Acute hemorrhagic rectal ulcer: Experience in 11 patients at an urban acute care center in the USA

A case series

Choichi Sugawa, PhD, MD∗, Ashley Culver, MD, Mark Diebel, MD, Jennifer S. McLeod, MD, Charles E. Lucas, MD

Abstract

Introduction: Acute hemorrhagic rectal ulcer (AHRU) is a rare entity which has most frequently been described in Japan and Taiwan literature. This study characterizes 11 AHRUs identified and managed at an urban acute care hospital in the United States of America (USA).

Methods: A total of 2253 inpatients underwent colonoscopy. In 1172 patients (52%), colonoscopy was performed for evaluation of lower gastrointestinal (LGI) bleeding. Eleven (0.9%) of the 1172 patients with LGI bleeding had AHRU.

Results: AHRU is characterized by a sudden onset of painless and massive lower rectal bleeding in elderly, bedridden patients (pts) with major underlying diseases. The endoscopic findings were classified into 4 types. All 11 ulcers were located in the distal rectum within 10 cm of the dentate line. All 11 patients required blood transfusion (mean=3.7 units; range 2–9 units). Seven patients responded to blood, plasma, and platelet transfusions. The other 4 patients required endoscopic hemostasis.

Three patients died within a month of colonoscopy from comorbidities. None had bleeding as a cause of death. Eight surviving patients did not have recurrent bleeding.

Conclusion: AHRU does exist in the USA and should be considered as an important cause of acute lower GI bleeding in elderly, critically ill, and bedridden patients. AHRU should be recognized and managed correctly.

Abbreviations: AHRU = acute hemorrhagic rectal ulcer, CT = computed tomography, CVA = cerebrovascular accident, EGD = esophagogastroduodenoscopy, HIV = human immunodeficiency virus, ICU = intensive care unit, LGI = lower gastrointestinal, pts = patients, USA = United States of America.

Keywords: acute hemorrhagic rectal ulcer in USA, critical illness, lowers gastrointestinal bleeding, treatment of AHRU

1. Introduction

Acute hemorrhagic rectal ulcer (AHRU) is a rare entity which has most frequently been described in the Eastern world. The term, AHRU, was coined by Soeno and co-authors in 1981 in the Japanese literature.1,11 They described this syndrome, in 4 patients with cerebral ischemia, by the acute onset of painless and massive rectal bleeding. This syndrome typically occurs in elderly bedridden patients. Endoscopic examination confirms the AHRU as the source of life-threatening bleeding. Most subsequent reports through 2018 emanated from the eastern world, primarily out of Japan and Taiwan.2–11 Delaney and Hitch, in 1974 (3 patients),12 and Duff and Wright, in 1981 (7/9 acute bleeding patients)13 described in Western world what is now called AHRU although they did not use the term “AHRU”. A recent experience in 2010 with a case of AHRU in an elderly male inpatient stimulated this review. This elderly patient required multiple transfusions and failed angiographic control of massive bleeding. When this failed, he was successfully controlled by endoscopic guided injection of 20cc of 1:10,000 normal saline and epinephrine solution. This experience instigated this retrospective review of a prospectively generated registry program to identify the incidence, treatment, morbidity, and mortality of this entity.

2. Methods

The medical records of 2253 consecutive inpatients, who underwent colonoscopies on the surgical service in an urban emergency hospital between July 1, 2009 and December 31, 2015, were reviewed. Patients who had colonoscopies as an outpatient were excluded. All rectal ulcers were tabulated and divided according to etiology. Patients with associated colitis, (inflammatory bowel disease, pouchitis, and radiation proctitis) were excluded. Electronic medical records, paper endoscopy reports, and endoscopic images were reviewed in detail. The incidence, underlying disorder, comorbidities, endoscopic
findings, ambulatory status, presence or absence of anticoagulant or antiplatelet therapy, treatment, and mortality were tabulated. A retrospective chart review was carried out to gain in-depth information regarding patient information and therapeutic interventions with the approval of the Wayne State University Institutional Review Board, under IRB# 080816MP2E, indicating informed consent for each patient was not needed.

