Original Article

Surgery Intervention of Acute Hemorrhagic Rectal Ulcer in Critically Ill Patients: Analysis of Surgical Outcome

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Key Words
Acute hemorrhagic rectal ulcer

Abbreviations
AHRU, acute hemorrhagic rectal ulcer;
ICU, intensive care unit

Purpose. Acute hemorrhagic rectal ulcer (AHRU) is a syndrome characterized by painless, massive hemorrhage from a solitary or multiple rectal ulcers in patients with serious underlying disease. A retrospective analysis is presented to investigate disease incidence rate in the intensive care unit (ICU), treatment modalities, and overall mortality.
Methods. Between November 2010 and July 2014, 18971 patients were admitted to the ICU ward. Of these, 96 patients with acute massive hematochezia received colonoscopy within 24 to 48 hours after onset. Diagnoses of AHRU were made according to the following criteria: (1) sudden onset of painless, massive hematochezia; (2) presence of ulcerations with ongoing bleeding or stigmata of recent bleeding in the rectum, as investigated by colonoscopy; (3) exclusion of other ulcerative disorders in the rectum such as mucosal-prolapse syndrome, solitary rectal ulcer syndrome, stercoral ulcer, inflammatory bowel diseases, ischemic colitis, infectious diseases (e.g., tuberculosis, cytomegalovirus infection), cancer, or possible mechanical injuries; and (4) no history of nonsteroidal anti-inflammatory drug suppositories within one week. Data on the clinical course, methods of hemostasis, number of operations, and mortality were collected and analyzed retrospectively.
Results. AHRU was diagnosed in 28 of 96 patients (29.1%), and the incidence rate for AHRU in the ICU was 1.48/1000. Thirteen patients (13/28, 46.4%) developed hypovolemic shock after the onset of bleeding. Surgical intervention was performed in all 28 patients with first-time bleeding and showed a success rate of 57.1% (16/28). Twelve patients (12/28, 42.9%) developed rebleeding within four weeks, and surgery was performed in 11 patients for hemostasis, with a success rate of 63.6% (7/11). Rebleeding recurred in four patients (4/28, 14.3%), all of whom died despite repeated surgery and other management efforts. The overall survival rate was 64.3% (18/28), and four patients died of intractable rectal ulcer bleeding.
Conclusions. Acute hemorrhagic rectal ulcer syndrome is an important etiology of acute lower gastrointestinal tract bleeding in ICU patients. Awareness of this clinical entity requiring a high index of suspicion results in early detection, diagnosis, and appropriate therapy. Intractable and repeated bleeding is associated with high mortality rate and worse outcomes.
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In 1974, Delancy and Hitch[1] first described three cases of acute, asymptomatic, and life-threatening hemorrhage from solitary ulcers of the rectum. Soeno et al.[2] used the term acute hemorrhagic rectal ulcer (AHRU) to describe such cases. In recent years, several series studies on AHRU have been reported, mainly in Japan and Taiwan.[3-6] Such lesions were characterized clinically as sudden onset, painless, massive hemorrhages from solitary or multiple rectal ulcers in elderly bedridden patients who have serious illness.[6] Endoscopic clipping and surgery (per anal suturing) have been reported as treatments for this life-threatening syndrome.[5,6] We retrospectively reviewed surgical intervention of AHRU patients in our intensive care unit (ICU) to evaluate the clinical characteristics and outcomes.

Method

Between November 2010 and July 2014, 18971 patients were admitted to ICU ward in our hospital. Of

