CARCINOMA OF THE COLON AND RECTUM

Diagnosis and Treatment

By H. E. LOCKHART-MUMMERY, M.D., M.Chir., F.R.C.S.

St. Mark's Hospital, London

According to the Registrar General's Statistical Review of 1956, carcinoma of the large bowel (that is, carcinoma of the rectum and carcinoma of the colon together) is one of the commonest forms of malignant disease in the United Kingdom. It appears to be rather less common in other parts of the world and is said to be relatively rare in India and the Far East; but in this country large bowel cancer accounts for about 16 per cent. of all deaths from malignant disease, over 15,000 deaths per annum. There are, however, significant differences in the incidence of carcinoma in different parts of the large intestine; thus, about half of all the growths arise in the rectum and recto-sigmoid region, about one-quarter occur in the sigmoid colon, and the remaining quarter are fairly evenly distributed throughout the remainder of the large bowel. Also, carcinoma of the rectum is commoner in men (at St. Mark's Hospital, the incidence has been two men to one woman; most reported figures, however, give three men to two women) while carcinoma of the colon is slightly commoner in women. Most cases of large bowel cancer occur between the ages of 50 and 70, but no age is exempt and occasional cases are reported in children. One important difference between the most common human cancers, however, is this: that whereas the prognosis after surgical treatment of carcinoma of the stomach or lung is relatively poor, following surgical treatment of carcinoma of the large bowel it is relatively good. In a recent report (Dukes, 1957) from St. Mark's Hospital, the five-year survival rate following treatment of rectal cancer was 48.3 per cent. and if correction is made for deaths due to intercurrent disease, 57.4 per cent. These figures take account of all resected cases, and in the cases in which no lymphatic metastases had occurred the five-year survival rates are much better than this, between 70 per cent. and 95 per cent. Such figures present a challenge to surgeons in that they show that this is not a particularly malignant form of cancer, and encourage the belief that early diagnosis and good

surgery can produce even better results and lead to the saving of many lives which would otherwise be lost.

An account of the classical symptoms of large bowel cancer can be found in any textbook and it is not necessary to repeat them here, but it may be useful to re-emphasize certain clinical features in order to call attention to their frequency. The commonest symptom of carcinoma occurring in the right colon is abdominal pain, which occurs in about 80 per cent. of patients. Sometimes the patient complains of colic, perhaps related to meals, or sometimes the pain may be of an aching nature; it may be felt in the mid abdomen or in the right iliac fossa. Less common symptoms are irregularity of bowel action, mentioned by about half the patients, vomiting and loss of weight. About one-fifth of the patients present only with symptoms due to secondary anaemia, that is, fatigue, shortness of breath, pallor, etc., with no abdominal pain and no bowel symptoms. In about two-thirds of all patients, a lump is palpable on the first clinical examination, and in some cases the patients may notice the lump themselves.

Pain is also the most frequent symptom in carcinomas of the left and sigmoid colon, being a complaint from about two-thirds of the patients. It is usually felt in the lower abdomen as a recurrent colic, often comes before or after defaecation, or may be related to meals. In about the same proportion of patients there is some alteration of bowel habit, and either constipation or diarrhoea, or both, may occur. Sometimes the diarrhoea may be continuous, though an irregular habit is more usual. Bleeding per rectum is a complaint in about one-third of the patients, and in about the same fraction a mass is palpable on examination, either in the abdomen or per rectum. A certain number of patients with large bowel cancer present for the first time with acute obstruction, this complication being much commoner in carcinomas of the left colon. Patients with carcinoma of the rectum present usually

with bleeding or alteration of bowel habit; tenesmus and morning spurious diarrhoea occur in more advanced growths, while pain is unusual until a very late stage. One may therefore summarize the symptoms of large bowel cancer by saying that the nearer the growth is to the rectum the more obvious is the fact that the patient is suffering from a bowel disorder.

