Acute colonic diverticulitis in patients under 50 years of age

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Background: There is ongoing controversy concerning the virulence and management of diverticulitis in young patients. This study reports on the management of acute diverticulitis with reference to the virulence and outcome of the disease with respect to age.

Methods: Between January 1994 and June 1999, 327 patients were treated for acute left colonic diverticulitis. Patients were divided in two groups: those aged 50 years or less (group 1, 72 patients) and those older than 50 years (group 2, 255 patients). The diagnosis was confirmed histologically or radiologically in all patients.

Results: There were differences in gender distribution related to age ($P < 0.001$). During the first hospital stay, 226 patients (69.1 per cent) had successful conservative treatment, 78 (23.9 per cent) needed emergency surgery and 23 (7.0 per cent) had a semi-elective operation ($P = 0.47$). The recurrence rate was 25.5 per cent in group 1 and 22.3 per cent in group 2 ($P = 0.93$). The type of surgical procedure and grade of peritonitis in emergency patients were similar in the two groups. Overall the mortality rate in patients who underwent an operation was 16.3 per cent. The mortality rate was zero in group 1 and 2.2 per cent in group 2 after elective or semi-elective operation ($P = 1.0$), and zero in group 1 and 34.9 per cent in group 2 after emergency operation ($P < 0.001$).

Conclusion: Diverticulitis in young patients does not have a particularly aggressive course and the risk of recurrence is similar to that of older patients.

Introduction

Colonic diverticulosis is common in the elderly with an incidence reaching 50 per cent in the ninth decade. The majority of patients are asymptomatic and operation is rarely required. However, acute complications of diverticular disease are relatively common and diverticulitis is the most frequent reason for hospital admission. Although there is agreement about the surgical treatment of complications of diverticular disease, such as fistula, stenosis and massive haemorrhage, there remains controversy about the management of colonic diverticulitis in young patients. Some authors suggest that elective resection should be considered if an acute infective episode is successfully managed conservatively because of the recurrent nature of diverticulitis and the risk of subsequent serious complications. However, others report that diverticulitis in young patients does not have a particularly aggressive nature. This study reports on the management of patients admitted with acute diverticulitis and evaluates the virulence and outcome of the disease with respect to age.

Patients and methods

All patients admitted to hospital and treated for acute left colonic diverticulitis between January 1994 and June 1999 were included in the study. Patients were divided in two groups: those aged 50 years or less (group 1) and those older than 50 years (group 2).

The diagnosis was based on clinical examination, blood tests and radiological evaluation. If on admission patients had diffuse peritonitis or an acute abdomen of uncertain cause, abdominal ultrasonography and/or abdominal computed tomography were performed. If diffuse intra-abdominal fluid was observed, emergency operation was indicated. Since January 1998, abdominal computed tomography has been performed in all patients with clinical signs of diverticulitis. Radiological findings that confirmed the diagnosis at computed tomography were thickening of pericolic fat in mild diverticulitis, and the presence of an abscess, extraluminal air or diffuse intra-abdominal fluid in severe diverticulitis.
Conservative treatment consisted of bowel rest and at least 7 days of intravenous antibiotics. In all patients treated conservatively, barium enema, colonoscopy or both were subsequently used to corroborate the clinical diagnosis of diverticulosis after the acute episode had resolved.

Emergency operative treatment was undertaken if patients had diffuse peritonitis, septic shock, pneumoperitoneum, or if the clinical course did not improve after 48–72 h of conservative management. In surgical patients the diagnosis was confirmed at operation or by histological examination.

Following the authors’ strategy for the management of left colonic emergencies, four types of surgical procedure were used. The first-choice operation was colonic resection and primary anastomosis with intraoperative colonic lavage (RPA). As previously noted, RPA was not performed in patients with faecal peritonitis, preoperative organ failure, immunocompromised status, those classified as American Society of Anesthesiologists (ASA) grade IV and patients with proximal colonic disease. Alternative interventions were Hartmann’s procedure in high-risk patients, subtotal colectomy if there was associated involvement of the proximal colon and colostomy when the patient’s general condition or local disease precluded resection.

Patients were operated on semielectively during the first admission because of failure to improve. Open or laparoscopic left colectomy with primary anastomosis was used in both semielective and elective operations. Elective operation was performed according to the guidelines of the American Society of Colon and Rectal Surgeons, which propose that all patients should be operated on after a second attack of uncomplicated diverticulitis to reduce the risk of subsequent recurrence and complications.

Patients were followed up until June 2001 (minimum 24 months, maximum 90 months). Recurrence of diverticulitis was diagnosed when the patient presented with similar symptoms and clinical findings, confirmed by radiological investigations. If an emergency operation was not required, treatment was again conservative and interval colectomy was planned.

