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CARCINOMA

of the

RECTUM: A REVIEW

by

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INTRODUCTION

For many years cancer has held its mysteries from the searching investigations of science. It is one of the few diseases which has been known since the time of the ancients that has not yielded to the onslaught of scientific investigation of the mysteries of its etiology and origin. For many years it has been the dreaded scourge of humanity, and even to-day with all our modern treatment it is still ranking high as a factor in our mortality rate.

It is the purpose of this paper to review some of the literature written by eminent men and the results of searching investigations conducted to eradicate the dreaded plague of humanity. Thanks to Sir James Ewing for his brief summary of the history of cancer, it will be possible in a few pages to give the reader a birdseye view of the things which have stood out along the line of progress which has been made down through the ages.

This brief review will, I believe, prepare the reader and give some insight into the problems which confront the diligent workers in the special field of carcinoma of the rectum.

In this field the scope is so large to be covered completely, so only a scanning of the literature will be possible in this article. In this review an attempt will be made to give as briefly as possible the most important facts and theories pertaining to carcinoma of the rectum with emphasis upon the etiology, diagnosis, treatment and the encouragement which patients may receive as the results of such treatment.
HISTORY

It is evident that the ancient physicians as early as the sixth century B.C. recognized cancer and treated it by excision and eschorotics. Democedes\(^1\)(520 B.C.) is reported to have cured the daughter of Darius of cancer of the breast. Hippocrates\(^2\)(460-375 B.C.) gave a vivid and accurate description of cancer of the breast, skin and uterus. An instance is mentioned where he removed a cancer from the neck by cauterization. Celsus\(^3\)(50 B.C.-38 A.D.) set up a crude classification of cancer. His means of treatment was by excision. Although Galen\(^4\)(131-203 A.D.), the great anatomist, made no contribution to the conception of cancer, his humoral theory dominated the conception of disease and cancer was supposed to be the concentration of the "black bile". As a result, menses and hemorrhoids were held largely responsible for cancer. Very little was known at this time of internal cancer, but enough was known that a treatment was prescribed for it. This treatment consisted of a vegetable diet with the meats of nuts, especially walnuts. In the year 180 A.D., Leonides\(^5\) advocated a more radical form of treatment. He used both knife and the cautery, and in the process of dissection of the cancer went so far as to remove some of the healthy tissue. From 475 to 1500 A.D., great progress was made in the differentiation of cancer from other diseases. Paulus of Aegina\(^6\)(625-690 A.D.) was able to differentiate between endometritis and cancer of the uterus. Radical changes were made in the treatment of cancer by Avicenna\(^7\)(980-1037 A.D.) who employed arsenic in his treatment. Avenzoar\(^8\)(1070-1162), an Arabian physician, introduced esophageal sounds and nutrient enemata. In 1290, Lanfranchi of Lyons advocated radical surgery. In the interval from 1300 to 1368 two physicians, Henri de Mondeville\(^9\) and Guy de Chaulliac\(^10\), used both the knife and...
caustic arsenic. Harvey\textsuperscript{12}, in 1628, not only discovered the circulation of the blood but furnished aid in the diagnosis and treatment of cancer. In 1514, Andreas Vesalius\textsuperscript{13} identified deep ulcerations with cancerous ulcerations and necrosis. Fabricius\textsuperscript{14}(1537-1619) made a distinction between inflammatory swelling and cancer. He sounded a warning against incomplete removal of the lesion. Marcus Aurelius Severinus\textsuperscript{15}(1680-1686) described myosarcoma and classified tumors into malignant and non-malignant. His classification applied especially to tumors of the breast. He also extirpated the axillary lymph nodes in treatment of tumors of the breast. Semnert\textsuperscript{16}(1572-1637) and Lusitanus\textsuperscript{17}(1642) held to the idea that cancer was contagious. Paracelsus\textsuperscript{18}(1413-1541) overthrew the humoral theory of Galen and substituted for it a theory which maintained that cancer was due to an excessive mineral content in the blood. He maintained that with the excessive amounts of calcium and potassium, a deposit was made at the point which the cancer originated. Although this theory badly upset Galen's humoral theory, complete overthrow was not accomplished until 1652 when Olen\textsuperscript{19} discovery of the lymphatic vessels and Malpighi\textsuperscript{20} with his microscopic investigations swayed the trend of thought toward the possibility of lymphoid origin of cancer. Le Dran\textsuperscript{21}(1685-1770) thought that metastasis was accomplished through the lymphatics. He got the idea that juice from the cancer was transmitted through the lymphatic vessels to other parts of the body where its spermatogenic effects upon cells in this area produced an increase in mitosis of the cells. Astruc\textsuperscript{22}(1684-1766) separated cysts from true tumors, and showed that scirrhous and soft cancers were one and the same. Morgagni\textsuperscript{23}(1682-1772) established the pathological anatomy of cancer and described cancer of the internal organs. He also differentiated between gumma, exostosis, struma and lipoma and showed the difference between this and cancer. He had his doubts as to the
origin of cancer from lymphoid tissue. Peyrilhe (1735-1804) submitted an essay to the Academy of Lyons summing up the results of scientific investigations in the whole field. He held to the idea that cancer produced a toxin which was released on degeneration of the cancer cells and produced the cachectic condition of cancer. He held that the primary lesion was produced by a virus and attempted to prove this by injecting an extract into a dog. He was successful to the extent that he produced an abscess in the dog. The experiment was brought to an abrupt termination by a servant drowning the dog. He used carbolic acid in the treatment of ulcerations.

In Germany during the seventh century the clinical theory held sway. It was held that acid was the cause of cancer and that the treatment was the use of alkalies. Stahl (1680-1734) held that the disease was due to stasis of the blood, and consequently he treated it by bleeding. Hoffman maintained that it was due to a stasis and atony of living tissue which was thought, normally, to possess movement.

