

## SURGERY IN RELATION TO CHRONIC NON-SPECIFIC ULCERATIVE COLITIS

Experience at the University of Minnesota Hospitals

CLARENCE DENNIS, M.D.  
Saint Paul, Minnesota

Chronic nonspecific ulcerative colitis is not a common disease, but the misery and mortality of the patients suffering from it and the satisfaction to be derived from the proper management of it draw more attention than frequency alone would allow.

The cause of the disease is open to debate. Bargen points out properly that one must differentiate the disease under discussion from tuberculous colitis, colitis due to lymphopathia venereum, colitis due to amebic or bacillary dysentery, and other forms. He believes most chronic ulcerative colitis to be due to a diplostrep-tococcus. His view is not universally accepted, and a large portion of authors group the majority of these cases as "idiopathic" or "non-specific" chronic ulcerative colitis.

Other authors have offered various explanations for the disease. Some stress the functional factor. R. A. Jensen of our Psychiatric Clinic for Children, has studied eight cases in children rather carefully from the psychiatric angle. He found that these children all had rigid personalities, an unyielding character, set exact standards for themselves, were not free and spontaneous in type, and usually were more intelligent than the average. He feels that in each of these cases the onset of diarrhea has been related to some unusual circumstance in the family relationship. As a rule, no consideration had been given to the psychiatric aspects of these cases until the patients came here. Jensen was able to find special circumstances in the individual experiences of the children underlying each exacerbation of the disease, and in each case there had been smouldering suppressed resentment against the family. He felt that in any case of diarrhea in a child in whom no specific diagnosis can be made in two to three weeks, the psychiatric aspects of the problem should be considered. In many of the adult cases coming to the surgical service, some of us have felt that far too little attention has been paid to these considerations.

The importance of allergic reactions to a variety of foodstuffs has been stressed by numerous writers. Andresen is particularly impressed by the frequency of sensitivity to milk. Rowe has reported a small series of cases in which exacerbations of the disease were conclusively traced to inhalants such as ragweed and thistle pollen.

Various vitamin deficiencies have been incriminated, particularly those of the B-complex. Studies have been undertaken to determine the importance of variations in activity of the various digestive enzymes.

It is apparent that no single cause has been positive-

ly established, and it seems likely that in each case a multiplicity of factors is at work.

*Pathology.*—The congested mucosa early becomes inflamed, bleeds easily on contact, and small hemorrhagic areas appear. Tiny abscesses form in these areas, and coalesce to form ulcers varying in size from pin-point to 2 or 3 cm. in diameter, with shaggy, undermined edges. As the process advances, more mucosa is destroyed, until in some cases only islands of mucosa remain, leaving a pseudopolyposis. All the layers of the bowel become involved in the inflammatory process, with marked thickening and fibrosis. The walls of the colon become thickened and rigid, and as the lumen becomes smaller, actual obstruction occasionally occurs. Perforation with abscess formation or peritonitis is an important cause of death while hemorrhage from vascular erosion is the second important cause of death. Fistulae and abscesses about the anal canal are frequently seen. When pseudopolyposis is present, malignant degeneration not infrequently occurs; pseudopolyposis is therefore regarded as a strong indication for colectomy.

The pathology of the disease may vary considerably from case to case. At the Cleveland Clinic, Jones reported 93 per cent of the cases started with disease in the rectum, and then spread to upper segments with successive attacks. Others report a higher incidence of this type, and give the impression that widespread involvement, even to the cecum, or occasionally into the terminal ileum, is an early result of the disease. Localized segmental involvement occurs in about 5 per cent of the cases.

*Symptoms and Course.*—Ulcerative colitis may be classified under three general headings (Table I).

TABLE I. TYPES OF NONSPECIFIC ULCERATIVE COLITIS

1. The fulminating type.
2. The very mild type.
3. The more common type—marked persistently by sufficient disease to prevent near-normal activity or by frequent exacerbations of such severity.

1. Ulcerative colitis may be ushered in as an overwhelming disease characterized by profuse stools of blood, mucus, and pus passed fifteen to thirty times a day with high or spiking fever, prostration, abdominal cramps and pain plus signs of peritoneal irritation. It may subside in the course of a few days or weeks or it may progress to a rapidly fatal outcome on the basis of inanition, sepsis, peritonitis, or massive hemorrhage.

2. On the other hand, it may begin in an insidious fashion, with mild cramps or diarrhea, later presenting mucus in the stools. As the process advances and ulceration develops, the stools may occasionally become frequent, purulent, and bloody. It may remain a mild disease which responds at once to medical management. Apparently, a somewhat more common course, however, is a prolonged one characterized by exacerbations and remissions. Usually the patient never becomes entirely well, but gets along well enough to continue work except during the exacerbations. There is just

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tification for medical management of some such cases.

