



Preoperative bleeding requiring transfusion: An under-reported indication for hemorrhoidectomy



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ABSTRACT

Background: Though hemorrhoids commonly cause minor gastrointestinal bleeding, major hemorrhage requiring blood transfusion is believed to be rare. We sought to identify the prevalence and risk factors for preoperative transfusion in surgical hemorrhoidectomy patients.

Methods: Patients undergoing surgical hemorrhoidectomy at a single institution (2012–2017) were evaluated for preoperative bleeding requiring transfusion. Bivariate analysis compared patients requiring transfusion to those who did not, and multivariable analysis evaluated for independent risk factors for transfusion.

Results: Out of 520 patients, 7.3% experienced hemorrhoidal bleeding requiring transfusion, and 80.6% reported bleeding. On multivariable analysis, the use of either an anticoagulant or non-aspirin antiplatelet agent was associated with transfusion (OR 3.08, $p = 0.03$). Patients requiring transfusion had extensive preoperative workups, including colonoscopy (94.7%), flexible sigmoidoscopy (7.89%), upper endoscopy (50%) and capsule endoscopy (26.3%).

Conclusions: Bleeding requiring transfusion is an under-reported complication of hemorrhoids. Increased recognition could lead to expeditious surgical treatment and less costly diagnostic workup.

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Introduction

Hemorrhoids are common and are estimated to affect 4%–38% of the adult population.^{1–3} Rectal bleeding is the most commonly reported symptom of hemorrhoidal disease.^{1,4} However, the published proportion of lower gastrointestinal (GI) bleeding attributed to hemorrhoids varies widely, and some studies do not even include hemorrhoids as a source of lower GI bleeding.^{5–7} Despite the prevalence of symptomatically bleeding hemorrhoids, life-threatening bleeding—either in the acute setting or in the form of chronic transfusion-dependent anemia—is believed to be rare, with a rate of 0.5 patients/100,000 population.^{8–11} Two small case series have reported hemorrhoidal disease as a cause of transfusion-dependent anemia and acute lower GI bleeding, noting a high prevalence of anticoagulant medication use and extensive

diagnostic workups in these patients.^{12,13} There is otherwise little published evidence regarding patients with hemorrhoids experiencing bleeding requiring transfusion, and the true prevalence of this condition remains unknown.

In this study, we sought to identify the prevalence and risk factors of preoperative bleeding requiring blood transfusions in patients undergoing hemorrhoidectomy. We hypothesized that significant hemorrhoidal bleeding was more common than previously anticipated. Furthermore, given the concern that the under-recognition of hemorrhoidal bleeding as a cause of significant lower GIB was resulting in unnecessary evaluation and invasive testing, we aimed to investigate the diagnostic evaluation of the patients reporting bleeding prior to undergoing hemorrhoidectomy.

Materials and methods

This was a retrospective study of all patients undergoing surgical hemorrhoidectomy at a single academic institution between

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January 1, 2008 and July 1, 2017. An institutional data repository and billing records identified all patients undergoing surgical hemorrhoidectomy. The electronic medical record was reviewed to collect demographic information, use of anticoagulant medications, hemorrhoidal bleeding, and instances of blood transfusion due to rectal bleeding. Because many patients were transfused at outside institutions, any documented report of a transfusion requirement—including transferring hospital notes, referring physician notes, or patient reported transfusions—were included. Demographics, comorbidities, and diagnostic studies/procedures prior to hemorrhoidectomy were also recorded. Patients with a documented history of cirrhosis were excluded from the study due to the confounding nature of rectal varices. The Institutional Review Board approved a waiver of consent for this study (UVA-HSR IRB 20246) due to its retrospective nature.

Patients who received a preoperative blood transfusion related to hemorrhoidal bleeding were compared to those patients who did not receive a transfusion prior to surgical hemorrhoidectomy. Results are reported as mean and standard deviation for normally distributed continuous variables and number and percentage for categorical variables. Bivariate analysis compared demographics and comorbidities between the groups, using Student's T-test, Chi-square analysis, and Fisher's exact test, where appropriate. Multivariable logistic regression evaluated for the independent effects of patient age, aspirin use, and the combined category of either anticoagulant or non-aspirin antiplatelet use on the need for a blood transfusion prior to surgical hemorrhoidectomy. Included variables were chosen *a priori* based on factors previously shown to impact bleeding risk, with a 1:10 predictor per event rule. Statistical analysis was performed using SAS Version 9.4 (SAS Institute, Cary, NC) using $p < 0.05$ as the significance threshold.