John Hunter (27) held that cancer was the result of coagulated lymph. Tumors received their nourishment the same as ordinary tissue, and developed according to the same biological laws. Hey (1736-1819) gave a detailed description of certain vascular tumors, and Wardop (29) in 1803 attempted to classify gross tumors and separate them from cancer. Abernethy (30) in 1804 attempted to give a definition of sarcoma with relation to soft tumors. Pott (1775) noted the frequency of cancer in chimney sweeps. Bichat (1801) observed the differentiation of tissues which make up cancer. He spoke of the parenchymatous tissue and stroma lying within the epithelial cells. Broussais (33) drew attention to the relationship of inflammation to occurrence of cancer. He stated that it never occurred in a normal tissue. Andral (34) thought that cancer originated from fibrin, and floated in the veins giving rise to metastasis.
In 1837 the classification of tumors was divided into four groups—hard, soft, pigmented and blood tumors. It was during this period that the modern conception of tumors originated. The general consensus of opinion at this time was that cancer originated from the serums and traveled via the blood stream. In 1826, Raspail by means of the microscope and stains discovered the mitotic division of cells. Collard (1828) described the various stages of embryological development and assumed that the cells originated from the lymph. At this same time J. Muller published a classical study of malignant tumors and classified them on the basis of different groups of cells found in the tumors, thus giving a clinical and anatomical basis for diagnosis of malignancies. He held that cancer developed not from normal cells but from germ cells isolated between the cells of normal tissue. Hannover, at this time, described tumors originating from squamous cells and named such tumors epitheliomata, and classified them as being different from cancer. He held that cancer originated in the blood and circulated as such. He further maintained that the origin came from a blastemic fluid. He classified blood into albuminous, chondrinous and glutinous forms in an attempt to place the etiology of cancer as a blood dyscrasia. This theory was supplanted by Virchow's cellular theory, holding that it was of connective tissue origin. In 1857, Thiersch traced epithelioma from the malpighian layer of the skin. Waldeyer extended Thiersch's idea to the internal organs and stated that cancer of these organs resulted from the epithelial lining of their structure. In 1873, Sir James Paget maintained that cancer was due to a constitutional predisposition.

From this review of the history of the disease we can conclude that down through the ages the conception of cancer has evolved through a myriad of conceptions as to its nature, origin, and treatment. Today the classes of tumors have been, by the aid of the microscope, definitely catalogued so that the confusion of various forms is practically eliminated.
Carcinoma as we know it to-day is a malignant growth made up of epithelial cells with a tendency to infiltrate tissues and spread to distant parts by metastasis.

Carcinoma of the rectum is like carcinoma of other parts of the body. It arises from the epithelial lining of the rectum and anus. Carcinomata of the rectum according to Miles are all of the adenocarcinoma type. This type can again be divided into four clinical types, namely, papilliferous, common adenocarcinoma, colloid, and melanotic carcinoma; each of which is characterized by its physical characteristics and malignant tendencies.

In the papilliferous type the growth resembles the simple papilloma except for its base which shows an irregular epithelial cell proliferation into the muscularis mucosa. The surface growth is quite rapid and soon involves the whole circumference of the bowel, producing an early obstruction in this type of carcinoma. Obstruction in this case resulting perhaps before the muscular coat is invaded. It is this tendency which makes it possible to make early diagnosis and gives rise to the idea that this type of carcinoma is not very malignant. There is seldom a recurrence after its removal.

In the adenocarcinoma the growth is of a different type. It forms a sessile tumor involving the mucosa and submucosa. It spreads in a transverse diameter rather than in the longitudinal. It soon becomes fixed upon the tissues of the canal, and in about six months infiltration of the deep tissues takes place. A definite ulcer is formed by the disintegrating tissue showing the characteristic malignant marking. The ulcer deepens, forming a crateriform nodular mass which spreads around the circumference of the bowel. When almost the entire circumference is involved a stenosis results from scar tissue producing an obstruction. Generalized metastasis has usually taken place before this occurs.
In this type of carcinoma metastasis may occur before scarcely any clinical evidence of carcinoma is present, making this one of the most treaterous classes for satisfactory treatment.

The colloid type is merely a degenerative phase of the above classes. All tissues, epithelial and connective, undergoing mucoid degeneration. Such growths are extremely malignant and recur rapidly upon removal.

The melanotic type is, fortunately, very rare, for such carcinomata in this region, as in other parts of the body, are extremely malignant. These growths occur either in the anal canal or low in the rectum. They are generally found upon the posterior wall of the rectum and are diagnosed only upon microscopic sections showing the pigmented cells, and this may sometimes be found only by examination of numerous slides.

Lockhart Mummery (42) also made a classification in which they divided these tumors clinically into classes for treatment. They had three classes, namely; (1) those which extend in the mucosa, (2) those which spread by direct extension into the muscle coat but not by direct continuity into the perirectal fat, and (3) those whose spread include the perirectal tissue.

ETIOLOGY

As we have seen, various theories have been set forth to explain the origin of cancer. In the historical consideration we see there was a great diversity of opinion among the ancient investigators as to the cause of this affection. Galen (4) with his humoral theory connected its origin with the bloody phenomena of menstruation and hemorrhoids; mineral and salt deposition by Paracelsus (18); origin from lymphoid tissue by Œlens (19); toxin and virus theory of Peyrilhe (24); chemical acids in nature as held by the German investigators of the
seventh century; stasis of blood and movement of tissues by Hoffman (26) and Stahl (25); coagulated lymph by John Hunter (27); fibrin origin by Andral (34); Muller (37) by the aid of the microscope presented the germ cell theory; the blood dyscrasia theory by Hannover (35); the blastema of connective tissue origin by Virchow (39); and the constitutional predisposition theory advanced by Sir James Paget (42).

The true factors to-day are not definitely known. We do know however, that it is a pathological physiological growth of cells which have failed to be governed by the law controlling supply and demand in the process of repair of the tissues. Just what stops proliferation of the cells in normal repair is not definitely known; and it is my opinion that, until this factor be known, will the true nature of carcinomata be understood.

The causes for setting into action of this process are thought by Frantzler (45) to be, chronic irritation, diverticulitis, inflammatory diseases, hemorrhoids and adenoma. We find Jelks (46) backing him up in this by his statement "Carcinoma of the rectum is always preceded by focal infection, inflammation, ulceration and protozoan diseases". The valves and flexures of the bowel being the most exposed to trauma by the passing feces are therefore the most common site of carcinoma. W. J. Synott (47) says "All authorities on malignancies agree that long continued irritation or chronic inflammation predisposes to cancer".

Another factor which seems to enter in is age. While generalized statements have been made that cancer is a disease of the middle aged and the aged, yet we see from the reports of some authors that no definite line can be drawn. Ellis Fischel (48) reported 44 cases, six of which were under 40 years of age, six between 40 and 49, twenty between 50 and 59, eight between 60 and 69 all of which were men, and four over 70 years of age. The youngest in this series was 27 and this a male. The oldest was a woman at the age of 79. L.M. McKillop (49) states that the incidence of the cancer age is between forty and sixty years, although he reports
a case in a girl 16 years of age. Doctor Russell Best (60) has told me personally that he has had one case in a girl 17 years of age and one of the cases that I will cite, which came into the University Hospital for treatment, was only 29 years of age.

