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META-ANALYSIS

Should a colonoscopy be offered routinely to patients with CT proven acute diverticulitis? A retrospective cohort study and meta-analysis of best available evidence

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Abstract

BACKGROUND

The current guidelines suggest that patients should undergo endoscopic evaluation of the colonic lumen after an episode of computed tomography (CT) proven acute diverticulitis to rule out malignancy. The usefulness of routine endoscopic evaluation of CT proven diverticulitis remains unknown.

AIM

To establish whether routine colonoscopy should be offered to patients after an episode of diverticulitis.

METHODS

We performed a retrospective study, comparing two groups: a diverticulitis group and a control group. The diverticulitis group consisted of patients undergoing a colonoscopy after an episode of diverticulitis. The control group consisted of asymptomatic patients undergoing a screening sigmoidoscopy. We also performed a systematic review and meta-analysis. We searched electronic data resources to identify all relevant studies. The primary outcome was the number of adenomas found, while the secondary outcomes were the number of cancers and polyps identified, and the adenoma risk.

RESULTS

68 and 1309 patients were included in the diverticulitis and control groups respectively. There was no difference in the risk of adenomas (5.9% *vs* 7.6%, *P* =

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0.59), non-advanced adenomas (5.9% *vs* 6.9%, *P* = 0.75), advanced adenomas (0% *vs* 0.8%, *P* = 1), cancer (0% *vs* 0.15%, *P* = 1.00), and polyps (16.2% *vs* 14.2%, *P* = 0.65) between both groups. Meta-analysis of data from 4 retrospective observational studies, enrolling 4459 patients, showed no difference between the groups in terms of risk of adenomas (RD = -0.05, 95%CI: -0.11, 0.01, *P* = 0.10), non-advanced adenomas (RD = -0.02, 95%CI: -0.08, 0.04, *P* = 0.44), advanced adenomas (RD = -0.01, 95%CI: -0.04, 0.02, *P* = 0.36), cancer (RD = 0.01, 95%CI: -0.01, 0.03, *P* = 0.32), and polyps (RD = -0.05, 95%CI: -0.12, 0.02, *P* = 0.18).

CONCLUSION

Routine colonoscopy may not be appropriate in patients with acute diverticulitis. High quality prospective studies are required for more robust conclusions.

Key words: Diverticulitis; Colon cancer; Screening, Colonoscopy; Sigmoidoscopy

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Core tip: The results of this study suggest that patients with computed tomography (CT)-proven acute diverticulitis are not at increased risk of colonic adenomas and neoplastic lesions as indicated by comparable endoscopic findings to general populations undergoing screening endoscopy. This suggests that endoscopic evaluation of colon may not be beneficial in cases with CT-proven acute diverticulitis and could be preserved for selected cases only. Our results are consistent with the best available evidence in the literature. However, the best available evidence is derived from a limited number of retrospective studies with moderate quality. High quality prospective studies are required for definite conclusions.

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INTRODUCTION

Diverticulosis is a common colonic condition, which increases in prevalence with age. In the United States, 50% of people over 50 years old, and 75% of people over 80 years old, are affected by this condition[1]. Although most of these patients remain asymptomatic, between 10%-25% of patients with diverticulosis, do develop diverticulitis[2]. That means, up to 12.5% of people over 50 years old, will develop diverticulitis in their lifetime. This represents a significant burden on the healthcare system, and therefore, it is important to have clear and evidence-based protocols to manage this condition.

The Association of Coloproctologists of Great Britain and Ireland (ACPGBI) guidelines, and the American Society of Colon and Rectal Surgeons (ASCRS) guidelines, both stipulate, that patients with a suspected episode of acute diverticulitis, should undergo a computed tomography (CT) scan during the acute episode for diagnostic purposes, and an endoscopic evaluation of the colonic lumen after the acute episode, to rule out other pathologies such as malignancy or inflammatory bowel disease[3,4]. The World Society of Emergency Surgery (WSES) published guidelines, suggesting that patients with diverticular abscesses treated conservatively require early colonic evaluation with colonoscopy, however, patients with CT proven uncomplicated diverticulitis do not require follow-up colonoscopy[5]. However, these guidelines are mainly based on expert opinion and low quality evidence[5].

Previously, diverticulitis was mainly a clinical diagnosis, and barium enema was the investigation of choice to assess this[6,7]. With the evolution and ease of access of modern day CT imaging, it has since become the gold standard of investigation for many intra-abdominal conditions, including diverticulitis. It has a high sensitivity and specificity in detecting diverticulitis, as well as its complications[6,7]. On the other hand, colonoscopy by nature is invasive. It is associated with discomfort, particularly

in patients with diverticular disease[6]. Patients with diverticular disease also have more difficult endoscopic procedures, and have a higher risk of perforation[8]. Cost-effectiveness of investigating every CT-proven diverticulitis remains unclear[9]. Because of this, several authors, between the years 2011 to 2017 have tried to investigate the usefulness of endoscopy post CT-proven diverticulitis. It is interesting to note, that the vast majority of studies concluded that there was no benefit for endoscopic evaluation post CT-proven diverticulitis, in particular, for those patients with uncomplicated diverticulitis[6,7,10-21]. This is contradictory to the guidelines' recommendations.

Our objective was to assess the usefulness of endoscopic evaluation of CT proven diverticulitis. To achieve this objective, we conducted a multicentre retrospective cohort to assess the risk of colonic adenoma in patients with CT-proven diverticulitis compared to those in general population undergoing colonoscopy for bowel cancer screening. Furthermore, we conducted a systematic review of the literature and meta-analysis of outcomes to provide the best available comparative evidence on usefulness of endoscopic evaluation of CT proven diverticulitis.

MATERIALS AND METHODS

Study design

On gaining approval from the clinical governance department unit, we conducted a retrospective cohort study in three centres in the north west of England. The study group included consecutive patients who were admitted to our trust with an episode of acute diverticulitis over a three-year period between January 2014 and December 2016. The control group included all patients who had undergone a one-off screening flexible sigmoidoscopy at the age of fifty-five, as part of the National Bowel Cancer Screening Programme over a fourteen-month period between October 2015 and December 2016.

Patient selection and data collection

For the study group, we considered all participants of any age or gender with an episode of CT-proven acute diverticulitis who subsequently underwent endoscopic evaluation of colon. Endoscopic evaluation of interest included either a flexible sigmoidoscopy or a colonoscopy. All patients who did not have CT scan for diagnosis of diverticulitis and those who did not have subsequent endoscopic evaluation were excluded. For the screening group, we considered participants of any age or gender in general population who underwent endoscopic evaluation of colon at the age of fifty-five as part of the National Bowel Screening Programme. Symptomatic patients were excluded.

A data collection proforma was designed for data collection. The proforma included data on participant's demographics (age and gender), type of endoscopic evaluation (flexible sigmoidoscopy or colonoscopy), endoscopic findings and outcomes [the number of polyps found, the number of adenomas found, the risk of the adenomas (low-risk, intermediate-risk, or high-risk), the number of cancers found, and the final histology]. Data collection was performed by three independent authors. Any discrepancies were resolved by discussion between the authors. An independent fourth author was consulted in the event of disagreement.

