Safety of endoscopic interventions in patients with thrombocytopenia

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Background: The risk of endoscopic interventions in thrombocytopenia has received little attention in the medical literature.

Objective: The aim of this study was to assess the safety of endoscopic interventions including evaluation of GI bleeding (GIB) in patients with thrombocytopenia.

Design and Setting: Retrospective study, tertiary oncology center.

Patients and Intervention: Review of consecutive endoscopies with preprocedure platelet counts (PCs) of 75 $\times$ 10^3/μL or lower.

Main Outcome Measurements: Risk of bleeding with routine endoscopic interventions and transfusion requirement after evaluation of GIB.

Results: A total of 617 (351 upper, 266 lower [90 colonoscopies]) endoscopies were performed in 395 patients. Forceps-biopsy specimens were obtained in 398 endoscopies (mean $\pm$ standard deviation [SD] PC: 38.21 $\pm$ 11.7 $\times$ 10^3/μL) and 45 polypectomies were performed in 17 endoscopies (mean $\pm$ SD PC: 39.65 $\pm$ 8.53 $\times$ 10^3/μL). The risk of bleeding was 1.5% (6 of 398 endoscopies) at the biopsy site and 4% (2 of 45 polypectomies) at the polypectomy site. Active GIB (mean $\pm$ SD PC: 32.85 $\pm$ 4.0 $\times$ 10^3/μL) was observed in 68 (11% of 617) endoscopies and intervention (mean $\pm$ SD PC: 33.68 $\pm$ 4.6 $\times$ 10^3/μL) was performed in 41 procedures. Together, angiodysplasias and ulcers were the most common etiology (51.2% of 41). Hemostasis was achieved in 39 (95.1% of 41) procedures. Comparison of blood transfusions $\pm$ 3 days of successful therapy showed a 52% reduction ($P < .001$). By multivariate analysis, a higher aggregate blood transfusion 3 days preceding endoscopy (odds ratio 1.32; 95% confidence interval, 1.16-1.50; $P < .001$) predicted endoscopic findings of active GIB.

Limitations: Retrospective design, single center.

Conclusions: In the largest endoscopic experience reported in thrombocytopenic patients (Common Terminology Criteria for Adverse Events grade 3 or lower), bleeding caused by standard forceps biopsy and polypectomy ($\leq$10 mm) was minor and easily controlled. Endoscopic therapy for GIB is safe and significantly reduces the packed red blood cell requirement and should be considered in patients with thrombocytopenia in the setting of an appropriate transfusion strategy. (Gastrointest Endosc 2014;80:425-34.)

(footnotes appear on last page of article)

Thrombocytopenia is common in cancer patients and raises concerns about endoscopic procedure risk.[1-3] The available literature on the safety of GI endoscopy in this patient population is sparse. Defining a minimum platelet level for interventions as simple as mucosal biopsy is not clear from available reports.[4,5]

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BACKGROUND

Traditionally a platelet count (PC) of 50 $\times$ 10^3/μL was defined as the minimum based on limited experience.[6,7] Other authors reviewing the topic have lowered this figure to 20 $\times$ 10^3/μL but with few supporting data.[8,9] The limited

number of reports on endoscopy in thrombocytopenic patients includes primarily diagnostic studies with few biopsies and even fewer interventions.[3,10,11] The heightened concern about endoscopic risk has also altered the approach to GI bleeding (GIB) in the thrombocytopenic patient. The few reports in the literature demonstrate an unwillingness to endoscopically evaluate the bleed, let alone apply therapeutic measures.[3,11] A common view is that endoscopy is of limited benefit because bleeding is most likely to be diffuse and not amenable to endoscopic measures.[11] However, earlier data from our institution showed that in many thrombocytopenic patients, endoscopy can reveal lesions amenable to medical or endoscopic management.[10] We have updated this experience by reviewing endoscopic outcomes in thrombocytopenic patients with the aim of defining the risk of procedure-induced bleeding as well as the utility of endoscopic evaluation and treatment of GIB.

