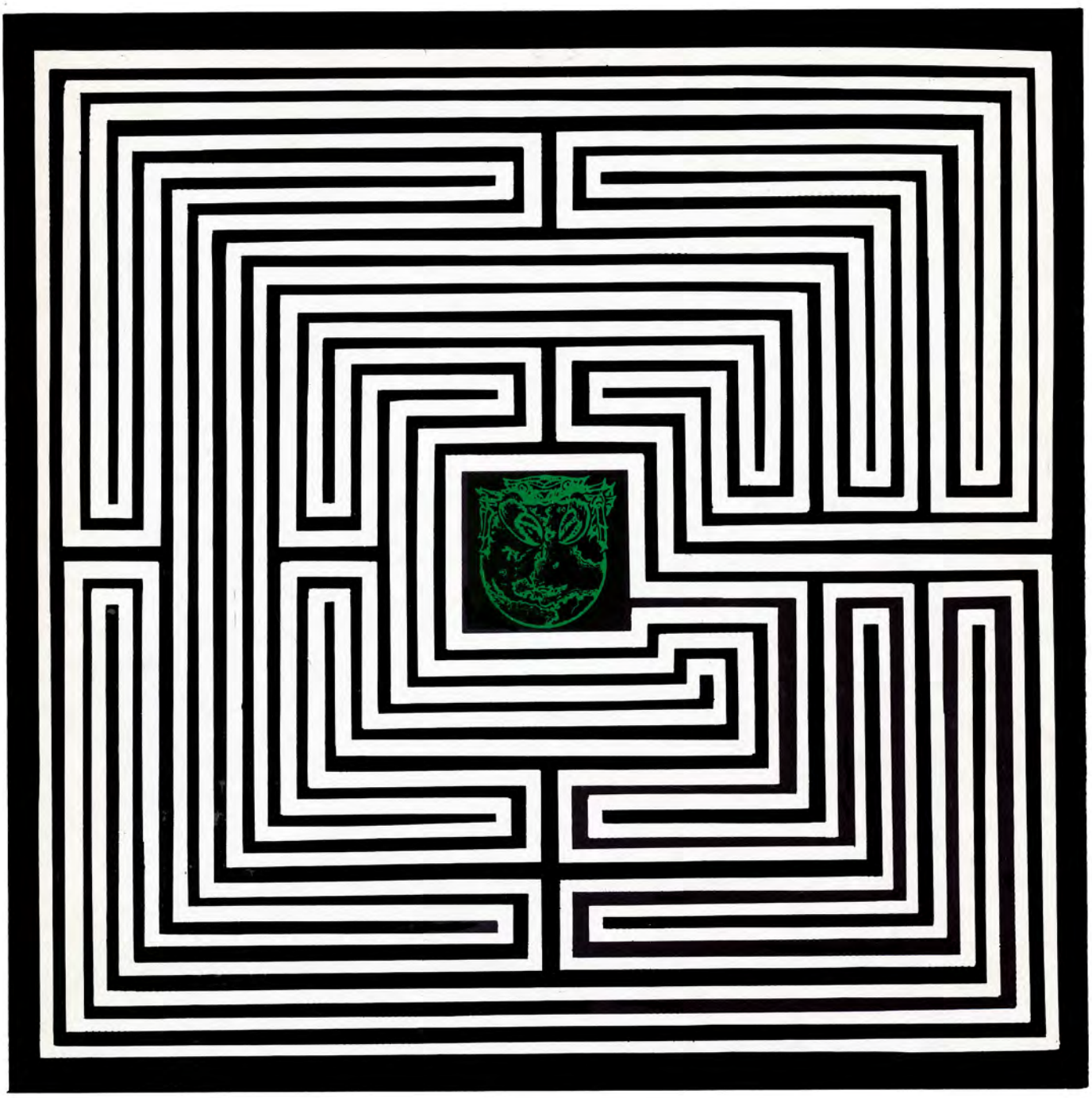

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Juan A. del Regato, *Editor*

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Charles Eckert, M.D.

Malcolm H. McGavran, M.D.

Robert D. Moseley, Jr., M.D.

GASTROINTESTINAL TUMORS

With this CANCER SEMINAR on gastrointestinal lesions, these radiologic-pathologic excises entered a third decade of annual events in Colorado Springs.

On this occasion the guest radiodiagnostician was Dr. Robert D. Moseley, Professor and Chairman of the Department of Radiology of the University of Chicago; he proved a master at the interpretation of limited radiographic evidence in the light of the available clinical information. Dr. Malcolm H. McGavran, Professor of Pathology, The Pennsylvania State University College of Medicine, Hershey, Pennsylvania, was our guest pathologist; Dr. McGavran displayed his unusual insight in histopathology of neoplasia; we owe to him the excellent photomicrographs which appear with the text and their carefully composed captions. Our third speaker was Dr. Charles E. Eckert, Professor of Surgery, The Albany Medical College of Union University, Albany, New York. Dr. Eckert, a recognized authority, gave freely to the discussion from his wide experience in surgery of cancer.

On December 7, 1969, this CANCER SEMINAR was repeated, in Spanish, at the 13th Centro-American Medical Congress held in Managua, Nicaragua. The guest speakers in Managua were: Dr. Luis Martínez, Associate Radiologist at the Mount Sinai Hospital of Miami Beach and Assistant Professor of Radiology, University of Miami, and Dr. Carlos Pérez-Mesa, Chief Pathologist at the Ellis Fischel Cancer Hospital at Columbia, Missouri, and Associate Professor of Pathology, University of Missouri. The proceedings of the CANCER SEMINAR in Managua are to be published in Spanish; some of the opinions emitted by the radiologists and pathologists in Managua, are included in this publication.

Without the offerings of the many friends who understand the requirements and value of these CANCER SEMINARS the exercise could not have a proper base to operate. The numerous eminent participants and their contributions to the discussion complement the proceedings which are herein presented. To all we extend once more our sincere thanks.

礼賀塔

J. A. del Regato, M.D.
Colorado Springs, Colorado
June, 1970

1. *Malignant Lymphoma of the Stomach*

Contributed by: **Jim Lipo, M.D.**, Denver, Colorado

THE PATIENT was a 52-year old man in June, 1969, when he gave a history of melena which occurred seven months previously. One month previously he had had an emergency suture for perforated gastric ulcer in the region of the fundus; biopsy was reported negative. He did well post-operatively. The hematocrit was 34%, gastric acid was 16.2 mEq/l and the pH was 1.88.

Dr. Moseley: There is no question of the value of roentgenographic examination of the stomach in patients with upper gastrointestinal symptoms. The accuracy of the radiologist in *detecting* all stomach abnormalities is widely accepted as being between 85 and 95 per cent. Differential diagnosis particularly of whether a gastric ulcer is benign or malignant is, however, more controversial. Wilson, and associates, have made a statistical evaluation of 70 radiographic signs and clinical findings, pertaining to benign and malignant gastric ulcers, that is useful on considering this case as well as several others that face us today. Of these 70 signs of findings, 17 were found to be statistically valid (probability limit of 0.05 or less). Ten of these 17 statistically valid variables are radiologic, and the most helpful radiologic information relates to the characteristics of the ulcer crater. Benign ulcers have as statistically significant parameters: a smooth border, are round or oval and regular, are symmetric, are small (of the order of 1 cm in diameter), project outside the gastric contour (in 70% of cases the base is on or outside the contour), rarely show gastric wall rigidity, have no associated mass, are more likely to have radiating folds, and may well be associated with a duodenal ulcer. In addition, clinical findings may be helpful: 20% of patients with benign ulcer are over 64 years of age, 39% are under 54 years of age; 73% of patients with benign ulcer will have had recent changes in their symptoms, but only 19% have obstructive symptoms.

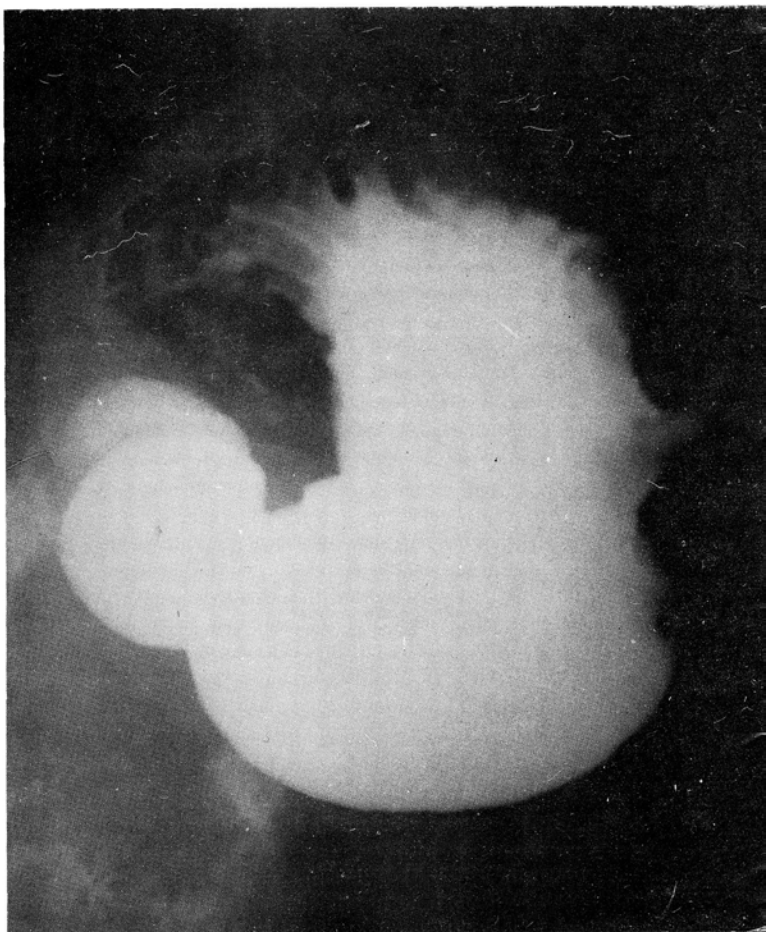
The characteristics of malignant ulcers are: an indistinct or nodular border, an irregular shape, asymmetry, a larger size (with 12% over 5 cm in diameter), lack of projection outside the gastric contour (base is on or outside the contour in only 4% of malignant ulcers), 80% will have rigidity of the gastric wall, an adjacent mass is frequent, about 33% of cases have radiating folds and associated duodenal ulcers are far less common than in the case of benign gastric ulcer. From the standpoint of clinical findings: 60% of patients are over 64 years of age and only 8% under 54; recent change in symptoms occurs in only 36% of cases but 52% have obstructive symptoms. Forty-eight per cent of patients with malignant ulcer have no gastric acid and 28 per cent of patients with benign gastric ulcer have no gastric acid.

On the basis of analysis of these statistically significant variables in relation to this case, my first diagnosis is ulcerating gastric carcinoma. The ulcer crater on the greater curvature side of the body of the stomach is relatively large, appears to be surrounded by the nodular border of an adjacent mass, has its base within the contour of the stomach and fails to project outside a presumed gastric contour. From the standpoint of clinical findings, the patient is not in the age group of highest incidence, there are no reported obstructive symptoms and there have been recent changes in symptoms; despite this lack of support from the clinical findings, the radiographic findings lead me to a diagnosis of ulcerating carcinoma as the first choice.

In consideration of other possibilities for differential diagnosis, my previous comments may be interpreted as placing benign gastric ulcer very far down the list, if not excluding this possibility entirely. It is not particularly disturbing even that a negative biopsy was obtained during the press of emergency surgery for the recent perforation. One would have to consider the possibility that the lesion is a lymphoma rather than a carcinoma (Nicoloff and associates).

In gastric lymphoma, the most common histologic diagnosis is small cell lymphosarcoma, but Hodgkin's disease and reticulum-cell sarcoma also occur. The duration of this patient's illness, over 7 months, is compatible with lymphoma, as is his age. We are not told about weight loss or pain, which are the most common symptoms in lymphoma. Bleeding is not uncommon in

Fig. 1—Large ulcer crater on the greater curvature of the body of the stomach.



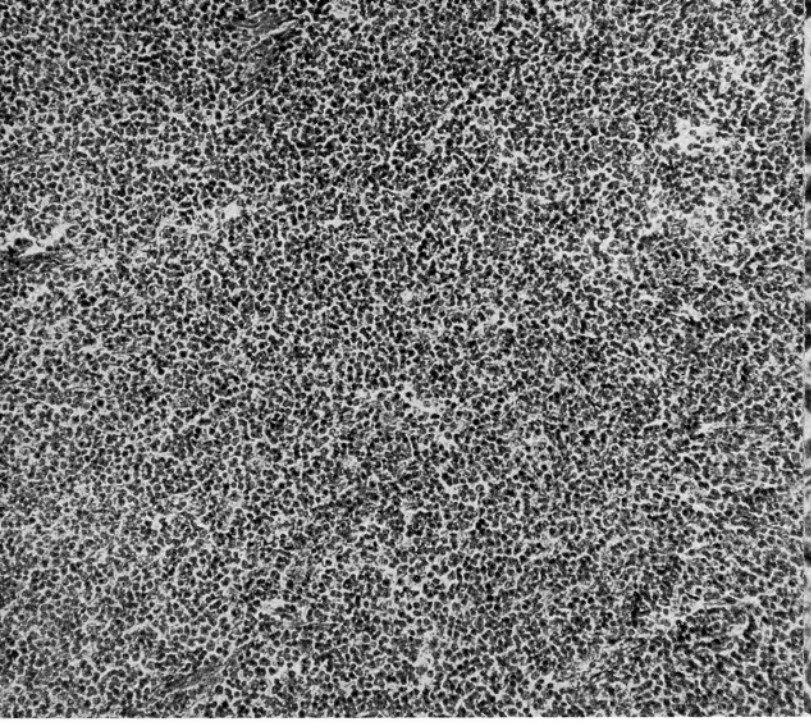


Fig. 2—The monotonous replacement of the gastric wall by a uniform cell type is requisite for a diagnosis of malignant lymphoma (H and E, X 150).

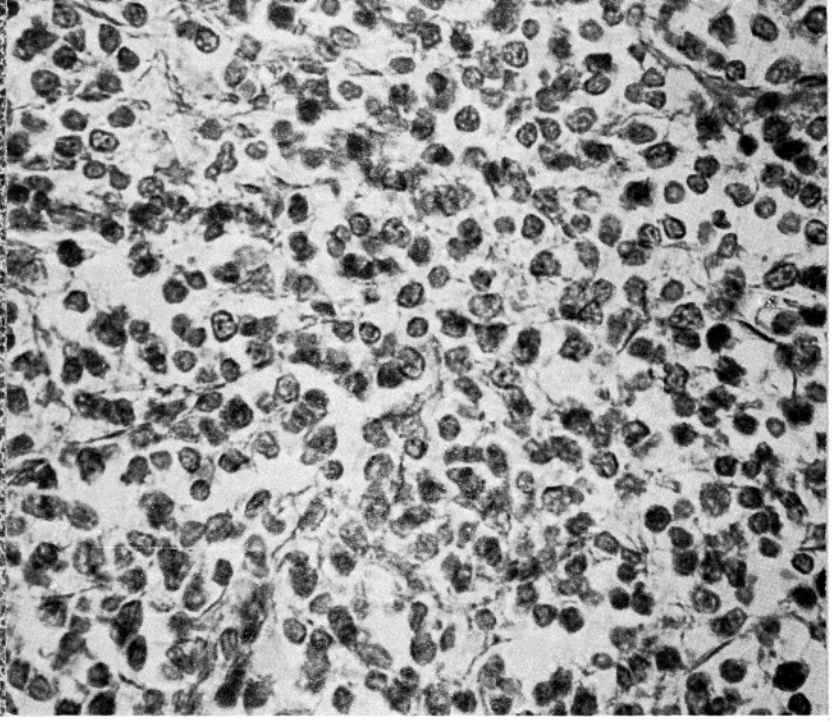


Fig. 3—The neoplasm is formed of moderately differentiated lymphocytic cells (H and E, X 600).

lymphoma, nor is the presence of gastric acidity. Ulceration of gastric lymphomas is common and perforation also occurs.

Dr. Moseley's impression: 1) ULCERATING CARCINOMA 2) GASTRIC "LYMPHOMA".

Roentgenologic impressions submitted by mail:

Gastric carcinoma	35
Gastric "lymphoma"	31
Benign lesion	12
Others	15

Dr. Moseley: Most of my colleagues agree. The possibility that this is a benign lesion does not seem reasonable to me in spite of the clinical history.

Dr. Regato: Dr. L. E. Kun, of Colorado Springs, also offered an impression of carcinoma of the stomach. Drs. Don Weir, of St. Louis, W. A. Irwin, of Detroit, and C. Bickham, of Washington, submitted an impression of lymphosarcoma of the stomach; Dr. J. H. Billings, of Beverly Hills, California, qualified it as a reticulum-cell sarcoma.

Operative findings: Gastroscopy showed a small ragged ulcer in the greater curvature. On July 3, 1969, a sub-total gastric resection was done. The specimen contained a 4x5 cm rounded mass on the greater curvature; the infiltration extended to the serosa.

Dr. McGavran: The entire gastric wall is infiltrated by moderately differentiated lymphocytes. No admixture of histiocytes, plasma cells or leukocytes is present, save in the area of ulceration. Nor are germinal centers apparent and fibrosis is minimal. I mention these latter points because it is now probable that some cases previously considered lymphoma are really reactive inflammatory or pseudolymphomatous processes. This case is malignant lymphoma, lymphocytic type or, in the common parlance, lymphosarcoma.

A diagnosis of primary gastric lymphoma necessitates exclusion of cases having evidence of disseminate disease, even if the gastric lesion be the most prominent manifestation. In about 1/3 of primary gastric lymphomas the diagnosis is simplified by the involvement of perigastric lymph nodes. In the remaining cases, having no evidence of extragastric involvement, it seems advisable to maintain strict criteria for and a certain conservatism in making a diagnosis of malignant lymphoma. Retrospective reviews (Jacobs, Berry) have shown that 30-50% of cases originally considered lymphoma were reclassified as pseudolymphoma.

Even after the exclusion of the pseudolymphomas, small, well-differentiated gastric lymphomas have remarkable good survivals following surgical excision e.g., five and ten year survivals from the Mayo Clinic running 68-54% respectively and from Columbia University 59-28% respectively. I know of no other site in the body where excision of malignant lymphoma yields such excellent results. In fact, in being the exception it raises the spectre of overdiagnosis.

Three fourths of these lesions are lymphocytic (lymphosarcoma); 1/4 histiocytic (reticulum cell sarcoma). Large size and nodal involvement are findings associated with a poor prognosis. Malignant lymphoma is a diagnosis to be considered in the radiographic or gross examination of giant gastric ulcers.

Dr. McGavran's diagnosis: MALIGNANT LYMPHOCYTIC LYMPHOMA.

Histopathologic diagnoses submitted by mail:

Lymphosarcoma	49
Malignant lymphocytic lymphoma	43
"Lymphoma"	27
Reticulum-cell sarcoma	17
Lymphoblastic lymphosarcoma	11
Pseudo lymphoma	9
Others	7

Dr. McGavran: I've covered the reasons why I don't consider this a pseudo-lymphoma. The lack of admixture of inflammatory cells, the absence of reactive germinal centers, and the absence of really a chronic gastric ulcer with a marked inflammatory reaction.

Dr. Regato: Drs. J. M. Loizaga, of Sevilla, and Carl Stones, of Tacoma, Washington, made a diagnosis of lymphoblastic lymphosarcoma; Dr. C. J. Thuss, of San Antonio, and Sister Ignatius, of Cincinnati, offered lymphosarcoma of the reticulum-cell type; Dr. C. J. Farinacci, of San Antonio, called it a lymphosarcoma of the lymphocytic-cell type; Dr. G. B. Elliott, of Vancouver, used the same designation but cautioned that leukemia must be ruled out; Dr. D. L. Dawson, of Colorado Springs, called it a malignant lymphoma of the mixed-cell type; Dr. J. Clifford, of Denver, preferred a well differentiated "lymphoma", but Dr. D. D. Zoller, of Kansas City, Missouri, designated it as a poorly differentiated one. Dr. R. D. Schultz, of Sioux Falls, chose to call it simply lymphosarcoma.

Subsequent history: This patient was last examined on August 6, 1969 at which time he was well and working at his job. His local physician has put him on 5-Fluorouracil. The patient complains often of nausea.

Dr. Eckert: When a surgeon operates on a patient with a lesion of this type, a solitary mass with a central ulcer, he is forced to feel that this is probably carcinoma of the stomach. The suggestion of lymphoma is best given when there are plaques of infiltration in the stomach. This plaque-like infiltration is significant to the surgeon because it means that the boundaries of the lesion are relatively vague and that a decision for a margin of the resection of the stomach might be quite difficult. For the large lymphomatous lesion which infringes on the fundus of the stomach, most of us would prefer doing a total gastrectomy, this being one of the few indications of total gastrectomy rather than subtotal gastrectomy. The results of surgical removal and radiation therapy are approximately the same, but the number of cases available for radiotherapeutic management is quite small compared with the number treated by surgical resection. In the past the indications for post-operative irradiation have consisted of obvious transection of tumor tissue or involvement of lymph nodes; in either situation, post-operative irradiation has been given. Ordinarily we do not obtain frozen sections unless there is a question of operability.

Steiner took a group of patients who were long-term survivors of gastric cancer and studied the histologic pattern; he compared them with a similar number of patients who survived less than one year following diagnosis; amongst the lesions that he considered to have an excellent prognosis was the so-called *blue tumor.* He though that these were small cell carcinomas at that time. I feel confident that the majority of these were lymphosarcomas rather than small cell carcinomas.

I cannot agree with chemotherapy at this time and definitely not 5-Fluorouracil. It is a toxic drug and you don't know what you are treating really. This patient in all likelihood is cured. The margins are free and the nodes were not involved. For gastric carcinomas the results of cytologic examination are very good if the material is properly selected. For gastric carcinomas the batting average has been quite high.

Dr. McGavran: Cytology in the diagnosis of lymphomatous disease is exceedingly difficult and even the best cytologists have a very poor batting average. In terms of whether the blue tumors were or were not lymphomas, I think we have to believe in some evolutionary improvement in pathologic interpretation.

Dr. Moseley: It is quite possible that the difficulty in pre-operative radiological diagnoses is a major factor in the fact that most of these patients have surgery as a primary treatment rather than radiation therapy; sarcomas of the stomach are relatively rare. Their simulation of carcinoma is so great that your normal tendency is to decide that it is carcinoma first and thus lead to a choice of surgery as the primary treatment. If cytologic diagnosis could get us out of this differential, it might be reasonable to build a group of cases that had radiation therapy as the primary treatment.

Dr. Regato: Dr. Eckert is right that there is no comparable series of radiotherapeutically managed cases to compare with surgery. The reasons are obvious: the diagnosis is not clear until after the surgical procedure has been carried out and by that time, the patient has been treated. Radiotherapists, however, deal very frequently with cases that have not been completely excised, or in which after the gastric resection has been done, there is a question of retroperitoneal lymph nodes left behind. In these cases, radiotherapy has proven very effective. There is something different about malignant tumors of the lymphoid structures of the stomach. It is obvious that the malignant tumors of the lymphoid structures of the stomach are different from those observed in other parts of the body. They are rather favorable to treatment. They can be cured even by surgery!

A morphologic diagnosis of "malignant lymphoma" that does not take in consideration important clinical details of the case may mislead the surgeon and others concerned. Such a diagnosis, particularly, but not exclusively, of the "lymphocytic type", can never exclude in the stomach as in the lymph nodes, the possibility of an undiagnosed leukemia, often chronic but at times acute; when the leukemia reveals itself the usual rationalization is that the "lymphoma" *became* leukemia; another frequent rationalization is that these things are all the same and, consequently, to differentiate them is like splitting hairs: this argument overlooks the obvious fact that lymphosarcomas are curable in some of their manifestations as leukemias are not.

Eugene C. Hwa, M.D., Newton, Kansas: I wonder if this patient was subjected to the gastric camera examination?

Dr. Moseley: It is apparent that the primary way of detecting the lesion will remain for some time to come radiologic, then once you have detected the lesion, any help that one can get, gastric camera or exfoliative cytology in attempting to make an accurate histologic diagnosis is great, but the entire population cannot be subjected to routine gastric camera examination; I feel no competitive threat from this.

Dr. Hwa: I agree, but since radiologically we cannot always make the correct diagnosis, any further examination to increase the accuracy of the diagnosis would be greatly appreciated. Our internists wanted an extra 5-10% of accuracy in diagnosis of gastric carcinomas, so we started having a gastric camera examination following radiographic examination and we have results that are very interesting. Even in benign diseases, you see a large crater at times, yet by camera examination we found that

this was not always a crater and many times the patient had an inflammatory disease, pocketing a collection of barium. In a case like this, the camera examination can show how extensively the mucosa is being involved and the character of the mucosal changes along with the ulceration. This would help us to make a diagnosis of lymphosarcoma rather than gastric carcinoma.

Lt. Col. David Langdon, M.C., Lackland AFB: We feel we supplement the radiologic examination; we have seen large gastric carcinomas after a reported negative radiologic examination; the patient was symptomatic. We have seen fundic ulcers which had not been seen on repeated careful examination by the radiologists. With instruments recently developed, one can obtain biopsy specimens and come up with a pathologic diagnosis. The gastric camera is not enough; it does not give you a tissue diagnosis.

Louis Dehner, M.D., Washington, D.C.: On the basis of the radiologic criteria can the radiologist tell the difference between a lymphoma or an ulcerating gastric carcinoma and the so-called pseudo-lymphomas?

Dr. Moseley: I don't think that it is possible radiologically on the basis of any of these criteria to differentiate between those circumstances.

Dr. Jerome Vaeth, San Francisco: I agree with Dr. Eckert that chemotherapeutic agents were not indicated. This particular case demonstrates very well what Dr. Regato has pointed out as the pitfalls of semantics: a tag of lymphoma is put on, many clinicians think automatically this is a systemic or wide-spread disease when, actually, this is merely a rather benign local manifestation. In our community, post-operative radiation therapy would be given routinely even though the pathologist would say that the resection had encompassed the entire tumor and even though they have sampled nodes. In lymphosarcoma of the stomach, regional lymph node metastasis are high and they can be missed. We would treat the patient post-operatively to doses that would be tolerated and would be curative.

Jim Lipo, M.D., Denver, Colorado: This man did have endoscopic examinations and the report was suspicious for a malignant tumor.

Leo Lowbeer, M. D., Tulsa, Oklahoma: In order to be certain that this tumor is limited to the stomach, wouldn't it be appropriate to study the bone marrow? Also to do a skeletal survey in order to find whether any other lesions may be present which would not be clinically apparent?

Dr. Lipo: There was no bone marrow examination done on this patient. The physicians that were managing the patient at the Medical Center did not recommend chemotherapy; they felt that radiation therapy was not called for at this time.

Dr. Regato: I agree with Dr. Vaeth that radiotherapy should be done routinely instead of waiting until the patient does badly to do the radiotherapy on a palliative basis. These lesions are curable and post-operative radiotherapy can add a great deal.

Dr. Lipo: They feel that the patient has been cured.

Dr. Regato: It is to *them* that this discussion is directed.

References

Berry, G.R. and Mathews, W.H.: Gastric Lymphosarcoma and Pseudolymphoma; Reappraisal of 12 Cases of Gastric Lymphosarcoma. Canad. Med. Assoc. J., **96**: 1312-1316, 1967.

Faris, T.D. and Saltzstein, S.L.: Gastric Lymphoid Hyperplasia; A Lesion Confused with Lymphosarcoma. Cancer, **17**: 207-212, 1964.

Jacobs, David S.: Primary Gastric Malignant Lymphoma and Pseudolymphoma. Am. J. Clin. Path., **40**: 379-394, 1963.

Joseph, J.I. and Lattes, Raffaele: Gastric Lymphosarcoma; Clinicopathologic Analysis of 71 Cases and Its Relation to Disseminated Lymphosarcoma. Am.J.Clin.Path., **45**:653-669, 1966.

Nicoloff, D.M., Haynes, L.B. and Wangensteen, O.H.: Primary Lymphosarcoma of the Gastrointestinal Tract. Surg., Gynec. & Obst., **117**: 433-437, 1963.

Stobbe, J.A., Dockerty, M.B., Bernatz, P.E.: Primary Gastric Lymphoma and its Grades of Malignancy. Am. J. Surg. **112**: 10-19, 1966.

Wilson, William J., Templeton, A.W., Turner, A.J., Jr.,and Lodwick, G.S.: The Computer Analysis and Diagnosis of Gastric Ulcers, Radiology, **85**: 1064-1073, 1965.

Zollinger, R.M. and Ellison, E.H.: Primary Peptic Ulceration of the Jejunum Associated with Islet Cell Tumors of the Pancreas. Ann. Surg., **142**: 709-723, 1955.

Zollinger, R.M. and Moore, F.T.: Zollinger-Ellison Syndrome Comes of Age. JAMA, **204**: 361-365, 1968.

2. *Retrogastric Leiomyosarcoma*

Contributed by: **R. H. Nishiyama, M. D.**, Ann Arbor, Michigan

THE PATIENT was a 67-year old man in October, 1968, when he gave a history of epigastric pain, abdominal distension and diarrhea of many years duration. Physical examination revealed pulmonary emphysema and a palpable upper abdominal mass 20x15 cm. The stool test was positive for blood; the hemoglobin was 5 gm%.

Dr. Moseley: This patient has an extremely large lesion with a large retrogastric component but with apparent involvement of at least the posterior wall of the body of the stomach in addition to displacement. Several masses within the stomach may represent portions of this tumor or may represent blood clots or food. There is severe anemia, leading one to the conclusion that the lesion is a hemorrhagic one.

Gastric sarcomas represent no more than 2 to 3 per cent of all malignant lesions of the stomach. The leiomyosarcomas are usually very hemorrhagic tumors and are usually accompanied by rather severe anemia. They present radiologically as hard, nodular masses with regular or irregular surfaces, arising from the gastric wall. They may proliferate as much outside as within the stomach and may be pedunculated. Other lesions which must be considered in the differential diagnosis of this case are (1) a pancreatic tumor or pseudocyst with gastric involvement (I find it difficult to exclude this possibility), or (2) a gastric carcinoma or lymphoma. These latter possibilities seem less likely because though the lesion is huge it remains reasonably localized and the presence of the huge retrogastric mass is less compatible

with these diagnoses. Two other possibilities should be mentioned: a tumor arising from gastric or retroperitoneal nerve tissue (which cannot be excluded on the basis of the radiologic appearance) and an abdominal aneurysm eroding into the stomach. The lack of calcium and the position of the lesion make this most unlikely.

In summary then, the most likely diagnosis from the radiologic point of view is leiomyosarcoma.

Dr. Moseley's impression: 1) LEIOMYOSARCOMA 2) "LYMPHOMA" 3) PANCREATIC TUMOR.

Roentgenologic impressions submitted by mail:

Carcinoma of the pancreas	25
Retroperitoneal "sarcoma"	22
Retroperitoneal "lymphoma"	17
Gastric leiomyosarcoma	9
Others	23

Dr. Moseley: My radiological colleagues had the same problem in differentiating the possible large carcinoma, erosion of the stomach and a retroperitoneal lesion. Only a few agreed with me in the diagnosis that I consider the primary one, a gastric leiomyosarcoma.

Dr. Regato: Drs. Harold Peterson, of Saint Paul, John Campbell, of Indianapolis, and Donald Germann, of Leawood, Kansas, offered a diagnosis of leiomyosarcoma. Dr. James Barber, of Cheyenne, preferred retrogastric "lymphoma". Dr. J. J. Darlak, of Fort Belvoir, Virginia, and Dr. I. Meschan, of Winston Salem, submitted retroperitoneal sarcoma.

Operative findings: At operation, on October 24, 1968, the stomach was found dilated and tented over a polylobated retroperitoneal mass; the mesentery and the parietal peritoneum were covered by small growths. A total gastrectomy pancreatoduodenectomy and right partial colectomy were carried out. There were two large gastric ulcerations extending deeply into the large retroperitoneal mass.

Dr. McGavran: This mesenchymal, predominantly extragastric, neoplasm shows closely set elongated cells, some with an identifiable myofilamentous cytoplasmic component: thus it is a smooth muscle tumor. Indications as to its biologic behavior, benign or malignant, are obtained from two features: the first is its size, for the larger these tumors are the worse their behavior; the second is the mitotic index, expressed in some semiquantitative term such as number per high power field or even less objectively as absent, hard to find, readily found, or numerous. In this tumor mitoses are readily found. It is patent that the distinction between "oma" and "sarcoma" is not sharp.

Leiomyosarcomas comprise about 1% of all gastric tumors, 10% of non-epithelial gastric neoplasms and 15-20% of symptomatic clinically recognized smooth muscle neoplasms. A reasonable estimate of the effect of surgical resection is that about 50% survive five years and if one excludes the inoperable cases and those having apparent metastasis at the time of initial exploration, this figure rises to about 75%. The usual manner of extension is invasion of contiguous structures: e. g. liver, abdominal parietes. Lymphatic metastases are infrequent.

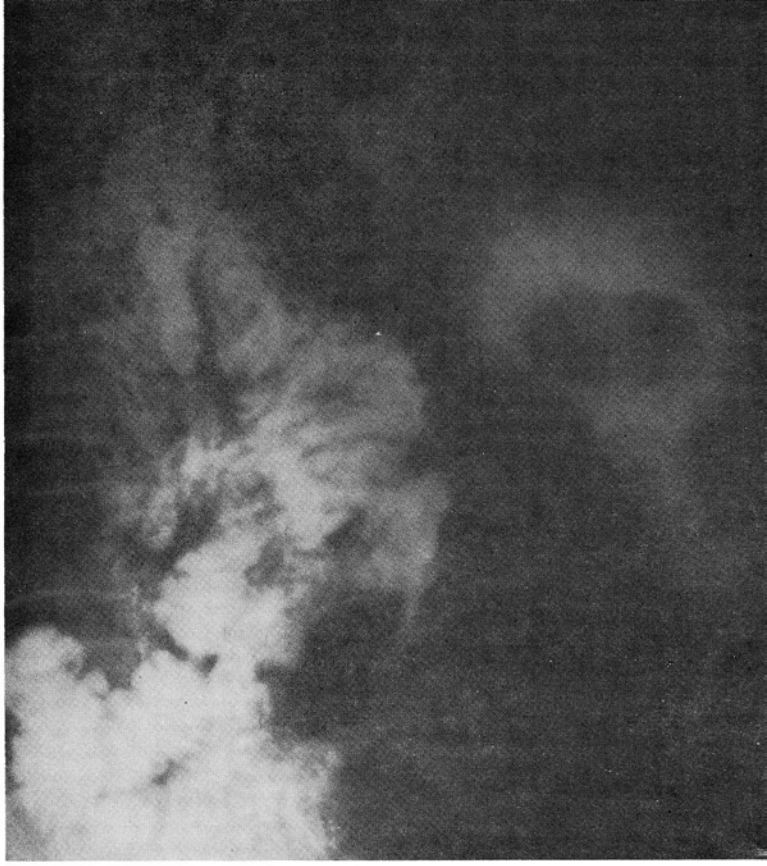


Fig. 1—Contrast roentgenogram showing retrogastric mass with apparent involvement of the posterior wall of the stomach and several intragastric masses.

Dr. McGavran's diagnosis: LEIOMYOSARCOMA.

Histopathologic diagnoses submitted by mail:

Leiomyoma (bizarre, epitheloid, atypical, blastic, vascular, cellular, clear cell)	43
Leiomyosarcoma (low-grade)	33
Leiomyoblastoma	18
Hemangiopericytoma (benign-5, malignant-12)	17
Liposarcoma	15
Neurilemoma	11
Glomus tumor	9
Angiosarcoma	6
Kaposi's	3
Neurosarcoma	3
Sarcoma, unqualified	3
5 others	8

Dr. McGavran: There is some low-grade-high-grade game being played. The features that I mention have led to this spectrum. Hemangiopericytomas do occur in the stomach but I don't believe they look like this. I doubt a Kaposi's has ever been as extensively extra-gastric as this. If one chooses to say that a glomus tumor is a specialized muscle tumor then I guess one is in the ballpark with that diagnosis too.