Primary and secondary outcomes

We considered the total number of adenomas, non-advanced adenomas, and advanced adenomas as primary outcome measures. The secondary outcomes included low-risk adenomas, intermediate-risk adenomas, high-risk adenomas, invasive cancers, total number of polyps, and hyperplastic polyps.

Advanced adenomas were defined as adenomas that on histology were greater than 1 cm in size, have a villous component, or have high-grade dysplasia. All other adenomas were non-advanced adenomas. Based on endoscopy findings, low-risk adenomas were defined as patients with only one or two small adenomas. Intermediate-risk adenomas were defined as patients with three to four small adenomas or one large adenoma. High-risk adenomas were defined as patients with five or more small adenomas, or three or more adenomas with at least one of them being large. Small adenomas were those that were less than 1 cm in size, while large adenomas were defined as those that were greater 1 cm in size.

Statistical analysis

Simple descriptive statistics was applied to present demographics, clinical characteristics, and outcome data. Data were summarized with mean ± SD for continuous variables, and frequencies/percentages for categorical variables.

Differences between the groups were tested for statistical significance using the independent *t*-test for continuous variables and the χ^2 test or Fisher exact test for categorical variables, as appropriate. All statistical tests were two-tailed and statistical significance was assumed at $P < 0.05$. Statistical analyses was performed using Minitab 17 (Minitab® 17.1.0).

Methods of systematic review and meta-analysis

We performed a systematic review according to an agreed predefined protocol and we were compliant with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement standards[22]. We conducted a search of electronic information sources, including MEDLINE; EMBASE; CINAHL; the Cochrane Central Register of Controlled Trials (CENTRAL); the World Health Organization International Clinical Trials Registry; ClinicalTrials.gov; and ISRCTN Register, and bibliographic reference lists to identify all studies comparing the risk of colonic adenoma and neoplastic lesions in patients with CT-proven diverticulitis compared to those in general population undergoing endoscopic evaluation for bowel cancer screening. Our data extraction spreadsheet included study-related data (first author, year of publication, country of origin of the corresponding author, journal in which the study was published, study design, study size, clinical condition of the study participants), baseline demographic information of the included populations (age, gender), and primary and secondary outcome data (adenomas, non-advanced adenomas, advanced adenomas, polyps, and invasive cancers). The methodological quality and risk of bias of the included studies were assessed using the Newcastle-Ottawa scale (NOS)[23]. Literature search, study selection, data collection, and methodological quality assessment were performed by two independent authors. Any discrepancies were resolved by discussion between the authors. An independent third author was consulted in the event of disagreement. We calculated the risk difference (RD) as the summary measure. Heterogeneity among the studies was assessed using the Cochran *Q* test (χ^2). Random or fixed effects modelling were used as appropriate for analysis; random effects models were used if considerable heterogeneity was found among the studies. The results were reported in a forest plot with 95% confidence intervals (CIs). We used the Review Manager 5.3 software for data synthesis.

RESULTS

Baseline patient characteristics

A total of 1377 patients were included in this study. Of these, 68 patients were included in the diverticulitis group and 1309 patients were included in the screening group. The mean age of the included patients in the diverticulitis group and screening group were 59.1(95%CI: 55.67- 62.4) and 55.4 (95%CI: 55.1-55.7), respectively. Thirty five out of 68 and 694 out of 1309 were male in the diverticulitis group and screening group, respectively (51.5% *vs* 53.0%, $P = 0.94$). Diverticulitis had been confirmed by CT scan in all patients in the diverticulitis group. In terms of endoscopic evaluation of colon, all patients in the diverticulitis group underwent colonoscopy while patients in the screening group underwent flexible sigmoidoscopy. Time from diagnosis of diverticulitis and endoscopic evaluations of the colon ranged from 2 to 12 mo.

Outcomes

The outcome data is summarised in Table 1

Adenomas: In the diverticulitis group, 4 out of 68 patients were found to have adenomas (5.9%), while in the screening group, 100 out of 1309 patients were found to have adenomas (7.6%). There was no significant difference in the total number of adenomas between the two groups (5.9% *vs* 7.6%, $P = 0.59$).

Non-advanced adenomas: In the diverticulitis group, 4 out of 68 patients were found to have non-advanced adenomas (5.9%), while in the screening group, 90 out of 1309 patients were found to have non-advanced adenomas (6.9%). There was no significant difference in the total number of non-advanced adenomas between the two groups (5.9% *vs* 6.9%, $P = 0.75$).

Advanced adenomas: In the diverticulitis group, 0 out of 68 patients were found to have advanced adenomas (0%), while in the screening group, 10 out of 1309 patients were found to have advanced adenomas (0.8%). There was no significant difference in the total number of advanced adenomas between the two groups (0% *vs* 0.8%, $P = 1$).

Table 1 The outcomes in diverticulitis and screening groups

	Diverticulitis group	Screening group	*P*-value
Total number of patients	68	1309	-
Mean age	59.1(55.67- 62.4)	55.4 (55.1, 55.7)	< 0.001
Male patients	35 of 68 (51.5%)	694 out of 1309	0.94
Patients with adenoma	4 out of 68 (5.9%)	100 out of 1309 (7.6%)	0.59
Patients with non-advanced adenoma	4 out of 68 (5.9%)	90 out of 1309 (6.9%)	0.75
Patients with advanced adenoma	0 out of 68 (0%)	10 out of 1309 (0.8%)	1
Patients with low-risk adenoma	4 out of 68 (5.9%)	84 out of 1309 (6.4%)	0.86
Patients with intermediate-risk adenoma	0 out of 68 (0%)	12 out of 1309 (0.92%)	1
Patients with high-risk adenoma	0 out of 68 (0%)	4 out of 1309 (0.31%)	1
Patients with cancers	0 out of 68 (0%)	2 out of 1309 (0.15%)	1
Patients with polyps	11 out of 68 (16.2%)	186 out of 1309 (14.2%)	0.65
Patients with hyperplastic polyps	6 out of 68 (8.8%)	60 out of 1309 (4.6%)	0.11
Patients with unbiopsied polyps	1 out of 68 (1.5%)	24 out of 1309 (1.8%)	0.83

Low-risk adenoma: In the diverticulitis group, 4 out of 68 patients were found to have low-risk adenoma (5.9%), while in the screening group, 84 out of 1309 patients were found to have low-risk adenoma (6.4%). There was no significant difference in the risk of low-risk adenomas between the two groups (5.9% *vs* 6.4%, $P = 0.86$).

Intermediate-risk adenoma: In the diverticulitis group, 0 out of 68 patients were found to have intermediate-risk adenoma (0%), while in the screening group, 12 out of 1309 patients were found to have intermediate-risk adenoma (0.92%). There was no significant difference in the risk of intermediate-risk adenomas between the two groups (0% *vs* 0.92%, $P = 1.00$).

High-risk adenoma: In the diverticulitis group, 0 out of 68 patients were found to have high-risk adenoma (0%), while in the screening group, 4 out of 1309 patients were found to have high-risk adenoma (0.31%). There was no significant difference in the risk of high-risk adenomas between the two groups (0% *vs* 0.31%, $P = 1.00$).

Cancers: No cancers were found in the 68 patients in the diverticulitis group. In the screening group, 2 out of 1309 patients had cancers (0.15%). There was no significant difference between the two groups in terms of cancers found (0% *vs* 0.15%, $P = 1.00$).

