POST-MORTEM OBSERVATIONS OF 118 CARCINOMAS OF THE LARGE BOWEL

WARREN G. HARDING, 2D, M.D., AND FRANKLYN D. HANKINS, M.D.
Department of Pathology, Newton Evans, M.D., Director, Los Angeles County General Hospital, Unit No. 1, Los Angeles, California

One of the common clinical problems in diagnosis faced by the general practitioner, as well as by the surgeon, is the symptom complex pointing to some derangement in the function of the large bowel. Of the many possible etiological factors, a new growth is not the least important. Not only does it offer a diagnostic challenge, but once the diagnosis is made, the future course of the disease depends largely upon the institution of immediate and proper therapy. The problem of life and symptom expectancy is equally difficult for the physician to solve. In an effort to obtain facts upon which to base an opinion in answer to these questions, we have studied a series of 333 cases of malignant tumors of the gastro-intestinal tract, among which were 118 cases of carcinomata of the large bowel. All these cases had come to a fatal termination, and the nature of the process was studied at autopsy and verified by microscopic section.

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<tr>
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<tr>
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<td>48</td>
<td>115</td>
</tr>
<tr>
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INCIDENCE

In approximately the last thirteen years the department of pathology of the Los Angeles County General Hospital has performed nine thousand autopsies. Included in this series is a group of 1,097 malignant tumor cases, constituting 12 per cent of the total. The new growths of the gastro-intestinal tract, including the tongue, esophagus, stomach, small intestine, large intestine, and anus, constitute 30.13 per cent of this group. They are distributed as shown in Table I. Carcinoma of the large bowel, in-
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Including the anus, represents approximately 35 per cent of all the new growths of the gastro-intestinal tract.

This distribution of gastro-intestinal tumors practically coincides with that reported by Raiford (1) in a study of the malignant tumors recorded in the General Pathology Department of the Johns Hopkins Hospital. In the 299 cases of his series of malignant tumors occurring in the gastro-intestinal tract from the stomach downward, 91 were located in the colon and rectum. In our series, squamous-cell carcinoma of the anus constitutes approximately 5.3 per cent of the tumors in the lower portion of the large bowel, an incidence quite similar to that recorded by Pack (2), who states that it occurs in 3 to 4 per cent of the cases.

The social distribution of the 118 cases of large bowel tumors reveals an interesting predominance of the Caucasian group, excluding Mexicans. While approximately 12 per cent of our tumor cases are in Mexicans (3), in this particular group of neoplasms there are protocols of only five Mexican patients, representing an incidence of 4 per cent. The growths occurred in 68 males and 50 females. These figures are in accord with the general sex incidence in our series of 1,097 tumors, 58 per cent in males, 42 per cent in females. Lynch (4) in an analysis of 491 tumors of the large bowel found 281 in males and 210 in females. Karsner and Clark (5) reported 61 cases occurring in the male in their series of 104 cases of cancer of the colon, including the rectum.
The age periods of highest incidence were the sixth and seventh decades, with 28 per cent and 31 per cent respectively. The ages ranged, however, from a boy of fourteen with a gelatinous carcinoma of the rectum to a man of 83 years with an adenocarcinoma in the same location. The age distribution is graphically shown in Fig. 1.

Pathology

In this study we have adopted Ewing’s classification (6) for both gross and microscopic features. In a much abridged form it is as follows:

A. Adenoma destruens: A broad, medullary, superficial ulcerating tumor producing obstruction and having a microscopic anatomy characteristic of a rapidly proliferating adenocarcinoma.

B. Stenosing fibrocarcinoma: A circumscribed fibrotic tumor with a tendency to become annular and presenting a microscopic picture of invading atypical cells with an excessive amount of newly formed connective tissue.

C. Gelatinous adenocarcinoma: A bulky, gelatinous tumor with or without obstruction, but having a tendency to peritoneal extension.

D. Polypoid carcinoma: A pedunculated growth developing from a pre-existing polyp and having a histological structure resembling an adenocarcinoma in which the acini contain mucus.

E. Squamous-cell carcinoma: A tumor arising from the anus or lower rectal mucosa, having a tendency to ulcerate and having the microscopic picture of an acanthoma.

F. Melanoma of the rectum: A pedunculated, ulcerated rectal growth producing obstruction, having the histological features of melanomata elsewhere in the body.