Dr. Regato: Dr. A. O. Severance of San Antonio, and Dr. P. Piyaratn, of Bangkok, also made a diagnosis of leiomyosarcoma; Dr. M. C. Wheelock, of Miami, qualified it as a low-grade one; Dr. M. R. Abell, of Ann Arbor, offered malignant leiomyoblastoma. Dr. F. R. Dutra, of Castro Valley, California, preferred angiosarcoma; Dr. G. B. Elliott, of Vancouver, commented that the appearance of hedges with halo hyalinization suggests hemangiopericytoma; Dr. P. B. Putong, of Chicago, called it a glomus tumor; Dr. R. M. Sherwin, of Colorado Springs, preferred bizarre, epitheloid leiomyoma and Drs. Magda and John Kepes, of Kansas City, considered it as a leiomyoma of vascular origin.

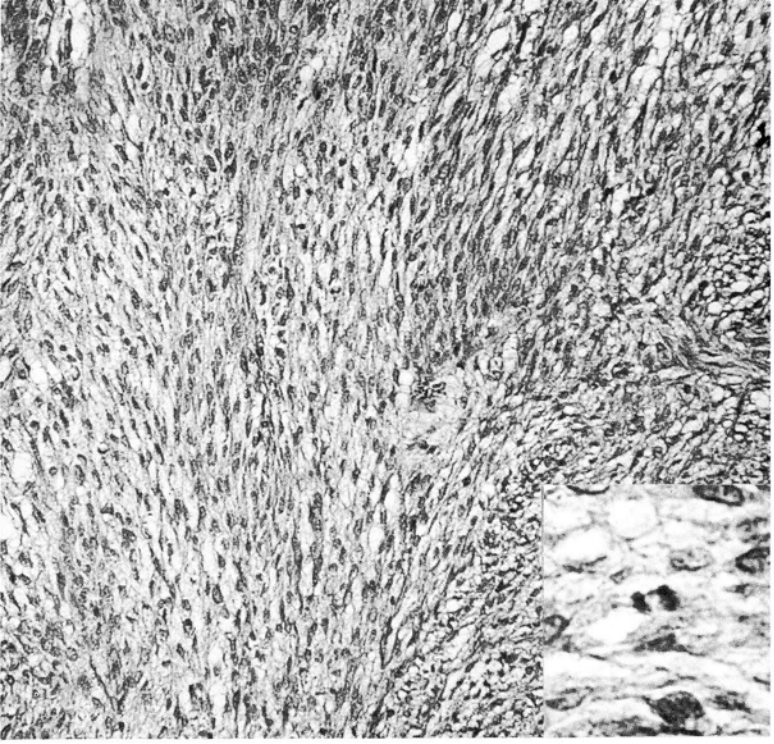


Fig. 2—The cellular spindly fascicular pattern of this smooth muscle neoplasm is evident. The inset shows a normal mitotic figure (H and E, X 150. Inset X 720).

Subsequent history: Following the intervention the patient had respiratory difficulties resulting in part from his emphysema; he required a respirator. On October 31, 1968 he expired; no autopsy was done.

Dr. Eckert: Dr. Moseley is to be congratulated on what I think is a very astute diagnosis. In looking at this single radiographic reproduction, I was very mystified by the history of prolonged diarrhea. I thought that a pancreatic lesion might be most likely, thinking in terms of a papillary cystadenocarcinoma of the pancreas, something which has a prolonged biologic course and that may eventually invade the stomach and lead to subsequent bleeding. The filling defects of the stomach, however, are very mild and unless you have a combined subserosal and submucosal leiomyoma you will seldom see this particular pattern. I think this is one that is quite unusual. Most of the leiomyomas or leiomyosarcomas of the stomach that we encounter are clinically asymptomatic, tend to be beneath the mucosa, they ulcerate, frequently bleed massively and require emergency surgery because of uncontrollable bleeding. We had a 13 year old girl who had a leiomyosarcoma of the stomach and on the bed next to hers, a 66-year old woman with the same lesion. I mention this to illustrate the fact that this tumor has a tremendous age spread. Some of these are terribly wild tumors with tremendous necrosis but most of them are relatively well differentiated, making a differential diagnosis between benign and malignant extremely difficult. However, a lesion of this size, with this type of course, would have to be considered as malignant and the likelihood of metastases very important. The radical surgery which was carried out in this case is justifiable in lesions that have a relatively prolonged biologic course and do tend to remain localized for considerable periods. Given a lesion which seems operable in terms of not invading other vital structures which can be circumscribed, the mortality rate should not be excessive. Given a patient in good general condition who is not excessively obese, a surgeon should be able to plan a good operation without subjecting the patient to a very high risk. I would point out that the mortality rate for pancreatico-duodenectomy by surgeons who do the operation with any frequency, has fallen well below 10%. There was a paper at the American Surgical Association in which 50 successive pancreatico-duodenectomies were carried out and without a mortality. We had at that time, 20 cases, the majority of which were done by residents without a single mortality.

Dr. Moseley: In this case there was a significant opertive finding that, had it been demonstrated before operation, would have led to greater security in the diagnosis of leiomyosarcoma: the two large gastric ulcerations extending deeply into the large retroperitoneal mass; this is rather characteristic of leiomysocarcoma.

Dr. Regato: To ask radiologists to submit a "diagnostic impression" on the basis of a single roentgenogram (which for others than the speaker is a reduced reproduction) naturally evokes just criticism. Often, we must explain that such is the unavoidable limitation of this educational exercise, not intended to test the accuracy of the radiologic procedures. Nevertheless, it must also be admitted that this forces the roentgenologist to utilize all of his knowledge of the possibilities. When they do as well as Dr. Moseley did in this case, we wonder if they would not do better with less films and more knowledge of gross pathology. At any rate, we have no regrets.

William McPhee, M. D., Kansas City, Missouri: Several years ago we presented, at another of these CANCER SEMINARS, a case of a 14-year old girl with multiple lesions of this kind. I'm happy to report that she is alive and well at this time.

David B. Troxel, M. D., Orinda, California: Dr. McGavran commented on the microcystic changes in the cells of this tumor and I wonder if he would elaborate on some of the features that differentiate this from the tumor that Dr. Stout described as a benign leiomyoblastoma, a tumor that has very prominent cystic changes and extra-cellular pseudocartilagineous hyaline areas, as in some parts of this tumor did.

Dr. McGavran: I have every hope of making those distinctions later on in this Seminar; it might be a little precipitous to do it at this time. In large neoplasms of the leiomyosarcoma type, the surgeon is frequently forced to scoop necrotic material out of the peritoneal cavity: a pathologic diagnosis on degenerated tissue is not easy; it is in terms of the best preserved areas that the final diagnosis should be made.

References

Alcott, D., M.D. and McCort, J., M.D.: Leiomyosarcoma of the Retroperitoneal Space. Cancer Seminar **III**: 104-106, 1964.

Anthony, C., M.D.: Leiomyosarcoma of the Jejunum. Cancer Seminar, **III**: 95-97, 1964.

Bauer, J.D., M.D.: Leiomyosarcoma (?) of the Stomach. Cancer Seminar, **I**: 124-125, 1953.

Berg, J. and McNeer, G.: Leiomyosacoma of the Stomach. Cancer, **13**: 25-33, 1960.

Campbell, J.A., M.D.: Leiomyosarcoma of the Stomach. Cancer Seminar, **I**: 122-123, 1953.

Giberson, R.G.; Dockerty, M.B.; Gray, H.K.: Leiomyosarcoma of the Stomach;Clinicopathologic Study of 40 Cases.Surg. Gynec. and Obst., **98**: 186-196, 1954.

Kay, S. and Still, W.J.: A Comparative Electron Microscopic Study of a Leiomyosarcoma and Bizarre Leiomyoma (Leiomyoblastoma of the Stomach. Am. J. Clin. Path.:**52**: 403-413, 1969.

McPhee, W.R., Roberts, L.M., Gaier, R., and Chapman, S.B.: Gastric Liposarcoma. Cancer Seminar, **III**: 39-42, 1961

Neustein, H.B., M.D.: Retroperitoneal Leiomyosarcoma. Cancer Seminar, **II**: 5-6, 1956.

Segard, E.C., M.D.: Leiomyosarcoma (?) of the Stomach. Cancer Seminar, **II**: 86-88, 1958.

Taylor, P.H.: Leiomyosarcoma of the Stomach. Brit. J. Surg., **56**: 187-192, 1969

Trimble, I.R. and Harkins, G.A.: Sarcoma of the Stomach Surg. Gynec. and Obst., **110**: 437-442, 1960

3. *Adenomatous Gastric Polyps*

Contributed by: **L. Williams, M.D., R. Smith, M.D.** and **L. Kennedy, M.D.**
Colorado Springs, Colorado

THE PATIENT was a 77-year old woman in October, 1967, when she complained of epigastric distress, dorso-lumbar and chest pains of several years duration. The physical examination uncovered no important abnormalities; the EKG showed ventricular extrasystoles and a depressed ST segment.

Dr. Moseley: This patient has several polypoid lesions in the body of the stomach or an irregularly pedunculated large solitary polypoid lesion. There appears to be an ulcer crater in this polypoid lesion.

Benign tumors of the stomach are not common, representing only 10 to 15 per cent of all gastric neoplasms (Good). They may be adenomatous polyps, leiomyomas, neuromas, fibromas, hemangiomas, glomus tumors, or eosinophilic granulomas. Differentiation of benign lesions from those undergoing malignant degeneration is almost impossible radiologically and difficult gastroscopically. A characteristic radiographic feature is frequently found in gastric leiomyomas and consists of a central sharply outlined epithelial dimple or ulcer crater. There is a suggestion that such a finding is present in this case. Neuromas may present a very similar appearance but tend to be more submucosal in location and to stretch the overlying gastric mucosa. They may, however, ulcerate. Lipomas, fibromas and fibromyomas have a similar submucosal appearance.

The association of adenomatous polyps with pernicious anemia is well known (Rigler), but there is no history presented in this case to substantiate this possible association. Metastatic lesions to the stomach—melanoma, for instance—can produce the radiologic appearance of a polypoid lesion.

Because of the appearance of an irregular ulcer in a polypoid gastric lesion, my first diagnosis is LEIOMYOMA.

Dr. Moseley's impression: 1)LEIOMYOMA 2) GASTRIC POLYPS.

Roentgenologic impressions submitted by mail:

Gastric polyps	41
Carcinoma	18
Lymphoma	10
Others	21

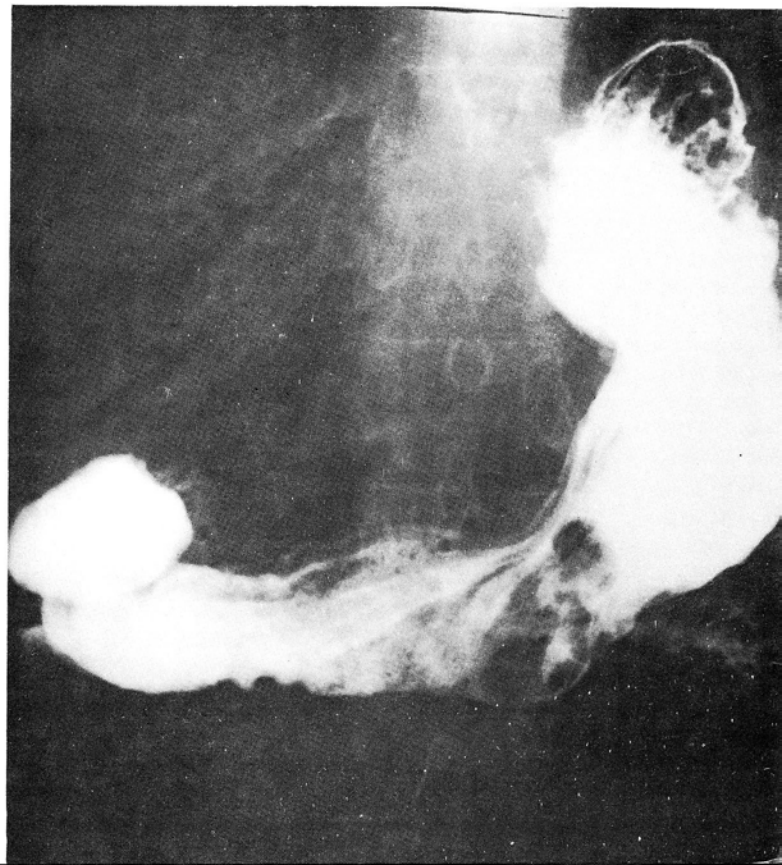
Dr. Moseley: I see that I'm alone in the diagnosis of leiomyoma as far as my colleagues are concerned. Gastric polyps certainly represents a likely possibility here; only the suggestion of this ulcer crater leads me to make a more specific diagnosis. Carcinoma and lymphoma, I would think would be far down the differential diagnostic list, because of the rather discrete nature of these lesions. It is basically impossible radiologically to differentiate the early malignant degeneration of the polyp into a carcinoma.

Dr. Regato: Dr. J. C. Lemon, of Denver, also offered a diagnosis of leiomyoma. Dr. Cyrus Klein, of Texarkana, Texas, Dr. R. Thoeny, of Phoenix, Arizona, and Dr. J. Ceballos, of Mexico City, submitted their impression of gastric polyposis.

Operative findings: Gastroscopy revealed several polyps; one was peduculated and eroded. On November 12, 1967 a gastrostomy was done: six polyps measuring 2 cm and 1.8 cm in diameter were excised and their base was fulgurated.

Dr. McGavran: These polyps are formed of a metaplastic mucinous epithelium with a few residual gastric

Fig. 1—Contrast roentgenogram showing several polypoid lesions in the body of the stomach.



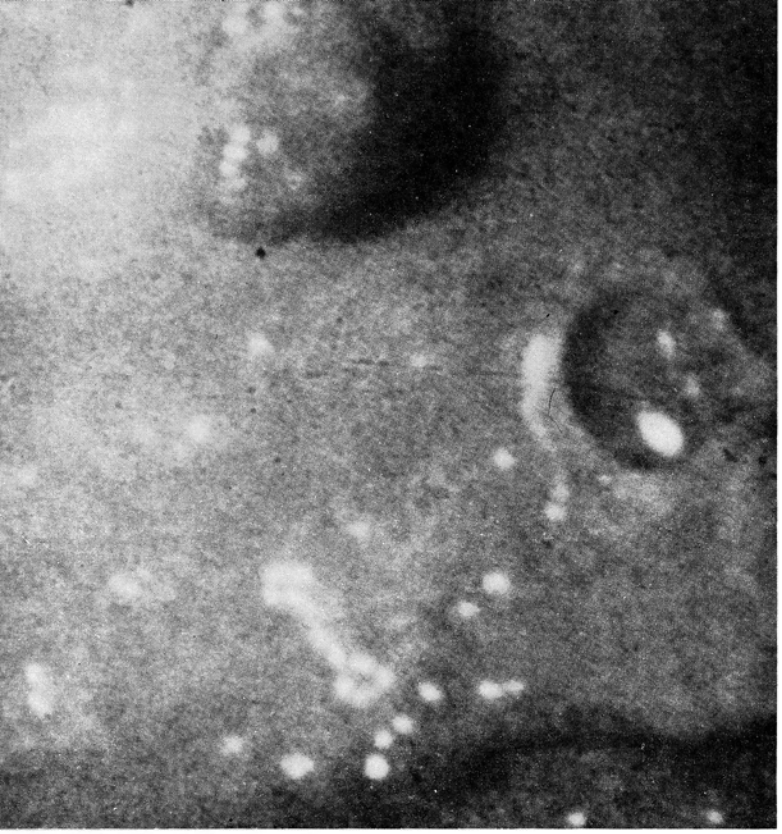


Fig. 2—Poor reproduction of gastroscopic photograph showing one of several polyps.

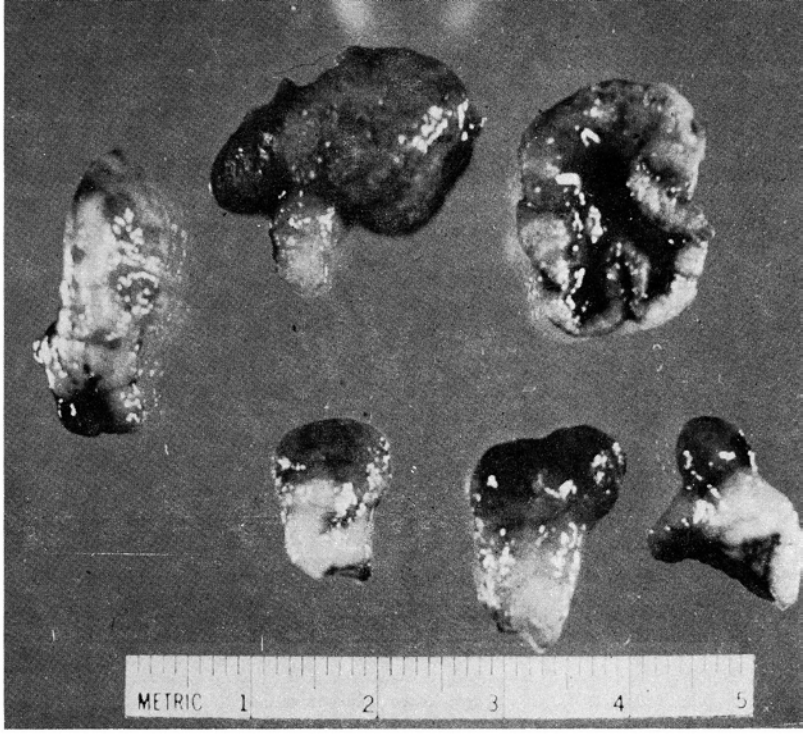


Fig. 3—Gross appearance of six excised polyps.

glands. Centrally mild cystic dilatation is present. The submucosa contains little inflammation, save for a focus of histiocytes, and some strands of invaginated muscularies mucosae. No dysplastic epithelium or evidence of epithelial atypia is present. The sections suggest that these polyps were removed without a gastric resection and the largest is less than 2 cm in size. This patient was not anemic, and unless there was a coincident cancer, she falls into the group of patients who may be watched, if they are relatively asymptomatic, or may have polypectomies if symptomatic or incapable of being adequately followed. Small, less than 2 cm, adenomatous polyps of the stomach, even if multiple, do not turn into cancers.

Dr. McGavran's diagnosis: ADENOMATOUS POLYPS.

Histopathologic diagnoses submitted by mail:

Adenomatous polyps	48
Benign gastric polyps	35
Menetrier's	15
Peutz-Jehger's	14
Polyp with carcinoma	11
Polypoid hyperplasia(pseudo-polyp)	10
Hamartoma (polypoid, adenomatous)	9

Dr. McGavran: It is amazing all of the things Menetrier did describe and all the things people attribute to him as having described. The Peutz-Jehger polyps: in the absence of the melanosis of the lips and oral mucosa, that diagnosis is an interesting one but not tenable. There is evidence of carcinoma at least in the sections that I saw.

Dr. Regato: Dr. A. Schmaman, of Johannesburg, and Dr. D. A. Parker, of Rhodesia, also made a diagnosis of adenomatous polyps. Dr. L. Lowbeer, of Tulsa, made a diagnosis of adenomyomatous hamartoma and Dr. Donald Alcott, of San Jose, California, called it myoepithelial hamartoma. Dr. P. A. Gikas, of Ann Arbor, offered chronic gastritis with enteric metaplasia. Drs. L. E. Luna, and W. A. Meriwether, of Tacoma, preferred Peutz-Jehger's polyps.

Subsequent History: The patient has had no recurrence of her gastric symptoms. Her blood pressure has remained slightly elevated and she has continued to have minor cardiovascular symptoms. In September, 1969, she was last seen at which time there was no gastric distress, no chest pains and she appeared recovered. No anemia.

Robert H. Smith, M.D., Colorado Springs: She has no anemia and seems to be fully recovered. She has no gastrointestinal symptoms at all.

Dr. Eckert: I agree with Dr. McGavran, that polyps of the stomach most likely are either benign or malignant and that probably they don't change. We have seen cancer of the stomach associated with benign polyps; in this instance, the presence of the cancer was grossly evident and did not lead to a limited operation. When polyps are present, the surgeon explores the stomach from without and the lesions are comparatively soft and seem to move about; he should open the stomach and examine them from within. Unless the lesions are relatively fixed and perhaps after obtaining help from the pathologist in the form of frozen section, limited removal is undoubtedly best. For a 77-year old woman with associated systemic disease, I think that this is the most appropriate operation, but this would also be appropriate for the younger individual, providing the correct differential diagnosis between benign and malignant polyp is made. Given a lesion in the pars media of the stomach as we have here, you have the choice of either doing polypectomies or segmental resection with anastomosis. The functional results of sleeve resection are very bad; this is a bad operation and shouldn't be done, The other procedure that might be done is distal gastrectomy to include the tumors; this, I would consider as unnecessary sacrifice of the stomach.

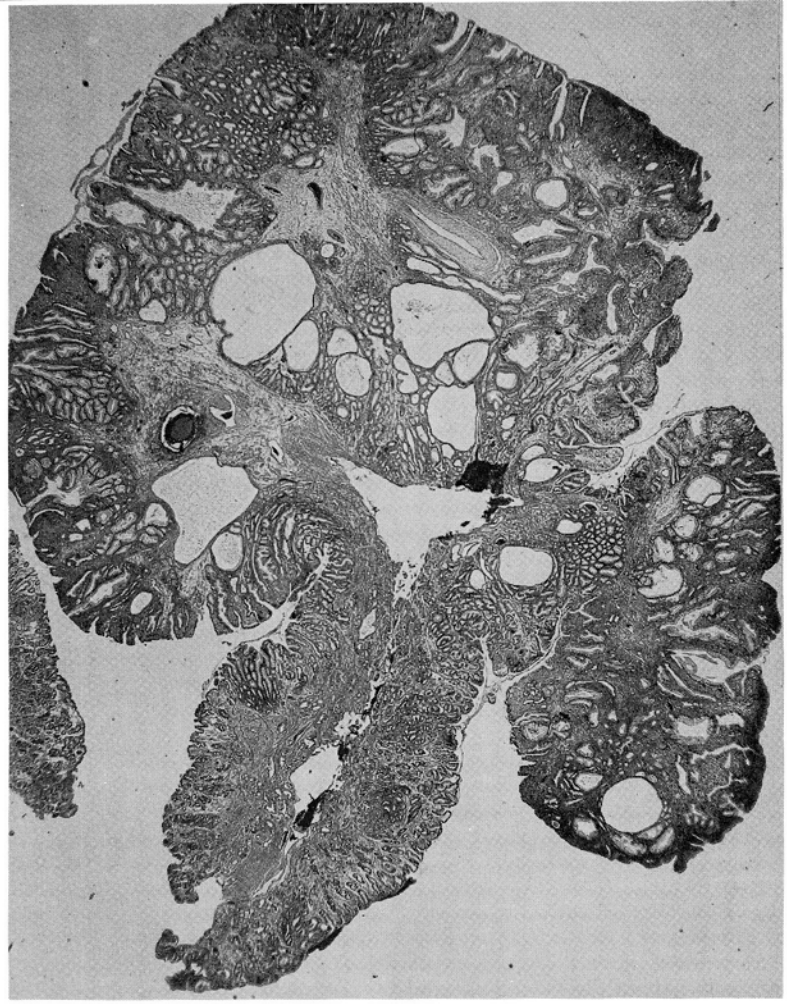


Fig. 4—Low power view of the adenomatous polyp that shows the superficial ulceration, the cortex of mucinous metaplastic epithelium and the core with cystic dilitation (H and E, X 8).

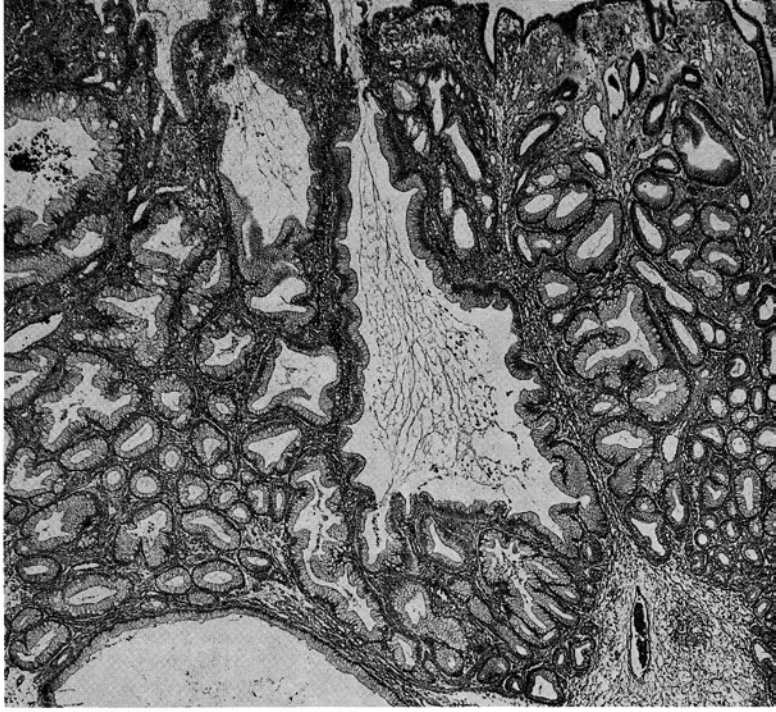


Fig. 5—The epithelium in this polyp is bland having an increase in mucin secreting cells. No atypia is present (H and E, X 32).

References

Good, C.A.: Benign Tumors of the Stomach and Duodenal Bulb. J. Canad. Ass. Radiol., **16**: 92-104, 1965

McAllister, A.J., Hicken, N.F., Latimer, R.G. and Condon, V.R.: 17 Patients with Peutz-Jehgers Syndrome in Four Generations. Am. J. Surg., **114**: 839-843, 1967.

Monaco, A.P., Roth, S.I., Castleman, B., Welch, C.E.: Adenomatous Polyps of the Stomach. Cancer, **15**: 456-467, 1962

Payson, B.A. and Morumgis, B.: Metastasizing Carcinoma of the Stomach in Peutz-Jehgers Syndrome. Ann. Surg., **165**: 145-151, 1967.

Rigler, L.G., Kaplan, H.S., and Fink, D.L.: Pernicious Anemia and Early Diagnosis of Tumors of the Stomach. JAMA, **128**: 426-432, 1945

4. *Atypical Adenomatous Polyposis of the Stomach*

Contributed by: **D. D. Dugan, M.D., R. McFarland, M.D.** and **R. Boyer, M.D.**
Boulder, Colorado

THE PATIENT was an 82-year old man in June, 1969, when he presented himself with chronic complaints. On physical examination he was found to suffer from pulmonary emphysema; there was mild tenderness to palpation of the upper left abdominal quadrant but no palpable masses, no enlargement of the spleen or liver. The hemoglobin was 16.6 gm%.

Dr. Moseley: Based on the appearance of the entire stomach on one of the spot films, I would describe a diffuse involvement of the entire stomach with the possible exception of the fundus, with obliteration of the folds and some evidence of polypoid lesions involving both the lesser and greater curvatures of the antrum. The stomach, in addition, seems small and shrunken; if the spot films were made with effective compression, their non-varying appearance suggests rigidity and non-distensibility. It is a little surprising that no mass was felt on palpation of the left upper quadrant but maybe this small stomach is mostly above the costal margin.

Linitis plastica is a scirrhous carcinoma which infiltrates in a spreading non-stenosing fashion and produces a small, rigid stomach with polypoid mucosal changes. From a radiologic standpoint, this is by all odds the diagnosis in this case. The roentgenologic changes in gastric syphilis (Sielman) may be impossible to differentiate from those of scirrhous carcinoma. Gastric actinomycosis (Bening) may also simulate scirrhous carcinoma at some phases of its development but usually leads to early abscess and fistula formation in the gastric region.

Dr. Moseley's impression: 1) LINITIS PLASTICA.

Roentgenologic impressions submitted by mail:

Gastric polyps	37
Gastric Carcinoma	22
Heterotopic pancreas	17
Benign tumors	12
Others	15

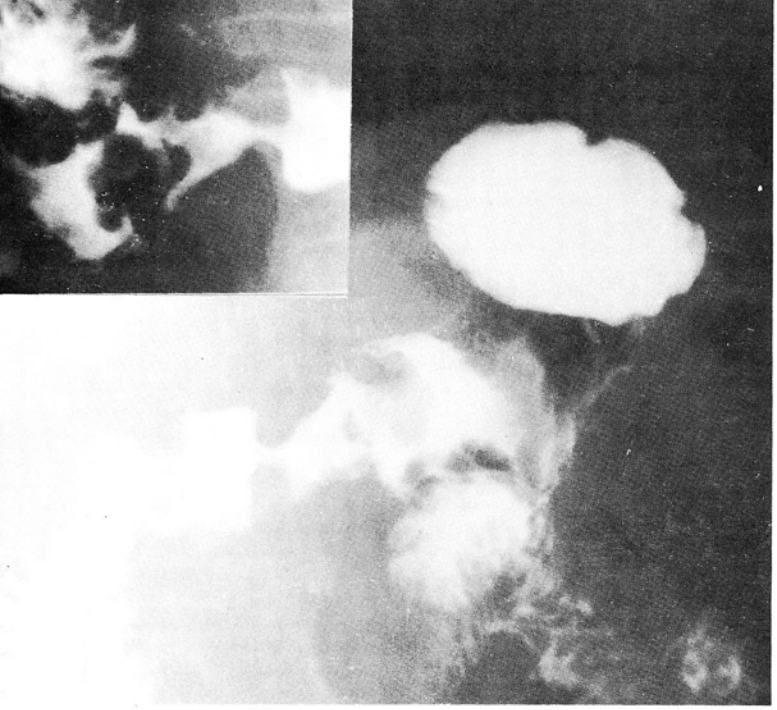


Fig. 1—Contrast roentgenogram and spot film (insert) showing polypoid lesion in the region of the gastric antrum.

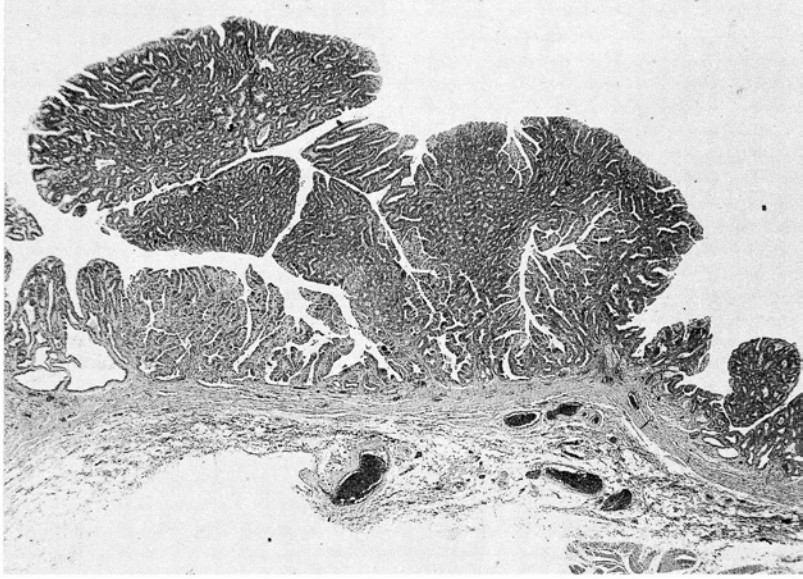


Fig. 2—The polypoid adenomatous replacement of the gastric mucosa is evident (H and E, X 10).

Dr. Moseley: I see my colleagues interpreted the changes as representing gastric polyps but 22 believed that there was gastric carcinoma. In heterotopic pancreas frequently one sees some radiologic evidence of pancreatic duct which, to my eye, was not present. Benign tumors, undifferentiable from gastric polyps or submucosal polyps, would be included. Unless the diagnosis of gastric carcinoma was of the type that I have described, I assume that I stand alone.

Dr. Regato: Dr. Harold Ibach, of Milwaukee, Wisconsin, and Dr. A. M. Bernstein, of Chicago, submitted an impression of malignant ulcer; Dr. Sam Levi, of Pascagoula, Mississippi, offered prolapsed malignant polyp. Dr. E. Salzman, of Denver, preferred adenomatous polyp.

Operative findings: On June 26, 1969 a soft ill-defined mass was felt at exploration of the gastric antrum; a subtotal gastrectomy was done. A sessile, scarlet color mass, measuring 3 cm in diameter was found in the lesser curvature; it was surrounded by smaller polypoid lesions.

Dr. McGavran: The sections from the stomach show replacement of the gastric mucosa by an atypical adenomatous epithelium. In addition to forming polypoid masses, it replaces the adjacent epithelium. Residual gastric epithelium can be found in the deeper and lateral areas. Focally a moderately complicated glandular pattern is found, but no marked crowding or growth of glands within glands is seen. No stromal invasion is present. Were this seen in the colon, it would be an adenomatous polyp with marked epithelial atypia. I chose to say the same of this gastric lesion. Some may consider this adenocarcinoma in-situ. Though I agree that such an entity exists, there is insufficient complexity for me to go that far. This appearance would, however, stimulate me to a thorough examination of the rest of the resected stomach.

As the omniscent pronouncements and fatuous transformations of the past have been questioned and some quasi-hard data accumulated, the malign predisposition of all gastric polyps is no longer tenable.

Certain prognostic correlates are note worthy. Polypoid masses, over 2 cm in size, may well be polypoid cancers. The biologic behavior of adenomatous polyps with foci of marked atypia, or carcinoma in-situ, is not that of cancer of the stomach. This is conclusively demonstrated in the work of Monaco and associates, wherein cancer did not eventuate even among the cases showing marked epithelial atypia or focal cancer and by the survival figures in the report of the Mayo Clinic experience by Huppler and associates. The effect of these studies and the morbidity-mortality of total gastrectomy has led to a distinct drop in resections for gastric polyps.

Dr. McGavran's diagnosis: ATYPICAL ADENOMATOUS POLYPOSIS.

Histopathologic diagnoses submitted by mail:

Superficially spreading carcinoma	76
Adenomatous hyperplasia (Menetrier's)	27
Gastritis (atrophic, hypertrophic)	20
Polyp with focal (in situ) carcinoma	18
Polyp with atypical hyperplasia	14
Intestinal metaplasia	11
Others	5

Dr. McGavran: Superficially spreading carcinoma, I presume means that they feel that all of the epithelium is carcinomatous. The lesion is certainly superficial and limited to the mucosa. I would guess from this demonstration that there are a minority of conservative pathologists who receive the Penrose Cancer Seminar slides. The work of Monaco, and associates shows that where polypoid masses of the stomach are excised and the pathologist chooses to say this is extremely atypical hyperplasia or focal cancer, these patients do not have a different eventuation than the group who do not show these morphologic changes. Hence, I think it is advisable for us pathologists to play down the uncertainties that some of the histopathologic impressions give us because of the potential excessive therapy that they might evoke.

Dr. Regato: Dr. C. Perez-Mesa, Columbia, Missouri, Dr. Leo Lowbeer, of Tulsa, and Dr. F. Cabanne, of Dijon, France, made a diagnosis of adenomatous polyposis with carcinoma in-situ; Dr. Morgan Berthrong, called it a superficial well differentiated adenocarcinoma; Dr. K. R. Holloman, of Denver, saw only atypical glandular hyperplasia; Dr. W. S. Holaday, of Columbus, Ohio, offered intestinalization of the gastric mucosa.

