INFLAMMATORY TUMORS OF THE GASTRO-INTESTINAL TRACT*

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THE not uncommon confusion of the so-called inflammatory tumors of the gastro-intestinal tract with malignant and other diseases and the poor results which may follow failure to make this differential diagnosis warrants a review of the subject.

The terms, inflammatory tumor, infective granuloma,[13] non-specific granuloma,[11] chronic cicatrizing enteritis,[18] regional ileitis,[17] and others, are all synonymous. They infer a type of chronic productive inflammatory reaction to infection with a tendency to the formation of a tumor or mass. Thus, they should be sharply differentiated from the specific granulomata of tuberculosis, lues, actinomycosis, *etc.*

A fairly thorough review of the literature yields a vast amount of varied information both factual and conjectural in character. Since recognition of the more widely accepted facts will probably lead to better diagnosis and treatment, it seems preferable to outline them rather than discuss many of the points still remaining controversial.

Ninety years ago Virchow,[1] discussing chronic peritonitis, described the formation of flat or villous-like thickenings on the peritoneum either single or multiple. He had observed their occurrence in the region of the appendix, hepatic, splenic, and sigmoid flexures of the colon. In some instances partial narrowing of the lumen with constriction was present. It was his impression that this peritonitis resulted from any inflammation of the intestinal wall by direct continuation or from other abdominal organs.

The problem lay practically dormant in the literature until Moynihan,[2] in 1906, read a paper entitled, "The Mimicry of Malignant Disease in the Large Intestine," in which, he reported six cases with a mistaken preoperative diagnosis of malignant disease. Four of these were diagnosed as consisting of chronic inflammatory tissue from various causes. He stated that: "The inflammatory tumors of the large intestine, excluding the tuberculous conditions, are, it would appear, far more frequent than we have supposed. The exact nature of the conditions present are not always the same. The inflammation may begin in and penetrate the mucosa, a false diverticulum may form and may perforate, extensive undermining ulceration may be combined with a form of polypoid growth or, finally, the inflammatory deposit may affect the peritoneal coat, chiefly or solely, leaving the mucosa

* Read before the New York Surgical Society, November 25, 1936. Submitted for publication March 4, 1937.

supple and intact." While offering no etiologic classification, he emphasized the mimicry of malignant disease.

In 1908, A. W. Mayo-Robson[3] detailed the record of 11 abdominal cases in which he had failed to differentiate inflammatory from malignant disease. His errors had occurred, once in the esophagus, four times in the stomach, once each in the small intestine, cecum, ascending colon, transverse colon and splenic flexure, and twice in the rectum. He related the satisfactory and frequently surprising results which he had obtained with short circuiting operations in some of these cases which had been diagnosed hopelessly incurable cancer. In view of this experience, he recommended exploration of all doubtful cases. Although he could offer no definite etiology, he clearly separated this group from the specific granulomata.

In 1909, Heinrich Braun[4] reviewed the literature and, adding two cases, was the first to describe in detail the gross and microscopic pathologic pictures. He definitely set this apart from the specific granulomata. In 1911, Giffin[5] reported an inflammatory mass around a diverticulum of the rectum and observed the possibility of fistula formation. Between 1907 and 1917, Proust and Lejars,[6] Hamann,[7] and Lee[8] each added case reports. Lee's case illustrated the possibility of abscess formation in this disease. In 1912, McGrath,[9] having found chronic extramucosal inflammation with mass formation in 27 cases of symptomatic diverticula of the large bowel, quoted Telling:[10] "Of all the secondary results this proliferative inflammation is the most important, the most frequent and probably the most overlooked." He cautioned against the hasty labeling of colonic masses as malignant disease. He attributed the lack of luminal intestinal symptoms (bloody and purulent stools, *etc.*) to the relative freedom of the mucosa from involvement and stated that careful handling of such inflammatory masses may avert adhesions, fistulae, abscesses, peritonitis and death.

Thus, to this time, attention had been directed to the presence of these tumors frequently closely resembling malignant disease, both clinically and pathologically; to their inflammatory nature as distinct from tuberculosis, lues and actinomycosis; to the danger of intraperitoneal infection and to the production of strictures or fistulae in the course of the disease. The lesions had occurred in both the large and small intestines, stomach and esophagus, with the only ascribable causes mentioned being foreign bodies, ulcers and diverticula.

It was not until Moschowitz and Wilensky,[11] in 1923, reported four cases under the caption of "Non-specific Granulomata of the Intestines" that the surgical profession in this country showed real interest in the subject. Although recognizing the etiologic importance of foreign bodies and diverticula, they believed that the cause was usually unknown and felt that the erroneous diagnosis of hyperplastic tuberculosis concealed many instances of this disease. They noted that after sidetracking operations, the tumors frequently tended to disappear. Without doubt, their paper is responsible for the present increase in the recognition of the disease.

In 1928, Barron,[12] studying the occurrence of simple, nonspecific ulcers from esophagus to anus (ulcers other than those due to tuberculosis, lues, dysentery, typhoid fever, parasites and malignant disease) mentions them as another possible and difficultly recognized cause of this type of inflammation, especially in the colon. In 1931, Mock[13] ventured the opinion that decreased blood supply and trauma may be etiologic factors in some cases. His advice to remove a section for biopsy in all apparently inoperable intestinal tumors should be accepted guardedly, since such procedure may excite serious sequelae. In 1932, Wilensky[14] summarized his attitude toward the problem by stating: "Non-specific granuloma of the intestinal tract offers no characteristic clinical concept because the etiology, symptoms and signs are protean and indefinable." In 1932, Raiford[15] classified the nonspecific granulomata of the gastro-intestinal tract as one of the lymphoblastomata, and emphasized the occasional difficulty of accurate pathologic diagnosis. In 1933, Erdmann and Burt[16] suggested that the process may originate in an injury to the mucosa with subsequent ingress of infection of a low-grade type. In 1932, Crohn, Ginzburg and Oppenheimer[17] introduced the term, "regional ileitis." They believed that the terminal ileum is involved selectively enough to constitute a new clinical entity. Their observation of the growth of a granuloma at the site of previous strangulation of intestine supports Mock's contention that the process may be initiated by an impaired blood supply. In 1933, Harris, Bell and Brunn[18] suggested the name, "chronic cicatrizing enteritis," based upon their belief that the process occurs throughout the small intestinal tract. This review indicates the rather wide acceptance of many facts.

