

Section of Proctology

President—W. B. GABRIEL, M.S.

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Venous Spread in Rectal Cancer

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In view of the severe consequences of the spread of rectal cancer by veins it is surprising that so little attention has been given to the state of the veins during the routine examination of pathological specimens. Our interest in this question was first aroused by Dr. P. C. Hou of Cheeloo University, North China, who demonstrated a case of cancerous occlusion of a branch of the superior hæmorrhoidal vein. Realizing the importance of such a finding we decided to make a special study of the state of the veins in rectal cancer and evolved a technique which we have now applied to 669 operation specimens.

Detection of Venous Spread

Venous spread can rarely be detected by inspecting or handling the rectum, and a dissection of the veins is usually necessary before deciding whether or not they contain malignant tissue. The following technique has been found most convenient for a vein dissection. The operation specimen is opened up along the mid-line anteriorly and sewn out on a rectangular meccano framework to preserve its natural relations. The stretched-out operation specimen is fixed in 10% formalin for twenty-four to forty-eight hours, after which the dissection can be commenced. It is best to begin with the ligated end of the superior hæmorrhoidal vessels and to work down the vessels until the terminal branches are observed to disappear through the muscle coat into the submucosa. Dissection is easy with specimens from thin patients and where there is little extrarectal spread but is more difficult in fat subjects and in cases with matted carcinomatous deposits or much inflammatory fibrosis. Bit by bit, fat and connective tissue are removed, leaving in situ veins, lymphatic glands and other deposits of carcinoma. A natural-size plan is next prepared on which all these structures are plotted. Portions of the veins, glands and extrarectal deposits are then taken for microscopic section. The most likely place to find evidence of intravascular extension is where the veins emerge from the region of the growth. Microscopic examination is always necessary to confirm the nature of any solid tissue found within the lumen of the veins. In cases where nothing suspicious has been noticed during the dissection it is seldom that any sign of venous spread is found in the sections.

Appearance of Intravascular Growth of Carcinoma

A vein containing carcinoma appears yellowish white in colour and feels hard and nodular. Only a short stretch of the vein is affected in most cases, though occasionally a solid cord is found along the whole course of the superior hæmorrhoidal vein. Often growth is found in more than one of the tributaries of the hæmorrhoidal veins and it has seemed as if some types of rectal cancer show a special predilection for extending along the veins.

The opening up of an affected vein reveals the lumen to be patent as far as the dilatation at which point the walls of the vein become stretched tightly over the solid clump of malignant tissue which occludes the lumen. As a rule the malignant tissue is not adherent to the intima. Vascular thrombosis is rare but we have occasionally found the veins to be filled with soft blood-clot entangling clumps of carcinoma cells. In most cases the malignant tissue lies free within the lumen of the vein and in direct contact with fluid blood. The ease with which fragments might become detached is at once apparent and is a warning of the danger during the operation of rough handling before the vessels have been ligated.

Widespread and massive intravascular growth is sometimes accompanied by secondary tumours elsewhere in the rectal mucous membrane: these consist of small umbilicated nodules projecting slightly from the surface. At first these are separate but they tend to become confluent later. They may be close to the primary growth or separated by several inches of normal-looking mucosa. Our dissections have shown that these secondary tumours are due to continuous growth along the superior hæmorrhoidal veins and extension to the submucous venules. This permeation of the veins, in the direction opposite to the natural flow of blood, results in the re-irruption of carcinomatous deposits in the submucosa and mucous membrane often at a considerable distance above or below the primary tumour. This peculiar manifestation of venous invasion is found only in a small proportion (about 5%) of cases in which there is evidence of intravascular growth.

The evidences of intravenous extension of carcinoma which can be found in operation specimens are more suggestive of growth along the veins by a process of permeation than of embolism, although, as already mentioned, a fragment of the growth might easily become detached and form an embolus. Support for this view is derived from the fact that intravascular spread begins at the margin of the primary tumour and pushes along the vein, bathed in the nutritious environment provided by the circulating blood. The malignant tissue grows along the vein in the same sort of way as a calculus grows down the ureter, by the constant deposition of new material at the growing "beak".

Frequency of Venous Extension

We have examined 669 operation specimens of rectal cancer by the method described and found clumps of carcinoma cells in the hæmorrhoidal veins in 111 (16.6%). In all these cases it seemed probable that venous dissemination had already taken place or would have done so in the near future. We regard this figure (16.6%) as an underestimate of the total number of cases in which venous spread was possible because it does not include those cases in which the hæmorrhoidal veins were embedded in a massive extension of the growth in the perirectal fat. We have included only those cases in which malignant tissue was found within the lumen of the veins.