3. Between the fulminating cases on the one hand, and the mild ones on the other, the majority of patients with ulcerative colitis will fall. The disease is constantly severe enough or marked by exacerbations of sufficient severity to prevent continuance at work or even at restricted activity. Chronic bleeding and loss of plasma, as demonstrated by Welch, lead to marked or moderate inanition and anemia, and these patients are difficult to handle because of loss of strength, impaired resistance to surgical procedures, and lack of ability to take an adequate diet without increasing the diarrhea.

The degree of weight loss in patients in the severe phases of the disease is greater than that seen in any other group of surgical patients at the University of Minnesota Hospitals. We have had several who have lost 35 per cent of the body weight, and one lost almost 50 per cent.

The complications of perforation, hemorrhage, and sinus formation have already been mentioned. Polyposis occurs only in the chronic cases, and carcinoma is a complication in this group. Arthritis, thrombophlebitis, achlorhydric gastritis, endocarditis, iritis, and other lesions seem to be late complications.

*Diagnosis.*—Diagnosis of ulcerative colitis is not usually difficult to establish, but to differentiate the chronic nonspecific type from other types is less simple. The patient usually looks chronically ill, underweight, and apprehensive. The abdomen is moderately to markedly tender to palpation. The chief complaint is usually of diarrhea, but may be of ischio-rectal abscess, fistula, or other complication. The diagnosis of colitis is largely settled by examination of the stool for pus, blood, and mucus, proctoscopy, and barium enema x-ray examination.

The proctoscopic appearance is one of a swollen, congested mucosa with a granular appearance, which bleeds easily on contact, usually with myriads of small ulcers, and sometimes larger ones. There are usually no areas which look entirely normal.

Barium enema x-ray examination is usually fairly typical. Early in the disease there may be a fine featherlike irregularity of the mucosal pattern. Later the haustrations are partly lost; they are totally lost still later in the disease. Because of spasm and scarring, the lumen is decreased markedly and the bowel is shortened. The caliber is fairly uniform. All these changes give rise to the "lead pipe" appearance considered so typical of the disease. Ladd and Gross feel the wide distribution of these changes is characteristic, and that it serves to differentiate nonspecific from amebic colitis, which usually involves chiefly or solely the right colon.

Mention of the important conditions which must be differentiated is necessary. Tuberculous enteritis may be recognized by careful general study of the patient and ileac barium injection through a Miller-Abbott tube. The bacillary dysenteries should be excluded by blood agglutination studies. Amebiasis can usually be recognized by repeated examinations of the

fresh stool, but it is customary to give a diagnostic trial of emetine nevertheless.

*Medical Therapy.*—The number of different measures employed in the medical management of ulcerative colitis is testimony of the lack of specificity of any form of therapy. Certain measures are generally accepted as of definite value. Strict bed rest and a low residue or bland diet are usually effective measures for tiding over exacerbations. The use of the vitamin B complex, especially thiamine, and of liver extract seems to be widely accepted. Brewer's yeast, cevitamic acid, and a host of other vitamin preparations have been added to the pot. Mackie has summarized present medical management and favors, in addition to the measures already mentioned, use of hydrochloric acid by mouth in those with achlorhydria, mild sedation, as with phenobarbital, and adequate mineral intake, bearing in mind that the involved colon is normally the site of absorption of most minerals. Andresen has called particular attention to the importance of allergic reactions to the development and perpetuation of ulcerative colitis, and favors elimination diets and a thorough allergic study on each patient.

As already indicated, more attention should be paid to the psychiatric study of these patients than has been the custom here in the past.

The advent of the sulfonamides brought new hope. Some are enthusiastic, but the general consensus of opinion seems to be that, although the bacterial count of the feces may be decreased by such drugs as sulfanylguanidine and succinyl sulfathiazole, yet no change in the course of the disease has been demonstrated consistently to occur.<sup>19,22,26,29,28</sup>

Various other procedures, popular some years ago, such as irrigation of the colon with Dakin's solution, have been abandoned.

*Medical Versus Surgical Management.*—An extreme wide difference of opinion exists about the part which surgical intervention should play in the management of patients with nonspecific ulcerative colitis. Most of the publications up to a few years ago indicated the internist's horror of the plight of the patient left with a permanent ileostomy. It has been appreciated that this is a disease in which more or less prolonged remissions are the rule, and therefore the temptation has constantly been to delay active treatment in the sicker patients in the hope that such a remission might occur.

Examples of the diversity of opinion on the choice of procedure are illustrated by the following. Mackie advises a thorough trial of conservative management for several months preferably, and avoids surgical measures to divert the fecal stream from the colon until proctoscopic examination and barium enema study show that irreversible changes are occurring. Willard and associates are almost bitterly opposed to surgery in this disease, basing their contentions on the finding of a high death rate in those referred for surgery late in the disease. The general consensus of opinion among the surgical authors, however, seems to be that the

high mortality following surgical intervention has occurred in patients who have reached a terminal status before reference by the internist.<sup>7,16,18</sup> Certain surgeons have suggested the performance of ileostomy in the first few weeks of the disease, for a fair portion of these recover and can successfully have the ileostomy closed.<sup>8,17,18,29</sup>

A fair comparison of figures has been presented by Elsom and Ferguson, internist and surgeon, respectively, of the Hospital of the University of Pennsylvania. They selected two groups of patients with disease of comparable severity and treated approximately half by surgical procedures, and the remainder by the more conventional medical management. The findings indicated that in all respects, survival, weight gain, ability to return to work, and present health, those treated surgically did better than did those in the other group.

