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BRIEF ARTICLE

Screening for colorectal neoplastic lesions following acute diverticulitis: Would a sigmoidoscopy suffice?

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Abstract

AIM: To investigate the yield of colorectal malignant or premalignant lesions during colonoscopy performed following an episode of acute diverticulitis.

METHODS: A prospectively maintained electronic database of a public teaching hospital (Modbury Hospital, South Australia) was searched for international classification of diseases codes for acute diverticulitis from July 2007 to June 2011. The electronic database and each patient's medical records were reviewed for demographic data, clinical presentation, investigation results, colonoscopy details and surgical intervention.

RESULTS: Two hundred and nineteen patients were diagnosed with acute diverticulitis with a median age of 60 years (range 24-93). One hundred and thirty-nine patients (63.5%) had follow-up screening colonoscopy, with the median interval between the episode of acute diverticulitis and colonoscopy being 8 wk (range: 1-66). Colonoscopy revealed polyps in 21 patients (15%) and no cases of colorectal cancer. Of the 21 patients with polyps, there were 14 patients (10%) with tubular/villous adenomas (13 in rectosigmoid region and 1 in descending colon).

CONCLUSION: Detection of colorectal cancer in patients undergoing routine colonoscopy following acute diverticulitis is rare. However, colonic polyps in the left colon are noted. A flexible sigmoidoscopy is an adequate screening tool in such patients. A complete colonoscopy reserved for patients with family history of colorectal cancer or with polyps detected on flexible sigmoidoscopy to evaluate the rest of the colon.

Key words: Polyps; Surgery; Diverticulitis; Colonoscopy; Colorectal cancer

Core tip: This paper shows that of the 139 patients who underwent routine colonoscopy after an episode of acute diverticulitis, the incidence of adenomatous and malignant colonic polyps discovered were 10% and 0% respectively. These figures are similar to that in the general population. In addition all the polyps were discovered in the left colon, therefore a flexible sigmoidoscopy may be adequate for the purpose of excluding the presence of neoplastic lesions.

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INTRODUCTION

Diverticulosis and colorectal cancer are 2 common diseases affecting the Western population which share many similar characteristics. For instance, both clinical entities have an increasing prevalence with advancing age[1,2], they tend to affect the left side of the colon more often than the right side[3,4], and have been associated with inadequate dietary fibre intake[5,6]. It has been advocated that a screening colonoscopy be performed for all patients following an episode of acute diverticulitis to exclude colorectal cancer[7]. However, the evidence in literature for such a practice is unclear. Some authors reported positive correlation between diverticulitis and colon cancer and therefore support routine screening colonoscopy[8,9]. Others, however, have found no increased risk of colon cancer in patients who were diagnosed with diverticulitis and thought that a screening colonoscopy was unnecessary[10-12].

The aim of the current study was, thus, to retrospectively determine the yield of colonoscopy performed routinely following an episode of acute diverticulitis in detecting colorectal malignant or premalignant lesions in a consecutive cohort of patients diagnosed with diverticulitis.

MATERIALS AND METHODS

A retrospective search of a prospectively maintained electronic database of a public teaching hospital was undertaken. International classification of diseases codes for acute diverticulitis over a 54-mo period, from January 2007 to October 2011 were analysed with the aim of identifying all patients treated for the disease at the hospital. The overall cohort included patients who were diagnosed and treated for acute diverticulitis. Each admission was reviewed within the electronic database. The case records of patients within the stated study period were manually reviewed.

It is a standard practice at the institute to advise all patients diagnosed with acute diverticulitis to undergo a colonoscopy within 8 wk of discharge so as to exclude a co-existent colorectal neoplastic/pre-neoplastic lesion.

Variables collected for each patient

The main presenting symptoms, demographic data, blood investigations [white cell count (WCC), neutrophil count and C-reactive protein (CRP) levels], computed tomography (CT) scan, and length of hospital stay were recorded.

The basis for diagnosis of the episode as acute diverticulitis, viz., clinical impression, radiological features or a combination of both, was noted. The management of each patient was also assessed as to whether they required only conservative treatment with antibiotics, or whether more invasive procedures (*e.g.*, percutaneous drainage of diverticular abscess or surgery) were needed. In case of patients with recurrent diverticulitis, only the first episode was included in this analysis. The CT scan images of the abdomen were assessed with regards to the following features; presence and location of the diverticulae, signs of acute inflammation, and the presence of intra-abdominal complications, *e.g.*, perforation or abscess formation. The severity of diverticulitis was graded according to the European Association for Endoscopic Surgery classification[13].

Additionally, complete data of the colonoscopic procedures were recorded. The colonoscopy reports were assessed with regards to: the time interval between the episode of acute diverticulitis and the colonoscopy, as well as the presence and location of any diverticulae, colitis, polyps, or cancer. The histological results were reviewed for polypectomies or biopsies performed. In patients in whom a colonoscopy was not performed, the reason for this was determined.