Polyps: In the diverticulitis group, 11 out of 68 patients were found to have polyps (16.2%), while in the screening group, 186 out of 1309 patients were found to have polyps (14.2%). There was no significant difference in the total number of polyps between the two groups (16.2% *vs* 14.2%, $P = 0.65$).

Hyperplastic polyps: In the diverticulitis group, 6 out of 68 patients were found to have hyperplastic polyps (8.8%), while in the screening group, 60 out of 1309 patients were found to have hyperplastic polyps (4.6%). There was no significant difference between the two groups in terms of hyperplastic polyps found (8.8% *vs* 4.6%, $P = 0.11$).

Unbiopsied polyps: In the study group, 1 out of 68 patients had polyps which were not biopsied during the endoscopy (1.5%), while in the control group, 24 out of 1309 patients had small benign looking polyps that were not biopsied during endoscopy (1.8%). There was no significant difference between the two groups in terms of unbiopsied polyps (1.5% *vs* 1.8%, $P = 0.83$).

Literature search results and meta-analysis

Searches of electronic databases identified 3 retrospective observational studies[16,17,24] enrolling a total of 3082 patients. We included the population of current study (1377 patients) in the meta-analysis increasing the total number of analysed patients to 4459 patients. Overall, 1022 patients were included in the diverticulitis group and 3437 patients were included in the screening group. The patients in the diverticulitis group were older than the screening group (Mean difference: 0.40, 95%CI: 0.11, 0.68, $P = 0.006$). There was no significant difference between the two groups in terms of gender (OR =C 0.94, 95%CI: 0.81, 1.09, $P = 0.41$). All patients in the diverticulitis group had CT-proven diverticulitis. In the diverticulitis group, all patients underwent colo-

noscopy for endoscopic assessment of the colon, while in the screening group, 2128 patients underwent colonoscopy and 1309 patients underwent flexible sigmoidoscopy. The baseline characteristics of the included studies and baseline characteristics of the included population are demonstrated in Table 2. The summary and results of methodological quality assessment of the 4 observational studies[16,17,24] are demonstrated graphically in Figure 1.

The results of analyses showed that there was no significant difference in the risk of adenomas (RD = -0.05, 95%CI: -0.11, 0.01, P = 0.10), non-advanced adenomas (RD = -0.02, 95%CI: -0.08, 0.04, P = 0.44), advanced adenomas (RD = -0.01, 95%CI: -0.04, 0.02, P = 0.36), cancer (RD = 0.01, 95%CI: -0.01, 0.03, P = 0.32), and polyps (RD = -0.05, 95%CI: -0.12, 0.02, P = 0.18) between the diverticulitis and screening groups (Figure 2). The between study heterogeneity was high for adenomas (I^2 = 77%, P = 0.01), high for non-advanced adenomas (I^2 = 81%, P = 0.005), high for advanced adenomas I^2 = 79%, P = 0.002), high for cancer (I^2 = 86%, P < 0.0001), and moderate for polyps (I^2 = 72%, P = 0.03) (Figure 2).

DISCUSSION

We conducted a multicentre retrospective cohort study to assess the risk of colonic adenomas and neoplastic lesions in patients with CT-proven diverticulitis compared to those in general population undergoing endoscopic evaluation for bowel cancer screening. The results of the current study showed that there was no difference in the risk of adenomas, non-advanced adenomas, advanced adenomas, cancer, and polyps between the diverticulitis and screening groups. We also performed a systematic review and meta-analysis of the literature to provide the best available evidence. We identified 4 retrospective observational studies[16,17,24] (including the current study) enrolling a total of 4459 patients. The results of analyses also showed that there is no difference in the risk of adenomas, non-advanced adenomas, advanced adenomas, cancer, and polyps between the diverticulitis and screening groups. The quality of the best available evidence was moderate.

The current ACPGBI and ASCRS guidelines both suggest that patients should undergo endoscopic evaluation of the colonic lumen after an episode of CT proven acute diverticulitis to rule out malignancy[3,4]. However, after reviewing all 1377 patients from our study, and 4459 patients in our meta-analysis, we did not find any evidence that diverticulitis patients had any more adenomas, advanced adenomas, or cancers than the general population. There was therefore seemingly no benefit from this endoscopic evaluation. It therefore follows, that routine endoscopic assessment of patients after an episode of CT proven acute diverticulitis, may be unnecessary.

Colonoscopy has several procedure-related risks such as bleeding or perforation[8]. Reducing the number of colonoscopies would reduce the number of colonoscopy-related complications, and therefore reduce the associated morbidity and mortality. Moreover, colonoscopies on patients with diverticular disease appear to have a higher failure rate, and tend to cause the patient a great deal of discomfort[6]. Furthermore, due to the high number of patients who suffer from diverticulitis, the cost-burden of performing colonoscopies on them post acute episode is significant[9]. Reducing unnecessary colonoscopies on patients with diverticular disease will therefore avoid these issues and reduce excess costs.

It is therefore of the authors' opinion, that patients should be considered for endoscopy on a case-by-case basis. Only patients who have uncertainty in the diagnosis, or those who have complicated diverticulitis should be offered endoscopic evaluation.

The reported outcomes of the current study should be viewed and interpreted in the context of inherent limitations. In terms of the cohort study, our study had a retrospective design which subject our results to inevitable selection bias. The included patients in the diverticulitis group were older than the patients in the screening group; Moreover, the number of patients in the diverticulitis group was conspicuously smaller than the number of patients in the screening group. All of these, together with the fact that patients in the screening group underwent flexible sigmoidoscopy instead of colonoscopy, might have led to underestimation of the risk of adenomas and neoplastic lesions in the screening group. In terms of the meta-analysis, the best available evidence is derived from a limited number retrospective of studies which are subject to selection bias. The between study heterogeneity was high for almost all outcomes and the quality of the available evidence was moderate. All of these might have affected the robustness of our results.

Our results suggest that patients with CT-proven acute diverticulitis are not at increased risk of colonic adenomas and neoplastic lesions as indicated by comparable

