

The Blatchford Score is an useful index in the management of Mallory-Weiss tear and gastrointestinal bleeding Experience from an urban Community Hospital

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Abstract

Objectives : The purpose of this study was to determine the utility of individual clinical parameters as well as a composite index like the Blatchford score in predicting the need for endoscopic intervention and prognosticating the outcome in patients with Mallory Weiss tear presenting with gastrointestinal bleeding.

Methods : We retrospectively reviewed our endoscopy database and our EMR system to identify patients with Mallory Weiss tear and collect relevant data.

Results : A total of 38 cases with Mallory-Weiss tear were identified at our center over a 5 year period. Thirty-two patients presented with gastrointestinal bleeding constituting 3.1% of all cases presenting with upper gastrointestinal bleeding. Nine (28%) of 32 patients were found to have active bleeding or stigmata of recent bleeding at endoscopy and required endoscopic therapy. The Blatchford score ranged from 0 to 11 in the patients with gastrointestinal bleeding. Nine patients had a Blatchford score < 6 (four 0, five 1-4) while 23 patients had a score > 6. None of the patients with a score < 6 required endoscopic intervention or a blood transfusion while 9 (39%) patients with a score > 6 required endoscopic intervention and 17 (74%) required a blood transfusion. Length of stay was significantly longer in patients with a score > 6.

Conclusions : The Blatchford score can be a useful index to risk stratify patients with Mallory Weiss tear who present with gastrointestinal bleeding with regards to hospital admission and identifying patients who warrant urgent endoscopic intervention, require blood transfusion and are likely to have a longer length of stay. (*Acta gastroenterol. belg.*, 2012, 75, 432-437).

Key words: Blatchford score, Mallory-Weiss tear, gastrointestinal bleeding, endoscopy.

Introduction

Mallory-Weiss syndrome refers to bleeding from a tear (a *Mallory-Weiss tear*) in the mucosa at the junction of the stomach and esophagus which is usually caused by severe retching, coughing, or vomiting. It is often associated with alcoholism (1) and eating disorders and there is some evidence that presence of a hiatal hernia is a predisposing condition. The condition was first described in 1929 by G. Kenneth Mallory and Soma Weiss in 15 alcoholic patients (2). Mallory-Weiss syndrome has been reported to occur in 2-14% of cases of upper gastrointestinal hemorrhage (3-7).

Our study describes the clinical presentation, endoscopic management and utility of the Blatchford score in patients with Mallory-Weiss tear and gastrointestinal bleeding in an urban community hospital during a five year period.

Materials and methods

Patients

This study was a retrospective analysis. Patients diagnosed to have a Mallory Weiss tear during a 5 year period (January 1, 2003 to December 31, 2007) were included in the study. Reports of all Esophagogastroduodenoscopies (EGD), done at Mount Sinai Services at Elmhurst Hospital Center, Elmhurst, NY in this time frame were reviewed to identify patients with Mallory-Weiss tear by accessing our CORI endoscopy database.

The Clinical Outcomes Research Initiative (CORI) is a standardized reporting system that incorporates specific data points and is used by physicians in private practice, hospital settings or ambulatory care centers to generate endoscopy reports. Data from these reports are transmitted to a central repository to be pooled together with data from other centers and analyzed to study the outcomes of gastrointestinal endoscopic procedures. Data can also be analyzed at each unit level.

Our hospital-wide EMR incorporates in-patient details, outpatient encounters, laboratory data, pathology reports and radiological studies and was used to extract additional data relevant to our study.

Initial Treatment, Diagnosis and Endoscopic intervention

All patients received intravenous proton pump inhibitors on admission and prior to endoscopy as per the clinical protocol in our institution and were continued on oral proton pump inhibitors after endoscopy.

Diagnosis of Mallory-Weiss tear was based on endoscopic finding of mucosal laceration occurring at or near the esophago-gastric junction. Criteria used for endoscopic intervention included active bleeding, non bleeding visible vessel and the presence of a fresh adherent clot.

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Four basic modalities of endoscopic intervention were utilized :

- 1) sub-mucosal injection of epinephrine (diluted to a strength of 1:10,000) via a sclerotherapy needle (Interject, Boston Scientific Corporation, Natick, MA, USA) in aliquots of 1-2 cc.
- 2) Heater probe (Olympus heater probe unit HPU-20, Olympus America Inc., Center Valley, PA, USA) application at a setting of 30 watts.
- 3) Endoclip (Resolution clip, Boston Scientific Corporation, Natick, MA, USA) deployment.
- 4) Application of band ligator (Seven Shooter Band Ligator, Boston Scientific Corporation, Natick, MA, USA).

Some patients were subjected to a combination of the above modalities.

