Operative Colonoscopy

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Summary

In 12 patients with radiologically-proved lesions of the colon total retrograde fiberoptic colonoscopy was performed on the unopened bowel at laparotomy. Additional polyps were found in five patients, and in four of these the polyp was not readily palpable through the bowel wall. This procedure is indicated whenever there are reasonable grounds for suspecting the presence of multiple polypi.

Introduction

Although the malignant potential of adenomatous polyps of the large bowel has been questioned, their association with carcinoma is well known and it is likely that both lesions arise in response to a common stimulus (Castleman and Krickstein, 1962). When polyps are found on repeated radiological examinations the likelihood of additional associated mucosal lesions being present is high. Bacon *et al.* (1963), for example, found in 180 patients who came to laparotomy after at least two double contrast barium enemas that colotomy and colonoscopy with the rigid sigmoidoscope showed 61 additional polyps of which 47 were sessile. Histology showed four of these to be frankly invasive carcinoma and seven to have carcinomata in situ. In a similar study Deddish and Hertz (1955) showed that 50% of 70 patients explored for radiologically-confirmed polyps had additional unsuspected polypoid lesions; this figure rose to 65% when surgery was undertaken for radiologically-established carcinoma (Deddish and Fairweather, 1953).

Because of the failure of the double contrast barium enema to find all colonic lesions, techniques for complete examination of the colon at laparotomy have been sought. Careful laparotomy and palpation shows most large tumours, and a second carcinoma may be found in 2.5% of cases (Swinton and Parshley, 1962; Hughes, 1970), but the regions of the flexures are often difficult to examine. Transillumination of a well prepared bowel will also detect many smaller lesions, but traces of faeces are not uncommonly mistaken for sessile polyps. Colonoscopy with the rigid sigmoidoscope after colotomy has been advocated (Deddish and Hertz, 1955; Bacon and Peale, 1956; Swinton and Weakley, 1963) but as the techniques are cumbersome and not without risk of serious sepsis they have not been widely adopted.

Our experience with the fiberoptic colonoscope in the investigation of large bowel disease (Salmon *et al.*, 1971), and particularly in the search for polyps and carcinoma (Salmon *et al.* 1972), has led us to investigate the value of total retrograde fiberoptic colonoscopy on the unopened bowel during laparotomy, and we report the technique and results of this relatively simple examination.

Materials and Methods

Four fiberoptic colonoscopes have been used for operative colonoscopy. These are the A.C.M.I. 9000A (Medical Supply Association, Crayford), 105 cm in length, and the Olympus CF-SB (85 cm), CF-MB (111 cm), and CF-LB (180 cm) (Key-Med, Southend). Portable, relatively low-power light sources (A.C.M.I. FCB 100, Olympus CLE) have been used and proved satisfactory. Detailed description of the Olympus CF-SB colonoscope and operating techniques have been given elsewhere (Dean and Shearman, 1970; Salmon *et al.*, 1971).

Twelve patients were selected for examination in order to help the surgeon locate a radiologically-diagnosed lesion, search for further lesions, or screen the bowel postoperatively for recurrence of carcinoma (see table).

In each case the patient was placed in the supine position on the operating table with the legs supported in Lloyd-Davis stirrups and the thighs extended. The abdomen was opened and the viscera inspected while the endoscopist introduced the colonoscope per rectum. The endoscope was not sterilized and the endoscopist took no aseptic precautions. The surgeon guided the instrument easily into the sigmoid colon and centered the tip of the endoscope in the lumen throughout the procedure. This allowed the endoscopist to be certain that he was inspecting all the mucosa. After passing the splenic flexure the transverse colon was eased over the endoscope and examination proceeded to the ileocaecal valve. The transillumination from within the unopened bowel allowed the surgeon to point out potential areas of disease to the endoscopist and also helped him to negotiate any residual faecal matter.

When the operation was undertaken for carcinoma in association with polyps the examination was confined to those parts of the bowel which were to be retained after the planned resection. Detailed examination of the mucosa was made while the endoscope was being withdrawn. As mucosal lesions were located endoscopically they were marked by the surgeon with a serosal suture in readiness for colotomy and polypectomy. Air used to distend the colon was aspirated through the colonoscope before its withdrawal.

Total colonoscopy by this procedure took between 10 and 25 minutes but did not always extend the duration of the operation by this length of time because the surgeon could proceed with preparation of the bowel for resection or colotomy as the examination continued distally.

Results

Details of the 12 patients studied, together with the relevant pathological data, are given in the table. Unsuspected polyps were found by colonoscopy in five patients (cases 2, 6, 8, 9, and 12), and in four of these (cases 2, 6, 8, and 9) the lesions were not palpable with certainty through the bowel wall before polypectomy. Endoscopy showed a second unsuspected polypoid carcinoma 10 cm proximal to a carcinoma of the sigmoid colon in one patient (case 3), but as the lesion fell within the planned extent of the resection the examination could not be claimed to have influenced the procedure.