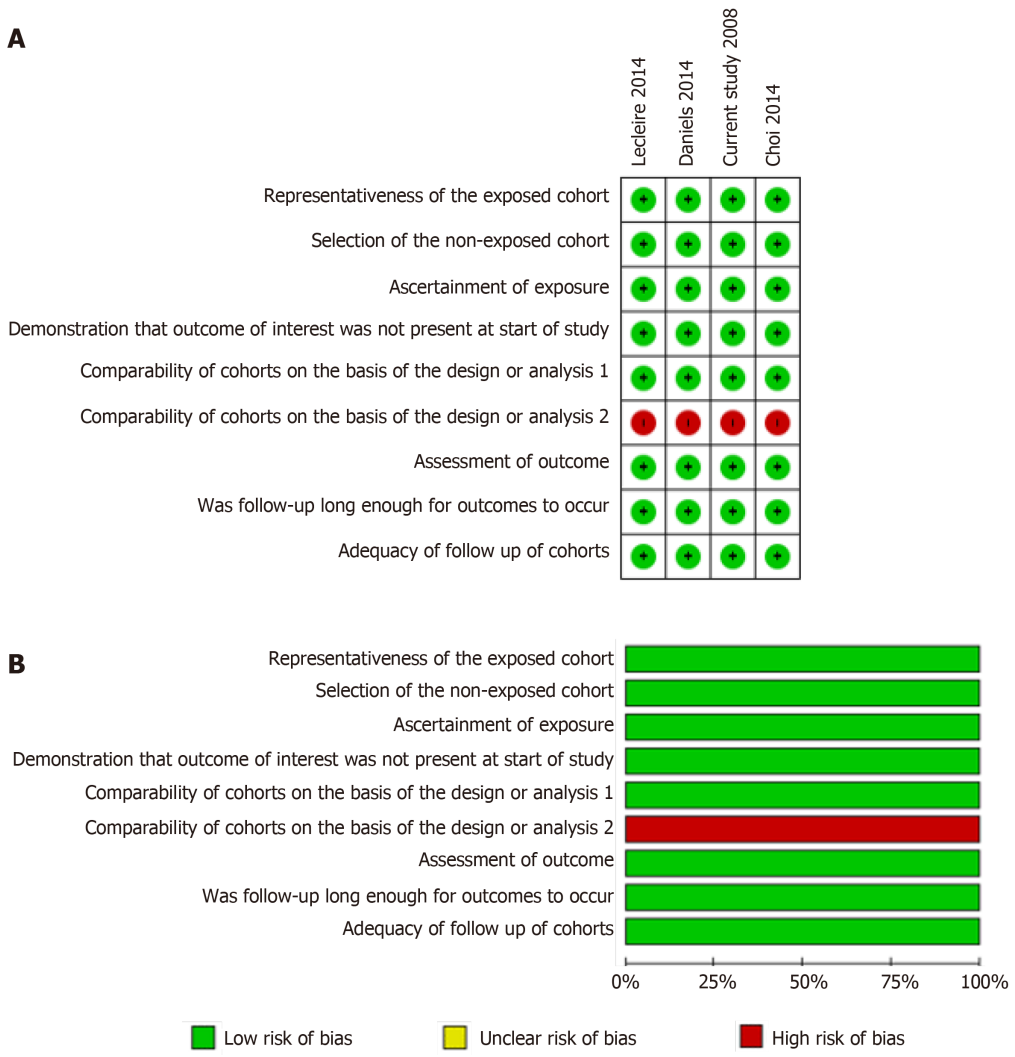


Figure 1 Risk of bias summary (A) and graph (B) showing authors' judgements about each risk of bias item for observational studies.

endoscopic findings to general populations undergoing screening endoscopy. This suggests that endoscopic evaluation of colon may not be beneficial in cases with CT-proven acute diverticulitis and could be preserved for selected cases only. Our results are consistent with the best available evidence in the literature. However, the best available evidence is derived from a limited number of retrospective studies with moderate quality. High quality prospective studies are required for definite conclusions.

Table 2 Baseline characteristics of the included studies in the meta-analysis

Ref.	Year	Country	Journal	Design	Description of diverticulitis group	Description of control group	How diverticulitis is diagnosed	Time from diagnosis to endoscopy	Sample size	
									Diverticulitis group	Screening group
Current study	2018	United Kingdom	Not applicable	Retrospective observational	Patients undergoing a colonoscopy after medical treatment of CT proven diverticulitis	Individuals from the general population undergoing flexible sigmoidoscopy for screening purposes at age of 55	Computed tomography	up to 12 mo	68	1309
Daniels *et al*[16]	2014	The Netherlands	*Surg Endosc*	Retrospective observational	Patients undergoing a colonoscopy after medical treatment of CT proven diverticulitis	Individuals from the general population between the age of 50-75 undergoing screening colonoscopy	Computed tomography	up to 6 mo	401	1426
Lecleire *et al*[17]	2014	France	*United European Gastroenterol J*	Retrospective observational	Patients undergoing a colonoscopy after medical treatment of CT proven diverticulitis	Asymptomatic patients undergoing a screening colonoscopy	Computed tomography	up to 6 mo	404	404
Choi *et al*[24]	2014	South Korea	*Dig Dis Sci*	Retrospective observational	Patients undergoing a colonoscopy after medical treatment of CT proven diverticulitis	Healthy individuals undergoing screening colonoscopy	Computed tomography	up to 12 mo	149	298

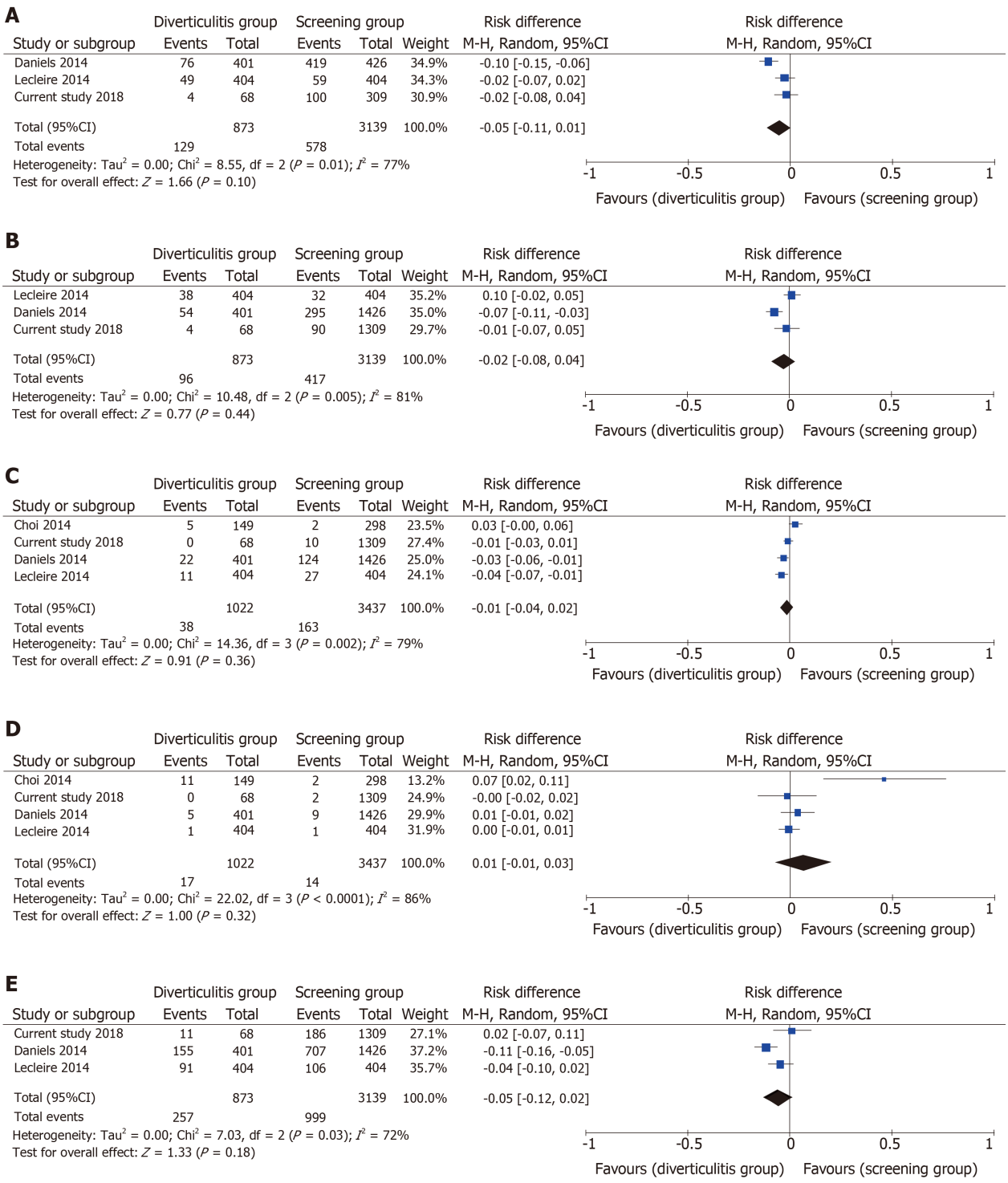


Figure 2 Forest plots of the comparisons of outcomes between the diverticulitis and screening groups. A: Adenomas; B: Non-advanced adenomas; C: Advanced adenomas; D: Cancer; E: Polyps.

