

3-1975

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Recommended Citation

Fox, Thomas A. Jr.; Schuman, Bernard; Allen, Hubert M.; and Escobar, E. (1975) "Fiberoptic Colonoscopic Polypectomies," *Henry Ford Hospital Medical Journal* : Vol. 23 : No. 1 , 21-24.

Available at: <https://scholarlycommons.henryford.com/hfhmedjournal/vol23/iss1/5>

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Fiberoptic Colonoscopic Polypectomies

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The development of fiberoptic instruments which permit direct visualization of the entire colonic lumen has made possible the safe removal of polyps from any part of the colon. The avoidance of transabdominal colotomy and polypectomy significantly decreases the mortality and morbidity as well as the duration of hospital stay.

We wish to present our experience in performing the endoscopic removal of 128 colonic polyps larger than 0.5 cm in size in 103 patients, located from the cecum to the sigmoid colon and beyond the reach of the rigid sigmoidoscope.

The polypectomy procedures via the colonoscope were done without mortality and with only three relatively minor complications, all of which responded to conservative measures.

Endoscopic removal of colonic polyps is proposed as a safe, practical alternative to either laparotomy and colotomy or repeated barium enema studies in the management of the patient with a colonic polyp.

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Fiberoptic colonoscopy can increase diagnostic accuracy and sometimes avert major surgery in patients with colorectal disease. The removal of colonic polyps by means of fiberoptic colonoscopy avoids the transabdominal approach to polypectomy and thus significantly decreases morbidity and mortality as well as the duration of hospital stay. By use of the electrosurgical snare described by Wolff and Shinya,^{1,2} 128 polyps in 103 patients were successfully removed.

Materials and Methods

Clinical Material: From December, 1972, through November, 1974, 128 colonic polyps were successfully removed in 103 patients at Henry Ford Hospital. Initially, most of these procedures were performed on inpatients, but recently, about one-half have been carried out on outpatients. All patients had at least one, and often two, preoperative barium enema roentgenographic examinations and also sigmoidoscopy. All polyps removed were above the reach of the standard sigmoidoscope.

Preparation: The routine for inpatients and outpatients involves a clear liquid diet the day before examination, a cathartic (usually castor oil) the evening before, and a warm tap water enema in the morning. Colonic

preparation done by the patient is usually better than that done in the hospital. Pre-medication for inpatients involves the intramuscular administration of 50 mg of meperidine hydrochloride at the time the patient leaves his room and 10 mg diazepam intravenously just prior to beginning the examination. Outpatients receive only the diazepam. Rarely is additional sedation required during the procedure. No prophylactic antibiotics are given.

Technique: The examination is started with the patient in the left lateral position. The colonoscope to be used, either the 110 cm or the 187 cm, instrument (Olympus), was selected according to location of the polyp. A well-lubricated finger is then inserted into the anus. The end of the well-lubricated colonoscope is introduced on the finger, as in rectal examination, and advanced, usually under direct vision. In negotiating bends in the colon, the "persuasive pressure" or "mucosal slide"² technique is often used, but with great caution. The position of the instrument can be checked by using anatomical landmarks, the position of the light at the end of the instrument on the abdominal wall, fluoroscopy or a flat-film roentgenogram of the abdomen. With increasing experience, fluoroscopy and flat-films are rarely required. Visualization and procedures are accomplished during withdrawal.

The polyp is excised by a loop of wire advanced through the biopsy channel of the colonoscope, and electric current is applied while the wire loop is being closed around the pedicle of the polyp.

Some colonoscopists insufflate the colon with carbon dioxide during electrosurgical procedures to prevent a possible explosion of colonic methane gas. We agree with Ragins⁴ that insufflation of carbon dioxide is unnecessary in a well-prepared colon, so do not perform this procedure. We have had no problems using this method.

The excised polyp is extracted from the

colon by bringing the instrument tip in close proximity to it and applying full suction. This maneuver impacts the polyp on the end of the colonoscope, which is then slowly removed, with polyp, from the colon. The colonoscope is then reintroduced and the polypectomy site inspected for any bleeding.

The patient is maintained on a clear liquid diet for the remainder of the day and, if inpatient, discharged the following morning. Outpatients are observed for approximately one hour post-polypectomy and, if asymptomatic, discharged home.

Results of Polypectomy

Of 236 colonoscopies performed between December, 1971, and November, 1974, 163 were for suspected colonic polyps. In 103 patients, 128 polyps were found, but in 60 patients, no polyps were found. It appears that, of the failures, nine polyps were above the reach of the colonoscope. Many of the remaining 51 cases can probably be related to our earlier efforts when our technique had not been perfected. Many of these are being re-examined in follow-up studies. The anatomic distribution of the polyps removed is given in Table 1. Some features of the polyps removed are presented in Tables 2-4.

