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CARCINOMA OF THE RIGHT COLON

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This study concerns all patients operated upon at the Henry Ford Hospital for carcinoma of the cecum or ascending colon during the period 1936 to 1955. The purpose of the study is to review the clinical, therapeutic and pathologic aspects of the disease. Furthermore, we wished to determine the efficacy of treatment in vogue during this period. Only those cases are included in which a histopathologic diagnosis was on a surgical specimen presented to the pathologist. No patients with lesions distal to the hepatic flexure are included. We found that 117 patients were treated for carcinoma of the right colon during the period 1936 to 1955.

AGE AND SEX DISTRIBUTION

The age of distribution was from 29 to 84 years. Nine patients, or 7.7%, were less than 40 years of age, while 75 patients, or 64%, represented sixth and seventh decades (Table I and Fig. 1). Generally the disease is found in older patients; 82% were over 50 years of age. Seventy of our patients were men and 47 were women, giving a ratio of 1.5 to 1.

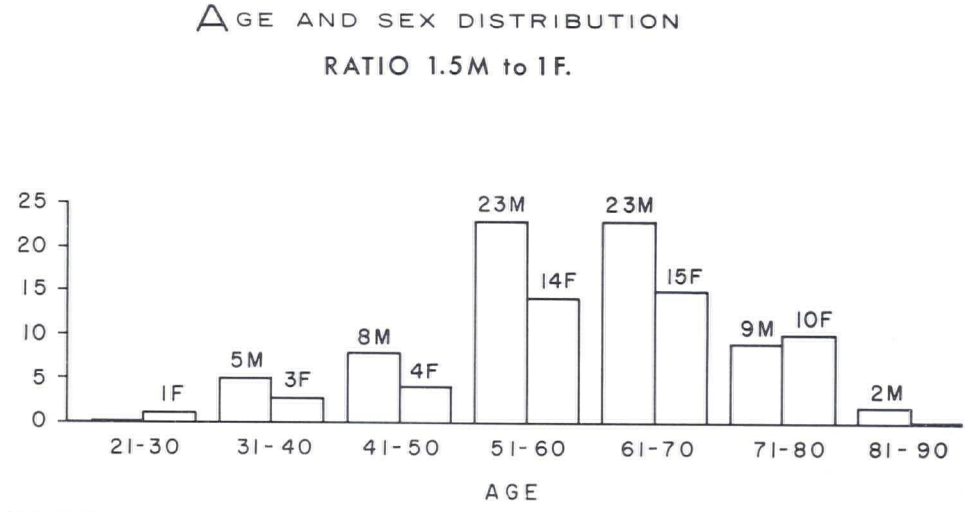

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Table I
AGE AND SEX DISTRIBUTION

	MALE	FEMALE	TOTALS
21 - 30	0	1	1
31 - 40	5	3	8
41 - 50	8	4	12
51 - 60	23	14	37
61 - 70	23	15	38
71 - 80	9	10	19
81 - 90	2	0	2
Totals —	70	47	117

Ration 1.5 M. to 1 F.

Symptoms and Signs

Clinical evidence of anemia, as evidenced by weakness and pallor, is usually recognized as an important manifestation of lesions of the right colon, yet 81 of our patients presented with the chief complaint of pain. The pain was variously localized as follows; right lower quadrant 39, epigastric or peri-umbilical 37; poorly localized or generalized 5. Some change in bowel habits was reported by 43 patients. Weakness was a complaint of 25 patients. Vomiting had occurred in 16 patients. Nutrition was interfered with and weight loss was manifested in 14 patients. The growth had progressed to a size which was palpable to the patient. Three patients stated that they were anemic. Table II summarizes the most common complaints.

Table II
COMPLAINTS

Pain	83
Change in bowel habits	43
Weakness	25
Vomiting	16
Weight Loss	14
Mass (palpable to patient)	8
"Anemia"	3

Duration of Sypmtoms

Delay in the diagnosis of carcinoma of the colon is unfortunately too frequent. More than one-half of our patients had symptoms for three to 12 months prior to admission (Table III). Eleven (9.4%) were treated for varying periods of time for "anemia." Other patients were treated for "irritable colon," "spastic colitis," and even appendicitis. Six patients (5.1%) had appendectomies during the 12 month period preceding admission for right lower quadrant pain. In only one individual in this group was the right colon malignancy recognized. Patients in this age group are also prone to develop cholecystitis, diverticulitis and duodenal ulcer. These diagnoses were encountered in a number of our patients. Concurrent malignancy could easily be overlooked in such situations.