Characteristic Features of Cases showing Venous Extension

Cases in which venous spread was demonstrable by dissection showed certain minor differences when compared with the general series. The average age of the 111 patients with evidence of venous spread was slightly lower than for the general series of cases of rectal cancer, the figures being 55.2 years for men and 52.7 for women. In a series of 1,000 cases of cancer of the rectum the average age for males was 58.6 years and for females 55.1 years. The lower average age of patients exhibiting venous spread was obviously related to the histological grade of the primary growth. As a general rule the higher the grade of malignancy of a rectal cancer the greater is the likelihood of venous spread. Growths of a high grade of malignancy are commoner in young subjects. Cases exhibiting venous spread are found to have a lower average age and also a higher proportion of colloid and Grade III growths (*see* Table).

PERCENTAGE DISTRIBUTION OF HISTOLOGICAL GRADES.

	Cases showing venous spread. Per cent.	Total series of 1,000 cases. Per cent.
Grade I	2.7	8.4
Grade II	37.6	55.6
Grade III	39.7	21.0
Grade IV	3.6	2.1
Colloid	16.2	12.9

Differences were also noticed in the size and position of the growths exhibiting venous spread when compared with other cases. As a general rule cases with demonstrable venous spread were large bulky tumours with obvious extrarectal extension and most commonly situated in the upper third of the rectum. But the most interesting correlation was found between the extent of spread (as measured by the A, B and C classification of rectal cancer) and the incidence of venous spread. No instance of venous spread was found in the A cases (growth limited to rectal wall) but intravascular growth was found in 35 out of 213 B cases (growth extending to extrarectal tissues but no lymphatic metastases). It was rather surprising to find evidence of venous spread in such a large number of cases without lymphatic involvement (16.4%). Amongst the 360 cases in which the lymphatic glands contained metastases (C cases) 76 were found to show venous spread, an incidence of 21.1%. The fact that there was so little difference in the incidence of venous spread in the B and C cases proves that the invasion of the veins must take place from the primary growth and not as the result of spread from lymphatic metastases.

Significance of Discovery of Growth within Veins

The full significance of the discovery of growth within veins can only be assessed when a series of cases such as these have been kept under observation for a period of five years or more. We hope that our records may answer this question more fully at a later date, but in the meantime we feel justified in saying that the discovery of growth within the hæmorrhoidal veins is not to be taken as proof of the existence of hepatic metastases. Several of our cases have been under observation for three, four and even five years and remained in good health without clinical evidence of growth within the liver. We assumed at first that whenever carcinoma was found in the hæmorrhoidal veins metastases would be found in the liver or lungs, but the results of post-mortem examinations have forced us to modify this opinion. Autopsies have been carried out in 13 of the cases where cancer cells were found in the veins and in only 3 of these were secondary deposits found in the liver. During the same period we have carried out 26 post-mortem examinations in cases where no growth was found in the veins and yet 4 of these had hepatic metastases.

Comment.—Evidence of growth within the hæmorrhoidal veins in an operation specimen is an indication that venous spread would certainly have taken place eventually if the operation had not been performed but is not to be taken as proof that spread to the liver or lungs has already occurred.

Terminal Ileostomy for Idiopathic Ulcerative Colitis.—RUPERT CORBETT, M.Ch.

This case was referred to in the discussion on surgical treatment of idiopathic ulcerative colitis in the Section in May 1940 (*Proceedings*, 33, 647 (Sect. Proct. 11)).

The patient, female, aged 28, had this operation performed just over five years ago. The onset of the disease was in September 1934. An appendicostomy was performed in December of that year. Medical treatment including numerous blood transfusions was given, but she became worse, and was bedridden, having to lie on a rubber bed-pan always. In March 1936, the terminal ileostomy was established. A dramatic recovery followed and in three months she had doubled her weight and was leading a normal life again. Now she is very fit and doing war work, and stated that she forgot she had an ileostomy. She has an unrestricted diet and takes a small amount of ferri redactum with her meals, keeping her motions dark to avoid soreness of the skin. A belt incorporating a box is worn with comfort, being emptied twice a day, morning and night. There is practically no discharge from the rectum.

Specimens Shown :

Dr. CUTHBERT DUKES and Mr. H. J. R. BUSSEY: "Venous Spread of Carcinoma of the Rectum."

Professor G. GREY TURNER: Specimens of Cancer of the Rectum.

Mr. O. V. LLOYD-DAVIES: Specimen of Squamous-cell Metaplasia.

Short Films:

Mr. W. B. GABRIEL: (1) Excision of Anal Fissure. (2) Diffuse Cavernous Angioma of the Pelvic Colon and Rectum.