In regard to the sex factor, it seems to be less in the females. Taking Fischel's(48) series, previously mentioned, 21 cases were females and 23 males. McKillop (49) in his record of a ten year period reports 2,197 deaths from cancer of the rectum and 913 of these were females and 1,284 were males. From statements made by various members of the staff of the University Hospital we gather that the incidence of constipation is higher in females than males, which would lead us to believe that, if carcinoma is due to chronic irritation, that the incidence would be much higher in the female than in the male.

METHODS of SPREAD

The methods of spread of carcinoma according to Miles (43)(51) are three in number, namely, (1) direct extension, (2) blood stream, and (3) lymphatics. Direct extension takes place in two directions, through the muscular wall and upon the surface. The latter being the less dangerous of the two, for at most only obstruction can occur. The extension is very slow and spreads mostly in the circumference of the intestine, taking about six months to encircle one fourth of the circumference of the ampulla of the rectum. Miles seemed to think that the duration of the disease might be determined from the amount of the circumference involved. The deep infiltration through the muscular wall is also very slow and, perhaps, not until eighteen months are the pararectal tissues involved through this method of extension. If these methods of spread were the only ones, control and treatment of the disease would be quite simple.

It is the two other systems, blood and lymph circulation, which produce the serious complications of carcinoma. The venous
system furnishes an outlet for the malignant particles to almost every part of the body. The most common route is by the portal system, whose blood supply meets its first capillary bed in the liver, and as a result this is one of the first organs involved by vascular metastasis. The ulcerating tissues erode into the venules and as a result detached groups enter the lumen and are whisked away by the blood stream to be deposited in fertile fields far removed from the primary lesion. Fortunately metastasis is rare and if present generally occurs late in the disease. It may be quite early, however, and small nodules in the liver may be overlooked in abdominal exploration. The lymphatic spread, however, the most common and occurs very early according to Miles, yet all authorities do not seem to share his opinion. To fully understand the various regions which maybe involved by this form of metastasis, it is necessary that we know something of the lymphatic drainage of the rectum. This has been covered very adequately by Miles. The lymphatics of this section are divided into three groups, namely, intramural, intermediary and extramural. The intramural is subdivided into the portion in the mucosa and the other in the muscularis. A free communication exists between these two. The submucosa communicates above, freely, with that of the pelvic colon and below with a network in the anal canal. From the anal canal network are ducts which lead to the perineal skin. From the perineal skin vessels lead to the innermost nodes of the horizontal group of the inguinal region. The intermuscular network communicates above with the pelvic colon and below with that of the sphincter ani. The collecting stems from the intermuscular group transverse the external muscular coat and enters the intermediary group. The intermediary group is divided into two divisions, a subserous lying in that portion covered by peritoneum and a network situated between the external muscular coat and the perirectal fat. The latter division is a massive labyrinth which empties into the extramural network. The extramural pass in three directions from the rectal glands and this
plexus in the perirectal fat, namely, downward, laterally and upward. The downward group pass with the inferior hemorrhoidal vessels through the ischiorectal fossa and enter a small group of nodes situated in Alcock's canal. From these communications other branches lead to the group of glands situated along the external iliac vessels. The lateral efferents enter a plexus situated between the levator ani and the pelvic fascia. From this, efferents lead to the obturator glands in the obturator foramen. From these still further spread is made possible by efferents leading to the internal iliac vessels and follow the course of these vessels. The network which leads upward follow the superior hemorrhoidal veins and enter the lower mesocolic glands. From here efferents follow the inferior mesenteric veins to a group of glands located at the bifurcation of the left common iliac vessels and glands along the aorta. Some of the upward spreading network pass with the paracolic network to the sigmoidal veins, ending in the median lumbar glands.

Thus we see from this variable network, carcinoma cells from the rectum may lodge in a myriad of different places, making it almost a surgical impossibility to remove all tissue into which metastasis has occurred. Spread in the intramural and intermediary groups scarcely ever takes place, so the surgeon's main concern is with this latter system (the extramural). This system is perhaps the one which gives rise to the wide spread metastasis before the carcinoma, clinically, is as yet scarcely recognizable. Cells passing by these channels may pass in any direction, depending upon the flow of lymph.

Dukes and Guthbert(52) states that lymphatic invasion does not occur until direct extension has penetrated the longitudinal muscular coat. They state that the direction of spread is mainly in the pararectal space and along the superior hemorrhoidal veins. The downward spread along the middle and inferior hemorrhoidal is negligible. They arrive at this conclusion after observation of 100 cases of carcinoma of the rectum.
SYMPTOMS

The common plea of those treating carcinomata in any region is early diagnosis, for only by diagnosing the condition early can we, with our present methods of treatment, hope to effect a cure. Therefore, in order to make an early diagnosis, the physician must be alert for the early symptoms, and what are the early symptoms?

Crockall (53) says that "Any unaccountable changes in bowel movements which have previously been regular should arouse our suspicion", and "Physicians are suffering from a rectal inferiority complex". This he ascribes to the false modesty produced by civilization. Rectal examination should be made routine in patients complaining of rectal discomfort, morning diarrhea or bloody mucus stool. He states that when ulceration occurs the disease has reached an advanced stage.

Fischel (48) reports on 44 cases and of these the most common symptoms were diarrhea and bleeding. Woolf (54) states that the earliest signs of carcinoma of the rectum are blood stained mucous stools, discomfort in the rectum, early morning diarrhea, constipation imposed upon a previously regular bowel action, and spurious diarrhea. McKillop (49) mentions rectal bleeding, rectal discomfort, and chronic sacral backache accompanied by morning diarrhea. Franzler (45) states that blood and mucus in the stool should always be regarded as a danger signal. Synott (47) says blood in the bowel discharges should always be regarded as dangerous.

In summing up the data from these authors it seems that the syndrome of cancer of the rectum is made up of blood and mucus in the stools, morning diarrhea, alternate constipation and diarrhea implanted upon a formerly regular acting bowel, low sacral backache with bloody stools, tenesmus, and later obstruction with gas and distention. Loss of weight appears only after the vital organs have been invaded or regular bowel functions have been upset. The presence of papillomata and nodules ascertained by rectal examination are suggestive of carcinoma, and should be regarded suspicious until proven otherwise.
The methods of diagnosis are based upon history, rectal examination, proctoscopic and biopsy, and X-ray findings. While a history in the diagnosis of carcinoma, early enough to permit successful treatment, is of great importance; it is also of great importance in ruling out other diseases. A history of a long drawn-out affair is very liable not to be carcinoma. The things which are of value in a history are only attained by very close questioning of the patient by the physician. They are things which would be readily passed up by the patient unless his attention was called to them. He would never think an early morning diarrhea of significance and perhaps not mention it if his attention was not called to it. Blood streaked stools or mucous stools would not be noticed by, perhaps, sixty per cent of the people, because of the tendency to jerk the chain and send the excreta on its way. An educational program should be instituted in which people should be taught to look twice before pulling the chain, especially if they have recurrent diarrhea or rectal discomfort and backache. Many patients come to the physician complaining of hemorrhoids, having had rectal distress and noted blood in the stool or have a low backache. The physician may either inject the hemorrhoids or advise surgical removal, to be confronted a year or six months later by an inoperable carcinoma. A digital examination at the time would have prevented such a catastrophe.

