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Chapter | 3

Is age still of prognostic value in diverticular disease?

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Submitted

Abstract

Introduction

In diverticular disease young patients are usually approached aggressively, whereas caution is taken in elderly patients. The goal of this study was to analyze the prognostic value of age in diverticular disease.

Methods

Between 1990 and 2000 a cohort of 291 patients were admitted to the VU University Medical Center with diverticulitis, follow-up was completed until present. In order to analyze the influence of age on the course of diverticular disease, three categories were created: YP under 40 years, RP between 40 and 80 years and OP over 80 years.

Results

YP had more recurrent episodes of acute diverticulitis, but no increase in severity of disease. Eventually 73% (8) of all YP required surgery, of which 63% (5) was in an acute setting. In contrast with the two other groups 40% (2) of YP requiring emergency surgery already had a history of diverticulitis. In OP a more conservative approach was demonstrated. 80% (16) was because of an emergency indication, mostly at the first presentation of the disease. Overall mortality rates were significantly associated with increasing age, up to 19% (8) in patients over 80 years.

Conclusion

In elderly patients a more conservative approach might be justified, because of higher postoperative mortality. In contrast, the course of younger patients was characterized by more recurrent episodes and a higher risk for having emergency surgery at one of these recurrences. When considering 73% (8) of patients under 40 years eventually requiring an operation, early elective sigmoid resection after a single episode of acute diverticulitis might well be indicated.

Introduction

Diverticular disease already is a common disease in Western society with arising incidence.¹ There is a strong association with age, with an overall incidence of 33% in the population over 45 years of age, increasing to 66% in those older than 85 years of age.^{2,3} 10- 25% of patients with diverticulosis will develop acute diverticulitis.⁴ The treatment of diverticular disease depends on the severity of the disease, varying from mild symptomatic diverticulosis to perforated diverticulitis.⁵ The latter is associated with high morbidity and mortality rates (10-15%),⁶ in order to prevent this severe complication it has been common practice to perform an elective sigmoid resection after one or two episodes of conservatively treated diverticulitis.

The management of diverticular disease in young patients remains controversial. The incidence among patients under 50 years is rising more rapidly than in older individuals and an association with obesity has been suggested.^{7,8} Moreover some publications suggest a more hazardous course in young patients, with more recurrences, more complications and a cumulative risk of emergency surgery of 15 - 88%.⁹ Therefore younger patients with diverticular disease have mostly been regarded as a distinct entity. Many surgeons advise prophylactic sigmoid resection after the initial episode of acute diverticulitis in young patients, hereby following the practice parameter of the American Society of Colon and Rectal Surgeons (ASCRS) published in 2000.¹⁰

Recently these recommendations have been challenged, new data on the natural history of diverticulitis have shown that most perforations do not occur after recurrences, but during the first attack of acute diverticulitis.¹¹ Furthermore, conservative management of recurrent non-perforated diverticulitis is associated with low morbidity and mortality rates.^{12,13} The same publications suggest that the increased risk of complications or recurrent attacks in young patients may be a chronological rather than pathological phenomenon, because of their longer life span. This contradicts the idea of a different and more aggressive approach in younger patients.⁹

In contrast, these controversies in the treatment of diverticular disease in elderly patients are of an entirely different nature.¹⁴ Several studies have also stated less favorable outcomes of acute diverticulitis in elderly patients, although this does not seem an independent factor.¹⁵ Comorbid conditions, social circumstances and physical fitness are probably the major determinants of these adverse effects. In addition, elective surgery might be renounced because of these factors. Even when an acute intervention is

warranted, a careful 'wait and see policy' sometimes is worth consideration. The goal of this study is to analyse the prognostic value of age in diverticular disease.

What is the best treatment strategy in elderly patients? Is diverticular disease more virulent in young patients? Could elective surgery be the answer?

Methods

Between 1990 and 2000 patients who were admitted at the VU University Medical Center with the diagnosis diverticulitis were identified in the prospective hospital patient registry (ICD-9). Follow-up was retrospectively completed until 2009. Patient identifiers were scrambled rendering this an anonymous dataset considered within the public domain.

Demographic data were collected, such as age, gender, Body Mass Index (BMI) and American Society of Anesthesiologists score (ASA). Disease specific data, like number of episodes of acute diverticulitis and Hinchey classification were recorded. Furthermore therapeutic data on conservative measures, surgical procedures and complications were noted.

In order to analyse the influence of age on the course of diverticular disease, three age categories were created: young patients under 40 years (YP), reference patients between 40 and 80 years (RP) and older patients over 80 years (OP).

A database (SPSS 15.0.1, SPSS Inc., Chicago, IL) was created for statistical analysis. Values were expressed as median and range for continuous variables. The distributions of dichotomous data were given in percentages. YP and OP were compared to the RP in separate two by two tables, using Pearson Chi-Square tests to evaluate univariate relations.

