EARLY DIAGNOSIS OF DISEASES OF THE COLON AND RECTUM

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In this discussion of the present status of diseases of the colon, only the practical features, which in our experience have proved helpful in early diagnosis, will be considered.

Diseases of the colon are now recognized more frequently than heretofore. This may mean that these diseases are becoming more prevalent, but, more likely, it probably indicates that the clinician is becoming more skillful in diagnosis. However, certain indispensable examinations which should be done in every patient suspected of having disease of the colon or rectum are still not being done *routinely*. The more widespread routine use of these examinations will result in a greater percentage of cured patients.

The newer developments in roentgenology during the past decade have played no little part in earlier diagnosis. In fact, the roentgen examination has become the most important single diagnostic procedure when dealing with lesions above the reach of the proctosigmoidoscope, which affect the lumenal contour of the colon.

In dealing with lesions in the lower sigmoid colon and rectum, we must remember that the findings by roentgen examination alone are not reliable. Even in this enlightened age, patients are being told that they have no organic disease because the roentgen examination was reported as showing normal findings, when a simple digital or proctosigmoidoscopic examination may reveal an obvious cancer.

Hemorrhoidectomies are still being done without making certain that a carcinoma or a polyposis above the hemorrhoids does not exist, as was the case ten years ago. Ointments and suppositories are still being prescribed without adequate examination to exclude other causes for the symptoms.

We must realize that *symptoms* pertaining to the rectum and colon are often indeterminate. Several types of lesions can cause the same symptoms. Organic abnormality cannot be excluded without doing digital and proctosigmoidoscopic examinations. The roentgen examination, using the barium enema, must, of course, be included in the *routine examination* when a lesion in the colon is suspected.

If a non-neoplastic ulcerative process in the colon is suspected, such as amebiasis, a bacillary dysentery or chronic nonspecific ulcerative colitis, stool examinations are of paramount importance, and they should be made prior to the administration of the barium enema.

The *digital* rectal examination is usually made in the left or right lateral position; however, when neoplastic disease is suspected and

examinations with the patient in the usual positions result in negative findings, the knee-chest and squatting positions should be used. The bimanual method also is of considerable importance in dealing with neoplastic disease, for this may reveal the presence of an obstructing lesion in the rectosigmoid area or a "Blumer's shelf," that is, evidence of retrograde metastases in the cul-de-sac, from neoplastic disease in the digestive tract above this level.

In doing the *proctosigmoidoscopic examination,* a special table is convenient where a large number of patients are examined, but the same results are obtained without special equipment, using any of the standard scopes and having the patient in the knee-chest position, the spine and abdominal wall being allowed to fall forward.

In obtaining *stools* for examination, we customarily give the patient a sterilized pasteboard carton in which to collect stools during the night and early morning hours. When careful appraisal of the patient's illness leads to the suspicion of parasitic disease and not an obstructing neoplastic process, a dose of Epsom salts is given the following morning before breakfast, and the patient is instructed to report to the bacteriologic laboratory immediately after breakfast. Warm-stage microscopic examinations of the stools are made for the motile forms of parasites as soon as the stool is passed. At least three stools are examined before this examination is considered adequate. In addition to searching for the motile forms in warm stools and encysted forms in the stools brought in by the patient, any other abnormalities, such as evidence of improper digestion of fats, starches or proteins is recorded. Cultures are made in dysentery cases.

Stool examinations not only give important information relative to an ulcerative process in the digestive tract. They may give evidence of other abnormalities, such as sprue which may have resulted in a confusing clinical syndrome. On the other hand, repeated normal findings on stool examination are significant in excluding organic disease of the digestive tract.