ARTICLE HIGHLIGHTS

Research background

The current guidelines suggest that patients should undergo endoscopic evaluation of the colonic lumen after an episode of computed tomography (CT) proven acute diverticulitis to rule out malignancy. However, with the advancement and evolution of CT scan technology, the necessity for routine colonoscopy post episode of acute diverticulitis has become questionable.

Research motivation

Colonoscopy is invasive and is associated with discomfort, particularly in patients with diverticular disease. Patients with diverticular disease also have more difficult endoscopic

procedures, and have a higher risk of perforation. Cost-effectiveness of investigating all patients also remains unclear. For this reason, this project has set out to establish whether routine colonoscopy should be offered to patients after an episode of acute diverticulitis.

Research objectives

The main objective of this research was to establish whether there was any added benefit to offering patients routine colonoscopy after every episode of acute diverticulitis. The significance of demonstrating that colonoscopy may in fact not be required routinely would be two-fold. It would allow for a reduction in number of colonoscopy related complications including discomfort, bleeding and perforation, as well as a significant reduction in overall costs, and financial burden.

Research methods

We conducted a retrospective cohort study in three centres in the north west of England. The study group included consecutive patients who were admitted to our trust with an episode of acute diverticulitis over a three-year period between January 2014 and December 2016. The control group included all patients who had undergone a one-off screening flexible sigmoidoscopy at the age of fifty-five, as part of the National Bowel Cancer Screening Programme over a fourteen-month period between October 2015 and December 2016. Three independent authors collected the data using a data collection proforma. We considered the total number of adenomas, non-advanced adenomas, and advanced adenomas as primary outcome measures. The secondary outcomes included low-risk adenomas, intermediate-risk adenomas, high-risk adenomas, invasive cancers, total number of polyps, and hyperplastic polyps. We also performed a systematic review according to an agreed predefined protocol and we were compliant with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement standards. We calculated the risk difference (RD) as the summary measure. Heterogeneity among the studies was assessed using the Cochrane *Q* test (χ^2). Random or fixed effects modelling were used as appropriate for analysis; random effects models were used if considerable heterogeneity was found among the studies. The results were reported in a forest plot with 95% confidence intervals (CIs). We used the Review Manager 5.3 software for data synthesis.

Research results

Overall, 68 and 1309 patients were included in the diverticulitis and control groups respectively. There was no difference in the risk of adenomas (5.9% *vs* 7.6%, $P = 0.59$), non-advanced adenomas (5.9% *vs* 6.9%, $P = 0.75$), advanced adenomas (0% *vs* 0.8%, $P = 1$), cancer (0% *vs* 0.15%, $P = 1.00$), and polyps (16.2% *vs* 14.2%, $P = 0.65$) between both groups. Meta-analysis of data from 4 retrospective observational studies, enrolling 4459 patients, showed no difference between the groups in terms of risk of adenomas (RD = -0.05, 95%CI: -0.11, 0.01, $P = 0.10$), non-advanced adenomas (RD = -0.02, 95%CI: -0.08, 0.04, $P = 0.44$), advanced adenomas (RD = -0.01, 95%CI: -0.04, 0.02, $P = 0.36$), cancer (RD = 0.01, 95%CI: -0.01, 0.03, $P = 0.32$), and polyps (RD = -0.05, 95%CI: -0.12, 0.02, $P = 0.18$). The results of the current study as well as the meta-analyses showed that there is no difference in the risk of adenomas, non-advanced adenomas, advanced adenomas, cancer, and polyps between the diverticulitis and screening groups. The quality of the best available evidence was moderate. It is therefore of the authors' opinion, that patients should be considered for endoscopy on a case-by-case basis. Only patients who have uncertainty in the diagnosis, or those who have complicated diverticulitis should be offered endoscopic evaluation. The reported outcomes of the current study should be viewed and interpreted in the context of inherent limitations. In terms of the cohort study, our study had a retrospective design which subject our results to inevitable selection bias. The included patients in the diverticulitis group were older than the patients in the screening group; Moreover, the number of patients in the diverticulitis group was conspicuously smaller than the number of patients in the screening group. All of these, together with the fact that patients in the screening group underwent flexible sigmoidoscopy instead of colonoscopy, might have led to underestimation of the risk of adenomas and neoplastic lesions in the screening group. In terms of the meta-analysis, the best available evidence is derived from a limited number retrospective of studies which are subject to selection bias. The between study heterogeneity was high for almost all outcomes and the quality of the available evidence was moderate. All of these might have affected the robustness of our results.

Research conclusions

The results of this study have shown no difference between diverticulitis and control groups in terms of its primary and secondary outcomes. It has therefore demonstrated that it may not be necessary to offer all patients with acute diverticulitis a subsequent colonoscopy. The implications of this in practice, would be a reduction in the number of unnecessary colonoscopies, and therefore a subsequent reduction in associated morbidity and cost.

Research perspectives

The best available evidence currently is derived from a limited number of retrospective studies with moderate quality. High quality prospective studies are required for definite conclusions.

REFERENCES

1 **RCS**. Commissioning Guide: Colonic Diverticular Disease. 2014. Available from: URL: https://www.acpgbi.org.uk/content/uploads/2017/02/Commissioning-guide-colonic-diverticular-disease-RCS-2014.pdf. Accessed April 26, 2017

2 **Stollman N**, Raskin JB. Diverticular disease of the colon. *Lancet* 2004; **363**: 631-639 [PMID: 14987890 DOI: 10.1016/S0140-6736(04)15597-9]

3 **Fozard JB**, Armitage NC, Schofield JB, Jones OM; Association of Coloproctology of Great Britain and Ireland. ACPGBI position statement on elective resection for diverticulitis. *Colorectal Dis* 2011; **13** Suppl 3: 1-11 [PMID: 21366820 DOI: 10.1111/j.1463-1318.2010.02531.x]

4 **Feingold D**, Steele SR, Lee S, Kaiser A, Boushey R, Buie WD, Rafferty JF. Practice parameters for the treatment of sigmoid diverticulitis. *Dis Colon Rectum* 2014; **57**: 284-294 [PMID: 24509449 DOI: 10.1097/DCR.0000000000000075]