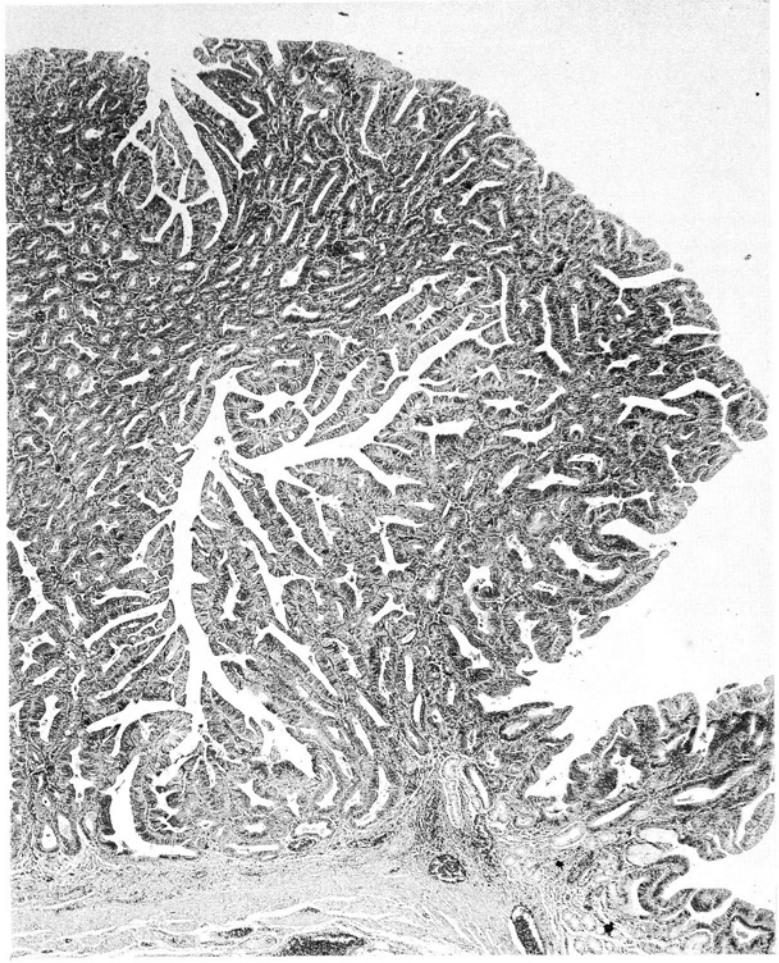


Fig. 3—A few fine villous processes extend from the compact glandular mass (H and E, X 32).

Subsequent history: Postoperatively the patient developed a gastrocutaneous fistula; he was last seen in good health in August, 1969.

Robert G. Boyer, M.D., Boulder, Colorado: The patient was seen last week. He is in good health. He has gained 5 pounds since his hospital release.

Dr. Eckert: I must confess that from the radiographs I thought this was probably a malignant polyp; I thought there would be cancerous infiltration of the wall of the stomach and the pre-pyloric region or in the polypoid chain and I'm simply amazed to see the microscopic section because this doesn't look as I expected it to. I would judge that the surgeon at the time of operation also was unable to show with certainty what the nature of the process was and felt that it was best to proceed with subtotal gastrectomy which, despite the age of 82, I agree with, if they thought this was cancer. I think it is Stanley Hoerr, from Cleveland, who likes small operations for small cancers and big operations for big cancers and I would consider this a small operation for what the surgeon probably thought would eventuate as a small cancer.

Leo Lowbeer, M.D., Tulsa, Oklahoma: Everyone has agreed that these changes are either severe atypia or carcinoma in situ. They are only at the surface of the lesion. They don't look any different like what is usually called a carcinoma in-situ of the endometrium or carcinoma in situ in polyps. That there are no further developments after removal of these lesions does not speak against them being carcinoma in situ. We do not expect any further malignant development after we remove the uterus for carcinoma in situ of the endometrium or after we remove a villous adenoma with such changes at the surface. The

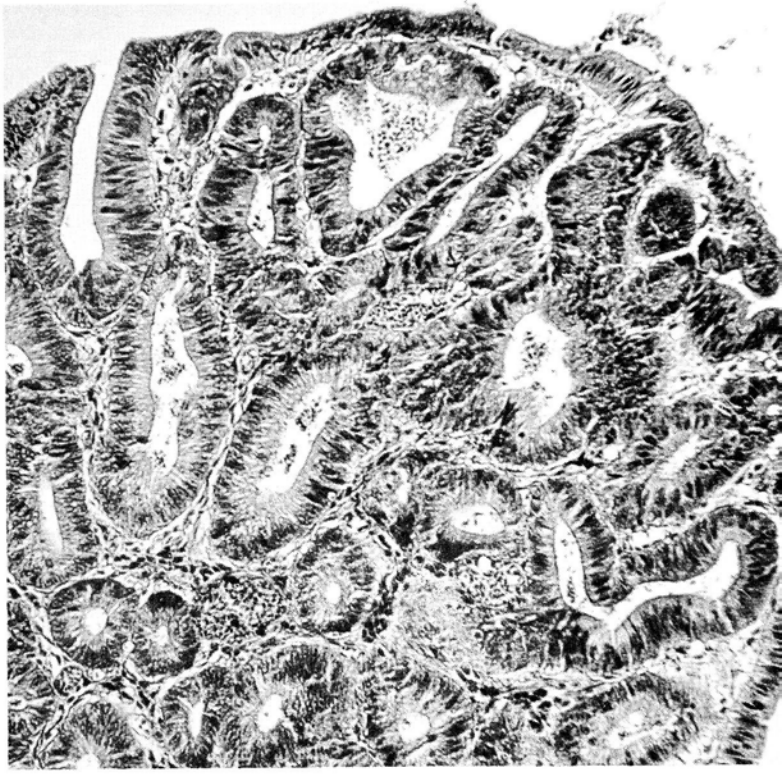


Fig. 4—Some stratification of nuclei and atypia is present but no evidences of invasion are seen (H and E, X 150).

only proof would be if we leave them alone and see what happens; that is obviously impossible to do; on the other hand, we see such changes in the vicinity of carcinomas. Therefore, we cannot prove that they are not malignant.

Frank B. McGlone, M.D., Denver, Colorado: Dr. Lowbeer has brought up a couple of points that I was going to make. Recently we reviewed about 55 patients with gastric polyps that we followed for 10-15 years and in some of these patients the 2 cm polyp became larger and in some of these they showed what was considered to be a carcinoma. When you take out these lesions early, you have a pathological specimen and the patient is cured, but we don't know what would happen if they weren't taken out. Carcinoma has to start somewhere. We also had 4-5 patients in whom there were completely benign appearing polyps with one polyp showing obvious malignant changes on the surface grossly and microscopically. Our feeling was that these are not as completely benign as brought up. In one of the first CANCER SEMINARS, we talked about gastroscopy without photography. Now with photography we can show more. We used to be told that the surgeon and pathologist cannot tell grossly what these things are—how could we tell anything endoscopically? As you saw from the colored pictures through the gastroscope and the pictures that were taken on the dissecting board when the tissue is out, there is no resemblence between the living and dead tissue. I would also like to repeat what others have said that the use of endoscopy, especially for following patients with gastric polyps is very useful.

Robert H. Smith, M.D., Colorado Springs: There is another clinical syndrome that hasn't been mentioned in this connection that I'd like to comment upon in the differential diagnosis, the entity of multiple polyposis of the stomach; this is a different condition altogether which resembles the disease of multiple polyposis of the colon. Fortunately this is rare, but the disease is much more serious. These stomachs are studded with polyps and the possibility of gastric carcinoma is almost 100%;

the only operation that can be used in these patients is a total gastrectomy.

Eugene C. Hwa, M.D., Newton, Kansas: I would like to ask of Dr. Moseley, if he had seen this patient in his department, would he have considered a repetition of the upper GI series with air contrast or other studies.

Dr. Moseley: In many instances in radiologic diagnosis, one is inhibited for full evaluation of the case by not having an adequate number of examinations and here we are even more limited. I trust, of course, that all the radiologists would not have been satisfied to determine the course of the patient's care on the basis of the examination of the one film.

F. P. Bornstein, M.D., El Paso, Texas: I would like to ask Dr. Eckert if he had received the diagnosis of carcinoma in situ, would he have suggested any further therapy?

Dr. Eckert: If the margins of the resection show normal mucosa, I would think that there would be no indication for further therapy. I would also like to look at the sections myself and try to evaluate what I thought was meant by this particular statement. This is an 82-year old man; if he is in good health he probably has something like 7 to 8 years life expectancy. I don't know what the impact of carcinoma in situ of the stomach is on the actuarial prediction of what his life expectancy may be. Generally, we try to do cooperative work with the pathologist; we expect him to study the material thoroughly and give us some idea as to whether we have left behind something that may have bad consequences. I must say that looking at the sections, I don't think this lesion has very bad intentions. I'm on the side of the angels.

Dr. Regato: At that age, do you think that another operation would be more hazardous to him?

Dr. Eckert: With the fiberoptic gastroscope, with the exception of a very few individuals who just can't seem to swallow the tube, this is no risky procedure at all. They accept this very well and you can get a very good examination of the stomach. The camera does not add much to this particular examination. I look upon the camera more as a screening instrument, as the Japanese have really used it, because of the very high incidence of gastric cancer in Japan.

William S. Curtis, M.D., Boulder, Colorado: In this particular case the important thing is the fluoroscopy. This was a perfectly normal stomach in all respects, other than the tumor itself. There was nothing wrong with the wall or the peristaltic action.

References

Bening, L.: Occurrence of Actinomycosis of the Stomach and Duodenum. Acta. Path. Microbiol. Scand., 16 (Suppl.): **18**, 1933.

Huppler, E.G., Priestley, J.T., Morlock, C.G., Gage, R.P.: Diagnosis and Results of Treatment in Gastric Polyps. Surg., Gynec. & Obst., **110**: 309-313, 1960.

Marshak, R. H., and Feldman, F.: Gastric Polyps. Am. J. Digest. Dis., **10**: 909-935, 1965

Monaco, A.P., Roth, S.I., Castleman, B., Welch, C.E.: Adenomatous Polyps of the Stomach. Cancer, **15**: 456-467, 1962.

Morson, B.C.: Gastric Polyps Composed of Intestinal Epithelium. Brit. J. Cancer, 9: 550-557, 1955.

Sielman, H.: Zur Diagnose der Syphilis des Magen. Fortschr. Geb. Rontgenstr., **85**: 515, 1956.

5. *Gastroduodenal Crohn's Disease*

Contributed by: **Claude O. Burdick, M.D.**, Pittsfield, Massachusetts

THE PATIENT was a 54-year old woman in January, 1969, when she complained of anorexia, pyrosis and lumbar pain radiating to both legs. She had had a left hemicolectomy, for colitis, in 1967, a laryngectomy for cancer, in 1966, and a hysterectomy for endometrial carcinoma, in 1960. On physical examination there was only tenderness to palpation of the epigastrium.

Dr. Moseley: The radiographic appearance in this case is that of an obstructive lesion in the distal antrum of the stomach. In a radiograph a small amount of opaque material has passed into the duodenal bulb; it appears deformed but there is so little material in the duodenum, it may simply not be sufficiently distended to make this observation.

The first diagnostic possibility to be considered is inflammatory or granulomatous distal antral gastitis. Isolated granulomatous gastritis is difficult or impossible to differentiate from sarcoidosis and regional enteritis (Fahimi). Of course, sarcoidosis and regional enteritis very rarely involve only the stomach. Early scirrhous carcinoma, syphilis, and tuberculosis involving the pre-pyloric area may all produce similar radiologic findings.

This case does not present the radiologic findings of adult hypertrophy of the pylorus; one does not see evidence of hypertrophic muscle producing an impression on the distal antrum or base of the duodenal bulb, although it is true that the pyloric canal seems to be elongated by this lesion. In addition, one does not see the sharply outlined longitudinal folds seen in prolapse of the gastric mucosa or in pyloric hypertrophy. The possibility that the stomach is secondarily involved in direct extension from recurrent colitis or from colon neoplasm arising in the pre-existing colitis may also be entertained.

Dr. Moseley's impression: INFLAMMATORY LESION OF THE GASTRIC ANTRUM WITH OBSTRUCTION.

Roentgenologic impressions submitted by mail:

Metastatic carcinoma	32
Gastric carcinoma	19
Peptic ulcer	17
Inflammatory stenosis	10
Others	12

Dr. Moseley: Ten of my good friends seem to agree with me; peptic ulcer being a benign diagnosis would fall in the same category. Most of the radiologists viewing this obviously felt that this was a neoplasm; I'm not really shaken. I'll stick with inflammatory distal antral obstruction.

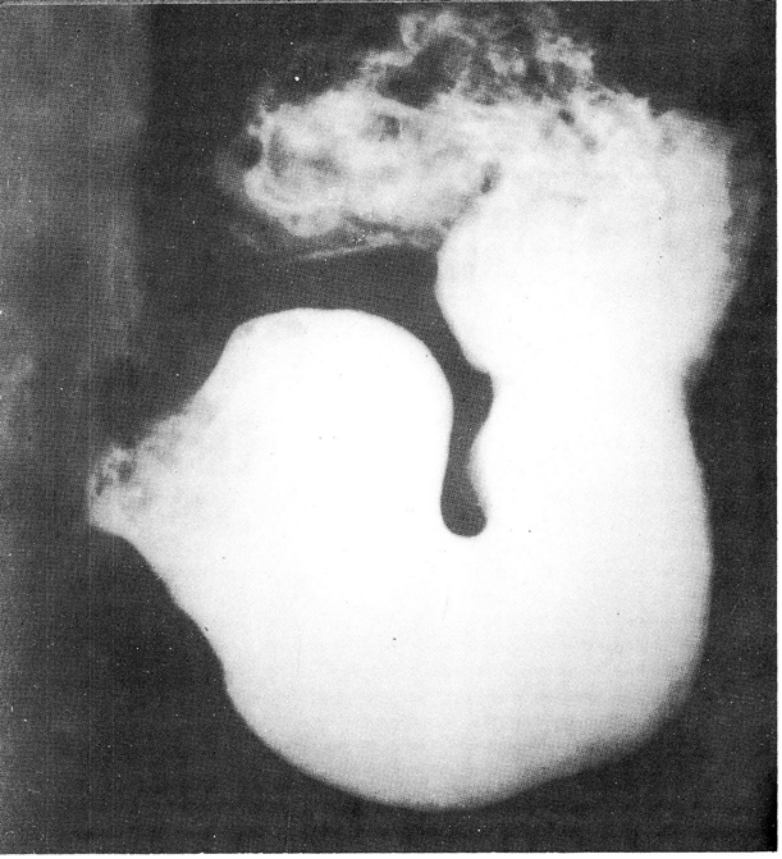


Fig. 1—Obstructed appearance of the stomach at level of distal antrum.

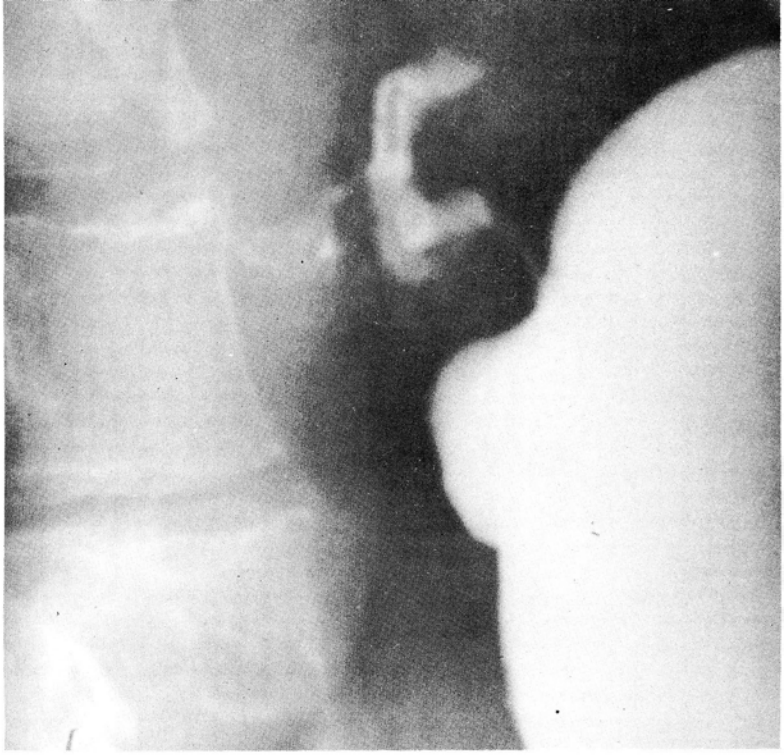


Fig. 2—Small amount of opaque material passing into duodenal bulb.

Dr. Regato: Drs. James Conti, of Santa Monica, California, and Donald Germann, of Leawood, Kansas, submitted an impression of stenotic ulcer and duodenitis; Drs. W. Irwin, of Detroit, and B. Young, of Santa Barbara, preferred a pyloric ulcer with obstruction. Drs. E. Salzman, Dr. L. O. Martinez, of Miami, and J. C. Lemon, of Denver, offered Crohn's disease.

Operative findings: On January 30, 1969 a subtotal gastrectomy was done. The pyloric mucosa presented prominent folds obstructing the lumen; there was no ulceration. The gastric wall was thickened by a firm, mucoid tumor-like mass 4x3x1.3 cm, gray in color on cut section.

Dr. McGavran: The sections of this process show all of the characteristic features associated with Crohn's disease —ulceration with deep spike like extensions into the muscularis associated with a sub-acute inflammatory reaction; submucosal, intramuscular and serosal fibrosis and inflammation, and foci of granulomatous response. Though these are not unique to regional enteritis, they are diagnostic in concert. Other processes involving the distal stomach and proximal duodenum that should be differentiated are: (1) chronic peptic ulceration with stenosis and obstruction; (2) eosinophilic gastroduodenitis; (3) tertiary syphilis; (4) sarcoidosis and other granulomatous, mycobacterial and fungal diseases; and perhaps in the wormier parts of the world, certain nematodes.

This woman had had a left hemicolectomy for "colitis." It is probable that upon review of that specimen, or of the findings at operation, or upon complete radiologic examination of the intestines evidence of Crohn's disease elsewhere would appear. Isolated gastroduodenal involvement is infrequent and in subsequent time the usual small intestinal involvement becomes manifest.

Crohn's original description appeared in 1932 and within five years reports of duodenal and proximal jejunal involvement had appeared. By now about 100 such cases have been reported and compiled by succeeding reporters. Gastric involvement is not as frequent but reports of half a dozen cases from several centers are out.

Recent reviews of large groups of patients with chronic ulcerative colitis have shown that the histologic criteria for its differentiation from Crohn's are by no means absolute. Though it may be early to be certain, it may well be that these two processes, the etiology of each undetermined, are but differing tissue manifestations of the same abnormality.

Dr. McGavran's diagnosis: GASTRODUODENAL CROHN'S DISEASE.

Histopathologic diagnoses submitted by mail:

Eosinophilic granuloma	53
Eosinophilic gastritis	29
Granulomatous gastritis	24
Chronic gastric ulcer	23
Crohn's disease	8
Others	21

Dr. McGavran: Eosinophilic gastritis or gastroduodenitis tends not to have extensive ulceration and fibrosis and I don't think it shows the epithelioid histiocytic response which we see here. Granulomatous gastritis I assume to be a synonym for a name I have used. A minority of the participants are with me and I congratulate them and me for our astuteness.

Dr. Regato: Drs. J. M. Loizaga, of Seville, R. A. Marcial-Rojas, of Puerto Rico, and D. D. Zoller, of Kansas City, Missouri, also made a diagnosis of Crohn's disease of the duodenum; Drs. M. R. Abell, of Ann Arbor, and G. Moore, of Colorado Springs, preferred the designation granulomatous gastritis. Dr. F. R. Dutra, of Castro Valley, California, called it a chronic peptic ulcer with "pseu-

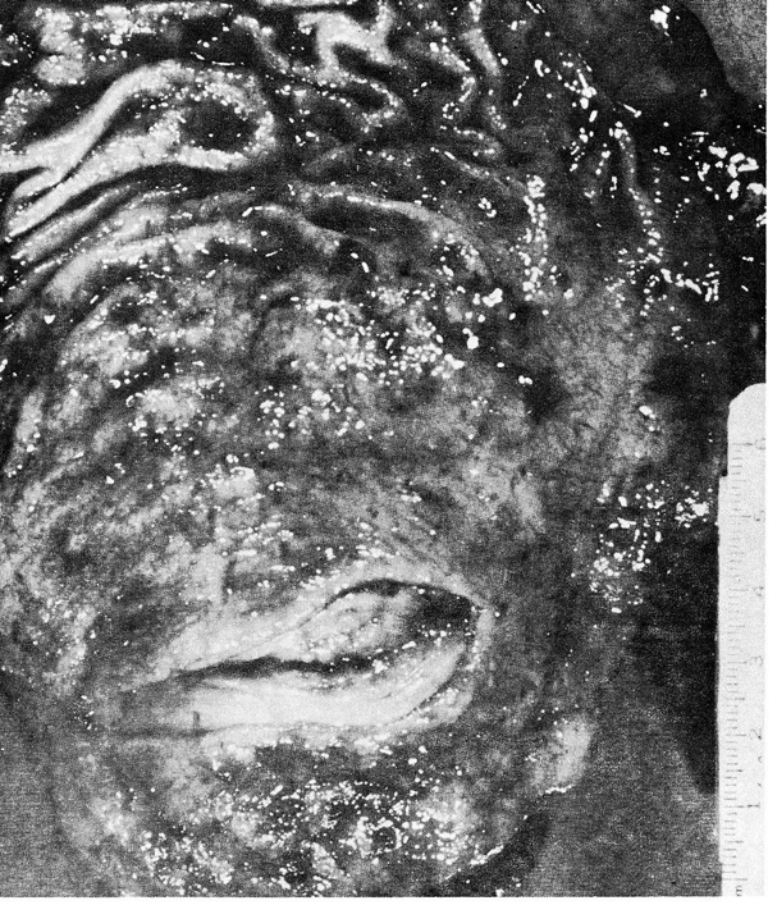
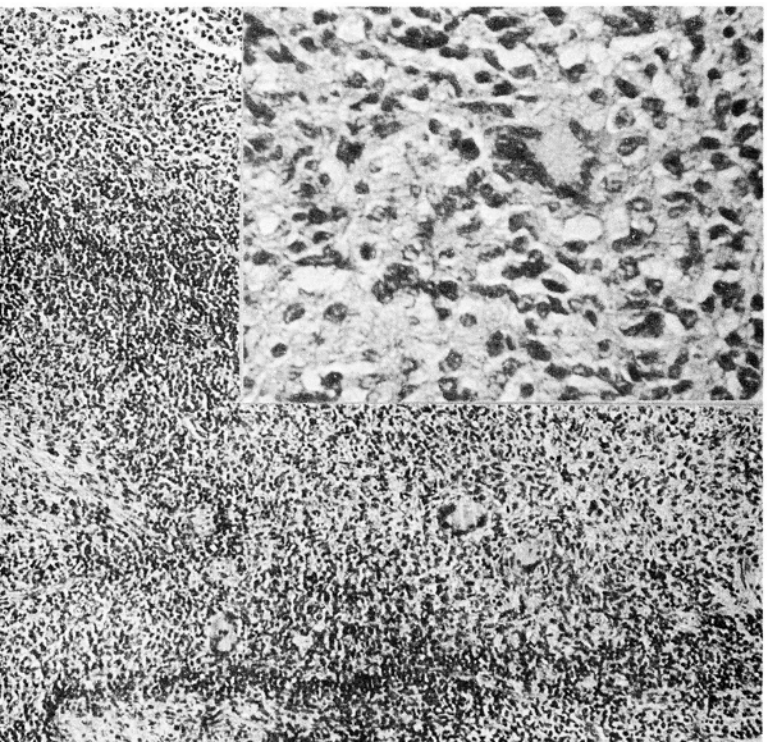


Fig. 3—Gross appearance of surgical specimen showing prominent gastric folds and thickening of the mucosa.

dolymphoma"; Dr. A. R. Keller, of Washington, D. C., preferred chronic gastric ulcer with muciphages. Dr. G. Gricouroff, of Paris, called it a *very* eosinophilic granuloma; Dr. D. Assor, of Columbus, Ohio, designated it as histiocytosis X, whereas Dr. C. O. Burdick, of Pittsfield, Massachusetts, made a diagnosis of reactive eosinophilic granuloma and specified "not histiocytosis X."

Fig. 5—The inflammatory reaction is acute and subacute with occasional giant and epitheloid-histiocytic predominance (H and E, X 90). Insert in higher power.



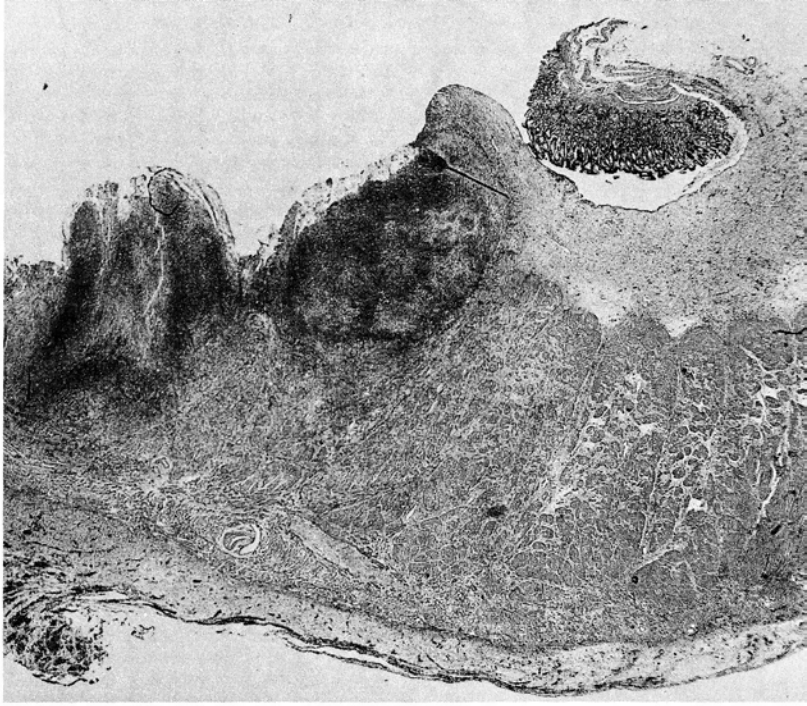


Fig. 4—The transmural extent of the inflammation and fibrosis in the wall of the stomach is evident as is the spike-like extensions of the ulceration (H and E, X 10).

Subsequent history: Following surgery this patient gained 10 pounds in weight and she has had no recurrence of any of the malignant tumors for which she has been treated. In June of this year she moved to California and has not been heard of since.

Dr. Eckert: This woman had a resection of colitis which suggests that this is not idiopathic ulcerative colitis because this would have led to rather devastating sequela; she also had multiple malignant tumors which apparently were controlled. The operation that was done appears to have very excellent results. When Crohn described this disease, he tried to unify a group of inflammatory diseases of the ileo-cecal region that were described under a variety of names and to put them into a single clinicopathological entity; Crohn's disease of the colon is a much more common disease than is idiopathic ulcerative colitis. This change in our thinking has taken place in the past five years and review of some cases previously classified under the heading of idiopathic ulcerative colitis has necessitated re-classification as Crohn's disease. I don't know what the etiology of this disease is; maybe we're going too far to classify all inflammatory lesions outside of the gastrointestinal tract, that are characterized by involvement of all layers with eventual fibrosis, as Crohn's disease of the stomach. At least it wouldn't be as gratifying to those who like to pigeon-hole things rather securely. Crohn's disease of the esophagus has been described and a series of six cases was reported upon by John Madden of New York City.

Claude O. Burdick, M.D., Pittsfield, Mass: I'd like to say a word in favor of the majority of pathologists who called this an eosinophilic granuloma. Most of the sections that I have and certainly the one which was sent out to me showed the material which was called an eosinophilic granuloma on first examination and most of us did not receive a section that had such a gorgeous ulcer in it. You mentioned that in some parts of the world, eosinophilic granuloma is more likely to be due to parasites or worms and that is an interesting consideration in

this case. This lady had a real fish fetish and her first words on waking up from the anesthesia were "Could I have some cracked crab". She ate an immense amount of fish and the possibility of parasites was closely considered; we chopped up the specimen to try and find a worm but we didn't find any. One could call it colitis; one could call it Crohn's disease. One could not reasonably say the slides were diagnostic of ulcerative colitis.

Stuart A. Patterson, M.D., Fort Collins, Colorado: I think that in this case the examination should have been repeated after cleansing of the stomach and medical management and then the pathology might very well have been better delineated.

Dr. Burdick: This patient was obstructed immediately after radiographic examination and surgery was necessary. Radiographs were inadequate at the time.

Dr. Moseley: I would like to raise a question about the precipitation of gastric obstruction by gastro-duodenal examination. It is certainly true that if the patient has a lesion of the colon and is given oral barium, the water resorption in the colon will precipitate a partial one into a completely obstructing lesion. In my experience this is not true either in the stomach or the small bowel because here there is not the pronounced water resorption. Most of these lesions have more fluid in the gastrointestinal tract than you would have otherwise.

Dr. Eckert: From a clinical standpoint a patient with pyloric obstruction is treated and prepared for operation by emptying the stomach usually by an indwelling catheter; if there are food particles, a large tube has to be passed and the stomach lavaged thoroughly; in most cases of duodenal ulcer with spasm and acute inflammation with some degree of fibrosis, usually the obstruction is relieved and Dr. Patterson is quite correct that subsequent examination is usually carried out and usually permits an accurate diagnosis because the usual cause is duodenal ulcer disease. We must realize that gastric pyloric obstruction does not represent a surgical emergency; the preferable management is after adequate preparation of the stomach to relieve edema and to allow for safer operation.

References

Cohen, W.N.: Gastric Involvement in Crohn's Disease. Am. J. Roentgenol., **101**: 425-430, 1967

Crohn, B.B.: Granulomatous Diseases of the Small and Large Bowel. Gastroenterology, **52**: 767-772, 1967

Crohn, B.B. and Rosenak, B.D.: A Combined Form of Ileitis and Colitis. JAMA, **106**: 1-7, 1936

Edwards, A.M., Muchalyshyn, B., Sherbaniuk, R.W., Costoponlos, L.B.: Regional Enteritis of the Duodenum. J. Cand. Med. Assoc., **93**: 1283-1295, 1965

Fahimi, H.D., Deren, J.J., Gottlieb, L.S., and Zarncheck, N.: Isolated granulomatous Gastritis; its Relationship to Disseminated Sarcoidosis and Regional Enteritis. Gastroenterology, **45**: 161, 1963

Marshak, H. and Lindner, A.: Ulcerative and Granulomatous Colitis. J. Mount Sinai Hosp., **33**: 444-502, 1966

Nelson, S.W.: Some Interesting and Unusual Manifestations of Crohn's Disease of the Stomach, Duodenum, and Small Intestine. Am. J. Roentgenol., **107**: 86-101, 1969

Pryse-Davies, J.: Gastroduodenal Crohn's Disease. Am. J. Clin. Path., **17**: 90-94, 1964

Samter, T.G., Alstott, D.F., and Kurlander, G.J.: Inflammatory Fibroid Polyps of the Gastrointestinal Tract. Am. J. Clin. Path., **45**: 420-436, 1966

6. *Hodgkin's Disease of the Small Intestine*

Contributed by: **L. S. Garfinkel, M.D., R. G. Pugh, M.D., J. M. Hori, M.D.** and **C. Pérez-Mesa, M.D.,** Columbia, Missouri

THE PATIENT was a 40-year old man in January, 1969, when he gave symptoms of intermittent bowel obstruction. On physical examination there was abdominal distention and enlargement of the liver 7 cm below the costal margin; there were also bilateral enlarged axillary and cervical lymph nodes. The hemoglobin was 11.1 gm%, the potassium 4.2 and chlorides 100 mEq/l.

Dr. Moseley: Tumors of the small intestine are rare (Good): only 2 to 6 per cent of neoplasms of the gastrointestinal tract occur in the small intestine. Of the malignant small bowel neoplasms, carcinoid tumors are the most common; of the benign tumors, leiomyomas are the most common. In addition, adenocarcinoma, lymphoma, leiomyosarcoma, adenomatous polyp, lipoma, and hemangioma occur with significant frequency. Less common tumors are lymphangioma, fibroma, neurogenic tumor, and malignant angiogenic tumor. As in this case, the most predominant clinical symptoms and signs of tumor of the small intestine are associated with partial or complete intestinal obstruction. Except in cases of carcinoid tumors, evidence of loss of blood is common; this patient's hemoglobin was 11.1 gm%.

The radiographic appearance in this case does not show complete obstruction but the distention of the jejunum may be indicative of partial obstruction; the rather large lesion in the jejunum appears to be producing slight intussusception of that segment. No evidence of ulceration of the lesion is seen. The presence in this case of peripheral lymphadenopathy leads me to a consideration of lymphoma as a prime diagnostic possibility; in addition, the mucosal pattern of portions of the small bowel not directly involved in the mass suggests infiltration of the submucosa and more diffuse involvement which would be compatible with a diagnosis of lymphoma. On the other hand, the mass itself, being nonannular and non-ulcerating, does not present the typical appearance of either lymphoma or adenocarcinoma. The fact that there seems to be some intussusception suggests an intraluminal rather than a mucosal or submucosal type of lesion—that is, this fact is more suggestive of adenomatous polyp, smooth muscle tumor or lipoma.

Carcinoid tumors are usually smaller than the lesion here but do metastasize to regional lymph nodes and to the liver frequently; the metastases are frequently more bulky than the original tumor.

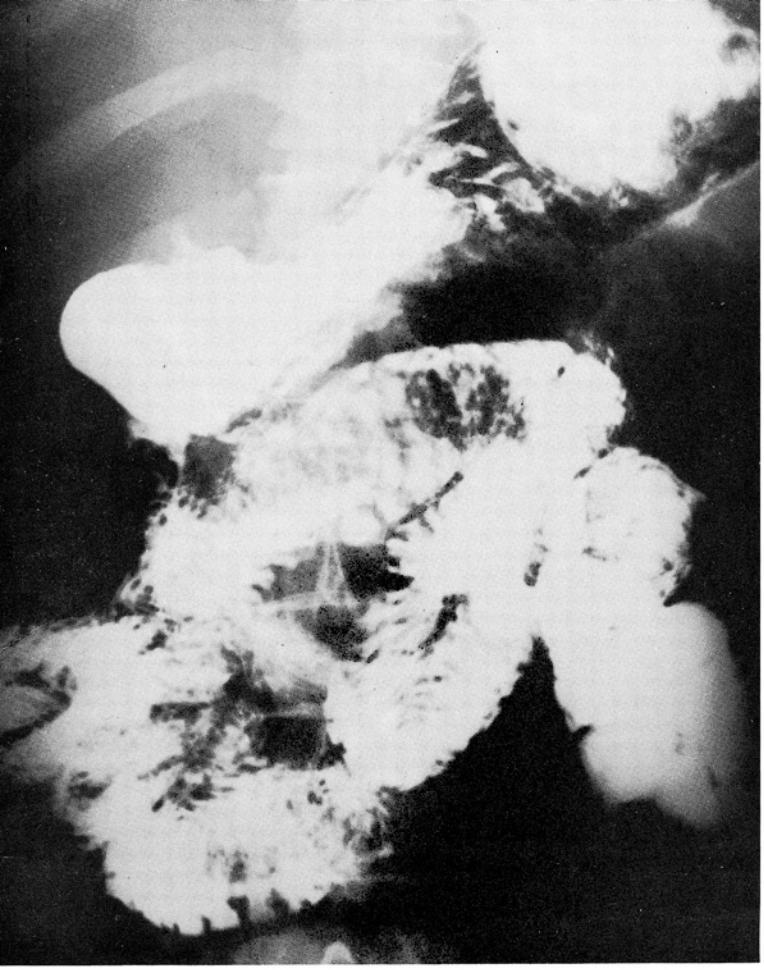


Fig. 1—Contrast roentgenogram showing large lesion of jejunum apparently causing intussusception.

