Family Practice Grand Rounds

Colonic Polyps and Colon Cancer

R. Prasaad Steiner, MD, Kenneth E. Holtzapple, MD, Herbert Dickstein, MD, Robert P. Kraft, Jr, MD, Gary H. Peterson, MD, and Donna M. Roberts, MD
Louisville, Kentucky

DR. R. PRASAAD STEINER *(Assistant Professor, Department of Family Practice)*: The family physician has the opportunity to use multiple diagnostic aids to screen patients for colonic lesions. Increased knowledge about risk factors and conditions associated with colonic cancer, as well as new or revised procedures for detecting colonic pathology, has led to earlier detection and decreased mortality. How to best use these new advances to provide optimal care for patients is the subject of this Grand Rounds.

Dr. Donna Roberts will present two brief case summaries for discussion by our panel.

DR. DONNA ROBERTS *(Second-year resident, Department of Family Practice)*: R.W. is a 69-year-old black woman with multiple problems including anemia, alcoholism, and traumatic rib fractures. There is no family history of bowel carcinoma. During the evaluation of her anemia, stools were negative for occult blood. An air-contrast barium enema revealed a 1.2-cm polyp in the rectal region and a polypoid lesion proximal to the hepatic flexure. The patient was admitted to the hospital for colonoscopy. Three polyps were identified, all of which were pedunculated and regular in surface appearance. All polyps were excised, but only two were retrieved.

Another patient, J.R., a 44-year-old black woman, presented with complaints of intermittent rectal bleeding first noted 18 months ago. Blood was almost always mixed with the stool. At times she had diarrhea associated with lower abdominal pain. Recently she felt that her stool was being pushed through a narrowed area. She denied other symptoms. There was no family history of colonic cancer. Physical examination revealed tenderness in the left lower quadrant of the abdomen. Pelvic and rectal examinations were normal, but a stool test for occult blood was positive. An outpatient barium enema showed a polypoid lesion in the midsigmoid colon. The patient was admitted to the hospital for colonoscopy, which showed a broad-based polypoid lesion in the distal sigmoid colon approximately 19 to 20 cm from the anus. Biopsies of the lesion were taken. As the lesion was large and sessile, endoscopic polypectomy was not feasible. Colonoscopy was performed proximal to the lesion, but was electively stopped at the splenic flexure because of severe pain. The patient underwent a sigmoid colectomy with primary anastomosis. The postoperative course was unremarkable.

DR. STEINER: These two cases represent contrasting presentations of colonic polyps. Both cases involve women aged over 40 years with no family history of cancer. The first patient had no

From the Departments of Family Practice, Pathology, and Diagnostic Radiology, University of Louisville, Kentucky. Requests for reprints should be addressed to Dr. R. Prasaad Steiner, Department of Family Practice, Ambulatory Care Building, 530 S. Jackson Street, Louisville, KY 40292.

THE JOURNAL OF FAMILY PRACTICE, VOL. 17, NO. 6: 983-995, 1983

bowel complaints and negative tests for occult blood in the stool. A barium enema revealed multiple pedunculated polyps that were resectable with colonoscopy. The second patient had bowel symptoms and gross and occult rectal bleeding, and a single large sessile mass in the distal colon was demonstrated on barium enema that could not be removed by colonoscopy. Pathology reports from these two cases revealed differing histologies, as will be discussed later.

DR. KENNETH HOLTZAPPLE *(Chairman, Department of Family Practice)*: Polyp, from the Greek *polypous* meaning "many footed," refers to any mass of tissue that projects from a mucosal surface. It is a general term used to describe many colonic abnormalities noted at the time of contrast or endoscopy studies. The vast majority of individuals with colonic polyps are asymptomatic. Polyps can, however, cause signs and symptoms of bowel dysfunction—abdominal discomfort, change in bowel habit, change in character of stool, gross or occult bleeding, and intussusception. Rarely, a villous adenoma can cause diarrhea from massive amounts of mucous secretion. This excessive mucous secretion may lead to hypokalemia, hypoproteinemia, and even hypovolemia.[1] Realizing that all the foregoing symptoms and signs can be distressing to a patient, the most bothersome issue to clinicians and to patients is the relationship of polyps to cancer of the colon.

