

## MALIGNANCY OF THE GASTROINTESTINAL TRACT

### EVALUATION OF STOOL EXAMINATIONS IN THE DIAGNOSIS \*

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The early diagnosis requisite for the successful treatment of cancer would be a matter of less concern, if only there were some test or characteristics of malignancy that were thoroughly dependable. Unfortunately we have not such a test at our disposal. On the contrary, we are dependent upon a very heterogenous mass of evidence, none of which is very reliable, when we are dealing with cancer in its incipency.

The diagnosis of early gastrointestinal malignancy is not an easy matter, even when studied under the most favorable circumstances. The physical examination, although of great importance, may not give us any definite information. The history, if not obtained with great care and accuracy, is likely to be very misleading as there is no sharp dividing line in many cases between the organic and the purely functional manifestations. There are no symptoms pathognomonic of early malignancy of the gastrointestinal tract, therefore we are dependent largely upon certain laboratory procedures and the use of the roentgen rays for our early diagnosis. Only by rigid application and careful interpreta-

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tion of all the procedures at our disposal may we hope to lessen our percentage of error.

Statistics show that 50 per cent of all the cancer in the body has its origin in the gastrointestinal tract. Consequently our responsibility must be more keenly felt, when we stop to consider that in no portion of the body is our opportunity greater to effect a cure, if diagnosis is made early. At the present time our attention is constantly being focussed on the ever increasing incidence of cancer. We are confronted daily with the gruesome aspect of cases that have passed beyond the stage where they may be aided materially and no special skill is necessary for diagnosis. Under these circumstances surely any test or procedure that will be of aid in making an early diagnosis or will serve to arouse our suspicions as to the cancer probability in any case is worthy of our consideration.

Examination of the feces has been recognized as a valuable procedure in the study of gastrointestinal diseases and disorders for many years. Most of the pioneer work in this field was done by German investigators. It was not until about the beginning of this century, however, when chemical tests for the detection of small amount of blood in the feces was first introduced, that it became recognized as an important procedure in the diagnosis of gastrointestinal malignancy. Today there seems to be a real danger that it is losing some of its early popularity. The reasons for this apparent neglect are, I think, to be found in the rapid development in roentgen facilities and technic offering a short cut to diagnosis, the lack of confidence in the meaning

and interpretation of stool findings, and, lastly, the inability on the part of many to devise adequate and satisfactory means for obtaining these specimens in office practice.

In our office examination of the feces is treated as a routine procedure. We feel that the frequent rewards received in the way of a more positive and timely diagnosis or the picking up of some unsuspected malignancy has repaid us many times for our efforts. Each patient upon his first visit to the office is placed upon a blood-free diet, and is provided with air tight pasteboard cartons as stool containers. They are instructed to begin saving stool specimens on the second day of their examination, thus allowing time for the passage of any ingested blood.

The stools obtained are examined as to their form and consistency, the macroscopic evidence and character of blood, mucus and pus, and amounts present are recorded on a plus 4 basis. A routine test is made on all stools for occult blood. For this purpose a small portion of feces is selected from the inner part of the stool in order to avoid any contamination from blood on the outside of the stool coming from fissures, abrasions or hemorrhoids at the outlet. The feces secured is placed upon a clean glass slide, and is treated with a solution composed of benzidine sufficient to saturate 2 c.c. of 50 per cent glacial acetic acid, and to which has been added an equal portion of hydrogen peroxide to make a clear solution. If blood is present, a bluish discoloration will appear in less than two minutes, depending in rate and density upon the amount of blood present.

This test is roughly sensitive to 200 red blood cells to the c.c., or the taking of 1 c.c. of blood per day by mouth is sufficient to give a positive blood reaction in the stools. Objections to this test have been made on the basis of its extreme sensitivity and the likelihood of contamination from other sources, thus making the interpretation of a positive finding very uncertain. The most obvious sources of error are to be found in easily bleeding gums, traumatic bleeding from the passage of a stomach tube, introduction of blood with the food or feeding of certain drugs, all of which are comparatively easy to rule out or control. Lastly and of great importance is the microscopic examination of the feces for blood, mucus, pus, tissue and so forth which may give us a clearer insight into the nature of the process with which we are dealing.

