Colonoscopy and flexible sigmoidoscopy for follow-up of patients with left-sided diverticulitis

Z Abdulazeed, N Kukreja, N Qureshi, S Lascelles

Medway Maritime Hospital, Gillingham, UK

ABSTRACT

INTRODUCTION The prevalence of diverticular disease has been increasing in the western world over the last few decades, causing a growing burden on health care systems. This study compared the uses of flexible sigmoidoscopy with colonoscopy as a follow-up investigation for patients diagnosed with acute left-sided diverticulitis and to evaluate the need for using either procedure.

MATERIALS AND METHODS A retrospective study of 327 patients diagnosed with acute diverticulitis was carried out. Of this total, 240 patients with left-sided diverticulitis diagnosed via computed tomography were included. These patients were categorised into two equal groups: the first 120 patients underwent colonoscopy and the second 120 patients underwent flexible sigmoidoscopy.

RESULTS All colonoscopies and flexible sigmoidoscopies confirmed the computed tomography diagnosis of sigmoid diverticular disease with no major new findings. All colonoscopies and flexible sigmoidoscopies were reported as having no complications, with nine colonoscopies reported as being difficult compared with only three flexible sigmoidoscopies. All biopsies were reported as no malignancy. Full bowel preparation was required in all colonoscopies, compared with no preparation required for flexible sigmoidoscopies.

CONCLUSIONS There is no evidence to support the routine use of endoscopic evaluation after an episode of left-sided diverticulitis diagnosed on computed tomography if no worrying radiological findings have been reported. This study supports similar findings from other studies and therefore we disagree with The Royal College of Surgeons of England (Association of Coloproctology of Great Britain and Ireland recommendations) commissioning guide, which advocates routine surveillance of the colon.

KEYWORDS

Colonoscopy – Flexible sigmoidoscopy – Acute diverticulitis – Left-sided diverticulitis

Accepted 15 June 2020

CORRESPONDENCE TO

Zakariya Abdulazeed, E: z.abdulazeed@nhs.net

Introduction

The prevalence of diverticular disease has been increasing in the Western world over the past few decades. While previously considered as a disease primarily affecting the elderly, the incidence among younger people is rising. The burden of diverticular disease on the healthcare system has increased with more hospital admissions and investigations required.¹

Diverticulitis can be simple (uncomplicated) or complicated by bleeding, perforation, abscess or bowel obstruction. Diagnosis is usually confirmed by computed tomography (CT).² In patients with complicated diverticulitis or those with concerning findings on CT, endoscopic follow-up is recommended after resolution of the acute episode to exclude any neoplasm or other colonic disease such as inflammatory bowel disease, which can mimic the symptoms of diverticulitis.^{3,4} Evaluation of the whole colon can be achieved using colonoscopy, while flexible sigmoidoscopy can only access the left side of the colon. The colonoscopy

compared with flexible sigmoidoscopy is a time-consuming and relatively expensive procedure with a higher chance of serious complications,⁵ and requires full bowel preparation, which can be challenging in some patients with other comorbidities.⁶

This study aims to assess the uses of flexible sigmoidoscopy and colonoscopy as a follow-up investigation for patients diagnosed with acute left-sided diverticulitis and to evaluate the need for using either procedure.

Materials and methods

A retrospective study was designed with 327 patients who were diagnosed with acute diverticulitis, based on their hospital electronic discharge notification, after admission to Medway Maritime Hospital, Kent, over a three-year period from 2016 to 2019. Diagnosis was confirmed via CT. Some 18 patients were excluded as they had extensive or right-sided diverticulitis and 69 patients did not attend their

follow-up appointment. After discharge, 240 patients with left-sided diverticulitis were included in the present study as they underwent endoscopic follow-up evaluation.

The selected patients were organised into two equal groups: one group included 120 patients who underwent colonoscopy and the other included 120 patients who underwent flexible sigmoidoscopy. The CT results were reviewed using the hospital picture archiving and communication system. All CT scans were originally reported by consultant radiologists. The endoscopic results were also reviewed on the hospital's online endoscopy website system (Endoweb). All endoscopes were performed and reported by fully trained endoscopists. A Lucera-type colonoscope (Olympus, Japan) was used in both colonoscopy and flexible sigmoidoscopy. Biopsies were obtained from 53 patients (32 during colonoscopy and 21 during flexible sigmoidoscopy) and the histopathology reports were reviewed on Maidstone and Tunbridge Wells NHS Trust Telepath website.