Table 1. Clinical characteristics of acute hemorrhagic rectal ulcer patients

Patient	Age (y)	Gender	Admission disease	Shock	A to E [a] (days)	Underlying disease	B [b]	RB [c]	Outcomes
1	74	M	Epidural abscess	Y	6	Uremia, CAD, RF	Y	N	Death from other
2	70	M	CVA	Y	42	Uremia, T2DM, RF, CVA	Y	N	Survived
3	51	F	CAD	Y	24	T2DM, CAD, RF	Y	Y	Survived
4	69	F	Cervical spine stenosis	N	22	Cancer	N	Y	Death from other
5	50	F	Perianal abscess	Y	31	Uremia, Bedridden, T2DM, CAD, RF	N	Y	Death from other
6	59	F	Transplant kidney failure	N	16	Uremia, T2DM	Y	N	Survived
7	34	M	Cellulitis	N	11	Uremia	Y	Y	Survived
8	54	F	Major trauma	N	29	T2DM, RF, Cancer	Y	Y	Death from bleeding
9	68	M	Gouty with sepsis shock	N	52	T2DM, CAD, RF	Y	N	Survived
10	76	M	Pneumonia with shock	Y	28	CAD, Cancer	Y	Y	Survived
11	88	F	Acute renal failure	N	3	Uremia, T2DM, RF	Y	N	Survived
12	60	F	Surgical wound bleeding and infection	Y	0	Uremia, T2DM, RF	Y	N	Survived
13	76	F	Pneumonia	Y	9	Uremia, RF	Y	Y	Death from bleeding
14	89	M	Pneumonia	N	17	Nil	Y	N	Survived
15	72	F	CAD	Y	17	Uremia, T2DM, CAD, RF	Y	N	Death from other
16	45	M	CAD	Y	29	Uremia, T2DM, CAD	Y	Y	Survived
17	73	F	Perianal abscess	N	9	Cirrhosis, T2DM, Cancer	Y	N	Survived
18	72	M	Cervical spine stenosis	Y	21	Uremia, T2DM, CAD, RF	Y	N	Death from bleeding
19	60	M	Pneumonia	Y	0	T2DM, RF, Cancer	Y	N	Survived
20	56	M	Wound infection of DM foot	Y	31	Cirrhosis, T2DM	N	Y	Survived
21	73	F	APN with shock	N	14	T2DM	Y	N	Survived
22	61	M	Wound infection of DM foot	N	18	Uremia, T2DM	Y	Y	Survived
23	61	M	DKA	N	18	Cirrhosis, T2DM, RF	Y	N	Survived
24	42	M	Gastric ulcer erosion	N	0	Uremia, Cirrhosis, T2DM	N	Y	Survived
25	69	M	CVA	N	6	CVA	Y	N	Death from other
26	66	F	Pancytopenia	N	14	Bedridden, T2DM, RF, Cancer	N	N	Death from other
27	50	M	Necrotizing fasciitis	N	11	T2DM	Y	N	Survived
28	65	M	Sepsis	Y	32	CVA, Cancer	Y	Y	Death from bleeding

[a] Admission to event. [b] Bleeding identified. [c] Rebleeding identified. CVA: cerebrovascular accident; CAD: coronary artery disease; DM: diabetes mellitus; T2DM: type II diabetes mellitus; APN: acute pyelonephritis; RF: respiratory failure.

these, 96 ICU patients underwent colonoscopic examination due to acute lower gastrointestinal tract bleeding. Medical records and colonoscopic files were then carefully reviewed. Patients who fulfilled all of the following criteria were considered to have AHRUS and included in this study: (1) sudden onset of painless, massive rectal bleeding, defined as hemoglobin < 10 g/dL with shock (systolic blood pressure < 90 mmHg and/or pulse > 110/min) or hemoglobin < 7 g/dL; (2) the presence of ulcerations with ongoing bleeding or stigmata of recent bleeding in the rectum, as confirmed by colonoscopy; (3) examination using esophagogastroduodenoscopy to exclude sources of bleeding from the upper gastrointestinal tract; and (4) no history of nonsteroidal anti-inflammatory drug administration within one preceding the bleeding episode. Clinical characteristics, hemostatic treatment, and surgical outcome were analyzed. Data were assessed by the Fisher exact test. Values of $p < 0.05$ were considered statistically significant.