5 **Sartelli M**, Catena F, Ansaloni L, Coccolini F, Griffiths EA, Abu-Zidan FM, Di Saverio S, Ulrych J, Kluger Y, Ben-Ishay O, Moore FA, Ivatury RR, Coimbra R, Peitzman AB, Leppaniemi A, Fraga GP, Maier RV, Chiara O, Kashuk J, Sakakushev B, Weber DG, Latifi R, Biffl W, Bala M, Karamarkovic A, Inaba K, Ordonez CA, Hecker A, Augustin G, Demetrashvili Z, Melo RB, Marwah S, Zachariah SK, Shelat VG, McFarlane M, Rems M, Gomes CA, Faro MP, Júnior GA, Negoi I, Cui Y, Sato N, Vereczkei A, Bellanova G, Birindelli A, Di Carlo I, Kok KY, Gachabayov M, Gkiokas G, Bouliaris K, Çolak E, Isik A, Rios-Cruz D, Soto R, Moore EE. WSES Guidelines for the management of acute left sided colonic diverticulitis in the emergency setting. *World J Emerg Surg* 2016; **11**: 37 [PMID: 27478494 DOI: 10.1186/s13017-016-0095-0]

6 **Daniels L**, Unlü C, de Wijkerslooth TR, Dekker E, Boermeester MA. Routine colonoscopy after left-sided acute uncomplicated diverticulitis: a systematic review. *Gastrointest Endosc* 2014; **79**: 378-89; quiz 498-498.e5 [PMID: 24434085 DOI: 10.1016/j.gie.2013.11.013]

7 **Brar MS**, Roxin G, Yaffe PB, Stanger J, MacLean AR, Buie WD. Colonoscopy following nonoperative management of uncomplicated diverticulitis may not be warranted. *Dis Colon Rectum* 2013; **56**: 1259-1264 [PMID: 24105001 DOI: 10.1097/DCR.0b013e3182a26bfd]

8 **Panteris V**, Haringsma J, Kuipers EJ. Colonoscopy perforation rate, mechanisms and outcome: from diagnostic to therapeutic colonoscopy. *Endoscopy* 2009; **41**: 941-951 [PMID: 19866393 DOI: 10.1055/s-0029-1215179]

9 **Disbrow M**, Foxx-Orenstein A, Agrwal N. Utility of Colonoscopy to Exclude Underlying Malignant Polyps After Resolution of Uncomplicated Diverticulitis. *J Am Osteopath Assoc* 2015; **115**: 720-723 [PMID: 26618817 DOI: 10.7556/jaoa.2015.147]

10 **Suhardja TS**, Norhadi S, Seah EZ, Rodgers-Wilson S. Is early colonoscopy after CT-diagnosed diverticulitis still necessary? *Int J Colorectal Dis* 2017; **32**: 485-489 [PMID: 28035461 DOI: 10.1007/s00384-016-2749-5]

11 **Andrade P**, Ribeiro A, Ramalho R, Lopes S, Macedo G. Routine Colonoscopy after Acute Uncomplicated Diverticulitis - Challenging a Putative Indication. *Dig Surg* 2017; **34**: 197-202 [PMID: 27941344 DOI: 10.1159/000449259]

12 **Walker AS**, Bingham JR, Janssen KM, Johnson EK, Maykel JA, Ocampo O, Gonzalez JP, Steele SR. Colonoscopy after Hinchey I and II left-sided diverticulitis: utility or futility? *Am J Surg* 2016; **212**: 837-843 [PMID: 27287835 DOI: 10.1016/j.amjsurg.2016.02.012]

13 **Horesh N**, Saeed Y, Horesh H, Berger Y, Speter C, Pery R, Rosin D, Gutman M, Zmora O. Colonoscopy after the first episode of acute diverticulitis: challenging management paradigms. *Tech Coloproctol* 2016; **20**: 383-387 [PMID: 27170283 DOI: 10.1007/s10151-016-1478-7]

14 **Hashimoto R**, Matsuda T, Chonan A. Colonoscopy After Computed Tomography-diagnosed Acute Right-sided Diverticulitis May Be Unnecessary. *J Clin Gastroenterol* 2016; **50**: 611-612 [PMID: 26974757 DOI: 10.1097/MCG.0000000000000516]

15 **Ou G**, Rosenfeld G, Brown J, Chan N, Hong T, Lim H, Bressler B. Colonoscopy after CT-diagnosed acute diverticulitis: Is it really necessary? *Can J Surg* 2015; **58**: 226-231 [PMID: 26022155 DOI: 10.1503/cjs.014514]

16 **Daniels L**, Ünlü Ç, de Wijkerslooth TR, Stockmann HB, Kuipers EJ, Boermeester MA, Dekker E. Yield of colonoscopy after recent CT-proven uncomplicated acute diverticulitis: a comparative cohort study. *Surg Endosc* 2015; **29**: 2605-2613 [PMID: 25472747 DOI: 10.1007/s00464-014-3977-9]

17 **Lecleire S**, Nahon S, Alatawi A, Antonietti M, Chaput U, Di-Fiore A, Alhameedi R, Marteau P, Ducrotté P, Dray X. Diagnostic impact of routine colonoscopy following acute diverticulitis: A multicenter study in 808 patients and controls. *United European Gastroenterol J* 2014; **2**: 301-306 [PMID: 25083288 DOI: 10.1177/2050640614541765]

18 **de Vries HS**, Boerma D, Timmer R, van Ramshorst B, Dieleman LA, van Westreenen HL. Routine colonoscopy is not required in uncomplicated diverticulitis: a systematic review. *Surg Endosc* 2014; **28**: 2039-2047 [PMID: 24488358 DOI: 10.1007/s00464-014-3447-4]

19 **Sallinen V**, Mentula P, Leppäniemi A. Risk of colon cancer after computed tomography-diagnosed acute diverticulitis: is routine colonoscopy necessary? *Surg Endosc* 2014; **28**: 961-966 [PMID: 24178863 DOI: 10.1007/s00464-013-3257-0]

20 **Schmilovitz-Weiss H**, Yalunin E, Boaz M, Sehayek-Shabbat V, Levin I, Chervinski A, Atar E, Niv Y, Shirin H. Does a colonoscopy after acute diverticulitis affect its management?: a single center experience. *J Clin Gastroenterol* 2012; **46**: 317-320 [PMID: 22186742 DOI: 10.1097/MCG.0b013e31823a43a1]

21 **Westwood DA**, Eglinton TW, Frizelle FA. Routine colonoscopy following acute uncomplicated diverticulitis. *Br J Surg* 2011; **98**: 1630-1634 [PMID: 21713756 DOI: 10.1002/bjs.7602]

22 **Liberati A**, Altman DG, Tetzlaff J, Mulrow C, Gøtzsche PC, Ioannidis JP, Clarke M, Devereaux PJ, Kleijnen J, Moher D. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ* 2009; **339**: b2700 [PMID: 19622552 DOI: 10.1136/bmj.b2700]

23 **Wells GA**, Shea B, O'Connell D, Peterson J, Welch V, Losos M, Tugwell P. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses. Available from: http://www.ohri.ca/programs/clinical_epidemiology/nos_manual.pdf. Accessed April 29, 2017

24 **Choi YH**, Koh SJ, Kim JW, Kim BG, Lee KL, Im JP, Kim JS, Jung HC. Do we need colonoscopy following acute diverticulitis detected on computed tomography to exclude colorectal malignancy? *Dig Dis Sci* 2014; **59**: 2236-2242 [PMID: 24723071 DOI: 10.1007/s10620-014-3151-1]

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CASE REPORT

Endoscopic management of massive rectal bleeding from a Dieulafoy's lesion: Case report

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Abstract

BACKGROUND

Rectal Dieulafoy's lesions (DLs) are very rare; however, they can be life threatening when presented with massive hemorrhage.