Pathologically, the inflammatory tumor may be described as a chronic, productive, inflammatory reaction to various etiologic factors and may often involve all the coats of the gut. Early, it resembles chronically infected granulation tissue with many new blood vessels infiltrated by lymphoid and polymorphonuclear cells. Giant cells of the foreign body type are not infrequently found. Fibroblastic elements soon appear in the reaction which may now progress in several ways. It may persist as a productive inflammation and, with progressively diminishing blood supply, may eventuate in adhesive peritonitis or fistula formation, or by suppuration in abscess formation or peritonitis. Fibroblastic predominance may result in a dense stenosing cicatrix. The small intestine, particularly the ileum, shows mucosal ulceration and cicatrization somewhat more often than the rest of the gastro-intestinal tract. It should be emphasized that any part of the gastro-intestinal tract may be affected even though in the 51 cases reviewed, 26, or 51 per cent, occurred in the ileocecal region with six in the cecum, 13 in the cecum and ileum together and seven in the ileum alone. Excepting the younger age incidence in the ileum most cases have been reported in the cancer age group (40 to 60).

Grossly, the lesion is most often confused with malignant disease in

the large bowel and stomach, and with either malignant disease or tuberculosis in the small bowel and cecum.

The known causes may be grouped as either intra- or extra-intestinal. From within the gastro-intestinal tract diverticula, foreign bodies, non-specific ulcers, colitis and polypi represent the major causes. From without the gastro-intestinal tract foreign bodies, progression from other foci, and embarrassed blood supply are the important known factors. However, in addition, a large number of cases remain without any indication of the actual origin. The importance of these factors varies with the portion of the tract affected. In most of the cases involving the stomach, an ulcer has accounted for the reaction. Cases involving either or both the ileum and cecum have usually shown no more definite cause than the occasional presence of a foreign body or embarrassed blood supply. Especially in the ileum does the question of etiology remain uncertain. However, it may be suggested that the marked amount of lymphoid tissue in this area may be contributory to ulceration, thus possibly initiating the disease here. The large intestine exhibits diverticula and foreign bodies as primary factors.

The multiplicity and diversity of symptoms and signs preclude any great degree of accuracy in preoperative diagnosis. Some points, however, deserve emphasis as possible aids. Long standing indefinite symptoms such as a low grade of fever, anorexia, nausea and abdominal pain may suggest subacute or chronic disease of the gastro-intestinal tract.

The pathologic stage of the disease gives rise to wide variation in the clinical picture. The stage of infection may be ushered in as an enteritis or a colitis, adhesive peritonitis, diverticulitis, intra-abdominal abscess, visceral perforation or peritonitis. Suffice it to state that usually the process remains of indolent nature and only rarely, as in sigmoid diverticulitis, progresses to an acute fulminating peritonitis. The stage of intestinal obstruction is usually incomplete and may occur either before or after fibrotic stenosis of the bowel.

Enumeration of the symptoms and signs of the above would entail a description of almost all intra-abdominal diagnoses. Local tenderness, leukocytosis and a palpable mass may be present. Further considerations in diagnosis must take into account the location of the disease. The high percentage of error in preoperative diagnosis makes it essential to appraise, at the same time, the possibility of diagnosis at operation.

The complaints of a young individual may have suggested duodenal ulcer which roentgenologic evidence of pyloric defect or obstruction may have corroborated. Anemia may be present but the true cachexia of cancer is usually absent. Palpation of a mass in the upper abdomen may readily throw the weight of evidence to malignant disease. Inflammatory tumor must be thought of if the mass is larger, more tender and less hard than to be expected in the latter. If at operation a large tumor of the stomach and duodenum with many inflammatory adhesions and without metastases in the liver be encountered, the diagnosis may be reasonably suspected. Competent

observers have reported the presence of inflammatory tumors in the stomach and duodenum treated surgically as inoperable carcinoma. Subsequent disappearance of these tumors has attested to their inflammatory nature.

The occurrence of indefinite symptoms in the right lower quadrant may easily lead to error. It is here that the inflammatory tumor is most common. There may be a history of one or frequent attacks of enteritis, perhaps ulcerative in type with abdominal cramps, nausea and vomiting, slight fever and anemia. At this stage the diagnosis is usually not made. The mimicry of acute appendicitis is usually misleading but long duration of symptoms and anemia may arouse suspicion. Many cases operated upon and dismissed as chronic appendicitis reveal the correct diagnosis with the subsequent development of a mass or intractable fistulae. Direct trauma or strangulation of intestine in a hernia may antedate the onset of symptoms and the development of a mass. A mass palpated before or at operation calls for differentiation from ileocecal tuberculosis, lymphosarcoma, carcinoma and benign tumors.

The inflammatory tumor is usually not sharply limited in extent, may involve the ileum, cecum or both and is usually firm, with many adhesions. The presence of fistulae, either viscerovisceral or external, either initial or postoperative, almost labels the disease. Peri-intestinal abscesses are not uncommon. Dense fibrosis of the ileum may exist. The lesion may be multiple. The absence of active, pulmonary tuberculosis almost rules out ileocecal tuberculosis. Lymphosarcoma does not spread as widely, nor does it have the excess of inflammatory adhesions. Carcinoma may be partially ruled out by the smaller area involved, the very hard consistency of the tumor, the presence of metastases and the lack of early adhesions. Benign tumors should be recognized easily.

It may be suggested that the use of roentgenologic studies with barium, in the presence of small intestinal obstruction, submits the patient to the possible precipitation of acute intestinal obstruction and should be used only with the greatest caution. The factors mentioned above hold good for the entire small intestinal tract.

If the symptoms are of colonic nature one must look for presumptive aids in the history such as colitis, nonspecific ulcers, foreign bodies and especially diverticula. The inflammatory tumor does not develop the bloody stools, anemia and cachexia of right-sided colonic carcinoma nor the acute obstruction of left-sided colonic carcinoma. A tender mass may be palpable and associated with leukocytosis, indicating infection. Proctoscopy with biopsy and roentgenologic studies are useful. At operation the inflammatory tumor is larger, more widespread, less hard and lacks the metastases of malignant disease. Many inflammatory adhesions and small abscesses may be found.

Surgical recommendations should be governed by several factors: First, conservative surgery may, and frequently does, result in cure without the added risk of radical intervention. Second, the ever present chance for

error should allow for the occasional necessity of further surgery. Third, any surgical procedure meeting these standards and offering the opportunity of accurate diagnosis certainly has merit in itself.