2.1. Inclusion and exclusion criteria of AHRU

Those patients who fulfilled all of the following criteria were considered to have AHRU; sudden onset of painless, massive rectal bleeding; (2) serious underlying disorders (e.g., respiratory failure, renal failure, liver failure, diabetes mellitus, cerebrovascular accident (CVA), atherosclerosis); (3) presence of benign ulcerations in the rectum with ongoing bleeding or stigma of recent bleeding confirmed by colonoscopy; (4) absence of fecal impaction in the rectum; (5) absence of colitis (inflammatory bowel disease, pouchitis, and radiation proctitis); (6) absence of other rectal ulcerative disorders such as solitary rectal ulcer syndrome, stercoral ulcer, ischemic colitis, or mechanical injuries (enema or rectal tube related).[3,7,8]

3. Results

3.1. Incidence of acute hemorrhagic rectal ulcers and causes of rectal ulcers

A total of 2253 inpatients underwent colonoscopy including 90 patients who had flexible sigmoidoscopy. In 1172 patients (52%), colonoscopy was performed for evaluation of lower gastrointestinal (LGI) bleeding. Fifty-four of the 2253 patients (2.4%) had rectal ulcers; 11 (0.5%) of those 2253 patients with ulcers met the criteria of AHRU. Eleven (0.9%) of the 1172 patients with LGI bleeding had AHRU.

The types of rectal ulcers in these 54 patients (Table 1) included stercoral (14), enema or rectal tube induced (13), AHRU (11), solitary (3), human immunodeficiency virus (HIV) (3), rectal injury (gunshot wound) (3), cocaine (2), ischemic (2), pseudomonas (1), nonbleeding acute rectal ulcer (1), and idiopathic (1). The 1 elderly patient (81 years old) with an acute rectal ulcer without hemorrhage was also bedridden and had multiple comorbidities without constipation or pain. This patient was found to be bleeding from a duodenal ulcer as seen by esophagogastroduodenoscopy (EGD). The idiopathic ulcer was a 2 cm × 2 cm deep rectal ulcer about 12 cm above the dentate line (Table 1). This patient with idiopathic ulcer was a healthy, ambulatory, middle-aged woman from Bangladesh, and her ulcer did not fit any criteria described above. Stercoral ulcers were sometimes difficult to differentiate from AHRU by colonoscopic findings only; the history of chronic constipation and very hard stool identified the stercoral ulcers.

3.2. Clinical features

All 11 AHRU patients, 5 men and 6 women, had painless hematochezia (Table 2). The mean age was 65 years (range 45–88), and all were treated in the intensive care unit (ICU). All 11 patients were in ICU when they started bleeding except Case 9. AAA = abdominal aortic aneurysm, A-ff with RVR = atrial fibrillation with rapid ventricular rate, CAD = coronary artery disease, CFF = congestive heart failure, COPD = chronic obstructive pulmonary disease, CVA = cerebrovascular accident, DM = diabetes mellitus, ESRD = endstage renal disease, HD = hemodialysis, HLD = hyperlipidemia, HTN = hypertension.