The establishment of a diagnosis of large bowel cancer depends primarily on proper history-taking and careful clinical examination which must include rectal examination. Bimanual examination with one finger in the rectum and the other hand on the abdomen is often very helpful. Sigmoidoscopy is the next step and is best done, for the first time anyway, without any bowel preparation, as even if the lesion is not reached there may be traces of blood on the wall of the bowel to indicate a growth at a higher level. It is worth emphasizing that more than half of all large bowel cancers are within reach of the sigmoidoscope, occurring as they so frequently do in the rectum and sigmoid colon. If sigmoidoscopy is negative then a barium enema examination is necessary, and will usually demonstrate a filling defect which suggests the diagnosis. The radiology of the large bowel is not easy and views from different angles may be necessary to demonstrate all parts clearly. Examination of the stools for occult blood is sometimes a helpful additional investigation. It must be remembered that X-rays and laboratory tests are not infallible and too much reliance should not be placed on negative investigations. If clinical suspicion remains of the presence of a growth, then investigations such as sigmoidoscopy, barium enema and occult blood tests should all be repeated, and where there is strong clinical suspicion, laparotomy should be undertaken even if the repeat X-ray is negative or inconclusive.

Diagnosis of rectal tumours is usually simple as the symptoms often strongly suggest a bowel disorder, and the growth is easy to discover if adequate examination is carried out. In carcinoma of the colon, however, the matter is seldom so easy, the main causes of error being a lack of suspicion that the large bowel is the source of symptoms and the acceptance of negative or misleading investigations. Errors are particularly frequent in growths of the right colon, and Muir (1956) estimated that in one-quarter of the cases investigated by him errors had led to delay in diagnosis. The main errors causing such delay were due to the acceptance of diagnoses such as indigestion, appendix trouble or cholecystitis to account for the patient's pain; sometimes a barium meal may show a duodenal scar or ulcer and thus mislead the surgeon from the true source

of symptoms. In particular, one should be careful about accepting the diagnosis of anaemia in middle-aged and elderly patients without full investigation into causes for it, as a growth of the colon is one possible cause.

Errors are likely to be fewer in carcinoma of the left colon. The most dangerous diagnoses are vague ones such as 'piles' or 'colitis' to explain bleeding or altered bowel habit without proper examination. Alteration of bowel habit, though not uncommon for many reasons, always requires investigation in patients of middle age. Another source of error lies in the difficulty often found in the radiology of the sigmoid colon; owing to the convolutions of this part of the bowel, parts of the loop may remain hidden and small lesions be missed; nor is it always easy to distinguish for certain between the appearance caused by diverticulitis and that due to carcinoma, and the conditions may co-exist. If there is any doubt, laparotomy is the safer and wiser course.

Treatment

The aim of treatment in large bowel cancer should be the removal of the tumour and the related lymphatic field with, if possible, restoration of normal bowel continuity. In growths arising in the colon this is nearly always possible, and whereas in former years limited resections with extra-peritoneal anastomoses (Paul's operation) were commonly performed, nowadays primary resection and anastomosis is usually preferred. The main reason that has led to the abandoning of the Paul's operation is the fact that a more radical operation is possible if intra-abdominal anastomosis is done, for if both ends of bowel have to be brought up to the surface the extent of the resection may have to be reduced. Other reasons are that with modern techniques and preparation, anastomosis can be made just as safe, and naturally a one-stage procedure is less unpleasant for the patient. In the treatment of rectal cancer there has been less change in methods of treatment, but the increasing use of restorative (anterior) resection for suitable growths must be considered.

Growths of the Colon

The surgeon who operates on growths of the colon should remember that in practically no other form of cancer surgery does a determined and aggressive attitude to fixed tumours give better results. Many colon growths are infected and sepsis plays a large part in adding to the size and fixity of many tumours. Removal of large adherent tumours is nearly always worth while, and often detailed examination of the growth in the pathological department will show that spread

has been less than might have been anticipated. The principles on which the surgery of the colon should be based have been well set out by McKittrick (1948) and his paper should be read in the original by those interested. It is first necessary to ensure that the patient is as fit as possible to withstand the operation by correction of anaemia and of any protein and vitamin deficits. The bowel should be prepared by aperients and washouts so as to make it as empty and clean as possible, but it must be admitted that in the presence of an obstructing growth good emptying and cleansing of the bowel is seldom possible. The bacterial content of the bowel should be reduced by giving insoluble sulphonamides or antibiotics such as Streptomycin or Neomycin orally for a few days prior to operation. It is unnecessary, and probably unwise, to try to eliminate all bowel bacteria, and preparation of the bowel in this way is no substitute for good technique at operation, which is still the main essential.

