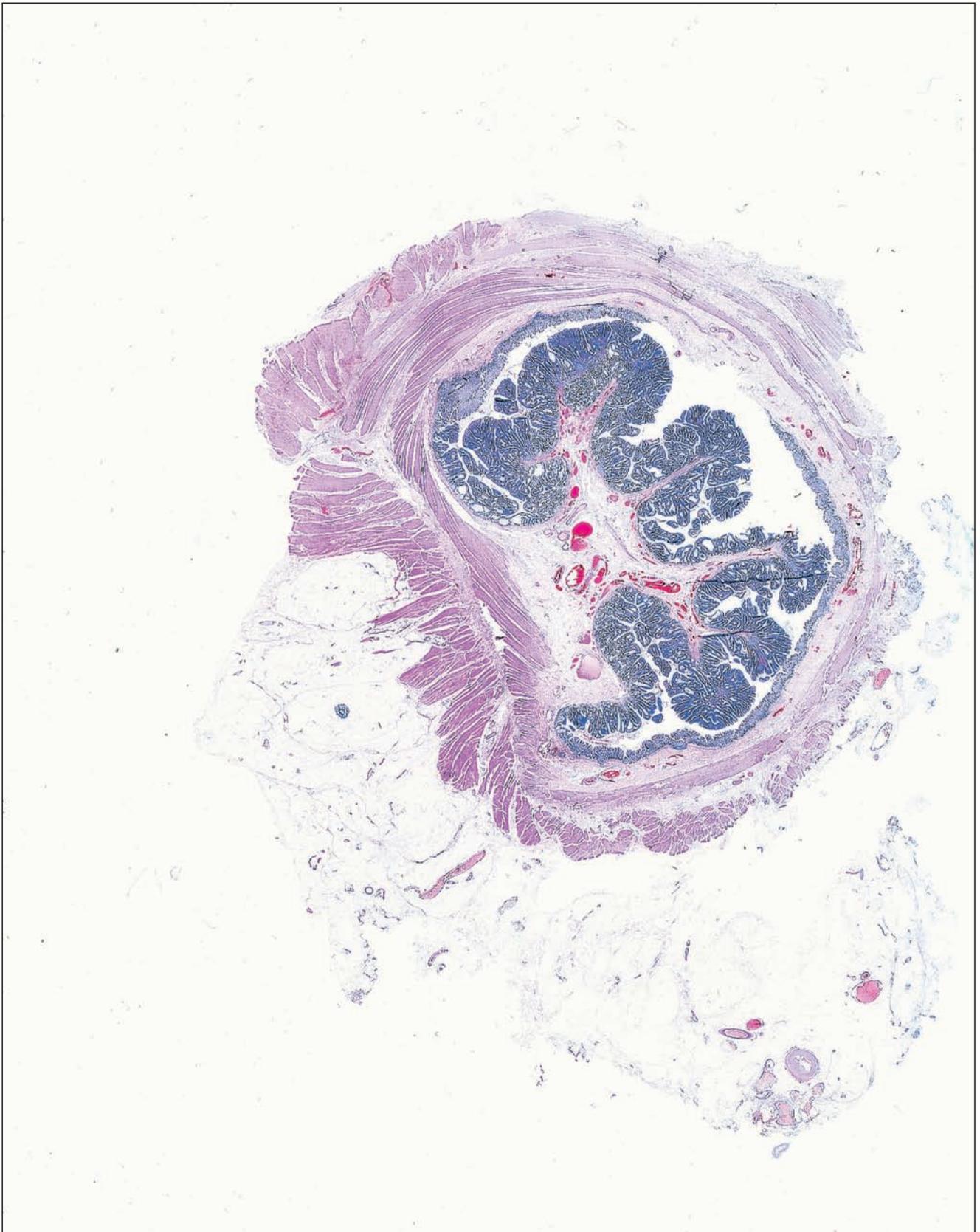


Fig. 1.7 Large-section histology image of a tubulovillous adenoma of the rectum.

Case 1.8 Tubulovillous Adenoma of the Colon with Severe Dysplasia

Patient data: 62-year-old woman presenting with bloody stools. Endoscopically, a pedunculated polypoid lesion was seen in the sigmoidum. Preoperative histologic examination of the endoscopic biopsies revealed structures of adenoma with severe dysplasia.

Surgical treatment: Sigmoidal resection.

Specimen: 14-cm-long segment of the large bowel with a 4 × 2-cm polypoid lesion 3 cm from the distal margin.

Histopathologic diagnosis: Tubulovillous adenoma with moderate to severe dysplasia. No signs of invasion.

Follow-up: 26 months, no signs of disease recurrence.