We believe that these criteria definitely favor the side-tracking operations as the best solution of the problem, at least, until more is known of the etiology and diagnosis of the disease. The application in any part of the gastro-intestinal tract of this treatment seems to show sound basic advantages over the more radical procedures.

If all findings do not label a gastric mass as malignant, a gastro-enterostomy and biopsy of the regional nodes should be performed. This procedure may cure an inflammatory tumor and, if the biopsy is reported malignant, secondary resection may be completed with little loss to the patient. Furthermore, resection for an inflammatory mass carries not only the higher risk inherent in the operation itself but also the added danger of severe infection and fatal peritonitis.

In the ileocecal region conservative surgery offers a definite advantage. A simple side-tracking operation, with biopsy of regional lymph nodes, permits of more accurate diagnosis and probably will cure the inflammatory tumor. It will reduce the incidence of complications often following radical procedures. Lymphosarcoma, notoriously, is not amenable to surgical cure. Radiation therapy may be of some benefit. Hyperplastic tuberculosis may be resected after the diagnosis has been proven. Adenocarcinoma of the ileum may be secondarily resected even though these tumors metastasize and recur early.

Surgery of the large bowel carries the risk of severe and fatal peritonitis calling for care and judgment in selection of the operative procedure. Such procedure should be at least consistent with possible recovery. Any abscess should be incised and drained only, even though it is known that fistulae may persist. Simple removal of a foreign body may effect a cure. Biopsy in this region, except for removing a regional lymph node, is inadvisable. If the diagnosis of inflammatory tumor can be reasonably suspected, short circuiting types of operations certainly are desirable. If practicable, colo-colostomy or enterocolostomy may be performed; if not, simple colostomy. If the tumor is readily delivered outside the abdominal cavity a Mikulicz type of procedure may be carried out. In the event of discovery that the process is of malignant nature, secondary operation may then be performed.

A total of 43 cases taken from the literature may be divided into three groups: seven of these involved the ileum alone. Thirteen involved the ileum and cecum and in some of these 13 there was additional involvement of other portions of the large or small bowel. Twenty-three involved only the large intestine exclusive of the cecum.

In the ileum alone, the seven case reports show seven resections with one death and two recurrences requiring secondary operation. The 13 case reports with ileum and cecum involved showed the following results. With nine resections, five cures occurred. The other four cases had two

TABLE I

ANALYSIS OF CASES REVIEWED IN THE LITERATURE

Part Involved	Age	Sex	Treatment	Result	Comment	Reported By
Esophagus			Gastrostomy	Cure		Robson, 1908
Pylorus	31	M.	Gastro-enterostomy	Cure	Ulcer?	Robson, 1908
Pylorus	45	M.	Gastro-enterostomy	Cure	Ulcer?	Robson, 1908
Pylorus	48	M.	Gastro-enterostomy	Cure	Ulcer?	Robson, 1908
Pylorus	50	M.	Diet and rest	Cure	Ulcer?	Robson, 1908
Stomach	56	F.	Resection	Cure	Ulcer?	Mock, 1931
Stomach	52	F.	Resection	Cure	Ulcer?	Mock, 1931
Stomach, duodenum and pancreas	38	M.	Resection	Death	Ulcer?	Mock, 1931
Stomach	54	M.	Resection	Death	Ulcer?	Kolodny, 1935
Stomach	43	M.	Resection	Cure	Ulcer?	Kolodny, 1935
Ileum	20	M.	Resection	Two recurrences		Coffin, 1925
Ileum	25	M.	Resection	Death (strang. hernia)	Torn meso.	Mock, 1931
Small intestine	31	M.	Resection	Cure	Pneu. death (1 mo.)	Cave, 1931
Ileum	52	M.	Resection	Cure	Ulceration	Andrews, 1932
Ileum	30	F.	Resection	Cure		Hanford, 1933
Ileum	42	F.	Resection	Cure		Erdmann and Burt, 1933
Ileum	24	M.	Resection	Death		Harriss, Bell and Brunn, 1933
Ileum	28	F.	(*a*) Short-circuit (*b*) Resection	Cure	Two operations	Bockus and Lee, 1935
Cecum and ileum	23	M.	Resection	Cure		Jones and Eisenberg, 1918
Cecum and ileum	23	M.	Resection	Fistula, abscess	2nd resec.	Moschowitz and Wilensky, 1923
Cecum and ileum	22	F.	Resection	Cure	Linen suture	Mock, 1931
Cecum and ileum	18	M.	Resection	Cure		Erdmann and Burt, 1933
Cecum and ileum	39	F.	Resection	Cure		Erdmann and Burt, 1933
Cecum, ileum and colon	60	F.	Resection	Death	2nd resec. (fistula)	Erdmann and Burt, 1933
Cecum and ileum	37	F.	I. and D. abscess	Fistula	2nd resec.	Erdmann and Burt, 1933
Cecum and ileum	30	F.	Resection	Cure		Molesworth, 1933
Cecum and ileum	49	F.	Resection	Abscess	2nd I. and D.	Gordon, 1933
Cecum and ileum	21	F.	Appendicectomy	Fistula		Janssen, 1933
Cecum and ileum	64	M.	Short circuit and Roentgen-ray	Cure	2nd ex. oper.	Eggers, 1933
Cecum and ileum	18	F.	Resection	Death		Harriss, Bell and Brunn, 1933
Cecum and ileum	19	F.	I. and D. abscess, appendicectomy	Cure, fistula	2nd resec.	Harriss, Bell and Brunn, 1933
Cecum	50	M.	Resection	Cure		Robson, 1908
Cecum		F.	Exp. celiotomy	Cure		Jones and Eisenberg, 1918
Cecum	44	M.	Resection	Cure		Golob, 1932
Cecum and ascending colon	33	M.	Resection	Cure		Moschowitz and Wilensky, 1923
Cecum and ascending colon	44	F.	Resection	Cure		Moschowitz and Wilensky, 1923

TABLE I (*Continued*)

