

## ENDOSCOPIC TREATMENT FOR UPPER GI BLEEDING. REVALIDATION OF FORREST CLASSIFICATION

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### ABSTRACT

Despite rapid advances in endoscopic treatments and the development of updated and evidence based guidelines, morbidity and mortality in upper gastrointestinal bleeding (UGIB) remains high. A recent study conducted in a tertiary centre on 80 consecutive patients with UGIB demonstrated that lower doses of Adrenaline 1:10000 and diathermy were superior to high doses of Adrenaline injections only, but failed to reduce the mortality rates, despite a reduction in the need for transfusion, second look and surgical interventions. We believe that comorbid conditions have greater influence on survival rates in patients with UGIB than the achievement of immediate haemostasis and we attribute a paramount importance to rapid and correct resuscitation of the bleeding patient prior to any endoscopic assessment.

**Keywords:** Upper GI bleeding, endoscopic treatment, Forrest classification

### INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is becoming a growing problem at the emergency departments (ED) with the aging of the population, increased number and severity of comorbidities in patients and raise in the use of ulcerogenic medication (1-3).

We define upper GI bleeding as any source of bleeding arising from above the ligament of Treitz. This type of bleeding could become clinically apparent through melena, haematemesis or PR (per rectum) bleeding and clinical instability.

The Forrest classification offers an excellent tool for predicting the probability of rebleeding in UGIB (3,5) guiding the endoscopist in deciding which lesions require endoscopic therapy (4,5). If correlated with clinical scoring systems it facilitates improvement of patients outcomes (6).

Endoscopic therapy should be offered only to actively bleeding lesions (spurting vessel, oozing hemorrhage) or high risk lesions with stigmata of recent hemorrhage (visible non bleeding vessel and adherent clots - when technically possible) (7).

Multimodal endoscopic therapy has been shown to be superior to single methods of achieving haemostasis (7).

The newest guidelines recommend the association of two endoscopic modalities in order to reduce the rebleeding episodes, yet in some centers single modalities are still employed for various reasons with variable results.

We conducted a study in our ED on 80 consecutive patients with UGIB and compared the efficacy of low dose Adrenaline and diathermy versus high doses of Adrenaline 1:10,000. The patients receiving higher doses of Adrenaline had inferior control of the bleeding but the overall mortality has not changed.

Multimodal endoscopic therapy was superior to injection only but it did not improve mortality probably because of independent factors like the co-morbid conditions of the patients.

Both multimodal endoscopic therapy and high doses of Adrenaline 1:10,000 injections correlated well with a reduction of the transfusions, second look endoscopies and surgical interventions.

We believe that with the increasing age of the population the cumulus of co-morbid conditions has a greater impact on the mortality than the achievement of rapid haemostasis in UGIB.

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## PATIENTS AND METHODS

We conducted a retrospective study on 80 patients with UGIB who had emergency endoscopies in an ED department at a tertiary centre. They all presented as acute patients with clinical suspicion of UGIB or had been diagnosed during the initial assessment with UGIB.

Charts of all the 80 patients were analyzed for history details, clinical and endoscopic variables.

We calculated an initial GBS score and a Rockall score based on the data available at the time of presentation and we categorized the endoscopic findings according to the Forrest classification. None of the patients were suitable candidates for follow up endoscopy in the community therefore they received endoscopic evaluation as soon as possible.

The candidates for endoscopic treatment received low or high doses of Adrenaline 1:10,000 and, if in the low Adrenaline dose arm diathermy was employed to secure the result. Rebleeding patients had a second look and another endoscopic attempt to achieve haemostasis before they were offered surgery. This small cohort of patients had injections, diathermy and clips depending on the endoscopic findings.

The Forrest classification was developed to predict mortality in UGIB patients but it is very useful in predicting rebleeding.

All lesion showing acute bleeding (spurting hemorrhage, oozing haemorrhage) and stigmata of recent bleeding (non-bleeding but visible vessel and lesions with adherent clots) were offered endoscopic treatment. Patients in whom adherent clots could not be mobilized with a vigorous wash were not offered endoscopic treatment unless they showed signs of clinical deterioration suggesting rebleeding.

**TABLE 1.** Forrest Classification for bleeding peptic lesions

I. Active Bleeding	II. Stigmata of recent haemorrhage	III. Lesions without signs of recent haemorrhage
Ia: Spurting haemorrhage	Ila: Visible vessel	
Ib: Oozing haemorrhage	Ilb: Adherent clot	
	Ilc: Hematin covered lesion	

This classification is a reliable predictor for re-bleeding, but does not predict mortality as well as other scores which also incorporates clinical variables. For this reason the use of Rockall and the Glasgow-Blanchard Score (GBS) is complementary to the endoscopic assessment in order to stratify the patients correctly (8-10).

The evaluation protocol made use of three endoscopic scoring systems, namely the Forrest classification for describing the lesions, the GBS score and the Rockall score for assessing the biological status of the patient at presentation. The GBS score incorporates blood results and can be useful in detecting acute anemia, high levels of urea as a consequence of dehydration or increased absorption from the gut and early signs of renal failure. The Rockall score integrates endoscopic findings with clinical variables and takes into account the comorbid conditions of the patients in order to predict the risk of death. Although age is not the best predictor of mortality if analyzed separately in an aging population, the correlations made with criteria for analyzing hypovolaemic shock and endoscopic diagnoses make this score a reliable tool in identifying patients at risk for poor outcomes.