CASE SUMMARY

A 44-year-old female with medical history of chronic renal failure who was on renal replacement therapy presented with lower gastrointestinal hemorrhage. Physical examination revealed signs of hypovolemic shock and massive rectal bleeding. Complete blood count revealed abrupt decrease in hematocrit. After hemodynamic stabilization, an urgent colonoscopy was performed. A rectal DL was diagnosed, and it was successfully treated with two hemoclips. There were no signs of recurrent bleeding at thirty days of follow-up.

CONCLUSION

Rectal DLs represent an unusual cause of lower gastrointestinal bleeding. Massive hemorrhage can increase the morbidity and mortality of these patients. Endoscopic management continues to be the reference standard in the diagnosis and therapy of these lesions. Thermal, mechanical (hemoclip or band ligation), or combination therapy (adrenaline injection combined with thermal or mechanical therapy) should be considered the first choice for treatment.

Key words: Dieulafoy's Lesion; Endoscopic hemostasis; Massive rectal bleeding; Case report

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Core tip: Rectal Dieulafoy's lesion (DL) represents an unusual cause of lower gastrointestinal bleeding. A 44-year-old female with medical history of chronic renal failure presented massive rectal bleeding. After proper initial management, an urgent colonoscopy was performed. A rectal DL was diagnosed and successfully treated with two hemoclips without recurrence of hemorrhage. Endoscopy is the reference standard for the diagnosis and treatment of these lesions.

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INTRODUCTION

Dieulafoy's lesions (DLs) represent less than 5% of all causes of gastrointestinal bleeding. These lesions were initially described as gastric aneurysms by Gallard in 1884, but it was in 1898 when George Dieulafoy, a French surgeon, identified them in three patients as the cause of gastrointestinal bleeding[1]. More than 90% of the lesions are located at the upper gastrointestinal tract and only 2% are found at the rectum[2]. Unlike the proximal lesions, rectal DLs (RDL) usually present hematochezia and/or fresh bleeding. The literature reveals only few case reports of RDL. We report the case of profuse lower gastrointestinal hemorrhage due to a RDL, as well as the proper literature review.

CASE PRESENTATION

Chief complaint

A 44-year-old female patient hospitalized in our institution due to a vascular access infection.

History of present illness

The patient presented profuse rectal bleeding that progressed to hypovolemic shock in four hours.

Past medical history

Her medical comorbidities included chronic kidney disease on replacement therapy and secondary hypertension. Patient denied any toxic habits.

Her surgical history included two cesarean sections, appendectomy, and living-donor kidney transplant followed by acute rejection. Family history was negative for any gastrointestinal disease.

Physical examination

On presentation her vital signs were temperature of 36 °C, pulse of 120 bpm, respiratory rate of 20 rpm, blood pressure of 80/50 mmHg, and oxygen saturation of 92%. On general physical examination she looked pale and dehydrated. Abdominal examination revealed non-distended, soft, non-tender abdomen with normal bowel sounds. Rectal examination revealed bright blood with clots. The cardiovascular, pulmonary and neurological examination was unremarkable.

Laboratory examinations

Complete blood count analysis revealed hemoglobin of 6.7 g/dL, normal platelet count (193000/mm^3), partial thromboplastin time of 42 s (RV 25-33), prothrombin time of 20 s (RV 11-15), and international normalized ratio 1.86.

Imaging examinations

Urgent colonoscopy findings were active bleeding from small bulgy vessel with minimal surrounding erosion and no ulcerative lesions (Figure 1).

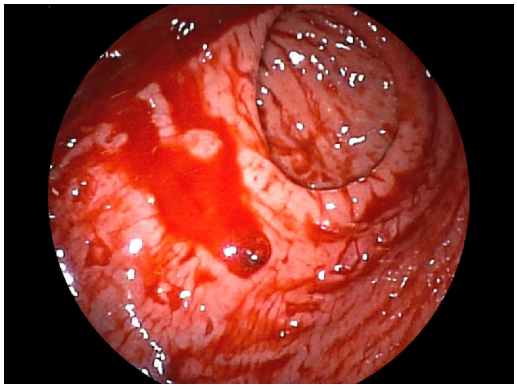


Figure 1 Endoscopic appearance of Dieulfoy's lesion. A small pigmented protuberance with minimal surrounding erosion and no ulcerative lesion.

FINAL DIAGNOSIS

The final diagnosis of the presented case was a RDL.

TREATMENT

For the management of the hypovolemic shock, proper resuscitation with crystalloids, transfusion of packed red blood cells and vasoactive agents was performed. After hemodynamic stabilization, endoscopic therapy with two hemoclips (Figure 2) was done.

OUTCOME AND FOLLOW-UP

Immediate hemostasis was achieved with endoscopic management, and on the fifth day the patient was discharged. There were no signs of recurrent bleeding at thirty days of follow-up.

DISCUSSION

DLs represent an unusual cause of non-variceal gastrointestinal bleeding, accounting for less than 5% of all cases. More than 90% of these lesions are located at the esophagus, stomach and duodenum; only 2% are found at the rectum. The most relevant histological findings are aneurysm and inflammation, but a biopsy is not usually necessary[2]. The reference standard for diagnosis is endoscopy. Common findings include a small, usually less than 3 mm, protruding pulsatile lesion surrounded by normal mucosa, with or without active bleeding[3].

Unlike the manifestations described in other parts of the digestive tract, RDL usually present with rectorrhagia or hematoquezia. There are previous case reports of profuse rectal bleeding, but most of them didn't evolve to hypovolemic shock as occurred with our patient. A computed tomography angiography was canceled due to hemodynamic instability in the CT-room. This hemodynamic instability can impact in the morbidity and mortality of these patients[4,5].

If technically feasible, the first line of treatment is endoscopic hemostasis. The European Gastrointestinal Endoscopy Society (ESGE) recommends endoscopic hemostasis for DLs, including: thermal coagulation, mechanical hemostasis (hemoclips or band ligation), or combined therapy (diluted adrenaline injection plus contact thermal or mechanical therapy)[6]. These endoscopic hemostasis techniques are safe and have similar outcomes in observational studies. As in other causes of non-variceal bleeding, there is superiority of combined, thermal and mechanical methods over injection monotherapy[6]. Endoscopic treatment achieves an initial hemostasis rate > 93.6% of cases, with a rebleeding rate of 12.1%, including cases of RDL[7,8]. A prospective study demonstrated superiority of mechanical endoscopic treatment with hemoclips or band ligation versus injection with diluted adrenaline[9]. Regarding to the mechanical therapy, there is no differences in endoscopic band ligation *vs* hemoclips. A meta-analysis that included 5 studies, compared endoscopic band