Part Involved	Age and Sex		Treatment	Result	Comment	Reported By
Cecum and ascending colon	57	M.	Short circuit and Roentgen-ray	Cure		Eggers, 1933
Ascending colon	70		Short circuit	Cure		Robson, 1908
Trans. colon	50	M.	Short circuit	Cure		Robson, 1908
Trans. colon	50	F.	Resection	Cure?		Moynihan, 1908
Trans. colon	32	F.	Resection	2nd abscess	I. and D. cure	Lee, 1917
Trans. and splenic colon	62	F.	Short circuit	Cure		Moynihan, 1908
Splenic flexure, small intestine	50	F.	Double short circuit	Cure		Robson, 1908
Splenic flexure	44	M.	Resection	Fistula	2nd oper.	Moschowitz and Wilensky, 1923
Splenic flexure	20	M.	Exteriorized, excision	Cure		Mock, 1931
Sigmoid	58	F.	I. and D. abscess	Cure	Diverticulitis	Moynihan, 1908
Sigmoid	52	M.	Colectomy	Cure	Diverticulitis	Moynihan, 1908
Sigmoid	7	F.	Exp. oper.	Cure		Ashurst, 1908
Sigmoid (tubes and ovaries)	49	F.	Exp. oper.	Cure		Mock, 1931
Colon and ileum		M.	Resection	Recurrence	Two—2nd opers.	Coffin, 1925
Rectum	28	F.	Colostomy—Ab. pern. sec.	Cure		Moynihan, 1908
Rectum	50	M.	Colostomy	Cure	Closure	Robson, 1908
Rectum	50	M.	Colostomy	Cure	Closure	Robson, 1908
Rectum	56	F.	Resection	Cure	Diverticulitis	Giffin, 1911

deaths with three secondary fistulae and two secondary abscesses requiring four additional operations. One death followed a primary operation and one a secondary resection for fistula. One fistula persisted. The two cases with secondary abscesses, both of which were incised and drained, ended with two fistulae which were both reoperated upon a third time. Four conservative operations were performed in this group. One short circuit followed by radiotherapy yielded a cure as did one appendicectomy. Incision and drainage of two primary abscesses resulted in two fistulae, which also were subsequently resected.

It is to be noted that three deaths, two recurrences, two secondary abscesses and three secondary fistulae requiring eight additional operative procedures do not incline one to consider that this type of surgery is all that is to be desired. It is certainly worthy of consideration, from a diagnostic standpoint, that all four cases having abscesses that were incised and drained, subsequently developed fistulae of an ileal type which tended to persist for a long time.

The 23 cases involving the large bowel showed these results. With 11 resections eight cures resulted, with two recurrences, two fistulae, and one abscess. In 12 cases conservative surgery yielded 12 cures. Seven of these 12 had a short circuiting procedure performed, and all recovered without any complications.

If the latter two groups of cases, totaling 36, are considered together these results may be observed: Twenty resections yielded 13 cures, with two deaths from primary operation, two recurrences requiring two secondary operations, resulting in one death, five persistent fistulae and three secondary abscesses all requiring reoperation. In 16 of these cases, conservative surgery of one type or another yielded 13 cures. Short circuiting performed eight times showed eight cures; exploratory celiotomy in four cases, three cures; exteriorization in one case, one cure; incision and drainage in three cases, one cure with two persistent fistulae. Omitting those cases that had only incision and drainage of an abscess from this group of 16, conservative surgery showed only one case without a favorable result. This may be contrasted, very definitely, with the frequent complications resulting from radical surgery.

The appended case reports are from the Second Surgical Division of Bellevue Hospital, New York.

CASE REPORTS

Case 1.—S. T., female, age 47, white, was admitted to the hospital April 17, 1926, with a seven weeks' history of irregularly, recurrent pain in the left lower quadrant with some nausea but no vomiting. Previously she had been quite constipated. There had been no weight loss.

She was subacutely ill without abnormal physical findings other than those localized to the abdomen. In the left lower quadrant there was a firm, round, orange-sized mass slightly tender and fairly mobile. Rectal and vaginal examinations were normal.

The temperature varied between normal and 101° F.; white blood cells, 17,200; polymorphonuclears, 85 per cent; red blood cells, 4,500,000; hemoglobin, 95 per cent; stools negative for blood; Wassermann negative; blood chemistry normal; cystoscopy normal; proctoscopy showed no visible pathology. Roentgenologic examination revealed incomplete obstruction of the midsigmoid.

She was operated upon 12 days after admission and a large, mobile mass was found in the left lower quadrant. This was composed of inflamed, thickened and adherent omentum and sigmoid colon. Several small abscesses were encountered during the exploration. A small splinter of wood about 2 cm. long was found in this mass when the omentum was separated from the sigmoid. However, no perforation of the sigmoid was seen. The splinter was removed and the abdomen closed with drainage.

The patient made an excellent convalescence, having been discharged on her twenty-fourth postoperative day, with the wound completely healed. For three years she has had no recurrence of symptoms and the mass has disappeared.

Case 2.—G. M., male, age 42, white, was admitted September 18, 1934, with a two day history of abdominal pain most marked in the left lower quadrant. He had had considerable vomiting and some dysuria. His past history elicited no prominent symptoms. He was acutely ill, dehydrated and had a distended and tender abdomen. Rectal examination showed marked tenderness on the left side. No mass was palpated. Temperature, 101.4° F.; urine, negative; white blood cells, 12,600; polymorphonuclears, 82 per cent.

He was operated upon shortly after admission and a diffuse peritonitis was found. In addition, the sigmoid was grossly inflamed and thickened and had many inflammatory adhesions about it. The abdomen was closed with drainage.

He had a stormy convalescence and was discharged on his thirtieth postoperative day. The wound healed completely without the formation of a fistula. Subsequent studies have

proven the presence of multiple diverticula of the sigmoid. The inflammation of one of these doubtless accounted for his illness.

Case 3.—M. R., female, age 37, was admitted August 1, 1933, with a three months' history of cramping, epigastric pain after meals. Alkalies eased the pain irregularly but vomiting gave constant and immediate relief. She remembered having had tarry stools several times. She had lost about 40 pounds in three to four months. Episodes of epigastric pain with vomiting had recurred for nine years and during this period repeated observation in various hospitals had resulted in no definite diagnosis. Three years before her admission, hematemesis and melena had been noted for the first time, and during the last three years both of these have recurred on several occasions.

She was a markedly emaciated young female, appearing chronically ill and complaining of fairly severe epigastric pain. Her head, neck, lungs, heart and extremities revealed no positive findings. The abdomen was soft, nontender, not distended and no masses were palpable. Rectal and vaginal examinations were negative.