Qualitative data were compared using the χ² test and two-tailed Fisher’s exact test. Student’s t test or Mann–Whitney U test was used to compare quantitative data. P < 0.05 was considered significant.

### Results

Some 327 patients, 156 men (47.7 per cent) and 171 women (52.3 per cent) were admitted during the study period. None had been admitted previously for diverticulitis. Although 62 (19.0 per cent) had suffered previous abdominal symptoms, 265 (81.0 per cent) had symptoms of diverticular disease for the first time during the first admission.

Group 1 included 72 patients (22.0 per cent), 51 men (70.8 per cent) and 21 women (29.2 per cent). Group 2 comprised 255 patients (78.0 per cent), 105 men (41.2 per cent) and 150 women (58.8 per cent). The differences in gender distribution with respect to age were significant (P < 0.001).

Types of treatment (medical or surgical) during the first hospital stay are reported in Table 1. There were no significant differences between the two groups (P = 0.47).

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Group 1 (≤ 50 years)</th>
<th>Group 2 (&gt; 50 years)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative treatment</td>
<td>47 (65.3)</td>
<td>179 (70.2)</td>
<td>226 (69.1)</td>
</tr>
<tr>
<td>Emergency operation</td>
<td>19 (26.4)</td>
<td>59 (23.1)</td>
<td>78 (23.9)</td>
</tr>
<tr>
<td>Semielective operation</td>
<td>6 (8.3)</td>
<td>17 (6.7)</td>
<td>23 (7.0)</td>
</tr>
<tr>
<td>Total</td>
<td>72 (22.0)</td>
<td>256 (78.0)</td>
<td>327</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages. There were no significant differences in type of treatment between the two groups (P = 0.47, χ² and two-tailed Fisher’s exact tests).

Fifty-two of the 327 patients (15.9 per cent) developed recurrent diverticular disease. None of those who were operated on as an emergency during first admission had a recurrence during the follow-up period. The median interval between the primary episode and the recurrent disease was 7.4 months in group 1 and 8.4 months in group 2 (P = 0.93). If patients who underwent primary operative treatment are excluded, the overall recurrence rate was 23.0 per cent, 23.5 per cent (12 of 47) in group 1 and 22.3 per cent (40 of 179) in group 2 (P = 0.93).

Of patients admitted because of acute recurrent diverticulitis, one of 12 in group 1 and three of 40 in group 2 were operated on as an emergency, while seven in group 1 and 26 in group 2 had an elective operation (P = 0.88). Four patients in group 1 and seven in group 2 refused surgery. Three of these seven patients were operated on after a third attack (one as an emergency and two electively). Operation was discouraged after the second episode of diverticulitis in four patients in group 2, because of advanced age and high risk.

Number and types of surgical procedures related to age are reported in Table 2. There were no significant differences between the two groups with respect to emergency, elective or semielective surgery.

According to the Hinchey classification, the grade of peritonitis of patients operated on as an emergency was: stage 1, no patients in group 1 and four (6.3 per cent) in...
Table 2 Surgical procedures for first and recurrent episodes related to age

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Group 1 (≤ 50 years)</th>
<th>Group 2 (&gt; 50 years)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elective and semi-elective left colectomy and primary anastomosis</td>
<td>13</td>
<td>45</td>
<td>58</td>
</tr>
<tr>
<td>Laparoscopic</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Laparotomy</td>
<td>10</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Emergency operation</td>
<td>20</td>
<td>63</td>
<td>83</td>
</tr>
<tr>
<td>RPA</td>
<td>11</td>
<td>29</td>
<td>40</td>
</tr>
<tr>
<td>Hartmann’s operation</td>
<td>7</td>
<td>29</td>
<td>36</td>
</tr>
<tr>
<td>Subtotal colectomy</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Colostomy</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>108</td>
<td>141</td>
</tr>
</tbody>
</table>

RPA, resection and primary anastomosis with intraoperative colonic lavage. There were no significant differences in type of elective/semi-elective (P = 0.48) or emergency (P = 0.54) operation between the two groups (χ² and two-tailed Fisher’s exact test).

Group 2; stage 2, six (30.0 per cent) in group 1 and 18 (28.6 per cent) in group 2; stage 3, 11 (55.0 per cent) in group 1 and 32 (50.8 per cent) in group 2; stage 4, three (15.0 per cent) in group 1 and nine (14.3 per cent) in group 2. There were no statistically significant differences between the two groups (P = 0.67).

