Algorithmic Approach to GI Bleed Using Video Capsule Endoscopy Prior to Double Balloon Enteroscopy

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PURPOSE/ OBJECTIVE(s)

- Define obscure gastrointestinal bleeding
- Discuss algorithmic approach to diagnosis
- Assess diagnostic and therapeutic utility of double balloon enteroscopy (DBE)
- Assess diagnostic and therapeutic utility of DBE when preceded by video capsule endoscopy (VCE)

INTRODUCTION

- Obscure gastrointestinal bleeding is defined as persistent bleeding despite negative colonoscopy and esophagogastroduodenoscopy (EGD).
- Obscure bleeding is typically secondary to small intestinal pathology.
- Common pathologies include Dieulafoy's lesions, angioectasias, neoplasms, ulceration, and polyps.
- Additional testing could include VCE, DBE, radiographic imaging, and intraoperative enteroscopy.

MATERIAL & METHODS

- We performed a retrospective chart review of all patients who underwent DBE at our institution from 2012-2020.
- Inclusion criteria included DBE performed for evaluation of gastrointestinal bleeding.
- Patient demographics, endoscopy indication, VCE use, endoscopic intervention, hospital readmission, and incidence of recurrent GI bleeding were obtained.
- Diagnostic yield was defined as the ability to identify a culprit lesion, and therapeutic yield was defined as any intervention performed on the culprit lesion that led to a resolution of bleeding.
- Variables were compared between the 2 groups via Chi-Squared test and student 2 sample t-test.
- Univariate and multivariable logistic regression analysis were run for adjusted odds ratio (OR) for 30-day readmission.

RESULTS

	Algorithmic approach (VCE + DBE) (n=354)	Non-Algorithmic approach (DBE) (n=451)	P value
Male, n (%)	172 (48.6%)	202 (44.8%)	0.284
Inpatient, n (%)	90 (25.4%)	198 (43.9%)	0.000
ESRD, n (%)	14 (3.9%)	36 (8.0%)	0.019
Anterograde DBE, n (%)	284 (80.2%)	336 (74.5%)	0.055
BMI >25, n (%)	268 (75.7%)	326 (72.3%)	0.273
Antiplatelet Use, n (%)	106 (29.9%)	139 (30.8%)	0.788
Anticoagulation Use, n (%)	48 (13.6%)	73 (16.2%)	0.301
Age, mean ± SD	65.0 ± 15.2	63.7 ± 14.2	0.199
Diagnostic Yield, n (%)	217 (62.3%)	250 (55.4%)	0.094
Therapeutic Yield, n (%)	212 (59.9%)	230 (51.0%)	0.012
Readmission 30 Days, n (%)	23 (6.5%)	64 (14.2%)	0.001
Readmission 6 Months, n (%)	43 (12.1%)	87 (19.3%)	0.006
Procedure Minutes, mean ± SD	35.6 ± 15.6	39.6 ± 21.3	0.003

Table 1: Patient Demographic and Outcomes

	Univariate Analysis		Multivariate Analysis	
30-day readmission	OR [95% CI]	P value	[OR 95% CI]	P value
Female	0.44 [0.27-0.72]	0.001	0.44 [0.26-0.72]	0.001
Age	0.99 [0.97-1.00]	0.103	0.99 [0.97-1.00]	0.153
Inpatient	4.34 [2.71-6.95]	0.000	3.61 [2.18-5.97]	0.000
Anticoagulation	1.53 [0.88-2.68]	0.134	1.11 [0.60-2.03]	0.747
ESRD	3.19 [1.62-6.26]	0.001	1.69 [0.82-3.49]	0.164
Procedure Minutes	1.01 [0.99-1.02]	0.081	1.00 [0.99-1.02]	0.444
Retro	0.60 [0.33-1.10]	0.098	0.54 [0.28-1.02]	0.059
Video Capsule Endoscopy	0.44 [0.27-0.72]	0.001	0.56 [0.33-0.94]	0.027

Table 2: Logistic regression univariate and multivariable analysis for 30-day readmission

- Our cohort had 805 patients with 374 males (46.4%) and an average age of 64.3 ± 14.7 years.
- Anterograde DBE was more commonly performed (77.0%) compared to retrograde, and most procedures were performed in the outpatient setting (64.2%).
- There were 354 patients (44.0%) that received a combination of VCE with subsequent DBE while the remaining 451 patients (56.0%) were evaluated with only DBE.
- Diagnostic success was higher in the algorithmic approach (VCE +DBE) (62.3%) when compared to DBE group (55.4%)(p=0.094).
- There was significantly higher therapeutic yield (59.9% vs 51.0%) (P=0.01) and shorter procedure time (35.6 ± 15.6 vs 39.6 ± 21.3 minutes, p=0.003) in those who received VCE+DBE compared to DBE alone.
- Multivariable logistic regression analysis demonstrated that the VCE algorithmic approach was associated with decreased readmission rates at 1 month [Odds Ratio (OR): 0.56, 95% CI (0.33-0.94), p=0.027].
- Female sex was associated with decreased 30-day readmission, and inpatient status was associated with increased 30-day readmission (both p<0.05).

SUMMARY / CONCLUSION

- Obscure gastrointestinal bleeding is a diagnostic challenge due to limitations of evaluating small intestinal pathology.
- There have been advances in technology that allow for better visualization of small intestinal bleeding including video capsule endoscopy and double balloon enteroscopy.
- The use of an algorithmic approach at our institution with VCE followed by subsequent DBE was found to have several significant benefits in our cohort including increased therapeutic yield, decreased readmission rates, and decreased procedure time.
- One limitation to our study is that patients receiving inpatient evaluation of obscure bleeding likely had larger, more significant bleeds along increased likelihood of having complicating comorbidities.
- These patient were also likely to proceed directly to double balloon enteroscopy instead of having capsule evaluation beforehand due to the urgent or emergent circumstances.
- Further studies are warranted to assess the utility of video capsule endoscopy followed by double balloon enteroscopy in the inpatient setting.
- Although limited in the setting of urgent GI bleed, our study shows significant benefit of using an algorithmic approach in the evaluation of obscure gastrointestinal bleeding.

REFERENCES / ACKNOWLEDGEMENTS

- No authors have any conflicts of interest to declare.
- This project received no funding of any kind.