The *roentgen findings* are obvious when a lesion in the colon is far advanced, but this may represent the hopeless stage. Almost any type of roentgen film will demonstrate this stage. In order to discover an early curable lesion of the colon (above the rectosigmoid region) by the roentgen examination, the patient and clinician must cooperate with the expert roentgenologist. Sufficient time and the use of certain routine procedures must be allowed so that the roentgenologist can make a satisfactory examination. Allowing adequate time for the proper preparation of the patient alone, may result in making an early diagnosis which might be missed without this precaution. A request by the roentgenologist for recheck or progress examinations should not be neglected by the clinician. We have found the following procedures most important:

1. The *preparation.* We know that inspissated fecal material in the colon can be mistaken for polypoid lesions. Our routine calls for giving the patient 1 to 2 ounces of castor oil on the day preceding the examination. In patients having obvious obstructing lesions, reliance is placed on cleansing enemas. If the colon is not empty at the time of the examination a more thorough preparation and recheck examination is used.

2. The careful *fluoroscopic* examination by the physician radiologist himself. Many patients bring in films of the colon made after an X-ray technician or a nurse has given a barium enema. Such films may, of course, reveal the presence of an advanced lesion but they do not, by any means, exclude the possibility of an early lesion which is covered by a redundant loop of colon. On the other hand, a simple spasm may have been interpreted as a carcinoma. During the fluoroscopic examination, the physician radiologist observes every segment of the colon as it fills, while the patient is turned into the most advantageous positions. The flow of barium suspension is stopped at once and films are made in the correct position to show the lesion, if an obstructing lesion or any questionable findings are observed. In the case of a lesion in the upper sigmoid colon, the flow of barium suspension may have been only started. Films are made in the left oblique position before barium has reached other loops of the colon or ileum, which may cover the suspicious area in the usual single film made after complete distention of the colon.

3. The *film* examination must include one or more films taken after the expulsion of the enema, as well as the one taken before expelling the enema. Although films made at both times are important, the one made after the enema is expelled is more important in the discovery of an early lesion. At this time there is the earliest evidence of a mucosal lesion because the mucosal markings are visualized. There is contracture of the longitudinal musculature as well as the circular musculature of the colon so that it is shorter. Many redundancies have disappeared. We routinely combine mucilage of acacia and tannic acid with our barium suspensions so that the mucosal markings are observed to best advantage in the films made after the expulsion of the enema.

4. *Air or gas insufflation* after the expulsion of the barium enema and the taking of stereoroentgenograms are done if the above procedures result in questionable findings or if there is clinical evidence of polyposis. This procedure is not necessary in most instances and is not done as a routine. Its use has resulted in the diagnosis of an early lesion when the other findings have been indeterminate.

Carcinoma

The operative removal of early cancer of the rectum or colon is followed by better results than is the case of cancer in any other part of the digestive tube. Notwithstanding, by the time a diagnosis is made,

approximately one-half the patients are found to have hopelessly inoperable lesions. In order to cure a larger number of these patients, earlier diagnoses must be made in the presence of less symptomatic evidence of cancer than has been the custom in the past.

The *symptoms* usually mentioned in the textbooks are *late* symptoms. We believe an unexplainable change in bowel habit is the most significant early symptom, but even this is not always present when the patient is first seen by the physician. Although most patients having this disease are in the usual carcinoma age, we are seeing an increasing number of patients between the ages of twenty-five and forty.

Patients having carcinoma of the rectum usually complain of passing rectal discharges, containing blood and mucus, if not pus. Any patient who has had a change in bowel habit and complains of unusual rectal discharges should have a digital and proctosigmoidoscopic examination without hesitation. Actual pain is a late symptom unless the anal canal is involved. If there is excessive loss of weight and strength, as well as pain, the lesion is usually extensive and metastases may be present.

Lesions in the right half of the colon produce different symptoms from those in the left half of the colon. When we think in terms of embryology and physiology, it is recalled that the right half develops from the mid-gut; it has a much larger lumen than the left colon; the lymphatics are more plentiful; its contents are liquid and rich in organisms of high virulence and its chief function is absorption. Therefore, *obstructive symptoms are rare* in cancer of the right colon unless the ileocecal valve is involved. Due to toxic absorption through the abnormal mucous membrane, some degree of cachexia and a *marked secondary anemia* are often present. By the time the patient consults a physician, a palpable mass may be present.