| Age/sex | Underlying diseases | Endoscopy ulcer type | Blood unit | Treatment | Prognosis |
|---------|---------------------|----------------------|------------|-----------|----------|
| 1       | 67/M                | HTN, CVA, hepatitis C, ESRD on HD | (D)        | 3         | Injection and clipping | Survived |
| 2       | 88/F                | ESRD on HD, HTN, DM | (A)        | 3         | Conservative management | Survived |
| 3       | 54/M                | CVAx3, MI, COPD      | (C)        | 9         | Arteriogram failed, injection therapy successful | Survived |
| 4       | 78/M                | DM, HTN, CHF, COPD, ESRD on HD, alcohol abuse | (A)        | 3         | Conservative management | Died 3d after colonoscopy from MI |
| 5       | 68/M                | DM, hepatitis B/C, CAD, ESRD on HD, BPH, AAA, CVA | (A)        | 3         | Conservative management | Discharged but readmitted, died 17 d later with PE |
| 6       | 46/F                | Chronic liver disease, pleural effusion, ARDS | (A)        | 3         | Conservative management | Palliative care, died 11 d after colonoscopy |
| 7       | 70/M                | ESRD on HD, hepatitis B/C, cirrhosis | (B)        | 2         | Conservative management | Survived |
| 8       | 45/F                | ESRD on HD, hepatitis B/C, bacterial meningitis | (B)        | 4         | Injection therapy failed, combination therapy successful | Survived |
| 9       | 80/F                | CVA, DM, HTN, CAD, hyponatremia | (C)        | 3         | Combination therapy successful | Survived |
| 10      | 68/F                | HTN, CHF, ESRD on HD, CAD, A-ff with RVR, HLD | (B)        | 2         | Conservative management | Survived |
| 11      | 48/F                | ESRD on HD, bilateral hip necrosis | (A)        | 6         | Conservative management | Survived |

All patients were bedridden. Ten patients were in ICU when they started bleeding except Case 9. AAA = abdominal aortic aneurysm, A-ff with RVR = atrial fibrillation with rapid ventricular rate, CAD = coronary artery disease, CFF = congestive heart failure, COPD = chronic obstructive pulmonary disease, CVA = cerebrovascular accident, DM = diabetes mellitus, ESRD = endstage renal disease, HD = hemodialysis, HLD = hyperlipidemia, HTN = hypertension.
patients were bedridden. Ten out of 11 patients were in the ICU when they started having severe painless LGI bleeding. The major underlying diseases included end stage renal disease in 8 patients, hypertension in 7 patients, diabetes mellitus in 4 patients, acute CVA in 3 patients, and liver failure in 3 patients. Five of the patients were being treated with anticoagulants and/or antiplatelet agents.

### 3.4. Treatment and prognosis

All 11 patients required blood transfusion (mean = 3.7 units; range 2–9 units). Seven patients responded to blood, plasma, and platelet transfusions (Table 2). The other 4 patients required endoscopic hemostasis consisting of epinephrine injection alone (2 patients (pts)), epinephrine injection followed by heater probe (1 pt), and epinephrine injection followed by endoclipping (1 pt). Endoscopic hemostasis was initially successful in these 4 patients. Recurrent bleeding in 1 patient after epinephrine injection alone was successfully controlled by a combination of epinephrine injection and heater probe. Three patients died within a month of colonoscopy from comorbidities. None had bleeding as a cause of death. Eight surviving patients did not have recurrent bleeding.

### 4. Discussion

The most common cause of LGI bleeding is diverticular disease, followed by hemorrhoids, carcinoma or polyps, and angiodysplasia. The reported incidence of severe lower gastrointestinal bleeding from rectal ulcers is 2 to 21 percent. Bleeding from rectal ulcers has been recognized and distinguished from the other etiologies of LGI bleeding over the past many years, but the term “acute hemorrhagic rectal ulcer” was seldom used in Western Hemisphere publications. AHRU has now been accepted as a specific entity and includes the ulcers described by Delaney and Hitch in 1974 and Hendrickson and coworkers in 2003. Kanwal and coworkers, in 2003, reported on 23 patients from the United States of America (USA) with bleeding rectal ulcers, including 16 patients with major comorbidities. They opined that the etiology was idiopathic in 11 of these 23 patients; in retrospect some of these may have been AHRU. Hendrickson and coworkers, also in 2003, described 4 inpatients with multiple comorbidities who had severe massive rectal bleeding from rectal ulcers in 1 institution during a 6-month period. Those reports from USA have not used the term “AHRU”. AHRU may be underreported due to difficulties in the localization of causes of rectal bleeding.