#### Surgical Therapy

*Ileostomy—Indications.*—The indications for surgical intervention are as diverse as the opinions of the value of surgery. Those listed recently in the surgical literature are fairly uniform, and include the following indications:

1. Emergency indications:
  - (a) Uncontrollable hemorrhage
  - (b) Acute ulcerative colitis with profound toxemia (fulminating cases)
  - (c) Impending perforation
  - (d) Obstruction
2. Elective indications:
  - (a) Chronic ulcerative colitis resisting all forms of medical treatment.
  - (b) Segmental ulcerative colitis.
  - (c) Very early ulcerative colitis.
  - (d) Polyposis including those cases with possible malignancy.

An impression of the variation in indications is gathered from the fact that at the Mayo Clinic the proportion of cases treated surgically has progressively declined from 20 per cent in the period from 1919 to 1923 to 1.4 per cent in the period from 1932 to 1936<sup>5</sup>, while in the same period at the Massachusetts General Hospital 65 per cent of cases were treated surgically.<sup>21</sup> In a discussion published with McKittrick's report of these figures, Dr. Daniel Jones of Boston questioned whether the classification of cases as ulcerative colitis was uniform in all clinics, also the criteria of cure.

Prior to about 1930, surgical treatment consisted of appendicostomy, cecostomy, and occasionally colostomy. Garlock states, "The purpose of these procedures was to permit irrigation of the diseased bowel with medicated solutions in the hope of restoring the mucosa to normal. Experience in recent years has shown that this therapy was based upon fallacious reasoning. It is important to emphasize that the first requisite of successful surgical treatment is complete diversion of the fecal stream from the diseased bowel segment." This can be accomplished only by terminal ileostomy.

The general indications for major surgical interven-

tion, aside from drainage of abscesses, have been discussed. The procedure to be done in any of these circumstances is ileostomy. Attempts to close perforations have all been reported unsuccessful. Attempts to do primary large or small resections with primary anastomosis have all proved too risky save in a few cases of segmental disease in which the process was too quiescent to reveal the true nature of the ailment until examination of the specimen by the pathologist. In short, any patient with severe enough ulcerative colitis to require surgery needs an ileostomy first, and a period of months or even years should pass before further procedures are undertaken.

*Technique of Ileostomy.*—The manner of performance of ileostomy has received too little attention. It is probably true that most patients with ileostomy will heal the operative wound satisfactorily without special precaution, but it is virtually impossible to tell which of the patients seen will have more than usually irritating ileac drainage and will therefore develop breakdown of the wound. The procedures recommended in the literature uniformly involve bringing a single-barrel or a double-barrel ileostomy out through the wound, and closure of the wound about the bowel. This type of procedure has been abandoned at this clinic.

These patients are regularly in extremely poor condition, and shock is easily induced. McKittrick's conclusions are in agreement with our own, that spinal anesthesia certainly should not be used for ileostomy, and general anesthesia also is better avoided. He favors the use of local anesthesia insofar as possible, a choice we also have adopted.

*Response to Ileostomy.*—Following performance of ileostomy, all are agreed that the majority of patients improve rapidly. The temperature frequently returns to normal in one or two days, the appetite returns, the rectal discharges diminish quickly, and thereafter the weight gain is marked and fast. One of our patients gained 56 pounds in two months after ileostomy. Those for whom the ileostomy is done as an emergency for bleeding have generally been observed to cease to suffer hemorrhage within a few days.

*Other Factors in the Performance of Ileostomy.*—The most trying complication of ileostomy is digestion of the wound by the unspent ferments of the ileac secretions. If the wound is not carefully protected early, the line of closure in the wound adjacent to the ileostomy is likely to break down and suppurate. Healing of such defects is slow and painful, for the wound is constantly soaked with intestinal discharge, and the ultimate results are not satisfactory. A wound so healed is ever subject to fresh digestion and can make the patient miserable indefinitely. Most satisfactory elimination of this problem has been accomplished by bringing the proximal end of the ileum out through a stab wound apart from the main incision. The distal end is closed and returned to the abdomen. The bowel

heals to the skin readily, and this process seems seldom to be delayed by secretions.†

Digestion of the skin about the ileostomy is equally trying. Apparently somewhat more than half of these patients have little difficulty regardless of the care given, but the others suffer from obstinate erosion of the skin. There are repeated references in the literature to the belief that this erosion subsides as soon as the diseased colon has been removed. This has not been our experience here.