Results

The investigated population consisted of 291 patients, 121 (42%) male patients and 170 (58%) female patients, the average age was 66 years (27-93). Overall mortality was 6% (18 patients) and morbidity 26% (76 patients). The population was divided in three groups according to age, categories were 40 years or younger (YP), 40 to 80 years (RP) and 80

years or older (OP). Patient characteristics and history of diverticular disease are depicted in Table 1.

Table 1 Patient characteristics

	YP (n=11)	P	RP (n=237)	P	OP (n=43)
Age	37 (27-39)		65 (40-79)		84 (80-93)
Male - female ratio	8 - 3	0.069	106 - 131	0.000	7 - 36
BMI > 25	5 (45.5%)	0.340	142 (59.9%)	0.002	15 (34.9%)
ASA > 2	0 (0%)	0.037	68 (28.7%)	0.021	20 (46.5%)
Single episode	5 (45.5%)	0.121	161 (67.9%)	0.016	37 (86.0%)
Recurrence	6 (54.5%)	0.121	76 (32.1%)	0.016	6 (14.0%)
2 episodes	5 (45.5%)	0.037	46 (19.4%)	0.111	4 (9.3%)
3 episodes or more	1 (9.1%)	0.727	30 (12.7%)	0.129	2 (4.7%)
Hinchey I	4 (36.4%)	0.114	143 (60.3%)	0.987	26 (60.5%)
Hinchey II	4 (36.4%)	0.070	37 (15.6%)	0.912	7 (16.3%)
Hinchey III	3 (27.3%)	0.397	41 (17.3%)	0.356	5 (11.6%)
Hinchey IV	0 (0.0%)	0.373	16 (6.8%)	0.264	5 (11.6%)

YP = patients younger than 40 years; RP = reference patients between 40 and 80 years of age; OP = patients older than 80 years. Values were expressed as median and range for continuous variables. The distributions of dichotomous data were given in percentages. YP and OP were compared to the RP in separate two by two tables, using Pearson Chi-Square tests to evaluate univariate relations.

In the OP group there were more males, less overweight and higher ASA score, resembling the normal older population. YP had more recurrent episodes of acute diverticulitis, but no differences in the severity of the disease (i.e. Hinchey stage) were found in comparison with the two other groups.

Therapeutic data is shown in Table 2. No significant differences were found in operative approach, but the high percentage of Hartmann's procedure (60%; 12 patients) in OP stands out. In contrast, the use of a deviating loop ileostomy is relatively low. In all YP

Table 2 Surgical data

	YP (n=11)	P	RP (n=237)	P	OP (n=43)
Laparoscopic sigmoid resection	2 (25.0%)	0.445	58 (38.2%)	0.058	5 (25.0%)
Open sigmoid resection	4 (50.0%)		44 (28.9%)		3 (15.0%)
Hartmann's procedure	2 (25.0%)		50 (32.9%)		12 (60.0%)
Protective ileostomy	1 (16.7%)	0.545	10 (9.8%)	0.161	0 (0.0%)
Reversal of ostomy	3 (100.0%)	0.435	38 (63.3%)	0.024	2 (16.7%)
Conservative	3 (27.3%)		85 (35.9%)		23 (53.5%)
		0.560		0.029	
Surgery	8 (72.7%)		152 (64.1%)		20 (46.5%)
Operation first episode	3 (37.5%)	0.157	95 (62.5%)	0.047	17 (85.0%)
Operation later episode	5 (62.5%)		57 (37.5%)		3 (15.0%)
Elective operation	3 (27.3%)	0.769	65 (27.4%)	0.051	4 (9.3%)
Elective first episode	0 (0.0%)	0.177	25 (38.5%)	0.646	2 (50.0%)
Elective later episode	3 (100.0%)		41 (61.5%)		2 (50.0%)
Acute operation	5 (45.5%)	0.769	87 (36.7%)	0.051	16 (37.2%)
Acute first episode	3 (60.0%)	0.488	70 (80.5%)	0.198	15 (93.8%)
Acute later episode	2 (40.0%)		17 (19.5%)		1 (6.2%)
Mortality	0 (0.0%)	0.487	10 (4.2%)	0.000	8 (18.6%)
Morbidity	5 (62.5%)	0.210	61 (40.1%)	0.091	12 (60.0%)

YP = patients younger than 40 years; RP = reference patients between 40 and 80 years of age;
 OP = patients older than 80 years. Values were expressed as median and range for continuous variables.
 The distributions of dichotomous data were given in percentages. YP and OP were compared to the RP
 in separate two by two tables, using Pearson Chi-Square tests to evaluate univariate relations.

with a temporal ostomy bowel continuity was restored, whereas in RP 63% (38 patients) and in OP only 17% (2 patients). A trend could be seen towards a more conservative approach in OP. When surgery was performed in OP, it was because of an emergency

indication, mostly at the first presentation of the disease. None of YP were scheduled for an elective sigmoid resection after a single attack, although 40% (2 patients) of YP, in need of an acute intervention, had a history of diverticulitis. Finally 73% (8 patients) of YP underwent a surgical intervention in the course of diverticular disease. Mortality was significantly related to ascending age.