A physician, aged thirty-seven, came to us complaining of a severe secondary anemia for which he had been taking iron both by mouth and by vein for at least one year, without avail. He had a "gaseous dyspepsia" which he did not believe was significant and a roentgen examination of the colon had not been made. His hemoglobin was 39 per cent and a palpable mass was felt in the cecum which was shown by roentgen examination to be an extensive carcinoma. An inoperable carcinoma of the right colon with extensive metastases was found at operation.

In considering the symptoms of carcinoma in the *left half of the colon*, there is a contrast to those in the right colon. The left colon is derived from the hind gut, the lumen is much smaller than that of the right colon, the lymphatics are relatively sparse, its contents relatively solid, and its function is primarily storage, rather than absorption. Because of the smaller lumen, containing fecal material which is relatively solid, *obstructive symptoms* occur early in carcinoma of the left colon. Al-

though bright red blood may be observed in the stools, there is usually no anemia or cachexia and there may be no palpable mass.

The passage of bright blood by rectum may be the only symptom produced by a carcinoma of the sigmoid colon. This may be attributed to hemorrhoids.

To summarize the significant early symptoms of carcinoma of the colon, we have found that an unexplainable change in bowel habit in a person of cancer age is present in most instances, and is practically always present in lesions of the left colon. A severe secondary anemia may be the only evidence of a lesion in the right colon. Obstructive symptoms occur relatively early in lesions of the ileocecal valve and of the left colon. The roentgen examination is the most important diagnostic procedure in determining the presence of carcinoma of the colon above the reach of the proctosigmoidoscope.

Benign Tumors

Benign tumors of the colon and rectum, in our experience, are relatively rare, and the ones we do see are usually adenomatous polypi. These must not be confused with the pseudo-polypi associated with ulcerative colitis. True polypi should be considered as precancerous lesions, regardless of whether or not they are familial.

There may be no symptoms, or there may be bleeding, prolapse or occasionally obstructive symptoms, due either to an encroachment upon the lumen or to intussusception.

We have found that adenomatous polypi are most common in the rectum, or if they are present elsewhere in the colon they are usually also found in the rectum. The proctoscopic examination generally gives the first clue to diagnosis. In these instances the roentgen examination should include an air or gas insufflation after the expulsion of the enema because, if polypi are present above the rectum, each may have a narrow pedicle at the mucosal junction which will result in very little disturbance of the general lumenal contour of the colon as visualized by the usual roentgen procedures.

The bleeding of an adenomatous polyp in the rectum may lead the clinician to believe that he is dealing with chronic ulcerative colitis, until the proctoscopic examination is made. The removal of a rectal polyp through a proctoscope is curative, of course, but proctoscopic examinations should continue to be made from time to time thereafter in order to make certain there is no recurrence.

Diverticulosis and Diverticulitis

In a series of 3000 consecutive roentgen examinations of colons, we found the incidence of diverticulosis to be 6.6 per cent. In most in-

stances the diverticula were limited to the sigmoid colon but they may occur in any part of the colon.

There may be no symptoms attributable to the presence of the diverticula or there may be an associated colonic instability. As is well known, acute diverticulitis resembles a left-sided appendicitis, while in the chronic forms there is usually a history of recurring attacks over a comparatively long period of time. Urinary symptoms may predominate, due to extension of the process to the bladder wall. The most frequent complication of diverticulitis is obstruction, and this may lead to the belief that the obstruction is due to carcinoma. Other complications, such as acute perforation, abscess, fistula, and the association of malignancy with the diverticulitis, have been rare in our experience.

The diagnosis is made by roentgen examination, but it must be remembered that the diverticula may be visualized at one examination and not at another, depending upon the fecal content at the time of the examination.