Such examinations should be made routinely and no case of hemorrhoids treated without first ruling out carcinoma (55)(47). Bloodgood (56) ascribes the high mortality in the treatment of cancer of the rectum and the late diagnosis of such a condition to the negligence of the patient or physician. Doctor Russel Best (50) states that at least thirty per cent of the carcinomata of the rectum lie within reach of the finger. The presence of any hard mass in the rectum should stimulate further investigation. Synott (47) states that "The greatest object of proctology is to facilitate in the diagnosis of early malignant growths and thus permit early treatment".

DIAGNOSIS
Best (50) thinks that at least eighty per cent of carcinomata of the rectum may be recognized by this method. X-ray is not of much value in early diagnosis but may be used in later cases where partial obstruction occurs. It can also be used to rule out an ulcerative colitis. Biopsy is used merely to confirm the other findings. No diagnosis is cinched until a biopsy is made" (50). A case at the University Hospital will prove this point. Although Synott (47) says a biopsy is not necessary, I think this case will point out the fallacy of such a stand. H.K., white, 65 years of age, was sent into the University Dispensary by an outcall student who had obtained the following history: severe diarrhea, blood in the stool, acute gastric distress and pain, loss of weight of about three weeks duration, but upon further questioning at the dispensary the patient stated that the symptom were present for four months. Patient was suffering considerable from gastric distress and was very weak from diarrhea. Digital examination showed a relaxed sphincter and extremely tender anal canal. About a finger breadth above the prostate on the anterior wall was felt a hard mass which protruded about one-half inch into the lumen. The mass extended lateral on both sides involving about three-fourths of the circumference and was slightly movable and smooth. Upon proctoscopic examination this mass prevented passage of the proctoscope beyond its border. It was light pink in color with no evidence of ulceration or inflammatory changes at the time. Doctor Best was asked at this time by one of the students if this was the normal color of a carcinoma of the rectum, to which he replied No. As a general rule there is a more hemorrhagic and inflamed condition and also necrosis in the growth of this size. The story seemed so evident that no biopsy was taken. The patient was referred to the University Hospital and prepared for operation. This was on February 22, 1933. An open colostomy was done by Doctor Best on February 25, 1933, at which time the abdomen was explored for metastasis but none was found. The patient showed marked improvement for three or four days and then started loosing ground.
He became distended as if an obstruction had occurred. This lasted for a few hours and then disappeared. The patient continued in a toxic condition and passed on March 12, 1933. Proceeding his exit, a considerable discharge was excreted from the distal portion of the gut. Autopsy showed ulceration of the entire colon, from cæcum to colostomy site and of the distal portion as well. The mass in the rectum had disappeared, and no evidence could be seen grossly. Microscopic examination of sections from the distal portion of the gut showed no malignancy, but microscopic examination of exudate from the ulcers showed amoebae. Autopsy diagnosis was ulcerative colitis of amoebic origin. Doctor Best stated that in any abdominal operation which was imposed upon an ulcerative colitis, the mortality was ninety per cent or better. He stated that this was the first patient whom he had operated for carcinoma of the rectum without first taking a biopsy. He also stated that even in the presence of an inflammatory finding with the presence of the mass he might have proceeded, as a large percentage of biopsies will show only inflammation even in the presence of a malignancy. Biopsy specimens are not always able to reach the malignant portion and then again the frozen section might not include the malignant portion of the section even though such was present.

TREATMENT

Treatment can be divided into two types, active and palliative. Under the former comes those devised to eradicate the disease from the body of the patient. This as we see owing to the intrinsic lymphatic network and venous drainage is sometimes a very discouraging and many times disastrous task. In approaching a task of this type, it is necessary to take many things into consideration. First comes the difficulties of the approach to the field. It is boxed in by bony structures, posteriorly and laterally, in which very little room is permitted for manipulation of instruments. Anteriorly the operator is confronted by the genito-urinary organs.
In the female this is made much more simple than in the male, for the approach can be readily made through the posterior vaginal wall with only a slight of damage to the parts. In the male, while the prostate may be removed, the urethra and bladder must be carefully dissected from the anterior wall. The bony wall limits lateral dissection and above the ureters and the great Iliac vessels must be guarded against. The next of importance comes the consideration of the happiness of the patient after recovery, if the operation is successful. The thing that confronts us most is putting the patient back into society so that he may take active part in the activities of business and social life without the eternal fear of embarrassment arising from accidents which might happen as a result of the artificial exit for excreta.

The question then comes up, can the sphincter be preserved with safety to the patient as far as eradication of the disease is concerned? Or can the patient be made comfortable with an exit abnormally placed in the abdominal wall or posterior through the sacral wall, where it will be a problem for the patient to take care of any containers for the reception of excreta and interfere with the patient sitting down? Another question is, can the rectum be removed so as not to interfere with future functioning of the urinary bladder and the ureters? The sexual life of the patient must also be considered. It has been these problems which have stimulated much activity and ingenuity on the part of surgeons treating patients so afflicted. Various operations have been planned seeking to solve the problems just mentioned.

Haden(57) says "Jacques Lisfranc in 1833 was the first surgeon to report an operative procedure for carcinoma of the rectum". He read a paper Before the French Academy of Medicine in 1830 in which he described a method used in nine cases between 1826 and 1830. He selected his cases and took only those which permitted the finger to pass easily, in the presence of a freely movable growth.
A circular incision was made around the anus and never over three inches, in the male and five inches in the female, of gut was removed. He found that peritonitis always resulted when more was removed. The dissection was carried along the bowel wall and cut across at the peritoneal floor. The wound was then left to fill in as best it might.

No operative work was reported for the next forty-seven years. Verneuil(58) in 1873 and Kocher(59) in 1874 increased the scope of the operation by removal of the tip of the coccyx. They also sutured the anus before removal of the dissected portion.

The first planned operation was given by Sir James Paget(41) in 1876.

Harrison Gripps(60) published three cases of perineal excision in 1884, one of which was alive after four years. It was on this that he wrote his prize winning essay.

Kraska(61) in 1886, increased the scope of manipulation by removing a portion of the sacrum. He did not remove the sphincter, but brought the gut down and attached it to the distal portion. This operation was used almost universally until 1900 and even to day it is still quite popular in Germany.