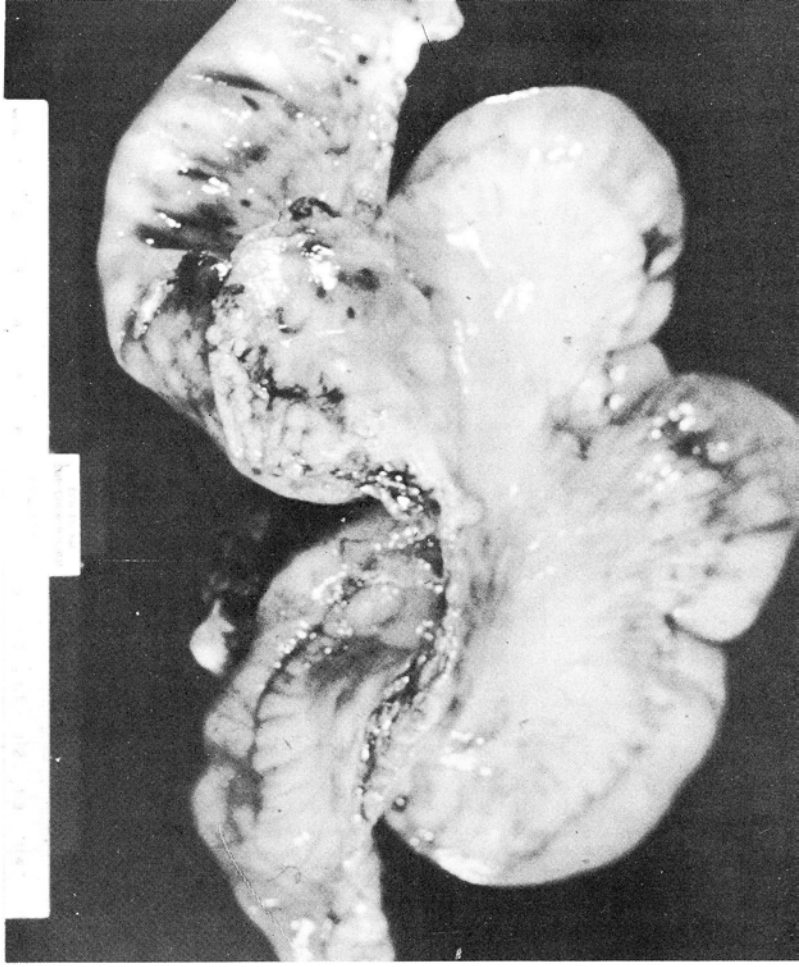


Fig. 2—Segment of the jejunum showing outward appearance.

Dr. Moseley's impression: "LYMPHOMA" WITH INTUSSUSCEPTION

Roentgenologic impressions submitted by mail:

"Lymphoma"	52
Chronic Lymphatic leukemia	10
Leiomyosarcoma of jejunum	9
Others	21

Dr. Moseley: The radiographic appearance with the exception of the abnormalities of the adjacent mucosa in the jejunum, is reasonably compatible with leiomyosarcoma; leiomyosarcomas of the small bowel tend to be pedunculated tumors and produce the intussusception pattern that I believe is present.

Dr. Regato: Dr. J. P. Medelman, of White Bear Lake, and Dr. Harold Peterson, of St. Paul, Minnesota, as well as Dr. M. Landa, of Fargo, North Dakota, also offered an impression of "lymphoma." Dr. J. Billings, of Beverly Hills, California, and Dr. G. Santin, of Mexico City, offered Hodgkin's disease.

Operative findings: On January 24, 1969, a surgical exploration revealed three areas of partial obstruction of the terminal ileum with nodules 3 cm in diameter. Two segments of the small intestine were removed: one of the terminal ileum 72 cm in length and one of the jejunum, 32 cm in length with attached mesentery. On section the nodules were formed by rubbery gray tissue with normal mucosa and numerous enlarged lymph nodes.

Dr. McGavran: At first view this neoplasm evokes a frustrating but not insurmountable choice. It is a poorly differentiated tumor with moderate cytologic aberration, no mucin secretion, and I wonder whether it was a very poorly differentiated carcinoma. Then I decided this would not explain the axillary and cervical lymphadenopathy, although it might the hepatomegaly and anemia. So I went back to looking, had the slide stained a bit lighter than my original and convinced myself that a few Reed-Sternberg cells were present. My confidence in this was strengthened because I know that Drs. Garfinkel and Pugh are hematologists, interested in lymphoma-leukemia.

This case does not really fit the definition of primary intestinal lymphoma and is rather Stage III B Hodgkin's. Nonetheless, lymphomas are manifest primarily in the small gut in approximately the following order: 40% lymphosarcoma (lymphocytic lymphoma both well and poorly differentiated); 40% reticulum cell sarcoma (histiocytic lymphoma); and 10% Hodgkin's disease. Survival data are scanty on the 20-25 cases reported of Hodgkin's primary in the gut. However, 25-50% of the patients with well differentiated lymphocytic lymphoma have survived five years. As in the stomach, the absence of regional lymph node involvement is a favorable finding. Surgical resection of the intestinal lesions is indicated for relief of obstruction, prevention of perforation as well as diagnosis.

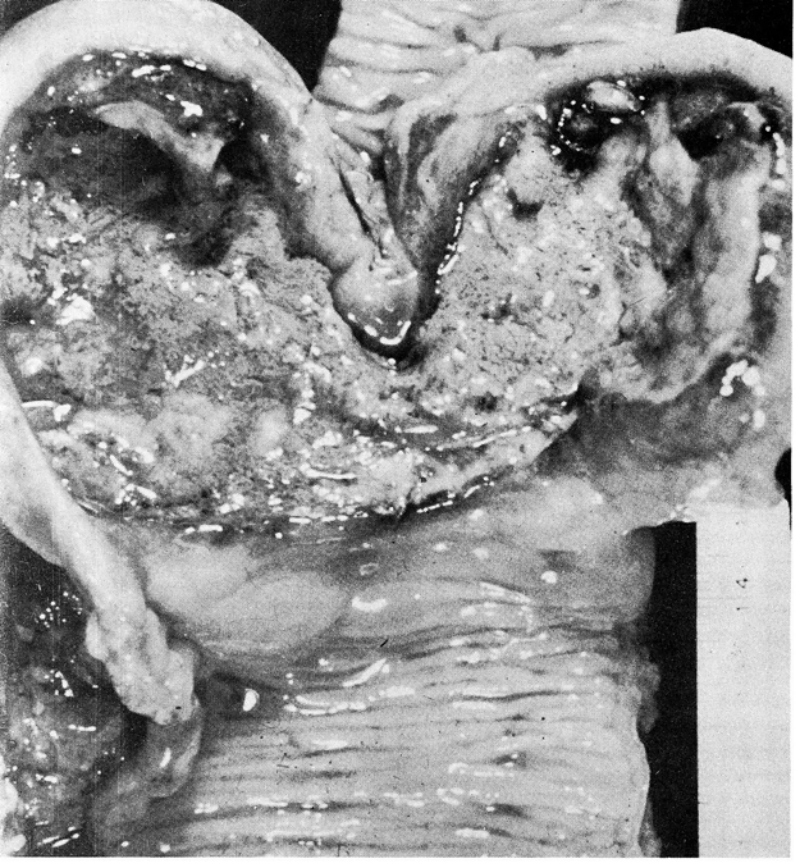


Fig. 3—Opened jejunum showing one of the lesions.

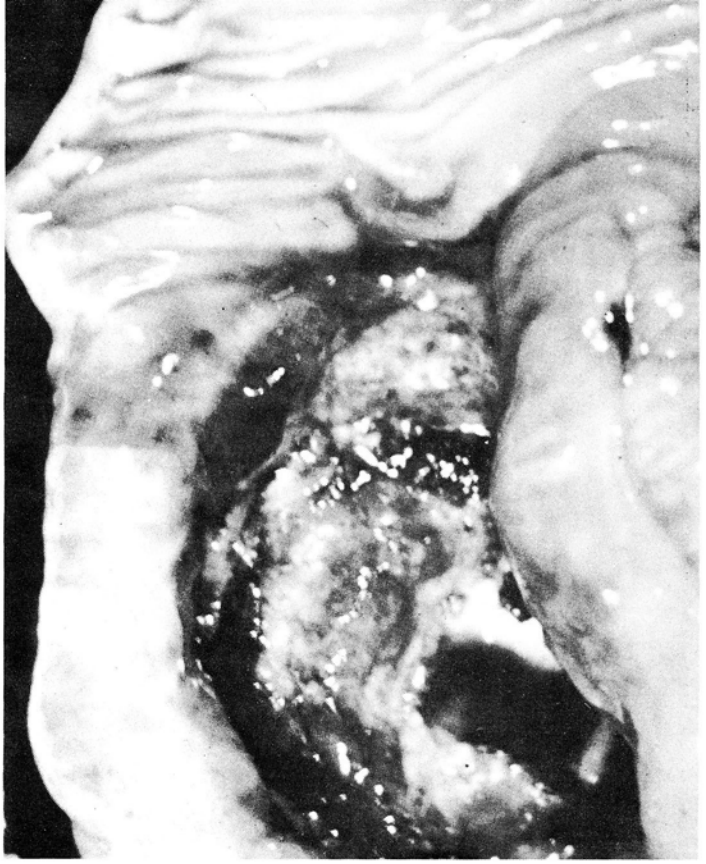


Fig. 4—Necrotic appearance of another section of the jejunum.

Dr. McGavran's diagnosis: HODGKIN'S DISEASE

Histopathologic diagnoses submitted by mail:

Hodgkin's disease (sarcoma 39)	78
Reticulum-cell sarcoma	54
Histiocytic "lymphoma"	11
Carcinoma	9
Leiomyosarcoma	8
Others	10

Dr. McGavran: The diagnosis of Hodgkin's is predominant; the choice of sarcoma of lymphocytic depletion is apparent there. These other diagnoses are understandable in that Reed-Sternberg cells may not have been present or the cells may not have filled the criteria of the individual pathologist. Carcinoma is the diagnosis that I considered for some time but in the review of a group of small intestinal adenocarcinomas very few, if any, are as poorly differentiated as this. This would have to be the most poorly differentiated manifestation of leiomyosarcoma that one could imagine.

Dr. Regato: Dr. C. R. Vest, of Fort Sam Houston, Texas, also made a diagnosis of Hodgkin's disease; Dr. B. Glick, of Tacoma, designated it as Hodgkin's sarcoma; Dr. M. E. Williamson, of Colorado Springs, preferred lymphocyte depleted Hodgkin's; Drs. J. H. Coffey, of Fargo, North Dakota, and G. C. Glenn, of San Francisco, California, called it a reticulum-cell sarcoma, whereas Dr. Don Alcott, of San Jose, California, preferred histiocytic "lymphoma."

Subsequent history: The patient developed cervical and axillary adenopathy, was treated by Cytoxan, Chlorambucyl and Velban. On August 6, 1969, the drugs were discontinued; the hemoglobin was 12 gm%, the WBC 3,300 per mm^3.

Carlos Perez-Mesa, M.D., Columbia, Missouri: This patient was later admitted to another hospital where a biopsy of the lymph node showed the classical features of Hodgkin's disease. Dr. McGavran mentioned that there was a lymph node adjacent to the lesion where no evidence of disease was seen; we collected 17 lymph nodes and in only 3 we were able to make a diagnosis of Reed-Sternberg cells. The patient is at the present time apparently free of disease.

Jerome Vaeth, M.D., San Francisco, California: I know that the lymphocytic depletion makes the prognosis a bad one, but in spite of this we would work up the case fully as all other cases of Hodgkin's. I am curious about what the chest roentgenogram showed and if this patient did have systemic symptoms - pruritis, fever and if the bone marrow biopsy was negative. We would go after this patient aggressively: we would irradiate the entire abdomen and the lymph nodes below the diaphragm but also above the diaphragm, mediastinum, axilla and neck, rather than put the patient on systemic chemotherapy.

Maj. Mike Dorr, M. C., Lackland AFB: It was my impression that the histologic classification of Hodgkin's disease was done in lymph nodes. I wonder if, once you have visceral involvement, does it make any difference whether or not you have lymphocyte depletion or lymphocyte predominence.

Dr. McGavran: I think your suspicions are correct in that the majority of diagnoses of Hodgkin's disease are made on lymph nodes but the same histologic pattern is seen in Hodgkin's when it presents in extra-lymph nodal sites. My understanding from Dr. Perez-Mesa's comment was that both in the lymph node from the small intestine had a comparable pattern.

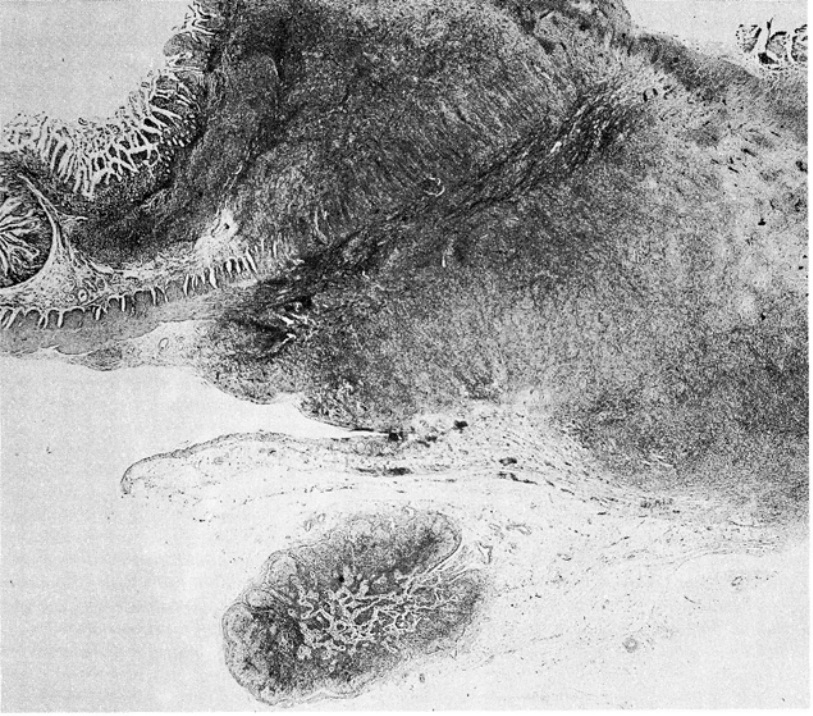


Fig. 5—The neoplastic tissue involves the entire bowel and mesentery, but spares the adjacent lymph node. A deep ulcer extends into the tumor outside the wall of the bowel (H and E, X 10).

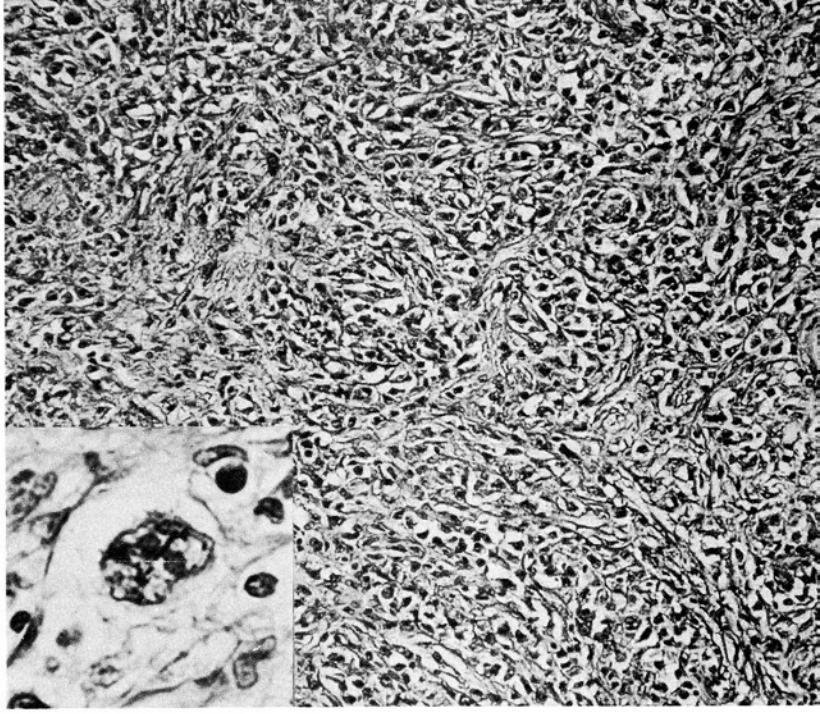


Fig. 6—This poorly differentiated neoplasm is diagnosable by the the presence of a few Reed-Sternberg cells (H and E, X 150. Inset X 700).

Dr. Eckert: The results of adequate lymph node dissection in stage I Hodgkin's are said to be just about equivalent to the results of radiotherapy. We actually do not do this in Albany, I'm simply quoting reports of others.

Dr. Regato: In this instance, I don't see how you could get around the fact that this patient had to be treated surgically in order to treat the obstruction and establish the diagnosis; that doesn't mean that surgery is the treatment of choice of the disease, you are simply treating symptoms and circumstances that are surgical in themselves. I am aware of the fact that there are surgeons who report surgical treatment for Hodgkin's disease which is, of course, medieval; they fail to say that on every one of their patients, there was post-operative radiotherapy given, consequently, their surgery, even though radical amounted to a biopsy. Surgery is not recommended for Hodgkin's disease and I'm sure any professor of surgery knows that. Radiotherapy is the treatment of choice of most cases of Hodgkin's disease. Proper management implies not only a matter of dosimetry, but also prophylactic irradiation of adjacent areas of potential involvement something which has now been re-discovered and dubbed "extended field" therapy. Such approach does not imply simultaneous or intensive irradiation of rather large areas which some believe to be a sin-qua-non. It is preferable to irradiate the various areas consecutively so as to allow the patient to stand the irradiation without systemic or locally injurious effects.

Dr. Eckert: I'm happy to have provided you with an opportunity to say that.

References

Balikian, J.P., et al: Primary Lymphomas of the Small Intestine. Am. J. Roentgenol., **107**: 131-141, 1969

Cohen, N., Canter, J.W.: Hodgkin's Disease of the Small Intestine. Am. J. Digest. Dis., **4**: 361-377, 1959

Good, C. A.: Tumors of the Small Intestine. Am. J. Roentgenol., **89**: 685-705, 1963

Weaver, D. K., Batsakis, J. G.: Primary Lymphomas of the Small Intestine. Am. J. Gastroenterol., **42**: 620-625, 1964

7. *Leiomyoblastoma (Bizarre Leiomyoma) of the Stomach*

Contributed by: **Robert M. Waters, M.D.** and **Robert Boyer, M.D.**, Boulder, Colorado

THE PATIENT was a 76-year old woman in January, 1969, when she complained of postprandial upper abdominal pains and gave a long history of "indigestion." Physical examination revealed no palpable abdominal masses. The Hg was 14.5 gm%, serum electrolytes were within normal limits.

Dr. Moseley: The radiograph in this case demonstrates a hiatus hernia and a smooth rounded mass; there is insufficient radiologic evidence as to the type of hernia; the mass may be in the upper body of the stomach rather than at the cardia. In addition, there appears to be a mass external to the stomach, associated with the gastric mass and containing some irregular calcifications.

It is characteristic of leiomyomas to have only a portion of their mass protruding into the gastric lumen; this disproportion between size of the intraluminal mass and a large external mass is diagnostic. In leiomyoma the mucosa covering the tumor is stretched smoothly and frequently there is a central sharply outlined ulcer crater; there is a suggestion of such a crater on the inferior surface of the mass in this case. Leiomyomas frequently bleed; the absence of anemia in this case is not favorable to the diagnosis. Calcification of gastric leiomyoma is frequently seen microscopically and has occasionally been observed radiologically (Leigh); it probably results from hemorrhage into the tumor.

Other histologic forms of benign tumor which should be considered in this case are: neuroma, fibroma, and fibromyoma; the density of the mass makes lipoma unlikely.

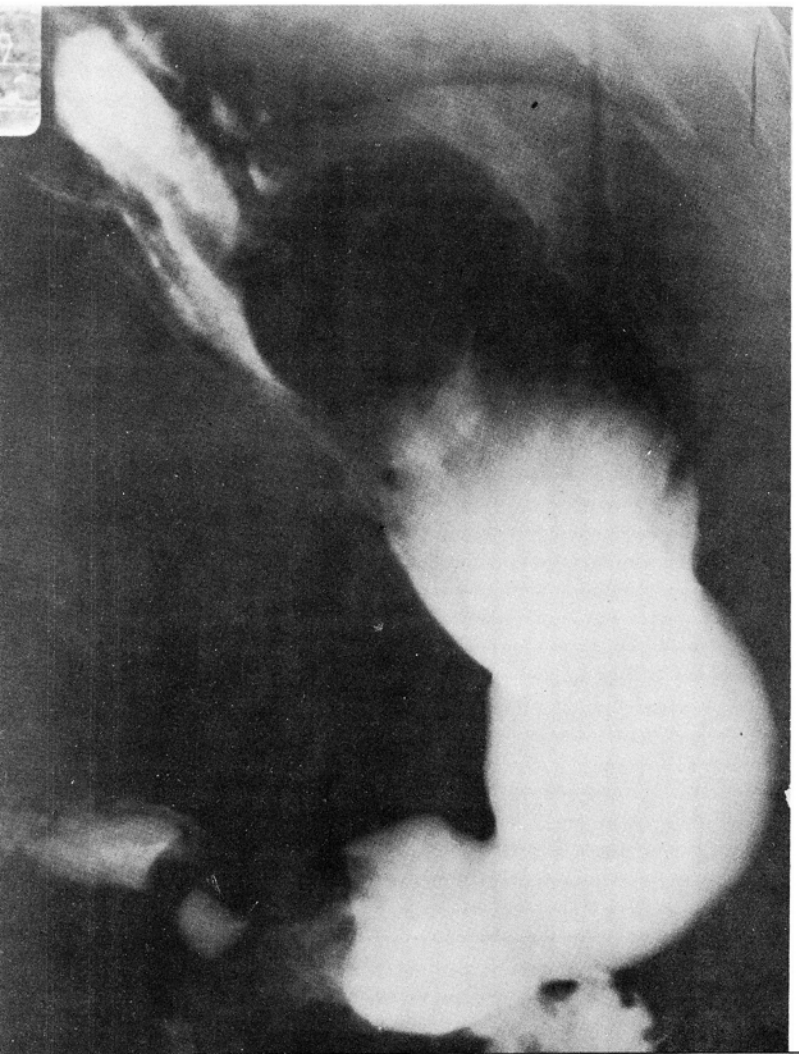
The mass appears too smooth and rounded to raise a consideration of malignant neoplasm.

Dr. Moseley's impression: LEIOMYOMA

Roentgenologic impressions submitted by mail:

Leiomyoma	49
Lipoma	24
Leiomyosarcoma	10
Polyp	9
Others	12

Fig. 1—Contrast roentgenograms showing apparent hiatus hernia and smooth rounded mass in the region of the fundus.



Dr. Moseley: This lesion has a density greater than the air surrounding it and for that reason I would put lipoma further down the list. Leiomyosarcoma versus leiomyoma is difficult for the pathologist on occasion and even more difficult for the radiologist. The earlier leiomyosarcoma we saw was a much larger lesion than this and this is why I stuck with the benign lesion in this case. The presence of a large portion of this mass outside the stomach, at least as I interpreted the radiograph, would mitigate against a diagnosis of polyp.

Dr. Regato: Dr. Edwin Hirsh, of Chicago, submitted an impression of liposarcoma; Dr. Don Weir, of St. Louis, offered leiomyosarcoma; Dr. J. P. Medelman, of White Bear Lake, Minnesota, Dr. J. Meschan, of Winston-Salem, Dr. J. Campbell, of Indianapolis, and Dr. J. Ceballos, of Mexico City, preferred leiomyoma.

Operative findings: On January 31, 1969, a gastrostomy was done. A tumor of the lesser curvature extending over the anterior wall was found. It was 2.5 cm in diameter and apparently intramural. A local excision was done. The specimen consisted of a 6 x 4 cm segment of the wall containing an intramural mass protruding over the serosa as much as on the lumen. On cut section the mass was soft, yellow and gelatinous.

Dr. McGavran: This tumor, because of the presence of atypical and bizarre cells will no doubt evoke a spectrum of malign diagnoses. The sections show in addition to the atypical foci that are, in my opinion, the sequellae of degenerative phenomenon, areas of closely packed ovoid and polyhedral cells with clear cytoplasm and uniform vesicular nuclei. Myofilaments are not demonstrable and the cytoplasm contains neither glycogen or mucin. Others with access to fresh material have shown that these cells do not contain fat either.

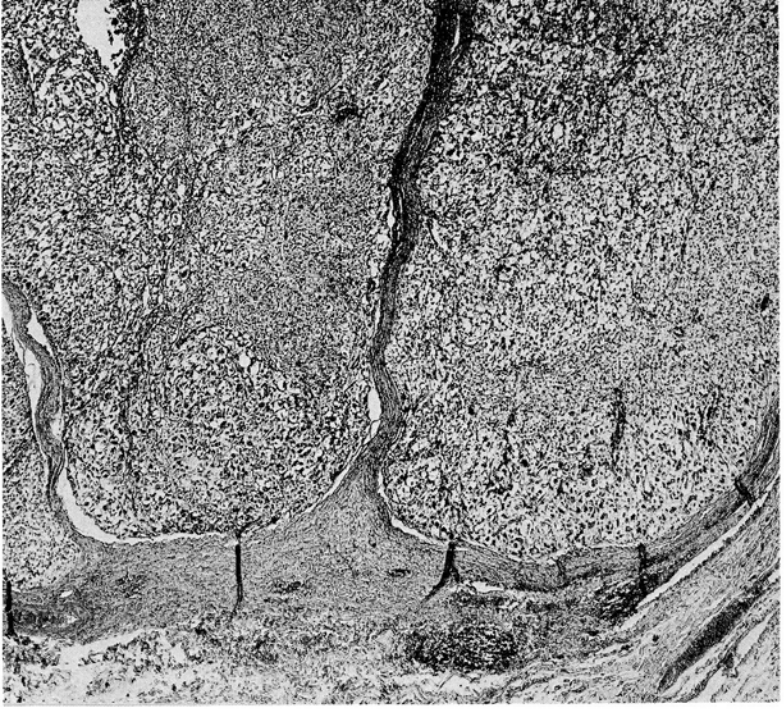


Fig. 2—The encapsulated lobules of vacuolated cells within the gastric wall are shown (H and E, X 35).

This is, in my opinion, a tumor that falls within the domain of the intramural myoid tumors of the stomach first reported by Martin in 1960. The names leiomyoblastoma or atypical (bizarre) leiomyoma were coined by Dr. Stout in 1962. Prior to these reports they existed among a variety of categories, including neuri- and fibrosarcoma and its synonyms; they may be large. A few, perhaps, 1 in 10, behave in a malign fashion. There are to date no clear histologic criteria for selecting these from the rest. In a few cases ultrastructural studies have not clarified the histogenesis of these tumors: myofilamentous structures and other specific features of smooth muscle cells are lacking.

In Finland leiomyoblastomas comprise 3% of mesenchymal gastric tumors and 5% of myomatous gastric tumors. These figures are not, I suspect, based on totals including small leiomyomas found at necropsy.

Dr. McGavran's diagnosis: LEIOMYOBLASTOMA (BIZARRE LEIOMYOMA)

Histopathologic diagnoses submitted by mail:

Rhabdomyosarcoma	69
Leiomyosarcoma	34
Leiomyoma (bizarre, etc.)	12
Leiomyoblastoma	11
Liposarcoma	29
Others	18

Dr. McGavran: The histologic features which were illustrated are evocative of rhabdomyosarcoma; however, to my knowledge skeletal muscle does not exist in the stomach and rhabdomyosarcomas are infrequent save in the proximal gastrointestinal tract and even there they are rare. Though lipomas occur in the stomach, diagnoses of liposarcoma are unfamiliar to me; I suspect they could be dug from the literature, but whether they were, in fact, liposarcomas, or not, I'm not prepared to say.

Dr. Regato: Drs. P. W. Gikas, of Ann Arbor, and K. R. Holloman, of Denver, also made a diagnosis of leiomyoblastoma; Dr. J. W. Shaw, Jr., of San Antonio,

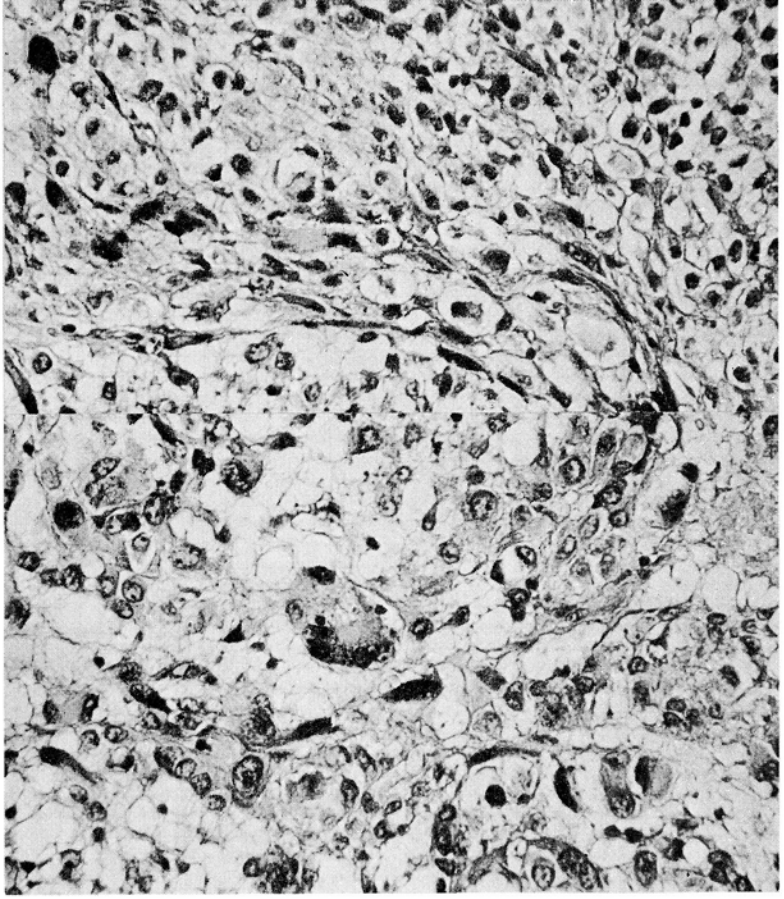


Fig. 3—These fields illustrate the predominant oval vacuolated cells and on the left the bizarre and multinucleat variants (H and E, X 300).

hesitated between leiomyoblastoma and rhabdomyosarcoma. Dr. W. M. Russell of Las Vegas, Nevada, considered it as a pseudosarcoma (or Stout's bizarre smooth muscle tumor), whereas Dr. A. R. Keller, of Washington, D. C., declared it outright leiomyosarcoma. Dr. R. W. Goodnow, of Tacoma, and Dr. R. A. Marcial-Rojas, of San Juan, made a diagnosis of liposarcoma; Dr. H. A. Van Auken, of San Antonio, Texas, offered rhabdomyosarcoma; Dr. J. Clifford, of Denver, designated it as embryonal and Dr. M. Dorr, of Lackland, as pleomorphic.

Subsequent history: On February 16, 1969 the patient expired. No autopsy was done.

Dr. Eckert: I would say that the operation carried out was a good one. This is a difficult surgical problem; the tumor does occupy the upper stomach and an attempt to remove it by partial gastrectomy would subject her to greater risk and would interfere with subsequent digestive function to a greater extent than the limited removal that was carried out. I question seriously whether the tumor was responsible for the symptoms and suggest rather that they probably are derived from a hiatus hernia and some degree of esophagitis. Older patients who are operated upon will occasionally die post-operatively even though they seem to be good operative risks; the actual mortality rate for a patient 76 years of age, without known diseases which increase operative risk, is really very low.

Robert Boyer, M.D., Boulder, Colorado: On the 16th post-operative day she expired after a short time in cardiogenic shock. Cardiac enzymes were elevated and EKG changes had occurred and it was felt that she expired of a myocardial infarct. No autopsy was done.

Dr. Regato: Dr. Boyer, would you tell us what your diagnosis was in this case?

Dr. Boyer: Leiomyosarcoma.

Dr. Regato: Was there any possibility of this tumor being a rhabdomyosarcoma of the diaphragm involving the stomach?

Dr. Boyer: I don't believe so.

Dr. Regato: Dr. McGavran, in order to diagnose rhabdomyosarcoma, you have to have striations that are either there or not; how do you explain that so many pathologists made the diagnosis of rhabdomyosarcoma? Did they see the striations or didn't they?

Dr. McGavran: The bizarre cells which are seen here are reminiscent and evocative of that diagnosis and I would suspect that this is the reason that these diagnoses were submitted; it is nice to see myofilamentous skeletal muscle in order to substantiate a diagnosis of rhabdomyosarcoma; however, as many of the reports indicate, particularly in the embryonal form, such may not be seen and this is a diagnosis taken as much in medicine as it is on faith.

References

Biesecker, J.L., Smithwich, W., Leand, B.: The Gastric Leiomyoblastoma; Behavior and Prognosis. Lab. Invest., 20; 576, 1969

Cornog, J.L.: The Ultrastructure of Leiomyoblastoma. Arch. Path., **87**; 404-410, 1969

Leigh, T.F.: Calcified Gastric Leiomyoma, Report of a Case. Radiology, **55**: 419-422, 1950

Martin, J.F., et al: Tumeurs Myoides Intramurales De L'Estomac. Ann. Anat. Path., **5**: 484-497, 1960

Medhurst, G.A.: Gastric Leiomyoma. Brit. J. Radiol., **31**: 372-376, 1958

Stout, A.P.: Bizarre Smooth Muscle Tumors of the Stomach. Cancer, **15**: 400-409, 1962

Tallqvist, G., Salmela, and Lindstrom: Leiomyoblastoma of the Stomach, A CPC of Ten Cases. Acta. Path. Microbiol. Scand., **71**: 194-202, 1967

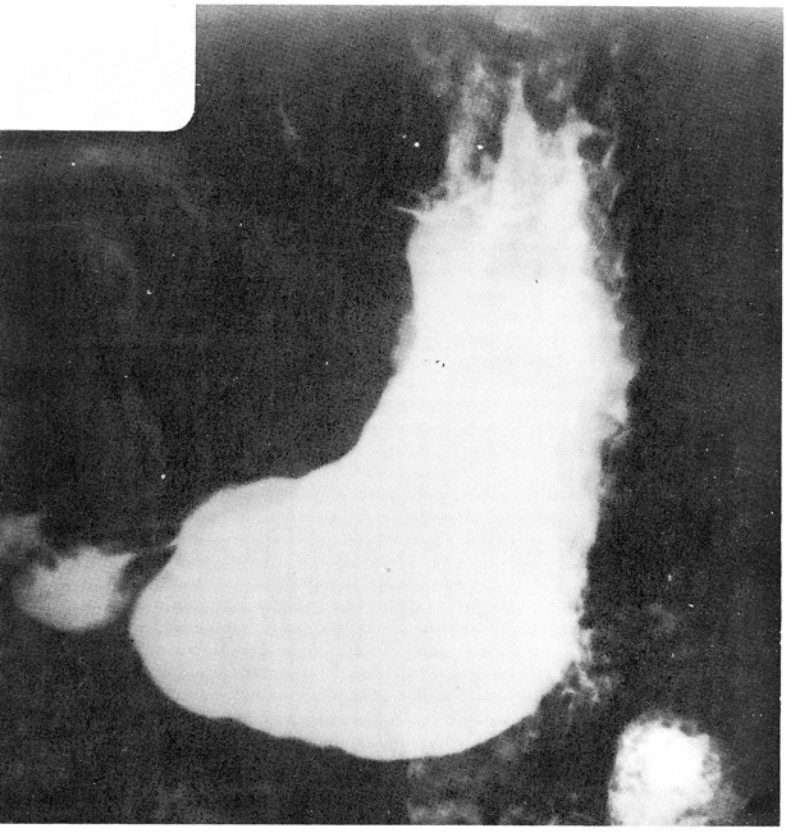
8. *Intramucosal (Superficial) Adenocarcinoma of the Stomach*

Contributed by: **B. W. Frank, M.D., T. K. Early, M.D.** and **J. B. Holyoke, M.D.**
Denver, Colorado

THE PATIENT was a 50-year old woman in June, 1968, when she complained of severe post-prandial epigastric pain and pyrosis. On physical examination there was only some epigastric tenderness to palpation; there was no occult blood in the stools.