Excluding nonmelanoma skin cancer and carcinomas in situ, cancer of the colon is the third most common cancer in adult men, exceeded only by cancer of the lung and prostate. It is the second most common carcinoma in women, being exceeded in incidence only by breast carcinoma. The expected incidence in 1983 for cancer of the colon totals 126,000 new cases with 87,000 cases expected in the colon and 39,000 cases of carcinoma expected in the rectum.[2] Over the past 30 years, the distribution of colonic carcinoma has progressed proximally so that fewer carcinomas occur in the rectum and more carcinomas occur in the cecum.[3] Recent studies show that 12 to 15 percent of colonic cancers are in the rectum, 38 to 42 percent in the rectosigmoid and sigmoid, and the remainder in the more proximal segments of the colon.[4] It is obvious from this distribution that the time-honored methods of rectal examination and rigid sigmoidoscopy for early detection of bowel carcinoma would miss a large number of lesions.

Table 1. Hereditary Patterns of Colon Cancer

Polyposis Group	Nonpolyposis Group
Familial polyposis (AD)*	Cancer family syndrome (AD)
Gardner's syndrome (AD)	Site-specific colon cancer (AD)
Turcot's syndrome (AR)**	Gastrocolonic cancer (AD)
Peutz-Jeghers syndrome (AD)	Torres' or Muir's syndrome (AD)
Juvenile polyposis (?)	Sporadic colon cancer (suggested inheritance)

*AD—Autosomal dominant
**AR—Autosomal recessive

The advent of the 35-cm flexible sigmoidoscope and the 60-cm sigmoidoscope has provided means for increasing the detection rate of these tumors.

There appears to be little question that early detection and proper treatment leads to a prolonged five-year survival. From 1970 to 1973, at the time of diagnosis, about 44 percent of patients with colonic cancer had localized lesions (Duke's stage A or B), 26 percent had regional lymph node involvement, and 25 percent had distant metastasis.[2] The five-year survival rate is about 70 percent for localized carcinoma for both men and women, but it decreases sharply as the staging of the disease advances.[5]

An aid to early detection of colonic carcinoma is the identification of populations at greater risk for the disease. Heredity is clearly a significant risk factor. It has been suggested that 20 to 30 percent of colon carcinomas may have a familial basis. The hereditary pattern of colon cancer can be divided into two main groups according to the presence or absence of colonic polyps (Table 1).[6]

The polyposis group consists of often-cited but rare syndromes. If patients with familial polyposis are left untreated, 95 percent develop carcinoma of the colon. Gardner's syndrome is characterized by bone and soft-tissue tumors, colonic polyps, and the occurrence of carcinoma of the colon at an early age. Central nervous system tumors, in association with adenomatous and villous polyps of the colon and a greater than expected incidence

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of carcinoma of the colon, characterizes Turcot's syndrome. The Peutz-Jeghers syndrome is now believed to be associated with an increased number of adenomatous polyps as well as a greater than expected incidence of carcinoma of the colon. Juvenile polyposis, also once thought to be relatively benign, is now believed to predispose to an increased incidence of carcinoma of the colon.

The nonpolyposis group contains common syndromes, and every family physician will undoubtedly encounter patients in this group. The cancer family syndrome is characterized by a high incidence of adenocarcinoma of the proximal colon, endometrial carcinoma, and multiple other carcinomas. Carcinomas occur at a young age in this group. Site-specific colon cancer refers to the occurrence of proximal bowel carcinoma, again occurring at a young age. Gastrocolonic syndrome refers to the occurrence of adenocarcinoma of the stomach and colon in the same family. Torres' syndrome is the occurrence of multiple sebaceous cysts and adenocarcinomas in the same patient. Sporadic colon cancer is the entity family physicians most frequently encounter. The risk of colon cancer developing in a first-degree relative of an individual with known colon cancer is three times greater than the risk in the general population.