Results

The ages of the 120 patients who underwent colonoscopy ranged between 46 and 90 years (standard deviation, SD, 70 ± 10.2 years) and 65% were female. All colonoscopies were reported as a sigmoid diverticular disease with no major new findings differing from the CT results. However, eight patients were reported with inflammation in addition to diverticular disease. Another 4 patients had mucosal ulcerations, 12 patients had low-risk polyps and 5 patients had muscle hypertrophy of the colonic wall (Table 1).

All colonoscopies were reported as having no complications during the procedure, while nine colonoscopies were reported as being difficult procedures, with or without looping. During the procedure, moderate to severe discomfort, with or without pain, was reported by 18 patients, which led to early termination of the procedure in 5 cases. Some 112 patients had the procedure under a variable degree of sedation and/or analgesia. During colonoscopy, poor bowel preparation was reported in seven procedures with poor visualisation in eight cases. Biopsies were obtained from 32 patients. A histopathological examination revealed no

dysplasia or malignancy, although eight were reported to have adenoma (Table 2). The average length of the procedure was 40 minutes.

The second 120 patients underwent flexible sigmoidoscopy. Their ages ranged between 28 and 91 years (SD 72 ± 13.9) and 65% were female. All flexible sigmoidoscopies were reported as a sigmoid diverticular disease with no major new findings differing from the CT results. However, 10 patients were reported with inflammation in addition to diverticular disease, another 4 with mucosal ulcerations, 8 with low-risk polyps and 2 with muscle hypertrophy of the colonic wall (Table 1). All flexible sigmoidoscopies were reported as having no complications during the procedure, while three flexible sigmoidoscopies were reported as being difficult procedures.

During the flexible sigmoidoscopies, moderate to severe discomfort with or without pain was reported by 16 patients, which led to early termination of the procedure in three cases. Sixteen patients had the procedure performed under a variable degree of sedation and/or analgesia. During the flexible sigmoidoscopy, poor bowel preparation was reported in 26 patients with poor visualisation in 16. Biopsies were obtained from 21 patients and their histopathological examination showed no dysplasia or malignancy, although 4 were reported with adenoma (Table 2). The average length of the procedure was 15 minutes.

Discussion

There are many conflicts between studies on the benefits of performing endoscopy after a diagnosis with diverticulitis, with many reviewed studies drawing the conclusion that endoscopy can be omitted after an episode of uncomplicated diverticulitis.⁷⁻¹² However, it can be beneficial in cases of complicated diverticulitis or continuing symptoms, and in patients aged over 70 years, because the risk of malignancy in these patients is higher.^{7-9,15} In contrast, the Association of Coloproctology of Great Britain and Ireland (ACPGBI) has recommended that all patients require investigation of the colonic lumen by endoscopy, barium enema or CT colonography after the acute attack of diverticulitis has resolved.⁴

Many studies have compared the use of flexible sigmoidoscopy with colonoscopy as a screening investigation

Table 1 Summary of endoscopic findings by colonoscopy and flexible sigmoidoscopy

Finding with diverticular disease	Colonoscopy (n)	Flexible sigmoidoscopy (n)
Inflammation	8	14
Mucosal ulceration	4	4
Muscle hypertrophy	5	2
Polyp	12	8
Normal	91	92
Total patients	120	120

Table 2 Summary of the histopathological results from biopsies by colonoscopy and flexible sigmoidoscopy

Results from biopsy	Colonoscopy		Flexible sigmoidoscopy	
	(n)	(%)	(n)	(%)
Cancer	0		0	
Adenoma	8	25	4	19
Neither	24	75	17	81
Total biopsies	32		21	

for colorectal cancer, but we are not aware of previous studies compared the use of flexible sigmoidoscopy and colonoscopy as a follow-up investigation for diverticulitis. The use of endoscopy for colorectal cancer screening or diverticulitis follow-up shares the same aim of ruling out malignancies.⁵ Proximal colon cancers are less common,¹² and some studies draw the conclusion that flexible sigmoidoscopy is an effective tool for colorectal cancer screening.^{10,14} This does indirectly support the use of flexible sigmoidoscopy as an effective investigation for diverticulitis follow-up.