In order to evaluate stool examinations in the diagnosis of gastrointestinal malignancy I reviewed some ninety cases from our office records as to stool findings, and formed the following conclusions as to its relative importance in the diagnosis of cancer in the various general regions in which it is most prone to occur.

#### CANCER OF THE ESOPHAGUS

In the diagnosis of cancer of the esophagus there is less to be gained by stool examination than in any other portion of the gastrointestinal tract. The primary symptom of dysphagia localizes the trouble to this organ and roentgen-ray examination, if properly conducted, in the majority of cases gives evidence of the nature of the lesion. Further evidence may be obtained by the passing of a bougie

or by direct examination with the esophagoscope, but this is seldom necessary for diagnosis. For this reason, of the twenty cases of cancer of the esophagus studied, stool examination for occult blood was made in only three. Two of these showed persistent bleeding and one was negative.

#### CANCER OF THE STOMACH

The primary concern in examination of feces where cancer of the stomach is suspected has to do with the presence of blood intimately mixed with the feces. In these the blood is usually so small in amount, and has been so changed in character by the fluid in the stomach and small intestines that its presence is usually not detected by other than chemical means. However, if the bleeding has been massive, which is the exception in malignancies, it assumes a black or brownish black appearance in the feces. In a series of sixty-one cases of cancer of the stomach, in which adequate stool examinations were made, fifty-one showed persistent bleeding. In six cases the bleeding was of the intermittent type and in four no blood was detected at any time during the period of observation. In many of these cases the test was found to be of material aid in the diagnosis, often being the first sign that made us aware of the cancer probability, appearing before any of the common objective or subjective symptoms had developed to any appreciable extent.

In cases of gastric ulcer, in which we had reason to suspect the presence of malignant degeneration, the test was often profitably used in making a more positive diagnosis. These cases were hospitalized and placed on a Sippy management and a blood-

free diet. If bleeding persisted beyond two to three weeks of such management, they were considered as malignant in most cases and surgery was advised without further delay. If in the course of medical treatment of any gastric ulcer the presence of occult blood in the feces was noted, the probability of cancer was considered. In comparing the cases of gastric ulcer with those of gastric cancer it was found that the tendency to bleed in those of gastric ulcer was markedly less; it was almost invariably of the intermittent type, and the tendency to frank hemorrhage was found to be much greater, producing black, tarry stools, whereas in gastric malignancy it was the exception rather than the rule to detect the presence of blood in the feces macroscopically.

Any patient of the cancer age, complaining of discomfort after meals, diminishing appetite, slowly failing strength and loss of weight, who has previously been well, should be regarded with suspicion. These people should have a thorough gastrointestinal study. It may not be possible in every case to use the roentgen ray as freely as we would like in office practice. However, few excuses can be offered for not examining the blood, stomach secretions and the stool for occult blood. These procedures alone if properly conducted will in a large majority of cases give us sufficient information to make at least a tentative diagnosis.

#### CANCER OF THE SMALL INTESTINE

This is a rare condition but when encountered is very difficult of diagnosis. Because of the fluid content of the small intestine the first symptoms point-

ing to the lesion are those of obstruction. A palpable mass is seldom felt and the roentgram helps very little in early cases. These, however, are prone to bleed, and of the cases in our office records the persistent presence of occult blood in the stools was the earliest and most outstanding manifestation. By the process of elimination it might be possible to locate the lesion early in some cases. The first essential, however, is not necessarily the localization of the lesion but the establishing of a cancer probability, making an exploratory operation a justifiable procedure. If the finding of occult blood in the stools will help to carry us this far in the diagnosis, certainly it is a most valuable procedure. I would like to cite a case history of such an instance.

Case 1. Mr. I. aged 60, came to our office on March 2, 1927. He gave a history of typical ulcer distress of one year's duration. For six months he had noticed some loss in strength and paleness. There had been a seven pound loss of weight over this period. His appetite had been very good. His bowel function had been regular and quite normal except for occasional loose movements and increased gas formation.