Dr. Moseley: I am working from some disadvantage in having only one view of the stomach and not multiple films made at fluoroscopy. Nonetheless, it appears to me that the stomach is involved in a large diffuse mass with large areas of ulceration, particularly along the lesser curvature; but there also seems to be involvement along the greater curvature side of the antrum. I am not too impressed by the "coarse rugal folds" along the greater curvature of the body of the stomach. I do not believe that the appearance is compatible with a diagnosis of Menetrier's disease (giant hypertrophy of the gastric mucosa); the protocol does not give information concerning the presence of hypoproteinemia, which is occasionally seen in association with this syndrome.

Fig. 1—Contrast roentgenogram of the stomach showing areas of ulceration along lesser curvature.



We are not given information concerning the acuteness of the patient's symptoms; acute gastritis from excessive alcoholic intake or high salicylate intake can produce diffuse gastric changes and even ulcerations.

The widespread infiltration and shallow ulcerations which is my interpretation of the roentgen findings here lead to a suggestion of lymphoma or diffuse gastric carcinoma.

Dr. Moseley's impression: 1) "LYMPHOMA" 2) CARCINOMA

Roentgenologic impressions submitted by mail:

"Lymphoma"	23
Menetrier's disease	20
Gastric ulcer	14
Gastritis	13
Carcinoma	12
Superficially spreading carcinoma	6
Others	5

Dr. Moseley: I have already explained why I would exclude a diagnosis of Menetrier's disease. It is certain that the patient had gastric ulcers on the basis of the radiologic appearance, but benign peptic ulceration, I don't believe is to be considered. Gastritis, with shallow ulceration could be a diagnosis. Carcinoma and superficially spreading carcinoma are lumped together and considered again with lymphoma as very difficult to differentiate from a radiological standpoint.

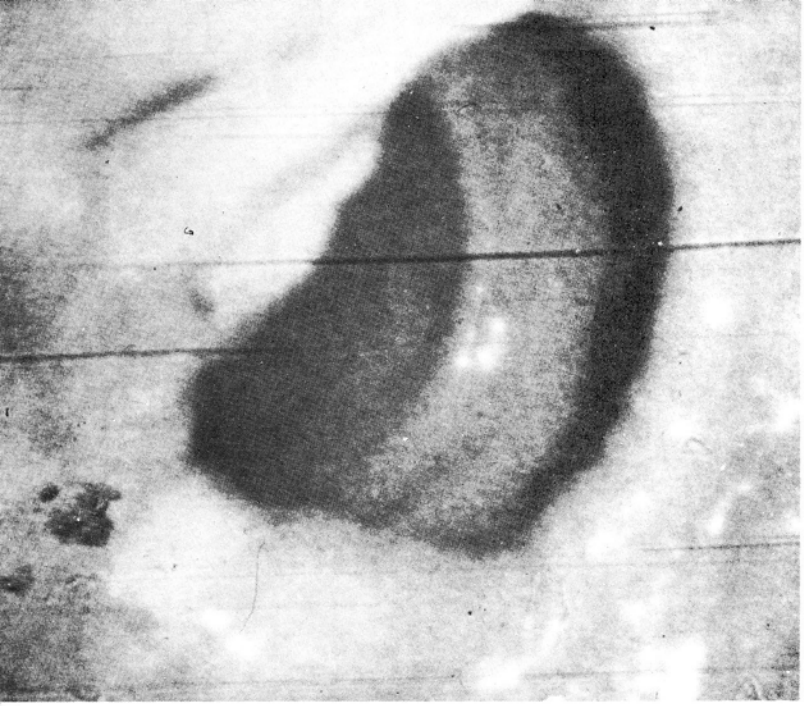


Fig. 2—Gastroscopic photograph showing thickening of the mucosa on greater curvature.

Fig. 3—Poor reproduction of gastroscopic photograph showing shallow ulceration.

Dr. Regato: Dr. J. D. Sutherland, of Denver, also offered an impression of "lymphoma." Dr. J. Conti, of Santa Monica, California, and Dr. J. Medelman, of White Bear Lake, Minnesota, diagnosed an ulceration in the lesser curvature. Dr. R. Calderón, of Managua, suggested Menetrier's. Dr. C. Bickham, of Washington, Dr. E. Salzman, of Denver, and Dr. H. P. Levesque, of Montreal, submitted an impression of superficially spreading carcinoma.

Operative findings: On June, 1968, gastroscopy revealed antral gastritis and 3 shallow ulcers of the lesser curvature and posterior wall with large folds on the greater curvature. The patient was put on a diet with rapid relief of symptoms; within days the ulcers had healed, but a thickened area was noted. On September 28, 1968 a subtotal gastric resection was done.

Dr. McGavran: The histologic picture in this case is one of superficial mucosal erosion associated with an acute and subacute gastritis. Upon closer inspection of the mucosa a population of non-inflammatory cells is found outside of the normal glands within the lamina propria that are characterized by cytologic atypia as well as mucin production. In the material examined these cells are limited to the mucosa. No intestinal metaplasia is apparent though I suspect it would be or was found in adjacent areas. This is an infrequent variant of gastric cancer, comprising less than 5% of the steadily diminishing number of cases seen in this country. It has a most favorable prognosis, with reported five and ten year survivals as high as 95%—75% respectively. Over the past 30 years there has been a continuing clarification and restriction in the definitions of this form of cancer. About half of such cases reported are of the ulcer-cancer, cancer-ulcer variety; one-fourth are plaque-like with or without superficial erosion; and one-fourth are polypoid. The recent papers by Friesen, Bragg, Mainzer, and their associates are valuable contributions. Patients do succumb to this type of gastric cancer, either from incomplete resection, (and hence the pertinence of examining the resection in subtotal gastrectomies) or to the infrequent lymph nodal metastases.

Dr. McGavran's diagnosis; INTRAMUCOSAL ADENOCARCINOMA

Histopathologic diagnoses submitted by mail:

Superficially spreading carcinoma	98
Adenocarcinoma (signet-ring, mucinous, linitis)	33
Peptic ulcer (with cancer, 6)	13
Gastritis	9
Others	11

Dr. McGavran: Superficially spreading cancer by far and away the front runner, but a few were not impressed by the intramucosal infiltration.

Dr. Regato: Drs. T. D. Coppin, of Tacoma, Washington, and E. P. Barlock, of Denver, made a diagnosis of superficially spreading carcinoma of the stomach. Dr. M. C. Wheelock, of Miami, offered chronic ulcer with incipient carcinoma; Dr. M. E. Williamson, of Colorado Springs, diagnosed an atypical mucus secreting epithelium, possibly secondary to pernicious anemia, presenting a focus of carcinoma in situ. Dr. D. Dawson, of Colorado Springs, offered a mucous-cell carcinoma; Dr. A. O. Severance, of San Antonio, designated the superficially spreading malignant cells as signet-ring cells; Dr. G. Gricouroff, of Paris, offered a diagnosis of linitis.

Subsequent history: In June, 1969, the patient was well and had gained 22 pounds in weight.

Dr. Eckert: The surgeon, in this case, must have had a very difficult time deciding how much of the stomach to remove and how much to leave behind. From the radiographic appearance it suggests that this is a very diffuse process and this seems to have been borne out by the gastric camera slides that we saw. I suspect that there may be a tumor still present but I have no way of proving this. I'd like to know if the margins were free. This is a lesion with a slow evolution and the time required for the development of invasive cancer, metastatic disease is really unknown. However, I suspect that

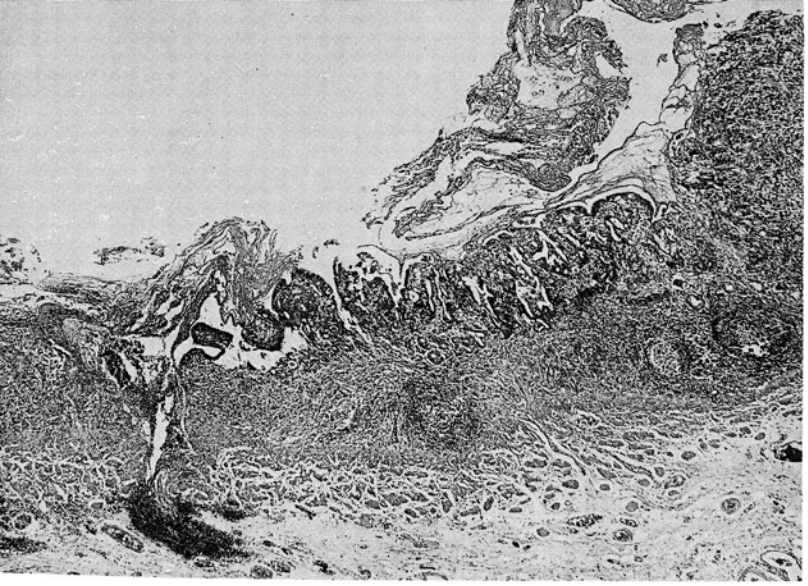
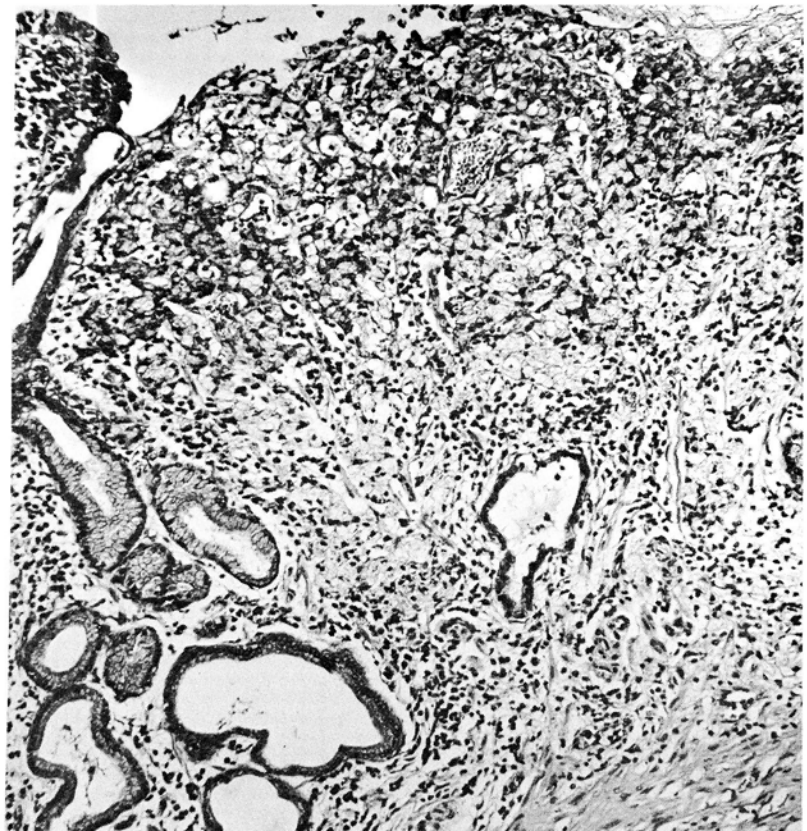


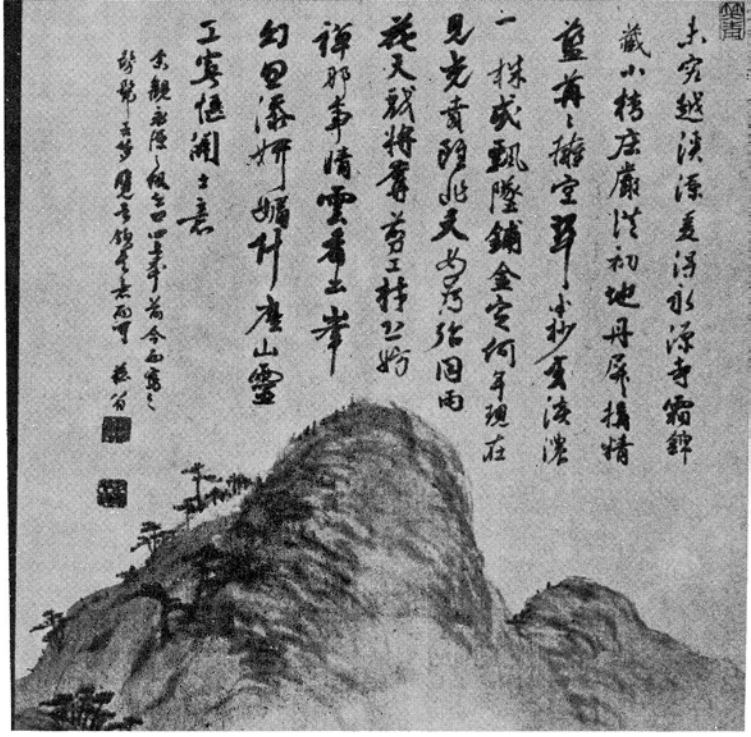
Fig. 4—An errosive lesion in an abnormal and inflammed gastric mucosa is apparent. The muscularis mucosae and submucosa are uninvolved (H and E, X 20).

it must take a considerable period. I wouldn't like to operate on such a case myself. I think that adding a name "linitis" to this is bad because it is associated with a hopeless prognosis instead of an excellent prognosis.

Jon E. Boline, M.D., Denver, Colorado: This was a diffuse disease covering several cm's but there was a significant free margin of resection on both ends. The lymph nodes were all negative. Both to H & E and mucous stains. The patient was gastroscoped and seen this last week; he appears to be doing very well and has now gained 25 pounds since surgery.

Fig. 5—Admixed with the inflammatory cells in the interstitium of the mucosa are mucin producing cancer cells. Remaining gastric glands are seen on the left. This is superficially invasive, not in-situ, carcinoma of the stomach (H and E, X 130).





References

Bragg, D.G., Seaman, W.B., Lattes, R.: Roentgenologic and Pathologic Aspects of Superficial Spreading Carcinoma of the Stomach. Am. J. Roentgenol., **101**: 437-446, 1967

Citrin, Y., Sterling, K. and Halsted, J.: The Mechanism of Hypoproteinemia Associated with Giant Hypertrophy of the Gastric Mucosa. New Eng. J. Med., **257**: 906-912, 1957

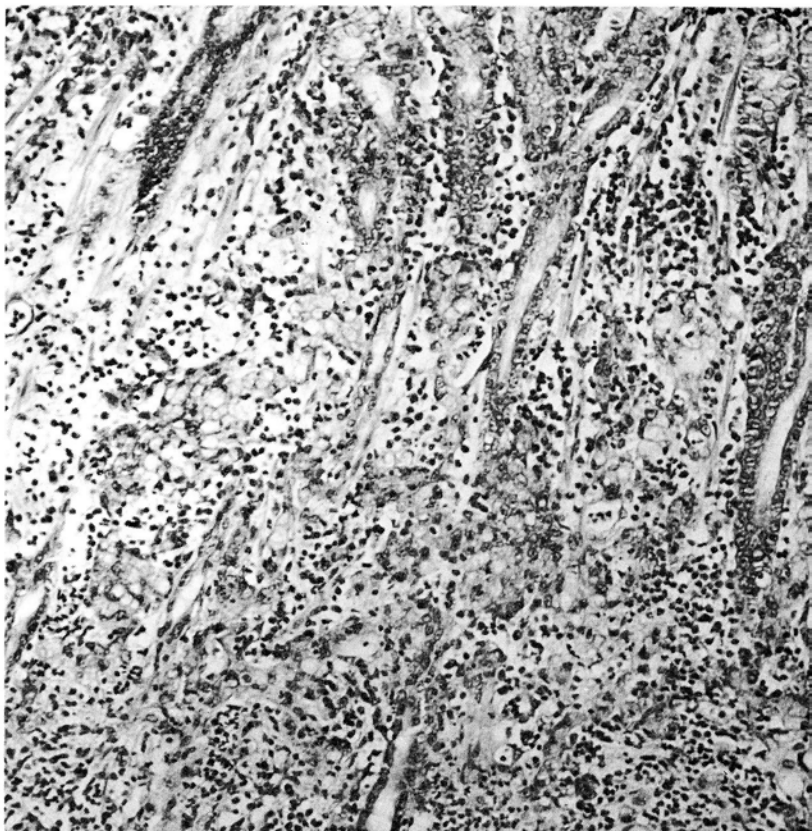
Fieber, S.: Hypertrophic Gastritis, Gastroenterology, **28**: 38-69, 1955

Friesen, G., Dockerty, M.B., ReMine, W.H.: Superficial Carcinoma of the Stomach. Surgery, **51**: 300-312, 1962

Kenney, F., Dockerty, M. and Waugh, J.: Giant Hypertrophy of Gastric Mucosa. Cancer, **7**: 671-681, 1954

Mainzer, F., Amberg, J.R., Margulis, A.R.: Superficial Carcinoma of the Stomach. Radiology, **93**: 109-116, 1969

Fig. 6—Larger magnification.



9. Mucinous Cystadenoma (Mucocele) of the Appendix

Contributed by: **C. Pérez-Mesa, M.D.**, Columbia, Missouri

THE PATIENT was an 80-year old woman in May, 1966, when she felt a mass in the abdomen. Examination confirmed the presence of a palpable, nontender mass 8 cm in the right lower quadrant. The hemoglobin was 13 gm%.

Dr. Moseley: In addition to the radiologic findings in the gastrointestinal tract, this patient has severe osteoporosis with collapse of several of the lumbar vertebrae and a fracture of the right femoral neck; since the patient is 80 years of age these changes may be on that basis. There is a mass adjacent to the cecum, producing displacement of it. There is also diverticulosis of the sigmoid colon and there are changes in the descending colon which involve a long segment and may be inflammatory. The string-like appearance of the barium in the small bowel seems more likely to result from admixture with mucus rather than from narrowing of the lumen since: 1) there is no evidence of dilatation proximal to these long segments of "narrowing" and, 2) the loops of string-like bowel are not widely separated as is the case when this appearance is caused by infiltrative processes in the bowel wall; in other words, I am considering this string-like appearance as artifactual. At the time of this visualization of the colon the patient has also had contrast material injected for visualization of the urinary tract; the visualization is not good but no gross abnormalities are seen; there is contrast material in the urinary bladder and in the collecting systems of both kidneys.

In differential diagnosis, I would consider inflammatory disease arising from the appendix (periappendiceal abscess) or from the colon diverticula as the most likely possibility. The possibility of a mucocele of the appendix must also be considered (Marshak). Mucoceles may present symptoms similar to early acute appendicitis; there may be tenderness and, as in this case, a mass may be palpable. From a radiologic standpoint one cannot differentiate a benign from a malignant mucocele (primary mucous cystadenocarcinoma) which is the second most common malignant neoplasm of the appendix (Scimeca and Dockerty).

Dr. Moseley's impression: 1) PERIAPPENDICEAL ABSCESS 2) MUCOCELE

Roentgenologic impressions submitted by mail:

Regional enteritis	34
Lymphosarcoma	18
Carcinoma	12
Inflammatory lesion	9
Carcinoid	9
Mucocele	6
Others	10

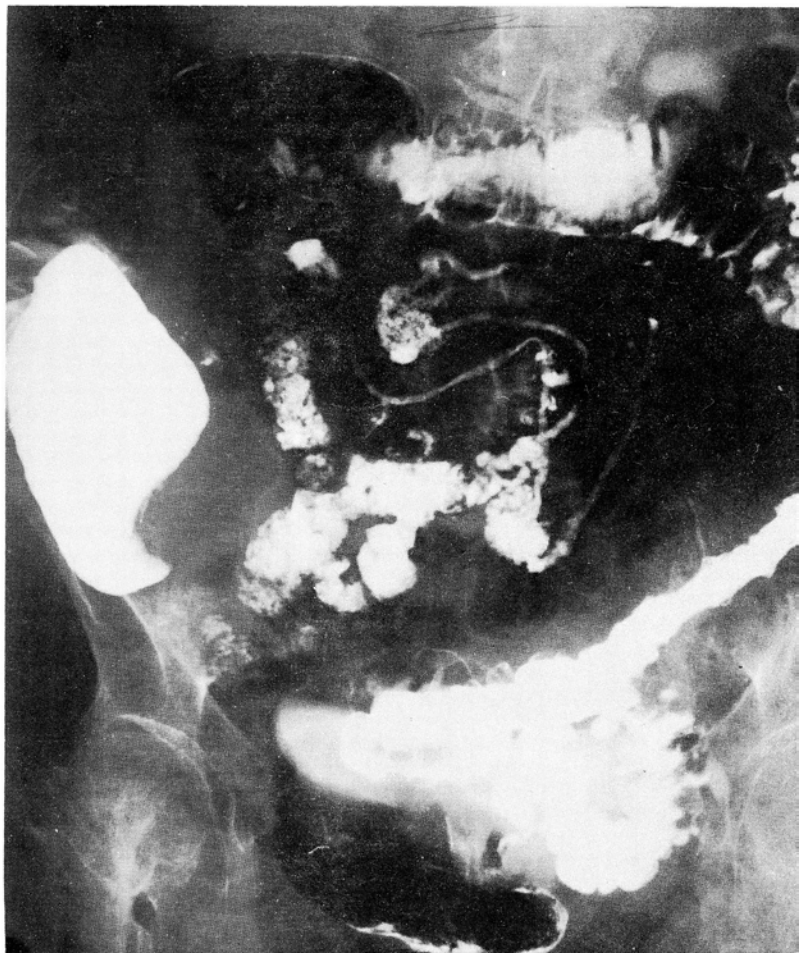
Dr. Moseley: The fact that the loops of bowel are not widely separated by thickening of the bowel wall, makes the diagnosis of enteritis unlikely. I suppose sarcoma is possible. If by inflammatory lesion one means the periappendiceal abscess I suppose that these radiologists were in agreement with one of my diagnostic impressions. Carcinoid is a possibility also and though they may be as large as this lesion is, the typical carcinoid is substantially smaller. There is nothing in the history to give us any indication that this patient has a carcinoid syndrome although it is apparent that carcinoids of the large bowel do not frequently cause the syndrome as carcinoids in other parts of the intestinal tract. A mucocele is my choice for a second diagnosis.

Dr. Regato: Drs. W. Irwin, of Detroit, and E. I. Hirsh, of Chicago, offered an impression of appendiceal abscess. Dr. J. Dolan, of Colorado Springs, submitted an impression of appendiceal tumor; Dr. Harold Peterson, of St. Paul, Minnesota, called it a mucocele, and Dr. M. Landa, of Fargo, a pseudomucinous cystadenoma of the appendix.

Operative findings: On May 11, 1966, an exploratory celiotomy was done; a mass was found in the cecal region and a right colectomy was carried out. The specimen contained a cyst 8 x 8 cm in diameter filled with mucoid material. A smaller cyst, 3 x 3 cm appeared connected with the larger one. There appear to be no connection of the cysts into the bowel lumen; the appendix was not visualized.

Dr. McGavran: This cyst adherent to the caecum is lined by mucinous epithelium that does not infiltrate the

Fig. 1—Contrast roentgenogram of the gastrointestinal tract showing mass adjacent to cecum.



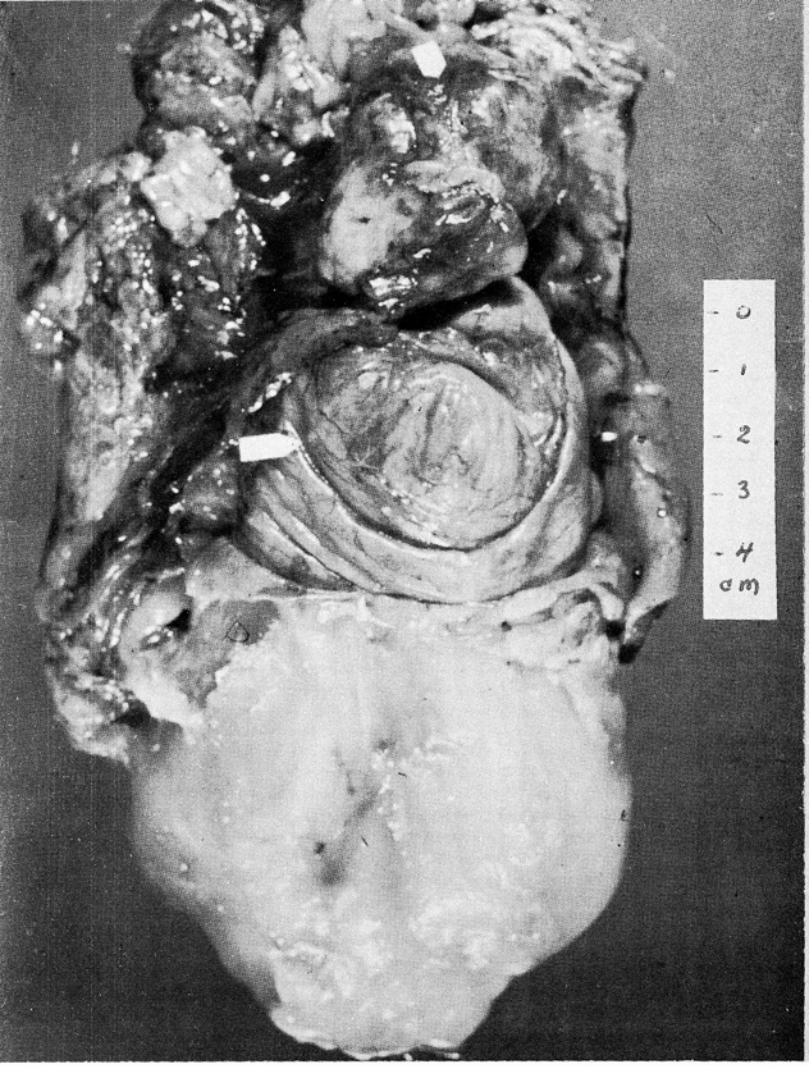


Fig. 2—Surgical specimen showing cyst-like mass.

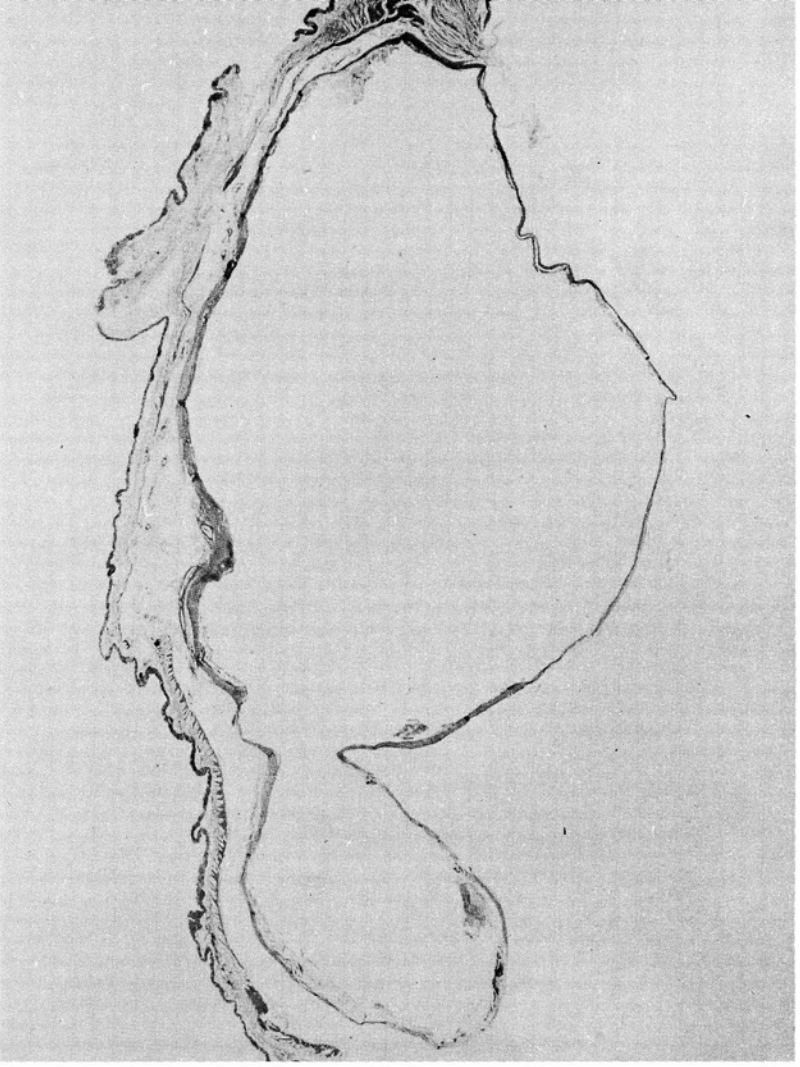


Fig. 3—Low power section of cyst.

wall, nor is it thrown into complex folds. It is a mucocele, so called. The problem is to determine what mucoceles really are. The vermiform appendix is a structure found only in the five great apes—chimpanzee, orangutang, gorilla, gibbon, and man. All of the reports about the "appendix" of the rabbit and other commonly used experimental subjects are in fact about the albeit elongate caecum.

From Collin's life-long study of the appendix, amounting to 71,000 cases, it appears that mucoceles occur in 0.75% of resected appendices. This figure seems a bit high when compared to our experience of 35 mucoceles from among 10,000 (0.3%) appendectomies in adults over a period of 20 years. But both are probably low if one excludes children and incidental appendectomies 35 of 1500 = 2%. The cause of the obstruction is unclear in 80-90% of these lesions. In 10-20% carcinoids or cecal neoplasms are found. An estimate of the incidence of malign behavior, namely peritoneal implantation with the production of pseudomyxoma peritonei can be had from the report of Hughes. From among 81 cases of appendiceal mucoceles 12 had pertoneal involvement. Of the six, followed more than four years, five had recurrence and intestinal obstruction.

I suspect that all of these mucoceles are in fact mucinous neoplasms and not the result of mucinous metaplasia secondary to obstruction. They have a range of biologic behavior comparable to the mucinous tumors of the ovary and hence I consider them mucinous cystadenomas or cystadenocarcinomas, when they extend beyond their luminal confines or have extensive and complicated papillations.

Dr. McGavran's diagnosis: MUCINOUS CYSTADENOMA

Histopathologic diagnoses submitted by mail:

Pseudomyxoma peritonei	59
Mucinous adenocarcinoma	35
Pseudomucinous cystadenocarcinoma	8
Appendiceal mucocele	45
Mucinous cystadenoma	8
Cyst (mucous, enterogenous)	12
Jelly Belly!	1
Others	12

Dr. McGavran: Pseudomyxoma peritonei leads the list; it is obvious that had these gentlemen been afforded the information that the lesion was confined to the appendix, or what I interpret as being the residuum of the appendix, peritoneal involvement would not have been suspected.

Dr. Regato: Dr. R.D. Schultz, of Sioux Falls, made a diagnosis of pseudomyxoma peritonei. Dr. D. Dawson, of Colorado Springs, diagnosed an ovarian mucinous cystadenoma; Dr. M. M. Dorr, of Lackland, offered pseudomucinous cystadenocarcinoma of the appendix. Dr. H. Hamperl, of Bonn, Dr. Morgan Berthrong, of Colorado

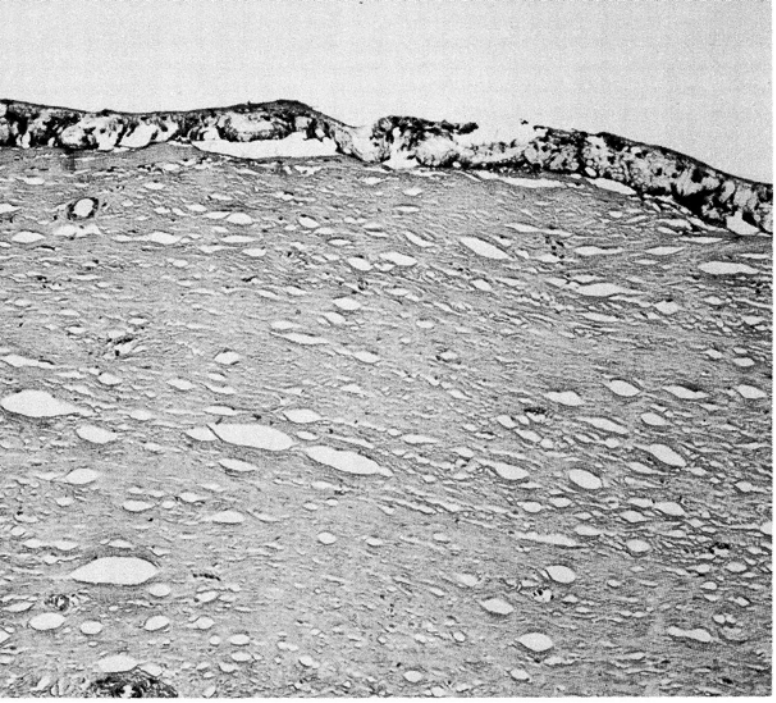


Fig. 4—The flattened mucinous epithelium of this cystadenoma of the appendix is set upon the fibrotic remnants of the wall of the appendix (H and E, X 90).

Springs, and Sister Ignatius, of Cincinnati, called it a mucocele.

Subsequent history: This patient was last examined on October 4, 1968 at which time she had no symptoms related to the condition for which she was treated.

Dr. Eckert: Older patients who have acute appendicitis frequently do so without remarkable symptoms; the frequency of perforative appendicitis in the older patients is quite high (50% and even as high as 80%). Frequently with other inflammatory lesions of the gastro-intestinal tract the elderly tend to underplay symptoms. Whether this is because they don't have them, or because they are afraid of some debilitating or serious illness, or refrain for economic or other reasons, I don't know. This woman didn't have diarrhea, blood in the stools, or anything else to suggest regional enteritis; she didn't have anything to suggest ulcerative colitis. Mucoceles are found more or less incidentally without an acute episode. This woman had resection of the cecum performed for what is a benign lesion; a lesser operation probably could have been done as well, although there is not much margin between this mucinous cyst and the cecum. In our own institution we have at least two patients who had a resection of the ascending colon for a perforation of the appendix with an appendiceal abscess that was walled off; this simply illustrates the difficulty the surgeon may have when things are walled off: unwilling to break into them to either spread mucinous tissue around in the peritoneal cavity or pus in the peritoneal cavity, he may prefer to do a resection. This is usually well tolerated and doesn't greatly increase the mortality risk.

Leo Lowbeer, M.D., Tulsa: I entirely agree with Dr. McGavran about most of the mucoceles being cystadenomas or cystadenocarcinomas; I believe there is a certain number of submucoceles with very flattened epithelium which have the same explanation as a hydrops of the gallbladder. Some of these may occur in the retroperitoneal space and then there may be very peculiar symptoms and consequences. These lesions have all kinds of degrees of invasiveness. We have seen one which seemed to be moderately malignant with an enormous mucocele sac; it was resected but 3 years later the patient had a metastasis to the lung and then had a metastasis to the brain. There are a number of cases in which there is an association of bilateral ovarian mucinous cystadenomas and appendiceal mucocele associated with peritoneal lymphoma. What is here the hen, and what the egg?

Dr. McGavran: I'm not in a position to know what came first, but I would suspect that it is the ovarian involvement; one might suspect also that the two sites occurred concomitantly. I have no way of knowing.

Dr. Lowbeer: I personally have the impression that the primary tumor is of the appendix and that the ovarian tumors represent metastases.

Weldon Bullock, M.D., Los Angeles: I thought from the gross description that there was no connection with the appendix, no connection with the bowel and so Dr. McGavran made a diagnosis of mucocele of the appendix. Is that correct?

Dr. McGavran: As I understand it, the appendix is not identified; we might have some clarification as to whether this patient has a prior appendectomy. The structures I observed in the wall of this lesion lead me to believe that they are the residuum of a fibrotic appendix that is plastered on to the cecum.