All patients were admitted to the hospital for further observation after endoscopy. The decision to transfuse blood was a clinical decision based on a combination of factors like the age of the patient, presence of symptoms, hemodynamic instability and the presence of co-morbidities like cardiac diseases. Rebleeding was defined as fresh hematemesis or melena accompanied by a drop in hemoglobin of at least 2 gm/dl.

The Blatchford Score

The Blatchford score (8) was calculated for each patient based on the admission criteria listed in Table 1 to ascertain its utility in identifying patients who require endoscopic intervention and those likely to have an adverse outcome as defined by the number of units of blood transfusion required and length of hospital stay.

Statistical Analysis

Non-parametric tests like the Median test and chi-square contingency table were used for statistical analysis.

Results

Incidence

A total of 5604 EGDs were done at our hospital over a 5 year period. Thirty-eight cases of Mallory Weiss tear were identified. Of these 38 cases, 32 presented with gastrointestinal bleeding, 3 were iatrogenically induced, in 2 patients the tear was discovered incidentally at the time of PEG insertion, 1 was found during endoscopy for odynophagia.

Of the 5604 EGD's, 1040 (18.6%) were done in the setting of acute gastro-intestinal bleeding with the primary indication being hematemesis in 368, melena in 569 and hematochezia in 103 patients. Mallory-Weiss tear was found to be the cause of bleeding in 32 (3.1%) out of those 1040 patients presenting with acute GI bleeding.

Table 1. — **Blatchford score**

Admission risk marker	Score component value
<i>Blood urea nitrogen level (mg/dL)</i>	
> 18.2 to < 22.4	2
> 22.4 to < 28	3
> 28 to < 70	4
> 70	6
<i>Hemoglobin level for men (g/dL)</i>	
> 12 to < 13	1
> 10 to < 12	3
< 10	6
<i>Hemoglobin level for women (g/dL)</i>	
> 10 to < 12	1
< 10	6
<i>Systolic blood pressure (mm Hg)</i>	
> 100 to < 109	1
> 90 to < 99	2
< 90	3
<i>Other markers</i>	
Pulse rate > 100 beats/min	1
Presentation with melena	1
Presentation with syncope	2
Hepatic disease	2
Heart failure	2

Age

Patients ranged in age from 22 to 93 years (median 46.5 yrs).

Gender

Out of total 38 patients diagnosed with Mallory-Weiss tear, 32 (84%) were male and 6(16%) were female.

History of Alcoholism

Twenty-four (63%) of 38 patients had a prior history of alcoholism.

Symptoms

The primary presenting symptom in the 32 patients with Mallory Weiss tear and bleeding was as follows : hematemesis in 25 patients (78%) and melena in 7 patients (22%). Of the patients presenting with hematemesis, 12 (37.5%) had melena as well and 1 patient (3.1%) had hematochezia.

Mallory Weiss was the cause of bleeding in 25(6.8%) of 368 patients presenting with hematemesis and in 7 (1.2%) of 569 patients presenting with melena.

Location of Laceration

In 32 (84%) patients the tear was located in the distal esophagus and esophago-gastric junction and in 6 (16%) patients the tear was found in the cardia of the stomach.

Endoscopic Finding

Twenty-three (72%) of the 32 patients who presented with GI bleeding did not show any active bleeding or stigmata of bleeding at endoscopy and required no endoscopic therapy. Nine patients (28%) were found to have active bleeding or stigmata of bleeding at endoscopy and were subject to endoscopic intervention. Of these 9 patients, 5 (16%) had actively bleeding, 2 (5%) had a non-bleeding visible vessel and 2 (5%) had an adherent clot.

One other patient who did not present with gastrointestinal bleeding and whose Mallory Weiss tear was iatrogenically induced had active bleeding on endoscopy and also required therapeutic intervention.

Endoscopic Therapy

Only one therapeutic modality was used in 6 patients : 4 epinephrine injection, 1-heater probe and 1-band ligation. Four patients had a combination of therapeutic interventions : 3-epinephrine injection followed by heater probe application, 1-epinephrine injection followed by hemoclippping. Successful hemostasis was achieved in all 10 (100%) patients.

Outcome

Of the 32 patients with gastrointestinal bleeding, 17 (53%) required blood transfusion.

The median length of hospital stay was 4 days (range 1-42). No patient had recurrent bleeding and none required surgery.

Comparison between patients requiring endoscopic therapy and no therapy

There was no statistical difference between the patients who required endoscopic therapy and those that did not in the subset that presented with gastrointestinal bleeding with regards to age, sex, presentation, admission blood pressure, admission heart rate, admission

hemoglobin and alcohol abuse (See Table 2). Six patients in whom a Mallory Weiss tear was iatrogenic or an incidental finding was excluded from the analysis.

