

The Importance of Complete Colonoscopy and Exploration of the Cecal Region

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2.1 The Importance of a Complete Colonoscopy

Ever since case-control studies demonstrated the ability of flexible sigmoidoscopy (FS) to decrease colon cancer mortality by 60–70%, it has become the most frequently recommended modalities for colon cancer screening [1]. Recent reports, however, have shown that FS may miss proximal neoplasms or cancers [2]. Moreover, the National Polyp Study found that the incidence of colorectal cancer (CRC) in an adenoma-bearing cohort that had undergone clearing colonoscopy was reduced by 76–90% compared to reference populations [3]. It is obvious that examination of the left colon alone misses right-sided lesions. Thus, while colonoscopy is more time-consuming and resource-demanding, in addition to causing greater patient discomfort and with a higher rate of complications due to bowel cleansing and the endoscopic procedure, it is widely appreciated as the most sensitive colonic imaging test for adenomas. An additional advantage of colonoscopy is that it allows the removal of precancerous polyps at the time of their detection.

A right-sided aging-related shift in the location of the initial development of colorectal adenomas was recently reported, based on repeated colonoscopies in subjects with no neoplasms [4]. Recurrent adenomas after polypectomy also tend to develop at locations

proximal to the initial adenomas [5]. Accordingly, total colonoscopy is needed for surveillance, regardless of the initial adenoma site. Moreover, the distribution of carcinoma and of adenomatous polyps in the colorectum likewise shows a proximal shift with age and female gender [6, 7]. Clinically, right-sided cancer is likely to be detected at a more advanced stage, with severe symptoms such as passage trouble or abdominal mass. Morphologically, the frequency of tumors with a flat-type appearance is significantly higher in right-sided than in left-sided colon cancers, while polypoid-type lesions are substantially more dominant in the left colon [8]. Histopathologically, poorly differentiated, mucinous, and signet-ring cell tumors are frequently seen in the right colon [9]. From a molecular aspect, the right-sided tumors that predominate in the elderly are those with a high frequency of CpG island methylation and those with microsatellite instability (MSI), in which there is often methylation of the promoter region of the hMLH1 mismatch repair gene [10]. A newly proposed disease entity, serrated polyps, comprises hyperplastic polyps, traditional serrated adenomas (TSAs), and sessile serrated adenomas (SSAs), which have also been described as sessile serrated polyps (SSPs) [11]. SSAs/SSPs are more prevalent in the proximal colon and lack classic dysplasia but may have mild cytologic atypia, whereas TSAs are more prevalent in the rectosigmoid and have cytologic dysplasia. SSAs/SSPs, particularly those with foci of classic histologic dysplasia, are considered the likely precursor lesions to sporadic MSI-H colon cancer, as determined in studies of their molecular profiles, which have shown inactivation through methylation of genes such as the MLH-1 DNA repair genes and/or

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Table 2.1 Endoscopic treatment at the National Cancer Center Hospital, Tokyo, Japan (January 1998 until September 2006)

	Adenoma (14,285)	M-Ca (1,717)	SM-Ca (302)	Total (%)
Cecum	860 (87.2%)	119 (12.1%)	7 (0.7%)	986 (6.0)
Ascending	2,942 (90.2%)	283 (8.7%)	35 (1.1%)	3,260 (20.0)
Transverse	4,004 (93.3%)	244 (5.7%)	42 (1.0%)	4,290 (26.3)
Descending	1,723 (92.8%)	122 (6.6%)	11 (0.6%)	1,856 (11.4)
Sigmoid	3,298 (84.2%)	513 (13.1%)	104 (2.7%)	3,915 (24.0)
Rectum	1,458 (73.0%)	436 (21.8%)	103 (5.2%)	1,997 (12.3)
Total (%)	14,285 (87.6)	1,717 (10.5)	302 (1.9)	16,304 (100.0)

0-6-methylguanine DNA methyltransferase (MGMT) [12]. The presence of SSAs/SSPs (≥ 10 mm in size) is also reported to be a risk factor for CRC, particularly of the proximal colon [13].