Various methods have been proposed to treat this skin erosion, but all are agreed that prevention of it in the first place is far simpler than management after it has developed. Most authors say little of this trouble, but careful reading of their reports indicates that the patients must have been made miserable by this complication. Numerous pastes and ointments have had their day, but in the experience of the Clinic here, that of Ladd and Gross is the only satisfactory one. They recommend a combination of zinc oxide ointment, castor oil, and aristol, made up into a thick paste. Others have favored yeast paste or aluminum paste. Pressman suggested use of a vinylite resin preparation which can be coated onto the skin, but this layer is quickly freed from the skin by the ileac secretions, and therefore gives little protection.

John R. Paine called our attention here to the use of the Koenig ileostomy bag, a description of which was published by Baker.\* This bag has a rubber facing which is fixed with rubber cement to the skin about the ileostomy stoma. The bag facing has an opening made to order to fit about 2 mm. around the slightly projecting bowel. In my experience, the use of rubber cement and rubber dam to protect the skin in the first few postoperative days, until a bag can be fitted, offers an excellent means of prevention of ulcerations and erosions. This may also be accomplished with Ladd and Gross' paste. The bag in my opinion offers the only satisfactory way to care for the ileostomies in these patients after they have become ambulatory.

*Further Surgical Management.*—In general, the opinion of those dealing with this disease is that colectomy should be done if two bouts of acute colitis occur after ileostomy. It should also be done if pronounced drainage continues for more than a few months after ileostomy. Pseudopolyposis is precancerous and should dictate both ileostomy and colectomy, but the last 12 cm. of rectum, which can be watched with the proctoscope, may be saved in the hope that later healing will permit ileoproctostomy.

In performing colectomies, McKittrick, Lahay, and Cave have recommended staged operations, utilizing as many as four procedures to complete removal of colon and rectum, and they all suggest the upper end of the segment left after each operation be brought through the abdominal wall as a mucous fistula, for secure closure cannot be assured in the involved colon.

†The details of the technique employed at the present time are published elsewhere. (*Surgery*—In press).

\*This is now obtained from H. W. Rutzen, 1819 Irving Park Road, Chicago.

In the experience here this procedure has proved nearly disastrous, and we feel that if the entire colon is to come out, it should be removed with the rectum, if the rectum is to be removed, in one stage, for this has given excellent results. The leaving of a mucous fistula has led in at least one instance to marked persistent pyoderma and deterioration of the patient, compromising subsequent management.

Rankin recommends removal of the colon to a point below the peritoneal reflection with inversion of the end and closure of the peritoneum above the closure. The rectum can then be observed at intervals, and, if sufficient healing occurs, ileoproctostomy may subsequently be done. Adequate inversion has been difficult to obtain, for the walls are thickened and infected, and the lumen is small; pelvic abscess was a frequent complication until methods of secure closure were developed. These are to be reported elsewhere.‡ This is nevertheless the procedure of choice, particularly in males, in whom impotence is the usual sequel of proctectomy.

A final type of procedure should be mentioned, namely, reconstitution of the normal fecal pathway, either by simple closure of the ileostomy or by anastomosis, at some time after ileostomy, of the end of the ileum to the lower sigmoid or upper rectum with removal of the intervening bowel. Either of these procedures is predicated on prior complete healing of the bowel from the proposed anastomosis to the anus.

Stone, Ladd and Gross, and Cattell have all reported series of cases of successfully closed ileostomies. They all stress that ileostomy must be done very early in the disease if subsequent closure is to be tolerated without recurrence of symptoms of colitis.

#### Experience with Chronic Ulcerative Colitis at University of Minnesota Hospitals

1934 to 1944

In the ten years from January 1, 1934, to January 1, 1944, eighty-two patients with chronic or acute non-specific ulcerative colitis have been seen at the University of Minnesota Hospitals. Fifty-seven of these have been treated solely by nonoperative means as far as the ulcerative colitis is concerned, although some of them had drainage of perineal abscesses or other incidental surgery performed. Three patients are included in this group who were treated by conservative means until death was inevitable, and then were subjected to operation. (Two of these came to operation with perforation, massive pneumoperitoneum, peritonitis, and marked inanition; the third after having been septic and comatose for several days.) It should be emphasized that comparison of results achieved by conservative as opposed to operative management is not to be construed as a comparison of the relative merits of one Department in the hospital as against another, but rather as a comparison of methods of therapy. Many of those managed conservatively early in the period of this study were treated on the Surgical Service. We are fortunate here in that the co-operation between the Medical Service and the Surgical

‡*Surgery* (In press).