The median length of stay for patients who underwent endoscopic intervention was 5 days (range 2-12) versus 4 days (range 1-42) for those patients who did not require endoscopic intervention. These results were not statistically different ($P = 0.59$).

The median blood transfusion requirement in the endoscopic intervention group was 2 units (range 0-5) and 0 (range 0-6) in the non-intervention group. This difference was not statistically different ($P = 0.87$).

Blatchford Score

The Blatchford Score ranged from 0-11.

BS -0

There were 4 patients who had a score of 0 and none of them required any endoscopic intervention or blood transfusion. Hemoglobin values in this category ranged from 13.1 g/dl to 15 g/dl (median 14.2).

BS -1 to 4

Five patients had a score ranging from 1-4 and all patients in this group also did not require any endoscopic intervention or blood transfusion. Hemoglobin values ranged from 12.1 g/dl to 13.9 g/dl (median 12.6). Compared to patients with a score of 0, this difference in hemoglobin levels was not statistically different ($P = 0.33$).

BS > 6

There were 23 patients who had a score of 6-11. Nine (39%) of the 23 patients required endoscopic intervention and 17 (74%) required blood transfusion. Hemoglobin values ranged from 4.6 g/dl to 12 g/dl (median 8.6).

Table 2. — Comparison of patients who required endoscopic therapy and those who did not

	Endoscopic Therapy (n = 9)	No Endoscopic Therapy (n = 23)	P value
Median Age	44 (range 33-61)	47 (range 22-89)	0.50
Median LOS	5 days (range 2-12)	4 days (range 1-42)	0.59
Median Hb [g/dl]	9.2 (range 6.6-12)	10.6 (range 4.6-15)	0.50
Median BT	2 Units (range 0-5)	0 Units (Range 0-6)	0.87
Alcohol Abuse	70%	48%	0.18
Median SBP	123 (range 108-197)	137 (Range 94-159)	0.43
Median HR	110 (range 74-124)	103 (range 63-130)	0.58
Males	88% (8 of 9)	91% (21 of 23)	0.64
Hematemesis	78% (7 of 9)	78% (18 of 23)	0.66

(SBP = Systolic Blood Pressure, HR = Heart Rate, BT = Blood transfusion, LOS = length of stay).

Table 3. — Outcome Correlation with Blatchford Score (BS)

BS	No. Patients	Endoscopic Intervention (%)	Blood Transfusion (%)
0	4	0	0
1-4	5	0	0
6	4	75	50
7	5	40	60
8	2	0	0
9	5	20	100
10	5	60	100
11	2	0	100
<i>Cut-off 6</i>			
0-4	9	0	0
6-11	23	39	74

BS of 6 as cut-off

With regards to the need for endoscopic intervention, a Blatchford score of 6 or greater had a sensitivity of 100%, specificity of 39%, and positive predictive value of 39% and a negative predictive value of 100% (See table 3).

Blood transfusion was not required in any of the 9 patients with a score < 6. Seventeen (74%) of the 23 patients with a score > 6 required blood transfusions. These results were statistically significant ($p < 0.001$).

With regards to length of stay (LOS) there were three outliers with durations of 18, 20 and 42 days. These 3 patients were excluded from the analysis. Patients with a score < 6 had a median LOS of 2 days (range 1-4) while patients with a score > 6 had a median LOS of 4 days (range 1-12). These results were statistically significant ($p < 0.018$).

Discussion

The incidence of Mallory-Weiss tear in our study was 3.1% (32 out of 1040) of patients presenting with upper gastrointestinal bleeding. This is similar to what recent studies have reported (3,5,6). A large multicenter survey done in UK indicated the incidence of Mallory Weiss tear inpatients with gastrointestinal bleeding to be 2.1% (3). Although older studies from the 1980's report a much higher incidence of 10-14% (4,7), a more reasonable estimate appears to be 2-5%. In our series, 0.7% of EGDs had a Mallory-Weiss tear when all indications for EGDs were included (38 of 5604).

Thirty-one to 52% (5,7,9) of patients with a Mallory Weiss tear have a history of alcoholism. In our study a higher percentage 63% (24 out of 38) patients had history of alcohol abuse which is probably due to the inner city population of our hospital.

The mean age at presentation was 50.7 years in our study with a range of 22 to 93 years. This is similar to what other researchers have reported (4,10). Higuchi *et al.* (10) noted a mean age of presentation of 53.6 years with a range of 23-88 years.

Mallory-Weiss tear tends to be more common in men with males accounting for 76 to 93% of patients (10-13). Our series showed a similar male preponderance with 32 of 38 (84%) patients being men.

Our study indicated that a patient presenting with hematemesis was more likely to have a Mallory Weiss tear than those presenting with melena.