Take-home Message

- Endoscopy and routine interventions can be safely performed in patients with thrombocytopenia (Common Terminology Criteria for Adverse Events grade ≤ 3). The risk of interventional bleeding is minimally increased but is typically minor and easily controlled.
- In thrombocytopenic oncology patients, GI bleeding is usually attributed to the underlying focal pathology where standard interventions can be safely and effectively performed.

METHODS

We performed a retrospective analysis of consecutive patients at the University of Texas MD Anderson Cancer Center referred for endoscopy with PCs less than $50 \times 10^3/\mu L$ between January 2008 and June 2012. Approval from the institutional review board was obtained before data collection and analysis. Inclusion criteria included all adult patients referred to endoscopy with a pretransfusion PC of $50 \times 10^3/\mu L$ or lower (Common Terminology Criteria for Adverse Events [CTCAE] thrombocytopenia grade 3 and above).[12] Exclusion criteria restricted the study population to patients with a history of at least 1 type of cancer and procedure type to EGD, sigmoidoscopy, and/or colonoscopy. Standard interventions such as forceps biopsy, polypectomy, and endoscopic techniques to control GIB were included. Patients were referred to endoscopy through outpatient clinics or from the inpatient gastroenterology consult service. PCs were assessed each morning in inpatients, and routine prophylactic platelet transfusions were given for counts of $10 \times 10^3/\mu L$ or lower. If the morning count was greater than $10 \times 10^3/\mu L$ but was thought to be too low for endoscopy by either the primary oncology service or gastroenterology consultants, the patient was given platelet transfusions. Posttransfusion PCs were not routinely obtained before endoscopy. Posttransfusion PCs obtained within 8 hours of endoscopy were considered representative of the PC at time of the procedure. For procedures in which PCs were obtained more than 8 hours from endoscopy, then preprocedure PCs were considered to be missing and imputed by using a fully conditional multiple imputation method. Patients with preprocedure posttransfusion PC of $75 \times 10^3/\mu L$ or lower (documented or calculated) were included for analysis (CTCAE thrombocytopenia grade 2 and higher).[12] A patient was defined as refractory to platelet transfusions if the patient's circulating platelet levels failed to increase by at least $5 \times 10^3/\mu L$ after transfusion.[13,14] Experienced gastroenterology faculty performed all endoscopies. A patient encounter was defined as a single episode of sedation in which 1 or more endoscopic procedures were performed.

Data collection

Each patient's chart was reviewed for demographic information, details of chemotherapy, hematopoietic stem cell transplantation (HSCT), pre- and postprocedure complete blood counts, blood urea nitrogen, serum creatinine, estimated glomerular filtration rate,[15] and coagulation profile. Active medications for all patients were reviewed for antiplatelet drugs (aspirin, clopidogrel, ticlopidine), heparin (low molecular weight heparin, subcutaneous heparin), nonsteroidal anti-inflammatory drugs, and selective serotonin reuptake inhibitors (SSRIs). Details of the endoscopy procedure including type of procedure, indication, interventions performed, and adverse events were collected. Data regarding transfusion of blood products were collected for the 3 days before, the day of, and 3 days after endoscopy. Medication history including antiplatelet drugs, proton pump inhibitors (PPIs), and sedatives was collected. Endoscopic interventions encompassing standard forceps biopsy, argon plasma coagulation, bipolar cautery, endoclips, submucosal injection, banding, and polypectomy were collected. Endoscopic findings of GIB and the location, therapeutics, and control were noted. Adverse events of an endoscopic intervention were defined as GIB, perforation, fever after procedure, hemodynamic instability during procedure, and aspiration/respiratory failure.

Statistical analysis

Data were presented as number and percentage for categorical variables, as mean $\pm$ standard deviation (SD), and as median and range (minimum-maximum) for continuous variables. All statistical analyses were performed by using SPSS statistical software, version 21.0 (IBM Corporation, Somers, NY). Normality of data was determined by using SPSS descriptive functions. To compare differences in continuous variables between groups, a t test was performed. A χ^2 test was used for analysis of categorical data. Statistical significance was defined as $P \leq .05$.