Other risk factors believed to play a role in cancer of the colon include an age of 40 years or over; dietary factors including a high fat, high animal protein, and low fiber content; and a high concentration of bile salts in the gut lumen and the bacterial flora of the gut. Occupational exposure to asbestos, presence of ulcerative colitis or other inflammatory bowel disease, and a previous history of adenoma or cancer of the colon all increase risk for the development of cancer of the colon.[7]

DR. STEINER: Dr. Peterson, please review the x-ray examinations of the two cases and comment on the radiologic issues in detection and evaluation of colonic masses.

DR. GARY PETERSON, MD *(Associate Professor, Department of Diagnostic Radiology):* These two patients had different types of colon examination. R.W. had a good-quality, double-contrast study that revealed three colonic polyps. Two of these were fairly large, in the range of 1.5 cm. The third was quite small. The two larger polyps were not sessile and had no direct signs of malignancy.

The second patient, J.R., was examined at another hospital using the conventional, full-column technique. A large, broad-based sigmoid mass was seen only on the early spot films taken during fluoroscopy. None of the overhead films, obtained after the colon was filled, showed any abnormality. The mass had extensive surface irregularity, suggesting a villous component.

In these patients, both types of examinations demonstrated the pathology, but this is not always the case. Most radiologists now agree that the double-contrast barium enema is far superior for detection of polyps and cancer of the colon, as well as inflammatory bowel disease. In one comparative study,[8] the detection rate of polyps 1.0 cm or larger was 60 percent using full-column techniques. This rate rose to 96 percent with double-contrast examinations.

Regardless of the examination performed, the single most important factor is the adequacy of patient preparation. The radiologist must assume the responsibility for bowel preparation for his patients. Our department uses a combination of senna (X-Prep) and castor oil, which produces a rather unpleasant but thorough catharsis. Maximum hydration of the patient is especially important to improve effectiveness of the preparation and to compensate for water loss. We also insist that patients be placed on a clear liquid diet from no later than noon the day before the study. Compliance with this regimen significantly increases the quality of the examination by reducing false-positive and false-negative results caused by fecal debris.

While the location of the polyp is of little clinical value, its appearance can sometimes help in predicting the likelihood of its being malignant.[9] Polyps on a stalk are far more likely to be benign than cancerous, but they must be removed for confirmation. Occasionally, a polyp or polypoid lesion will show evidence of dimpling or actual invasion of the colonic wall. This is an ominous sign and is suggestive of malignancy. Size is the most important factor, as increasing polyp size is known to increase malignant potential.

The air-contrast barium enema requires more time from the radiologist, more radiation exposure, more patient discomfort, and about $15 additional expense compared with the full-column barium enema. The results of any radiologic examination are operator dependent so that the training and expertise of the radiologist is one important aspect of an air-contrast barium enema. A frequently neglected item concerning air-contrast barium enemas is the requirement that the patient be cooperative and moveable. Too often, the elderly, disabled patient is sent for an air-contrast barium enema for the evaluation of rectal bleeding when a full-column barium enema would actually serve the patient's purpose much better. Community physicians should always strive to match the requested procedure with the suspected diagnosis with an eye to the particular limitations of the patient.

DR. ROBERT P. KRAFT, JR *(Gastroenterologist)*: The American Cancer Society recommends that patients over the age of 50 years have a sigmoidoscopy performed every three years to screen for cancer of the distal colon and rectum. Patients who are in high-risk groups may need to be screened on a more frequent basis from an earlier age. A barium enema examination is essential to rule out possible neoplasm of the proximal colon in those patients who are in a high-risk group or those who have a stool that is positive for occult blood along with a negative sigmoidoscopic examination. Colonoscopy is not used as a screening procedure in most patients; rather, it is used to gain more information on a lesion suggested by barium enema or in selected individuals at high risk for colonic neoplasms. Some of the indications for colonoscopy are as follows: follow-up examination of patients who have a lesion seen on barium enema, biopsy, or removal of colonic polyps; evaluation of inflammatory bowel disease; evaluation of diarrhea; localizing the source of either occult or gross bleeding; follow-up examination of patients with prior colonic surgery for neoplasms; and evaluation of patients with abdominal symptoms suggesting colorectal disease.