Results

Of 96 patients who had acute massive hematochezia between November 2010 and July 2014, 28 (29.1%) were diagnosed with AHRU. Clinical characteristics and treatment outcomes are summarized in Table 1. The incidence of AHRU in the ICU ward was 1.48/1000. Sixteen of our patients (81.67%) were male, 12 (18.33%) were female, and the mean age was 63.68 ± 12.95 years (range 34-89). Thirteen patients (13/28, 46.4%) developed hypovolemic shock. The mean time from the day of admission day to the development of bleeding was 18.21 (range 0-52) days. All of the patients underwent an urgent operation upon confirmation of the diagnosis.

Surgical intervention with suture ligation was performed in 28 patients for the first occurrence of bleeding with 57.1% (16/28) success rate. Twelve patients (12/28, 42.9%) developed rebleeding within four weeks. The operation was repeated in 11 patients with a successful outcome in seven (7/11, 63.6%). A third bleeding episode occurred in four patients (4/28, 14.3%), all of whom subsequently died despite a repeated surgery and other management efforts (Fig. 1). The mean time for the development of rebleeding after surgery was 7.75 (range 3-22) days. Table 2 shows a comparison of clinical characteristics between rebleeding and non-rebleeding groups. There was no difference in distribution between these two groups. No significant factor was identified for rebleeding. The overall mortality rate and the rates following one, two, or three episodes in our series were 36.7% (10/28), 31.25% (5/16), 12.5% (1/8), and 100% (4/4), respectively. Four patients died of intractable ulcer bleeding, and six other patients died due to other causes. Disease-specific mortality was 14.3% (4/28). A comparison of clinical characteristics between surviving and non-surviving patient groups revealed a significantly higher incidence of advanced age (> 65 years) and the presence of thrombocytopenia among non-survivors (p = 0.0382, 0.0204, respectively) (Table 3). Univariate

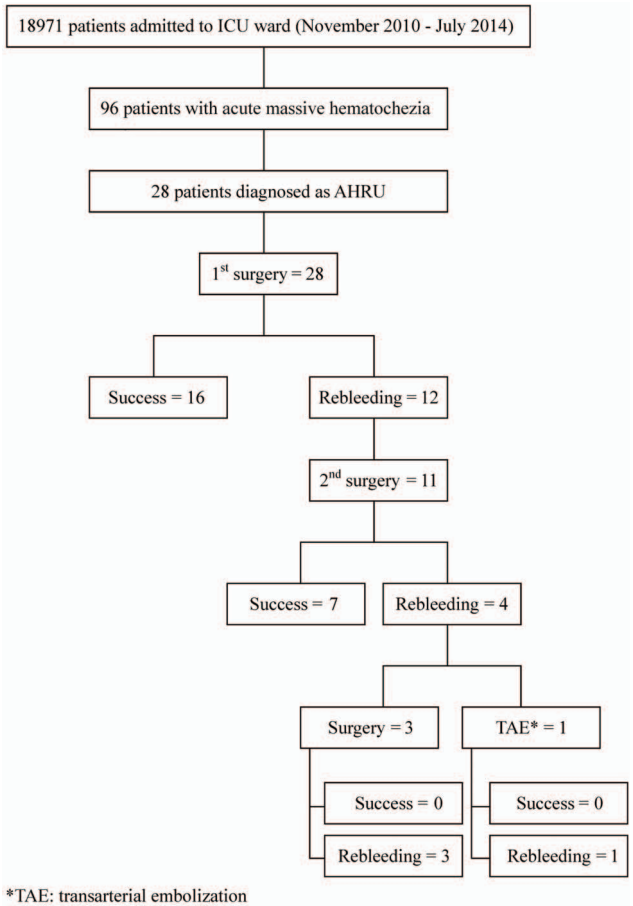

Fig. 1. Algorithm for clinical course and treatment in AHRU patients.

