

Classic "Outlet" Rectal Bleeding does not Require Full Colonoscopy to Exclude Significant Pathology

ORIGINAL CONTRIBUTION

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PURPOSE: Full diagnostic colonoscopy often is performed to exclude significant pathology in patients presenting with rectal bleeding. In patients with classic "outlet" bleeding, defined as bright red blood after or during defecation, with no family history of colorectal neoplasia or change in bowel habits, we hypothesize that the diagnostic yield of complete colonoscopy will be low. The purpose of this study was to determine whether complete colonoscopy is necessary in the evaluation of patients with "outlet" rectal bleeding.

METHODS: Information for all patients undergoing colonoscopy by a single endoscopist was prospectively recorded. Before each colonoscopy, a complete history, including indication for the examination, was obtained. Using standard definitions, patients with outlet bleeding, suspicious bleeding, hemorrhage, and occult bleeding were accessed and the findings of their colonoscopies were analyzed. Institutional permission was obtained.

RESULTS: A total of 9,098 patients had colonoscopy recorded in the database, and 703 had the indication of outlet bleeding, 251 suspicious bleeding, 204 occult bleeding, and 67 hemorrhage. Of the patients with outlet bleeding, only 47 (6.7 percent) had significant lesions on colonoscopy (adenomas >1 cm, villous adenomas, cancer *in situ*, or invasive cancer). By contrast a greater number of significant lesions were present in patients with all other types of bleeding (17.2 percent; $P<0.001$). The incidence of invasive cancer was significantly lower in the outlet bleeding group compared with other types of bleeding (1 vs. 3.6 percent; $P<0.01$). Patients with outlet bleeding were much less likely than patients with other bleeding to have isolated right-sided colonic pathology. Younger patients with outlet bleeding have a particularly low yield on colonoscopy. In 182 patients younger than aged 50 years with outlet bleeding, only 3 (1.6 percent) had adenomas > 1 cm and no invasive cancers were detected.

CONCLUSIONS: In patients with classic outlet bleeding, the yield of a complete diagnostic colonoscopy is low. If the history is classic for outlet bleeding and no other indication for colonoscopy exists, flexible sigmoidoscopy is enough to exclude significant pathology.

KEY WORDS: Outlet bleeding; Gastrointestinal bleeding; Colonoscopy; Sigmoidoscopy.

Colonoscopy is an important diagnostic tool in the workup of a variety of gastrointestinal symptoms. It is very sensitive for the detection of pathology, resulting in lower gastrointestinal bleeding, and can be used to provide treatment at the time of the examination.^{1,2} Additionally, it has proven effective as a screening examination for the early diagnosis of colorectal cancer. The U.S. Preventive Services Task Force has recommended screening for colorectal cancer at aged 50 years for average-risk individuals.³ As the demand for colonoscopy has increased, difficulties in access have emerged with estimates that it would take more than ten years to screen all who meet the criteria.⁴ Therefore, analysis of the indications for colonoscopy to verify the appropriateness of the examination is worthwhile as an attempt to prioritize patients.

A detailed history of the type of gastrointestinal bleeding can provide insight as to the likely source of the pathology.⁵ In particular, typical outlet bleeding is likely to originate from benign anal disease or from distal colonic pathology. A "knee-jerk" reaction by referring practitioners is to send all patients with any type of rectal bleeding for full colonoscopy, whereas flexible sigmoidoscopy will potentially identify all lesions up to the splenic flexure and may be all that is needed in patients with outlet bleeding that do not meet other indications for colonoscopy. Furthermore, colonoscopy, although extremely safe, is not an entirely benign test.

The first purpose of this investigation was to compare the incidence of significant pathology demonstrated on colonoscopy performed for the indication of lower gastrointestinal bleeding, stratified by the pattern of bleeding history. The second purpose was to determine the diagnostic yield of colonoscopy in patients with outlet bleeding stratified by age and reported according to

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location in the colon. It can then be determined whether flexible sigmoidoscopy alone is enough to exclude significant pathology in this subset of patients.

