Use of Endoscopic Doppler Probe by General Gastroenterologists and Trainees to Guide Hemostasis in Non-Variceal Upper Gastrointestinal Bleeding

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Introduction

- Endoscopic doppler probe (EDP) is a novel device that can help guide hemostasis by assessing for arterial blood flow (ABF) within an ulcer base despite its visual appearance.
- Ulcers with residual ABF flow following treatment have been associated with higher rates of rebleeding. The use of EDP to confirm eradication of arterial blood flow improves rebleeding.
- Use of the EDP has not been widely adopted. We evaluate the outcomes in hemostasis with the use of EDP by general gastroenterologists and trainees.

Methods

- Retrospective study of patients admitted to a large quaternary care academic medical center with non-variceal upper gastrointestinal bleeding (NVUGIB) for whom EDP was used during endoscopy (EGD) before and/or after endoscopic treatment.
- Procedures were performed between January 2021 and May 2022 by general gastroenterologists and trainees.
- Primary outcome was 30-day rebleeding rate, defined as clinical evidence of bleeding plus need for repeat endoscopy or other therapeutic intervention at the location of initial hemostasis as guided by EDP.

Results

- We identified 37 patients who underwent EGD with EDP.
- We found a 30-day rebleeding rate of 13.5% (n = 5).
- Patients who rebled were more likely to be of Hispanic heritage and previously treated with bipolar cautery ($p < 0.05$).
- Most ulcers were located within the duodenum (67.6%, n = 25), and most were large (> 10mm in size; 75.7%, n = 28).

Table 1: Characteristics of 37 patients with use of EDP as a guide in hemostasis

	Patients n = 37	Hemostasis N=32 (86.5%)	Rebleed N=5 (13.5%)	P-value
Age (Mean Years)	68.5	67.6	74.6	NS
Gender				NS
Female	13 (35.1%)	13 (40.6%)	0	
Male	24 (64.9%)	19 (54.4%)	5 (100%)	
Race				P<0.05
White	20 (54.1%)	19 (59.4%)	1 (20.0%)	
Black	4 (10.8%)	3 (9.4%)	1 (20.0%)	
Asian	7 (18.9%)	7 (21.9)	0	
Hispanic	6 (16.2%)	3 (9.4%)	3 (60.0%)	
Medical History				
Hypertension	20 (54.1%)	17 (53.1%)	3 (60.0%)	NS
CKD any stage	8 (21.5%)	7 (21.9%)	1 (20.0%)	NS
Diabetes	5 (13.5%)	4 (12.5%)	1 (20.0%)	NS
ASA Class				NS
1	0	0	0	
2	7 (18.9%)	7 (21.9%)	0	
3	21 (56.8%)	17 (53.1%)	4 (80.0%)	
4	9 (24.3%)	8 (25.0%)	1 (20.0%)	
Labs (Mean Values)				
Admission Hemoglobin (g/dL)	9.0	9.1	8.4	NS
Hemoglobin Nadir (g/dL)	6.7	6.8	6.0	NS
Platelets	301	313	223	NS
INR	1.3	1.3	1.1	NS

Table 2: Endoscopic findings and outcomes of EDP use

	Patients n = 37	Hemostasis N=32 (86.5%)	Rebleed N=5 (13.5%)	P-value
Forrest Classification of Ulcer				NS
Forrest Ia	1 (2.7%)	1 (3.1%)	0	
Forrest Ib	6 (16.2%)	5 (15.6%)	1 (20.0%)	
Forrest IIa	17 (46.0%)	14 (43.8%)	3 (60.0%)	
Forrest IIb	1 (2.7%)	1 (3.2%)	0	
Forrest IIc	5 (13.5%)	5 (15.6%)	0	
Forrest III	7 (18.9%)	6 (18.8%)	1 (20.0%)	
Outcomes				
Mean LOS, days	14.9	13.6	23.2	NS
Readmission within 30 days of index EGD	6 (16.2%)	4 (12.5%)	2 (40.0%)	NS
Adjuvant Endoscopic Treatment	33 (89.1%)	28 (87.5%)	5 (100%)	
Epinephrine Injection	18 (48.7%)	15 (46.9%)	3 (60.0%)	NS
Bipolar Cautery	7 (18.9%)	4 (12.5%)	3 (60.0%)	P<0.05
Through the Scope (TTS) Clips	8 (21.6%)	7 (21.9%)	1 (20.0%)	NS
Over-the-Scope Clips (OTSC)	20 (54.5%)	18 (56.3%)	2 (40.0%)	NS
Endoscopic Doppler Probe used before treatment				NS
No arterial flow detected	6 (16.2%)	5 (15.6%)	1 (20.0%)	
Arterial flow detected	25 (67.6%)	22 (68.8%)	3 (60.0%)	
Not attempted/Used	6 (16.2%)	5 (15.6%)	1 (20.0%)	
Endoscopic Doppler Probe used after treatment				NS
No arterial flow detected	27 (73.0%)	24 (75%)	3 (60.0%)	
Arterial flow detected	1 (2.7%)	0	1 (20.0%)	
Not attempted/Used	9 (24.3%)	8 (25.0%)	1 (20.0%)	

Conclusions

- EDP is a highly effective tool in the management of NVUGIB, improving upon standard visual assessment of stigmata of hemorrhage.
- EDP can be safely and successfully used by general GI attendings and trainees.
- Training in EDP should be encouraged in physicians who treat NVUGIB.