

## Emergency Resection in Treatment of Diverticular Disease of Colon Complicated by Peritonitis

R. A. ROXBURGH,\* M.S., M.CHIR., F.R.C.S., F.R.C.S.ED.; J. L. DAWSON,† M.S., F.R.C.S.  
R. YEO,‡ M.A., M.CHIR., F.R.C.S.

*Brit. med. J.*, 1968, 3, 465-466

**Summary:** Of a consecutive series of 25 patients with peritonitis secondary to colonic diverticular disease all, except one with faecal peritonitis, underwent some form of emergency resection.

All the three patients with faecal peritonitis died, but the 22 with purulent peritonitis survived. The average duration of the emergency admission of the 22 survivors was 25.4 days, and in nine (41%) of them intestinal continuity had been restored by the end of that admission.

Thus some form of emergency resection is the operation of choice in patients with spreading peritonitis due to diverticular disease of the sigmoid colon.

### Introduction

Although there is no unanimity of opinion about the best form of treatment for "perforated diverticulitis" there was no doubt about the dangerous nature of the condition in the two largest reported series. MacLaren (1957) and Dawson, Hanon, and Roxburgh (1965) reported mortality rates of approximately 25% for patients under 60 years of age and approximately 50% for those over 60.

For patients who reach operation transverse colostomy and drainage is a commonly employed method of treatment; 42% of MacLaren's patients and 77% of those of Dawson *et al.* were so treated. In recent years various authors have suggested that emergency resection of the affected colon might yield better results, perhaps because the cause of the peritonitis and the source of the persistent sepsis would then be removed from the body (Ryan, 1958; Large, 1964; Madden, 1966).

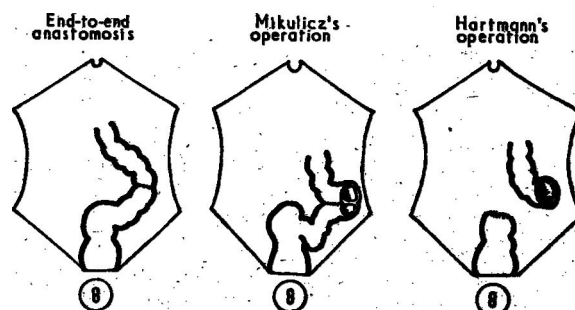
In this paper we report our experience of emergency resection over the past four years.

### Material

During 1964-7 25 consecutive patients (11 men and 14 women) with spreading peritonitis due to diverticular disease of the colon were treated by one or other of us. Their ages ranged from 48 to 86, the average age for each sex being 61 years. Twenty-two patients had purulent peritonitis and the remaining three had gross faecal peritonitis. A perforation was readily evident in 12 of the patients with purulent peritonitis. No patient was rejected as being unfit for surgery, though several were still desperately ill at the time of operation despite attempts at resuscitation.

**Indications for Operation.**—There was only one indication for operation, and that was clinical evidence of generalized or spreading peritonitis, and all patients in this series had free purulent or faeculent peritoneal fluid at operation. Often the exact cause of the peritonitis was not established until laparotomy in some patients.

**Operative Procedures.**—Some form of emergency resection was employed on all the patients, except one with faecal peritonitis in whom a simple exteriorization was done as her condition precluded any form of resection. Primary end-to-end anastomosis was carried out in eight patients (with the addition of a transverse colostomy in one and a caecostomy in another), a Paul-Mikulicz excision in eight, and a Hartmann's operation in the remaining eight (see Fig.). Intestinal continuity has now been restored, without further mortality, in six of the patients who underwent a Hartmann operation.



Type and number of emergency resections performed in 24 patients.

### Results

**Mortality.**—The 22 patients with purulent peritonitis survived, but the three with faecal peritonitis died. The operations performed on the three fatal cases were Hartmann's in one, exteriorization in one, and primary anastomosis in one.

**Progress and Complications.**—Progress in the main was remarkably smooth, and certainly no complications arose which led us to regret having performed an emergency resection. No anastomotic leaks developed. No complications arose as a consequence of the fairly extensive mobilization that is required to perform a Paul-Mikulicz operation, nor did any technical problems arise when restoring continuity after a Hartmann operation.

**Length of Stay in Hospital.**—The average duration of the emergency admission of the 22 survivors was 25.4 days. In nine (41%) of them intestinal continuity had been restored by the end of that admission. Continuity has now been restored, without further mortality, in 19 out of the 22 survivors. These 19 patients required on average a total of 43 days in hospital—that is, both the emergency and elective admissions.

**Incidence of Carcinoma.**—Four patients were encountered who had peritonitis secondary to what subsequently proved to be carcinoma of the colon; these patients have been excluded from the present series.

### Discussion

Transverse colostomy and drainage emerged badly as a treatment for "perforated diverticulitis" in the series of Dawson

\* Senior Surgical Registrar, the Middlesex Hospital, London W.1.

