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Therapeutic water soluble contrast-thrombin enema use in bleeding colonic diverticula: A case report

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ABSTRACT

Introduction: Diverticular hemorrhage is a typical manifestation of diverticular disease with recurrent diverticular hemorrhage taking place in 20–30% of those with a single episode of bleeding. Patients with multiple bleeding diverticula or unclear diverticular bleeding sources are difficult to treat with the standard mesenteric embolization or endoscopic vessel clipping or cauterization. In case reports, therapeutic thrombin-barium enema has been successfully utilized in these types of patients after standard treatments had failed.
Case Report: We present a case in which a soluble water contrast thrombin enema was used for treatment of likely recurrent diverticular bleeding prior to attempting standard treatment modalities.
Conclusion: This case may represent a useful management strategy for reducing hospital costs, avoiding risks of standard treatments, and effectively treating those with diverticular hemorrhage and multiple or unclear bleeding diverticula.

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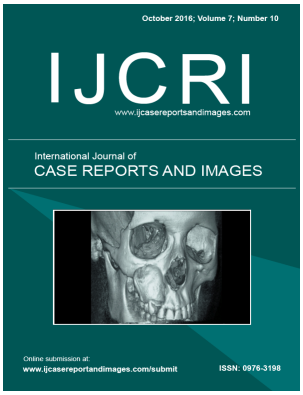

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Introduction: Diverticular hemorrhage is a typical manifestation of diverticular disease with recurrent diverticular hemorrhage taking place in 20–30% of those with a single episode of bleeding. Patients with multiple bleeding diverticula or unclear diverticular bleeding sources are difficult to treat with the standard mesenteric embolization or endoscopic vessel clipping or cauterization. In case reports, therapeutic thrombin-barium enema has been successfully utilized in these types of patients after standard treatments had failed. Case Report: We present a case in which a soluble water contrast thrombin enema was used for treatment of likely recurrent diverticular bleeding prior to attempting standard treatment modalities. Conclusion: This case may represent a useful management strategy for reducing hospital costs, avoiding risks of standard treatments, and effectively treating those with diverticular hemorrhage and multiple or unclear bleeding diverticula.

Keywords: Bleeding colonic diverticula, Diverticular hemorrhage, Thrombin enema

Edward Fogarty[1], Justin Mauch[2], Dakota Orvedal[1]

Affiliations: [1]University of North Dakota School of Medicine and Health Sciences, Grand Forks, ND, USA; [2]Mayo Clinic, Rochester, MN, USA.

Corresponding Author: Dakota Orvedal, University of North Dakota School of Medicine and Health Sciences, ND, USA; Email: dakota.orvedal.1@und.edu

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INTRODUCTION

Diverticula are present in approximately 65% of those 65 and older [1]. Seventy-five to eighty percent of these people will remain asymptomatic; however, others will go on to develop complications such as hemorrhage [2]. For those individuals who develop diverticular hemorrhage there are three commonly used treatment modalities: mesenteric angiography and embolization, endoscopic cauterization or vessel clipping, and surgery. However, when there are multiple bleeding diverticula or an unclear source of diverticular bleeding, these treatment modalities are less useful. The use of therapeutic barium thrombin enema has been documented in case reports to be efficacious as potential treatment for these types of patients [3].

The therapeutic thrombin enema may have another potential role in the treatment and cost reduction of patients with recurrent diverticular hemorrhage. Of those individuals with a single episode of diverticular bleeding, 10.8–43.4% will have at least one more [4]. These people will most likely undergo diagnostic workup and treatment for a lower gastrointestinal bleed which

can have a total hospital cost of around $11,800 [5]. Patients with a medical history of prior diverticular hemorrhage with a suspicious clinical presentation for recurrent diverticular hemorrhage may not need to have a full lower gastrointestinal bleed workup and subsequent traditional therapy. We present a case in which the thrombin enema with water soluble contrast rather than barium is utilized as a therapeutic agent for probable recurrent diverticular hemorrhage instead of the more commonly used lower gastrointestinal bleed management.

