

Evaluation of Post-procedural Symptoms and Complications of Mesenteric Angiography with Coil Embolization in Patients with Lower Gastrointestinal Hemorrhage

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Introduction

Gastrointestinal hemorrhage can be a life threatening condition requiring rapid diagnosis and treatment. This is usually divided into upper gastrointestinal hemorrhage, which involves the esophagus, stomach and duodenum, and lower gastrointestinal hemorrhage. Although endoscopy is typically the first line approach for upper gastrointestinal hemorrhage, endoscopy is much more difficult when diagnosing and treating lower gastrointestinal hemorrhage. As a result, imaging studies such as CT scans and nuclear medicine tagged RBC scans are important to determine whether bleeding is occurring. Nuclear medicine tagged RBC scans are helpful since these tests can typically detect hemorrhage at a rate of 0.3 cc/min. If this test is positive, the patient can undergo mesenteric angiography which can detect bleeding at a rate of 0.1 cc/min with the added benefit of treating hemorrhage via coil embolization of the offending vessel. Alternatively, if a patient is having massive lower gastrointestinal hemorrhage, the patient can proceed directly to mesenteric angiography. Patients seem to tolerate this procedure well, however data analyzing post-procedure symptoms and complications are lacking.

Purpose

This study aims to analyze the post-procedural symptoms and complications that commonly occur after mesenteric angiography when coil embolization is performed for lower gastrointestinal hemorrhage. This will help physicians understand how long these symptoms typically last following the procedure and which ones portend a worse outcome.

Table 2: Peri-Procedural Blood Product Requirement

	Packed Red Blood Cells	Platelets	Fresh Frozen Plasma	Cryoprecipitate
Average Pre-Procedural Requirement (units)	4.47 (+/- 5.08; range 0 to 22)	0.59 (+/- 1.06; range 0 to 2)	0.24 (+/- 0.67; range 0 to 2)	0.06 (+/- 0.24; range 0 to 1)
Average Post-Procedural Requirement (units)	1.18 (+/- 1.6; range 0 to 6)	0	0	0

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Materials and Methods

- This study identified patients who had lower gastrointestinal bleeding and underwent coil embolization to stop the bleeding. A retrospective analysis of the patients' charts was made to evaluate symptoms, laboratory values, and diagnostic imaging before and after the intervention to identify whether symptoms improved or worsened after the procedure and whether any new complications arose. All data was collected retrospectively using electronic medical record and PACS imaging system.
- The patients were selected using the search engine on PACS to identify mesenteric angiography studies. Then these reports were analyzed to determine which patients actually had coil embolization interventions performed. Then, the location of the embolization was noted. Subsequently, the electronic medical record was used and hospital notes 7 days prior and 7 days after the procedure were analyzed to evaluate the patients' symptoms. Also, laboratory values such as hemoglobin and blood pressure were also noted during this time period. This data was then analyzed to determine whether any difference exists between pre procedure and post procedure symptoms.
- The study population includes adults aged 18 years or older who were inpatients at Royal Oak William Beaumont Hospital at the time of requiring mesenteric angiography for lower gastrointestinal hemorrhage. This sample size is approximately 30 patients per year. This study included patients from 3/1/2014 to 7/15/2015. As a result, approximately 45 patients were included in the initial sample size. Subsequently, patients who then underwent coil embolization were studied.

Results

- A total of 17 patients were identified. The most common symptoms noted are presented in Table 1 and included hematochezia, maroon stool, dark stool, lightheadedness, and altered mental status. Of note, hematochezia did not persist in patients after successful coil embolization. Hematochezia only persisted in one patient who eventually required another mesenteric angiogram and coil embolization of a different vessel. Maroon or dark colored stool persisted up until 6 days after the initial procedure and these patients did not require repeat mesenteric angiography. Lightheadedness and altered mental status typically began prior to the mesenteric angiography and usually resolved within 2 days after successful coil embolization. Other, less common symptoms included generalized weakness, abdominal pain, and headache.
- Blood product requirements prior to after following mesenteric angiogram are noted in Table 2. Packed red blood cells (pRBC), platelets, fresh frozen plasma, and cryoprecipitate were required in all of the patients studied. On average, approximately 4.47 units of pRBC were required prior to mesenteric angiography being performed. After mesenteric angiography, an average of 1.18 units of pRBC were required, but the other blood products were not needed.
- Of the patients studied, only one patient underwent mesenteric angiography with coiling that required repeat coiling (Figure 1). None of the patients studied required surgical intervention after coil embolization. Groin puncture site bleeding was not noted any of the patients.