In two patients with suspected mucosal lesions (one a polyp of the transverse colon and another a carcinoma of the caecum—both diagnosed by barium enema) the finding of normal

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Clinical Data of the 12 Patients Studied

Case No.	Age	Sex	Preoperative Diagnosis	Operative Findings	Endoscopic Findings	Influence of Endoscopy on Operation	Histology
1	59	M.	Polyp of transverse colon	Normal bowel	Normal bowel	Colotomy avoided	
2	63	M.	Polyp of transverse colon	Normal bowel on inspection and palpation	Polyp of transverse colon confirmed. Additional polyp of sigmoid colon found. Previously undiagnosed, total colitis found	Second colotomy performed on sigmoid colon together with biopsy of mucosa to confirm diagnosis of colitis	Polyp of transverse colon, 2-cm-adenoma. Polyp of sigmoid colon, 1.5-cm adenoma. Biopsy of mucosa, ulcerative colitis
3	54	M.	Carcinoma of sigmoid colon	Carcinoma of sigmoid confirmed	Polyp, 10-cm proximal to sigmoid carcinoma	None (polyp removed with resection)	Polyp, 2.5-cm adenocarcinoma. Sigmoid carcinoma, adenocarcinoma
4	40	F.	Carcinoma of descending colon	Carcinoma confirmed	Carcinoma confirmed	None	Adenocarcinoma
5	49	F.	Polyp of descending colon	Polyp confirmed by palpation	Polyp seen in descending colon	None	Polyp, 2-cm adenoma
6	55	M.	Carcinoma of caecum	Carcinoma of caecum	Two additional polyps, transverse colon and sigmoid colon	1. Resection extended to include polyp of transverse colon 2. Sigmoid colotomy	Polyp of transverse colon, 0.5-cm adenoma Polyp of sigmoid colon, 0.6-cm adenoma
7	65	M.	For colostomy closure after previous resection of carcinoma colon	Normal bowel	Normal bowel	None	
8	65	M.	1. Polypoid carcinoma of rectum 2. Carcinoma of transverse colon	1. Rectal carcinoma removed by posterior approach before laparotomy 2. Carcinoma of transverse colon confirmed	Polyp of sigmoid colon found Carcinoma confirmed	Additional sigmoid colotomy	Polyp of sigmoid, 1-cm adenoma Carcinoma transverse colon, adenocarcinoma
9	65	F.	Carcinoma of rectosigmoid	Carcinoma confirmed	Three further polyps proximal to carcinoma found in sigmoid	Resection extended to include polyps	Polyps of sigmoid—1-cm, 0.8-cm, 0.5-cm adenomas Sigmoid, adenocarcinoma
10	61	F.	Carcinoma of caecum	Normal bowel	Normal bowel	No operative measures taken	
11	63	F.	Stomal polyp of colostomy	Normal residual bowel	Normal residual bowel	None	
12	34	F.	Polyp of sigmoid colon	Sigmoid polyp palpable through bowel wall	Further polyp found in descending colon	Additional colotomy and polypectomy of descending colon	Sigmoid polyp, 2.5-cm adenoma Descending colon polyp, 1.5-cm adenoma

mucosa throughout the colon by endoscopy allowed the surgeon to terminate the operation without opening the bowel (cases 1 and 10). Thus after a careful laparotomy the addition of endoscopy contributed to modification of the proposed operation in seven of the 12 cases, and in five of these it was directly responsible for a more extensive procedure.

Discussion

The method of operative colonoscopy presented here is simple, convenient, and safe. Total inspection was achieved easily and quickly in all the cases. By contrast the previously described techniques of colotomy and colonoscopy (Bacon *et al.*, 1963), extended colotomy (Gants *et al.*, 1956), and open colotomy with intraluminal transillumination (Potet and Soullard, 1971) all involved opening the bowel at operation, and in spite of meticulous preparation and scrupulous technique serious septic complications were not uncommon (Kleinfeld and Gump, 1960). Preoperative total colonoscopy might be considered as an alternative, but if surgery is indicated for an established lesion the patient can be spared another procedure (not without inconvenience and discomfort) by combining the examination with the operation; only one bowel preparation is required and there is greater certainty of total coverage of the colon. In addition the gentle guidance of the instrument by the surgeon should eliminate the small but definite risk of perforation (Deyhle and Demling, 1971).

While the likelihood of finding additional polypi is high their significance in terms of prognosis may be questioned; thus rather than advocate the use of operative colonoscopy in all cases it might be better to reserve it for patients in whom at least two mucosal lesions have already been found

by the standard investigations of barium enema and sigmoidoscopy before surgery.

In the cases we selected for examination the actual operative procedure was modified in seven cases, and though the numbers are too few for us to define clear indications, the technique should certainly be considered when colonic polypi and polypoid carcinoma coexist.

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