The physical examination was essentially negative except for moderate hemorrhoids and a fairly large and firm prostate. Proctoscopic examination was negative. His blood showed 3,660,000 red cells; 7,900 white cells and 53 per cent Hgb. The differential count was normal, except for some variation in the size and shape of the red blood cells. The urine showed a trace of albumin and an occasional hyalin cast. The kidney function test showed a 48 per cent phenolsulphonephthalein excretion in one and one-half hours. The stools were persistently positive for occult blood. The roentgram revealed a defect in the greater curvature of the stomach one to two inches proximal to the pyloric ring. There was a persistent deformity of the cap and moderate pylorospasm which subsided with atro-

pine. There was no evidence of pathology in the small intestine or colon.

On ulcer management the patient's symptoms subsided but the blood in the stools persisted, making us suspicious of a hidden malignancy. The entire gastrointestinal tract was reexamined with the roentgen ray and no further evidence of pathology found. Because of the persistent occult blood in the stools the question of an exploratory operation arose and a consultation was called. The patient was feeling so well that it was decided to observe him longer. One month later the stools were still positive for occult blood but the patient refused an exploratory operation. During the course of the next six months two roentgen studies were made and no further change was found. The patient had gained about eight pounds in weight and the blood had maintained quite a constant level, around 4,000,000 red cells and a Hgb. of 70-80 per cent. During this period the patient had been treated with the quartz light and intravenous iron in addition to his ulcer management. The stools were still positive for occult blood.

Nine months after the patient presented himself for examination he went to California for three months and upon his return stated that he was feeling fine. This was the last we heard from him until some nine months later he was operated upon for acute intestinal obstruction and died shortly following the operation. The operation revealed a carcinoma of the ileocecal ring with metastasis to the liver and the serosa about the primary growth and cecum. The autopsy revealed in addition a healed gastric ulcer on the greater curvature, one and one-half inches proximal to the pyloric ring.

The most constant finding in this case was the persistent occurrence of occult blood in the feces and I believe that, if it had been possible to bring this patient to surgery some fourteen months earlier, he would be alive today. Eighteen months had elapsed since he first presented himself for examination and we have reasons to suspect that the growth began six months to a year prior to this date.

Comparatively speaking, cancer of the colon is a chronic and local disease. Many of the cases are of long standing, and make relatively few inroads upon the patient's health. It is a known fact that a considerable percentage of cases that go to post-mortem are localized. Here, as in cancer of the small intestine but to a lesser degree, the appearance of any tell-tale symptoms or signs are often a late manifestation. The use of the roentgen rays, especially with the barium enema, is a very valuable procedure, but unless employed by a skilled observer is likely to lead to many errors in diagnosis, because of the many loops and folds encountered and the great tendency to spasm.

It is in these cases that stool examination as an aid to diagnosis is of prime importance. Aside from the change in character in the stool that may occur but is not of any great diagnostic value, mucus and blood in varying amounts are very often found, especially after the stage of ulceration begins. Blood in microscopic quantities is probably always present and may be recognized by chemical means in the majority of cases. In a series of twelve cases a positive benzidine test was persistently found in ten.

Cancer of the colon most frequently occurs in the fixed areas subjected to the greatest trauma and irritation. Possibly for this same reason cancer of the colon is prone to ulcerate early. In the distal colon the presence of firm fecal material adds an additional traumatic factor which may predispose to early bleeding. Occasionally an acute hemorrhage

occurs which frightens the patient into consulting a physician sooner than he ordinarily would. A constant slight hemorrhage from the bowel may produce a slow progressive anemia, and it should be routine procedure to examine the stools in any patient presenting such a picture.

After the stage of ulceration begins and a point of irritation is set up in the bowel wall there is often a pouring out of a clear viscid mucus, usually streaked with blood and containing pus. This may be rather intimately mixed with the stool, if the movements are loose, or if not, it may be passed as rather large polypoid masses of pure mucus. This is especially prone to occur in the tumors of the pelvic colon. The presence of mucus of this character should always arouse suspicions of a growth either in the rectum or colon.

It is my belief that, if all cases coming to us and complaining of symptoms referable to the gastrointestinal tract were given a careful stool examination, there would be fewer cases of cancer of the colon reaching the stage of obstruction and inoperability. Certainly there is no portion of the body more amendable by surgery if taken early. I wish to cite briefly a case history which illustrates the point I wish to make.