Temperature rose to a maximum of 101° F. on several days. Pulse and respirations normal. Blood pressure, 98/72; urine, negative; white blood cells, 8,400; polymorphonuclears, 74 per cent; red blood cells, 4,500,000; hemoglobin, 80 per cent. Wassermann, negative; blood chemistry, normal. Repeated G.I. series showed only a very large atonic stomach and dilated duodenum.

After having left the hospital against advice on three occasions she finally consented to an exploratory celiotomy because of almost constant vomiting. She was operated upon August 15, 1933, with a preoperative diagnosis of high obstruction.

The operative findings consisted of a markedly dilated stomach and duodenum; a lemon sized mass in the jejunum, six inches below the angle of Treitz, causing almost complete obstruction; many soft small lymph nodes were found in the mesentery at this point. The mass was resected and a side-to-side anastomosis done and the abdomen closed without drainage.

Postoperatively a wound infection cleared fairly rapidly. She progressed well for about two weeks when the vomiting recurred. Conservative measures were of no avail. Roentgenologic studies again showed marked dilatation of the stomach and duodenum. It was felt that she might have been obstructed at the jejunojejunostomy stoma and she was reoperated upon September 27, 1933, six weeks after her first operation.

The abdomen contained a mass of adhesions between both the parietal and visceral peritoneum. The anastomosis appeared patent. The first portion of the jejunum was slightly hypertrophied and had a granular appearance. An anterior gastro-enterostomy was performed with an entero-anastomosis 20 inches below the angle of Treitz. The wound healed by primary union and she made good progress for another two weeks. At this time recurrence of vomiting seemed to indicate another obstruction from adhesions and she was reoperated upon November 4, 1933, six weeks after the second operation.

At operation the gastro-enterostomy and both entero-anastomoses were apparently functioning. The peritoneal cavity contained a mass of adhesions. The stomach was not dilated. The exploratory celiotomy, with lysis of the adhesions, was completed. Postoperatively she made some progress for about two weeks but died suddenly on the sixteenth postoperative day, approximately 30 hours after a recurrence of the vomiting.

Pathologic examination of the tissue removed from the jejunum at the first operation showed a stenosing lemon-sized tumor of the jejunum. It was interpreted as a chronic, productive inflammatory tissue. The mucosa was slightly ulcerated and the tumor showed a marked amount of fibrosis with infiltration by many lymphoid cells. Some giant cells were also present.

Autopsy revealed the presence of two other similar tumors, one in the duodenum and one low down in the jejunum. The origin of these tumors is unknown.

Case 4.—M. M., female, age 46, white, was admitted in December, 1934, with a one week's history of generalized abdominal cramps, with considerable nausea and vomiting and slight diarrhea. She believed this to be due to some type of food poisoning. With the

onset of fever and some abdominal distention accompanied by constipation, she came to the hospital. She admitted having had some irregular lower abdominal pain with constipation for a few months before the present illness.

She was well developed and well nourished but chronically ill. Examination showed only abdominal distention and tenderness in both lower quadrants. A slight cystocele and rectocele were present, and the culdesac was slightly boggy but not tender.

Temperature on admission 103° F.; pulse and respirations, normal; urine, negative; blood pressure, 105/70; white blood cells, 12,000; polymorphonuclears, 78 per cent; Wassermann, negative; Widal, negative; red blood cells, 4,000,000; hemoglobin, 70 per cent. The stool was negative for blood. Culture and direct examination of the stool showed no abnormal findings. Proctoscopy negative. A barium enema, which was repeated, showed finger printing in the sigmoid and was interpreted as an infiltrative lesion. A diagnosis of possible foreign body perforation of the sigmoid with abscess formation was made, and operation carried out January 9, 1935.

Operation.—The pelvis and lower abdomen were a mass of adhesions in which were embedded the tubes and ovaries and the small and large intestines. This mass was the seat of an inflammatory reaction, the tissue being of porky consistency. The sigmoid was incorporated in this mass and its wall was tremendously thickened. The tubes were also markedly enlarged. There was a small amount of odorless pus, enclosed in the meshes of these adhesions.

Both tubes were removed by sharp dissection and an appendicectomy with simple ligation of the stump effected. The abdomen was closed with drainage.

She died on the eighteenth postoperative day from an acute nephritis and sepsis. A postmortem examination revealed a small amount of purulent exudate in the lower abdomen, which showed a hemolytic streptococcus in pure culture as did the pus from the original abscess.

Friable adhesions were present throughout the abdomen, particularly low down. The wall of the large intestine at the rectosigmoid junction was thickened, firm and indurated without ulceration of the mucosa. The ileum and small intestine were intimately adherent to this mass. Microscopic examination of this tumor of the rectosigmoid region showed a chronic productive inflammatory reaction with an increase in the connective tissue, infiltration by lymphoid cells and some edema. The surgical specimen was reported as showing a chronic productive salpingitis.

Although the origin of this tumor of the rectosigmoid junction is not definitely established it seems probable that it may be due to progression from the pathologic process in the tubes.

Case 5.—T. G., female, age 61, white, was admitted June 10, 1935, with a four months' history of cramplike abdominal pain with nausea and irregular vomiting. She had noted intermittent constipation with distention. She had had no melena or hematemesis. She had gradually become weaker during the past two months, with a weight loss of approximately 30 pounds. She stated that on several occasions she had had some fever.

The patient was subacutely ill. Examination showed fairly marked tenderness over the lower abdomen, particularly on the left side. An irregular suprapubic mass was palpable but could not be definitely outlined. On bimanual examination the tumor seemed to be intimately connected with the posterior vaginal wall.

Her temperature ran irregularly between normal and 102° F.; red blood cells, 4,000,000; hemoglobin, 80 per cent; white blood cells, 11,000; polymorphonuclears, 85 per cent; urine, negative; blood pressure, 140/90; proctoscopic examination, negative; stools negative for blood.

At operation, June 14, 1935, an orange-sized mass was found in the sigmoid adherent to the ileum, which caused subacute obstruction of both the ileum and the large bowel. The adhesions encapsulated 50 cc. of thick, greenish pus.

In separating the adhesions the abscess was opened, and in attempting to free the sigmoid from the ileum, a small opening was accidentally made into the large bowel. This was closed after a small piece of tissue had been removed for biopsy. The wound was closed with drainage.

Postoperatively, she developed a fecal fistula which drained for a considerable length of time. The patient refused further surgery of any type and left the hospital, returning, however, to the O.P.D. for subsequent dressings. The fistula persisted for approximately one year when it finally closed spontaneously. It is now a year and one-half since operation and the patient is in excellent health.