The large histologic section in this case demonstrates a pedunculated tubulovillous adenoma of the colon (Fig. 1.8). The mucosa surrounding the adenoma exhibited hyperplastic changes. The interface of the adenomatous and hyperplastic structures is demonstrated in Figure 1.8a (corresponding to the area marked with the green arrow in Fig. 1.8d). The surface of the adenoma contained a small area of granulation tissue at the site of preoperative endoscopic biopsy (magnified in Fig. 1.8b, corresponding to the area of the red arrow in Fig. 1.8d). The delicate branching stroma of the tumor is well demonstrated in the large section. No signs of invasion could be detected, but focally the tumor contained areas of severe dysplasia. One of these foci is marked with the yellow rectangle in Figure 1.8d and is microscopically magnified in Figure 1.8c.

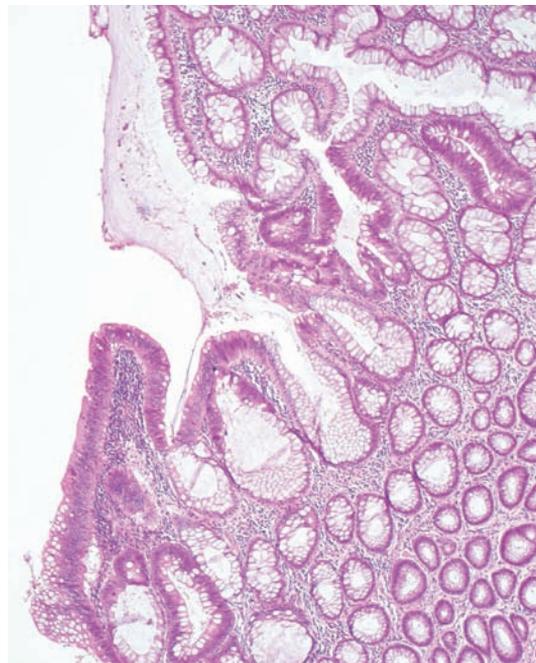


Fig. 1.8a

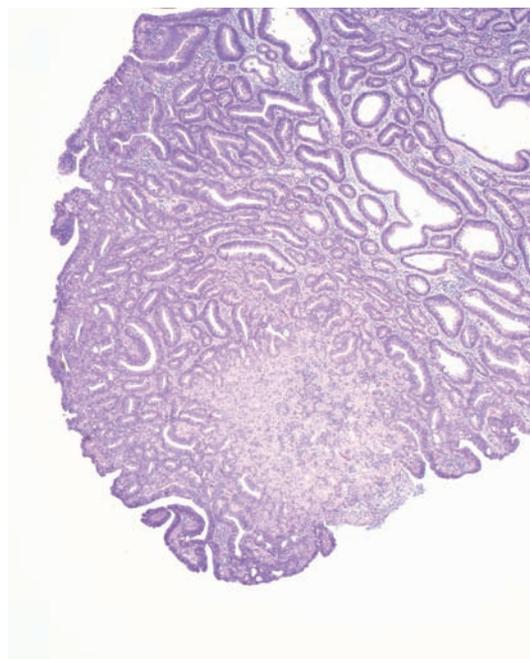


Fig. 1.8b

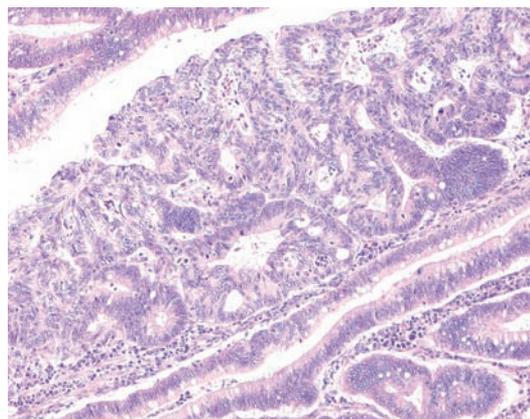


Fig. 1.8c

Practical points

As a large histologic section may include a transection of the entire adenoma, it shows the contiguous tissue of the stromal core and the epithelial structures. Detailed analysis of the epithelium is important to detect severe dysplasia and malignant transformation.