## MINNEAPOLIS SURGICAL SOCIETY

**TABLE II. GROSS MORTALITY FIGURES OF CONSERVATIVE VERSUS SURGICAL MANAGEMENT**  
ULCERATIVE COLITIS

|              | No. of Cases | Died under therapy |           | Died later | Total mortality |             |
|--------------|--------------|--------------------|-----------|------------|-----------------|-------------|
|              |              | No.                | %         |            | No.             | %           |
| Conservative | 57           | 16                 | 28        | 0          | 16              | 28          |
| Surgical     | 25           | 2                  | 8         | 1          | 3               | 12          |
| <b>Total</b> | <b>82</b>    | <b>18</b>          | <b>22</b> | <b>1</b>   | <b>19</b>       | <b>23.2</b> |

**TABLE III. CAUSES OF DEATH IN CASES OF ULCERATIVE COLITIS TREATED CONSERVATIVELY**

1934 to 1944, University of Minnesota Hospitals

|   |                 |
|---|-----------------|
| Died solely of disease proper.....                        | 10 <sup>1</sup> |
| Died of complications of chronic ulcerative colitis....   | 4 <sup>2</sup>  |
| Died of other disease plus chronic ulcerative colitis.... | 2 <sup>3</sup>  |
| <b>Total .....</b>  | <b>16 (28%)</b> |

1. One was admitted terminally and died in three hours. Three went through surgery on the way to the morgue; one had spesis and coma for days, two had perforations.
2. One of sepsis, one of thrombophlebitis, two bronchopneumonia.
3. One obstructive jaundice and cerebral hemorrhage, one myxedema.

**TABLE IV. STATUS OF PATIENTS WITH ULCERATIVE COLITIS TREATED CONSERVATIVELY WHEN LAST SEEN**

1934 to 1944 University of Minnesota Hospitals

|                  |                |
|------------------|----------------|
| Improved .....   | 19             |
| Unimproved ..... | 18             |
| Worse .....      | 4 <sup>1</sup> |

1. Two of these refused ileostomy and left.
- Complications: Large psychiatric component..... 12  
 Polyposis ..... 4  
 Others ..... 3

Service has been excellent, at least throughout the period when I have observed it.

Twenty-five individuals were treated surgically for ulcerative colitis.\* These cases have excited the interest of various members of the surgical staff and have therefore been carefully followed, while there has been no one particularly interested in those treated conservatively, and the follow-up in a large proportion of those cases is nonexistent or only of a few weeks.

A comparison of the overall mortality figures of conservative as against surgical management is offered in Table II.

The medical therapy is not the subject of this review. An analysis of the causes of death in the conservative group is given in Table III. It should be borne in mind that the follow-up was poor and that many of those listed as surviving have probably since died.

The status of those surviving on conservative management is given in Table IV.

The indications under which surgery was undertaken and the results thereof are indicated in Table V.

As has already been stated, a great deal of trouble was encountered in the healing of ileostomy wounds until the adoption of the method of ileostomy indicated

\*The author wishes to stress that the care of these patients was a joint effort. First Dr. O. H. Waugensteen, and later Drs. W. T. Peyton, W. H. Manson, and John R. Palme have been active in the care of these patients, and many of the conclusions presented in this paper, and certainly many of the successful cases, come from the efforts of this group as a whole rather than from the writer alone.

**TABLE V. INDICATIONS FOR SURGERY IN ULCERATIVE COLITIS**  
1934 to 1944 University of Minnesota Hospitals

|  | Fulminating disease | Hemorrhage | Progressive disease | Sealed Perforation | Polyps   | Total     |
|--|---------------------|------------|---------------------|--------------------|----------|-----------|
| Ileostomy                                  | 7 <sup>1</sup>      | 1          | 10 <sup>1</sup>     | 1                  | 1        | 20        |
| Colostomy                                  | 1 <sup>2</sup>      |            |                     |                    |          | 1         |
| Segmental Resection                        |                     |            | 1                   |                    |          | 1         |
| Primary Colectomy and Ileoproctostomy      |                     |            | 2                   |                    |          | 2         |
| Primary Total Colectomy and "Pull-through" |                     |            | 1                   |                    |          | 1         |
| <b>Total</b>                               | <b>8</b>            | <b>1</b>   | <b>14</b>           | <b>1</b>           | <b>1</b> | <b>25</b> |

1. One death due to improper surgery.
2. Patient died.

**TABLE VI. INCIDENCE OF WOUND BREAKDOWN IN ILEOSTOMIES**

1934 to 1944 University of Minnesota Hospitals

|                             | Primary Healing | Disruption of Wound | Late Hernia or Prolapse | Late Stenosis |
|-----------------------------|-----------------|---------------------|-------------------------|---------------|
| Ileostomy made in incision  | 14              | 7 <sup>1</sup>      | 3                       | 1             |
| Ileostomy made as described | 6               | 0                   | 1                       | 0             |

1. Three healed after 1 to 12 months. Three were redone after 6 months to 3 years. One died from massive wound breakdown and skin excoriation.
- Total ileostomies ..... 27  
 Total ileostomy patients..... 22

above. The results with ileostomy are indicated in Table VI.

Evaluation of the factors contributing to erosion of the skin is impossible because there are inadequate notes in the charts concerning care of the skin, but in several of the earlier cases in which the measures outlined were not used, extreme erosion occurred. One case required transplantation of the ileostomy because of erosion alone, and another died of erosion and wound breakdown. In the cases in the past one and a half years, which is the time in which the ileostomy has been made as described and in addition carefully protected by rubber dam and cement, there has been none but the most insignificant erosion.