Table 2. Comparison of clinical characteristics between rebleeding and non-rebleeding groups

		Rebleeding (n = 12)	Non-rebleeding (n = 16)	*p* value
Gender	M = 16	7 (58.33)	9 (56.25)	0.9122
	F = 12	5 (41.67)	7 (43.75)	
Age > 65	Y = 15	4 (33.33)	11 (68.75)	0.0629
	N = 13	8 (66.67)	5 (31.25)	
INR prolong	Y = 18	8 (66.67)	10 (62.50)	0.3021
	N = 10	4 (33.33)	6 (37.50)	
Thrombocytopenia	Y = 17	7 (58.33)	10 (62.50)	0.2953
	N = 11	5 (41.67)	6 (37.50)	
Uremia	Y = 13	6 (50.00)	7 (43.75)	0.7428
	N = 15	6 (50.00)	9 (56.25)	
Cirrhosis	Y = 4	2 (16.67)	2 (12.50)	0.3868
	N = 24	10 (83.33)	14 (87.50)	
Bedridden	Y = 2	1 (8.33)	1 (6.25)	0.5079
	N = 26	11 (91.67)	15 (93.75)	
Type 2 DM	Y = 20	7 (58.33)	13 (81.25)	0.1427
	N = 8	5 (41.67)	3 (18.75)	
Shock	Y = 13	7 (58.33)	6 (37.50)	0.2740
	N = 15	5 (41.67)	10 (62.50)	
HTN	Y = 16	6 (50.00)	10 (62.50)	0.5083
	N = 12	6 (50.00)	6 (37.50)	
CVA	Y = 6	3 (25.00)	3 (18.75)	0.3270
	N = 22	9 (75.00)	13 (81.25)	
CAD	Y = 8	4 (33.33)	4 (25.00)	0.2899[a]
	N = 20	8 (66.67)	12 (75.00)	
Bacteremia	Y = 10	4 (33.33)	6 (37.50)	0.3021
	N = 18	8 (66.67)	10 (62.50)	
Arrhythmia	Y = 4	2 (16.67)	2 (12.50)	0.3868[a]
	N = 24	10 (83.33)	14 (87.50)	
Cancer	Y = 7	4 (33.33)	3 (18.75)	0.2341
	N = 21	8 (66.67)	13 (81.25)	
Ventilator use	Y = 14	4 (33.33)	10 (62.50)	0.1266
	N = 14	8 (66.67)	6 (37.50)	
Comorbidity ≥ 1	Y = 6	2 (16.67)	4 (25.00)	0.6730
	N = 22	10 (83.33)	12 (75.00)	
Comorbidity = 2	Y = 6	5 (41.67)	1 (6.25)	0.0573
	N = 22	7 (58.33)	15 (93.75)	
Comorbidity ≥ 3	Y = 16	5 (41.67)	11 (68.75)	0.2495
	N = 12	7 (58.33)	5 (31.25)	
Found bleeder	Y = 23	8 (66.67)	15 (93.75)	0.0806
	N = 5	4 (33.33)	1 (6.25)	
Death	Y = 10	5 (41.67)	5 (31.25)	0.2636
	N = 18	7 (58.33)	11 (68.75)	

INR: international normalized ratio; DM: diabetes mellitus; HTN: hypertension; CVA: cerebrovascular accident; CAD: coronary artery disease.

Table 3. Comparison of clinical characteristics between death and survivor groups