2.2 The Importance of Exploring the Cecum

It has been known for many years that colorectal adenoma and CRC have different distributions in the colon. The anatomic distribution of adenomas in the colon was described in previous reports (e.g., [14]) that included autopsy and endoscopic studies. Autopsy studies show a relatively even distribution of adenomas throughout the colon whereas cancer is more frequent in the distal colon and rectum. In those studies, the incidence of adenomas located in the cecum varied from 2 to 67%. However, in some reports fewer than 200 cases were evaluated. By contrast, endoscopic studies evaluated more than 200 cases (one was based on 6,942 cases), reporting cecal adenomas in 2–20%. Based on data from the National Cancer Center, the incidence of early colorectal neoplasia involving the cecum, as determined from tumors resected endoscopically, is 6.0% (Table 2.1) whereas the incidence of CRCs located in the cecum, as determined from surgically removed tumors, is 6.8% (Table 2.2). Although the incidence of colorectal neoplasia in the cecum is lower than in other sites, it should be kept in mind that some non-polypoid neoplasias, including SSAs/SSPs or laterally spreading tumor, can occur at this site, especially at the periphery of the appendiceal orifice, and are endoscopically detectable. Obviously, visualization of the appendiceal orifice and ileocecal valve confirms a complete total colonoscopy.

2.3 Case Presentation

2.3.1 Case 1

A 74-year-old woman underwent total colonoscopy because of a positive fecal occult blood test. During conventional endoscopic observation, a superficially reddish area was detected on the ileocecal valve (Fig. 2.1a). Narrow-band imaging revealed a flat brownish lesion (Fig. 2.1b). Chromoendoscopy, performed using indigo-carmin spraying, further demonstrated a non-granular type of laterally spreading tumor (LST-NG), 20 mm in diameter, on the ileocecal valve (Fig. 2.1c). Magnification with chromoendoscopy using indigo-carmin and crystal-violet staining showed a type IIIIL pit pattern, according to Kudo's classification, which is a good indication for endoscopic resection (Fig. 2.1d, e). The tumor was completely removed en bloc with endoscopic submucosal dissection (Fig. 2.1f). Histologically, the lesion was identified as a tubular adenoma with high- and low-grade atypia, with the cut end free of adenoma.

2.3.2 Case 2

A 48-year-old man underwent total colonoscopy because of a positive fecal occult blood test. A flat elevated lesion was detected in the cecum near the orifice of the appendix (Fig. 2.2a). Chromoendoscopy using indigo-carmin day spraying showed a lesion covered by a small amount of mucus, even after vital water washing (Fig. 2.2b). Magnification after chromoendoscopy revealed an elongated type II pit pattern at the periphery, with features similar to those of a type IIIIL pit pattern (Fig. 2.2c). A dilated type II pit pattern

Table 2.2 Surgery at the National Cancer Center Hospital, Tokyo, Japan (January 1998 until September 2006)

	Early (618)	Advanced (2,651)	Total (%)
Cecum	39	183	222 (6.8)
Ascending	73	322	395 (12.1)
Transverse	58	215	273 (8.4)
Descending	26	117	143 (4.4)
Sigmoid	166	660	826 (25.3)
Rectum	256	1,154	1,410 (43.0)
Total (%)	618 (18.9)	2,651 (81.1)	3,269 (100.0)

Fig. 2.1 a–f A non-granular type of laterally spreading tumor (LST-NG), 20 mm in diameter, is seen on the ileocecal valve