The first abdominal perineal operation was performed by Vicents Cerezy(62)in 1884. He became so enthusiastic in his progress with a perineal resection that he found it necessary to enter the abdomen in order to finish the operation. He, or no one else, used this method routinely after this until quem(63) in 1897 advocated its use. He was supported in America by Weir(64), Abby(65) and Tuttle(66). England, France and Germany still remained true to the Kraska sacral excision.

Allingham of England(67) introduced the colostomy in 1897, and Handley(68) showed by means of methylene blue that it was possible for carcinoma cells to be carried in the lymphatics of the submucosa. This started a campaign for removal of more of the fat and as a result
a wider field of operation was desirable. Cripps(60) maintained that one
inch above the lesion was sufficient and stated that the main spread was
in the connective tissue outside of the bowel wall. Handley(68) convinced
his colleagues that he was right. There was a radical change in the method
of approach. The prevailing custom was to bring the gut down to the anus
or to form a posterior opening which required the removal of the coccyx
and part of the sacrum. The inguinal colostomy was done without abdominal
excision, when done at all. Recurrence ran high because the perineal
excision was inadequate. In 1903, Miss Aldrich Blake(69) introduced into
London the abdominal anal excision. This consisted of a perineal dissec-
tion accompanied by some abdominal dissection. The bowel was still
mobilized and brought down to the anus. No widespread dissection of
abdominal tissues or pelvic tissues was accomplished by this operation.
Mayo(70) reported a series, in 1906, of 26 cases operated on by a modified
quenu(63) procedure. During the preceding five years he had used this
method of resection of high growths. He resected low in the sigmoid and
brought the gut to the surface in an abdominal colostomy. He used the
loop of the sigmoid as a collecting trap for the feces. Seven of the
twenty-six died and seventeen recovered. Three were alive for three
years, five for two years, and seven for one year. Two were untraced.
He used the Kraska(61) method for low growths. These cases ran about
twenty-six per cent mortality. Sixteen per cent were alive after three
years.

Hausman(71) reported on 112 autopsies in which carcinoma was
limited to the bowel in 55, to the lymphatics in 36, and a generalized
metastasis in 21.

Miles(72) published a report in 1906 in which he described an
abdominal perineal method which he had used since 1906. Previous to this
he had used a simple perineal resection and had had recurrences in 54 out
of 57 cases. Out of twelve cases reported by this new method, done in a
one stage abdominal perineal manner, five died, a mortality of 41.8 per cent.
The first three patients operated were three year cures at the time of the report. He blamed the high mortality on lack of technique, at this time he emphasized the importance of adequate removal of the pelvic mesocolon thus removing the gland bearing area. In 1910 he(61)definitely demonstrated that carcinoma might be transmitted in three zones. At this time he was removing all pelvic tissue and gland bearing surfaces. He also made a permanent colostomy. He had only 10 deaths out of 26 cases. Twelve cases survived for 7 months to 3½ years without any recurrence. Two had recurrences and one died in 13 months without recurrence.

In 1910, Mayo(73)reported on 120 cases operated during the past 12 years. The various procedures had been done. Ninety-four by the perineal route, twenty-six by the abdominal perineal route, of which he did a permanent colostomy in six and in the others the sigmoid was anastomosed to the anus. In the total series the mortality was sixteen per cent. Thirteen out of sixty were alive after three years. He concluded that the abdominal perineal method held many advantages and also permitted a wider dissection. In 1912 he(74)he reported another series of 71 cases, since the close of the previous series. There were 27 by the sacral route and 44 by the abdominal perineal route. Of the 44 fourteen were done in a single stage operation. Only five deaths occurred. He did four anastomoses to the anus and ten left inguinal permanent colostomies. When doing a two stage operation, the inverted distal end was dropped below and the peritoneum sutured together forming a floor over the top of it. This was performed on thirty cases and four of these died.

In 1910 only the Germans remained true to the Kraska(61) method. French surgeons and Miles(51)of England were converted to the abdominal perineal method. The Miles(72)one stage method was too drastic and carried a high mortality to be applied to all cases. It was especially unsatisfactory when used on old, fat or otherwise enfeebled patients. Special methods had to be devised to take care of these patients.

Mayo(74) was the first to report a series of cases in which
the two stage operation was used. He did a preliminary end colostomy, and inverted the distal portion, placing it below the peritoneal floor. At a later date he resected the distal portion. Of 30 cases treated in this way the mortality was only thirteen percent, and where the whole procedure was accomplished in one stage the mortality was 35 per cent. These results shows quite a marked improvement over Miles' report of 41.8 per cent mortality in his first series by the abdominal perineal resections.

Coffee(75)(76) reported 8 cases in which he ligated the superior hemorrhoidal vessels, did a permanent end colostomy, passed a catheter by way of the anus and with this draw the inverted distal fragment out of the anus. He closed the peritoneum over the inverted distal fragment and waited 12 to 20 days at which time there was a line of demarcation produced by the ligation of the superior hemorrhoidal vessels. This could be easily dissected out. The cavity thus formed was allowed to granulate in and fill as best it might. In 1924 he published in complete form a method which can be varied to suit the type of patient being operated upon. The method, similar to the one above, could be done in one stage or if two stages were required wick drains were brought out from the pelvic cavity suprapublicly in the males and through the posterior vaginal wall in the females. This drained the cavity formed beneath the closed peritoneum in the pelvis. The first stage consisted of three manoeuvres. First, an exploration of the abdominal organs, second, colostomy and closing of the peritoneal floor and drainage of the cavity formed beneath, and third, pulling the inverted distal end out at the anus. For the second stage a definite line of cleavage had been formed by the ligation of the superior hemorrhoidal vessels. In his report on 47 cases, he reported only two deaths.

Jones(77) in 1915 attempted a modification of Mayo's(73) procedure. He published a two stage procedure in which a loop colostomy was brought to the surface in the left inguinal region. The superior hemorrhoidal vessels were ligated but the sigmoidal branch from the left
coli were spared to preserve the blood supply to the sigmoid. The sigmoid and rectum were dissected loose and the peritoneum closed around them.

Ten days later he removed up to the peritoneal floor by perineal dissection and cut across the gut, thus leaving a pouch distal to the colostomy. He says this maybe applied over a wide range of cases and is safe. His objection to Mayo's method was that the buried stump gave rise to septic conditions when left for a period in contact with the macerated pelvic tissues.

Mummery performed a two stage in which he first did a simple colostomy and, second, a resection below the peritoneal floor.

Lehey performed an end colostomy but did not ligate the vessels which lead to the portion to be removed. The severed end of the distal portion was left in the mid-line incision until the second stage was to be performed. The second stage required going into the abdomen the second time and dissecting the pelvic tissues, closing the peritoneal floor and ligating the vessels. The distal portion was then removed by the perineal route.