The critical illnesses of our patients reflected the overall syndrome of AHRU; the common major comorbidities included end stage renal failure, hypertension, severe diabetes mellitus, liver failure, and cardiac failure or arrhythmia, often with ongoing therapy with anticoagulants or antiplatelet agents (Table 2). All 11 patients were bedridden. These clinical features coincide with the many reports in the literature. With the acceptance of AHRU as a distinct entity, more recent reports demonstrate that this is the most common cause of massive rectal bleeding in patients being managed in the intensive care unit.

The report herein supports that observation, as 10 of 11 patients developed AHRU during their ICU hospitalization.

Tseng and coworkers divided the endoscopic findings of AHRU into 3 categories, namely round type, geographic type, and circumferential type. Oku and coworkers also had a 3-type classification defined as “nearly” round type, irregular type, and Dieulafoy type. The classification by Motomura and coworkers has 4 categories, including circumferential type, small linear/round type, circumferential plus small ulcer type, and Dieulafoy-like type. Motomura’s classification was used in this report with some modification (Fig. 1A–D). Among the patients with AHRU, those with whole circumferential ulcers (Type A) should be considered for especially high risk of delayed ulcer healing and rebleeding.

One of the challenges in classifying AHRU was distinguishing this entity from other bleeding rectal lesions. The endoscopic appearance of some stercoral ulcers could be similar to AHRU but the clinical scenario was much different. The stercoral ulcers were associated with severe constipation and the presence of impacted, brick hard stool at the margin of the ulcer. Some bleeding from a stercoral ulcer is difficult to control transanally due to the impacted stool and the difficulty exposing transabdominally without resecting that portion of the proximal rectum and sigmoid colon that was solidly impacted with very hard stool. Endoscopic findings of ischemic ulcers could also be difficult to distinguish from AHRU on endoscopic
interventions such as sclerotherapy or hemorrhoidal therapy.\[31\] Collateral rectal ulcers were thought to be rare due to the abundant discomfort.\[17\] The painless subtype of ischemia typically results painless or painful hematochezia with left-sided abdominal pain, laceration plus the history of the recent use of a rectal tube, enema, or other foreign body. An inflated rectal tube may produce a deep ulcer near the dentate line. The solitary rectal ulcer was more likely to be associated with rectal prolapse after straining in patients with pelvic floor incoordination caused by chronic constipation.\[27,28\] The histologic features of a solitary rectal ulcer (fibromuscular obliteration) are not found in patients with AHRU. The rectal ulcer caused by HIV was suspected by the presence of HIV, the colonoscopic findings, and histopathologic evaluation.\[29\] There were 2 patients in this series who had ulcers due to cocaine injection. This was associated with ischemic ulceration of many areas of the gut and was suspected by the recent use of cocaine. Cocaine is known to cause intense vasoconstriction with ischemia and localized perforation with or without bleeding.\[30\]

Nakamura reported that the rectal mucosal blood flow was actually reduced in the supine position.\[21\] This was measured by laser-Doppler technique. They postulated that this reduction of mucosal blood flow is a major etiology of AHRU.\[23\] Ischemic rectal ulcers were thought to be rare due to the abundant collateral flow around the rectum, but they may develop in patients who have not had vascular surgery or other iatrogenic interventions such as sclerotherapy or hemorrhoidal therapy.\[31\] Rectal ischemia can occur in conjunction with or without colonic ischemia and represents about 10 to 15 percent of all cases of large bowel ischemia.\[17\] Ischemic colitis could also present as painless or painful hematochezia with left-sided abdominal discomfort.\[17\] The painless subtype of ischemia typically results from mucosal hypoxia and is thought to be caused by hyperperfusion of the intramural vessels of the colonic wall.\[17\]

In the study reported herein, hypertension and/or stroke were present in 8 patients, and there were 4 patients with diabetes who might have had compromised flow. The elderly age in most patients suggested that arterial sclerosis may be a potential risk factor. Bleeding tendencies were also found in 8 patients being treated with end stage renal disease. Furthermore, 5 patients were being treated with anticoagulants or antiplatelet agents. The combination of poor rectal perfusion and coagulopathy in the bedridden,\[10\] arteriosclerotic patient played a role in the onset of massive painless bleeding from AHRU.