CASE REPORT

An 81-year-old female was admitted to the hospital for two episodes within the previous day of bright red blood per rectum. Her relevant medical history is significant for diabetes mellitus, hypertension, carcinoid tumor with wedge lung resection, osteoarthritis, diverticulosis, colonic polyps, and hemorrhoids. She was taking aspirin 81 mg daily, naproxen 200 mg 1-4 tablets daily as needed for joint pain, no history of anticoagulant use, and multiple anti-hypertensive medications. She had a previous episode of lower gastrointestinal bleeding two years ago due to bleeding diverticula which were cauterized successfully during endoscopy at that time. Prior screening colonoscopies had revealed extensive diverticulosis of the sigmoid and descending colon. She had no abdominal pain, no rectal pain, and no obvious bleeding hemorrhoids upon physical examination. Her laboratory results showed anemia with a hemoglobin level of 9.7 g/dL. Technetium 99 red blood cell scan demonstrated diffuse left colonic bleeding with no discrete focal lesions identified. Mesenteric angiography and potential embolization were considered at this time, but the patient's age, comorbidities, and likely calcified tortuous mesenteric vessels made this option less desirable. Colonoscopy with vessel clipping or cauterization was also considered and thought to be most likely unsuccessful given the probable multiple colonic diverticula as suggested by the technetium scan and previous colonoscopies.

The patient was then treated with a therapeutic thrombin enema. A water soluble contrast iohexol 300 was diluted in a 1:1 ratio with water which was then mixed with 50,000 international units of thrombin and administered in the procedure. Severe diverticular disease was identified throughout the sigmoid, descending, and ascending colon with relative sparing of the transverse colon. The patient tolerated the procedure without incident. Upon follow-up at second week and first month the patient had no complaints of bleeding per rectum and hemoglobin returned to normal. After one year, there had not been a return to gastroenterology or the emergency department for clinically significant gastrointestinal bleeding.

DISCUSSION

The prevalence of diverticulosis varies depending on age. Those under 40 years of age have an approximate prevalence of 5%; while this increases to 65% for those aged 65 and older. The majority of patients with diverticulosis remain asymptomatic. For largely unknown reasons, only about 20% of individuals go on to develop diverticular disease, and about 15% of those will develop complications [1]. Symptomatic diverticular disease arises from either acute or chronic inflammation, perforation, or hemorrhage. A range of 4–48% of those with colonic diverticula will experience hemorrhage depending on various risk factors including advanced age, hyperuricemia, hypertension, three or more concomitant medical disorders, and steroid or nonsteroidal anti-inflammatory drug use [2].

Hemorrhagic diverticula will present as a lower gastrointestinal bleed. In determining the etiology of a lower gastrointestinal bleed a common diagnostic algorithm is used. An upper gastrointestinal source is ruled out with either nasogastric tube placement and gastric lavage or upper gastrointestinal endoscopy. A physical examination with emphasis on ruling out anorectal sources as well as a potential anoscopy or flexible sigmoidoscopy should be considered. If no upper gastrointestinal or anorectal source is found, then typically a colonoscopy is performed to find a lower gastrointestinal source. Mesenteric angiography in addition to nuclear scanning can also be undertaken in place of or as adjuncts to colonoscopy, depending on the clinical scenario [6, 7].

Standard treatment of diverticular hemorrhage typically includes either mesenteric embolization, endoscopic vessel clipping, or endoscopic cauterization [8]. Mesenteric angiography and embolization is both diagnostic and therapeutic. There is a risk of bowel ischemia (16.7% in one study) from the procedure as well as the possibility of renal failure and contrast reactions in select patient populations [9]. Endoscopy can also be diagnostic through direct visualization and therapeutic with epinephrine injection, cauterization, or vessel clipping. The procedure is generally tolerated very well with few complications [8].

In patients where the aforementioned workup and treatment fails to localize or effectively treat diverticular bleeding, surgery is then a potential option. In hemodynamically stable patients, segmental colon resection can be undertaken if the bleeding is localized. This procedure has an 8–10% mortality rate and a 15% chance of rebleeding within the first year [10].