The operative notes, in patients who underwent surgery, were assessed for the details of the operation (elective or emergency; and the intra-operative findings). If bowel resections were performed, the histologic results were reviewed for the presence of diverticulitis and/or cancer.

Patient excluded from the study

Patients who had episodes of per rectal bleeding since the investigation for this group of patients would normally include colonoscopy to exclude bowel cancer.

RESULTS

A total of 219 patients were diagnosed with acute diverticulitis from July 2007 until June 2011. There were 114 males and 105 females respectively, with a median age of 60 (range 24-93) years. The median length of hospital stay was 3.5 d (range 1-58 d). The inflammatory markers were raised with median WCC of 11.4×10^{-9}/L and CRP of 72.5 mg/L respectively. There were 129 (58.9%), 30 (13.7%) and 40 (18.3%) patients respectively with grade Ⅰ, Ⅱ and Ⅲ diverticulitis according to the European Association for Endoscopic Surgery diverticulitis severity classification. Details of severity of diverticulitis were not available for 20 (9.1%) patients. 196 (89%) patients were managed conservatively, whilst 23 (11%) patients required emergency surgery for complicated diverticulitis; Hartman's procedure (n = 5), anterior resection with loop stoma (n = 5), right hemi-colectomy for right sided diverticulitis (n = 1), open/laparoscopic washout of abscesses (n = 4), and no data available (n = 8).

Patients who had colonoscopy

A total of 139 (63.5%) patients had follow-up screening colonoscopy. The median time lapse between the episode of acute diverticulitis and the colonoscopy was 8 wk (range 1-66). During colonoscopy, diverticulosis was confirmed in 120 (86%) of the patients. Of the 19 (14%) patients whose colonoscopy did not show diverticular disease, 8 had been diagnosed with diverticulitis on CT scan while the other 11 had been labelled to have acute diverticulitis based on clinical presentation and laboratory parameters. Five (4%) patients had inflammatory strictures secondary to the diverticulitis found during colonoscopy.

Table 1 Colorectal polyps and cancer detection in 139 patients who had screening colonoscopy

Polyps	*n* (%)
Yes	21 (15)
No	116 (84)
N/A	2 (1)
Histology	
Tubular adenoma	4 (2.9)
Tubular adenoma with low grade dysplasia	7 (5)
Tubulovillous adenoma	2 (1.4)
Sessile serrated adenoma	1 (0.7)
Others including benign polyps	3 (2.2)
N/A	4 (2.9)

N/A: Not available.

Table 1 provides a complete depiction of the findings of 139 patients who underwent colonoscopy. No colorectal cancer was found during the screening colonoscopy in all 139 patients. Polyps were discovered in 21 (15%) patients, of which 14 (10%) had tubular/villous adenomas and 3 (2.2%) had benign hyperplastic polyps. The polyps could not be retrieved in 4 (2.9%) patients and so no histological information was available. Of the 14 patients with adenomatous polyps, 13 (93%) had polyps excised from the recto-sigmoid area while 1 patient had a polyp excised from the descending colon.

Patients who did not have screening colonoscopy

There were 43 (19.3%) patients who did not have screening colonoscopy for various reasons as shown in Table 2.

Miscellaneous

Eighteen (8.2%) patients elected to be treated and followed-up by their private doctor, and therefore no further reports were available. Nineteen (8.7%) patients did not return for their colonoscopy or outpatient appointment, and therefore were lost to follow-up.

DISCUSSION

The data from our study indicate that 14 (10%) of the 139 patients with acute diverticulitis who subsequently had a screening colonoscopy had colorectal polyps removed, all of which originated from the left colon. No colorectal cancer was found in this cohort of patients. Other studies have reported an incidence of 6%-10% and 1%-2% for colorectal polyps and cancer, respectively[8,10,12].

Several clinical practice guidelines have been published in recent years on the indications for colonoscopy, some of which include lower gastro-intestinal bleeding, unexplained iron-deficiency anaemia, patients with significant family history of colorectal cancer, and inherited colorectal cancer syndromes, *e.g.*, familial adenomatous polyposis (FAP) and hereditary non-polyposis colorectal cancer (HNPCC)[14-16]. However acute diverticulitis is not listed as an indication for screening colonoscopy to exclude colorectal cancer.

Table 2 Patient whose colonoscopy did not occur

Reasons no colonoscopy was arranged	*n* (%)
Advanced age and severe co-morbidities	7 (16)
Had diverticulosis confirmed on colonoscopy previously	7 (16)
Emergency surgery	3 (7)
Deceased	3 (7)
Discharged directly from the emergency department	5 (12)
Transferred to another hospital	1 (2)
Unknown	17 (40)

There is evidence of a significant association between diverticular disease and colorectal polyps[17-19], and research has shown that removal of adenomatous polyps significantly reduces the incidence of colorectal cancer[20-22]. Therefore routine colonoscopy after diverticulitis may facilitate early detection of these polyps, the removal of which may reduce the risk of developing a future cancer. On the other hand the association between diverticulitis and colorectal cancer is unclear; some authors reported a positive correlation and supported routine screening colonoscopy[8,9], whilst the others have not[10-12].