Table III
DURATION OF SYMPTOMS

1 month	16
2 months	15
3 to 6 months	38
7 to 12 months	30
13 to 18 months	4
19 to 24 months	11
Not stated	2
"6 years"	1

Physical Signs

It is reasonable to assume that in order for a neoplasm to reach a size sufficiently large to be palpated through the thickness of the abdominal wall, it must have been present for many months. In 57 patients, (48.7%) the tumor mass was described by at least one examiner. Obstruction of the colon, either complete or partial, was present in only 12 patients. This is consistent with the anatomical fact that the right colon has a large diameter; it is consistent with the physiology of the intestine in this area, for the contents are liquid, and finally, it is consistent with the pathologic nature of the neoplasm, which is fungating, ulcerating rather than stenotic.

Weight loss, although not a common complaint, was demonstrable when the patient's weight was taken at the time of hospitalization. Whereas only 14 patients complained of weight loss, 51.2% of the patients were found to have lost up to 20 lbs. Nine patients had actually lost more than 30 lbs.

Laboratory Findings

Clinical evidence of anemia generally resulted in a study of the blood picture. On admission a hemoglobin of less than 12 gm.% was found in 76 patients (64.9%). In five patients the hemoglobin was less than 6 gm.%. Stool examinations for blood provided valuable information in 38 patients in whom guaiac positive stools were reported. Fifty-two patients had guaiac negative stools. It is our impression that the use of the test for occult blood, or even gross blood in the stool is not as universal as it might be.

Barium Enema Examinations

Barium enema studies performed in patients carefully prepared yield the most accurate information regarding the lesion present. In 83% of the patients studied, the lesion was correctly diagnosed on the first examination. In 17 patients (16.5%) the lesion was missed on the first examination. In only four patients was the lesion missed after two barium enema examinations. These, of course, were identified on subsequent examinations.

Operative Treatment and Results

The majority of the patients had a right colectomy with an end-to-end ileo-transverse colostomy in one stage. The terminal ileum, cecum, ascending colon and a portion of the right transverse colon are removed en bloc. In 68 patients this proce-

dure was performed with a cure in mind; in 12 patients the procedures were considered palliative. In 15 patients the procedure employed was a Mikulicz resection. In ten of these, the procedure was accomplished with the intent of cure. Ten patients had ileo-transverse colostomies as palliative by-pass procedures. Two patients had multifocal carcinomas of the colon and were treated with total colectomies.

In one patient a right colectomy and transverse colectomy was performed for separate lesions in these areas. Finally, another patient had a right colon lesion, as well as a rectal lesion, requiring a right colectomy, abdomino-perineal resection and a pan-hysterectomy for the multicentric malignancies. Table IV summarizes the operative treatment utilized in 117 patients.

Table IV
SURGICAL PROCEDURES

Procedures	Curative Patients	Palliative Patients	5 yr. Cure Patients
Right Colectomy	68	12	41
Mikulicz resection	15	4	10
Ileo-transverse colostomy (by-pass)		10	0
Total colectomy	2	1	1
Right colectomy, plus additional resections	2	0	1
Biopsy only		3	0
	87	30	53

Best results were obtained when a curative right colectomy was performed, with the intent of cure. Forty-one patients (51%) in whom a right colectomy was performed, survived five years or longer. Of the patients having a Mikulicz resection for cure, 10 (67%) survived five or more years. Multicentric malignancies of the colon offer a less favorable prognosis. Only two of five patients requiring operative procedures upon other, or adjacent organs, survived as long as five years. In a total of 117 patients it was possible to perform surgery with the hope of cure in 87, or 74.3% of the total. Fifty-three of these patients, or 60.9%, survived five years or more. This is an excellent and aggressive approach to the disease, as far as operability statistics are concerned. Furthermore, a very acceptable resectability rate of 89% was achieved. This means that resection was accomplished in 104 of 117 patients. We feel that removal of the lesion improves the patient's sense of well-being, avoids loss of blood and protein through an ulcerating lesion, and is desirable even in patients with hepatic metastases.