		Death = 10	Survivor = 18	*p* value
Gender	M = 16	4 (40.00)	12 (66.67)	0.1281
	F = 12	6 (60.00)	6 (33.33)	
Age > 65	Y = 15	8 (80.00)	7 (38.89)	0.0382
	N = 13	2 (20.00)	11 (61.11)	
INR prolong	Y = 18	8 (80.00)	10 (55.56)	0.1500
	N = 10	2 (20.00)	8 (44.44)	
Thrombocytopenia	Y = 17	9 (90.00)	8 (44.44)	0.0204
	N = 11	1 (10.00)	10 (55.56)	
Uremia	Y = 13	5 (50.00)	8 (44.44)	0.2945
	N = 15	5 (50.00)	10 (55.56)	
Cirrhosis	Y = 4	0 (0.00)	4 (22.22)	0.1495
	N = 24	10 (100.00)	14 (77.78)	
Bedridden	Y = 2	2 (20.00)	0 (0.00)	0.1190
	N = 26	8 (80.00)	18 (100.00)	
Type 2 DM	Y = 20	5 (50.00)	15 (83.33)	0.0662
	N = 8	5 (50.00)	3 (16.67)	
Shock	Y = 13	6 (60.00)	7 (38.89)	0.1785
	N = 15	4 (40.00)	11 (61.11)	
HTN	Y = 16	5 (50.00)	11 (61.11)	0.2636
	N = 12	5 (50.00)	7 (38.89)	
CVA	Y = 6	4 (40.00)	2 (11.11)	0.0853
	N = 22	6 (60.00)	16 (88.89)	
CAD	Y = 8	4 (40.00)	4 (22.22)	0.2067
	N = 20	6 (60.00)	14 (77.78)	
Bacteremia	Y = 10	4 (40.00)	6 (33.33)	0.2971
	N = 18	6 (60.00)	12 (66.67)	
Arrhythmia	Y = 4	2 (20.00)	2 (11.11)	0.3363
	N = 24	8 (80.00)	16 (88.89)	
Cancer	Y = 7	4 (40.00)	3 (16.67)	0.1447
	N = 21	6 (60.00)	15 (83.33)	
Ventilator use	Y = 14	3 (30.00)	11 (61.11)	0.1147
	N = 14	7 (70.00)	7 (38.89)	
Comorbidity ≤ 1	Y = 6	2 (20.00)	4 (22.22)	1.0000
	N = 22	8 (80.00)	14 (77.78)	
Comorbidity = 2	Y = 6	2 (20.00)	4 (22.22)	1.0000
	N = 22	8 (80.00)	14 (77.78)	
Comorbidity ≥ 3	Y = 16	6 (60.00)	10 (55.56)	1.0000
	N = 12	4 (40.00)	8 (44.44)	
Found bleeder	Y = 23	7 (70.00)	16 (88.89)	0.1868
	N = 5	3 (30.00)	2 (11.11)	
Rebleeding	Y = 12	5 (50.00)	7 (38.89)	0.2636
	N = 16	5 (50.00)	11 (61.11)	

INR: international normalized ratio; DM: diabetes mellitus; HTN: hypertension; CVA: cerebrovascular accident; CAD: coronary artery disease.

logistic regression analysis revealed that advanced age (> 65 years) (odds ratio [OR] = 6.285, $p = 0.0473$)

and thrombocytopenia upon the initial presentation of bleeding (OR = 11.250, $p = 0.0363$) were risk factors for mortality. Multivariate logistic regression analysis, however, indicated no significant predictors of mortality (Table 4).

Discussion

Massive lower gastrointestinal bleeding is commonplace event and a thorny problem to deal with in the ICU ward. Of those ICU patients who underwent colonoscopic examination due to acute lower gastrointestinal tract bleeding, approximately 30% were diagnosed with AHRU. The overall incidence of AHRU in ICU was 1.48/1000. Thus, as in previous reports, AHRU was found to be a common cause of acute lower gastrointestinal bleeding in patients after hospitalization for other morbidities.[7,8] AHRU is most commonly encountered in elderly, bed-ridden patients with serious comorbidities.[3,4,6]

The pathophysiology of AHRU is still controversial and not completely understood. In our study, patients were mostly elderly, with a median age of 63.68 ± 12.95 years and presented with a serious underlying disease. Type 2 diabetes mellitus, hypertension, and uremia were the most common comorbidities in our patients. We found most of those diagnosed with AHRU to have more than two comorbidities (21/28, 75%). Prior to the first bleeding episode, half of those developing AHRU were in respiratory failure status requiring ventilator support. It has also been suspected that atherosclerotic disorders such as diabetes mellitus and vascular disease are associated with AHRU.[6] In the current study, diabetes mellitus was seen in 20 (71.4%) patients, hypertension in 16 (57.1%) patients, coronary artery disease in 8 (28.6%) patients, and 6 (21.4%) patients had experienced a cerebrovascular accident. Advancing age and the above comorbidities were closely related to vascular atherosclerosis. In addition, 13 patients (46.4%) in our study were diagnosed with uremia. Recent studies have pointed out that vascular calcification, specifically arterial calcification, is a major cause of cardiovascular disease in the dialysis