Dr. Bullock: I had an alternative diagnosis of enterogenous cyst. The wall was not the usual appendiceal structure or bowel structure; it was a smooth muscle that didn't have any layers that you see in an enterogenous cyst. Earl Henderson, of Los Angeles, has been collecting pseudo-mucinous cystadenomas of the ovaries in women who do not have an appendix; he thinks he settled the question of those that occur spontaneously in the appendix, those in the ovary no doubt come from the ovary. In our experience, if a mucinous cystadenoma of the ovary is ruptured spontaneously or at the time of surgery and scatters its contents nothing happens; it has to be carcinoma that is capable of peritoneal spreading. In the appendix we have given the term incipient mucocele to lesions presenting at the tip; I beleive that these are malignant and not an adenomatous type of lesion. In regard to obstructive mucocele I do believe there is such a lesion. I have seen several in which there is no remnant of epithelial changes. Woodard also separated them in obstructive and neoplastic.

References

Hughes, John: Mucocele of the Appendix with Pseudomyxoma Peritonei; A Benign or Malignant Disease? Ann. Surg., **165**: 73-76, 1965

Long, R.T.L., Spratt, J.S., Dowling, E.: Pseudomyxoma Peritonei; New Concepts in Management With a Report of Seventeen Patients. Am. J. Surg., **117**: 162-169, 1969

Marshak, R.H. and Gerson, A.: Mucocele of the Appendix. Am. J. Digest. Dis., **5**: 49-54, 1960

Melcher, D.H. and Rayan, A.S.: Columnar Cell Tumors of the Appendix. Brit. J. Surg., **55**: 693-696, 1968

Scimeca, W.B., and Dockerty, M.B.: Carcinoma of the Vermiform Appendix; A Review of the Literature and Report of a Case. Proc. Staff Meet. Mayo Clinic, **30**: 527, 1955

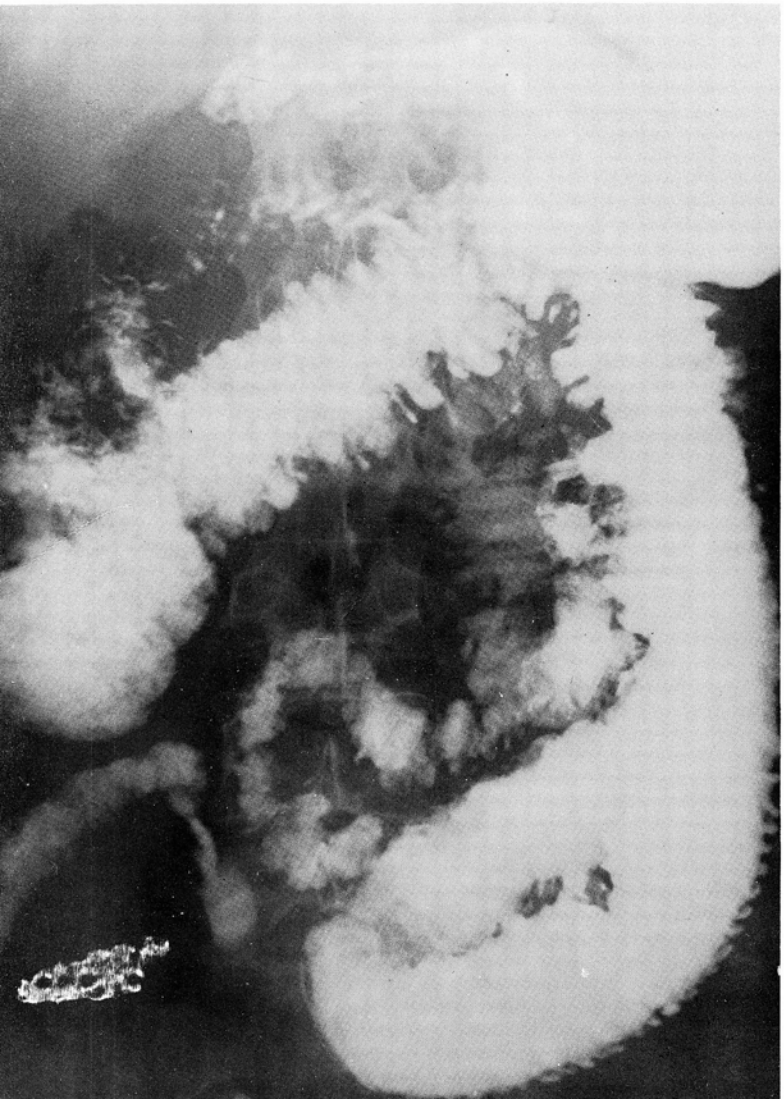
10. *Ulceration of the Ileum Secondary to Irradiation*

Contributed by: **L. Kennedy, M.D.** and **M. Berthrong, M.D.**, Colorado Springs, Colorado

THE PATIENT was a 43-year old woman in March, 1968 when she complained of diarrhea, abdominal distention and tenderness of the lower abdomen. One year previously she had been successfully irradiated for carcinoma of the cervix. Physical examination revealed no other abnormality than abdominal distention.

Dr. Moseley: The radiograph in this case does demonstrate distention of the jejunum but, from my standpoint, the filling of the small bowel distal to the upper jejunum is insufficient on this single view to warrant the conclusion that the ileum is abnormally smooth. In addition to the slight distention of the jejunum, there is frank abnormality of the appearance of the mucosa. There is diffuse thickening of the mucosal folds; there is a suggestion of edema of the bowel wall. The tips of the villi are enlarged and bleblike. The small bowel seems to have a central location suggestive of the presence of some ascites.

Fig. 1—Contrast roentgenogram of the small intestine showing abdominal appearing jejunal mucosa and diminution in the caliber of the ileum.



Intestinal lymphangiectasia may cause hypoproteinemia, edema, serous effusion, malabsorption and diarrhea (Waldman). The possibility that this patient has developed widespread metastatic lymphatic system lesions from her carcinoma of the cervix could be the mechanism for the development of acquired intestinal lymphangiectasia.

The appearance of the jejunum also requires differential diagnosis from other lesions producing thickening of the folds: in Whipple's disease there is usually more sequestration and fragmentation than is present in this case. In amyloidosis, edema and secretions are usually absent. The absence of tumor nodules in the bowel makes lymphosarcoma unlikely although the diffuse involvement is compatible. The appearance of the thickened fold pattern might be seen in sprue but there is no evidence of segmentation, fragmentation or scattering of the barium column.

In view of the history of radiation therapy, the possibility of radiation damage must be considered. Small bowel epithelium is extremely radio-sensitive. The location of the changes in the jejunum, outside of the area of normally utilized treatment portals, makes this difficult to support. Edema and hyperemia are early changes following irradiation. In the later stages there may be ulceration and necrosis with subsequent stricture—but these findings are not seen in the portion of the small bowel outlined with opaque material.

Dr. Moseley's impression: 1) LYMPHANGIECTASIA 2) MALABSORPTION SYNDROME 3) EFFECTS OF IRRADIATION

Roentgenologic impressions submitted by mail:

Post-irradiation effects	54
Regional enteritis	15
Carcinomatous infiltration	9
Others	18

Dr. Moseley: A small number entertained the diagnosis of regional enteritis; in the jejunum which I saw in the radiograph this diagnosis is not tenable. Carcinomatous infiltration is in a sense the type of lesion that I've implied with the diagnosis of acquired intestinal lymphangectasia, that is, a metastasis or infiltration of the lymphatic system producing the secondary changes.

Dr. Regato: Drs. J. E. Livesay, of Flint, Donald Germann, of Leawood, Kansas, and James Conti, of Santa Monica, made a diagnosis of post-irradiation effects of the ileum.

Operative findings: On March, 1968, an exploratory laparotomy was done: The distal ileum was found thickened and bound together. A length of 35 cm of the terminal ileum was resected with preservation of the ileocecal valve. The specimen showed diminution of the caliber of the bowel, the rugal markings were thick and the mucosa discolored.

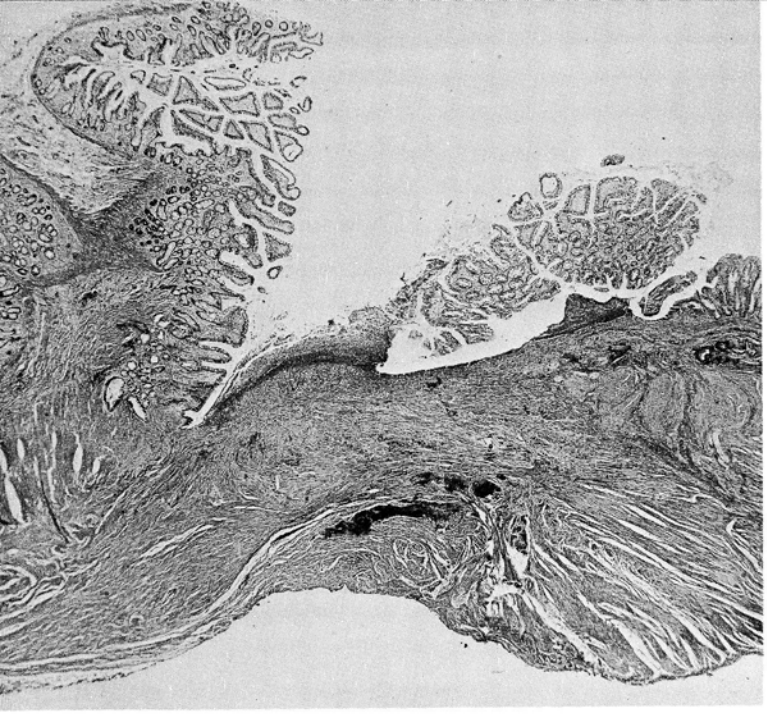


Fig. 2—The ulcer has extended through the muscularis. Its bed is in thickened fibrotic tissue that produces extensive serosal thickening (H and E, X 12).

Dr. McGavran: Histologically one sees a narrow ulcer that extends through the muscularis mucosae into the muscularis. The adjacent mucosa is normal. Within the submucosa many, but not all of the arteries and arterioles show a spectrum of change. This carries from intimal thickening to hyalinization of the media, to duplication and distortion of the elastisa, to occlusion. No intraluminal or intramural lipid laden histiocytes are found in my sections. Some fibrosis is present in the muscularis and serosa.

Ulcers of the small intestine are associated with a variety of lesions—e.g., vascular insufficiency, long standing sprue that may or may not have progressed to malignant lymphoma and enteric coated KC1 tablets given in the therapeutic regimen for hypertension, peptic disease adjacent to heterotopic gastric mucosa in Meckel's diverticulum. Radiations produce no pathognomonic morphologic lesion. But by the process of exclusion of the other predisposing factors it is reasonable to conclude, in cases like this, that this ulcer is the result of irradiational injury. The anatomic manifestations are of significant small vessel damage.

A current study by Drs. Carlos-Perez and Lagos, of the incidence of irradiational injury to the intestines, has shown that besides the now discontinued therapeutic adjunct of parametrial radioactive gold injection that led to a significant incidence of sigmoidal bowel injury, antecedent abdominal operations and pelvic inflammatory disease are contributing factors. I am loath, in the presence of an eminent radiotherapist to discuss the problems of applicators, fields, split and unsplit, but am certain he will agree that in the standard radiotherapeutic treatment of carcinoma of the uterine cervix the area of the cul de sac, wherein the small intestine may reside receives a dose in the vicinity of 7000 rads.

Dr. McGavran's diagnosis: ULCERATION OF THE ILEUM SECONDARY TO IRRADIATION

Histopathologic diagnoses submitted by mail:

Radiation effects (enteritis, ileitis)	128
Amyloidosis	12
Ischemic ulcer	11
Malabsorption syndrome	9
Lymphangiectasia	6
Radiation (God forbid!) enteropathy	1
Others	11

Dr. McGavran: The ischemic ulcer fits in here probably on the basis of not wishing to malign anybody. The hyalinization seen in those small vessels is more intra-luminal than the usual accumulation of amyloid. Lymphangiectasia was not apparent in this section.

Dr. Regato: Dr. R. A. Marcial-Rojas, of San Juan, noted the flattened and broadened intestinal villi, the edema and degenerative changes of the myoenteric plexuses, the more prominent effects on the blood vessels and

Fig. 3—A small submucosal artery shows extensive medial and intimal hyalinization. An adjacent venule shows replication of the elastica (VVG, X 150).

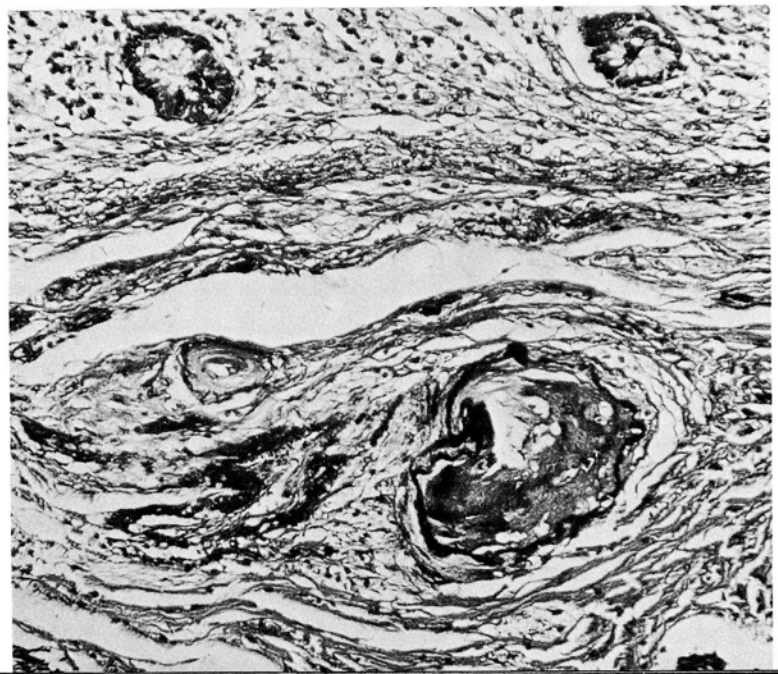
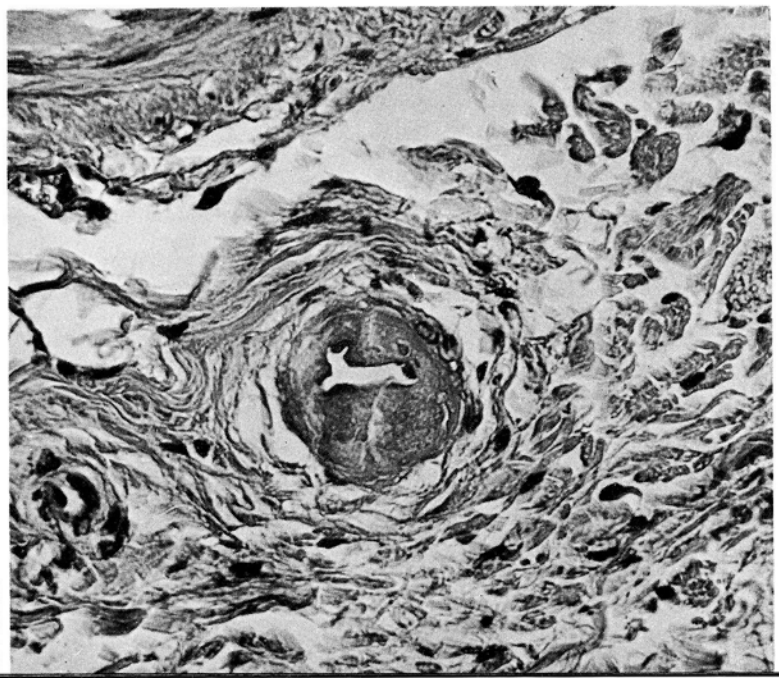


Fig. 4—An arteriole showing marked medial thickening and hyalinization that reduces the lumen to a narrow slit (H and E, X 350).



the submucosal fibroblasts: he concluded to irradiation effects. Dr. C. O. Burdick, of Pittsfield, Massachusetts, also made a diagnosis of radiation ileitis. Dr. W. M. Russell, of Las Vegas, suggested a malabsorption syndrome.

Subsequent history: On July 11, 1968 this patient complained of abdominal cramps, which were thought to be due to volvulus and which subsided under medical treatment. She was again admitted to the hospital on August 12, 1969 with symptoms suggesting partial bowel obstruction. On examination she was found to have a large gastric ulcer; medical treatment resulted in dramatic improvement within 48 hours. On October 20, 1969 she was again admitted. Radiographic and gastroscopic examination revealed enlargement of the gastric ulcer and she is presently being considered for surgical treatment.

Dr. Eckert: These radiation injuries, involving intestines and other structures, are among the most difficult for a surgeon to handle. The margins sometimes aren't quite as clear-cut as they might be. Fistula formation has been a complication of surgical resection. A number of these produce short napkin-ring type fibrotic lesions years after radiation therapy. The majority, however, are seen in the first year after treatment and these are the ones that are the most difficult to manage. This is always further complicated by the question of whether the tumor has been controlled. Apparently the resection of the small intestine for this particular lesion was successful. She continues to have other inflammatory lesions probably not associated with radiation therapy. I don't see how you can incriminate the gastric ulcer unless this is psycogenically oriented for fear of recurrent disease.

Dr. Regato: Because of the historical evolution of radiotherapy for carcinoma of the cervix, the early literature abounds on the effects of irradiation of the large intestine; ulcers and necrosis of the rectum do result whenever the radium that is applied in the vagina is not sufficiently separated from the rectum. The effects of irradiation on the small intestine are less frequently suspected by clinicians; this is unfortunate for it delays surgical treatment and as a result unnecessary death may ensue. For 30 years we have been aware that this is not uncommon and that this is more likely to occur in patients whose treatment consisted of a rather extensive or intensive external rather than internal treatment. With supervoltage equipment and cobalt units the external irradiation is done to a much greater extent than a few years back. Two surgical colleagues of mine published a paper about 25 years ago on facticial radiation of the bowel and described the fact that these patients could succumb to gangrene of the small bowel when actually they had been cured of cancer, and that either an enterectomy or entero-colostomy were very often capable of solving the problem (Wiley and Sugarbaker). Often the surgeon tends to save the ileo-cecal valve and when that happens the patient may have to be re-operated again.

Morgan Berthrong, M.D., Colorado Springs: I think the vascular changes here are perhaps a little more severe than most although not out of line with what they all show. I might say that the Congo Red stain was negative as was the Metachromatic stain. The interesting thing about our group of about 15 or 17 cases, who have had this syndrome, is that they have had repeated previous operations as was indicated: they include appendectomies, ovarian cysts, pelvic inflammatory disease, previous ruptured peptic ulcer, etc. We suspect that the radiation enteritis is more prone to develop in a patient who has had adhesions and fixation of the terminal ileum. The vasculitis very likely contributed to this ulceration or at least to its persistance; on the other hand, we see ulceration in the absence of such severe changes. We've also noted severe reaction in many of the myenteric ganglia and submucosal ganglia. Lymphatic changes have been prominent.

Dr. Regato: Dr. McGavran brought up the matter of dosage. Patients with carcinoma of the cervix receive a large amount of radiations in order to give them the best chance of cure; as a consequence, everything that is in the pelvis is irradiated to that extent also: several thousand roentgens are delivered in a period of about 6 weeks; irrespective of dose, the patients with a history of previous surgery seem more prone to develop this complication. This will continue to be a complication; not necessarily a fatal one, of the treatment of carcinoma of cervix.

Louis P. Dehner, M.D., Washington, D.C.: A recent review of radiation changes that appeared in the Annals of Surgery in the past three months indicates the more distal the lesion, the shorter the latent period between the treatment and the appearance of lesions. For instance, the small bowel lesions have the longest latent period as long as 10 to 20 years. Also, the patients who have these changes in the bowel have an increased incidence of arteriosclerotic heart disease and also hypertension (De Cosse and associates).

References

Ackerman, L.V.: Irradiation Effect of the Ileum. Cancer Seminar, **1**: 142-144, 1954

Chan, P.M., Fletcher, G.H., Ruttedge, F.H., Dodd, G.D.: Complications in High Dose Whole Pelvis Irradiation in Female Pelvic Cancer. Am. J. Roentgenol., **87**: 22-40, 1962

DeCosse, J.J., Rhodes, R.S., Wentz, W.B., Reagan, J.W., Dworken, H.J., and Holden, W.D.: The Natural History and Management of Radiation Induced Injury of the Gastrointestinal Tract. Ann. Surg., **170**: 369-384, 1969

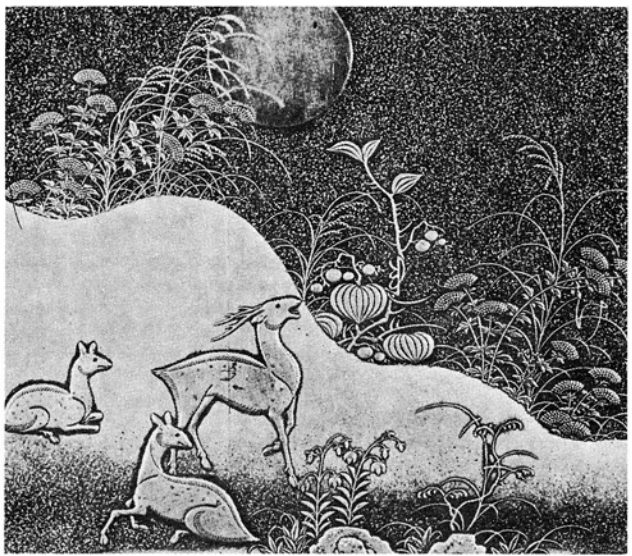
Hurteau, G.D., Morris, J.M., and Chang, C.H.: Injuries Related to Radiation Treatment of Carcinoma of the Cervix and Complications of Supplemental Surgery. Am. J. Obst. and Gynec., **95**: 696-705, 1966

Perkins, D.E., and Spjut, H.J.: Intestinal Stenosis Following Radiation Therapy. Am. J. Roentgenol., **88**: 953-965, 1962

Waldman, T.A., Steinfeld, J.L., Dutcher, T.F., Davidson, J.D., and Gordon, R.S., Jr.: The Role of the Gastrointestinal System in "Idiopathic Hypoproteinemia." Gastroenterology, **41**: 197-207, 1961

Wayte, D.M., and Helwig, E.B.: Small Bowel Ulceration—Iatrogenic or Multifactorial Origin. Am. J. Clin. Path., **49**:26-40, 1968

Wiley, H.M., and Sugarbaker, E.D.: Roentgenotherapeutic Changes in the Small Intestine. Cancer, **3**: 629-640, 1950



11. *Giant Inflammatory Pseudo-Polyposis of the Colon*

Contributed by: **M. L. Elliott, Capt., USAF, M.C.,** Scott AFB
and **William C. Black, M.D.,** Albuquerque, New Mexico

THE PATIENT was a 49-year old man in March, 1968, when he gave a history of repeated past episodes of blood in the stools and complained of bloody diarrhea of recent onset; there had been no weight loss. One year previously a thorough rectal and radiographic examination had revealed only a rectal polyp. Physical examination uncovered only tenderness to palpation of the abdomen. Hematocrit was 52%.

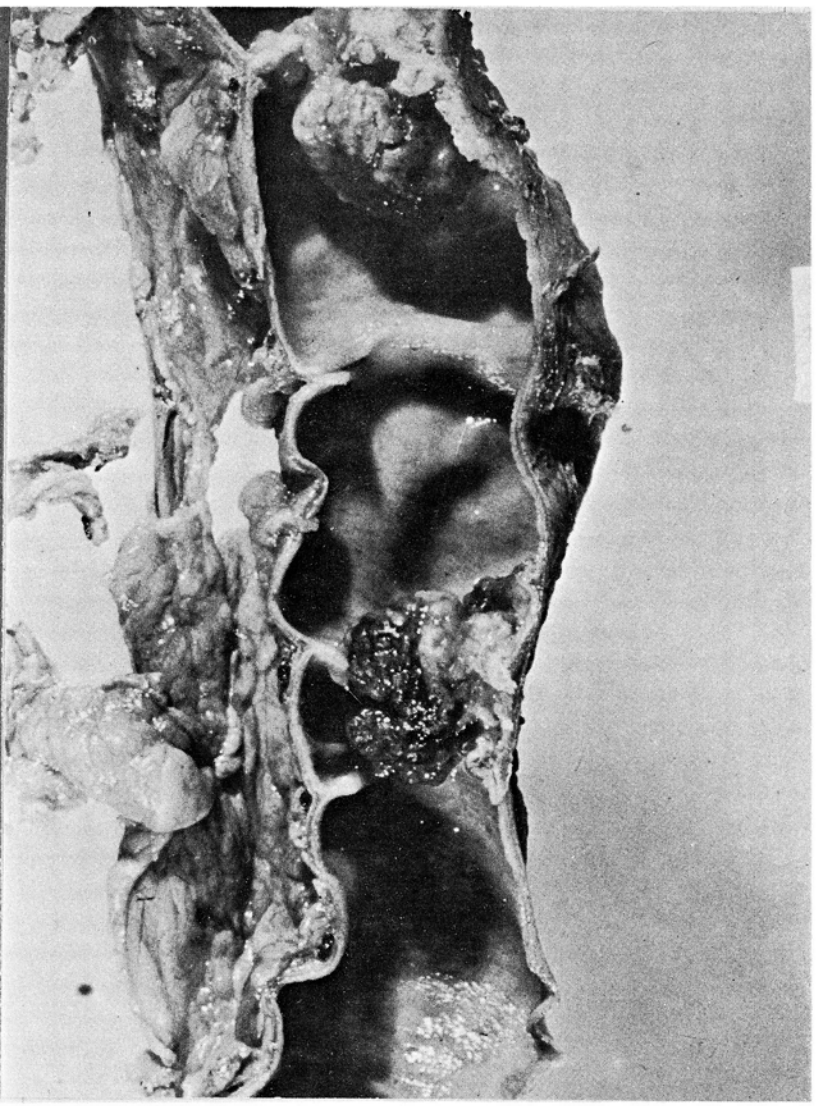
Dr. Moseley: The prominent radiographic lesions in this case consist of two separate areas of rather severe narrowing of the descending colon and a polypoid lesion of the mid-transverse colon. The areas of narrowing have a somewhat polypoid appearance also.

The differential diagnosis in this case (Marshak and associates) involves consideration of granulomatous colitis and polyps. The discrete areas of localized involvement mitigate against differential diagnosis of more generalized polyposis, such as familial polyposis, ulcerative colitis with inflammatory polyps, diffuse lymphosarcoma, and pneumatosis cystoides intestinalis. The Peutz-Jeghers syndrome consists of mucocutaneous pigmentation (about which we have no information in this case) and intestinal polyposis (Peutz-Jeghers). Though in this condition most of the polyps occur in the small bowel, polypoid tumors may be present throughout the entire gastro-intestinal tract. Malignant degeneration may occur and the two constricting lesions in the descending colon may be so involved. Gardner's syndrome (consisting of polyposis of the large bowel, associated with multiple osteomas of the facial bones, sebaceous or epidermoid cysts or fibromas of the skin) carries also a risk of malignant degeneration (Gardner and Richards). But we are given no information concerning the presence or absence of facial osteomas in this case.

Since this patient's hematocrit is 52% and since hypernephromas are known to produce erythropoeitin, the possibility that these lesions might represent metastatic hypernephroma deserves a passing glance. Granulomatous

Fig. 1—Barium enema showing polypoid lesions of the transverse and descending colon.

Fig. 2—Surgical specimen of descending colon showing two sessile lesions.



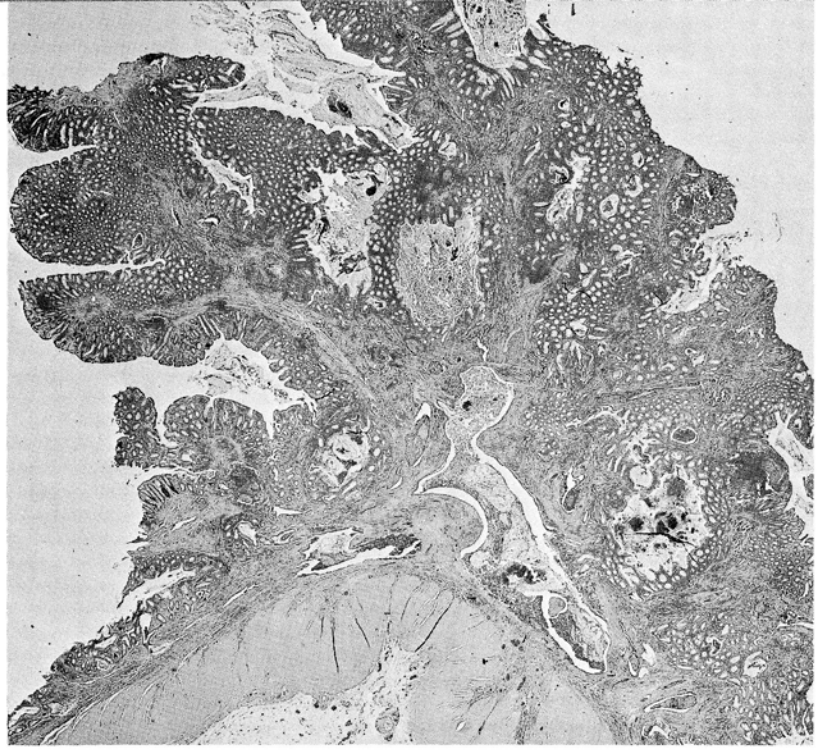


Fig. 3—The polyp is formed of inflammed normal colonic mucosa. Large submucosal abscesses are evident (H and E, X 5).

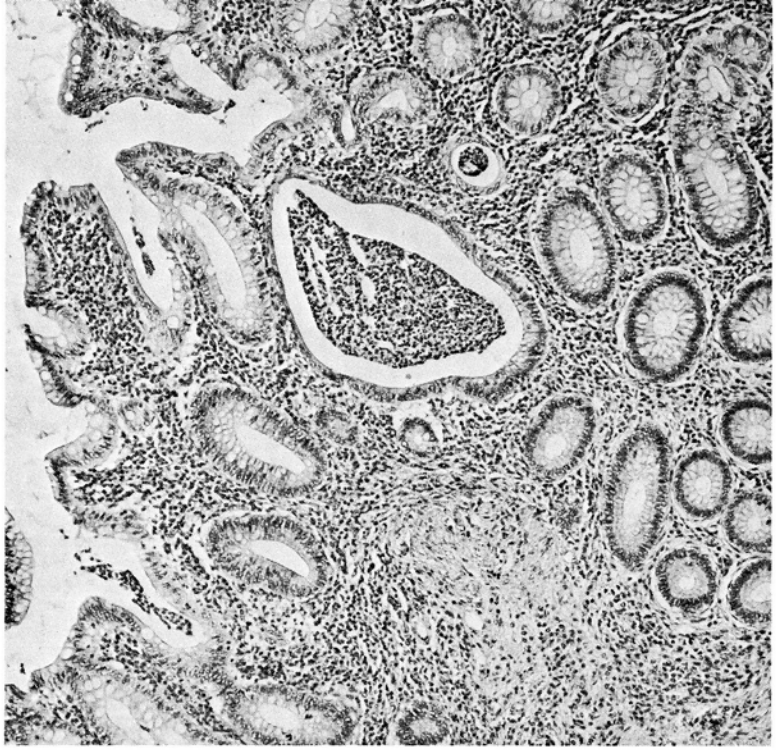


Fig. 4—The acute intraluminal and chronic interstitial inflammation in an otherwise unaltered colonic mucosa is shown (H and E, X 90).

colitis (Wolf and Marshak) has radiologic features essentially the same as regional enteritis of the small bowel. This includes skip lesions (which these in this case might be), narrowing or stricture formation and pseudopolypoid changes. Absent in this case but seen in cases of granulomatous colitis are ulcerations, pseudodiverticula, internal fistulas and sinus tracts. Thickening of the bowel secondary to intramural fibrotic changes is common in granulomatous colitis and produces irregular stenotic segments. Specific inflammatory diseases (amebiasis and tuberculosis) might also be responsible for the production of granulomas in the colon.

Because of the difficulties of differential diagnosis of the lesions in this case, I am left with two conflicting impressions.

Dr. Moseley's impressions: 1) POLYPOSIS OF THE COLON POSSIBLY WITH MALIGNANT DEGENERATION 2) GRANULOMATOUS COLITIS

Roentgenologic impressions submitted by mail:

Multiple carcinomas	62
Multiple benign polyps	15
Granulomatous colitis	6
Others	10

Dr. Regato: Dr. E. I. Hirsh, of Chicago and Dr. V. Perez, of Costa Rica, also submitted a diagnosis of nonspecific granulomas with polyp formation. Drs. E. Salzman, of Denver, and John Campbell, of Indianapolis, offered an impression of multiple colonic carcinomas. Dr. J. Dolan, of Colorado Springs, preferred villous adenomata. Dr. J. Ceballos, of Mexico City, offered ulcerative colitis with multiple carcinomas.

Operative findings: On March 18, 1969, the patient was operated upon. A polypoid lesion was felt in the distal transverse colon and annular infiltrations were found in the descending colon. A left hemicolectomy was carried out. Four sessile polypoid lesions, 4 cm, 3 cm, 2.5 cm and 1 cm in diameter were described. The intervening mucosa was normal. All the examined lymph nodes were negative.

Dr. McGavran: This is a puzzling case. If one accepts the statement that one year previously there were no lesions demonstrable on barium enema at the sites now showing these large polypoid excresences, and in the absence of any of the stigmata of Peutz-Jeghers and Gardner's syndromes the choices become very restricted.

Histologically these polyps are composed of inflammed colonic epithelium and submucosa. Acute intraluminal abscesses, submucosal dissection and a heavy chronic infiltrate are seen. None of the features whereby retention (juvenile), adenomatous, villous or hyperplastic—metaplastic polyps are recognized are present.

The recent reports on Gardner's syndrome show that not all of the afflicted manifest the full spectrum of lesions—keratinous cysts, fibromas and desmoids, osteomas and polyps. Dr. Elliot assures me that none of these stigmata were present, nor was there any familial history of colonic polyps. So I think hamartomatous polyps are best discarded.

The history in this man of bloody diarrhea, antedating the demonstration of these polyps by a year suggests another possibility. Hinrichs and Goldman have reported a case, and dug up three others, of what they call localized giant pseudopolyps of the colon. These all occurred in patients who for various reasons were thought to have ulcerative colitis. I think this case fits this unusual sequella of colitis.

Dr. McGavran's diagnosis: INFLAMMATORY PSEUDO POLYP OF THE COLON WITH ULCERATIVE COLITIS

Histopathologic diagnoses submitted by mail:

Adenomatous polyp	60
Inflammatory (pseudo) polyp	51
Ulcerative colitis	32
Villous adenoma	11
Polyposis	9
Others	17

Dr. McGavran: I do not feel that the epithelial changes present in the polyps fit those of the usual adenomatous polyp. There is nothing villous about this and the others are there.

Dr. Regato: Dr. F. Schajowicz, of Buenos Aires, offered adenomatous polyp with intense inflammatory reaction. Dr. G. C. Glenn, of San Francisco, made a diagnosis of adenomatous polyp with colitis cystica profunda; Dr. W. A. Meriwether, of Tacoma, called it an inflammatory polyp and Dr. C. Maso, of Chicago, a hamartomatous polyp.

Subsequent history: In June, 1969, the patient complained of some diarrhea but was otherwise in good health.

Dr. Eckert: These polyps must have developed very rapidly because they are of considerable size; one would suspect that a barium enema one year previously would have demonstrated some abnormality. In the gross specimen, there are a number of smaller polyps and one wonders if other smaller polyps would have been found had a sigmoidoscope been inserted proximally and distally at the operation. I don't think this is anything to do with idiopathic ulcerative colitis or pseudo-polypoid changes that are usually associated with them. I don't see the changes here to suggest idiopathic ulcerative colitis. I suspect that there are still polyps present.

Murray R. Abell, M.D., Ann Arbor, Michigan: I'd like to know if any of the other lesions showed any submucosal involvement. Granted this is inflammatory, could it not be simply a variant of colitis cystica polyposa or profunda?