To perform an optimal examination of the colon, the bowel must be clean and empty. If the patient is poorly prepared, the ability of the endoscopist to visualize the colon is limited, and advancement of the colonoscope becomes both difficult and risky for the patient. The patient may be prepared as if he were having a barium enema. A newer and more rapid technique for cleansing the bowel includes the use of a lavage solution administered orally in adequate volumes to induce diarrhea. Currently, the most accepted solution is called Go-Lytely.[10] This solution contains sodium

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salts, magnesium chloride, and polyethylene glycol, is isotonic, and because polyethylene glycol is a nonabsorbable solute, causes no flux of water either into or out of the intestinal lumen. The solution is administered at the rate of 1,000 mL/h and is continued until the patient has developed diarrhea; the infusion is stopped when the diarrhea becomes clear. Metaclopromide may be given with Go-Lytely to accelerate gastric emptying of the solution. Residual fluid, which commonly remains in the colon after this preparation, can be removed with the colonoscope. This bowel preparation is not suitable for barium enemas as fluid retention will dilute the barium within the colon.

Colonoscopy is a procedure best performed in the hospital but may be done on an outpatient basis. The patient is usually placed in the left lateral decubitus position with the knees and hips flexed. This position, rather than the prone knee-chest position used in standard rigid sigmoidoscopy, is preferred for performing colonoscopy.

The diagnostic yield of fiberoptic sigmoidoscopy has been compared with both rigid sigmoidoscopy and barium enema.[11] Using the long (60 cm) flexible fiberoptic sigmoidoscope, the diagnosis rate is approximately three times that of the rigid 25-cm sigmoidoscope. The detection rate for both benign polyps and malignancies is increased by using the long flexible sigmoidoscope. The amount of time for the procedure using the long scope is only slightly longer than procedure time using the rigid proctosigmoidoscopy. Polls of patient preference indicate that the flexible sigmoidoscopic examination is more comfortable than that using the rigid 25-cm sigmoidoscope.

The flexible sigmoidoscope and colonoscope afford the physician the opportunity to perform electrosurgical polypectomy. Visualization of masses is superior with the flexible instrument, and lesions beyond the 25-cm mark can be successfully removed. Any pedunculated polyp the size of which is less than that of the snare can be successfully removed with the colonoscope. Larger lesions, obviously, must be surgically removed. There is present controversy over whether large sessile polyps should be endoscopically removed in a piecemeal fashion or removed by colectomy.

The complication rate with colonoscopy is low. A poll of members of the American Society for Gastrointestinal Endoscopy showed a morbidity

rate of 0.32 percent and a mortality rate of 0.008 percent with the use of colonoscope for diagnostic purposes.[12] Surgical procedures with the colonoscope raised morbidity to 1.0 to 2.5 percent, with complications such as hemorrhage being slightly more common than that of perforation. The risk to the patient is considerably higher with untrained endoscopists. Most complications will occur during the training period of the endoscopist, especially during the first 40 to 50 procedures. Potential complications include hematoma of the intestine and explosion. Explosion may occur in patients who have been inadequately prepared, causing methane gas to be retained in the colon. The use of bowel preparations containing mannitol may also increase the methane content within the bowel.

The development of the fiberoptic sigmoidoscopy and colonoscopy has improved the detection and treatment of diseases of the lower gastrointestinal tract. Family practice residency programs should encourage proper training sessions for the residents and faculty in the use of the fiberoptic sigmoidoscope.