Table 4. Predictors of mortality in AHRU patients

Covariate	Crude Odds ratio (95% CI)	*p* value	Adjusted Odds ratio (95% CI)	*p* value
Gender (male vs. female)	0.333 (0.067-1.652)	0.1785		
Age (age > 65 vs. age ≦ 65)	6.285 (1.022-38.646)*	0.0473	4.941 (0.700-34.903)	0.1092
Age	1.031 (0.966-1.099)	0.3562		
INR prolong (yes vs. no)	3.200 (0.525-19.495)	0.2071		
Thrombocytopenia (yes vs. no)	11.250 (1.167-108.406)*	0.0363	9.143 (0.877-95.367)	0.0643
Uremia (yes vs. no)	1.250 (0.265-5.886)	0.7777		
Cirrhosis (yes vs. no)	-			
Bedridden (yes vs. no)	-			
T2DM (yes vs. no)	0.200 (0.035-1.154)	0.0720		
Shock (yes vs. no)	2.357 (0.485-11.449)	0.2878		
HTN (yes vs. no)	0.636 (0.134-3.029)	0.5702		
CVA (yes vs. no)	5.333 (0.767-37.093)	0.0907		
CAD (yes vs. no)	2.333 (0.433-12.568)	0.3240		
Bacteremia (yes vs. no)	1.333 (0.269-6.606)	0.7246		
Arrhythmia (yes vs. no)	2.000 (0.236-16.928)	0.5247		
Cancer (yes vs. no)	3.332 (0.567-19.586)	0.1829		
Ventilator (yes vs. no)	3.667 (0.703-19.120)	0.1231		
Comorbidity				
≤ 1	1.000			
= 2	1.000 (0.091-11.028)	1.000		
≥ 3	1.200 (0.166-8.659)	0.8565		
Found bleeder (yes vs. no)	0.292 (0.040-2.150)	0.2267		
Rebleeding (yes vs. no)	1.570 (0.330-7.480)	0.5702		

population. Consistent with previous published articles, up to 92.95% of patients (26/28) in our study could be considered to have a vascular disorder. Furthermore, impaired arterial blood flow to the rectal mucosa may be an important and possible mechanism contributing to the development of AHRU.

Nakamura et al.[9] reported that most of their AHRU patients were bedridden, and the rectal mucosal blood flow was actually reduced in the supine position during bed rest. They proposed that the reduction of mucosal blood perfusion is the main etiological factor in AHRU. In our study, only two patients were bedridden, an observation that is not fully consistent with this theory. However, every patient in the ICU ward was on absolute bed rest and maintained in a supine position. From our study, bedridden status seems to be a part of the etiology of AHRU. In fact, long term restriction to a supine position resulting in reduced rectal mucosa blood flow is the most important predisposing factor for AHRU. Furthermore, reduced rectal mucosal flow with progressive mucosa ischemia and sloughing is the patholophysiologic mechanism of AHRU. Physical conditions such as long term confinement to a supine position and a history of peripheral rectal vessel occlusion due to atherosclerosis or vascular calcification are the two most important predisposing factors for AHRU.

Low rectal ulcers are manifestations of various clinical processes. These include solitary rectal ulcer syndrome,[10] stercoral ulcer,[11] ischemic rectal ulcer, radiation-related ulcer, traumatic rectal ulcer, and rectal ulcers secondary to therapy with nonsteroidal compounds. Solitary rectal ulcer syndrome often occurs in young adults with a history of constipation, self-digitation, or rectal prolapse.[12] Solitary rectal ulcer syndrome is usually seen in women, and symptoms usually consist of a variety of bowel complaints: constipation, diarrhea, passage of mucus, tenesmus, rectal bleeding, and proctalgia fugax. A classic history is one of blood and mucus per rectum associated with straining and a feeling of incomplete evacuation. The histologic characteristics of solitary rectal ulcer syndrome, such as fibrous obliteration of the lamina propria with disorientation of muscle fibers, are absent in AHRU.[4,13] Stercoral ulceration is an ulcer developed by pressure necrosis from a fecal mass, which occurs most frequently as an individual lesion in the rectosigmoid-colon junction. Ischemic colitis patients often experience abdominal pain, but the onset of AHRU is painless. Lesions of solitary rectal ulcer syndrome most commonly appear with erythematous and edematous mucosa. However, the mucosa surrounding the AHRU is normal or only slightly hyperemic. Rectal ulcer caused by radiation, trauma, or nonsteroidal antiinflammatory compounds is distinguishable by history from AHRU.