Table 1
Anatomic Distribution of 128
Colonic Polyps (103 Patients)
as Noted on Roentgenograms

Site in Colon	Number
Sigmoid	82
Descending	25
Splenic Flexure	5
Transverse	8
Hepatic Flexure	1
Cecum and Ascending	7
TOTAL	128

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Table 2
Number of Polyps Removed
in Each Patient

Number of Polyps Removed	Number of Patients
1	86
2	12
3	4
4	0
5	0
6	1
TOTAL	103

Table 3
Size of Polyps Removed

Size of Polyp Removed (cm)	Number of Polyps
Less than 0.5	0
0.5—1.0	67
1.1—2.0	52
2.1—3.0	8
3.1—4.0	0
4.1—5.0	1
TOTAL	128

Table 4
Pathologic Features of
Polyps Removed by Colonoscopy

Feature	Polyps Removed
Adenomatous	81
Villous adenoma	22
Adenomatous polyp with focal carcinoma in-situ	7
Adenocarcinoma	2
Lipoma	2
Hemangioma	2
Mucosa	2
Juvenile	1
Polyps removed but not recovered	9
TOTAL	128

Nine of the 128 polyps removed and retrieved at colonoscopy were adenocarcinoma (Table 4). It is possible that some of the polyps not retrieved are malignant. However, greater efforts at retrieval are made when the polyps are suspected to be malignant by their gross appearance. All of the unretrieved polyps were small and grossly appeared benign.

Complications of Polypectomy

All significant complications are listed in Table 5.

Table 5
Complications in 128
Polypectomies in 103 Patients

Complication	Number of Patients
Rectal bleeding	2
Abdominal pain and tenderness	1

Fortunately we have had no perforations while performing polypectomies, although, these have been reported by others.^{3,5}

Two patients had rectal bleeding following polypectomy. One patient had two tarry stools and her hemoglobin decreased by two grams. She was treated conservatively and the bleeding ceased. The other patient developed rectal bleeding three days postpolypectomy. All of his diagnostic studies were negative and he received four units of blood. His bleeding ceased and he was discharged seven days later and has had no further bleeding.

One patient, who had a polyp removed from her splenic flexure, two days later developed right upper quadrant pain and slight tenderness. She was hospitalized and observed for seven days and then discharged, asymptomatic. This episode probably represented localized serositis or possibly a sealed off perforation.

Discussion

The use of the fiberoptic colonoscope is a new approach to the diagnosis and management of colonic lesions. Wolff and associates,² Waye⁷ and Gaisford⁸ have reported large series of both diagnostic and therapeutic colonoscopies without significant complication. Other authors^{3,5} have reported a few significant complications, including perforation and hemorrhage. Our experience included two episodes of bleeding and one of possible serositis. With increasing experience, the morbidity of colonoscopic examinations and polypectomies should decrease, and this valuable new procedure likely will become more extensively used. Pedunculated lesions that are more than 4 cm in diameter probably will have to be removed piecemeal, whereas those that are smaller can be removed in one piece. Small benign appearing sessile lesions can be removed by this means, but great caution must be exercised to prevent a perforation. When there are more than 12 polyps, this technique probably should not be used. These patients should undergo colectomy because the chance of malignant neoplasms of the colon is excessively high.

In addition to the nine polyps which showed adenocarcinoma, five additional patients were found to have an unsuspected carcinoma at a location other than that of the polyp which led to their examination.

These unsuspected carcinomas are another strong indication for colonoscopic examination in patients having what appear to be small benign polyps. In another patient undergoing colonoscopy for undiagnosed rectal bleeding, a small carcinoma was found.

In several patients examined for polyps seen on roentgenograms, at the time of the examination more polyps were found and removed than were diagnosed on the roentgenograms.

For these reasons, we recommend that, where feasible, the colonoscopic examination be performed on the entire colon and not just that portion of the bowel containing polyps; in other words, to the cecum. Although we realize that this entails more time and effort by the colonoscopist and possibly more morbidity to the patient, we believe the benefits will more than compensate for these factors.

Fiberoptic colonoscopy is one of the most important developments of many years in the management of all colonic disorders. When expressed in terms of patient safety, comfort, cost of hospitalization, and loss of gainful employment,—plus enhanced diagnosis and colonic polypectomy without laparotomy, the advantages defy measurement.

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