Rankins describes a method in which an end colostomy is performed and the sectioned distal end is dropped into the peritoneal cavity. Six weeks or later, he approaches from below until the peritoneal floor is reached. Then protecting the sutured anus with a rubber glove covering, he pushes it up into the resected cavity. He closes the perineum with sutures and then opens the abdomen, ligating the vessels and removing the pelvic tissues. He brings the distal portion out through the abdominal incision. After finishing the abdominal part of the operation, a suture is cut in the perineal region and drainage established.

The advantage of this operation, he maintains, is that the patient may go home while he is waiting for the second stage. He emphasizes adequate preliminary preparation. With this method he states that he has lost only one case of the 23 operated.
Bartlett and Bartlett\(^{(80)}\) published a unique method which is just the reverse from the others described. It is a one-stage operation which begins first by dissecting the perineum and followed by abdominal removal. The preliminary preparation is performed by making a coecostomy, helping to give a sterile bowel below the opening and to clear out any fecal material which might be present. When a sterile bowel has been obtained, the perineal procedure is then carried out. This is carried up to the peritoneal floor, at which time, protecting the dissected portion with a rubber glove it is shoved against the peritoneal floor. The patient is now turned over and approach is made with a left mid-rectus incision. The peritoneal floor is opened and the resected portion is brought out through the abdominal incision. Dissection of the mesocolon and gland areas is then performed with all motions toward the operator rather than away as in the other methods. The gut is mobilized as far up as necessary and brought through the abdominal incision. A clamp is applied to the gut at the desired height above the lesion. The wound is closed with a clamp on the cut side and left until necrosis allows the clamp to drop off. The wound should be well healed by this time and no infection should result from the bowel discharges. With this out-let the coecostomy closes itself. He maintains that this method will prevent blowouts and necrosis at the site of coelostomy.

What does this type of treatment offer the patient? Hayden\(^{(87)}\) states that a complete operation for these types are practically the only cure for the disease. Cures have been reported as high as 75 per cent in selected cases by competent men and 25 per cent of all cases seen. A coelostomy is very satisfactory after the patient has learned to care for it. He states that Miles operates 33 per cent of the cases that come to him using the one-stage procedure and in 1909 had reduced his operative mortality to 9.4 per cent, using spinal anesthesia, whereas with ether or chloroform his mortality was 36 per cent. He reports a five year cure in 71 per cent of the operated cases.
Jones(77) operated about 65 per cent of the cases coming under his observation, selecting his method of procedure to fit the individual case, with a mortality of 12.5 per cent in his private patients and 33 per cent in his hospital patients. With his one and two stage operation he has obtained results in which 70 per cent of the cases were living and well after 3 years, and 50 per cent after five years. In the favorable group his five year cures ran about 72 per cent. Mummery(44) reported his cases with about the same results. Hayden(57) reported a series of 18 cases in which the operative mortality was only nine per cent.

So we see from these reports, a marked improvement has taken place over the earlier methods of treatment by surgery. Where the recurrence was practically 100 per cent by the earlier methods of treatment, it is now reduced to a mortality around 10 per cent.

Another phase to be considered in the active treatment is the use of the X-ray and radium therapy. Hayden(57) states, "Although radium and X-ray treatment often of benefit in inoperable cases, their use as a substitute for resection, when the latter is feasible, is to be condemned". He gives a series of cases in which he shows a very high mortality resulting from the use of radium therapy.

Schreiner and O'Brien(81) reported 210 cases treated by radium between 1914 and 1925. The cases up until 1921 were treated with low voltage and radium emanations. Of the cases reported up until 1925, group one shows a 17 per cent of five year cures and group two 1.4 per cent of five year cures and a number of which showed an improvement for one to four years after paliative treatment.

Smith, Boving and Frick(82) state that tumors of the rectum are now dealt with most effectively by operation and radium and the best results may be secured by combining the two. They reported on 127 cases passing through the radium therapy department of the Mayo Clinic during the period from 1923 to 1927. These cases were divided into operable and
inoperable by Coders classification which is based upon biopsy reports and extent of the growth. It was found that the most undifferentiated cells responded more readily to radiation. In 62 per cent of the cases colostomy was done. In 29 per cent no colostomy was performed. Exploration was carried out in 2.36 per cent and local excision in 2.36 per cent. About 20 per cent of the cases were considered operable. In 38.63 per cent of the cases complete radium therapy was carried out. In 36 per cent only limited treatment was carried out and in 9 per cent of the cases the treatment had to be stopped. In 17 per cent of the cases only prophylactic measures were used. All applications were made with the aid of the proctoscope. Ninety-two of the 103 patients were improved and 24 were not treated. The treatment in this series of cases was carried out by application within the rectal lumen. This method, according to Synott (47), causes increased pain and proctitis accompanied by muscle spasm. He says that radium has little value as a cure of rectal tumors. He also has the same opinion of X-ray therapy. He does, however, think that it is the proper treatment of the squamous cell tumors of the rectal canal. This and its use in palliative treatment are the only uses for it in the treatment of tumors of this region. Polyps, which he holds are precursors of carcinoma, should be treated with electro-coagulation; and in cases of very early malignancy electro-coagulation may also be used.

Crockall (53) states that medullary tumors are most common to the young, while scirrhus tumors are the rule of old age. It is the common knowledge that the more undifferentiated the cell the more sensitive it is to radiation. Charles Gordon Watson (53) states that "The rapid growing adenocarcinoma of young is more sensitive to radiation than that of the slow growing tumor in the older patients and much more liable to recurrence after removal". This would seem to indicate that when possible radium and X-ray therapy might find its most value in conjunction with surgery in the treatment of carcinoma cases in young patients. This, I
think, from the different authors I have read, seems to be the position that radium and X-ray therapy should hold. Some use it as a preparatory method to form cicatricial tissue to prevent escape of dislodged cells during the operative procedure. Although several reported five year cures, yet most physicians and surgeons hold with Watson(83) when he says, "Radium is not certain enough to use in the place of surgery in early carcinoma".

Gaarenstroom(84) reported two cases when first seen were thought to be inoperable but upon radium and X-ray treatment in conjunction with a colostomy have cleared up and showed no further signs after six years. One of these cases was 27 years of age and the other 55 years of age. Various cases of this type have been reported in the literature, but innumerable failures have resulted in so many cases that not much faith is placed in this treatment during the early stages. Treatment, in the main, of early carcinoma is still that of surgery. Improvement in the technique may, however, change this.