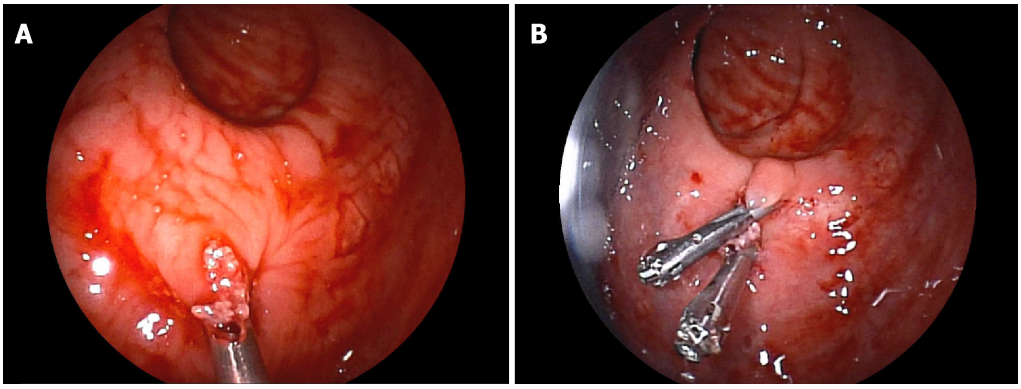


Figure 2 Endoscopic management of Dieulafoy's lesion. A: Placement of the first hemoclip; B: Placement of a second hemoclip to ensure hemostasis.

ligation (75 patients) versus hemoclips (87 patients) for primary hemostasis of DLs; results didn't find any difference for the primary outcome [0.96 (95%CI: 0.88-0.99) *vs* 0.91 (95%CI: 0.83-0.96), respectively]; there were no differences in rebleeding rates neither [0.06 (95%CI: 0.02-0.15) *vs* 0.17 (95%CI: 0.10-0.28), respectively][10]. In our patient, there was no rebleeding after the initial effective hemostasis with the placement of two hemoclips. Table 1 shows a summary of endoscopic treatment modalities.

Transcatheter angiographic embolization (TAE) should be the next option in cases that can't be treated endoscopically[6,11]. Surgical resection should be reserved for selected cases that can't be treated with endoscopic or angiographic methods[6,12].

CONCLUSION

Rectal DLs represent a rare cause of lower gastrointestinal bleeding. Massive hemorrhage can increase the morbidity and mortality of these patients. Endoscopic management continues to be the reference standard in the diagnostic and therapeutic approach. Thermal, mechanical (hemoclip or band ligation), or combination therapy (adrenaline injection combined with thermal or mechanical therapy) should be considered the first choice for treatment.

Table 1 Endoscopic treatment modalities for Dieulafoy's lesion (modified from Nguyen *et al*[7])

Technique	Initial hemostasis (%)	Rebleeding (%)	Mortality (%)	Adverse events[1] (%)
Thermal				
Bipolar EC	80	13.3	0	0
APC	100	3.4	NA	3.4
Injection				
Epinephrine	88	32.7	2.4	0
Mechanical				
Hemoclip	94.7	10.5	0.4	0.5
EBL	99.2	5.3	0	0.8
Combined				
Epinephrine + Hemoclip	98.2	5	0	0
Epinephrine + EBL	100	0	0	0

[1]Adverse events: Perforation, hemorrhage. EC: Electrocoagulation; APC: Argon plasma coagulation; NA: Not applicable; EBL: Endoscopic band ligation.

REFERENCES

1 **Chaer RA**, Helton WS. Dieulafoy's disease. *J Am Coll Surg* 2003; **196**: 290-296 [PMID: 12595057 DOI: 10.1016/S1072/7515(02)01801-X]
2 **Lara LF**, Sreenarasimhaiah J, Jiang Tang S, Alonso BB, Rochey DC. Localization, efficacy of therapy and outcomes of Dieulafoy's lesions of the GI tract-the UT Southwestern GI Bleed Team experience. *Gastrointest Endosc* 2008; **67**: AB87 [DOI: 10.1016/j.gie.2008.03.063]
3 **Lee YT**, Walmsley RS, Leong RW, Sung JJ. Dieulafoy's lesion. *Gastrointest Endosc* 2003; **58**: 236-243 [PMID: 12872092 DOI: 10.1016/mge.2003.328]
4 **Tursi A**. Rectal Dieulafoy lesion. *Clin Res Hepatol Gastroenterol* 2017; **41**: 1-2 [PMID: 26186876 DOI: 10.1016/j.clinre.2015.06.006]
5 **Kanth R**, Mali P, Roy PK. Outcomes in Dieulafoy's Lesion: A 10-Year Clinical Review. *Dig Dis Sci* 2015; **60**: 2097-2103 [PMID: 25663242 DOI: 10.1007/s10620-015-3568-1]
6 **Gralnek IM**, Dumonceau JM, Kuipers EJ, Lanas A, Sanders DS, Kurien M, Rotondano G, Hucl T, Dinis-Ribeiro M, Marmo R, Racz I, Arezzo A, Hoffmann RT, Lesur G, de Franchis R, Aabakken L, Veitch A, Radaelli F, Salgueiro P, Cardoso R, Maia L, Zullo A, Cipolletta L, Hassan C. Diagnosis and management of nonvariceal upper gastrointestinal hemorrhage: European Society of Gastrointestinal Endoscopy (ESGE) Guideline. *Endoscopy* 2015; **47**: a1-46 [PMID: 26417980 DOI: 10.1055/s-0034-1393172]
7 **Nguyen DC**, Jackson CS. The Dieulafoy's Lesion: An Update on Evaluation, Diagnosis, and Management. *J Clin Gastroenterol* 2015; **49**: 541-549 [PMID: 25887110 DOI: 10.1097/MCG.0000000000000321]
8 **Park JG**, Park JC, Kwon YH, Ahn SY, Jeon SW. Endoscopic Management of Rectal Dieulafoy's Lesion: A Case Series and Optimal Treatment. *Clin Endosc* 2014; **47**: 362-366 [PMID: 25133127 DOI: 10.5946/ce.2014.47.4.362]
9 **Chung IK**, Kim EJ, Lee MS, Kim HS, Park SH, Lee MH, Kim SJ, Cho MS. Bleeding Dieulafoy's lesions and the choice of endoscopic method: comparing the hemostatic efficacy of mechanical and injection methods. *Gastrointest Endosc* 2000; **52**: 721-724 [PMID: 11115902]
10 **Barakat M**, Hamed A, Shady A, Homsi M, Eskaros S. Endoscopic band ligation versus endoscopic hemoclip placement for Dieulafoy's lesion: a meta-analysis. *Eur J Gastroenterol Hepatol* 2018; **30**: 995-996 [PMID: 30048368 DOI: 10.1097/MEG.0000000000001179]
11 **Alshumrani G**, Almuaikeel M. Angiographic findings and endovascular embolization in Dieulafoy disease: a case report and literature review. *Diagn Interv Radiol* 2006; **12**: 151-154 [PMID: 16972222 DOI: 10.1067/mag.2000.108040]
12 **Dogan U**, Gomceli I, Koc U, Habibi M, Bulbuller N. Rectal dieulafoy lesions: a rare etiology of chronic lower gastrointestinal bleeding. *Case Rep Med* 2014; **2014**: 180230 [PMID: 25349614 DOI: 10.1155/2014/180230]



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