PATIENTS AND METHODS

A prospectively maintained database of patients undergoing colonoscopy by a single endoscopist at a tertiary care center from 1984 to 2006 was retrospectively queried to provide data for this study. Before the endoscopic examination, a structured history was obtained that included the indication for the colonoscopy. Included among the many indications for colonoscopy was lower gastrointestinal bleeding. This was prospectively categorized into four types by using the standard definitions listed below and previously described.⁵

Outlet Bleeding: Patients with bright red blood seen during or after defecation, on the toilet paper or in the toilet bowl, and with no family or past history of colorectal neoplasia, and no change in bowel habit.

Suspicious Bleeding: Patients with dark red blood, and/or blood mixed with or streaked on stool. Patients with any bleeding and a family or past history of colorectal neoplasia. Patients with bleeding associated with a change in bowel habit or the passage of mucus.

Hemorrhage: Large-volume bleeding needing urgent admission to hospital and transfusion of one or more units of blood.

Occult Bleeding: Patients with rectal bleeding and anemia, or a positive stool occult blood test.

Patients with outlet bleeding, suspicious bleeding, hemorrhage, or occult bleeding formed the study cohort. The following data were extracted from the database: age, gender, colonoscopic examination findings, pathology, and location of lesions. Significant findings were defined as adenomas > 1 cm, villous adenomas of any size, cancer *in situ*, invasive cancer, or arteriovenous malformations. Location of lesions was further subdivided by their relationship (proximal or distal) to the splenic flexure. All examinations were performed by a single endoscopist. Patients involved in a previous study of colonoscopic findings in patients with rectal bleeding were excluded from this analysis.⁵

Statistical analysis was performed by using the chi-squared test in most cases, except when the expected value of a column was < 5 in which case the Fisher's exact test was used. Statistical significance was defined as $P < 0.05$. Institutional permission was granted for creation and maintenance of the database as well as the details of this particular research project.

RESULTS

Table 1 lists the total number of patients in the database, including the number of patients with each pattern of rectal bleeding: outlet bleeding, suspicious bleeding, occult bleeding, and hemorrhage. Overall, 703 patients had the indication of outlet bleeding, and 522 had the other types of bleeding combined.

Table 2 lists the incidence of significant findings by indication for colonoscopy. Outlet bleeding had a low (6.7 percent) incidence of significant findings compared with rates of significant findings for suspicious bleeding (19.5 percent), occult bleeding (12.7 percent), and hemorrhage (22.4 percent). When directly compared with all other types of bleeding, this lower rate of findings for outlet bleeding was statistically significant (6.7 to 17.2 percent; $P < 0.001$). Of the 47 significant findings in patients with outlet bleeding, 34 had large polyps, 6 had arteriovenous malformations, and 7 had cancer. Of the 90 significant findings in patients with all other bleeding, 64 had large polyps, 7 had arteriovenous malformations, and 19 had cancer. In Table 3, the incidence of cancer is compared. Patients with outlet bleeding as their indication for colonoscopy had a statistically significantly lower rate of cancer compared with patients with all other bleeding (1–3.6 percent; $P < 0.001$).

Table 4 summarizes the effect of age on colonoscopy findings in patients with outlet bleeding. When patients with outlet bleeding were stratified by age, it was seen that older patients had a much higher rate of significant findings on their colonoscopy. In patients younger than aged 50 years, only 1.6 percent had significant findings compared with 8.4 percent of those older than aged 50 years. No patients younger than aged 50 years had cancer. Although this rate was certainly less than the rate for those older than aged 50 years with outlet bleeding (1.3 percent), the sample sizes were only enough to detect a trend and the difference was not statistically significant. The proximal lesions found in the three young patients were adenomatous polyps > 1 cm in size but completely endoscopically resected with no elements of invasive cancer or cancer *in situ*.

Table 5 shows the location of lesions detected by indication for colonoscopy. Importantly, only three lesions were proximal to the splenic flexure in patients with outlet bleeding and would not have been detected had only a flexible sigmoidoscopy been performed. Both in aggregate and individually for each indication, the percentage of isolated proximal lesions compared with total patients with significant findings was statistically significantly less for patients with outlet bleeding compared with those with the other patterns. All cancers detected in patients with outlet bleeding were in those with isolated left-sided pathology or both proximal and distal lesions.