William C. Black, M.D., Albuquerque: The submucosa was completely normal in the other polyps. They seemed to stop abruptly at the lamina muscularis. The original polyp that was removed in March in 1968 looked just like the ones in this CANCER SEMINAR. We did look at the mucous membrane between the polyps very carefully, for evidence of smouldering or queiscent colitis and could find none.

Dr. McGavran: Bill, how do you account for his continuing bloody diarrhea?

Dr. Black: I suspect that he has a rare just newly described form of chronic ulcerative colitis.

Robert Goode, M.D., Morristown, New Jersey: I'd like to ask Dr. McGavran how you could differentiate this from the diffuse type of colitis cystica profunda as Wayte and Helwig have described in the literature. Is this a different lesion?

Dr. McGavran: As Dr. Black mentioned, the 3 of 4 polypoid lesions examined, did not show submucosal or profound type involvement.

Dr. Abell: If we go back into the early literature, colitis cystica polyposa was divided into a profunda and a superficial; this superficial form which doesn't involve the submucosa is a variant of this same disease.

References

Gardner, E.G., and Richards, R.C.: Multiple Cutaneous and Subcutaneous Lesions Occurring Simultaneously with Hereditary Polyposis and Osteomatosis. Amer. J. Hum. Genet., **5**: 139-147, 1953

Hinrichs, H.R., Goldman, H.: Localized Giant Pseudopolpys of the Colon, JAMA, **205**: 248-249,1968

Jeghers, H., McKusick, V.A., and Kata, H.H.: Generalized Intestinal Polyposis and Melanin Spots of the Oral Mucosa, Lips and Digits. New Eng. J. Med. **241**: 993-1036, 1949

Marshak, R.H., Moseley, J.E., and Wolf, B.S.: The Roentgen Findings in Familial Polyposis with Special Emphasis on Differential Diagnosis. Radiology, **80**: 374-382, 1963

Peutz, J.L.A.: A Very Remarkable Case of Familial Polyposis of Mucous Membrane of Intestinal Tract and Nasopharynx Accompanied by Peculiar Pigmentations of Skin and Mucous Membrane. Nedere. Mavandschr. Geneesk., **10**: 134, 1921

Wolf, B.S., and Marshak, R.H.: Granulomatous Colitis (Crohn's Disease of the Colon) Roentgen Features. Am. J. Roentgenol., **88**: 662-670, 1962

12. *Villous Tumor of the Colon*

Contributed by: **M. Wiggins, M.D.** and **E. Liddle, M.D.**, Colorado Springs, Colorado

THE PATIENT was a 61-year old man in June, 1969, when he complained of increasing lethargy and dypspnea. For 10 years he had been under treatment for pulmonary emphysema, bronchitis and polycythemia. There was no history of diarrhea or blood in the stools. Physical examination revealed no significant findings.

Dr. Moseley: This patient has a mass approximately four centimeters in diameter arising from a broad base in the proximal descending colon just below the splenic flexure. Though the mass is relatively large it does not appear to have caused any obstruction. The surface of the mass seems somewhat irregular and on its inferior surface appears to have some deep spaces and clefts into which some barium suspension has entered.

Villous adenoma is an uncommon lesion. The most frequent site of occurrence is in the rectum but rare cases involving other portions of the colon are reported. They are typically sessile lesions with a broad base arising directly from the mucosa. Malignant changes are much more often found in villous adenomas than in common polyps. The radiologic appearance of a villous adenoma may be sufficiently characteristic to permit a pre-operative diagnosis (Wolf). The lack of infiltration in the adjacent bowel wall, the mottled surface pattern and the collection of barium suspension in the clefts and recesses of the tumor lead one to this diagnosis. These tumors have a great tendency to recur locally after excision which forms an indication for frequent follow-up examinations.

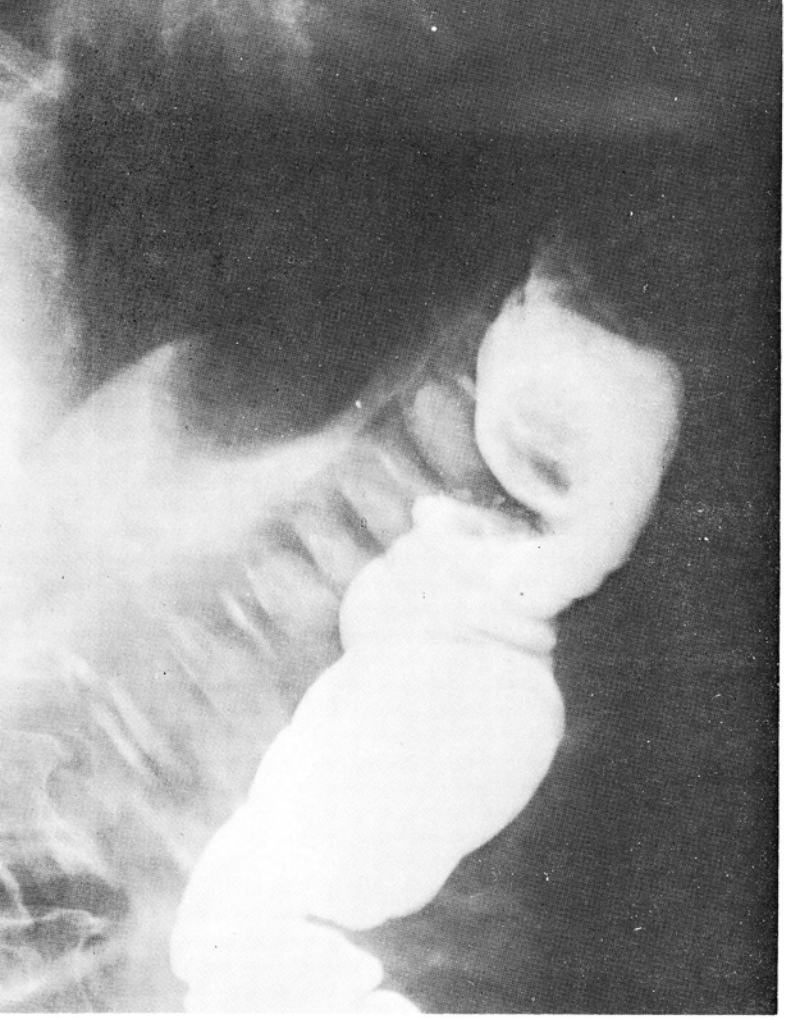


Fig. 1—Barium enema showing mass just below splenic flexure.

Because I am strongly influenced by the highly suggestive radiologic findings in this case, I find differential diagnosis difficult.

Dr. Moseley's impression: VILLOUS ADENOMA

Roentgenologic impressions submitted by mail:

Carcinoma	46
Villous adenoma	17
Polyp	14
Lipoma	12
Others	7

Dr. Moseley: Most of my colleagues are more malignant than I, although villous adenoma is sort of a borderline lesion as far as malignancy is concerned. This lesion has a broad sessile base; it does not have the appearance of the common polyp. A lipoma is a possibility also. I was influenced by the surface characteristics of this lesion in opting for villous adenoma rather than lipoma or common polyp.

Dr. Regato: Dr. Barton Young, of Santa Barbara, diagnosed an intussuscepting polyp. Dr. I. Meschan, of Winston Salem, Dr. R. Calderon, of Managua, and Dr. H. P. Levesque, of Montreal, offered villous adenoma. Dr. L. O. Martinez, of Miami, suggested metastatic carcinoma or villous adenoma.

Operative findings: On June 13, 1969 the patient was surgically explored; a frozen section was done and reported as showing a polypoid carcinoma; a resection of the affected section of the colon was done. The specimen consisted of 11 cm of large bowel with a nodular, nonulcerated, reddish, broad-based polypoid lesion, 4.5 cm in diameter.

Dr. McGavran: These neoplasms of the intestines are characterized by long slender mucosal projections covered by epithelium distinctly altered from the normal colonic mucosa. Loss of goblet cells, nuclear stratification and increased mitotic activity are seen. In some areas complex glandular patterns may be found but no evidence of submucosal invasion or carcinoma in-situ are apparent in the sections available.

Villous tumors are associated with frankly invasive adenocarcinomas in about one-fourth of the cases. The larger the villous tumor, the greater the likelihood of frank cancer. Thus, adequate sampling of these lesions is advisable. Frequently the surgeon can feel the firmer invasive area, though he may have difficulty getting a biopsy therefrom.

The association of invasive cancer and the even more frequent finding of severe atypia and/or carcinoma in-situ combined with the findings of Welin and Spratt, that the growth rates of these villous tumors are similar to adenocarcinomas of the large bowel, provides a basis on which one may well decide to consider them cancer from the onset. Cancers that have a spectrum of biologic behavior analagous to transitional-cell tumors of the urinary tract. Local removal suffices in cases limited to the mucosa. Several reports document implantation of villous tumors.

Villous tumors occur throughout the colon, though their distribution is weighted as in adenocarcinoma to the distal segments. Cases of appendiceal involvement and a single case in the small intestinal are reported.

Dr. McGavran's diagnosis: VILLOUS TUMOR OF THE COLON

Histopathologic diagnoses submitted by mail:

Adenomatous polyp	70
Villous adenoma (atypia—15)	63
Carcinoma in situ	30
Mixed polyp	11
Others	5

Dr. McGavran: You may be familiar with the hybridization which goes along with villous adenoma; some choose to call them a villoglandular polyp or mixed polyp. In an attempt to find out what is the significance, if any, of the admixed patterns of both glandular and villous tumors, I went back to Welin and associates' paper: they had 3 cases in which histopathologically it was a mixed pattern. Those three lesions had growth rates in the same range as the villous tumors, distinctly more rapid than the growth rates of the adenomatous polyps. Perhaps the hybridization of villoglandular or mixed should carry with it a connotation which is more akin to the villous tumor than to the adenomatous polyp.

Dr. Regato: Dr. D. A. Parker, of Rhodesia, diagnosed villous papillary adenoma; Dr. R. M. Sherwin, of Colorado Springs, made a diagnosis of papillary adenocarcinoma with possible invasion. Dr. G. Gricouroff, of Paris, also saw a malignant transformation of a pedunculated adenosis; Dr. C. F. Farinacci, of San Antonio, called it a carcinoma in-situ in adenomatous polyp. Dr. H. Hamperl, of Bonn, offered adeno-papillary carcinoma, grade I.

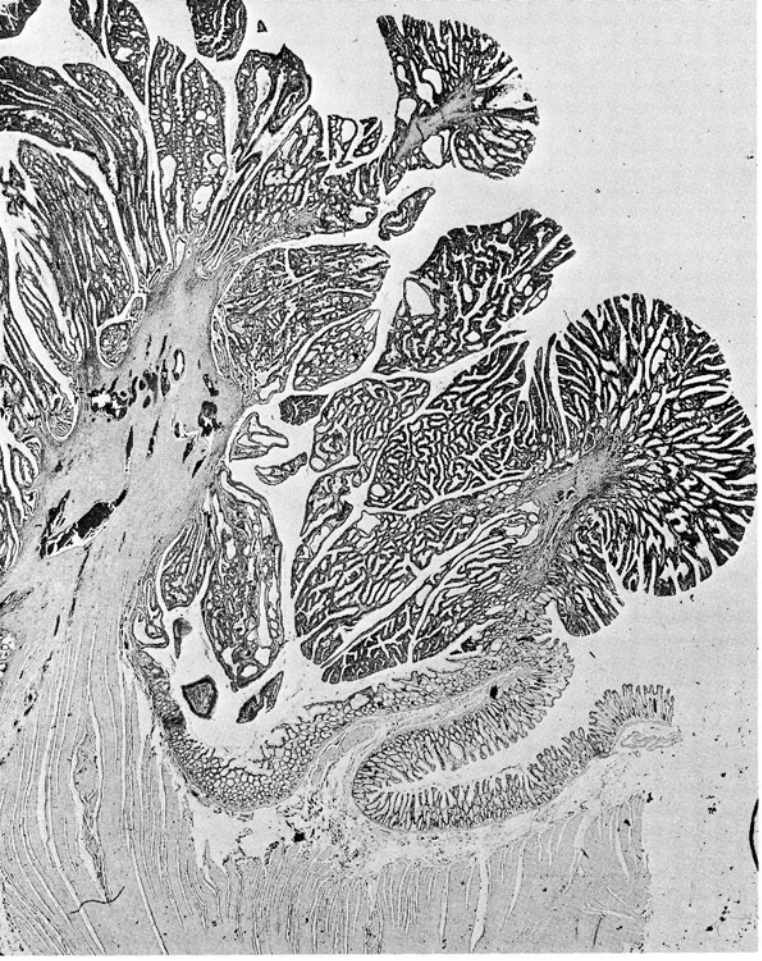


Fig. 2—An overall view of the villous tumor in which the elongated mucosal processes are evident. In some areas a non-villous and moderately complicated glandular pattern is seen. This is in part due to orientation of the section. The muscularis of the colon has been pulled up into the stalk of the mass, but no evidence of invasion is present (H and E, X 5).

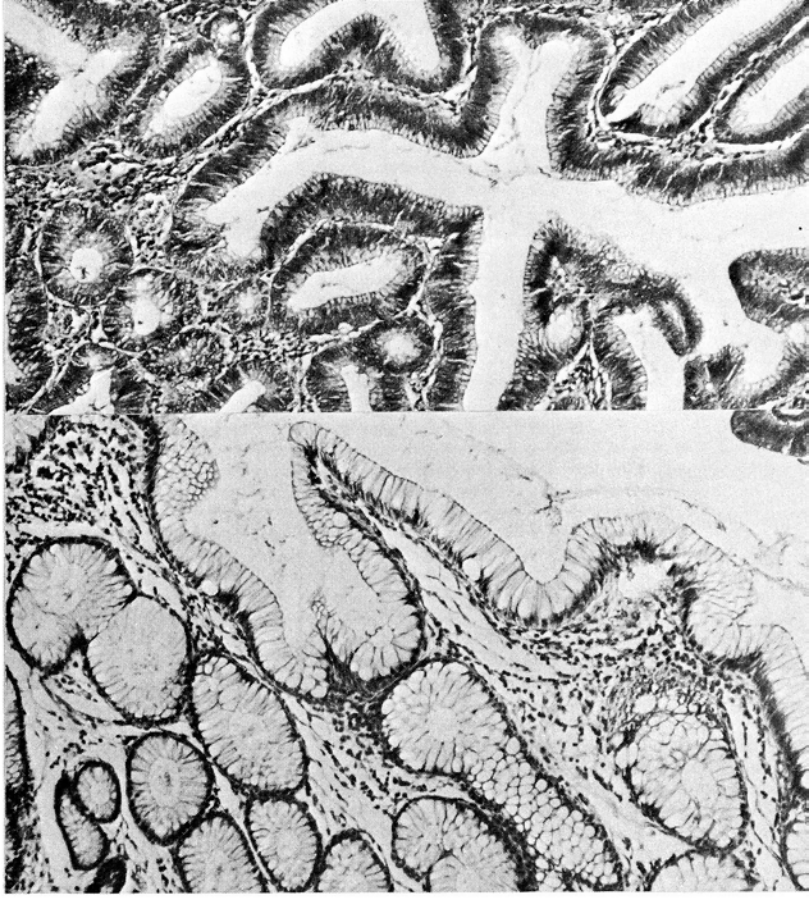


Fig. 3—The contrast between the normal colonic epithelium and the hypercellular fronds of the villous tumor are shown (H and E, X 90).

Subsequent history: In July, 1969 the patient was seen in good health.

E. B. Liddle, Jr., M.D., Colorado Springs: The extent of the resection may be questioned, but this is a man with severe emphysema and very limited pulmonary reserve, so we did a rather limited resection and anastomosis. To our knowledge, he has remained well. No signs of recurrence of this lesion.

Dr. Eckert: I feel that at least two separate examinations should be carried out and the lesion demonstrated in all of the films, before operating in a lesion like this one. In other words, there are causes for filling defects that may be seen in one film that turn out not to be polyps; it is important to be certain of the diagnosis. For lesions of this size, the frequency of malignant change is sufficient, I think, to justify operation rather than observation, even in a 61-year old man with emphysema. At the time of operation the lesion should be palpated and if it feels soft and movable, one should open the colon over it: if there is a stalk, one simply should do an excision of the lesion. If there is nothing hard in the lesion, usually I will do nothing more than that, rather than ask our pathologists to do multiple frozen sections on such material. On the other hand, if on palpation there is a hard area, I wouldn't open the colon, I would simply proceed with resection. In this particular case, the resection that was carried out is perfectly adequate. I think that anything that would remove this with an adequate margin and not result in implantation would suffice for cure. You can tell a great deal on gross examination. I think in this particular situation the problem is not nearly as great as what we encounter in the rectum, for example, when we deal with large villous adenomas where there is nothing suspicious of cancer on palpation and we know that multiple biopsies usually show nothing in the way of infiltrative cancer; whatever you do, you are risking doing the wrong thing because if you do a limited operation and there is cancer, you have to do something else and maybe the limited operation has contaminated the field in some way. On the other hand, I prefer not to remove the rectum on the basis that these are potentially malignant lesions and that they are associated in 24% of cases with infiltrative cancer. Perhaps another 40% of the cases show focal change suggesting malignant alteration with no evidence of infiltration.

John Kepes, M.D., Kansas City, Kansas: The history states that this patient had lethargy; he had severe emphysema and hypoxia responsible for his lethargy but I wonder if there was hypopotassemia and whether or not removal of the tumor has improved his lethargy in any way.

Dr. Liddle: I don't recall anything unusual about the serum potassium. Actually, this man had no symptoms referrable to the tumor except some vague bowel symptoms. The diagnosis was made because of a careful scrutiny by the internist, Dr. Wiggins, who requested a barium enema. We did initially a colotomy. The tumor

was firm but with no hard areas on a broad base, nor a pedicle. Therefore, we did a resection rather than just removing the polyp.

References

Cogan, J.E.: Surgical Management of Villous Tumors of the Colon and Rectum. Dis. Colon and Rectum, **11**: 64-66, 1968

Goldfarb, W.B.: Villous Adenomas of the Right Colon. Cancer, **17**: 264-271, 1964

Kaye, J.J., and Bragg, D.G.: Unusual Roentgenologic and Clinicopathologic Features of Villous Adenomas of the Colon. Radiology, **91**: 799-806, 1968

Porter, S.D., and Liechty, R.D.: Villous Adenoma in 108 Patients. Am. J. Surg., **116**: 13-16, 1968

Welin, S., Youker, J., and Spratt, J.S., Jr.: The Rates and Patterns of Growth of 375 Tumors of the Large Intestine and Rectum Observed Serially by Double Contrast Enema Study. Am. J. Roentgenol., **90**: 673-687, 1963

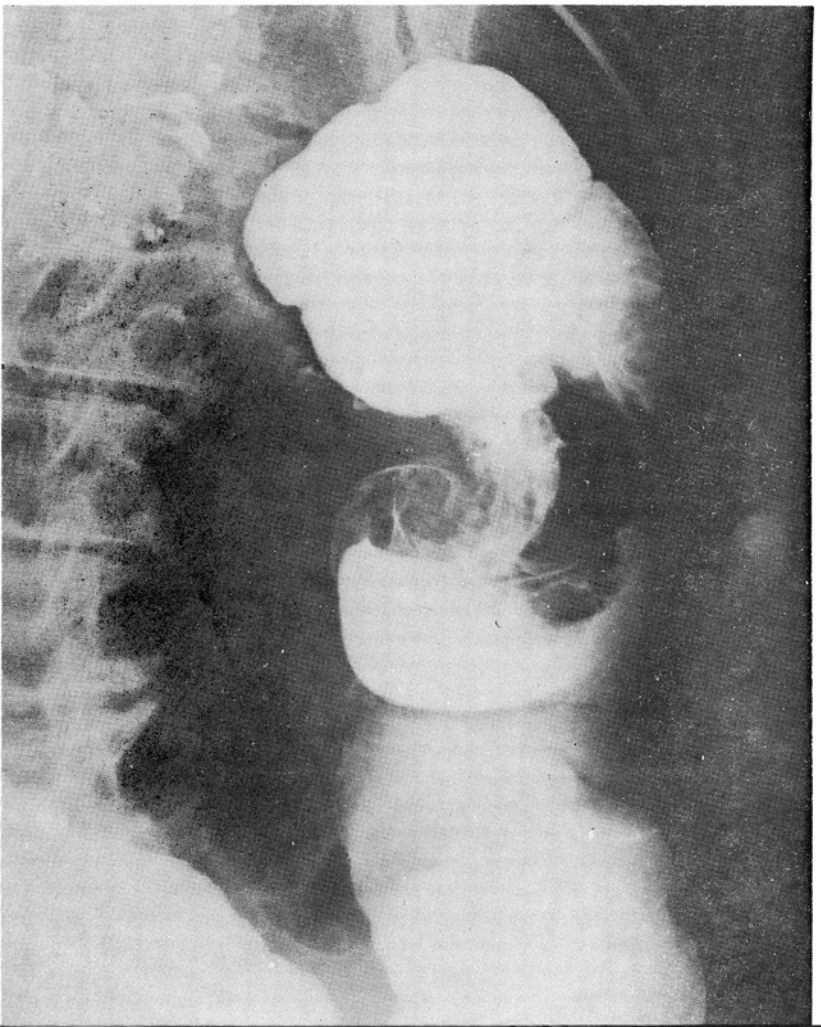
Wolf, B.S.: Roentgen Diagnosis of Villous Tumors of the Colon. Am. J. Roentgenol., **84**: 1093-1104, 1960

13. *Histiocytic Lymphoma (Reticulum-Cell Sarcoma) of the Right Colon*

Contributed by: **M. R. Abell, M.D.** and **W. Martell, M.D.**, Ann Arbor, Michigan

THE PATIENT was a 79-year old man in April, 1953, when he complained of pain in the right lower abdominal quadrant and of 10 pounds weight loss. On physical examination there was abdominal distention and tenderness but no palpable masses. The hemoglobin was 12 gm%.

Fig. 1—Barium enema showing constricting lesion of the ascending colon.



Dr. Moseley: The radiographic findings in this case are classical for an annular constricting malignant neoplasm of the ascending colon. No real differential diagnosis is possible. Cancers in the colon and rectum are almost exclusively adenocarcinomas (97.8%). Squamous cell carcinomas are relatively infrequent (approximately 1% of all colon cancers) and are usually in the ano-rectal area. Sarcomas, uncommon generally in the gastro-intestinal tract, are especially rare in the colon.

Dr. Moseley's impression: ANNULAR CARCINOMA

Roentgenologic impressions submitted by mail:

Carcinoma	71
Inflammatory lesion	18
Others	8

Dr. Moseley: It is the radiologist responsibility in a case presenting this roentgen appearance to make a diagnosis of annular carcinoma and let the histopathologic chips fall where they may.

Dr. Regato: Most experts offered a diagnosis of carcinoma. Dr. John Campbell, of Indianapolis, and Dr. H. P. Levesque, of Montreal, preferred reticulum-cell sarcoma.

Operative findings: On April 9, 1953, a surgical exploration revealed the presence of an annular tumor in the proximal ascending colon with posterior infiltration; a right colectomy and ileo-transverse colostomy was done.

Dr. McGavran: This case presents a pretty problem in the limitations of morphologic analysis. The frankly neoplastic cells have no mucinous, argentiffin or argyrophilic secretory product identifiable. Their pattern is not quite epithelial, and I am led to consider a lymphoma of a poorly differentiated histiocytic type as the best bet. The pattern of the reticulum fibers is not that classically held as "diagnostic," but no one really believes that the pattern of fine collagenous network is the key to the diagnosis of reticulum cell sarcoma. I am in complete sympathy with anyone who chooses to stop at undifferentiated malignant tumor and await the help of other findings—such as the regional lymph nodes, history of antecedent or subsequent tumor elsewhere might provide.

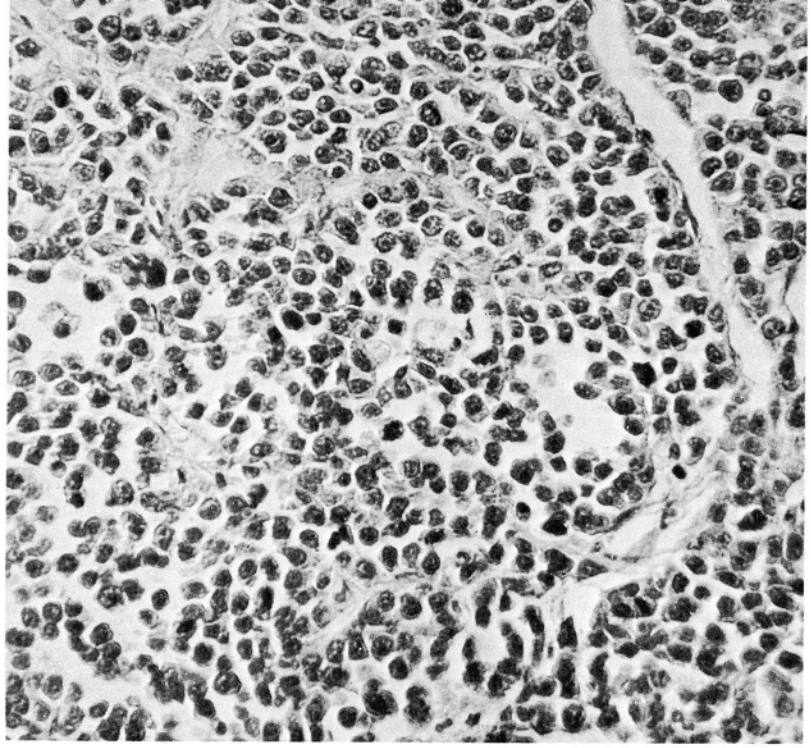


Fig. 2—The nesting of the non-cohesive, poorly differentiated tumor cells is evident (H and E, X 350).

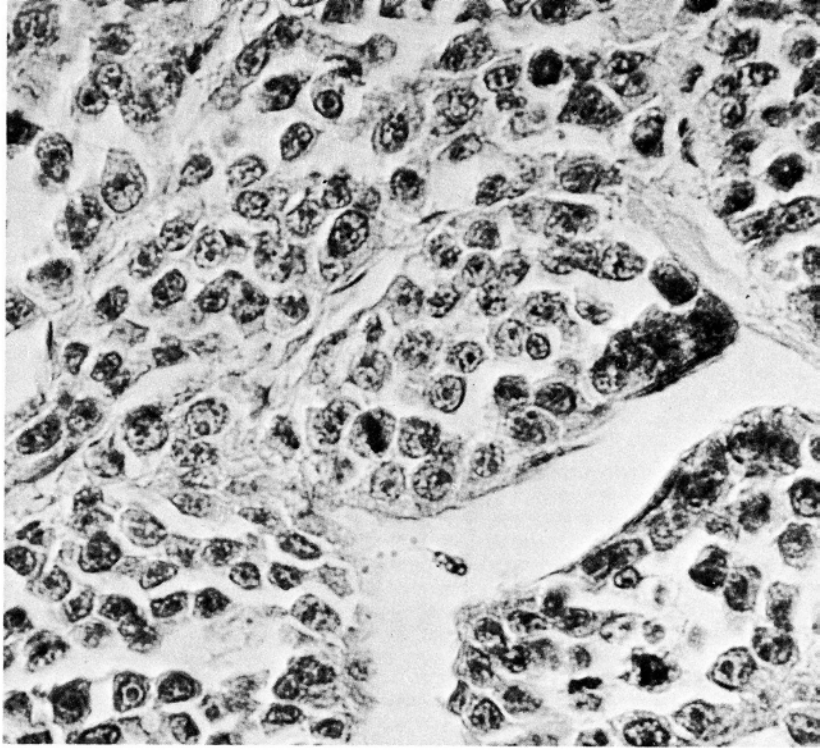


Fig. 3—Nucleolar prominence, mitotic figures and the faintly granular cytoplasm of this poorly differentiated histiocytic lymphoma are shown (H and E, X 600).

The colon is subject to both primary and secondary involvement by lymphomatous processes. In our material about three-fourths of the primary cases are in the right colon; and of these, two-thirds are histiocytic lymphomas.

Dr. McGavran's diagnosis: HISTIOCYTIC LYMPHOMA

Histopathologic diagnoses submitted by mail:

Reticulum-cell sarcoma	61
Lymphosarcoma (lymphoblastic)	15
Histiocytic "lymphoma"	12
Burkitt's	12
Carcinoid	27
Undifferentiated carcinoma	21
Plasmacytoma	20
Others	18

Dr. McGavran: In Burkitt's, the predominent cell is a mature lymphocyte. In this case, in the sections that I have, these are not mature lymphocytes. If it is a carcinoid, it certainly is a very poorly differentiated and anaplastic carcinoid. I doubt plasma cells get quite this cytologically aberrant.

Dr. Regato: Dr. C. Perez-Mesa, of Columbia, Missouri, made a diagnosis of reticulum-cell sarcoma. Dr. F. B. Kimball, of Tacoma, Washington, offered a diagnosis of malignant lymphoma, Burkitt's type. Dr. J. W. Shaw, Jr., of San Antonio, preferred small-cell undifferentiated carcinoma. Dr. M. C. Wheelock, of Miami, suggested a plasmacytoma and Dr. M. R. Abell, of Ann Arbor, and Dr. P. Piyaratn, of Bangkok, a malignant carcinoid tumor.

Subsequent history: In December, 1953, a recurrent tumor of the abdominal wall was excised and the patient recovered. He did well until May, 1964, when he died of congestive heart failure at age 90. Eleven years after operation there was no evidence of recurrence.

M. R. Abell, M.D., Ann Arbor: This lesion was at least 10 cm in the greatest diameter involving the entire circumference at this level and did extend to the wall. No lymph nodes were involved.

Dr. Eckert: Things are seldom what they seem. This looks like a perfectly typical garden variety adenocarcinoma of the right colon. I've seen other lymphomas of this particular variety with multiple foci, one of them had a resection of the right colon: he is still alive 35 to 40 years after treatment.

Dr. McGavran: Dr. Abell, can you tell us if there was in your material argyrophilic argentaffin follicles demonstrable?

Dr. Abell: In the 15 or 20 blocks which were made of this lesion there are a couple of better differentiated areas that did show some small gland formation; in this area there were Giemsa and argentophilic granules. The portions that most of you saw were the undifferentiated or anaplastic component of this carcinoid tumor.

Weldon K. Bullock, M.D., Los Angeles: I have never seen a so-called de-differentiated or anaplastic carcinoid of the intestinal tract. You see them in the lungs; you see a different one in the ovary. I doubt very much that this is a carcinoid tumor.

Dr. McGavran: We may solve this whole problem by saying that in one small area there was a carcinoid which was secondarily infiltrated by histiocytic lymphoma.

Dr. Abell: I'll make sure that Dr. Bullock gets some of the sections that show the gland pattern; I think then he will have no doubt.

References

Farber, M., Bandler, M., Mackles, A.: Hemangiopericytoma of the Stomach. Gastroenterology, 33: 503-508, 1957

Kay, S., and Warthen, H.J.: Hemangiopericytoma of the Rectum. Cancer, 6: 167-169, 1953

Kuhn, C., and Rosai, J.: Tumors Arising from Pericytes; Ultrastructure and Organ Culture of a Case. Arch. Path., In Press

Stout, A.P., Hendry, J., and Purdie, F.J.: Primary Solid Tumors of the Great Omentum. Cancer, 16: 231-243, 1963

14. *Hemangiopericytoma of the Retroperitoneal Space*

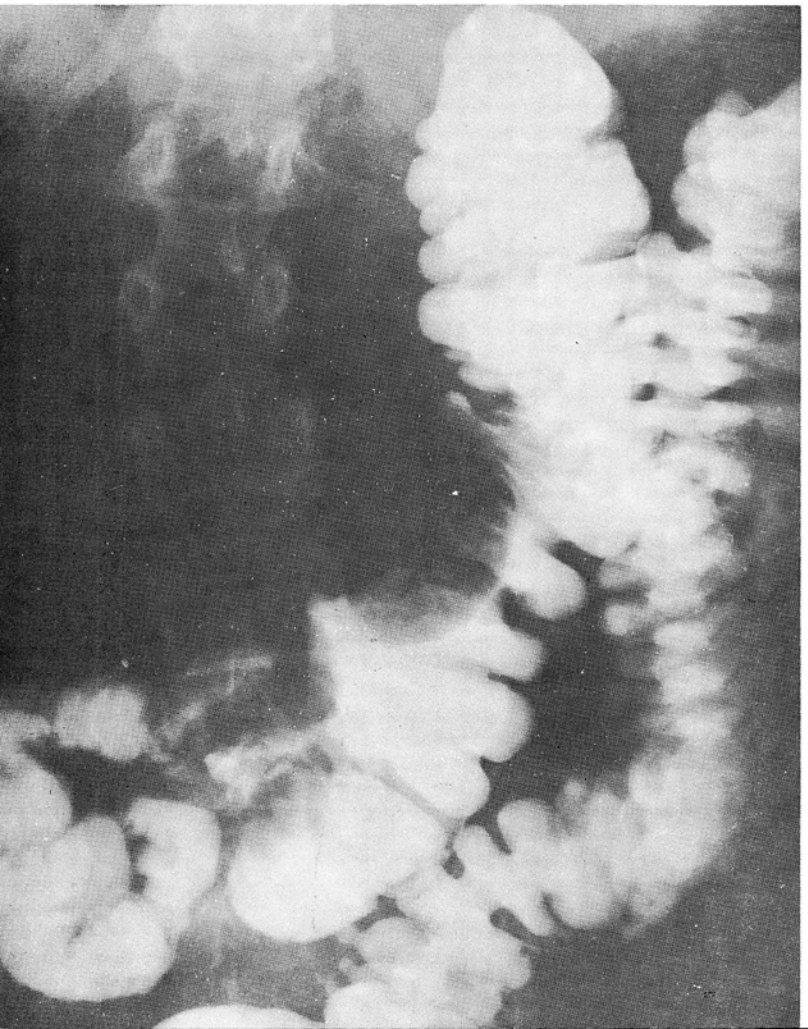
Contributed by: **D. A. Mulkey, M.D., Robert E. Levis, M.D., C. J. Berne, M.D.** and **Gerald B. Dermer, Ph.D.**, Los Angeles, California

THE PATIENT was a 57-year old woman in July, 1969, when she presented blood in the stools. A thyroidectomy for cancer had been done 10 years previously. Physical examination and laboratory findings were not contributory, except for suprapubic and RLQ tenderness.

Dr. Moseley: The radiographic findings in this case consist of at least two masses involving the cecum and proximal ascending colon. The largest of these lesions measures approximately five centimeters in length; all appear to arise within the wall of the colon rather than to project into the lumen. In addition, there is a malrotation of the colon with the cecum at the midline and the ascending colon to the left of the midline; there does not appear to be a large mass in the right abdomen displacing the colon to the left and no mass was reported on physical examination.

The lesions do not have the pedunculated or intraluminal configuration that is usually seen in benign adenomatous polyps, leiomyomas, or lipomas of the colon. Their size and multiplicity mitigate against a diagnosis of carcinoid; the absence of the "carcinoid syndrome" does not exclude this diagnosis since unlike small bowel carcinoids, such lesions in the colon much more rarely give rise to the syndrome.

Fig. 1—Barium enema showing malrotation of the colon and two filling defects apparently arising from the wall of the cecum and ascending colon.



In view of the previous history of cancer, one would have to consider the possibility of metastases, though this location and size of the lesions are hard to relate to thyroid carcinoma. In view of the malrotation one might consider the possibility of associated congenital defect such as duplication cyst of the colon.

Vascular tumors (Gentry and associates) are rare in the colon but may originate multicentrically and occur in several locations in the bowel. Intestinal hemorrhage, present in this case, is the commonest symptom but is found, of course, in other lesions of the colon. These tumors usually give the appearance of arising in the bowel wall but rarely can be polypoid. Occasionally one may see calcified phleboliths in such a lesion, giving a characteristic radiographic sign of this diagnosis; this finding is not present in this case.