Table 1: Most Common Symptoms

	Hematochezia	Maroon Stool	Dark Stool	Lightheadedness	Altered Mental Status
n	17	4	5	7	5
Average start day of symptom	2.1 days prior to procedure (+/- 2.75; range 7 days prior to procedure and the day of the procedure)	0.4 days prior to procedure (+/- 2.61; range 5 days prior to procedure and 1 days after the procedure)	1.6 days after the procedure (+/- 0.55; range 1 day after the procedure and 2 days after the procedure)	2.6 days prior to procedure (+/- 3.04; range 7 days prior to procedure and the day of the procedure)	4.2 days prior to procedure (+/- 3.42; range 7 days prior to procedure and the day of the procedure)
Average end day of symptom	0.1 days prior to procedure (+/- 1.83; range 7 days prior to the day of the procedure and 1 day after the procedure)	0.2 days after the procedure (+/- 3.03; range 5 days prior to procedure and 3 days after the procedure)	2.8 days after the procedure (+/- 1.79; range 2 days after the procedure and 6 days after the procedure)	0.43 days after the procedure (+/- 0.53; range the day of the procedure to 1 day after the procedure)	1.8 days after the procedure (+/- 2.94; range the day of the procedure to 7 days after the procedure)

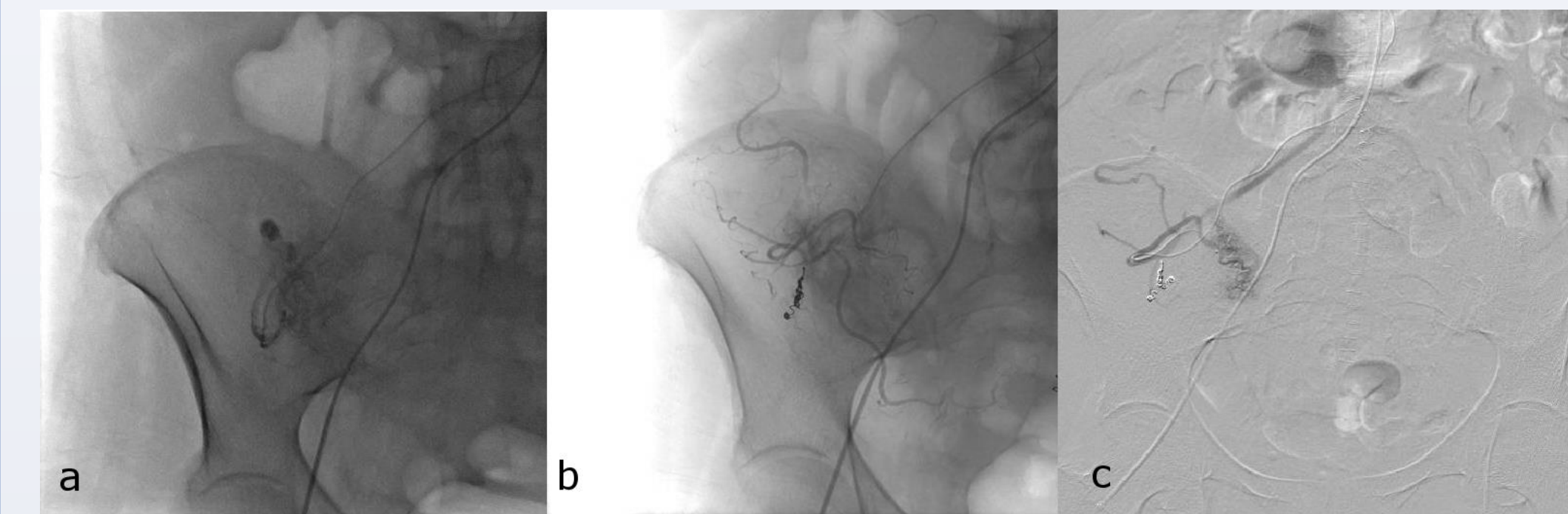


Figure 1: Extravasation was noted on mesenteric angiography involving a distal right colic artery branch (a) which was successfully embolized with several coils to stasis (b). However, this patient continued to bleed with blood pressure dropping to 67/21. A repeat mesenteric angiogram was performed approximately 11 hours later which demonstrated abnormal vessels on the mesenteric border of the colon which were not readily seen on the initial study, suspicious for angiodysplasia (c) which was subsequently coiled. This patient continued to have dark stool up until 5 days after the second mesenteric angiogram coiling procedure, but this patient's hematochezia resolved, the patient was hemodynamically stable and the patient was eventually discharged from the hospital.

Conclusions

When managing patients who have undergone coil embolization of lower gastrointestinal hemorrhage, it is important to note that hematochezia is an important predictor of the need for repeat mesenteric angiogram. The patients that did not require repeat angiogram had resolution of hematochezia after coil embolization. Maroon and dark stool following the procedure is not a reliable indicator of the need for repeat angiogram and persisted up to 6 days following coil embolization. Additionally, pRBCs may be necessary following mesenteric angiogram, even in patients who do not require a repeat study.

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