Gauze tamponade,[4] transanal suture ligation,[4,5] and clipping[6] have been reported as effective hemostatic treatments for AHRU. The incidence of recurrent bleeding was 72.7% with gauze tamponade,[4] 42.3% with transanal suturing,[5] and 23.1% with the clipping procedure.[6] Localized bleeders and treatment by endoscopy has been documented in several reports. Injection of epinephrine, heater probe thermocoagulation, injection sclerotherapy, or clipping may all be used for hemostasis.[14] However, if the physician is unfamiliar with this particular disease entity, AHRU can be easily overlooked because of the proximity of the lesion to the anal verge. A study by Lin[8] indicated a success rate of 97.2% immediate hemostasis with endoscopic intervention, with a rate of rebleeding within four weeks of 48.3%.[8] Motomura et al.[15] reported a rebleeding rate of 30.2% after endoscopic haemostatic treatment. In our study, all of the patients underwent surgical intervention with suture ligation. Colonoscopic hemostasis was performed in 22 patients prior to surgical therapy, but it failed. Surgical intervention with suture ligation was performed in 28 patients following the first episode of bleeding and yielded a 57.1% success rate. Twelve patients developed rebleeding within four weeks. A second operation was performed in 11 patients, with 63.6% success rate. A third bleeding episode occurred in four patients (14.3%), who, despite undergoing repeat surgical intervention and angioembolization therapy, all died of intractable ulcer bleeding. Thus, the success rate of suture ligation was 54.7% with a 45.5% rebleeding rate.

Predictors of rebleeding have been reported in several papers. Patients with anticoagulant use, high

APACHE II scores, and coagulopathy easily developed recurrent bleeding.[5,15] An associated study by Lin et al.[8] showed thrombocytopenia upon initial presentation of bleeding and the presence of more than one comorbidity were risk factors for mortality on univariate analysis. Multivariate logistic regression analysis indicated that only thrombocytopenia was predictive of mortality. Matsumoto and Inokuma[16] reported that the presence of a whole circumferential ulcer was a significant independent predictor based on univariate analysis and stepwise multivariate analysis. Our result revealed no independent factors for rebleeding and post-operative mortality, however, thrombocytopenia and old age showed a trend for an association with post-operative mortality. The overall mortality rate in our cohort was 36.7%. The AHRU-specific mortality rate was 14.3%, and the underlying patient comorbidities seemed to have impact on the outcome after bleeding.

In a previous report, only 2.8% of AHRU patients in a general hospital population had massive bleeding with hypovolemic shock.[4] The proportion was higher (46.4%) in our patients, and likely due to the clinical presentation of AHRU bleeding and severe illness requiring ICU admission. Clinically, the interval for the sudden onset of massive blood clots passage was usually noted for AHRU patients. The specific pattern of blood stool was related to the rectoanal inhibitory reflex. When AHRU bleeding occurred, the blood clots accumulated gradually in the rectum. After distension of the rectum by the accumulating blood clots, relaxation of the internal anal sphincter muscle occurred. Thereafter, passage of massive blood clots was noted. A lack of awareness of a diagnosis of AHRU can lead to hypovolemic shock after several episodes of blood clots passage. We suggest that clinicians require a high suspicion of AHRU in critically ill patients with sudden onset of massive hematochezia. AHRU was located in the rectum, which can initially be differentially diagnosed with rigid or flexible sigmoidoscopy.