Discussion

The present study was designed to evaluate the ongoing controversy in the treatment of diverticular disease in young patients. Several publications claim a more virulent course of diverticular disease in young patients,¹⁶ while others assert the contrary.^{17,18} Altered insights in the natural course of diverticular disease, have recently renewed the attention to the age issue. Furthermore the increasing incidence of diverticular disease among young patients warrants a more structural policy in its treatment. According to the guidelines of the ASCRS every patient should be evaluated on a case-by-case basis and early elective resection in young patients is no longer recommended.¹⁹

Data from this series does not support the assumption of more hazardous episodes of diverticular disease in young patients. No significant differences in the number of patients suffering perforated disease could be demonstrated, although slightly more young patients have associated abscesses or require an acute operation. When compared to a recent study of 234 patients published by Hjern et al.³, the overall rate of emergency surgery seems high (37% versus 4.3%). When only young patients are considered, this difference even increases (46% versus 1.7%). This year an extensive review article reported much higher rates for emergency surgery of 4 to 88% in young patients, the great variation in these rates suggest the inclusion of a substantial number of emergency explorations for incorrect diagnosis.²⁰ Misdiagnosis seemed more common in early studies up to 1980, since than the progressive use of Computed Tomography resulted in more accurate classification of diverticular disease.

When recurrent disease is considered, significantly more previous episodes occurred in young patients (55%; 6 patients). It was suggested by Janes et al.⁹ that this increased recurrence rate may be a chronological rather than pathological phenomenon, however all recurrences in this series were diagnosed in the same follow-up period for the three groups. Some 40% (2 patients) of all young patients requiring emergency surgery in this series already had an earlier conservatively treated episode of acute diverticulitis. Although significance could not be reached, this is a twofold of the rate in the reference

group. In the older patients the opposite was noted, 94% (15 patients) never had an episode of diverticulitis before emergency surgery was required. Moreover most older patients only suffer one episode of acute diverticulitis (86%; 37 patients).

Since 2005 a more conservative approach to elective surgery in diverticular disease has been advocated, indications have been restricted to complicated disease. The inclusion period for the cohort was between 1990 and 2000, in this era the 'old' ASCRS-rules were still daily practice. Therefore it was interestingly that none of the younger patients underwent an early elective sigmoid resection after one conservatively treated episode of diverticulitis. An explanation might be that the majority of the indications for elective resections was already based on complaints and complications, such as stenosis or fistulas, instead of the number of uncomplicated episodes alone. In elderly patients surgeons tend to take a more cautious attitude. Only 9% (4 patients) of the patients were offered elective surgery in spite of significant complaints, all of whom had gone through two or more previous episodes. Age should not be the only reason to withhold a patient from surgery. Instead associated comorbid conditions should be taken into account when surgery is contemplated.

Overall mortality rates were significantly associated with increasing age, up to 19% (8 patients) in patients over 80 years of age. This rate might be biased by the fact that a bigger portion of the elderly patients (80%; 16 patients) underwent acute surgery instead of elective surgery, without any mortality in this series. The same could be said about the ASA grades, with significantly more elderly patients in grade three or four, representing a poorer health condition. These results are in concordance with the 14% mortality in patients over 70 years of age presented by Makela et al.¹⁵, but it was also believed that the surgical outcome of elderly patients was more closely related to the urgency of the operation and the comorbid conditions than age.

Maybe similar reasons as for elective resections account for the low percentage of ostomy reversals in the older group. Just 17% (2 patients) of these patients with a temporary ostomy had their ostomy reversed. In contrast with 100% (3 patients) of the patients under 40 years of age. Oomen et al. presented a reversal rate after Hartmann's procedure of 90% in patients with an average age of 62 years (29 – 89).²¹

In conclusion, the course as well as the treatment of patients with diverticular disease are greatly determined by age. Elderly patients are approached with caution, mostly because of their comorbid conditions and subsequently higher mortality rates when

surgery is performed. The course of younger patients is characterized by more recurrent episodes in the same time span as elderly patients and a higher risk for having emergency surgery after a conservatively treated episode of acute diverticulitis. When considering 73% (8 patients) of patients under 40 years of age eventually requiring an operation, early elective sigmoid resection after a single episode of acute diverticulitis might well be indicated.

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