Colonoscopy in patients after an episode of acute diverticulitis is not without risks. The risk of perforation during colonoscopy in the general population has been report to be about 0.1%[23]. Patients with diverticulitis have higher risk of complications as the nature of their disease makes the colonoscopy more difficult with strictures, spasms, muscular hypertrophy and colonic fixation[24].

It would be more useful to identify risk factors that could better categorize the patients with diverticulitis who have an increased risk of having colorectal adenomas or cancer, and therefore warrant a colonoscopy. A recently published article reported that the risks of cancer was higher in patients with CT diagnosed left sided diverticulitis complicated by abscess [odds ratio (OR) = 6.7, 95%CI: 2.4-18.7], local perforation (OR = 4, 95%CI: 1.1-14.9) or fistula (OR = 18, 95%CI: 5.1-63.7)[8]. There are at least 2 other reports in the literature showing evidence of a higher incidence of left sided colon cancer in patients with diverticulitis[10,11]. Data from our own study showed that almost all of the adenomatous polyps (13 out of 14 patients) originated from the recto-sigmoid area, while the last one originated from the descending colon.

An alternative option worth considering is performing a flexible sigmoidoscopy instead of a full colonoscopy. A flexible sigmoidoscopy has the advantage of having less risks as it is easier to perform and can be done without sedation. In addition patients do not need to take a full bowel preparation; instead 1-2 rectal enemas can usually clear the left colon enough to provide satisfactory views. It can also be more cost-effective as the cost according to the current Australian Medicare Benefit Schedule[25] for a flexible sigmoidoscopy is $109.25, which is less than half that of a colonoscopy ($328.10). CT colonography is another option as it does not carry the risk of bowel perforation as colonoscopy does. Although CT colonography is a relatively new radio-imaging modality, there is

increasing evidence that it is useful for the screening of colorectal cancer. A recently published meta-analysis of CT colonography for the detection of colorectal cancer showed a sensitivity of 96%[26]. There is no data currently available on the usefulness of CT colonography as a screening tool for colorectal cancer in patients with acute diverticulitis, and therefore there is a need for further investigation in this area. The cost for a CT colonography ($600) according to the Australian Medicare Benefit Schedules is much higher than those of a colonoscopy or a flexible sigmoidoscopy. Therefore, further studies are required to investigate the cost-effectiveness of CT colonography in comparison to colonoscopy or flexible sigmoidoscopy as a screening tool for colorectal cancer in patient with diverticulitis.

In conclusion, based on the findings of our study, the detection of colorectal cancer in patients undergoing routine colonoscopy following an acute episode of diverticulitis is rare. However, colonic polyps in the left colon are noted. Thus, a flexible sigmoidoscopy in patients without a family history of bowel cancer (sporadic or as part of a familial syndrome) could be a viable and possibly a time- and cost-effective option. In patients with a family history of colorectal cancer or those in whom pre-malignant polyps (serrated adenomas, tubulo-villous adenomas with moderate or high grade dysplasia) or many polyps are encountered in the recto-sigmoid region, a full colonoscopy would be justified.

COMMENTS

Background

Diverticulosis and colorectal cancer are two common diseases, which share similar characteristics, affecting the Western population. There is evidence of a significant association between diverticular disease and colorectal polyps.

Research frontiers

The aim of the current study was, thus, to retrospectively determine the yield of colonoscopy performed routinely following an episode of acute diverticulitis in detecting colorectal malignant or premalignant lesions in a consecutive cohort of patients diagnosed with diverticulitis.

Innovations and breakthroughs

This paper shows that of the 139 patients who underwent routine colonoscopy after an episode of acute diverticulitis, the incidence of adenomatous and malignant colonic polyps discovered were 10% and 0% respectively. These figures are similar to that in the general population. In addition all the polyps were discovered in the left colon, therefore a flexible sigmoidoscopy may be adequate for the purpose of excluding the presence of neoplastic lesions.

Applications

The results from this study suggest that a flexible sigmoidoscopy may be adequate to exclude colorectal neoplasms in patients after an episode of acute diverticulitis.

Terminology

Diverticulosis is the presence of outpouchings in the colon, most commonly affecting the sigmoid colon. Diverticulitis is acute inflammation of these outpouchings. Colonoscopy is the process of inspecting the lumen and mucosa of the colon using a flexible fibre-optic camera.

Peer review

The authors reported the result of colonoscopy after acute diverticulitis. This paper may have consequences on each National health system policy. The conclusions are based on good data.

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