Results

Records were reviewed for 520 patients undergoing hemorrhoidectomy over a 10-year period. Of these, 419 (80.6%) experienced rectal bleeding as a symptom, and 38 (7.3%) experienced preoperative bleeding clinically significant enough to necessitate a blood transfusion. Demographics and preoperative characteristics are shown in Table 1. Patients who experienced bleeding requiring transfusion(s) were of similar age (mean 52.9 vs. 50.2, $p = 0.27$) and

were more likely to have medical comorbidities including diabetes mellitus (15.7% vs. 4.6%, $p < 0.01$), chronic obstructive pulmonary disease (COPD) (5.3% vs. 0.8%, $p = 0.01$), and coronary artery disease (10.5% vs. 1.0%, $p < 0.01$). More patients in the transfusion group used aspirin (23.7% vs. 17.0%), anticoagulant medications (10.5% vs. 4.5%), and antiplatelet medications (0.8% vs. 5.2%), though these differences were not statistically significant ($p = 0.30$, $p = 0.12$, $p = 0.06$, respectively). On multivariable analysis, when controlling for patient age, use of either an anticoagulant or non-aspirin antiplatelet agent was associated with an increased risk of bleeding requiring a preoperative blood transfusion (OR 3.08, 95% CI 1.14–8.34, $p = 0.03$), while aspirin use alone was not significantly associated with receiving a transfusion (OR 1.38, 95% CI 0.60–3.20, $p = 0.45$). Multivariable logistic regression results are reported in Table 2.

The preoperative diagnostic evaluation performed in patients requiring a blood transfusion prior to hemorrhoidectomy is shown in Table 3. Thirty-six (94.7%) patients underwent preoperative colonoscopy. Other common diagnostic modalities used included upper endoscopy (19, 50.0%) and capsule endoscopy (10, 26.3%). One patient underwent exploratory laparotomy with push enteroscopy (1, 2.6%). Many of these bleeding patients received multiple diagnostic modalities, including 10 (26.3%) who underwent colonoscopy, upper endoscopy, and capsule endoscopy, and 19 (50.0%) who underwent both upper endoscopy and colonoscopy.

Discussion

This retrospective investigation of 520 surgical hemorrhoidectomy patients revealed 7.3% of patients requiring blood transfusion(s) prior to surgery. Use of anticoagulant or non-aspirin antiplatelet agents was independently associated with receiving a blood transfusion, though aspirin use was not. Furthermore, patients who required a transfusion underwent an extensive preoperative diagnostic evaluation, including colonoscopy, upper endoscopy, capsule endoscopy, and in one case even laparotomy with push enteroscopy.

The present investigation represents, to our knowledge, the largest existing series of patients requiring blood transfusions due to bleeding from hemorrhoids. One case series reported five patients with hemorrhoids leading to transfusion-dependent anemia, noting that there may be a higher prevalence of patients requiring transfusion for hemorrhoids than previously thought.¹³ Another case series reported eight patients requiring blood transfusion due to bleeding in the acute setting.¹² However, these patients were elderly (mean age 73), and all were taking anticoagulant medications, as opposed to the present study, in which patients requiring blood transfusion had a mean age of 53 and only 10.5% and 5.3% were on an anticoagulant or antiplatelet agent. Our study highlights that hemorrhoids should be considered in the differential of severe lower GI bleed even in younger “healthier” patients not on anticoagulation.

Expectedly, patients on anticoagulant or antiplatelet agents were more likely to have blood loss requiring transfusion as a result of hemorrhoidal disease. Patients taking anticoagulant medications have been reported to have GI bleeding rates of 0.3%–4.5%, though

Table 1
Demographics and risk factors of patients with and without hemorrhoidal bleeding requiring transfusion.

Variable	No Transfusion (n = 482)	Transfusion (n = 38)	p-value
Female	261 54.3%	17 46.0%	0.33
Age (years)	50.2 14.40	52.9 14.4	0.29
White	375 78.1%	28 75.7%	0.73
Alcohol Abuse	27 5.6%	4 10.5%	0.27
CAD	5 1.0%	4 10.5%	<0.01
COPD	4 0.8%	2 5.3%	0.01
Diabetes	22 4.6%	6 15.8%	<0.01
Hypertension	44 9.1%	5 13.2%	0.41
IBD	4 0.8%	0 0.0%	1.00
Psychiatric Disorder	155 32.2%	14 36.8%	0.55
Smoker	142 29.5%	15 39.5%	0.20
Medications:			
Aspirin	82 17.0%	9 23.7%	0.30
Anticoagulant	23 4.5%	4 10.5%	0.13
Non-Aspirin Antiplatelet agent	4 0.8%	2 5.3%	0.07

Results are presented as n, % for categorical variables and mean, standard deviation for continuous variables. CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; IBD, inflammatory bowel disease.