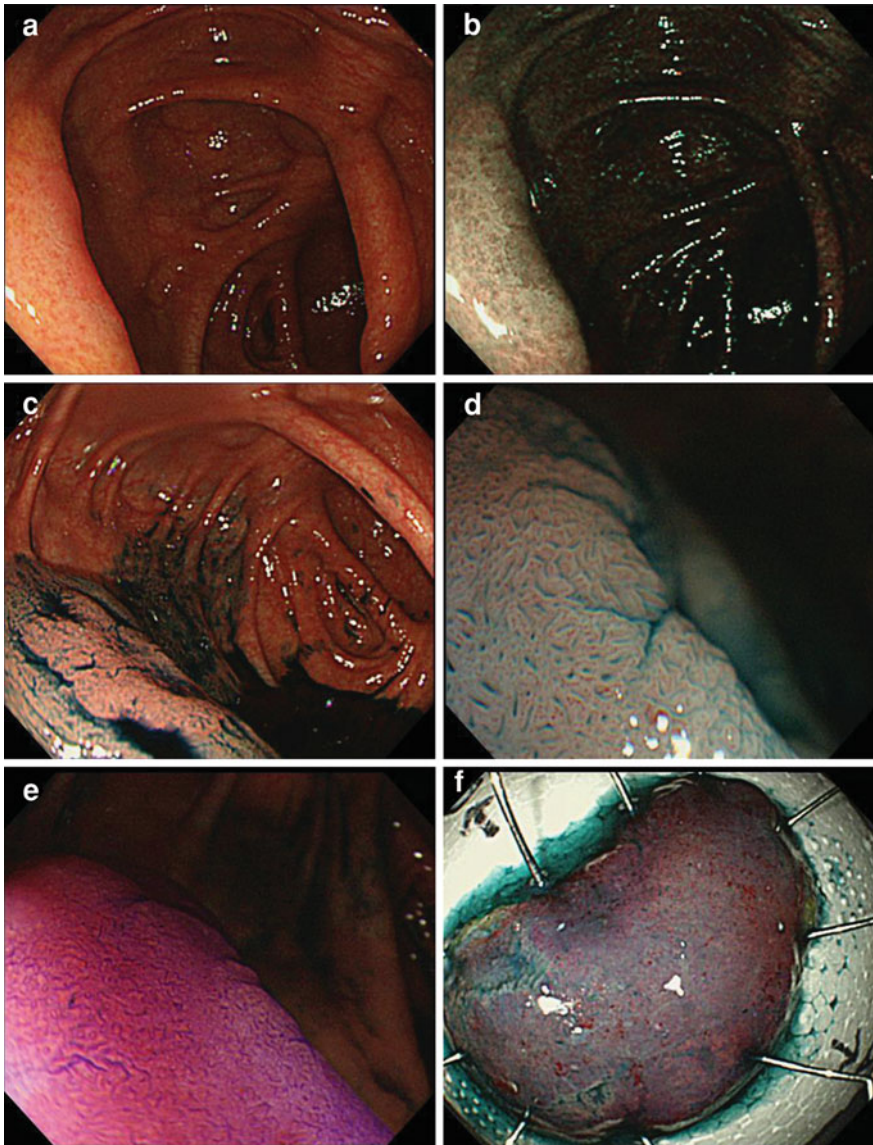
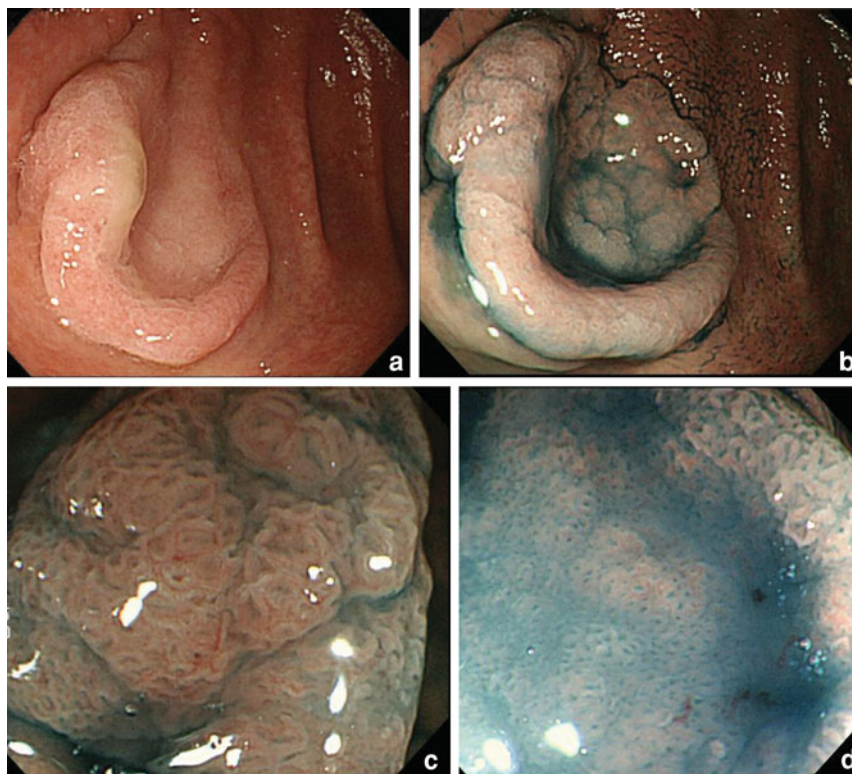


Fig. 2.2 a–d A sessile serrated adenoma/polyp is detected in the cecum adjacent to the orifice of appendix



was detected in the central flat area (Fig. 2.2d). These endoscopic results suggested a large hyperplastic polyp, or an SSA/SSP. The lesion was completely removed en bloc with endoscopic mucosal resection (the conventional lift and cut technique). Histologically, the lesion was identified as an SSA/SSP.

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