The tear was located on the esophageal side of the EG junction in 85% of our patients which is similar to the 80 to 91% range reported by most other studies (11,12,14). In one study however by Sugawa *et al.*, the tear was located on the gastric side in 83% of their patients (7).

Most Mallory-Weiss tears stop bleeding spontaneously and supportive treatment is all that is required (4, 7,10). Twenty-seven to 34% of patients have active bleeding and/or high risk stigmata at the time of endoscopy (5,11,12,14). Our study concurred with these findings. In our series 28% (9 out of 32) patients had active bleeding or high risk stigmata.

Patients with active bleeding or high risk stigmata benefit from therapeutic intervention. Studies (5,15) indicate that injection with epinephrine is superior to no intervention in this subset of patients with Mallory Weiss tear. In one study patients in the control group had a higher rate of recurrent bleeding and a longer length of stay when compared to patients who had undergone endoscopic epinephrine injection (5).

Other endoscopic interventional modalities used to successfully treat Mallory Weiss tear include band ligation (EBL), hemoclips (EHC) and heater probe/ gold probe (6,10,11,14,12). In our series we used a variety of modalities, all of which proved to be effective in controlling the bleeding.

While some studies (12,14) do not show any appreciable difference in the efficacy of mechanical hemostatic measures [hemoclippping and band ligation] when compared to epinephrine injection, other studies (16) suggest that mechanical measures [band ligation, hemoclippping, bicep/gold probe] may be more effective. Hemoclips have the advantage of closing deep tears and preventing further damage, in addition to controlling bleeding (10).

No re-bleeding was noted in our series, contrary to the 2.7-11% re-bleeding noted in previous studies (9,10, 16,17). Likely explanation of this finding is improvement in techniques of therapeutic endoscopy and increasing familiarity of endoscopists with newer hemostatic methods.

If endoscopy is unsuccessful in achieving hemostasis, angiography and infusion of vasoactive substances into the celiac artery or into the left gastric artery may be attempted (4). Surgical intervention is usually reserved as last resort. Even though some early surgical literature suggested 11-30% of patients with Mallory-Weiss tear

needing surgical intervention (18,19), advances in endoscopic techniques have obviated the need for surgery being only minimally required (10). We concur with this finding as none of the patients in our study needed surgical intervention.

Comparison of clinical parameters like age, history of alcoholism, sex, mode of presentation, admission blood pressure, admission hemoglobin were not able to distinguish between the group that required endoscopic intervention and the group that did not. The groups also did not differ in terms of outcome measures like blood transfusion requirements and length of hospital stay.

The Blatchford score has been used to risk stratify patients with upper gastrointestinal bleeding helping to distinguish between patients who can be managed on an outpatient basis and those that require admission and any form of clinical intervention be it blood transfusion, endoscopy or the need for surgery (8,20).

A Blatchford score of 0 has been categorized as low risk (8,20,21) and indicative of an outpatient management. While some (8,20,21) strictly believe that any score > 0 falls into the high risk category, others (22) suggest that patients with low scores upto 2 may also qualify as low-risk. There were 4 patients in our cohort with a score of 0 ; as none of them required endoscopic intervention or blood transfusion they could have been managed as outpatients which is in agreement with what other studies have reported.

In our study we have attempted to drill down deeper to ascertain whether the Blatchford score would identify patients who specifically require endoscopic intervention in the setting of a Mallory Weiss tear. We chose a cut-off level of 6 as no patient with a score < 6 required endoscopic intervention. A cut-off value of 6 had a negative predictive value of 100%, that is at values less than 6 the need for endoscopic intervention is highly unlikely-which could help in making a decision as to whether a patient requires urgent endoscopy that is within 4 hours which maybe in the middle of the night as compared to next day endoscopy. Therefore patients with a score of > 6 constitute a high-risk category.

Patients with scores of > 0 but < 6 fall into the intermediate category and may require admission to the hospital for observation only. These patients have a very low probability of requiring endoscopic therapeutic intervention and could be scheduled for endoscopy on an elective basis the next working day as opposed to urgent endoscopy for patients with scores > 6. There were 5 patients in our study with scores ranging from 1-4 and none of them required endoscopic intervention or blood transfusion.

A cut-off score of 6 also prognosticated the outcome. None of the patients with a score less than 6 required blood transfusion. A patient with a score greater than 6 was also more likely to receive blood transfusion and stay longer in the hospital than a patient with a score less than 6.

Therefore we conclude that the Blatchford score maybe a useful index to guide the management of patients with gastrointestinal bleeding from Mallory Weiss tear. We are aware of the limitations of our study especially its retrospective design and the small number of patients studied. But the relative rarity of Mallory Weiss tear -2 to 5% may make these numbers acceptable. We feel that our findings are remarkable enough to warrant other studies to duplicate our results.

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