Among the 327 patients admitted with acute diverticular disease there were 23 deaths (7.0 per cent) within 30 days. The mortality rate in the surgical group was 16.3 per cent (23 of 141). The mortality rate after elective and semi-elective operations was 1.7 per cent (one of 58), zero in group 1 and 2.2 per cent in group 2 (P = 1.0); the patient died after a myocardial infarction. Among patients operated on as an emergency, 26.5 per cent died (22 of 83), 17 patients treated by Hartmann’s procedure, three by subtotal colectomy and two patients by RPA. The mortality rate was zero in group 1 and 34.9 per cent in group 2 (22 of 63) (P < 0.001). Sixteen patients (19.3 per cent) died as a consequence of persistent septic shock, four after a myocardial infarction, one as a result of anastomotic dehiscence and the other after massive upper gastrointestinal haemorrhage.

The mortality rate among patients treated conservatively was zero in group 1 and 0.7 per cent (one of 147) in group 2. One patient died from a myocardial infarction 1 year after the acute episode of diverticulitis.

The hospital stay after elective surgery was 13-7 days in group 1 and 15-1 days in group 2 (P = 0.32); after emergency surgery, it was 16-2 days in group 1 and 16-3 days in group 2 (P = 0.43).

Discussion

Only a small proportion (5–10 per cent) of patients who develop diverticulitis are younger than 50 years. In the present study, the proportion of young patients was higher than that in other studies; 22.0 per cent of patients were admitted for the first time aged less than 50 years. This could be explained by the increase in prevalence of diverticular disease, particularly in western countries.

There continues to be controversy concerning the virulence of diverticulitis in young patients and the most appropriate management of those whose acute diverticulitis resolves with medical treatment. Diverticulitis in younger patients has been reported to have a more aggressive course or to require emergency surgery more frequently than that in the general population. In a prospective study of 226 patients with left colonic diverticulitis, Ambrosotti et al. observed that patients younger than 50 years were more prone to recurrences after conservative treatment, whereas older patients required operations significantly more often during their first hospital admission. Ouriel and Schwartz followed 92 patients under the age of 40 years who were admitted with diverticulitis. They observed that 55.2 per cent of patients, initially managed medically, required readmission. Furthermore 43.2 per cent underwent urgent surgery for complications of the disease. Given the high rates of recurrence and complication during the follow-up period they concluded that ‘elective resection after a cooling period appeared to be the safest alternative’.

In the present experience, when patients who underwent primary operative treatment were excluded, the recurrence rate was similar in the two groups. Furthermore, the proportion of patients who needed emergency surgery during the first episode was similar.

In contrast to other authors, who observed that readmission of patients younger than 50 years was associated with the need for surgical intervention in 55.0 per cent of the cohort, in the present study only one of 12 patients under 50 years and three of 40 patients older than 50 years needed...
emergency surgery during the second episode of acute diverticulitis. Further support for a more conservative approach can be found in a study by Simonowitz and Paloyan who identified 33 hospitalized patients under the age of 40 years, nine of whom underwent surgery during the initial admission. With a mean follow-up of 52 months, none of the remaining 24 patients required surgery.

The optimal surgical approach to complicated diverticular disease remains controversial. Tudor et al. recommended early laparotomy and Hartmann’s resection if percutaneous drainage is unsuccessful because sepsis is poorly tolerated by the elderly. Others have suggested that a two-stage procedure is the safest option in the presence of peritonitis or that a one-stage procedure is indicated when infection is localized. A recent study showed that generald purulent peritonitis and age by themselves are not contraindications to resection, perioperative lavage and primary anastomosis when performed in selected patients and by experienced surgeons.

The overall mortality rate was higher after emergency than elective surgery. Among patients operated on as an emergency it was higher in older patients. Sixteen of 83 patients died as a consequence of persistent sepsis and the mortality rate was higher in the patients who had a Hartmann’s procedure. The difference in mortality rates between surgical groups can be explained by differences in the characteristics of the patients. The authors have studied the predictive value of several factors in left colonic peritonitis and observed that ASA score and preoperative organ failure are the only significant predictors of outcome in multivariate logistic regression. They only perform Hartmann’s procedure in selected patients with poor general condition, ASA IV, immunocompromised status, faecal peritonitis or when preoperative organ failure is observed.

There was no specific evidence of the aggressive nature of diverticulitis in young patients in this study. The severity of peritonitis, as assessed by the Hinchey classification, was no different in younger or older patients. Furthermore, the risk of a poor outcome after a second episode, following successful conservative management of the acute attack, was similar in younger patients to that of patients older than 50 years. Diverticulitis in young patients was associated with a rate of emergency operation similar to that of older patients, without differences in the grade of peritonitis. The majority of patients did not require surgery after an initial episode that responded to medical treatment and a single attack of diverticulitis in young patients did not warrant an elective resection. The authors therefore believe that diverticular disease in young patients is no different from that affecting older patients and should be managed according to the same protocol.

The risk after a second episode of diverticulitis treated conservatively without an elective operation remains to be determined. A prospective randomized trial might resolve this issue.

References