Table 1. Distribution of patients by indication for colonoscopy

Outlet bleeding	703
Suspicious bleeding	251
Occult bleeding	204
Hemorrhage	67
Total in database	9,498

Table 2. Incidence of significant findings by indication for colonoscopy

Examination indication	Significant finding?		Percentage
	Yes	No	
Outlet bleeding	47	656	6.7
All other bleeding	90	432	17.2*
Suspicious bleeding	49	202	19.5*
Occult bleeding	26	178	12.7†
Hemorrhage	15	52	22.4*

*Chi-squared for $P < 0.001$. †Chi-squared for $P < 0.01$.

DISCUSSION

A history of classic outlet bleeding is thought to indicate benign anal disease or distal colorectal pathology. This study provides strong evidence that outlet bleeding is much less likely to be associated with significant colorectal pathology compared with a history of other types of bleeding, such as occult, suspicious, or hemorrhage. The likelihood of neoplasia is particularly low in patients younger than aged 50 years who presented with outlet bleeding, and in those young patients, a complete colonoscopy is not necessary to exclude significant pathology. Church⁵ previously had demonstrated similar results in a smaller subset of patients. This study is confirmatory of previous data in a different and much larger cohort of patients.

Other groups have studied aspects of this problem from different approaches. Longo *et al.*⁶ conducted a prospective study that enrolled patients with anorectal disease to have a colonoscopy. They determined that the risk of neoplasia was associated with age older than 50 years but not with any specific anorectal symptom, including outlet bleeding. In a retrospective chart review of patients younger than aged 50 years undergoing a colonoscopy for rectal bleeding, Wong *et al.*⁷ determined that 9.9 percent of patients had adenomas and 1.8 percent had cancer, all in the distal colon: 2.7 percent of patients had a proximal adenoma only. Although the results of this study suggest that young patients with rectal bleeding should receive colonoscopy, their data contain relatively few isolated right sided lesions. A key difference between the study reported by Wong *et al.* and ours is that the

Table 4. Colonoscopy findings by age for patients with outlet bleeding

Age (yr)	Significant finding?		Percent	Cancer	Percent
	Yes	No			
<50	3	179	1.6	0	0
>50	44	477	8.4*	7	1.3†

*Fisher's exact test for $P < 0.001$. †Fisher's exact test not significant $P = 0.2$.

history of bleeding as an indication for colonoscopy was not subdivided further and all patients with "bleeding" were grouped together. Using a structured precolonoscopy interview, Eckardt *et al.*⁸ defined a subset of patients presenting with "scant hematochezia" and found that these patients had no increased risk for proximal neoplasms compared with control patients. Carlo *et al.*⁹ prospectively identified young patients presenting for colonoscopy with hematochezia and found a very low incidence of significant colonoscopic findings. They likewise recommended flexible sigmoidoscopy for young patients without other risk factors for colorectal cancer.

Colonoscopy, although safe, is not without risk. Sigmoidoscopy has several advantages that make its safety profile more attractive compared with colonoscopy and is associated with fewer adverse events. A retrospective comparison study by Anderson *et al.*¹⁰ found 2 perforations in 49,501 sigmoidoscopic examinations compared with 20 perforations in 10,486 colonoscopies during the same time period. A study by Atkin *et al.*¹¹ noted a patient self-reported incidence of bleeding of 2.5 percent after diagnostic sigmoidoscopy and 5.5 percent after therapeutic sigmoidoscopy, but only 1 of 1,235 patients required hospitalization and none required transfusion. Importantly, sigmoidoscopy can be performed without the conscious sedation that is typically needed to complete a colonoscopy in most patients. In a retrospective review of 21,000 patients experiencing conscious sedation for gastrointestinal endoscopy, 0.54 percent experienced cardiopulmonary events of variable severity.¹²