The approach to the field is just as difficult for the radiologist as the surgeon, so we have various methods of application. Smith, Fricke and Bowing(82) made direct application through the lumen of the gut. McKillop(49) and Klivington(85) made use of needles and radium seeds. The needles may be implanted directly into the center of the mass, thus giving a better exposure to the whole field without the risk of exposure to surrounding tissues. These are used in the lower growths. In the higher growths an abdominal laparotomy is made and the seeds planted directly into the growth and surrounding glands. These do not require a second operation for removal as they are not removed. McKillop(49) states that best results are obtained with the use of the radon seeds backed with large doses of X-ray.

No definite dosage has, at present, been worked out. The amount given is generally dependent upon the reaction of the patient.
The general opinion seems to be that massive doses up to the point of toxicity to the patient is best. It is generally held that the more complete the first treatment can be, the better, as carcinoma cells develop a radio sensitivity which makes future applications of very little value.

X-ray treatment is handicapped by the fact that so much normal tissue must be exposed in order to give the proper dosage to the tumor mass. To avoid this, shots are given from various angles making the tumor mass the center of which all lines of rays meet. The low tumors present one more angle in that they may be reached through the perineum.

In palliative treatment the aim is to make the patient comfortable and to prolong the span of life as much as possible. Both surgical and radiation treatment have been used. It is perhaps in this field that radium and X-ray are of most value. These treatments seem to reduce the size of the growth, but in some cases produces scar tissue and contracts the lumen, giving rise to obstruction and at times much pain. Most authors seem to think that colostomy is to be performed in these cases only when obstructive symptoms are present. Some say that every case should have the benefit of an abdominal exploratory. Abdominal manipulation, however, seems to only increase the rapidity of its course in some cases. In many others it has given quite a comfortable existence of from six to eighteen months.

The indications for treatment and the type of treatment depend upon several factors, namely, the progress of the disease, the physical condition of the patient, the location of the lesion, the type of lesion, and the attitude of the patient. While some still hold that radical excision is unnecessary, the general consensus of opinion is that all early carcinomata should be radically excised and complete removal of the channels of spread. This is to be undertaken only if the mass is freely movable and has not obstructed the lumen and upon abdominal exploratory metastasis is not found in the liver. The extent of the operation
depends upon the physical condition of the patient. The medullary carcinomata and those of the anal canal respond to radium and may yield to this type of treatment if the patient cannot be sold to an operation or if no competent man can be found for the job. With spread to the liver or cases considered inoperable, only palliative treatment is indicated.

SUMMARY

1. Carcinoma has been recognized since the time of the ancients. Various theories as to the etiology have prevailed and varied treatments have been prescribed.

2. Carcinomata of the rectum are governed by the same biological laws as carcinomata in other parts of the body. The carcinomata of this region are all adenocarcinomata which are divided into clinical types; papilliferous, adenocarcinoma, colloid and melanotic.

3. The type of growth and the nature of the cellular makeup determine the malignancy of the disease.

4. Various factors have been mentioned as the cause of cancer, such as, chronic irritation, inflammation, heredity tendency, misplaced embryonic cells and hormone. The true etiology is at present unknown. Chronic irritation, physical and chemical, do play a part. Although it has been found in youth, old age appears to be a factor. Males seem to be more susceptible to cancer of the rectum than females. Heredity also appears to have some bearing upon cancerous growths.

5. Carcinoma spreads by three methods - direct extension, blood stream and lymphatics. The liver is the most common organ affected by blood stream metastasis. The lymphatic spread is in three directions, namely, upward, lateralward and downward. The lymphatics give the earliest and most dangerous metastasis.

6. The typical text-book symptoms are symptoms of late
carcinoma. Any irregularity appearing upon a regular functioning bowel should be treated with suspicion. No hemorrhoids should be treated without first ruling out carcinoma. Digital rectal examination should be routine. Proctoscopy is the most efficient means of diagnosis. Biopsy should always be taken.

7. Early diagnosis will save many lives.

8. Early carcinoma can be cured.

9. Treatment should fit the patient. In other words no treatment has been devised which is satisfactory for all cases.

10. Various surgical procedures have been brought forth to meet the various cases. The two-stage abdominal perineal perhaps gives the larger percentage of cures although it carries a higher mortality. The perineal resection does not give ample dissecting space or permit satisfactory obliteration of the field of spread. It does not permit exploration of abdominal organs for evidence of metastasis. Radium is not reliable enough although several cures have been reported. It is a valuable asset when used in conjunction with surgery. Radium is the best instrument we have for palliative treatment.

11. Colostomy is not the despicable condition that it was first thought to be, and many people comfortably fill their position in the social and business world in spite of their colostomy.

12. The evolution in methods of treatment has made possible a prognosis of 40 per cent cures and 90 per cent relief from symptoms.

13. More heed given to symptoms and education of the public will serve to reduce this to a considerable degree.
CASE REPORTS

CASE I.

Reported on page 14.

CASE II.

Mrs. G.S., age 79, white, female, widow, was admitted to the University Hospital 4/26/32 complaining of difficulty in bowel movements and pain in the rectum. Last December she noticed burning in the rectum during bowel movements and difficulty in passing the stool. These symptoms had never been noticed before. Symptoms have gradually increased and pain has become quite severe. Patient has to take enemata to get a bowel movement. There is a sensation of an obstructive mass in the rectum during bowel movement. Has to strain a great deal. There has never been any bloody discharge or protrusion of the rectum noticed. No alternate periods of diarrhea. No loss of weight. Family history negative for carcinoma. Physical examination showed a well developed individual of about stated age and well nourished. Heart revealed a murmur, systolic in time, over mitral area. Abdomen showed a scar in the R.U.Q. Liver one finger below G.M. No palpable masses elicited. Rectal examination showed a hard palpable smooth mass 1 ½ inches from the anal opening and surrounding the rectum, also adherent to the right side. There was no marked fixation. Doctor H. Davis saw patient 4/27/32 and reported a hard nodular growth extending half way around the rectum, 4cm from the external opening. The mass was about 3 cm. long on the left wall. Advised biopsy and a sigmoid-ostomy if the report was malignant. Dr. Brown saw the patient 5/6/32 and pronounced it a fixed mass and advised radium. Dr. Hunt saw patient on the same day and stated that radiation therapy might retard the growth for a certain period but it was improbable it would cure. Patient was seen by Dr. Summers 5/7/32 who advised against operation. Patient was dismissed without treatment. Opium suppositories were recommended for pain.
CASE III.