The predominant growth in this series was adenoma destruens. Sixty-one, or 51 per cent of the tumors were of this type, both grossly and microscopically. They were distributed as follows: Cæcum, 7, ascending colon 3, descending colon 4, sigmoid 15, rectum 23. More than one-half of the entire group were located in the rectosigmoid region, where, theoretically at least, they are available for direct observation by means of the proctoscope and sigmoidoscope. The problem of metastasis is always of utmost importance in the clinical consideration of neoplasia. Twenty-seven of the patients of this group had no metastasis at the time of their demise. There was no apparent difference in the frequency of metastasis to the lymph nodes or to the viscera depend-
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ing upon the location of the tumor in the right or left half of the abdomen. Among the 34 cases showing metastasis there were 25 in which the viscera were involved, the liver being the predominating organ. The growth had infiltrated the muscle layers of the colon and perforated in 21 cases. Obstruction was present in 47 cases, as manifested by hypertrophy and dilatation of the bowel above the growth; in other cases the growth encroached upon the lumen to a minor degree but not sufficiently to cause marked stasis in the proximal portion of the bowel.

Stenosing fibrocarcinoma contributed twenty-six cases to this series, or 22 per cent. These lesions were distributed anatomically throughout the length of the large intestine, practically in the same proportion as the cases of adenoma destruens. There were two in the cecum, one in the ascending colon, two in the hepatic flexure, three in the splenic flexure, two in the descending colon, ten in the sigmoid, and six in the rectum. Eleven, or 42 per cent of the group, showed no evidence of metastasis. There was no appreciable difference in this regard in respect to the anatomical location of the primary growth in the right or left side of the abdomen.

Hauser (7), as quoted by Ewing, found a higher percentage of visceral metastasis among tumors of this group than in the adenoma destruens group. In our cases, however, the incidence of visceral metastasis was greater in the latter group, 41 per cent. Thirty-four per cent of the stenosing fibrocarcinomata showed metastases to the viscera, with involvement of the liver in all cases. In each of the cases of fibrocarcinoma there was some degree of obstruction present. In only four of the entire series was there a perforation. This is attributable, no doubt, to the extensive fibrosis of the adjacent bowel wall, probably secondary to the chronic inflammatory reaction due in a large measure to the long standing superficial ulceration present in this type of growth.

The gelatinous type of carcinoma was found in approximately 10 per cent of our cases, the anatomical distribution being comparatively the same as in the preceding groups. Seven tumors were found in the rectosigmoid region and two in the cecum, while the transverse colon, splenic flexure, and descending colon were each represented by one case. This growth appears somewhat more unfavorable than the others in its metastatic characteristics. Six, or 50 per cent, of the patients had secondary tumor masses in the viscera, and, in addition, two had penetrated the wall of the colon and had spread throughout the peritoneum. In ten of the twelve cases there was evidence of obstruction. There was a marked tendency to perforation in this group. Six cases had perforated and caused acute generalized peritonitis.
Of the 19 cases not accounted for in the three classes described above, 3 were squamous-cell carcinomata of the anus, one bulky polypoid papillary carcinoma, one multiple polypoid carcinoma, one mixed-cell sarcoma, and 13 growths which appeared to be transitional forms from adenoma destruens to stenosing fibrocarcinomata. We have felt free to recognize a transitional group in view of Ewing’s (6) statement that “transition stages from adenoma destruens are often found and suggest that early ulceration in a relatively resistant tissue leads to early fibrosis and cicatrizatio...” These 13 transitional cases were omitted in the group study, although in the final analysis they would have made no significant difference in the percentage of pathological findings of either group.

We have also studied this series of 118 cases from the point of view of anatomical location of the growths. This is graphically represented in Fig. 2.

The predilection of the growths for the two extremities of the bowel raises the interesting problem of stasis in relation to the etiology of these tumors. In the cecum stasis is associated with the physiological dehydration of fecal material; in the rectosigmoid region it results from storage of the feces.

The question of metastasis is always of vital importance to the patient and of concern to the physician. Forty per cent of these cases had no apparent metastasis on post-mortem examination. An additional 4 per cent presented metastases which mechanically could have been extirpated by surgical procedures. In other words, the carcinoma appeared to be resectable in 44 per cent of the 118 cases. In those cases in which secondary deposits of tumor.
tissue were found, the liver was involved in 39 per cent, the lungs and peritoneum each in 12 per cent. In the remaining cases of the series, instances of metastases were found in every organ of the body, including the heart and brain.