Table 5. Location of significant findings by indication for colonoscopy

Examination indication	Total examinations	Cancer	Percentage	Relation to splenic flexure (cancer in parenthesis)		
				Proximal	Distal	Both
Outlet bleeding	703	7	1	3 (0)	19 (5)	25 (2)
All other bleeding	522	19	3.6*	29 (6)*	29 (7)	32 (6)
Suspicious bleeding	251	6	2.4	12 (1)†	17 (3)	20 (2)
Occult bleeding	204	9	4.4*	11 (4)*	5 (2)	10 (3)
Hemorrhage	67	4	6	6 (1)*	7 (2)	2 (1)

*Fisher's exact test for $P < 0.001$. †Fisher's exact test for $P < 0.05$. ‡Fisher's exact test for $P < 0.01$.

*Chi-squared for $P < 0.01$.

For colonoscopy to be a useful test, the patient must take a bowel preparation to cleanse the colon of stool and debris so that the mucosa can be examined. Oral bowel preparation has a risk of dehydration and electrolyte imbalance, especially in elderly patients or those with concurrent renal or cardiac disease.¹³ In a recent study of the tolerability of bowel preparation for colonoscopy, Kastenberget *et al.*¹⁴ demonstrated that only 57 percent of patients were able to complete 4 liters of polyethylene glycol solution and 40 percent of patients described completion of the preparation as moderately or extremely difficult. Sigmoidoscopy often can be performed with simple enema preparation and does not require a full oral bowel preparation. In most cases, the endoscopic examination itself takes less time.

Flexible sigmoidoscopy, despite these advantages, has some drawbacks. Because no sedation is typically used, some studies have demonstrated that it can be more uncomfortable than colonoscopy.¹⁵ If an advanced adenoma is found in the distal bowel, it would be necessary to have the patient take a bowel preparation and return for full colonoscopy. This greatly affects patient convenience and potentially compliance because the patient is subjected to two procedures. Our data support this approach in that the majority of patients with outlet bleeding who had proximal significant colonic lesions were those with distal colonic findings. Imperiale *et al.*¹⁶ in designing a clinical index to stratify risk of proximal colonic advanced adenomas determined that distal colonic findings are strongly predictive of proximal findings.

Although this study makes some important conclusions about colonoscopy in patients with outlet bleeding, it has some shortcomings. It is unknown how many of the patients in the study had previous colonoscopies before their inclusion in the database. This would bias the data in the direction of studies without significant findings because adenomas may have been removed during previous examinations. In addition, patients were included in the study cohort if they reported a history of outlet bleeding, but they may have been seen for the colonoscopy by their physician because of their symptom in addition to their age to be screened whether or not this was implicitly stated. This could potentially act as a confounding variable in seeking a true association between type of bleeding and significant colonoscopic findings. Also, it could not be reliably determined from review of the records which of the patients had anorectal disease that may have explained some of their bleeding symptoms. If no anorectal source of bleeding is located on physical examination, then it would be logical to expect an endoscopic examination to be more likely to detect a bleeding source and have a significant finding. Finally, although we advocate that sigmoidoscopy would be enough to exclude significant pathology in patients with outlet bleeding, all patients in this study had a complete

colonoscopy by an experienced colonoscopist. The ability to perform flexible sigmoidoscopy and reach the splenic flexure in the same subset of patients is unknown and the inability to examine the bowel to the flexure would compromise the effectiveness of the proposed strategy. Previous studies quantifying the ability to reach the splenic flexure on sigmoidoscopy demonstrate adequate examination rates of 83.3 percent,¹⁷ 84.4 percent,¹⁸ and 84.8 percent,¹⁹ respectively. Thus, not all patients can expect a thorough examination to the splenic flexure with sigmoidoscopy.

Our data support the conclusion that the exact history of the type of bleeding is important in predicting the incidence of significant findings at colonoscopy. Outlet bleeding is associated with a very low incidence of significant findings and they are predominantly within the reach of the sigmoidoscope, especially in young patients. If the history is classic for outlet bleeding and no other indication for colonoscopy exists, flexible sigmoidoscopy is enough to exclude significant pathology.

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