† Consultant Surgeon, King's College Hospital, London S.E.5, and Bromley Hospital.

‡ Consultant Surgeon, Hastings Group of Hospitals.

*et al.* (1965). While the provision of drainage is deservedly a time-honoured surgical practice, there are several conditions in which the best results are to be obtained by removing the source of persistent sepsis from the body—for example, appendicitis—and it seemed rational, therefore, to attempt to determine the results of extending this principle to the sigmoid colon in cases of peritonitis due to diverticular disease.

Critics of emergency resection have suggested that it is a difficult and dangerous operation and that if an unsuspected carcinoma is removed an inadequate cancer operation would have been done. It is clear from the present series that it is not a dangerous operation, for all the patients with purulent peritonitis survived, and this contrasts strongly with our earlier series (Dawson *et al.*, 1965), in which transverse colostomy and drainage carried a mortality of approximately 30%. In that series the mortality of purulent peritonitis for the series as a whole varied between 50% and 29%, depending on whether or not a perforation was readily evident. The higher figure probably reflects the more severe peritoneal contamination with a perforation. Moreover, in the previous series the average duration of the survivors' stay in hospital was 33 days, and in none of them had intestinal continuity been restored by the time of their discharge. The results of emergency resection show a considerable improvement in this respect too. We have also been impressed by the rapid early postoperative improvement in the general condition of these patients and attribute this to the fact that no further toxic absorption or peritoneal soiling is taking place.

Madden (1966) found a mortality of 9% when primary resection and anastomosis was practised on 110 patients with perforated lesions of the colon, and he strongly advocated this procedure, since he found that the mortality of preliminary "conservative" surgery was five times as great. It should be noted that his series consisted of patients with diverticulitis and of patients with carcinoma, so that, although an emergency resection may be an inadequate cancer operation, it may none the less be life-saving in terms of the peritonitis. Obviously the main concern under these circumstances must be to save life rather than to try to improve the results of radical cancer surgery, and if such a patient survives emergency resection then a good case could be made out for a "second-look" operation some months later.

As regards the criticism that these operations are difficult (and by implication also lengthy) we can only say that in general we have not found them to be so. Certainly they are nothing like as difficult as some elective resections for chronic diverticular disease. The most likely explanation of this is that only in a very small percentage of patients with "perforated diverticulitis" has the disease been sufficiently chronic to cause previous symptoms (Dawson *et al.*, 1965). This may account for the relative paucity of pericolic fibrosis in the very patients in whom we feel emergency resection is most required. Though

there may be a disconcerting amount of inflammatory reaction we have generally found that what appears at first to be an unpromising situation may often be transformed by a determined trial dissection which, as it proceeds, often becomes surprisingly easy.

### Choice of Operative Procedure

*Resection with Primary Anastomosis.*—This has the great advantage that if it is successful the patient does not require another operation, but there is obviously some risk of anastomotic leakage. Though Madden (1966) recommends the procedure, he advises the addition of a transverse colostomy if extensive mobilization of the rectum is required.

*Paul-Mikulicz Excision.*—Some mobilization of the rectum is usually necessary to allow exteriorization of the affected bowel, but we have been agreeably surprised how often this can be done. The enterotome is applied at the end of the operation, as this obviates the discomfort of its application later and the spur is crushed in time for the colostomy to be closed, if so desired, some time between the tenth and the fourteenth day.

*Hartmann's Operation.*—If the inflammatory process extends too far distally, or if the patient is very obese, to allow exteriorization and excision, then a safe and simple alternative is to excise the affected bowel, close the distal end, and bring out the proximal end as a terminal colostomy. The Hartmann operation is quicker to perform than either a Paul-Mikulicz or an end-to-end anastomosis and may therefore be considered the best form of resection in an especially poor-risk patient.

The decision regarding which, if any, of these procedures to adopt must depend on the surgeon's experience and on his judgement of the patient, but in the present series there was only one patient (with faecal peritonitis and a thrombosed common iliac artery) in whom any form of resection was thought inadvisable.

We wish to thank the surgeons of St. James's Hospital, Balham, the Central Middlesex Hospital, the Brighton Hospital Group, and King's College Hospital, under whose care the majority of the patients were admitted.

### REFERENCES

- Dawson, J. L., Hanon, I., and Roxburgh, R. A. (1965). *Brit. J. Surg.*, **52**, 354.  
 Large, J. M. (1964). *Lancet*, **1**, 413.  
 MacLaren, I. F. (1957). *J. roy. Coll. Surg. Edinb.*, **3**, 129.  
 Madden, J. L. (1966). *Dis. Colon Rect.*, **9**, 413.  
 Ryan, P. (1958). *Brit. J. Surg.*, **45**, 611.