Fourteen patients have been subjected to colectomy of one type or another, and there have been no deaths in association with these operations, all patients being alive at the end of the study period. The present status of these patients as well as that of those not yet having undergone colectomy is indicated in Table VII.

*Comment.*—One rightly concludes from Tables V and VII that we have ample evidence in our own series of cases that when operation is necessary in the management of ulcerative colitis, the procedure should be ileostomy and nothing else, for no other procedure has left us with a good result without subsequent operation. In other words, "shortcut" operations made in an effort to spare the patient one operation and the inconvenience, even if temporary, of an ileostomy have not been successful.

It is my impression, therefore, that the colon should be put at rest for a period of months or years and until complete subsidence of the inflammatory process in the

TABLE VII. PRESENT STATUS (JAN. 1, 1944) OF PATIENTS SUBMITTING TO OPERATION FOR CHRONIC ULCERATIVE COLITIS

| 1934 to 1944  | University of Minnesota | Hospitals      | Good           | Fair           | Poor           | Dead           |
|---|-------------------------|----------------|----------------|----------------|----------------|----------------|
|   | 3 <sup>a</sup>          | 3 <sup>b</sup> | 2 <sup>c</sup> | 2 <sup>d</sup> | 2 <sup>e</sup> | 2 <sup>f</sup> |
| Ileostomy only  |                         |                |                |                |                |                |
| Ileostomy, later colectomy including rectum                     | 4                       | 1 <sup>a</sup> | 1 <sup>b</sup> | 0              | 0              | 0              |
| Ileostomy, later colectomy leaving rectum                       | 2                       | 0              | 0              | 0              | 0              | 0              |
| Ileostomy, later colectomy and anastomosis to sigmoid or rectum | 1                       | 1 <sup>a</sup> | 0              | 0              | 0              | 0              |
| Primary colectomy and "pull-through"—subsequent ileostomy       | 1 <sup>a</sup>          | 0              | 0              | 0              | 0              | 0              |
| Primary colectomy and ileoproctostomy                           | 0                       | 1              | 1              | 0              | 0              | 0              |
| Segmental colectomy   | 0                       | 1              | 0              | 0              | 0              | 0              |
| Colostomy   | 0                       | 0              | 0              | 0              | 0              | 1              |
| <b>Total</b>  | <b>11</b>               | <b>7</b>       | <b>4</b>       | <b>0</b>       | <b>0</b>       | <b>3</b>       |
|   | (45.8%)                 | (29.2%)        | (16.7%)        | (8.3%)         |                |                |

- One of these is now seriously ill (May 1944) after effort at resection and anastomosis to involved rectum. Recovered.
- One still has some rectal discharge, one has Simmond's Disease and one had skin erosion when last seen, 1941.
- One refused colectomy for polyps and has carcinomatosis now. One has cancer, presumably.
- One died of cancer of rectum; one of improperly done ileostomy.
- Had only mucosa of rectum removed—still drains.
- Has ventral hernia and poor healing of perineal wound.
- Has small (3 cm.) ventral hernia. Later repaired.
- Very poor control after first operation; erosion of skin of perineum and buttocks, weight loss, pain. Later had ileostomy improperly done, later properly revised, now well.
- N.B. 4 cases of polyposis—2 of these developed cancer, possibly a third.

rectum or lower sigmoid before attempts are made to remove the colon in these patients and anastomose the ileum to the pelvic colon.

In the majority of patients with advanced disease, this reanastomosis will never become feasible. In those given ileostomy very early it may become the rule.

**Conclusions**

- Careful surgical management seems to offer patients with nonspecific ulcerative colitis better hope of survival and good health than the medical therapy employed today.
- Heavier emphasis should probably be placed on the psychiatric aspects early in the disease. It is possible that combination of this and early ileostomy will offer more effective therapy than we have had in the past.
- When surgery is necessary, ileostomy is the procedure of choice. If it is done properly, the artificial anus causes most patients little difficulty.
- Colectomy is indicated for polyposis, recurrent bouts after ileostomy, or hopelessly damaged colons. It should be done in one stage.
- Very early ileostomy should be contemplated in a series of cases to test the promising suggestion that closure with good results will later be possible.

**References**

- Andresen, A. F. R.: Gastro-intestinal allergy; its present status. *South. M. J.*, 34:418, 1941.
- Baker, Joel W.: Ileostomy preliminary to resection of gastro-jejuno-colic fistula. *Northwest Med.*, 39:398, 1940.
- Bargen, J. Arnold: The management of ulcerative colitis. *Gastroenterol.*, 1:449, 1943.
- Bargen, J. Arnold: *The Modern Management of Colitis*. Springfield, Illinois: Charles C. Thomas, 1944.
- Buie, L. A.: *Practical Proctology*. Philadelphia: W. B. Saunders Co., 1937.
- Cave, H. W.: The surgical treatment of intractable, chronic ulcerative colitis. *Ann. Surg.*, 107:396, 1938.