All our patients were offered endoscopy within few hours since they presented to ED because none had a Rockall or a GBS as low as to allow them to be treated in the community. The GBS was classically associated with a good prediction of the need

**TABLE 2.** The Rockal score

	0	1	2	3
<b>Age</b>	<60	60-79	>80	
<b>Shock</b>	Pulse <100 BP > 100	Pulse >100 BP < 100	Pulse <100 BP < 100	
<b>Comorbidities</b>	None		Heart failure/Ischemic heart disease	Renal failure Liver failure Disseminated malignancy
<b>Endoscopic signs of bleeding</b>	None/dark spots		Blood/adherent clot/ Visible or spurting vessel	
<b>Diagnosis</b>	Mallory Weiss/no finding	All other diagnoses	Upper GI malignancies	

for endoscopic treatment, but it could be used to predict the need for transfusions, surgical interventions and up to a point, mortality (10).

We used SPSS for data processing and Excel. The study aimed to compare low doses of Adrenaline and diathermy versus high doses of Adrenaline injections used for achievement of haemostasis. Secondary objectives were to determine if low doses of adrenaline prevented precipitation of cardiovascular events in the anemic patient and if there was any improvement in the mortality rates with the use of scoring systems.

## RESULTS

**TABLE 3.** *The GBS score*

Blood urea (mmol/L)	
• 6.5-7.9 = 2 points	• 2
• 8.0-9.9 = 3 points	• 3
• 10.0-25.0 = 4 points	• 4
• >25.0 = 6 points	• 6
Haemoglobin for men (g/L)	
• 120-129 = 1 points	• 1
• 100-119 = 3 points	• 3
• <100 = 6 points	• 6
Haemoglobin for women (g/L)	
• 100-119 = 1 point	• 1
• <100 = 6 point	• 6
Systolic blood pressure (mmHg)	
• 100-109 = 1 point	• 1
• 90-99 = 2 point	• 2
• <90 = 3 point	• 3
Other markers Pulse	
• ≥100/min = 1 point	• 1
• presentation with melaena = 1 point	• 1
• presentation with syncope = 2 point	• 2
• hepatic disease* = 2 point	• 2
• cardiac failure** = 2 point	• 2

We analyzed 80 consecutive patients with UGIB requiring urgent endoscopy in the ED department.

A proportion of 26% of patients were female patients and 74% male.

We concluded that the number of patients requiring endoscopic treatment was 84%. Out of these only 15 patients rebled and only 3 required surgery.

The findings at the endoscopy placed 21.8% in the active bleeding category, 63.3% in the stigmata of recent bleeding category and only 14.6% in the third category.

The largest proportion of rebleeds were attributed to the second category, namely the IIa and IIB lesions.

A number of 34% of patients required small doses of Adrenaline to control the bleeding and 66% needed larger doses.

In patients requiring small doses of Adrenaline to control the bleeding another endoscopic modality had been used to prevent rebleeding.

We did not find any correlation between the amount of Adrenaline used and precipitation of cardiovascular events nor it influenced the overall mortality, need for transfusion and the length of stay in the hospital.

**TABLE 4.** *Stratification of patients according to the Forrest classification*

Endoscopic diagnosis	Number of patients	Number of rebleeding	Percentage of rebleeding
Forrest Ia	3 (3.65%)	0	0%
Forrest Ib	15 (18.2%)	3	20%
Forrest IIa	28 (34.1%)	5	17%
Forrest IIb	24 (29.2%)	7	29%
Forrest IIc.III	12 (14.6%)	0	0%

## DISCUSSIONS AND CONCLUSIONS

This study had been envisaged having in mind that higher doses of vasopressor medication could precipitate cardiovascular events in elderly patients presenting with UGIB.

The biggest predictor of death in the cohort we analyzed was not the severity of the lesion or the rebleeding but the associated co-morbidities of the patients. We believe that in order to reduce the mortality related to UGIB the initial resuscitation has to be conducted rigorously, with minimal delay and supported by evidence based developed guidelines.

The aging of the population and the increase of the ulcerogenic medicines have a big impact on the outcome in UGIB patients through the cumulative effect of the co-morbid conditions.

Through our study we revalidated the predictive value of the Forrest classification for rebleeding. Once the bleeding had been stopped by Adrenaline injection 1:10,000 we did not employ a second haemostatic modality in the higher dose Adrenaline arm, but in order to prevent rebleeding we used diathermy in the low doses arm. The use of lower doses of vasoactive medication is a useful point of view especially in the anemic elderly patient in whom high doses of vasopressors could lead to precipitation of cardiovascular events.

In our study the percentage of male patients was very high although we enrolled consecutive patients in the study. We believe that the discrepancies are related to the demographic particularities

The immense value of scoring systems in the management of UGIB patients has been reconfirmed. These rapid and reproducible clinical as-

assessment tools are of immense value in recognizing the patients at risk and should prompt immediate action. In the critically ill patient early recognition of the severity of the illness is crucial for a better outcome.

We conducted a small study on 80 consecutive patients presenting with signs of UGIB at the ED and requiring endoscopy. The Forrest classification

as a predictor for rebleeding in patients with grade I and II lesions has been reconfirmed. We believe that spreading of multimodal endoscopic treatment could improve outcomes and prevent precipitation of cardiovascular events in the anemic patient who requires vasopressors for bleeding lesions. A larger study has to be designed in order to validate these findings.

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