R.F. age 76, male, white, a janitor, entered the University Hospital complaining of diarrhea for past 3 or 4 months. Average of three or four stools per day. The stool is formed but has been streaked with blood for past 3 or 4 months. Patient has been well and symptom free until 4 months ago when he noted bright red blood on stool. At this time bowel movements which had been one per day now were increased to three or four. This diarrhea has not become worse since the onset. No increase in the amount of blood. No pain associated with defecation. Never had clay-colored or tarry-black stools. Patient remained at his work until entrance to the hospital. Has not felt as strong for the past year and with onset of diarrhea felt sick enough to mention it to a coworker. Patient was referred to Dean Poynter who advised hospitalization. Patient said food has not tasted as well since onset of P.I. Fourteen pounds loss of weight in six months. Mother died of cancer of the uterus.

Physical examination show a well nourished and well developed individual of about stated age with a marked kyphosis of the thoracic region.

Liver was one finger below costal margin, spleen was palpable, ascending and descending colon palpable and contained fecal material. No abdominal tenderness. Bladder was three fingers above the symphisis. Rectal examination showed a small hemorrhoidal tag externally and the sphincter relaxed.

Prostate enlarged but not hard. Formed fecal material in the rectum. No blood on the examining finger. Dr. R. Best did a proctoscopic examination and reported a carcinoma of the rectum. Barium enema showed mass causing partial obstruction on anterior wall. Fifteen hundred mg-hrs of radium was given and followed later by deep X-ray therapy. Three weeks later 900 mg-hrs of radium was given and five days after this the tumor was about one half its former size and two days later it had completely disappeared.

Patient was then dismissed and is now in an old folks home happy and comfortable.
CASE IV.

J.H., age 78, white, male, retired railroad man, widower, entered the University Hospital 1/25/33 complaining of pain and bleeding from rectum, incontinence of the bladder and rectum, tenderness in lower abdomen. Patient has not felt well for the past two years. Has gradually become weaker and had a "Dead" feeling in the stomach. He was advised by a doctor to get a check up of the G.I. tract for a possible malignancy but refused. He has had severe constipation for past 1½ years. About 5 months ago the stool became small in amount and all were bloody and dirty black. He has had incontinence for the past 6 weeks, first of feces then the urine. Has had difficulty in starting his urinating and the stream is small. His appetite has been fair. Lost 20 lbs. in past 6 weeks. Had occasional bloody urine the past month. No family history of carcinoma. Physical examination - well developed and fairly well nourished and about 10 years younger than stated. Abdominal examination - spleen was palpable and moderately enlarged. Liver three fingers below C.M. No nodular irregularities. Moderate fullness of the lower abdomen with a questionable mass on the left with tenderness. Rectal examination showed a marked relaxation of sphincter, a hard contracted tubular mass about 1½ inches above the anus, more prominent posterior and to the right. Prostate appears to have implants in that region. A proctoscopic was done 1/26/33 and reported an inoperable carcinoma. A hard irregular mass completely encircling the lower rectum, invading sphincter muscle and prostate. Examining finger extends through the hard tubular area to the full length of the finger. It was impossible to introduce the proctoscope. No masses elicited in the abdomen. No fluid in the abdomen and liver was down 1½ inches below C.M. Opinion was that patient would be more comfortable with colostomy followed by X-ray or radium. Colostomy was performed 2/1/33. X-ray was given on 2/17/33 - 600 units. The patient was dismissed 2/23/33.
CASE V.

Mrs. R.V., age 37, white, housewife, entered the Uni. Hosp. 11/11/32 complaining of gas and pain in bowel for past four months. Two years before was aborted of a 7 months baby because of diabetes and has not felt good since. Sleepy tired feeling with diarrhea. Diarrhea stopped 4 months ago and at that time pin worms were noted in the feces and patient became somewhat constipated. Patient has been taking S.S. enemata and salt water enemata for the past 4 months. Has noted a bearing down sensation in the rectum during the past 4 months with blood in stool, constipation, gas, and low back pain. Symptoms have been getting worse. Painful urination. Used cold wet cloth to start urine for past month. Rectum feels sore and hurts to pass stool. Family history—father died of carcinoma of the stomach. Physical examination—patient to lying in bed, large ventral hernia, liver 2 cm below C.M. Suggestion of a mass in L.L.O. Tympanitic abdomen. Vaginal examination—large mass pushes into posterior wall not associated with uterus. Rectal examination—stony hard fixed mass on left wall of rectum 4 cm in diameter. Bimanual examination revealed a nodular mass involving the anterior and right wall of rectum and pushes lumen to left where it barely admits the finger tip. Posterior vaginal wall infiltrated. Mass is fixed. No nodules in the liver. 11/12/32. Drs. Conlin and Bridges advised colostomy. Abdominal peristalsis has been visible through abdominal wall for past 3 or 4 months. 11/13/32. Dr. Best saw patient and made the tentative diagnosis of carcinoma of the rectum, advanced stage. Petrolagar, belladonna and opium suppositories recommended with an oil enema at night. 11/14/32. Biopsy taken and 45 mg of radium given per vaginal vault filtered through 3 mm of lead. 11/15/32. Dr Brown advised colostomy. Second application of radium made. 11/16/32. Colostomy was done following a total radium radiation of 400 mg-hrs. 11/20/32. Colostomy opened with cautery. 12/2/32. Colostomy belt applied and patient dismissed.
Case VI.

Mr. W.S. age 28, white laborer, entered the Uni. Hosp. 10/17/32 complaining of bleeding on defecation, pain, constipation, distension, weakness and loss of 30 lbs. of weight. He also complained of low lumbar pain and nocturia. Had no complaint, except for itching around the anus, until January 1932, at which time he developed constipation and flatus and pain and bleeding on defecation. Tenesmus and a desire to pass more at the completion of bowel movement. Sometimes goes to stool with this feeling and is unable to pass any stool. Sometimes only the feces is streaked with bright red blood, other times perhaps a teaspoonful of pure blood is passed on straining. Pain usually comes on following bowel movement. Attempts at defecation sometimes produce generalized abdominal pain and distress as well as pain in the rectum. Has pain in lumbar muscles since January 1932 which has been relieved by hot applications.

Family history- mother died of carcinoma of the uterus. Physical examination- well developed and well nourished and up about the ward with no apparent distress. Abdomen flat, good muscular tone, no masses or tenderness, liver and spleen not palpable. Rectal examination- no external tabs, fissures or masses. Sphincter tight. Tenderness over prostate which was not enlarged and quite soft. 10/18/32. Dr. Brown requested a proctoscopic examination which revealed an annular carcinoma of the rectum about 4 inches above the sphincter partially obstructing the lumen. A biopsy and frozen section revealed malignancy. 10/26/32. Colostomy first stage was performed. 10/27/32. Loop of bowel opened. 11/9/32. Laparotomy for removal of carcinoma was done but on palpating the liver metastasis was present. Incision closed without excision of carcinoma. The patient was dismissed 11/22/32, with no further treatment.
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