- Cave, H. W., and Thompson, James E.: Mortality factors in the surgical treatment of ulcerative colitis. *Ann. Surg.*, 114:46, 1941.
- Cattell, Richard B.: Closure of ileostomy in ulcerative colitis. *Ann. Surg.*, 115:956, 1942.
- Cheney, G.: Vitamin B<sub>12</sub> and liver extract in the treatment of nonspecific diarrhea and colitis. *Am. J. Digest. Dis.*, 6:161, 1939.
- Crohn, B. B.: The clinical use of succinyl sulfathiazole. *Gastroenterol.*, 1:140, 1943.
- Daniels, Geo. E.: Psychiatric aspects of ulcerative colitis. *New England J. Med.*, 226:178, 1942.
- Dragstedt, Leste. R., Duck, G. M., and Kirsner, J. B.: Chronic ulcerative colitis. A summary of evidence implicating *Bacterium necrophorum* as an etiologic agent. *Ann. Surg.*, 114:653, 1941.
- Elson, Kendall A., and Ferguson, L. Kracer: An appraisal of the medical versus the surgical treatment of idiopathic ulcerative colitis. Follow-up data on fifty cases. *Am. J. M. Sc.*, 262:59, 1941.
- Garlock, John H.: The surgical treatment of intractable ulcerative colitis. *Ann. Surg.*, 113:2, 1941.
- Jensen, R. A.: Personal communication.
- Jones, Thomas E.: The surgical treatment of ulcerative colitis. *J.A.M.A.*, 111:2076, 1938.
- Ladd, William E., and Gross, Robert E.: *Abdominal Surgery of Infancy and Childhood*. Philadelphia: W. B. Saunders Co., 1941.
- Lahay, Frank H.: Ulcerative colitis. *New York State J. M.*, 41:475, 1941.
- Linn, R.: Observations on etiology of ulcerative colitis. *Am. J. M. Sc.*, 197:841, 1939.
- Mackie, Thomas T.: The medical management of chronic ulcerative colitis. *J.A.M.A.*, 111:2071, 1938.
- McKittick, Leland S., and Miller, Richard H.: Idiopathic ulcerative colitis: A review of 149 cases with particular reference to the value of, and indications for, surgical treatment. *Ann. Surg.*, 102:636, 1935.
- Mills, M. A., and Mackie, T. T.: The chemotherapy of chronic ulcerative colitis. *Am. J. Digest. Dis.*, 10:55, 1943.
- Presman, David: A new method of skin protection for ileostomies and colostomies. *Surgery*, 13:322, 1943.
- Raukin, Fred W., Bergen, J. Arnold, and Buie, Louis A.: *The Colon, Rectum, and Anus*. Philadelphia: W. B. Saunders Co., 1932.
- Raukin, Fred W., and Johnston, Coleman C.: Chronic ulcerative colitis: special considerations of its treatment. *South. M. J.*, 34:466, 1941.
- Rodaniche, E. C., Kirsner, J. B., and Palmer, W. L.: Effect of the oral administration of sulfonamide compounds on the fecal flora of patients with nonspecific ulcerative colitis. *Gastroenterol.*, 1:132, 1943.
- Rowe, Albert H.: Chronic ulcerative colitis—allergy in its etiology. *Ann. Int. Med.*, 17:83, 1942.
- Spink, W. W.: *Sulfanilamide and Related Compounds in General Practice*. 2nd ed., Chicago: Year Book Publishers, 1942.
- Stone, H. B.: Chronic ulcerative colitis. *Pennsylvania M. J.*, 32:211, (Jan.) 1929.
- Streicher, M. H.: Sulfonamides: clinical evaluation in infectious diseases of the colon. *M. Clin. North America*, 27:189, 1943.
- Welch, C. S., Adams, M., and Wakefield, E. G.: Metabolic studies in chronic ulcerative colitis. *J. Clin. Invest.*, 16: 161, 1937.
- Willard, J. H., Pessel, J. F., Hundley, J. W., and Bockus, H. J.: Prognosis of ulcerative colitis. *J.A.M.A.*, 111: 2078, 1938.

**Discussion**

DR. HARRY W. CHRISTIANSON: Thrombocytic colitis-idiopathic ulcerative colitis is a disease of manifest fascination and intrigue, which, during twenty-five years past, has occupied a prominent position in medical literature. Primarily, I feel, it is a systemic disease, the cardinal lesions of which are localized in the colon. It might be said, that in resorting to surgery in its management we accept an attitude of defeatism. A few years ago I firmly believed that surgery was to be resorted to in but a limited number of cases, namely, those with serious complications. Further, it seemed that the disease was firmly entrenched in the wall of the colon and, hence, the performance of an ileostomy allowed the diseased bowel to remain behind, to be dealt with at a later date. One assumed that ileostomy, therefore, merely complicated the situation by adding a "second rectum."

It is apparent that surgery has a greater role in the management of ulcerative colitis. Dr. Dennis advocates ileostomy early in the course of the disease, earlier than has heretofore been generally suggested. In retrospect, and in reviewing the presented data, it seems that we

have been tardy, if not reticent, in suggesting ileostomy in the management of this disease.