The specimen removed from the tumor in the rectosigmoid region showed a dense granulation tissue in which there were numerous vessels. Considerable fibrous tissue of a dense character, with numerous fibroblasts, was present and was infiltrated by many round cells.

Case 6.—C. L., male, age 40, white, was admitted May 15, 1934, complaining of epigastric pain of ten years' duration. This occurred about an hour after each meal and was relieved by alkalies and emesis. There was no history of hematemesis or melena. During the past month he had had almost constant vomiting, having been able to retain only fluids. He had been operated upon previously for hemorrhoids and for a perforated appendix, both in 1932.

The patient was emaciated. No abdominal tenderness was present. No mass was palpated. Temperature, pulse and respirations normal. Urine, negative; white blood cells, 15,000; polymorphonuclears, 70 per cent; red blood cells, 5,000,000; hemoglobin, 100 per cent; gastro-intestinal roentgenograms showed complete retention of the gastric meal at 24 hours.

At operation, May 16, 1934, an orange-sized mass was found in the first portion of the duodenum and extended slightly over onto the gastric side. There were many adhesions to the surrounding structures. No metastases were felt.

A posterior gastro-enterostomy was performed; although it was felt that the tumor might be a carcinoma. A lymph node was taken for biopsy.

The patient made an uneventful postoperative recovery and left the hospital on the eighteenth postoperative day, against advice. Since that time he has gained 35 pounds in weight. Gastro-intestinal roentgenologic studies show good function of the gastro-enterostomy stoma, with a slight area of narrowing of the proximal jejunum about one-half inch distal to the site of anastomosis. The lymph node was reported to show subacute and chronic inflammatory changes without evidences of malignant disease. It is two and one-half years since operation and the patient is now enjoying excellent health.

Case 7.—F. A., male, age 54, white, was admitted February 1, 1932, with a 15 year history of epigastric pain with irregular vomiting. The pain had recurred frequently during this time. He had lost considerable weight. He was emaciated. The abdomen was soft and nontender. No mass was palpated. Rectal examination was negative.

Temperature, pulse and respirations normal. Urine, normal; red blood cells, 4,000,000; hemoglobin, 80 per cent; white blood cells, 9,500; polymorphonuclears, 70 per cent; stools negative for blood; gastric analysis showed both free and combined acid; gastro-intestinal roentgenologic examination demonstrated an ulcer of the first portion of the duodenum with considerable residue at 24 hours.

At operation a lemon sized tumor was found in the first portion of the duodenum mainly on the anterior and inferior duodenal wall. A crater was palpated in the center of the tumor. No metastases were present in the liver although there were many fairly large regional nodes. A posterior gastro-enterostomy was performed with biopsy of a regional node. The patient made an uneventful recovery except for a slight wound infection and was discharged from the hospital on the twenty-seventh postoperative day.

The biopsy of the regional node was reported to show chronic inflammation without evidence of malignant disease.

The patient has been followed for nearly five years and has had two herniae repaired

during that time. He has gained approximately 40 pounds in weight and has absolutely no gastric symptoms.

These latter two cases may be called duodenal ulcers with chronic productive inflammation around them causing tumor formation.

Case 8.—J. K., male, age 60, white, was admitted in May, 1921, with a 48 hour history of lower abdominal pain and vomiting. Examination showed an acutely ill patient with a temperature of 101° F., and leukocytosis of 23,000. No palpable abdominal mass. Preoperative diagnosis was acute diffuse peritonitis.

Operation revealed a mass within the pelvis involving the lower segment of the sigmoid and upper rectum. The mass did not have the consistency suggestive of carcinoma. A peach pit which had ulcerated through the inflamed colon was found and removed. No other pathologic specimen. A diffuse lower abdominal peritonitis was present. A sigmoid colostomy was performed and the peritoneal cavity was drained. Death on the ninth postoperative day. No autopsy.

This case was an inflammatory tumor resulting from a foreign body.

Case 9.—G. F., male, age 55, white, was admitted in October, 1935, with a four months' history of frequent and painful defecation. There was no history of blood in stools. Positive physical findings were confined to rectal examinations. Digital examinations showed hard, tender mass on the anterior rectal wall at tip of finger. Proctoscopic examination showed no ulceration; no bleeding. A biopsy specimen was reported as chronic inflammatory process. Roentgenologic examination of lungs, lumbar spine and pelvis showed no metastases. Temperature 99.6° F.; erythrocyte count, 4,400,000; hemoglobin, 86 per cent; leukocyte count, 11,700; polymorphonuclears, 85 per cent. Stool negative for blood by chemical examination. Preoperative diagnosis: Carcinoma of rectum.

Operation showed hard, fixed mass the size of an orange at rectosigmoid junction. Adjacent loops of small intestine were adherent to the mass. No free fluid; no palpable metastasis in liver. Condition considered inoperable carcinoma. Node removed from pelvis adjacent to mass. Sigmoid colostomy performed.

Pathologic report of this node, chronic lymphadenitis.

Readmitted in March, 1936, for proctoscopic examination. Twenty-six pound weight gain. Spinal anesthesia. Two proctoscopes inserted; one through anus and one through colostomy. Impossible to make the two proctoscopes meet. No erosion: no bleeding. On left side of rectum a hard mass, outside the gut, could be felt. No biopsy.

This case very suggestive of inflammatory tumor of rectosigmoid with cicatricial stenosis.

Case 10.—G. N., male, age 14, white, was admitted February 5, 1920, complaining of generalized abdominal cramps with vomiting. For the past four months he had had recurrent attacks similar to the present one. He was emaciated and somewhat anemic. The abdomen was symmetrical with some tenderness in the right lower quadrant where there was a mass. Temperature rose to 100° F. on several occasions. Pulse and respirations normal. Urine, negative; white blood cells, 14,000; polymorphonuclears, 65 per cent; red blood cells, 3,500,000; hemoglobin, 70 per cent.

At operation, February 12, 1920, a tumor involving the terminal portion of the ileum, cecum and appendix was found. The ileum and right half of the colon were resected, and an end-to-side anastomosis performed.

The patient developed a fecal fistula which persisted for nine months, and on two occasions he developed secondary abscesses around this fistula which required incision and drainage. The fistula finally closed and the patient was followed for five years. His only complaints during this time were irregular recurrence of pain in the right lower quadrant with opening of the fistula on two occasions.