Nonspecific Chronic Ulcerative Colitis

The incidence of this serious disease, which is most common between the ages of fifteen and forty, seems to be increasing. The most extensive involvement is usually in the rectum and the process becomes less extensive in a proximal direction of the colon. However, in seven per cent of our cases the process was localized in a limited segment of the colon.

As yet there is a lack of unanimity of opinion in regard to the cause of this disease. Bargen, who has reported more than 2000 cases, believes it is due to a diplostreptococcus. He attributes the decreasing number of ileostomies done at the Mayo Clinic for this condition to the use of sera and vaccines made from this organism. Some writers believe the disease is a form of bacillary dysentery and that the diplostreptococcus is one of the secondary invaders. Others are of the opinion that it is a manifestation of nutritional deficiency disease. Mackie reports relief of symptoms over a long period of time in 50 per cent of his cases when the condition is treated from the standpoint of gastro-intestinal allergy, and so on.

The diagnosis is usually made by proctoscopic examination which shows a spongy, granular mucosa which bleeds easily when touched with a cotton swab. There may be multiple miliary abscesses and ulcers. Smears from the rectal scrapings and culture are routinely made. The criteria established by Bargen and Buie need greater emphasis in the appraisal of this disease.

The proctoscopic findings may be those of a diffuse hemorrhagic proctitis with edema. The various stages of a diffuse inflammatory process are usually observed, the stage and severity of which depends on the time the patient is examined in relation to the course of his disease.

The stool examinations give information relative to the quantity of blood and pus being expelled and permit additional studies of cultures.

The roentgen examination gives important evidence relative to the extent of the disease and is necessary in order to make a diagnosis of the segmental or localized form above the reach of the proctosigmoidoscope. However, in many cases where the disease is limited to the lower sigmoid colon and rectum the roentgen examination may show no abnormality.

In other words, normal roentgen findings do not exclude a diagnosis of chronic ulcerative colitis. On the other hand, roentgen findings pertaining to the left colon which may be interpreted as indicating the presence of this disease, may not be substantiated by the stool and proctosigmoidoscopic examinations. It is not uncommon for us to observe patients who have had a diagnosis of chronic ulcerative colitis, made from the roentgen examination alone, who later proved to have only an unusually spastic colon due to the self-use of irritating cathartics, enemas or colonic irrigations over a long period of time.

From the diagnostic standpoint we must realize that no diagnosis of this serious disease is established until all three of the examinations; stool, proctoscopic and roentgen examinations have been done. The outlook for the patient's future welfare demands this minimum examination.

In many cases the seriousness of the problem justifies the inclusion of a roentgen examination of the chest, a complete gastro-intestinal series, roentgen examination (including cholecystography) and special examinations of other parts of the body, which may reveal findings of etiologic significance if not findings of significance from the standpoint of general treatment of the individual. We have found that when the patient does not make satisfactory progress on treatment there may be a lack of thoroughness at the time of the initial examination.

Amebiasis

The diagnosis of amebiasis is usually made by finding the Endameba histolytica in the stools or by proctoscopic examination. About one-third of the patients who have active amebic dysentery have characteristic lesions in the rectum. The ulcers are larger than those seen in chronic nonspecific ulcerative colitis, have a punched-out appearance and the mucosa between the ulcers has a normal appearance. The organisms are found in the base of the ulcer.

When the proctoscopic examination is not diagnostic, formed stools are examined for cysts, and warm liquid stools obtained after the administration of Epsom salts are examined for motile forms. In our experience, the roentgen examination results in negative findings. This is important in the exclusion of other disease.

In the absence of evidence of amebiasis in the stool and proctoscopic examinations, the clinician may still believe that there is amebic infection in the wall of the intestine or elsewhere in the body. Under these circumstances in a therapeutic test for amebiasis, the use of emetine usually brings the acute attack under control quickly, but it alone will not effect a cure. Emetine must be used with care because of its toxic effect on the myocardium and it may produce a peripheral neuritis. Since it affects primarily the organisms in the tissues of the bowel, the use of oral medication such as carbarsone and vioform have been used to affect the organisms in the lumen of the bowel. As in cases of peptic ulcer, chronic ulcerative colitis, and other gastro-intestinal diseases, we believe the most important feature in the treatment of amebiasis is continued supervision of the patient's management over a period of time. Stool examinations, made every three to six months should remain negative for eighteen months before one can assure the patient of cure.