The diagnostic and therapeutic options for non-localized diverticular bleeding can be problematic. Surgical intervention carries significant risk, but may be necessary in some patients. In a prior case study, Iwamoto and colleagues propose another option for these patients, the barium-thrombin enema. The cases described patients where the standard treatments of

endoscopic clipping and cauterization or mesenteric embolization were ineffective in relieving the bleeding from the multiple or ill-defined bleeding sources. Instead of surgical intervention, the patients were given barium-thrombin enemas. They remained without further hemorrhage or complications up to 35 months, with no cases having any re-bleeding [3].

Our case is a similar example of the use of thrombin enema for diffuse non-localized recurrent colonic diverticular bleeding. However, our patient did not undergo the extensive lower gastrointestinal bleeding workup. It was assumed that the patient's bleeding was from diverticula given the history of extensive diverticula on prior screening colonoscopies, prior treatment with endoscopic vessel clipping for an episode of bleeding diverticula, clinical presentation, and technetium scanning indicative of diffuse left colonic bleed. Another key difference in the management of our patient was the use of a water soluble contrast agent instead of barium. Barium enemas will increase the difficulty of performing an endoscopic procedure after the enema if needed. After use of water soluble contrast, it is still possible to proceed with the traditional treatment options of endoscopic vessel clipping and mesenteric embolization, although it was not necessary in our patient.

The exact mechanism of action of this procedure is likely multifactorial. There would be an increased pressure within the lumen of the colon, which will likely tamponade the bleeding vessel to some extent. The thrombin in this combination would contribute through increasing activation of the clotting cascade.

The lower gastrointestinal bleed workup may be excessive in the patients described in both Iwamoto's cases and our case report. The total mean hospital cost for a lower gastrointestinal bleed in the last decade has been estimated between $9,700 to $11,800 [5]. Individuals with a single episode of diverticular bleeding have a 10.8–43.4% chance of having another, potentially subjecting them to another costly lower gastrointestinal bleed workup and hospital stay [4]. Keeping this in mind, the optimal patient for this procedure would be one with a known history of diverticulosis and a high suspicion for a diverticular hemorrhage. Patients that undergo endoscopy or angiography without an identified source of bleeding may also be appropriate patients in which to try a thrombin enema, as the next step in many of these patients would be a partial or total colectomy.

Our patient was able to avoid potential surgery risks and the cost of the lower gastrointestinal bleed workup while still having a positive outcome from treatment without re-bleeding or complications. Use of the thrombin enema may serve as a means to reducing hospital costs and lowering complication risks in similar patients presenting with lower gastrointestinal bleeding, significant history of diverticular disease, and a high clinical suspicion for recurrent diverticular hemorrhage. The use of the technetium scan as a screening exam in these patients may help to identify potential bleeding sites to corroborate with previous colonoscopies or endoscopic interventions. Further investigation should be undertaken to ascertain if the thrombin enema would be a viable therapeutic option for those who have failed non-surgical standard treatments such as mesenteric embolization and endoscopic vessel cauterization, or who are poor surgical candidates. We also suggest future studies focused on the reduction of procedural complications and the cost-effectiveness of early use of the thrombin enema within the standard lower gastrointestinal bleed diagnostic workup. The thrombin enema may be considered diagnostic and therapeutic, especially in those patients presenting with lower gastrointestinal bleeding with a high likelihood of recurrent diverticular bleed. We feel that the water-soluble contrast-thrombin enema may have potential for development of phase 1 trials investigating safety/tolerability as well as economic impact of conservative image guided medical therapy for immediate hemostasis of bleeding diverticula. We hope other groups will see the potential and advance this treatment modality.

CONCLUSION

We present a case of a difficult to localize diverticular hemorrhage that was successfully treated using a water soluble contrast-thrombin enema. When other potential treatment modalities are not feasible or in patients with the right past medical history, the thrombin enema may be a worthwhile consideration in an attempt to avoid procedural complications and surgery.

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Author Contributions

Edward Fogarty – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Justin Mauch – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Dakota Orvedal – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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Edorium Journals: An introduction

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