Nine patients expired in the immediate postoperative period while in the hospital, resulting in an operative mortality of 7.7%. Of the 80 patients undergoing right colectomy, five expired in the hospital, (6.3%). Only one of the patients having had a Mikulicz resection expired following a palliative procedure. Two patients having by-pass procedures and one having a biopsy also expired while in the hospital.

Table V

RESULTS OF TREATMENT RELATED TO STAGE OF DISEASE

	No. of Patients	DATE OF DEATH Post-operative in years 0-1	1-5	5-10	10+	5 yr. survival
—Stage I and II	52	9(1*)	9	10	24	65%
Stage III	7	2	0	4(3*)	1	71%
Stage IV	53	34	6	6	7	25%
TOTAL	112					

Description not available in 5 specimens

*Represents death with evidence of disease.

Pathology

Detailed descriptions of the gross specimen were not present in many cases. Nevertheless the most commonly described growth was annular. Ulcerated lesions were seen in a number of instances. Only two lesions were described as pedunculated. Gelatinous carcinoma was present in four patients. No worthwhile statistical study could be made from the pathologist's report. Table V is more informative in that it relates the survival of the patient to the stage of the disease. General descriptions of the condition of the tumor, metastases, and presence or absence of enlarged lymph nodes were well documented. Patients with multiple foci of metastases were generally dead of their disease within one year. Metastases to the liver also resulted in short periods of survival. These patients died within the three year period.

Discussion

From this study there is obviously great need for improvement in the diagnosis of carcinoma of the right colon, for it is apparent now that only early operation will improve results. Careful study of Table VI is most provocative. From a number of centers, it is clear that surgery has been applied with increasing vigor in the hope of improving survival rates. Resectability rates are acceptable and vary from 67% to 89%. Surgeons are generally aggressive in their attempt to eradicate this malignancy. Hospital mortality has steadily decreased in all of the centers to which reference is made. Improved pre-operative, operative and post-operative care are rightfully given credit for this favorable trend. Today the operative mortality is probably less than five percent. If patients could be presented for surgical care earlier, even further improvement in mortality rates is possible. The startling fact in Table VI is that the five year survivals have varied less than 10% in the past 50 years. In many instances there has been a disappointing improvement of only three to five percent in five year cures. It is obvious from these statistics that earlier diagnosis will lead to prompt surgical extirpation and eventually result in improvement in the mortality statistics.

There are many reasons for delay in diagnosis. Early symptoms of carcinoma of the right colon are well known to be vague and poorly localized. Schutt[1] summarized the problem of early diagnosis very well. He pointed out that the early, ill-defined abdominal distress of carcinoma of the right colon often simulates other diseases, which, in some instances, may be present as well. Functional bowel disorders are too

Table VI

CARCINOMA OF THE RIGHT COLON
Collected Resectability, Survival and Mortality Statistics

Hospital or Clinic Group and Author	Period of Study	No. of Patients	Percent Resectability	Overall 5 yr. Survival	Hospital Mortality Rate	5 year Survival-operation for cure
Mayo Clinic: Mayo, C. W., and Lovelace, W. R.[9]	1907-1938	885	67%	19.8%	23.5%	57%
Presbyterian (N.Y.) Grinnell, R. S.[6]	1916-1945	Cecum 51	75.5%	49%	17.6%	59.5%
		Ascending colon 70	82.1%	47%	14.3%	55.5%
Mayo Clinic: Griffin, G. D. J., Judd, E. S.,[8] and Gage, R. P.	1939-1948	646	77.1%	40.7%	6.5%	60.4%
Mass. Gen. Hosp.: Welch, C. E. and[10] Giddings, W. P.	1937-1944	26				50%
Lahey Clinic:[7] Colcock, B. D.	1930-1950	242	85.5%		10.4%	50.5%
Henry Ford Hosp.: Ponka, J. L. and Welborn, J. K.	1936-1955	117	89.0%	45.3%	7.7%	60.9%

frequently diagnosed and treated for long periods of time in these patients. In a respectable number of such patients an obscure hypochromic anemia may be present. As in our series, some of these unfortunate individuals may even respond favorably to anti-anemic therapy for a time. Under such circumstances, delay in the proper diagnosis is a tragic consequence. Ransom[2] observed that 11% of patients in his report had appendectomies prior to admission. Six of our patients had appendectomies within 12 months of their hospitalization for carcinoma of the right colon.