Many types of treatment for AHRU have been applied since ulcer types of AHRU are multiple. Transanal gauze tamponade may be initially successful but has a significant recurrence rate.\[4\] Transanal suture ligation of an actively bleeding vessel, ideally, would be an excellent technique, but access to the bleeding vessel through a limited orifice and actual isolation of the artery may be very frustrating and result in failure to achieve good hemostasis.\[6\] Clipping of a visible vessel has been reported with success, whereby both hypertonic saline injection and band ligation have been used.\[17,18\] Application of a heater probe has also been reported with some success.\[9\] Endoscopic hemostasis in this report was achieved in 4 of 11 patients with excellent results. The technique for successful hemostasis in these patients included clipping, epinephrine/saline injection, heater probe, and bipolar electrocoagulation.

The treatment in this series included 7 patients who responded to blood plasma and platelet transfusion without the need for endoscopic hemostasis. The other 4 patients required endoscopic hemostasis, which was successful. Unfortunately, the comorbidities in these patients were major, so 3 patients died within 1 month of presentation. None of the patients died from continuous bleeding. The surviving 8 patients responded to treatment and did not rebleed. This coincides with prior reports showing that the patient outcome is influenced by underlying diseases rather than continued bleeding.\[4,7,9\]

4.1. Limitations of the present study

Limitations of the present study include that it was carried out at a single emergency hospital and the number of AHRU was small. Nevertheless, this study shows that AHRU exists in the USA. AHRU should be considered as an important cause of acute LGI bleeding in patients with a severe underlying illness.

5. Conclusion

AHRU does exist in the USA and should be considered as an important cause of acute LGI bleeding in elderly, critically ill, and bedridden patients. AHRU should be recognized as an important cause of severe rectal bleeding and should be managed correctly.

Author contributions

Choichi Sugawa designed, analyzed, wrote, and revised this manuscript; Ashley Culver analyzed the data and helped in the revision of this manuscript; Mark Diebel and Jennifer S. McLeod collected the data for this manuscript; Charles E. Lucas is responsible for the critical editing in the revision of this manuscript.