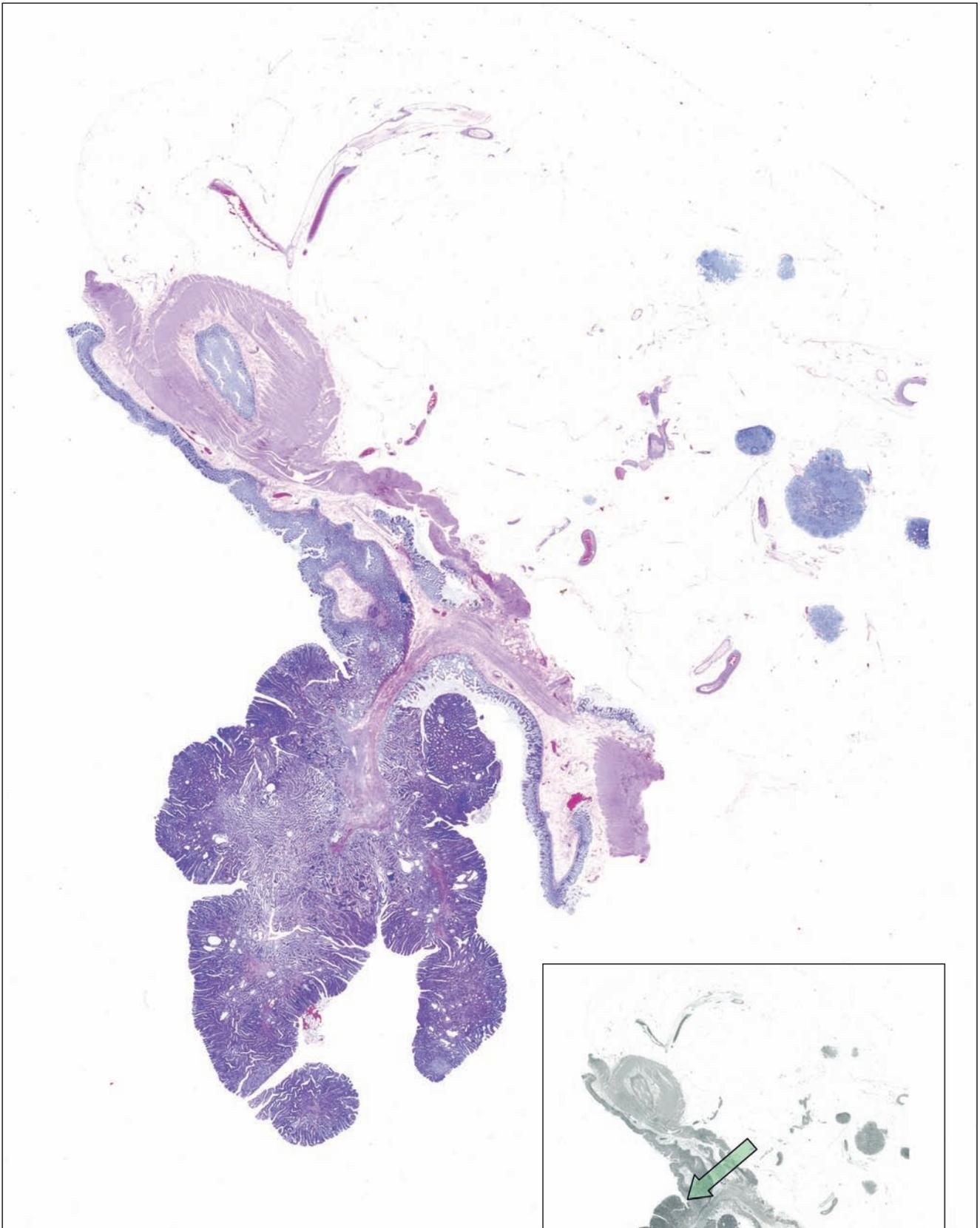


Fig. 1.8 Large-section histology image of a tubulovillous adenoma of the colon.

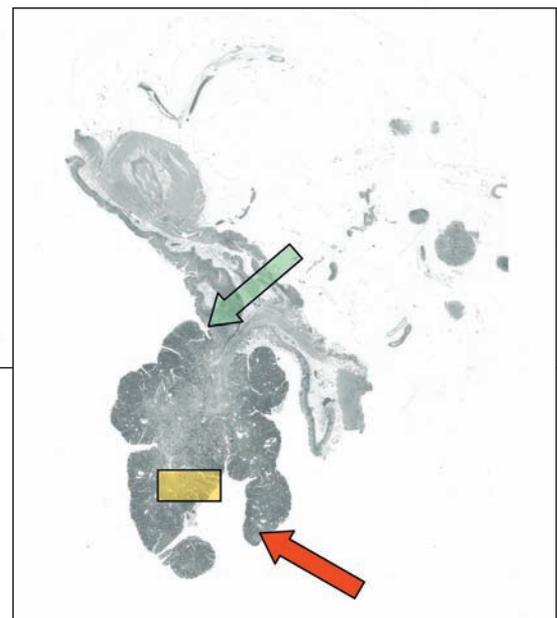


Fig. 1.8d Schematic guide to the morphologic details in the large section in Fig. 1.8.