In the presence of acute obstruction immediate resection of the tumour is usually unwise, because the patient is often in poor condition and because the bowel is unsuitable for anastomosis. Moreover, a careful removal of the related lymphatic field is seldom possible. It is better in the majority of obstructions to carry out a simple proximal decompression, usually a transverse colostomy, and to proceed to resection of the primary growth two or three weeks later, and then to close the transverse colostomy as a third and final stage. An exception to this principle occurs in the occasional case where an acute obstruction arises from a carcinoma in the right colon, and leads to extreme distension of the caecum but with little distension of the terminal ileum. In such cases immediate resection (right hemicolectomy) and anastomosis is probably the wisest course if the patient's general condition permits.

The main factors that make for success and safety in colon surgery are good anaesthesia and abdominal relaxation, good exposure through an adequate incision, and proper mobilization of the colon. A long right or left paramedian incision is preferred by most surgeons, but transverse or oblique incisions are sometimes helpful. The mobilization of the colon from its lateral attachments is an essential step, as it will be found that the bowel can then be delivered out of the abdomen and a wide mesenteric removal can be done while yet allowing the two ends of colon remaining to come together without any tension. One must ensure that both ends of the bowel to be anastomosed have an adequate blood supply; the most certain way of ensuring this is to do open anastomoses and to see that both ends are bleeding before the anastomosis is commenced. A further im-

portant factor in colon surgery that has been realized in recent years is the danger of implantation of malignant cells on a suture line or elsewhere in the abdomen or in the wound. Precautions must be taken to avoid this form of implantation recurrence by handling the tumour as little as possible and by occluding the lumen of the bowel above and below the tumour, or by washing and mopping out with 1 in 500 perchloride of mercury the two ends of bowel just prior to anastomosis.

The extent of operations regarded as necessary for tumours in various parts of the colon are illustrated in most textbooks and do not need to be repeated here. There is a trend to more radical operations for growths of the left side. It is usual now to tie the superior haemorrhoidal artery for all sigmoid growths and some surgeons advocate ligation of the inferior mesenteric artery at its origin from the aorta for any growth of the left colon. The latter operation, while a logical extension of the more accepted procedure, has some technical difficulties in fat people and usually requires full mobilization of the splenic flexure to allow of safe anastomosis. It has yet to be proved that this rather more extensive and dangerous operation will result in a higher percentage of long survivors.

Growths of the Rectum

The abdomino-perineal operation (Miles 1926) has been for many years the accepted and the most widely performed operation for rectal cancer. More recent researches into the spread of this disease (Gabriel, Dukes and Bussey, 1935) have shown, however, that distal spread below the tumour is actually very rare and only occurs in 2 per cent. of growths, and then only when the upward lymphatics are blocked by malignant infiltration in an advanced growth. It has thus been shown to be justified to try to preserve the rectum below the tumour and to restore continuity if possible. Many surgeons will now accept that this operation, anterior or restorative resection, is as radical an operation for growths in the recto-sigmoid region or upper rectum as is the classical abdomino-perineal resection, and prefer to use it where technically possible so as to spare the patient a colostomy. It must be emphasized, however, that the operation is technically rather more difficult than combined excision and that if unsuitable cases are chosen for it, bad results will follow. Many local recurrences were seen in the years when this operation was first being done, but it was soon realized that most of these recurrences were due to implantation on the suture line and since steps have been taken to avoid this the results have been excellent. For growths lower down in the rectum, combined

excision is still the best treatment. This can be done either by the abdomino-perineal operation, as originally described by Miles in 1908, or by doing most of the dissection from the perineum as in Gabriel's perineo-abdominal operation (Gabriel, 1948). In this country the synchronous combined operation, as described by Lloyd-Davies in 1939, has become popular and has many advantages. With two surgeons working simultaneously, operating time is reduced and, more important, difficult adherent tumours can often be removed which would be inoperable by other means.

As in tumours of the colon, there has been advocacy in recent years of an extended form of rectal excision with ligation of the inferior mesenteric artery at its origin and dissection of the pelvic lymph nodes. This does allow of the widest possible lymphatic clearance but it is as yet too early to know if the follow-up results will justify the bigger procedure, which carries a

higher morbidity, particularly in post-operative urinary disturbances.

As discussed previously, the prognosis after treatment of large bowel cancer is better than in many other forms of cancer. Recent analysis of long-term results at St. Mark's Hospital, however, has shown that there are significant differences in survival according to the age and the sex of the patients, as well as to the more obvious factors of spread and grade of malignancy (Dukes, 1957). Therefore all these factors must be considered when comparing different sets of statistics, and in trying to assess the value of new operations.

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