The cecum, ileum and appendix were the seat of a chronic productive inflammatory reaction which was definitely not tuberculous. The cecal mucosa was ulcerated. There was a fistula between the terminal portion of the ileum and the cecum which was embedded in a mass of adhesions.

The origin of the inflammatory reaction in this case was unknown and it represents a case similar to those described under the heading of regional ileitis.

Case 11.—P. F., male, age 37, white, was admitted May 4, 1922, complaining of increasing constipation for five months. He has also had, during the last five weeks, irregular cramping pain particularly in the lower abdomen. He had lost approximately 40 pounds in two and one-half months. He was markedly emaciated and chronically ill. In the left upper quadrant there was an orange-sized mass which was fairly tender. Rectal examination, negative. Temperature, pulse and respirations, normal. Urine, negative; white blood cells, 9,000; polymorphonuclears, 82 per cent; red blood cells, 3,600,000; hemoglobin, 70 per cent. Stool negative for blood. Barium enema showed defective filling at the splenic flexure.

At operation, May 12, 1922, a large mass was found involving the splenic flexure of the colon. This was resected and a side-to-side anastomosis performed. The abdomen was closed with drainage. The patient died on the fourth postoperative day, having developed a severe pulmonary infection.

The wall of the large intestine was markedly thickened and firm, forming a tumor about five inches long and four inches in diameter. The mucosa was ulcerated. There was marked fibroblastic proliferation in the wall of the gut with infiltration with many plasma cells.

This was interpreted as a chronic productive inflammatory reaction probably on the basis of a colitis.

CONCLUSIONS

It should be emphasized that these tumors occur throughout the gastrointestinal tract and that, while the etiology varies, the pathology is essentially the same in all regions. It is our belief that incision and drainage alone is indicated in the presence of abscess, even though fistulae may persist. In the presence of intestinal obstruction nothing but conservative surgery should be carried out. In the absence of abscess, side-tracking and regional node biopsy carries a lower mortality and a lower incidence of complications than resection. The observation of Moschowitz and Wilensky, that the disease is often cured by this type of procedure, still holds good. In addition, conservatism provides the opportunity for subsequent operation when required by a confirmed diagnosis of malignant disease.

It is to be noted that the problem lies more in avoiding radical surgery with its high mortality in a condition not demanding it than in assuring radical surgery to those individuals who may not be benefited by it.

The authors wish to express their appreciation for the generous aid of Dr. Rudolf M. Paltauf, in the translation of foreign literature.

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DISCUSSION.—DR. CARL EGGERS (New York) said that it would be helpful if a common terminology could be found for these conditions. The name proposed by Doctor Dudley, namely, "nonspecific granuloma" or "inflammatory tumors of the gastro-intestinal tract" may serve very well. It seems better than to have a specific name for inflammatory tumors in each section of the gastro-intestinal tract. Somehow he had never had under his care a patient with an inflammatory tumor of the lower ileum other than tuberculous. However, he had come in contact with inflammatory tumors of the pyloric region, so-called hypertrophic tumors or hypertrophic ulcers, as well as with inflammatory tumors of the cecum and especially the sigmoid.

The first pyloric case encountered was in a man who, four years previously, had had a diagnosis made of inoperable carcinoma of the stomach and a gastro-enterostomy with a Murphy button had been performed. He came in now with recurrence of his symptoms. It was learned that the button had apparently not passed. Roentgenologic examination showed a foreign body in his stomach. He was operated upon and the two cylindrical portions of the button, the so-called male and female part, were recovered from his stomach; the remainder seemed to have been digested. There was no sign of a tumor. The gastro-enterostomy was intact. The man died of postoperative pneumonia. At autopsy the steel spring of the button was found to be stuck in the pylorus; it had not shown in the roentgenogram. Since then he had seen a number of large tumors in this region. They bring out a point stressed by Doctor Dudley, namely, that a side tracking operation is safe and is an ideal procedure in these cases. Most cases are cured by a gastro-enterostomy, but one has to be sure not to overlook a carcinoma.

Two cases with large palpable tumors of the cecum were of interest. The first case of this type was seen many years ago. He had intestinal symptoms and a palpable mass. Various diagnoses were suggested, ranging from tumor of the colon to tumor of the kidney. The roentgenologic examination was not conclusive. At operation there was found a large tumor occupying the cecum and ascending colon, extending into the mesentery, and evidently inoperable. An ileocolostomy was performed, after which he was given some roentgenotherapy more as a palliative measure than

with the intention of curing the lesion, and he did very well. The mass disappeared completely and he has had no symptoms since.

Four years ago a second case came under observation which presented a large palpable tumor of the cecum, with obstructive symptoms. He was an old cardiac case. An ileocolostomy was performed as a preliminary procedure, with the intention of removing the tumor at a second stage. A few weeks later when his heart condition had improved, reoperation to remove the tumor was undertaken and it was found that the mass had disappeared. It has not recurred.

Both of these cases illustrate the value of a side tracking operation in the presence of these inflammatory tumors. Unfortunately we do not know the pathology of these cases, since no pathologic examination was possible. They were evidently large granulomata.

Inflammatory tumors of the sigmoid seem to be the most common, and one can distinguish two groups of cases. In some patients one has diverticula and diverticulitis; in others, there are large palpable tumors of the sigmoid in whom one does not see any diverticula in the roentgenograms or at operation. This constitutes a rather interesting group. Dr. Eggers has collected 51 personally observed cases of inflammatory conditions of the sigmoid giving symptoms sufficiently severe to require surgical consultation or operation. In most instances, consultation only. Sometimes these tumors were very large. In a few instances, a diagnosis of ovarian cyst or ovarian tumor was made in the beginning. Some have had very high fever, usually with a high leukocyte count. Another surprising feature has been the speed with which they may disappear after rest in bed, emptying of the bowel, and other measures. In a number of instances we operated and found a large tumor, which looked inflammatory, red, partly covered with fibrin and unlike carcinoma. If one has seen a number, one may differentiate with reasonable certainty. After making the diagnosis, the tumor, in some instances has not been resected, but has been replaced and the patients have recovered. The mortality connected with resection is known, and if one can recognize the tumor as inflammatory in character, one may be conservative.