Case 1.9 Tubulovillous Adenoma Associated with Invasive Carcinoma

Patient data: 75-year-old woman presenting with anemia. Endoscopically, a pedunculated polypoid lesion and a separate ulcerated tumor were seen at the border between the sigmoideum and rectum. Preoperative histologic examination of the endoscopic biopsies (from the ulcerated tumor) revealed invasive carcinoma.

Surgical treatment: Rectosigmoidal resection, no preoperative irradiation.

Specimen: 20-cm-long segment of the large bowel with a 1-cm polypoid lesion and a 4×3-cm ulcerated tumor, 14 cm from the distal margin.

Histopathologic diagnosis: Tubulovillous adenoma with moderate dysplasia. Moderately differentiated invasive adenocarcinoma growing in but not penetrating the lamina muscularis propria. Two of the 12 examined lymph nodes contained metastasis.

TNM stage: IIIa(T2N1M0), Dukes C.

Follow-up: 39 months, no signs of disease recurrence.

This large histologic section (Fig. 1.9) was taken through an invasive carcinoma, seen on the right side of the image (the red-colored area on the schematic image, Fig. 1.9c), and also includes a transection of a separate pedunculated tubulovillous adenoma, seen on the left side of the image (marked with the green arrow in Fig. 1.9c). The large section demonstrates the level of tumoral invasion within the lamina muscularis propria (magnified in Fig. 1.9a, corresponding to the area of the blue rectangle in Fig. 1.9c). The large histologic section also showed some mesenteric lymph nodes, one of them (marked with the orange rectangle in Fig. 1.9c and microscopically magnified in Fig. 1.9b) containing metastasis.

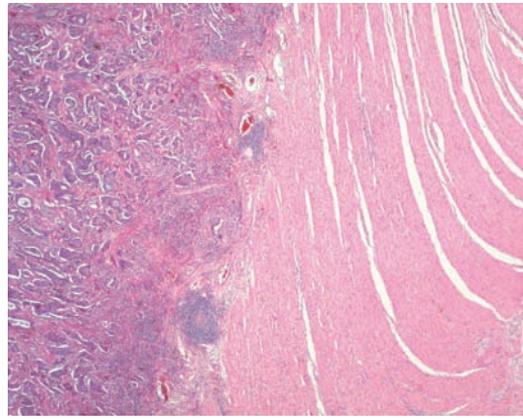


Fig. 1.9a

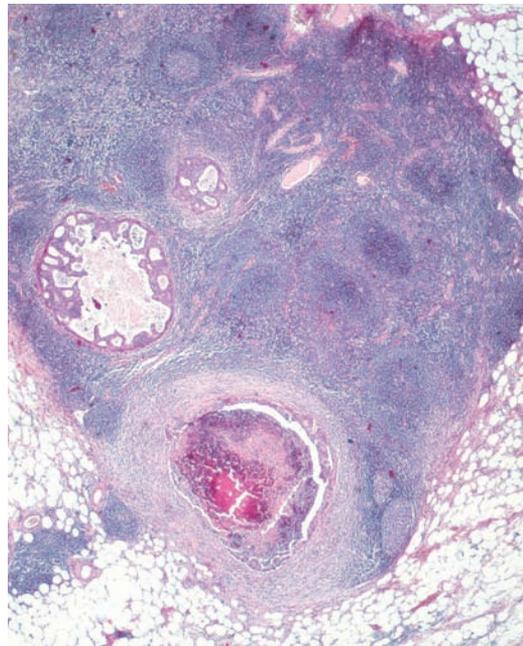


Fig. 1.9b

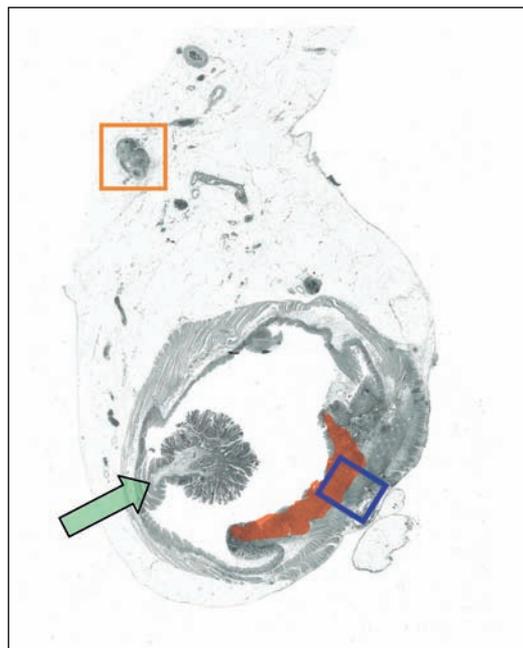


Fig. 1.9c Schematic guide to the morphologic details in the large section in Fig. 1.9.