A study of the frequency of metastatic lesions in relation to the region involved reveals one interesting fact. The number of cases showing no metastatic deposits closely approximates the general distribution curve; however, in the rectum and sigmoid region there was a marked difference in the tendency to generalized extension. When metastasis occurred in the rectal cases it had a tendency to involve the viscera, as shown by 14 cases. In a comparable number of sigmoid cases this type of extension was seen in only 5 instances. The difference is perhaps not statistically significant, but it is encouraging in view of the greater accessibility of the sigmoid for surgical intervention due to its mobility. We found no difference in the tendency to metastasis depending upon the location of the growth in the right or left half of the bowel.

The frequency of obstruction is of importance in view of its distressing symptomatic and disastrous termination. Fifteen of these tumors produced complete obstruction while an additional 75 occluded the lumen to some degree. Seventy-five per cent of the tumors had ulcerated, and 33 per cent of these had perforated, giving rise to a terminal peritonitis. The distribution of the perforations followed the anatomical frequency distribution of the lesions in every detail.

**Operative Procedures**

An analysis of the pathological findings in the 56 cases of this group in which some form of surgical treatment had been instituted reveals several interesting facts. In fairness to the clinicians it must be remembered that these observations are based upon the findings in those patients who died and do not include any who left the hospital alive. Consequently these figures cannot be considered to reveal the operative risks and hazards met with in this disease but serve only to show certain dangers which must be kept in mind in making a decision as to how much or how little to attempt.

The operations performed may be roughly classified as curative and palliative. The term curative is used to designate treatment by which complete extirpation of the tumor was attempted. This effort was made in 21 instances. The palliative operations consisted in drainage of the intestinal tract through an artificial abdominal opening. This procedure was done in 35 cases. In the 21 cases in which resection was attempted the tumor was found
at autopsy to have extended beyond the possibility of mechanical removal in 9 cases. This was largely due to extension to the aortic group of lymph nodes and metastatic deposits in the viscera, notably the liver. In the 12 cases in which the tumor had been completely eradicated surgically death was due to immediate complications, of which shock and peritonitis were the most prominent. Twenty of the 35 cases in which palliative operations were performed were found at autopsy to be confined within the realm of possible resection. These 20 cases either showed no secondary growths or the secondary deposits were limited to the nodes lying in the immediately adjacent mesentery. It must again be emphasized that this study does not take into consideration the actual clinical condition of the patient when first applying for treatment. Doubtless some were neglected before entering the hospital and were in such a precarious condition that attempts at radical resection would have precipitated an immediate exitus.

**Cause of Death**

The modus operandi of death in carcinoma of the large bowel is always of concern to those interested in the patient. In 51 of the 118 cases death was of the “exhaustion type,” apparently the result of the deleterious toxic effects of the primary tumor and its metastases. Nineteen patients died of an intestinal obstruction, and an additional 13 of septic peritonitis following a perforation due to obstruction. In an additional 19 cases death was due to peritonitis which was attributed to mechanical defects in the operative procedures, permitting leakage of bowel contents within the abdomen. The remaining 16 deaths were the immediate result of non-cancerous conditions, the tumor in most of these cases being an incidental autopsy finding. These included lobar pneumonia, pulmonary embolism, coronary thrombosis, cerebral hemorrhage, and other common causes of death in individuals dying in the sixth and seventh decades.

**Summary**

1. This study is based upon the protocols of 333 cases of malignant neoplasia of the gastro-intestinal tract, of which 118 were located in the large bowel.

2. The incidence of this tumor in Mexican patients was unusually low.

3. The ratio of male to female was 1.3:1.

4. The cases occurred predominantly in the sixth and seventh decades with an age range from fourteen to eighty-three years.

5. The anatomical distribution showed the two extremities of the large bowel to contain most of the growths.
6. Forty-four per cent of the cases apparently were mechanically resectable at the termination of the disease.

7. The liver was involved in 39 per cent of the cases showing metastases.

8. Approximately 75 per cent of the cases showed ulceration of the tumor and a degree of obstruction.

9. The types of cases in which surgery was done are briefly summarized.

10. The so-called "exhaustion type" of cancer death predominated in this series.

BIBLIOGRAPHY


7. HAUSER: Quoted by Ewing.