Tuberculosis of the Intestine

Roentgen evidence of ulcerative involvement of the terminal ileum and cecum, the site of predilection, in a young adult who has pulmonary tuberculosis or a primary focus elsewhere in the body, makes the diagnosis of intestinal tuberculosis highly probable. However, many patients with this disease do not have symptoms or signs of pulmonary tuberculosis at the time the physician is consulted. Therefore, whenever an ulcerative condition is found in the terminal ileum or cecum, a roentgen examination of the chest is indicated, even though physical examination shows no evidence of pulmonary involvement.

The hyperplastic form often presents roentgen evidence in the cecum which is difficult, if not impossible, to differentiate from a neoplasm. Tuberculoma usually occurs in young individuals, and its duration is usually in terms of years. The surgical treatment is the same in both lesions. In the ulcerative form of tuberculosis, surgery is usually contraindicated unless the primary focus is inactive or complications are present.

Regional Enteritis

Although this entity which was established by Crohn, Ginsburg, and Oppenheimer in 1932, as "Regional Ileitis," is most commonly related to the terminal ileum, it may be found in any part of the small intestine and there may be associated lesions in the adjacent colon. Crohn has reported sixty cases, in nine of which there were associated lesions in the colon. The pathologic changes are those of a low grade, chronic, cicatrizing process with a tendency to formation of fistulas.

The symptoms, of course, vary with the stage of the disease at the time the patient is seen. Early in the course of the disease, the symptoms simulate those of recurring appendicitis even though the appendix has

been removed. The patient usually consults the physician during the ulcerating enteritis phase when the symptoms are similar to those of chronic ulcerative colitis, that is, diarrhea with pus and blood in the stools. Later, during the stenotic phase, the signs are those of partial obstruction. Fistulas may form at any stage.

Roentgen examination helps in the differentiation from ulcerative colitis. When the disease is limited to the small intestine, the barium enema will give evidence of a normal colon, which in view of the symptoms which suggest colonic disease, is important negative evidence. If the lesion is limited to the terminal ileum, its most frequent site, the regurgitation of the barium enema through the ileocecal valve discloses evidences of ulceration which is positive evidence. If the stage and extent of the disease is not clearly established by this examination, interval roentgen studies of the small intestine must be made after the administration of a barium meal. Tuberculosis is considered to be eliminated in most instances if the roentgen examination of the chest gives negative findings.

Megacolon

The diagnosis of megacolon is easily established by roentgen examination, using the barium enema. The use of a spinal anesthetic has proved helpful in two respects—it gives relief for several months in some cases, and it furnishes a means of determining the likelihood of cure by doing a lumbar sympathectomy. The use of pitressin and acetylcholine has proved significant in the appraisal of this condition.

Benign Stricture of the Intestine

Benign stricture of the intestine due to irradiation of carcinoma of the cervix uteri has been found in fifteen of 800 cases, an incidence of 1.9 per cent. Although this apparently is a rare condition, its presence should be suspected when a patient gives a history suggesting partial or complete intestinal obstruction subsequent to the original radiation therapy, particularly if pelvic examination reveals normal findings. The condition may be encountered months or even years after irradiation and its incidence, where metastatic lesions from a carcinoma of the uterine cervix are suspected, may be greater than has heretofore been recognized. In our cases, the most common location of the stricture was in a redundant sigmoid colon and the diagnosis was made by the roentgen examination, using the barium enema. At operation, there was no evidence of carcinoma in any of our cases. Resection of the involved segment and end-to-end anastomosis is curative.