Chamberlin[3], more specifically, called attention to the difficulties in the diagnosis of carcinoma of the cecum. Right lower quadrant pain, anemia, weakness and fatigue, palpable mass and changes in bowel habits were important symptoms. These were among the most important symptoms in our patients. He summarized the earliest x-ray signs of cecal carcinoma as follows: 1) Blunting of the lower pole; 2) Failure of barium to enter the terminal ileum; 3) Slow filling of the cecum with spasm in this area; 4) Ragged filling of the cecum with changes in the mucosal pattern following evacuation. Co-operation between the clinician and the radiologist could improve the diagnosis in a few instances.

Even though the patient is found to have one carcinoma of the colon, other colonic malignancies should not be overlooked. All of these patients should have stool examination for blood, proctosigmoidoscopic and barium enema examinations. Before labeling

a patient with the too frequent "irritable colon syndrome" these studies must be carefully performed and, in many patients, repeated until the conviction is firm that no hidden malignancy is overlooked.

There has been a consistent trend away from staged operations in right colonic carcinoma. At the present time a one-stage resection of the right colon with ileo-transverse colostomy is our procedure of choice. Judd and Merrill[4] performed one-stage resections in 268 (90.2%) of their patients. Eighty out of our 117 patients had such an operation. We follow the basic principles outlined by McKittrick,[5] insofar as technical details and preparation of the patient are concerned. He encouraged optimum exposure of the colon to be excised. Mobilization of the lesion should be thorough, permitting ligation of the ileocolic, right colic and right branch of the middle colic arteries, as close to the points of origin as possible. Painstaking excision of the entire lymph-node bearing area must be achieved. Grinnell[6] in a careful study of lymph node metastases of carcinoma of the colon pointed out the highest node in the specimen was the site of metastatic carcinoma in 11% of specimens studied. He stated that when normal lymphatic channels are occluded, retrograde metastases may occur.

Hospital mortality statistics have steadily improved in all centers. Colcock[7] reported a death rate of 10.4% in 242 patients treated at the Lahey Clinic from 1930 to 1950. Griffin et al[8] reported their mortality rate as 6.5% in 646 patients treated from 1939-1948. While the resectability rates have increased, the death rates have declined, indicating effective progress in the surgical treatment of carcinoma of the right colon.

Summary and Conclusions

1. The records of 117 patients with carcinoma of the right colon treated during the year 1936-1955 are reviewed.

2. Early complaints include abdominal distress and "gaseousness," later progressing to abdominal pain. Change in bowel habits, weakness, anemia, vomiting and palpable abdominal mass are other important complaints.

3. The examining physician frequently discovers a palpable mass, anemia and weight loss.

4. Barium enema x-ray, carefully performed, offers the best hope of early diagnosis. Patients with bowel dysfunction and anemia should be studied in an orderly fashion. Stool examination for blood, proctoscopic examination and barium enema studies are essential to the proper evaluation of these patients.

5. Right colectomy and ileo-transverse colostomy is the preferred surgical treatment for cure of this disease, when feasible. We occasionally utilize the Mikulicz resection when there is some degree of obstruction present, or when it is felt that a one-stage procedure may be hazardous. For palliation, an ileo-transverse colostomy by-pass procedure is favored.

6. Our hospital mortality rate in 117 patients was 7.7%.

7. A brief review of the literature indicates that the resectability rate for carcinoma of the colon varies from 67 to 89%. There has been a steady improvement in resectability statistics in the past 50 years.

8. The five year survival statistics vary from 50 to 60.9% These have improved surprisingly little when considered together with decreasing hospital mortality rates and increasing resectability rates.

9. Further improvement in the treatment of carcinoma of the right colon will depend upon earlier diagnosis. The malignancy, unfortunately, manifests itself only after it has attained considerable size. Early symptoms are too frequently confused with functional bowel disorders.

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