Table 2
Multivariable analysis evaluating risk factors for bleeding requiring transfusion.

Variable	OR	95% CI	p value
Age (years)	1.004	0.980–1.03	0.737
Aspirin	1.383	0.598–3.20	0.449
Anticoagulant or Antiplatelet agent	3.077	1.135–8.344	0.027

Table 3
Diagnostic procedures performed prior to hemorrhoidectomy in patients requiring transfusion.

Diagnostic Procedure	Number performed (n = 38)	%
Colonoscopy	36	94.7%
Flexible Sigmoidoscopy	3	7.9%
Upper Endoscopy	19	50.0%
Capsule Endoscopy	10	26.3%
Exploratory Laparotomy (with push enteroscopy)	1	2.6%

the proportion due to hemorrhoids is not specified.^{14,15} Guidelines for the management of GI bleeding in therapeutically anticoagulated patients emphasize the importance of early intervention for definitive management, with delayed resumption of anticoagulation if the source of bleeding remains unidentified.¹⁶ Additionally, failure to restart anticoagulant agents after cessation of GI bleeding has been associated with an increased risk of thromboembolic events and death.¹⁵ As such, recognition of hemorrhoids as the source of anemia and subsequent hemorrhoidectomy could result in more expeditious resumption of anticoagulation, minimizing morbidity in these patients.

In their pre-surgical diagnostic evaluation, 94.7% of patients with bleeding requiring transfusion underwent colonoscopy, while another 7.9% underwent flexible sigmoidoscopy. Both the American Society of Colon and Rectal Surgeons and American College of Gastroenterology recommend complete endoscopic evaluation of the colon in patients with bleeding from hemorrhoids.^{17,18} Furthermore, in an investigation of missed opportunities for the diagnosis of colorectal cancer, hemorrhoids were the most common alternate diagnosis cited when patients truly had cancer.¹⁹ Though colonoscopy was an indicated investigation in these patients, many patients had a much more extensive diagnostic evaluation, including upper endoscopy, capsule endoscopy, and even laparotomy. While these diagnostic modalities are indicated in the care of occult GI bleeding, in this instance they reflect increased resource utilization in patients who may have benefitted from early hemorrhoidectomy. Given that these diagnostic modalities can cost over \$1000 each, patients with bleeding that is characteristic of hemorrhoids may be able to avoid these excess costs by undergoing earlier surgical treatment for hemorrhoids.²⁰

This study does have limitations. First, our patient population included only those who had undergone surgical hemorrhoidectomy, excluding patients who underwent smaller office procedures or non-operative management. This population was chosen as it was identifiable by CPT code in our institutional billing and records database; however, this may have selected patients with more severe hemorrhoidal disease. Second, we included patients who were recorded as having had a blood transfusion by self-report. Outside hospital records, and/or institutional electronic medical record. This was necessary to capture the true prevalence of transfusion-dependent anemia, as we are a tertiary referral center with many patients transfused at smaller community hospitals, however we are unable to confirm these occurrences within our own records. Finally, it should be noted that we excluded patients with a history of cirrhosis due to the confounding nature of rectal varices. The prevalence of bleeding requiring transfusion in these patients may be higher, and is not accounted for in this study.

Conclusion

Despite existing perceptions that transfusion-dependent bleeding due to hemorrhoids is rare, we found that 7.3% of patients undergoing hemorrhoidectomy had previously required blood transfusion for hemorrhoidal bleeding. These patients

requiring transfusion often underwent extensive diagnostic evaluation prior to hemorrhoidectomy, representing an area for improvement in care. Increased recognition of hemorrhoids as a cause of clinically significant bleeding may prevent unnecessary invasive testing and lead to timely therapeutic interventions in these patients.

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Author contribution

Conception and design: EDK, TEH, PSB, SCH, TLH, CMF. Data acquisition: EDK, AYZ, MOS. Analysis and interpretation: EDK, TEH. Manuscript drafting and editing for important intellectual content: All Authors.

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