Case 2. Mr. B, aged 37, presented the following complaints. For six years he had been subject to cramp-like pains in the upper abdomen, accompanied by bloating, nausea and vomiting, and a stoppage of the bowels. Following an attack he would have diarrhea. Each attack was preceded by a migraine type of headache. Previous to the beginning of his present complaint he had had suggestive ulcer distress. Ten days before presenting himself for examination he had passed several black tarry stools, follow-

ing which he had felt quite weak. Two years before the patient had had his appendix removed and abdomen explored during one of the attacks described.

The physical examination was essentially negative except for tenderness throughout the colon and in the epigastrium. The proctoscope passed to 18 cm. revealed no lesion. His blood showed 4,992,000 red cells, 10,000 white cells and 62 per cent Hgb. The differential count was normal. The urine was negative. The stools showed occult blood in all specimens. The roentgen examination was negative throughout except for a persistent deformity of the duodenal cap. Ulcer management and hospital observation was advised. The stools continued to show occult blood and while in the hospital the patient had one of his typical attacks. A second roentgen study revealed a defect at the splenic flexure in the colon. Because of the persistent bleeding a malignant growth was suspected and an exploratory operation was advised. It revealed a carcinoma of the splenic flexure which was successfully removed. The patient is alive and well today, fifteen months after the operation.

This is a case in which we feel that the stool findings were largely responsible for the diagnosis.

#### CANCER OF THE RECTUM

There is probably no place in the body where a cancer may develop that we have less excuse for not making a diagnosis as soon as the patient presents himself for examination. Many cases, however, are overlooked until the stage of operability is passed. Perhaps the most common error is the diagnosis of hemorrhoids, where a carcinoma actually exists. Because of the accessibility of the rectum to digital examination and its visibility with the proctoscope we have been enabled to make a more accurate study of the behavior of cancer in this region. It is thought that cancer of the rectum has a definite latent period, the exact length of which is not known and doubtless varies, but is considered to

extend from a few months to a year. This comprises a preulcerative period in its growth, in which no symptoms may be manifest in sufficient degree to cause a patient to consult a physician. Perhaps the most valuable symptom, if it occurs during this period, is the sudden interruption of a previously normal bowel function by constipation. Any patient in the cancer age presenting such a symptom should incite our suspicions and lead to a thorough investigation and a verification of his statements.

After the ulcerative stage begins symptoms of a more definite character develop, due to the irritation set up in the mucosa in or about the ulceration. Constipation may give way to diarrhea or intermittent diarrhea and constipation, with a frequent desire to go to stool or a sensation that the rectum has not emptied itself completely. At this stage the stool may be streaked with blood or a frank hemorrhage occasionally occur. It is very often that the appearance of blood is the first sign that causes the patient to consult a physician. Upon more careful examination of the stools they may be found to contain bright red blood or streaks of blood clinging to the outside of the firm stool. Mucus is almost invariably present and pus is quite a constant finding. In a series of fourteen cases of cancer of the rectum blood, mucus and pus were found in varying amounts in all the cases but one.

Occasionally the main body of the growth may not encroach upon the lumen of the rectum and only a very small portion of it may ulcerate through into the rectum. These cases are easily missed on digital examination. One of these cases in particu-

lar was entirely overlooked on the first examination, but the persistence of fresh blood and mucus in the stools led us to make a more searching investigation a few days later which disclosed a small ulcerated area about four inches proximal to the anal opening. The symptoms in this case were those that we commonly encounter with an ordinary irritable bowel. The patient had not noticed blood or mucus in the stools. Consequently it would have been an easy matter to have completely overlooked the lesion for sometime at least, had it not been for the unexplained presence of blood and mucus in the stools. It is a gross neglect and no justifiable excuse can possibly be offered for a failure to make a thorough investigation of the rectum in the presence of any of these signs or symptoms.

#### COMMENT

The data presented, although observed in the course of our usual clinical study of each case, tend to point out the constancy with which blood is found in the feces in the presence of malignancy of the gastrointestinal tract. It often leads to a correct understanding of the condition when other methods have failed.

The presence of blood, mucus or pus in the feces should be considered with serious respect, and never be disregarded without a thorough examination when found under proper conditions. No gastrointestinal study should be considered complete without an examination of the feces.