The limitations of this study are its retrospective design and the heterogeneity and small size of the study population. Further prospective studies regarding the optimal therapeutic modalities and prevention of rebleeding after surgical intervention are needed to improve the management of AHRU in the critically ill patients. Nakamura et al.[9] examined blood flow in the mucosa of the upper and lower rectum as measured by the laser-doppler method in 11 patients with AHRU and 11 control subjects. They examined the effect of changing from the lateral position to the horizontal supine position on blood flow. No difference in the mucosal flow in the upper or lower rectum was observed between the two groups in the lateral position. However, changing the position from lateral to supine significantly decreased mucosal blood flow up to 16.6 ± 11.8% only in the lower rectum of the AHRU group. This finding that the site of significant decrease in the mucosal blood flow caused by a shift in position coincides with the region susceptible to AHRU, the lower rectum, and suggests an important role of the persistent horizontal supine position in the development of AHRU in bedridden patients. The results of this study indicate that avoiding long-term horizontal supine position for ICU patients and maintaining ICU patients with risk factors of vascular disorder (such as type 2 diabetes mellitus, coronary artery disease, hypertension, cerebrovascular accident, uremia) in a lateral position may be easy and feasible means of reducing the occurrence rate of AHRU.

Conclusion

In conclusion, AHRU should be considered as an important contributor in the etiology of acute lower gastrointestinal bleeding in critically ill patients who have underlying comorbidities. The mortality rate is high and is associated with old age and thrombocytopenia in those undergoing surgical intervention of AHRU. Awareness of this clinical entity requires a high index of suspicion to ensure early detection, diagnosis, and appropriate therapy. The prognosis for AHRU patients depends mainly on accurate diagnosis and management of the underlying disorder.

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原　著

對於急性出血性直腸潰瘍病危病人的手術治療：手術預後分析

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目的　急性出血性直腸潰瘍為單發或多發性直腸潰瘍，其特徵為無痛且合併大出血的一種症候群。患者通常合併有嚴重的原發症，本研究是以回顧性分析調查其在重症加護病房的發病率，治療方式和總死亡率。

方法　研究期間自 2010 年 11 月到 2014 年 7 月，共有 18971 位重症加護病房住院患者。其中有 96 在患者在發生急性大量血便的 24-48 小時內接受大腸鏡檢查。急性出血性直腸潰瘍的診斷是根據下列標準：1. 突然發作無痛，塊狀血便；2. 大腸鏡下發生潰瘍與正在進行的性出血或近期出血紅斑；3. 排除其他直腸潰瘍性疾病，例如粘膜脫垂症候，孤立性直腸潰瘍症候群，糞性潰瘍，炎症性腸病，缺血性結腸炎，感染性疾病 (結核，巨細胞病毒感染等)，癌症或可能的機械損傷；4. 一週內有接受非類固醇抗炎藥劑病史。回顧性分析案例的臨床過程，止血的方法，手術次數和死亡率。

結果　96 例中有 28 例急性出血性直腸潰瘍 (29.1%)，在重症加護病房的發病率為 1.48/1000。其中 13 名患者 (13/28, 46.4%)，因出血合併低血容量休克。所有 28 例患者皆進行手術治療，16 位患者於手術後未再出血，第一次手術成功止血率為 57.1% (16/28)。另外 12 例 (12/28, 42.9%) 在手術後 4 週內發生再次出血，11 例患者接受第二次手術且成功止血，手術成功止血率為 63.6% (7/11)。在 28 個案例中，有 4 例併發二次以上再出血 (4/28, 14.3%)，儘管接受再次手術或其他治療方式，這 4 位患者最後皆死亡。總存活率為 64.3% (18/28)，其中 4 例死於頑固性急性出血性直腸潰瘍出血。

結論　急性出血性直腸潰瘍是重症加護病房住院患者，急性下消化道出血的重要病因。臨床上需早期察知以及給予早期診斷和治療。頑固性和反覆性出血會導致高死亡率和不佳的預後。

關鍵詞　急性出血性直腸潰瘍。