Both screening colonoscopy and flexible sigmoidoscopy were associated with reductions in overall colorectal cancer incidence, with greater reductions in incidence associated with colonoscopy rather than flexible sigmoidoscopy, particularly in the right colon.¹⁰ All patients included in the current study were diagnosed with left-sided diverticulitis. Although the number of patients included in this study was relatively small, it shows interesting findings of clinical significance.

Colonoscopy has certain disadvantages, such as the risk of colonic perforation and the need for full colonic preparation.^{5,6} Despite the increasing number of colonoscopy trials solving technical difficulties, a small number of complications do occur.¹¹ Although in the current study there were no complications reported in either colonoscopy and flexible sigmoidoscopy, approximately 8% of the colonoscopies were reported as being difficult, with moderate to severe discomfort with or without pain in 15% of the patients. Full colonic preparation can be an unpleasant experience for patients, particularly in the older age group, with mobility problems or incontinence. Certain patients with renal or heart failure are at high risk from colonic preparation and elderly patients have a higher risk of dehydration, thereby necessitating admissions to hospital for intravenous fluid infusion prior to their colonoscopy.^{6,15}

Flexible sigmoidoscopy does not require full colonic preparation as it has been shown that preparation by enema can give satisfactory results.^{15,16} It has also a lower risk of complications than colonoscopy and is better tolerated by patients.^{15,17,18} Flexible sigmoidoscopy is less expensive than a colonoscopy because it is quicker and can be performed by specialist nurses.^{19–21}

In this study, almost all colonoscopies were performed under variable degrees of sedation and/or analgesia, while it was only used in 13% of patients who underwent flexible sigmoidoscopy. Taking into account the risks associated with sedation,²² prolonged procedure time and costs,^{23,24} flexible sigmoidoscopy is preferable to colonoscopy if an endoscopic evaluation is warranted.

Finally, the recent consensus guidelines jointly commissioned by the British Society of Gastroenterology, the ACPGBI and Public Health England recommended no colonoscopic surveillance post-polypectomy if there is no evidence to suggest high-risk findings (≥ 2 premalignant polyps including ≥ 1 advanced colorectal polyp; or ≥ 5 premalignant polyps).²⁵ In our study, polyps detected were of low risk and biopsies confirmed no malignancy, so all patients were discharged with no follow-up required.

Conclusion

There is no evidence to support the routine use of endoscopic evaluation after an episode of left-sided diverticulitis diagnosed on CT if no worrying radiological findings have been reported. This study supports similar findings from other recent studies and therefore we disagree with The Royal College of Surgeons of England (ACPGBI recommendation) commissioning guide, which advocates routine surveillance of the colon.

Acknowledgements

We would like to thank the teams at the Research and Audit Departments at Medway Maritime Hospital, Kent, especially Ms Hayley Beresford (Senior Research and Innovation Officer) and Mr Andrew Foote (Clinical Audit and Quality Improvement Facilitator), for their support and collaborative efforts during data collection. We would like also to thank the staff working at the Endoscopy Unit at Medway Maritime Hospital for their kind cooperation.