DR. STEINER: The family physician should be aware that there are many classifications of colonic polyps. Polyps can be classified as neoplastic and nonneoplastic. The nonneoplastic group consists of hyperplastic polyps, inflammatory pseudopolyps, hamartomas, and lipomas. The neoplastic polyps are customarily grouped into mainly adenomatous and mainly villous types. Although most cancers of the colon arise as adenomas, it should be remembered that the majority of adenomas never develop into cancer.[13]

DR. HERBERT DICKSTEIN *(Clinical Associate Pathologist):* The biopsy specimen from the second patient, J.R., shows a polyp composed of adenomatous glands that become tortuous and show cellular changes regarded as atypical. The specimen from the colon resection was a 2.5×2.0-cm pedunculated polyp. Microscopic examination demonstrates that elongated villous areas are present in addition to the adenomatous glands. The stalk shows no invasion. This polyp was classified as a villous and glandular adenoma with atypia.

The biopsy from R.W., the first patient, shows a polyp composed of hyperplastic columnar mucosal glands. There is no infiltration of the lamina propria.

Histopathologic features of polyps are useful in the assessment of the malignant potential of a lesion.[14] The hyperplastic mucosal polyp, composed of colonic mucosal glands, is benign, and is sometimes found in association with carcinoma in other areas of the bowel. The adenomatous polyp, with its tortuous glandular configuration, is generally benign. If severe atypia is found, the pathologist may interpret changes as carcinoma in situ. If the stalk shows no invasion, then the prognosis after removal is excellent. However, there are occasional reports of adenomatous polyps with carcinoma with no invasion of the stalk associated with metastasis to a regional lymph node.[15] Polyps with a villous component have a high malignant potential, with the pure villous adenomas having the highest incidence of becoming malignant. It is estimated that 40 to 50 percent of mainly villous polyps will become malignant.

In summary, the first patient, R.W., has a benign lesion and should have an excellent prognosis. However, the second patient, J.R., has a good prognosis as the present lesion was completely removed, but because of the presence of villous features, the patient should be followed closely.

DR. HOLTZAPPLE: Having identified groups at greater risk for carcinoma of the colon, we then need a sensitive and specific screening tool to identify premalignant lesions such as polyps and early cancers. It was noted earlier that rectal examination will detect relatively few lesions. Rigid sigmoidoscopy, while capable of detecting a greater number of lesions, has never gained wide acceptance with either physicians or patients as a screening tool. It should be mentioned, however, that in populations where it has been used, there has been a significant reduction in mortality from carcinoma of the rectosigmoid.[16]

Since the late 1960s detection of occult blood in the stool has been touted as a screening tool for early detection of colorectal carcinoma and premalignant lesions. The best controlled studies of screening for colorectal cancer with stool occult blood suggest the following: (1) testing for occult blood in stool is more likely to detect cancer than precancerous lesions such as adenomas, although the latter do frequently produce occult bleeding when greater than 2.0 cm in size, (2) cancers detected by occult blood testing are more often localized (Duke's stage A and B) than not, and (3) occult blood testing and proctosigmoidoscopy are

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complementary screening procedures.[16] Slides impregnated with guaiac are most commonly used for the detection of occult blood in the stool. Most physicians are familiar with the product Hemoccult.

Using recent evidence regarding the value of a low-peroxidase diet,[17] an optimal protocol for stool occult blood screening is as follows: before collecting the first stool specimen, adherence to a diet for 24 to 48 hours that contains no red meat, but permits chicken, pork, ham, bacon, or white fish; no uncooked fruit, except for oranges or strawberries; no uncooked vegetables; and no vitamin C supplements. The use of bran cereals or Metamucil to increase fiber content should be encouraged. This diet should be continued until the patient has prepared two slides from the stools on each of three consecutive days. All slides should be rehydrated, as this significantly improves yield. All bluish reactions are interpreted as positive; all others as negative. A single positive slide has the same significance as multiple positive slides.