References

[1] Delaney H, Hinch WS. Solitary rectal ulcer a cause of life-threatening hemorrhage. Surgery 1974;76:830–2.
[2] Duff JH, Wright FF. Acute and chronic benign ulcers of the rectum. Surg Gynecol Obstet 1981;153:398–400.
[3] Soeno T, Shoji S, Sakuraba K. Acute hemorrhagic rectal ulcer accompanied with the brain disease (in Japanese with English abstract). Akita J Med 1981;8:207–13.
[4] Nakamura S, Okawa K, Hara J, et al. Etiology of acute hemorrhagic rectal ulcer Laser-Doppler analysis of rectal mucosal blood flow in lateral and horizontal supine position at bed rest (in Japanese with English abstract). Gastroenterol Endosc 1996;38:1481–7.
[5] Takeuchi K, Tsuzuki Y, Ando T, et al. Clinical characteristics of acute hemorrhagic rectal ulcer. J Clin Gastroenter 2001;33:226–8.
[6] Tseng CA, Chen LT, Tsai KB, et al. Acute hemorrhagic rectal ulcer syndrome: a new clinical entity? Report of 19 cases and review of the literature. Dis Colon Rectum 2004;47:895–905.
[7] Lin CC, Lee YC, Lee H, et al. Bedside colonoscopy for critical ill patients with acute lower gastrointestinal bleeding. Intensive Care Med 2005;31:743–6.
[8] Hung HY, Changchien CR, You JF, et al. Massive hematochezia from acute hemorrhagic rectal ulcer in patients with severe comorbid illness:
rapid control of bleeding by per anal suturing of bleeder using ano retractor. Dis Colon Rectum 2006;49:238–43.
[9] Oku T, Maeda M, Ibara H, et al. Clinical and endoscopic features of acute hemorrhagic rectal ulcer. J Gastroenterol 2006;41:962–70.
[10] Motomura Y, Akahosi K, Matsui N, et al. Clinical and endoscopic characteristics of acute haemorrhagic rectal ulcer, and endoscopic haemostatic treatment: a retrospective study of 95 patients. Colorectal Dis 2010;12:320–5.
[11] Lin CK, Liang CC, Chang HW, et al. Acute hemorrhagic rectal ulcer: an important cause of lower gastrointestinal bleeding in the critically ill patients. Digest Dis Sci 2011;56:3631–7.
[12] Matsumoto T, Inokuma T. Clinical course and rebleeding predictors of acute hemorrhagic rectal ulcer: 5 year experience and review of the literature. Colorectal Dis 2013;15:878–84.
[13] Jung JH, Kim JW, Lee HW, et al. Acute hemorrhagic rectal ulcer syndrome: comparison with non-hemorrhagic rectal ulcer lower gastrointestinal bleeding. J Dig Dis 2017;18:521–8.
[14] Edelman DA, Sugawa C. Lower gastrointestinal bleeding: a review. Surg Endosc 2007;21:514–20.
[15] Strate LL, Ayanian JZ, Kotler G, et al. Risk factors for mortality in lower intestinal bleeding. Clin Gastroenterol Hepatol 2008;6:1004–10.
[16] Gayer C, Chino A, Lucas C, et al. Acute lower gastrointestinal bleeding in 1,112 patients admitted to an urban emergency medical center. Surgery 2009;146:600–7.
[17] Martínez PC, Martínez CA, Antón RG, et al. Rectal ulcer secondary to a fecal impaction due to pomegranate seed bezoar. Revista Española de Enfermedades Digestivas 2012;104:266–7.
[18] Maull KI, Kinning WK, Kay S. Stercoral ulceration. Am Surg 1982;48:20–4.
[19] Serpel JW, Nicholls R. Stercoral perforation of the colon. Br J Surg 1990;77:1325–9.
[20] Montoro MA, Brandt LJ, Santolaria S, et al. Clinical patterns and outcomes of ischemic colitis: results of the working group for the study of ischemic colitis in Spain (CIE study). Scand J Gastroenterol 2011;46:236–46.
[21] Stark ME, Goustout CJ, Balm RK. Clinical features and endoscopic management of Dieulafoy’s disease. Gastrointest Endosc 1992;38:545–50.
[22] Meister T, Varilek G, Marsano L, et al. Endoscopic management of rectal Dieulafoy-like lesions: a case series and review of literature. Gastrointest Endosc 1998;48:302–5.
[23] Vaizey CJ, Van Den Bogaerde JB, Emmanuel AV, et al. Solitary rectal ulcer syndrome. Br J Surg 1998;85:1637–23.
[24] Abid S, Khawaja A, Bhimani SA, et al. The clinical, endoscopic and histological spectrum of the solitary rectal ulcer syndrome: a single-center experience of 116 cases. BMC Gastroenterol 2012;12:72https://doi.org/10.1186/1471-230X-12-72.
[25] Wilcox CM, Schwartz DA. Idiopathic anorectal ulceration in patients with human immunodeficiency virus infection. Am J Gastroenter 1994;89:599–604.
[26] Shanti CM, Lucas CE. Cocaine and the critical care challenge. Crit Care Med 2003;31:1851–9.
[27] Geboes K, Jain D, Riddell R, Jain D, Bernstein CN, Guha S. Vascular disorders and related disease. Lewin, Weinstein and Riddell’s Gastrointestinal Pathology and Its Clinical Implications 2nd ed. Philadelphia: Lippincott Williams & Wilkins, Wolters Kluwer; 2014; 28–87.