References

1. Munie ST, Nalamati SPM. Epidemiology and pathophysiology of diverticular disease. *Clin Colon Rectal Surg* 2018; **31**: 209–213.
2. Young-Fadok TM. Diverticulitis. *N Engl J Med* 2018; **379**: 1635–1642.
3. Weizman AV, Nguyen GC. Diverticular disease: epidemiology and management. *Can J Gastroenterol* 2011; **25**: 385–389.
4. Royal College of Surgeons of England. *Commissioning Guide: Colonic Diverticular Disease*. London: RCS; 2014.
5. De'Angelis N, Di Saverio S, Chiara O *et al*. 2017 WSES guidelines for the management of iatrogenic colonoscopy perforation. *World J Emerg Surg* 2018; **13**: 5.
6. Bonnington SN, Rutter MD. Surveillance of colonic polyps: are we getting it right? *World J Gastroenterol* 2016; **22**: 1925–1934.
7. Sharma PV, Eglington T, Hider P *et al*. Systematic review and meta analysis of the role of routine colonic evaluation after radiologically confirmed acute diverticulitis. *Ann Surg* 2014; **259**: 263–272.
8. Rottier SJ, van Dijk ST, van Geloven AAW *et al*. Meta-analysis of the role of colonoscopy after an episode of left-sided acute diverticulitis. *Br J Surg* 2019; **106**: 988–997.
9. Ng ZQ, Moe KS, Wijesuriya R. Routine colonoscopy after acute diverticulitis: is it warranted? *Surg Laparosc Endosc Percutan Tech* 2019; **29**: 462–466.
10. Ko CW, Doria-Rose VP, Barrett MJ *et al*. Screening colonoscopy and flexible sigmoidoscopy for reduction of colorectal cancer incidence: a case-control study. *PLoS One* 2019; **14**: e0226027.
11. Kim SY, Kim HS, Park HJ. Adverse events related to colonoscopy: global trends and future challenges. *World J Emerg Surg* 2019; **25**: 190–204.
12. Cross AJ, Wooldrage K, Robbins EC *et al*. Whole-colon investigation vs. flexible sigmoidoscopy for suspected colorectal cancer based on presenting symptoms and signs: a multicentre cohort study. *Br J Cancer* 2019; **120**: 154–164.
13. Diaz JJT, Asenjo BA, Soriano MR *et al*. Efficacy of colonoscopy after an episode of acute diverticulitis and risk of colorectal cancer. *Ann Gastroenterol* 2020; **33**: 68–72.
14. Holme Ø, Schoen RE, Senore C *et al*. Effectiveness of flexible sigmoidoscopy screening in men and women and different age groups: pooled analysis of randomised trials. *BMJ* 2017; **356**: i6673.
15. Cox B, Sneyd MJ, Hingston G *et al*. Enhancing bowel screening: preventing colorectal cancer by flexible sigmoidoscopy in New Zealand. *Public Health* 2019 **11**: 27–37.
16. Ghimire R, Limbu Y, Chakradhar R. Flexible sigmoidoscopy: optimal bowel preparation with enema versus polyethylene glycol. *J Kathmandu Med Coll* 2018; **7**: 50–54.

17. Bevan R, Rutter MD. Colorectal cancer screening-who, how, and when? *Clin Endosc* 2018; **51**: 37–49.
18. Kirkøyen B, Berstad P, Botteri E *et al*. Acceptability of two colorectal cancer screening tests: pain as a key determinant in sigmoidoscopy. *Endoscopy* 2017; **49**: 1075–1086.
19. Senore C, Hassan C, Regge D *et al*. Cost-effectiveness of colorectal cancer screening programmes using sigmoidoscopy and immunochemical faecal occult blood test. *J Med Screen* 2019; **26**: 76–83.
20. Makhzoum A, Louw J, Paterson WG. Comparison of flexible sigmoidoscopy screening in average risk patients performed by nurses versus gastroenterologists. *J Can Assoc Gastroenterol* 2018; **1**: 82–86.
21. Pathmakanthan S, Murray I, Smith K *et al*. Nurse endoscopists in United Kingdom health care: a survey of prevalence, skills and attitudes. *J Adv Nurs* 2001; **36**: 611–712.
22. Wernli KJ, Brenner AT, Rutter CM, Inadomi JM. Risks associated with anesthesia services during colonoscopy. *Gastroenterology* 2016; **150**: 888–e18.
23. Leung FW, Aljebreen AM, Brocchi E *et al*. Sedation-risk-free colonoscopy for minimizing the burden of colorectal cancer screening. *World J Gastrointest Endosc* 2010; **2**: 81–89.
24. Helmers RA, Dilling JA, Chaffee CR *et al*. Overall cost comparison of gastrointestinal endoscopic procedures with endoscopist- or anaesthesia-supported sedation by activity-based costing techniques. *Mayo Clin Proc Innov Qual Outcomes* 2017; **1**: 234–241.
25. Rutter MD, East J, Rees CJ *et al*. British Society of Gastroenterology/Association of Coloproctology of Great Britain and Ireland/Public Health England post-polypectomy and post-colorectal cancer resection surveillance guidelines. *Gut* 2020; **69**: 201–223.