Dr. Moseley's impression: HEMANGIOMATA OF THE CECUM AND ASCENDING COLON

Roentgenologic impressions submitted by mail:

Colonic carcinoma	25
Lipoma	24
Metastatic carcinoma	19
Intramural tumor	10
Intramural hematomas	6
Others	11

Dr. Moseley: It seems to me that the multi-central origin of these lesions mitigates against a radiologic diagnosis of carcinoma; lipomas are usually pedunculated. I mentioned intramural hematomas as a diagnostic possibility. Apparently no one is willing to join me in a diagnosis of hemangiomata.

Dr. Regato: Drs. D. Germann, of Leawood, Kansas, and Cyrus Klein, of Texarkana, offered a diagnosis of intramural tumor. Dr. M. Landa, of Fargo, preferred intramural hematomas. Dr. L. O. Martinez, of Miami, proposed a recurrent carcinoma and lipoma associated with it.

Operative findings: On July 31, 1969 the patient was explored. A malrotation of the cecum was encountered and a resection of the terminal ileum and cecum was carried out. The specimen consisted of 7 cm of segment of the terminal ileum and 17 cm segment of cecum; there were two large intramural masses, 6 cm x 5 cm and 4 cm x 3 cm in diameter and a polypoid mass 4.5 x 2.7 cm.

Dr. McGavran: These available sections demonstrate a cellular mesenchymal tumor abutting on the intestinal wall. There is a prominent vascular arborization among the proliferating stromal cells and upon examination of Masson trichrome or reticulin stained sections, these bland and uniform cells appear to be peeling off from the perithelium. A diagnosis of hemangiopericytoma is,

Fig. 2—Surgical specimen of terminal ileum and cecum showing two intramural masses.

in my opinion, one that should be made only after elimination of all other reasonable possibilities.

The history of thyroid cancer in this patient and the known, though uncommon, sarcomatoid transformation of thyroidal carcinomas poses the only other reasonable possibility. I have chosen to exclude it because the total absence of anaplasia and nuclear atypia, arbitrary as these choices may be, and the long interval.

Hemangiopericytomas have been a favorite out for frustrated pathologists, and I have avoided making such a diagnosis whenever possible. I have been shown, by the true believers, a sufficient number of cases that have patterns comparable to this case, and have become a half-hearted convert. If one chooses to be a lumper and not swayed by the demonstration of basement membranes, cytoplasmic filaments and the like, mesenchymal tumors such as this are just that: mesenchymal tumors of varying degrees of differentiation. On the other hand, one may join the splitters whose remarkable conviction in finite characteristics, today generally demonstrated by ultrastructural examination of suboptimally fixed tissues, leads them to the conclusion that hemangiopericytomas exist. Drs. Kuhn and Rosai have a paper in press that characterizes the latter position. These neoplasms, having a predominantly benign biologic behavior, occur chiefly in the soft tissues but are reported from sites such as the brain, mediastinum, lung, and abdominal parietes. With regard to prognosis, I think Dr. Stout's observations are probably the best. He found no correlations between biologic behavior and cytologic characteristics. Of the lesions so diagnosed, about 10% recur locally and 10% metastasize. Of the cases occurring in the abdomen, the majority are retroperitoneal. A very few arise in the mesentery and intestinal involvement appears to be secondary, as in this case.

Dr. McGavran's diagnosis: HEMANGIOPERICYTOMA OF MESOCOLON

Fig. 3—Open bowel showing polypoid tumor.

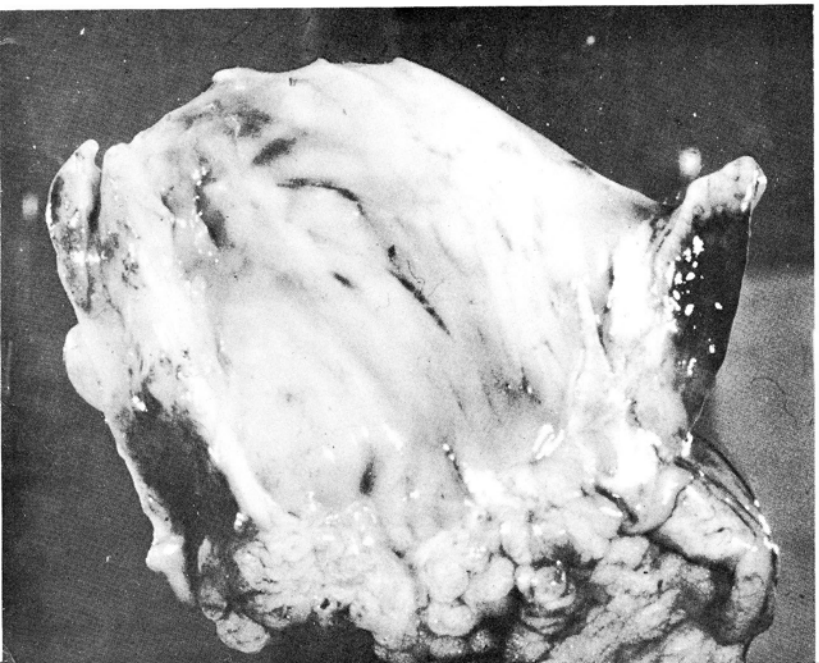
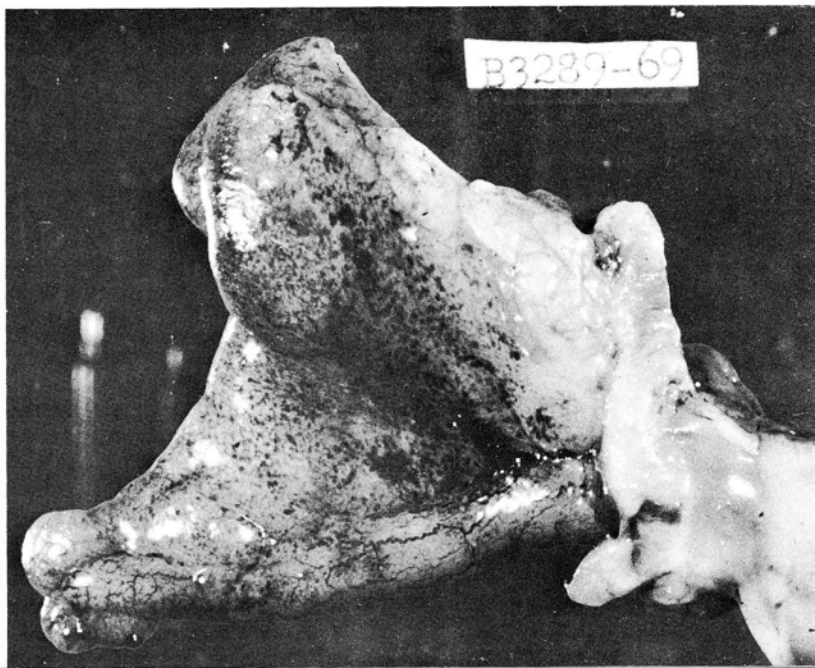


Fig. 4—Surgical specimen showing appendix.



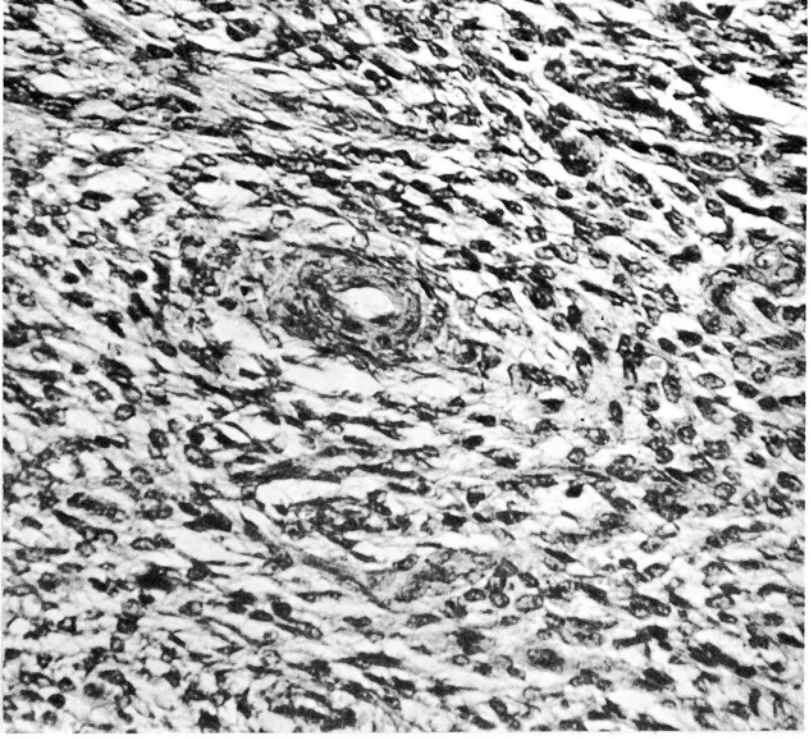


Fig. 5—The small vessels lined by inconspicuous endothelial cells are surrounded by pericytes that have an identical appearance to the intervascular stromal cells (H and E, X 350).

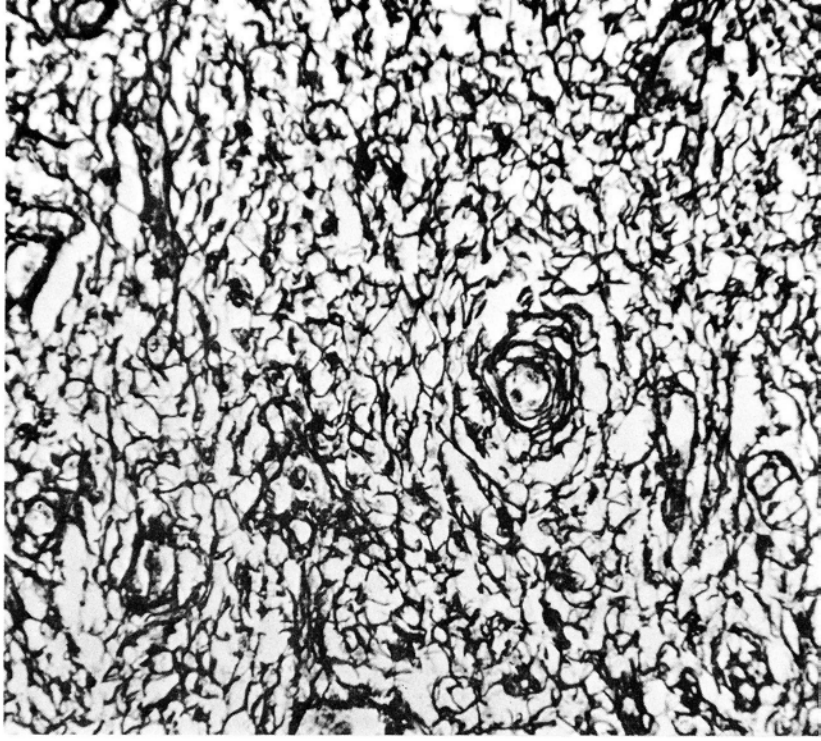


Fig. 6—Wilder's reticulum stain shows the perithelial and perivascular proliferation (H and E, X 350).

Histopathologic diagnoses submitted by mail:

Hemangiopericytoma	93
Hemangiosarcoma (endothelioma)	20
Leiomyosarcoma	27
Leiomyoblastoma	6
Various sarcomas	15
Endometrial sarcoma	8
Others	5

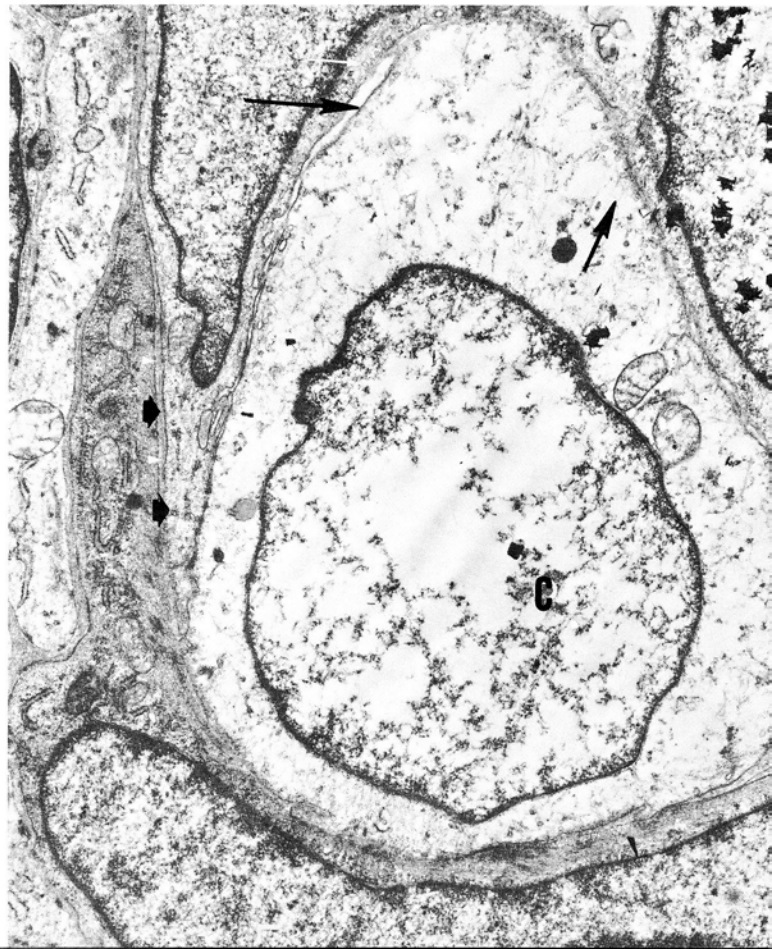
Dr. McGavran: In the sections that I had there were some areas the endothelial components with frank dysplastic changes of the endothelium. Leiomyosarcoma does not have the rich vascularization and arborization and the similarity of the stromal cells to the perithelial cells. I think that diagnoses of endometrial sarcoma or endolymphatic stromal myosis would have to be made on the antecedent or concomitant demonstration of involvement in the pelvis.

Dr. Regato: Dr. M. Navarro, of Plantation, Florida, also made a diagnosis of hemangiopericytoma. Dr. J. H. Coffey, of Fargo, North Dakota, made a diagnosis of leiomyosarcoma; Dr. M. E. Williamson, of Colorado Springs, called it a bizarre leiomyoma. Dr. R. A. Marcial-Rojas, of San Juan, recalled to have heard Dr. Stout say that leiomyoblasts and pericytes are birds of a feather. Dr. A. R. Keller, of Washington, D.C., offered low-grade angiosarcoma. Dr. D. L. Dawson, of Colorado Springs, offered a uterine stromal sarcoma and Dr. M. R. Abell, of Ann Arbor, proposed stromatosis, defined as an endolymphatic stromal myosis or well differentiated stromal sarcoma.

Subsequent history: This patient was last seen on October 13, 1969 at which time there were no symptoms or findings on examination.

Dr. Eckert: The identification of intramural defects in a malrotated cecum and the surgical treatment appeared far simpler than the pathologic identification thereof.

Fig. 7—This electron micrograph shows the juxtaposition of typical leiomyocytes (L) with basement membranes ( ) and clear cells (C) with numerous pinocytic vesicles ( ). These and other ultrastructural observations on this tumor support the concept of vascular origin.



References

Gentry, R.W., Dockerty, M.B., and Clagett, O.T.: Collective Review: Vascular Malformations and Vascular Tumors of the Gastrointestinal Tract. Internat. Abstr. Surg., **88**: 281-323, 1949

Kay, S., and Still, W.J.S.: A Comparative Electron Microscopic Study of a Leiomyosarcoma and Bizarre Leiomyoma (Leiomyoblastoma) of the Stomach. Am. J. Clin. Path., **52**: 403-413, 1969

Mainzer, F., Amberg, J., and Margulis, A.: Superficial Carcinoma of the Stomach. Radiology, **93**: 109-116, 1969

Taylor, P.H.: Leiomyosarcoma of the Stomach. Brit. J. Surg., **56**: 187-192, 1969

15. *Mucinous Adenocarcinoma of the Colon*

Contributed by: **M. R. Abell, M.D.** and **W. Martel, M.D.**, Ann Arbor, Michigan

THE PATIENT was a 17-year old girl in May, 1953, when she complained of intermittent lower abdominal pain. Physical examination revealed abdominal distention and a slightly tender palpable mass in the left lower quadrant.

Dr. Moseley: This young patient has a lesion of the sigmoid colon which extends over a substantial length of bowel, approximately 15 centimeters. It has produced a marked irregular narrowing, has tapering ends where the lesion joins the adjacent normal bowel and does not have associated with it a large mass external to the colon.

Endometriosis is usually found only when ovarian function is active and thus occurs most commonly between the age of 20 and the menopause; however, cases have been reported in both younger and older age groups. In large endometriotic lesions involving the sigmoid, the mass may simulate a neoplasm although the typical collaring type of defect is lacking as it is in this case. Granulomatous colitis will produce marked narrowing of long segments of the colon with lack of involvement of other segments. Lymphogranuloma venereum, as a specific inflammatory disease, will also produce long areas of narrowing, but it is uncommon to have the rectum uninvolved in this disease. The possibility of pelvic inflammatory disease secondarily involving the colon seems remote because of the lack of associated mass. A far-out possibility is that of thrombo-necrotizing colitis—particularly if this patient is on "the pill."

It is difficult to believe that this lesion is neoplastic. In particular, carcinoma of the colon usually involves a much shorter segment, has an abrupt beginning and end, and frequently has ballooning of the normal adjacent bowel wall over the edges of the carcinomatous mass. Of all colon neoplasms, the very rare lymphosarcoma seems to be a possibility for consideration since lymphoma may involve a long segment and simulate this inflammatory appearance.

Dr. Moseley's impressions: 1) GRANULOMATOUS COLITIS 2) ENDOMETRIOSIS

Roentgenologic impressions submitted by mail:

Carcinoma	50
Granulomatous colitis	15
Endometriosis	13
Lymphosarcoma	11
Others	6

Dr. Moseley: The majority of my colleagues didn't agree with me. The possibilities of endometriosis, granulomatous colitis, lymphosarcoma were raised and discussed in my differential diagnosis.

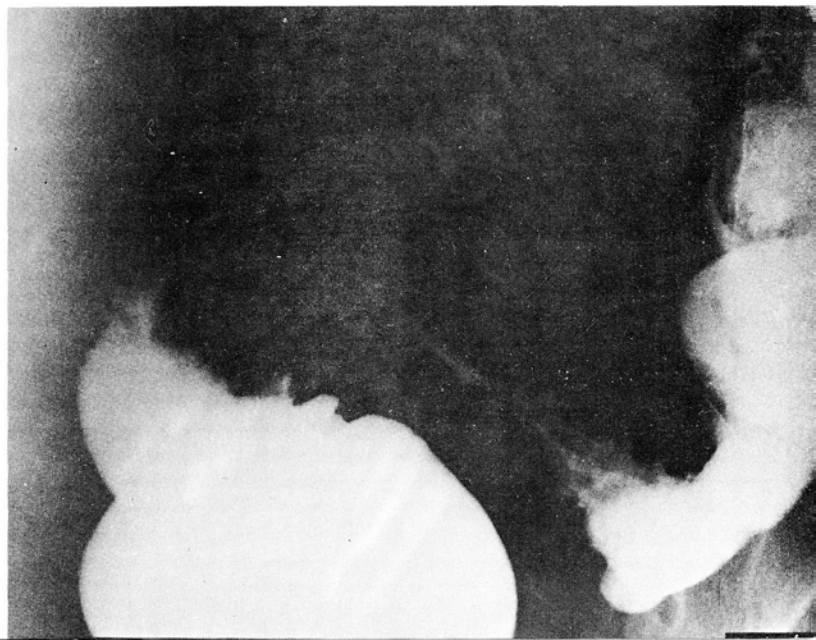
Dr. Regato: Dr. J. Dolan, of Colorado Springs, and Dr. J. D. Sutherland, of Denver, also suggested endometriosis. Dr. J. A. Campbell, of Indianapolis, and Dr. J. J. Darlak, of Fort Belvoir, granulomatous colitis. Drs. Harold Ibach, of Milwaukee, A. Ariza, of Bogota, and Alexander Bernstein, of Chicago, offered a diagnosis of carcinoma.

Operative findings: On May 28, 1953, a resection of 20 cm of the sigmoid colon was done. The wall of the bowel was heavily infiltrated and hard with considerable narrowing of the bowel caliber. The lymph nodes were found microscopically invaded.

Dr. McGavran: The abnormalities first noted are the absence of the mucosa and the thickening of the entire wall. These are due to replacement and infiltration of poorly differentiated mucinous adenocarcinoma. In many fields signet ring cells are predominant. A moderate desmoplastic and mild inflammatory reaction accompany the infiltrating tumor, and it is akin to gastric linitis plastica in both histologic appearance and prognosis.

Carcinoma of the colon is uncommon in the first two decades of life, comprising something less than 0.5% of all the neoplasms occurring during these years. Prior to the ninth and tenth years, colonic cancer is a great rarity. Kern and White's case of a nine-month old infant in the CANCER SEMINAR of 1957 is probably the youngest. Other cases have been associated with ulcerative colitis, familial polyposis, and Gardner's syndrome. The majority of the reported cases are without documented syn-

Fig. 1—Irregular narrowing of the sigmoid colon with tapering ends.



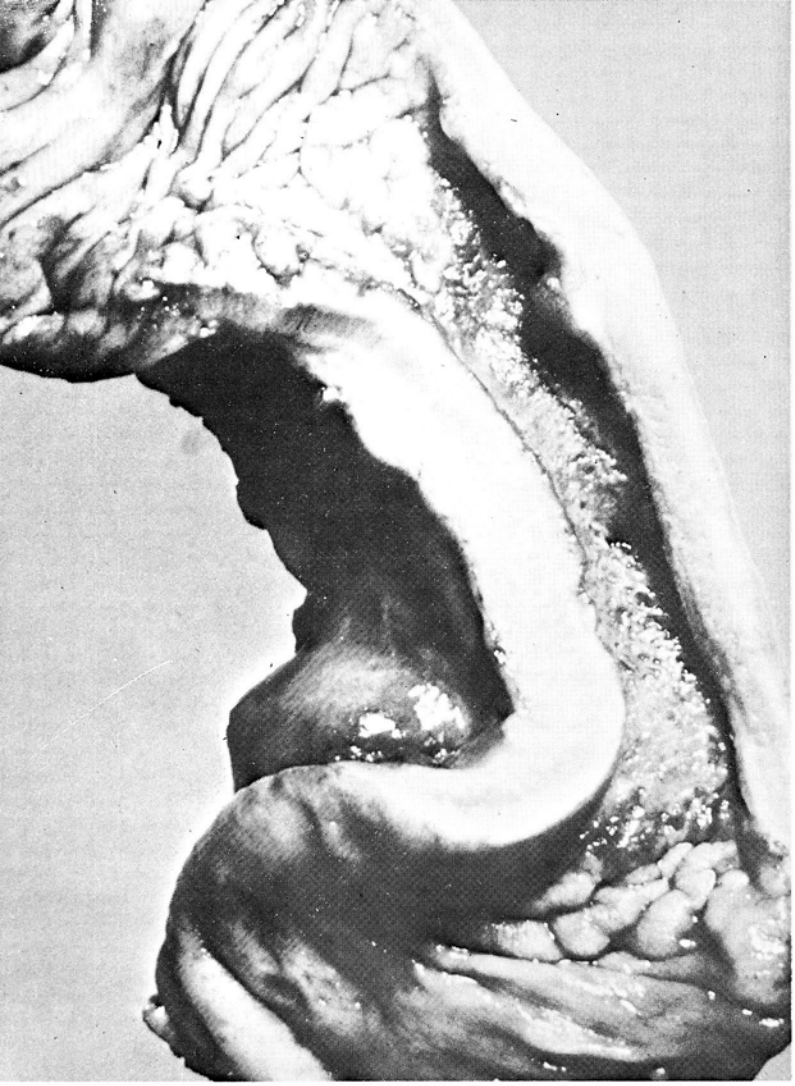


Fig. 2—Cut section of surgical specimen of sigmoid colon.

drome or ulcerative colitis. It would be of interest to know whether any such predilection was found in this girl.

The prognosis in children is very poor, judging from the reported cases and series. This is because of the advanced stage of the disease at time of diagnosis and therapy, although the signs and symptoms are similar to those of colonic cancers occurring in adults, and because of the predominance, circa 50%, of poorly differentiated infiltrative mucinous adenocarcinoma. Middelkamp and Haffner could find only two long term survivors among 70 odd cases.

Sessions and associates reported two survivors from 11 patients seen at the Vanderbilt Hospital from 1925-1960. During the inevitable delay between acceptance and publication, one of their two survivors died of disseminated carcinoma 54 months after resection.

Dr. McGavran's diagnosis: MUCINOUS ADENOCARCINOMA

Histopathologic diagnoses submitted by mail:

Mucinous adenocarcinoma	74
Signet-ring carcinoma	53
Adenocarcinoma (colloid)	36
Linitis plastica	6
Others	5

Dr. McGavran: There is really no variation here except in terminology as to the pathologic characteristics of this lesion.

Dr. Regato: With colorful variations in nomenclature the participants agreed almost unanimously that this was a case of linitis plastica, mucin-producing, colloid, so-called signet-ring type of adenocarcinoma. Dr. R. A. Marcial-Rojas, of San Juan, noted that all four cases like this, which he has seen in patients under 20 years of age, were found in the left colon and that all were of the diffusely infiltrating mucinous type.

Fig. 3—Replacement of the mucosa, submucosa and infiltration of the muscularis and serosa are apparent in this overall view (H and E, X 4).

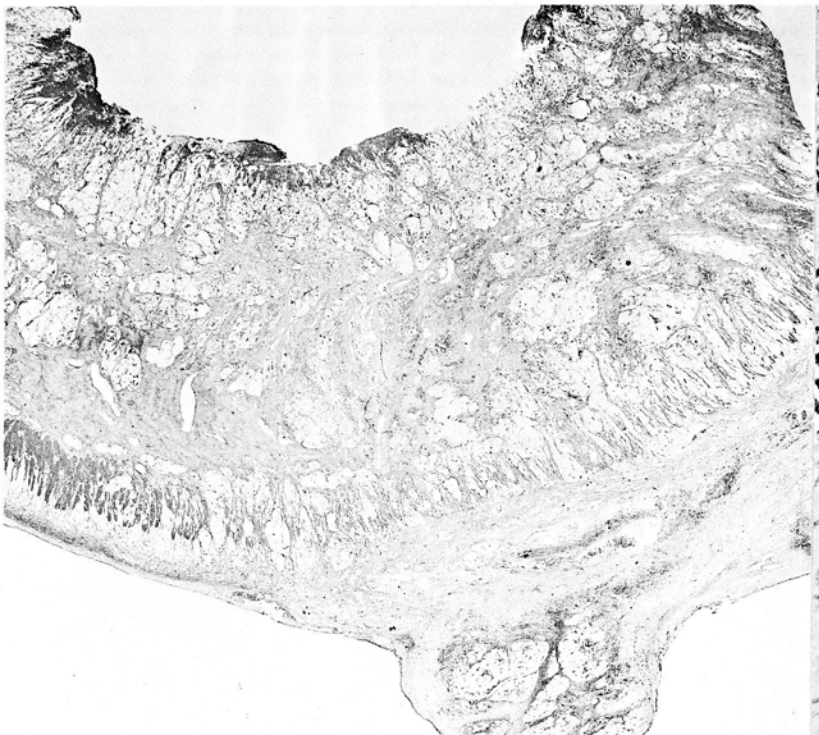
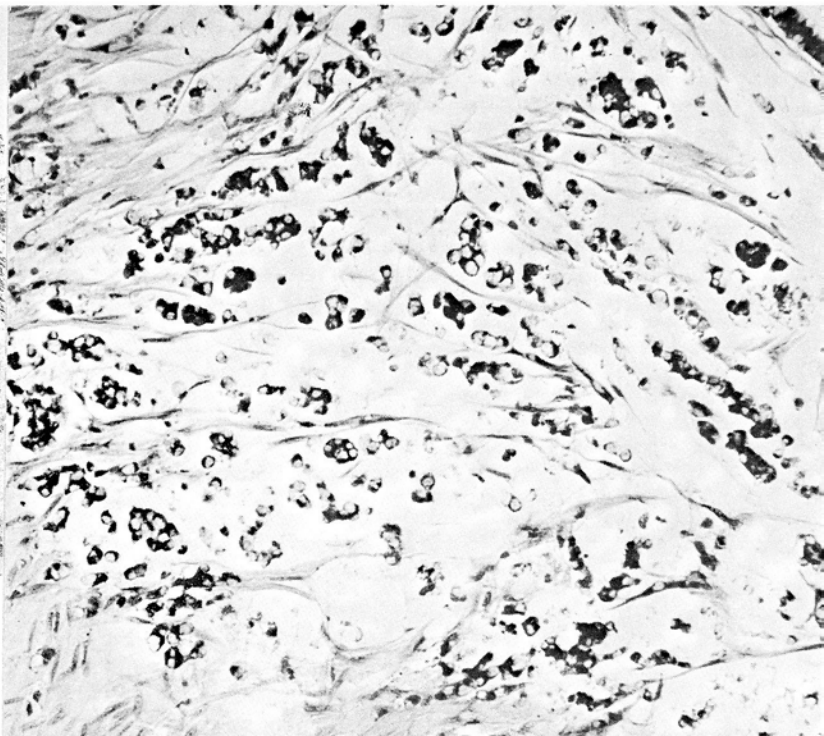


Fig. 4—The clusters, nests and single mucinous signet ring cells within the muscularis of the bowel are shown (H and E, X 150).



Subsequent history: Two months after operation the patient complained of abdominal pain and vomiting; a barium enema showed obstruction of the large bowel 13 cm above the surgical anastomosis. A celiotomy revealed massive neoplastic recurrence and infiltration with liver metastasis. The patient died on September 20, 1953.

Dr. Eckert: I've had the misfortune of taking care of two youngsters in their teens with identical lesions both located in the sigmoid colon, both with radiographs that could be superimposed upon this one. Both of these youngsters had been previously operated upon without a histologic diagnosis and a variety of clinical diagnoses had been made before I saw them; in order to settle the issue, I operated upon both of them. In both, the infiltration of the base of the mesentery and around the vessels was complete such that the diagnosis was established only on the basis of biopsy showing malignant signet-ring type of tumor. I think they are identical cases, fortunately rare. This is just a horrendous tumor.

Leo Lowbeer, M.D., Tulsa, Oklahoma: A number of years ago in the CANCER SEMINAR devoted to tumors of the gastrointestinal tract, I contributed a case similar to this one in which the sigmoid was involved. The primary tumor was in the urinary bladder and it was a rather eccentric involvement of the lower sigmoid colon.

Dr. McGavran: May I ask Dr. Abell, was there any antecedent history suggestive of ulcerative colitis. We have recently seen several cases of very similar appearance in young patients who have had ulcerative colitis in their early teens.

M. R. Abell, M.D., Ann Arbor: No, there wasn't. Her history was extremely short. Symptoms were relatively mild.

Morgan Berthrong, M.D., Colorado Springs: May I change the subject. I'd like to take a moment to publicly express my appreciation to my histologic technician, Mr. Melvin Barhite for his 20 odd years of preparing slides for this CANCER SEMINAR. He gives enormously of his time, quite a lot of his heart, and he usually reactivates his duodenal ulcer making the slides that you guys look at every year.

Dr. Regato: Indeed, we all owe Mr. Barhite a debt of gratitude; no one has been as devoted to our common interest as he has.

References

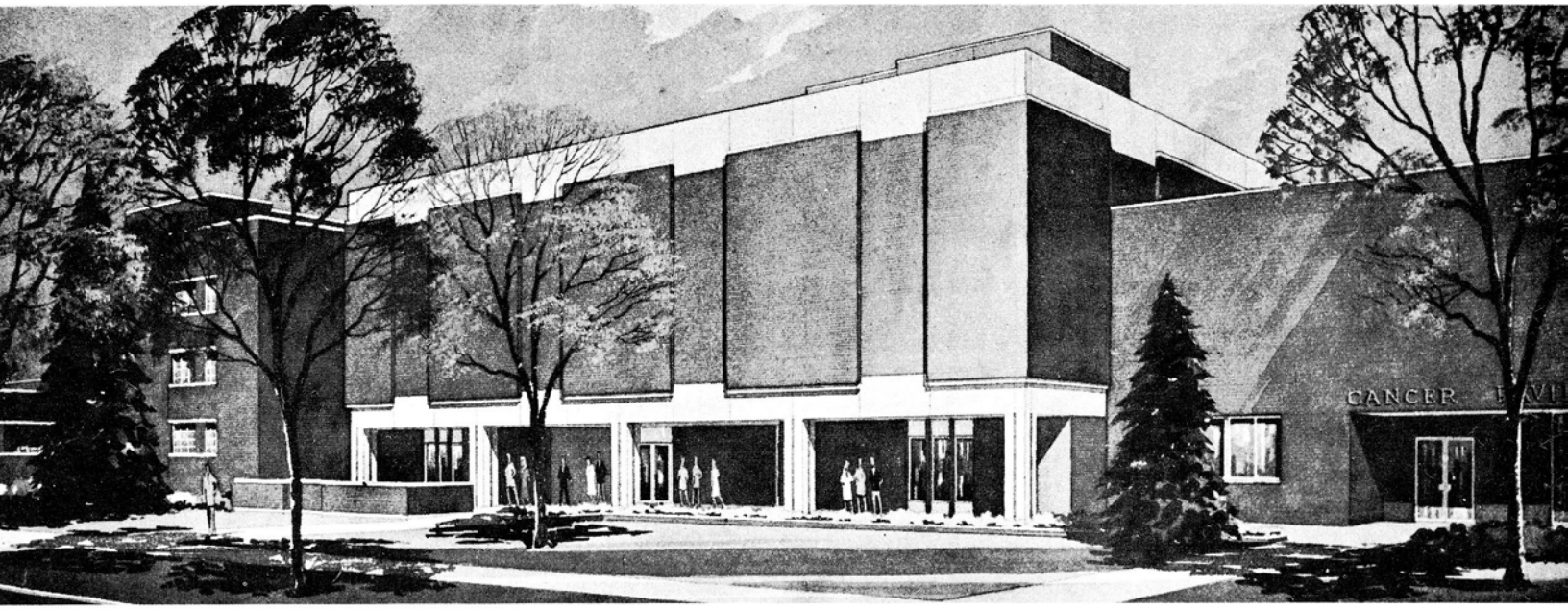
Kern, W.H., and White, W.C.: Adenocarcinoma of the Colon in a Nine Month Infant. Cancer, **11**: 855-857, 1958

Lowbeer, L.: Signet-Ring Cell Carcinoma of the Urinary Bladder. CANCER SEMINAR, **I**: 167-169, 1955

Middelkamp, J.M., and Haffner, H.: Carcinoma of the Colon in Children. Pediatrics, **32**: 558-571, 1963

Sessions, R.T., Riddell, D.H., Kaplan, H.J., and Foster, J.H.: Carcinoma of the Colon in the First Two Decades of Life. Ann. Surg., **162**: 279-284, 1965

White, W.C., Kern, W.H., Salzman, E.: Adenocarcinoma of the Descending Colon. CANCER SEMINAR, **II**: 89-90, 1958



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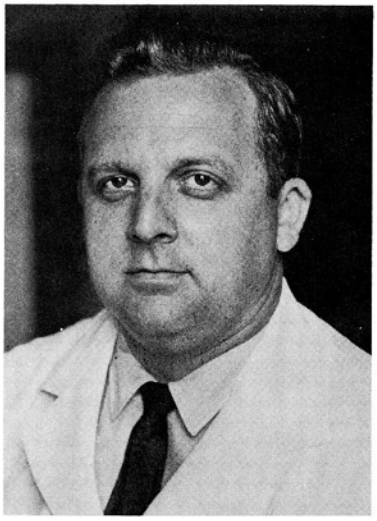

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