He recalled an interesting case, seen in 1930, with a tumor which reached to the umbilicus. She had been in bed with fever for a few weeks. It had been diagnosed as a tubo-ovarian condition but on questioning, symptoms of an intestinal disorder were elicited. At operation a large tumor in the pelvis adherent to the bladder, anterior and lateral abdominal wall and adnexa was found. She had a very high leukocytosis—up to 50,000. The mass was apparently an inflammatory one. Resection was not performed, but the mass was liberated and placed in a more favorable position higher in the abdomen where it would not be so likely to reform adhesions. The lymph nodes of the mesentery which drained the tumor were cultured, but no growth obtained. After a prolonged convalescence the patient recovered and she has had no recurrence of symptoms since. During her convalescence she was given roentgenotherapy, which in some of these inflammatory conditions appears to be of value.

Doctor Eggers then presented a series of lantern slides in order to illustrate certain points connected with the diagnosis of sigmoiditis and diverticulitis, as well as its possible underlying pathology. The first was that of a patient who had been admitted on two different occasions, with several years' interval. Each time she presented a large palpable tumor which subsided in five or six days with rest in bed, application of an icebag and attention to the bowels. No diverticula were ever demonstrated.

The next showed a middle-aged female, who presented a tumor in the left lower abdomen with symptoms suggestive of a sigmoid lesion rather than a pelvic mass. The roentgenologic examination was reported negative. A year later she was seen again, and bearing in mind the previous negative roentgenologic finding, a diagnosis of pelvic disease was made. At operation a rather hard inflammatory tumor of the sigmoid was found. It was replaced and the abdomen closed without drainage. Subsequent roentgenologic examinations, expecially after defecation, showed what was considered to represent a typical sigmoiditis. Four years have passed, and though the patient has had occasional intestinal symptoms, she has remained well. The modern technic of visualizing sigmoid lesions, particularly after defecation, is most important.

Another interesting case was one in whom a diagnosis of sigmoiditis had been made on the basis of intestinal symptoms and a palpable mass. It had been verified roentgenologically. His diet was regulated and mineral oil administered. A year later he was taken acutely ill, with what was thought to be acute appendicitis. Knowing that he had diverticula of the sigmoid, perforation of this segment of the gut was considered. There were signs of peritonitis over the entire lower abdomen. At operation fluid was evacuated, and the appendix removed. It did not explain the symptoms. The sigmoid was inspected. It was red, hard, and covered with fibrin. No gross perforation was seen; it was evidently closed off by fibrin. The tumor mass was replaced and the abdomen drained. He made a good recovery. Culture of fluid showed colon bacilli and streptococci. Intestinal symptoms, consisting of pain and vomiting, and suggesting obstruction, continued. A resection was performed about six months later with a good result.

A fourth case was that of an elderly male, in whom a diagnosis of carcinoma of the sigmoid had been made. He had pain, tenderness and a palpable mass. Roentgenologic examination demonstrated a small diverticulum next to the mass. Diagnosis of sigmoiditis was made and as the patient was not a good surgical risk, roentgenotherapy and observation were advised. He continues to remain well, six years later.

A fifth case illustrated the value of taking roentgenograms before and after defecation, as the lesion may show after defecation, when it does not do so before. This patient had a palpable tumor apparently with a perforation of the lumen of the gut into the mass. It was resected and found to be inflammatory. Careful microscopic studies had been made, and it had been determined that the lesion was the result of perforation of a diverticulum into the wall of the gut.

Dr. Eggers thought that in a case, such as that just cited, one may obtain a clue to the etiology of some of these inflammatory tumors of the gastro-intestinal tract. A foreign body may be considered to be the cause in some cases. A few of the cases, cited herewith, may have had a mucosal ulcer as the port of entry. In two instances it was apparently a perforation of a diverticulum into the wall of the gut. The mucosa was normal, but there was an infected diverticulum in the wall. It was the speaker's feeling that infected diverticula were probably frequently the cause of inflammatory intestinal tumors. One may visualize the process as follows: We usually picture a diverticulum as projecting beyond the serosa of the gut wall. Perforation of such a diverticulum may form a local abscess or peritonitis. However, a diverticulum has a beginning, and before it projects beyond the serosa, it must work its way between the fibers of the gut wall. At any time during this process, stagnation and infection may occur. As the result of the increased tension it may perforate in different directions. The

reason many of these inflammatory tumors subside is because they perforate into the lumen and drain that way. Others perforate into the wall, spread along between the layers and form the large hard tumors we sometimes see. Still others perforate externally and form a local abscess or peritonitis.

DR. PERCY KLINGENSTEIN (New York) thought that Doctor Dudley had brought out very important considerations in connection with the cases cited. In the future, now that attention has been drawn so actively to this condition, with refinements in roentgenology, so that the small intestine will become less a silent field in roentgenologic study of the abdomen, more accurate preoperative diagnosis will be made. The lesions, as Doctor Eggers stated, do tend to localize on the left side, yet in Doctor Klingenstein's experience there have been a number localized on the right side. The factor accounting for this is not known. A more exact classification could be made if the etiology were more definitely understood.

DR. SEWARD ERDMAN (New York) asked Doctor Dudley whether, in looking up the literature, he had noted that the majority belonged in the cancer age group. If so, this would be in contrast to the many patients shown during the meeting who were young, in a number of instances. Doctor Erdman was also surprised to observe that so many of the cases were on the right side.

DR. GUILFORD S. DUDLEY (closing) answered that his impression regarding age has been that those inflammatory lesions involving the small intestine and particularly the ileum, or ileum and cecum, tend to be in a younger age group, whereas those involving only the large intestine tend to occur in older patients, that is, in the cancer age group. Common terminology was the thought uppermost in mind in captioning the paper presented. "Inflammatory Tumors of the Gastro-intestinal Tract," being chosen in preference to one that would have been confined to any particular portion of the tract.

DR. LAURENCE MISCALL (closing) pointed out that in the literature the occurrence of inflammatory tumors throughout the gastro-intestinal tract is generally recognized. Many authors have noted minor variations in the pathologic picture and an abundance of etiologic factors in the different parts affected. The common occurrence of fistulae and abscesses complicating radical operative procedures on inflammatory tumors of the gastro-intestinal tract is impressive. These complications have often required secondary or tertiary reoperation. The conservative procedures seem indicated: First, they may cure the patient. Second, they may reduce the incidence of complications. Third, if reoperation becomes necessary it may be carried out when the acute infectious stage may have subsided and been replaced by fibrosis.