Linking the information about populations at risk with our current knowledge of screening tools, the protocols charted in Figure 1[16] are recommended for the early detection of premalignant or malignant lesions of the colon.

DR. STEINER: The panel members have provided a comprehensive and up-to-date presentation on many aspects of colonic polyps, colonic cancer, and colonoscopy. The family physician should be aware that family history of cancer and colonic lesions is an important factor for selecting appropriate screening procedures. These protocols should help eliminate much of the low-yield repetition and cost of some screening tests while maintaining high early detection rates in the at-risk population. Training family physicians to use the fiberoptic sigmoidoscope will help provide optimal care for patients.

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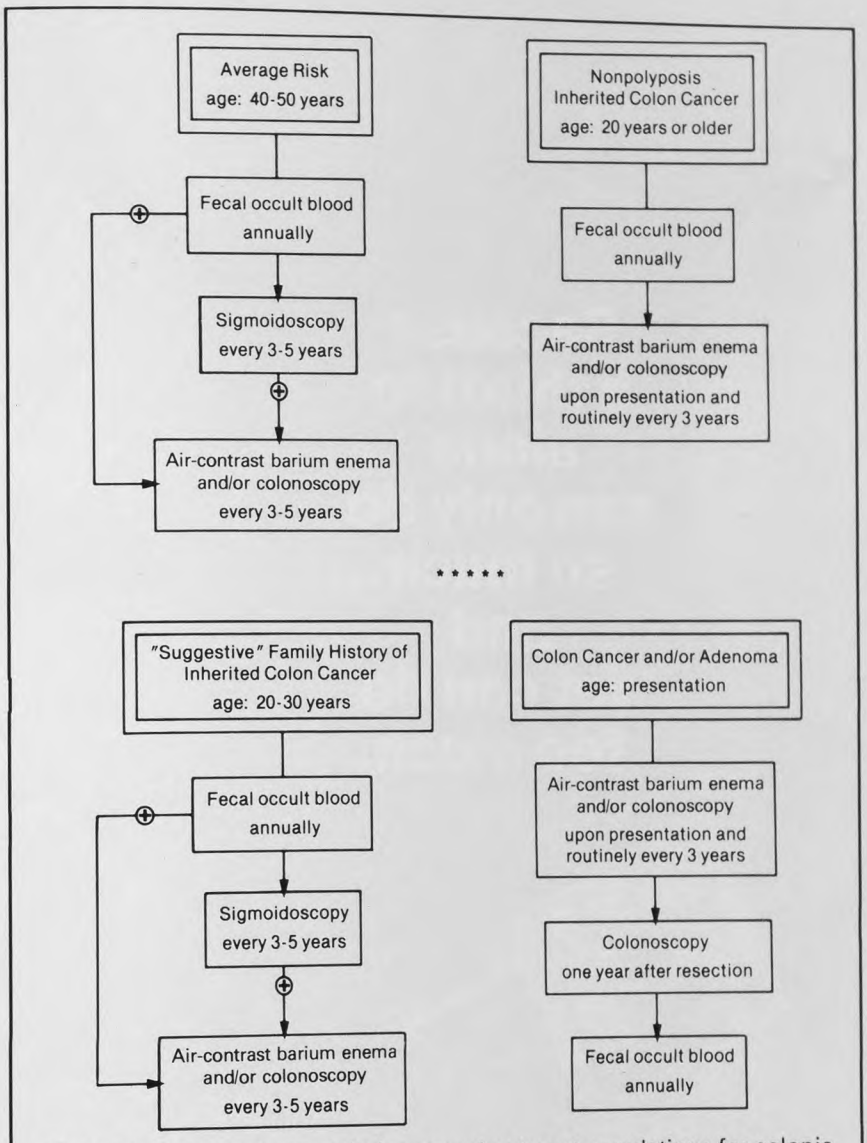

Figure 1. Proposed schedule for screening target populations for colonic cancer (adapted from Winawer and Sherlock[16])

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