Practical points

- Large histologic section may include several different lesions, allowing the interrelation of these lesions to be analyzed.
- Inclusion of the mesorectal/mesocolic lymph nodes is a further advantage of large sections, as it may assist the pathologist in proper staging of the tumor.

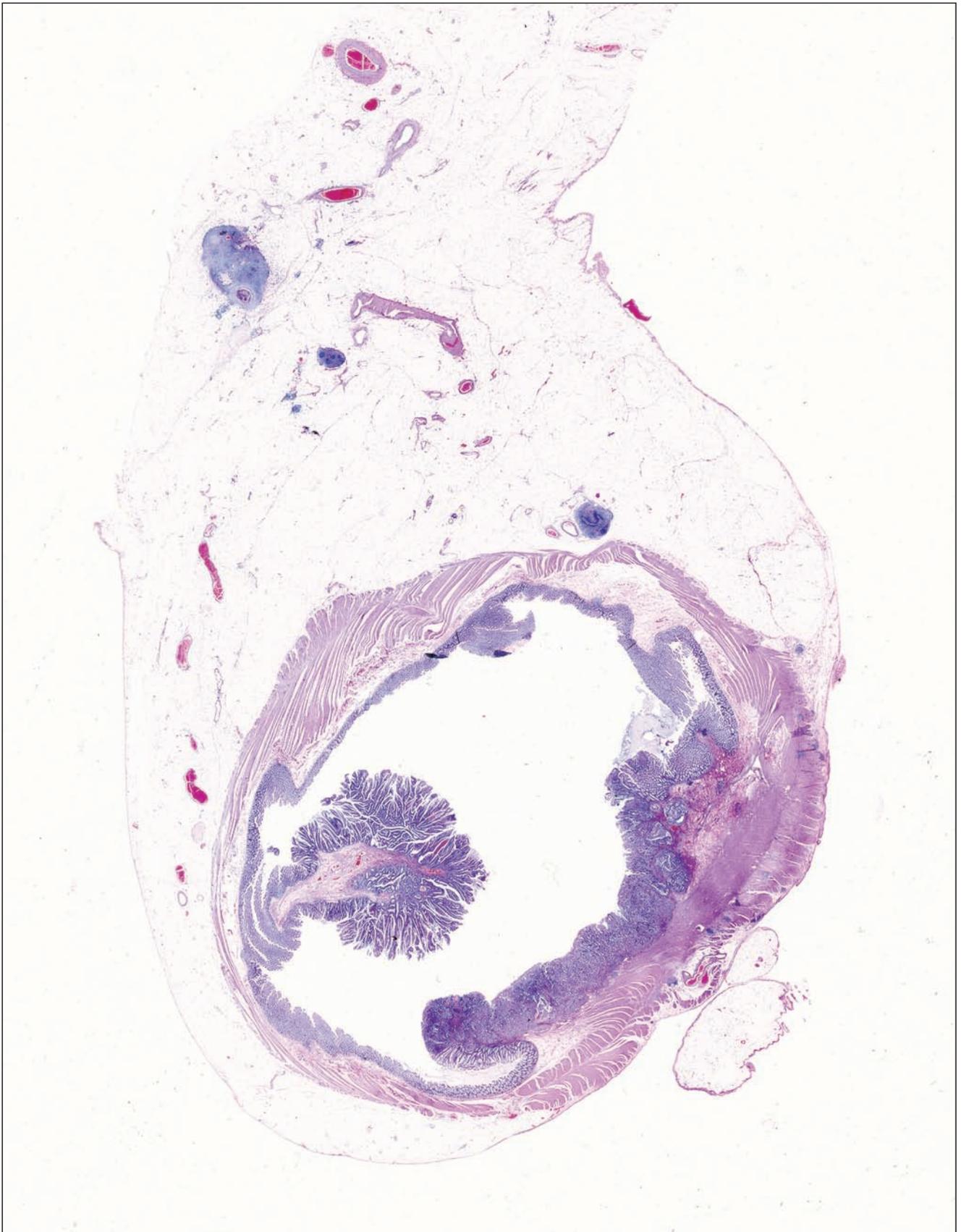


Fig. 1.9 Large-section histology image of a tubulovillous adenoma of the rectum and the associated invasive carcinoma.