At the outset it is to be understood that we are considering thrombolytic colitis and excluding any of the other types of ulcerative colitis, such as tuberculosis, amebiasis, allergic colitis, colitis with avitaminosis, bacillary colitis, lymphogranuloma venereum or the unknown types 2 and 3 of Barger.\* These are separate and distinct entities which must be painstakingly excluded by exhaustive clinical study and laboratory procedure, in order to establish the differential diagnosis. Each requires separate and distinct therapy.

Although ileostomy seems, at this time, to be of considerably more value in the management of ulcerative colitis than was formerly believed, I cannot as yet concur with the present suggestion as to the exact time of its performance. To do an ileostomy in every early case which exhibits an insufficient or delayed initial response to medical or conservative management seems too radical an approach. I have had the opportunity to observe a large number of patients with this disease who responded well to conservative therapy. As I see them today, fully recovered, I would have felt guilty, in the least, had I subjected them to the hazard and discomfort of an ileostomy; for, in the majority of hands this procedure is fraught with difficulty and danger. The surgical skill and ingenuity manifested by the excellent results Dr. Dennis has presented, might distract us from the real dangers attendant to this procedure. He has developed a meticulous technique together with a painstaking and exhaustive pre-operative and postoperative regime of care in the management of these patients. Further, in this connection, it is interesting to note that this procedure is only effected, in his hands, under local anesthesia.

Certain fairly definite indications for ileostomy and probably for subsequent partial or total colectomy, seem apparent at this stage in development of our knowledge of the management of thrombolytic colitis. On the other hand, certain other situations encountered in this disease seem to contraindicate these surgical procedures. Ileostomy does not seem advisable as an emergency measure; nor does it seem advisable in instances of perforation of the bowel, or of acute fulminating thrombolytic colitis. Stricture formation, pseudo-polyposis or dual abscesses and fistulae, regardless of the time element, constitute indications for ileostomy. Early thickening of the bowel wall, because of its potentiality for forming intramural abscesses, constitute an absolute indication for ileostomy. The development of polyposis or pseudo-polyposis in the colon of ulcerative colitis renders ileostomy mandatory, coupled with a subsequent colon resection. The occurrence of multiple anal abscesses or fistulae dictates the almost immediate performance of an ileostomy.

To withstand surgical procedure the patient with ulcerative colitis must be in comparatively satisfactory condition. Manifest starvation and exhaustion, so often noted in patients with this disease, when it has been allowed to progress, constitutes a situation most difficult to adjudicate. Further unimpeded progression of the disease leads unequivocally to rapid exodus, while on the other hand, the addition of the surgical trauma of an ileostomy most frequently eventuates in the same conclusion. The status of this patient is already so far gone that recovery cannot be effected. The physiological pre-operative preparation of these patients, as employed by Dr. Dennis, considerably reduces this hazard. However, we are in agreement on the point that the patient should not be allowed to progress to this extreme status of affairs, but rather, that an ileostomy should be performed sufficiently early to obviate this possibility.

The time for the performance of a colectomy, after preliminary ileostomy, must be ascertained in each indi-

vidual case. I agree that one should not be in haste, but, rather, that one should allow sufficient time to elapse in order to ensure complete subsidence of inflammation of the affected bowel. In some cases the rectum can be preserved and an ileoproctostomy effected. This procedure should be reserved for those ileostomy patients in whom the stools have become solid (all suggestion of watery or liquid stools or diarrhea has subsided). Further, before this procedure can be contemplated all inflammation and ulceration in the rectum must have abated.

In conclusion, I wish to state that Dr. Dennis should be commended for his painstaking labors in obtaining his remarkable results. Thrombolytic colitis constitutes a severe and mysterious malady with which in many respects we are still unfamiliar, and, it is only with work such as that which has just been presented that progress is made.

Dr. DENNIS (closing): I would like to add a few words. In the first place, I am very flattered to have been asked to talk tonight. It has been a much appreciated privilege.

I want to say a word about Doctor Christianson's remarks. I am impressed with his bringing out one indication for ileostomy which I had overlooked, and that was the matter of abscess and fistula formation in the rectum. I happen to know of one case in which this was the indication for which ileostomy was performed. Doctor Paine did the procedure, as that was before my interest in the disease.

In this matter of hemorrhage, my series has been limited to but one case, so what I say about hemorrhage should be taken with many grains of salt. In this case bleeding was profuse, over a liter of blood every day before ileostomy.

The conclusions in the patients we have been able to follow are that the patients who develop ulcerative colitis are never entirely free of trouble and are always subject to exacerbations of the disease.

I am glad Dr. Christianson brought out the matter of the type of colitis under question. My comments have been intended to apply to nonspecific ulcerative colitis, and not to the other types.

ERNEST R. ANDERSON, M.D.

Recorder

\*Type 3 of Barger represents the form involving the rectum and rectosigmoid. Type 2 involves the remainder of the colon, not the rectum and rectosigmoid.