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# Comparison of clinical outcomes in traditional gastrointestinal hemorrhage work up versus direct utilization by push enteroscopy in patients with a left ventricular assist device

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# Comparison of clinical outcomes in traditional gastrointestinal hemorrhage work up versus direct utilization by push enteroscopy in patients with a left ventricular assist device

26th Annual Medical Education Research Forum

Presenter: Sandra Naffouj, MD

Naffouj S, Abu Ghanimeh M, Mazhar A, Isseh M, Kutait, A, Blumenkehl M

# Background and introduction

- ▶ Patients with left ventricular assist devices (LVADs) are at **considerable risk** of gastrointestinal bleeding (GIB) of about 23%.
- ▶ A significant portion of GIB occurs in the **stomach, duodenum or small intestine** as compared to the colon.
- ▶ A traditional work up and management plan for such a patients differs between institutions but generally includes an EGD and colonoscopy +/- RBC tagged scan. If the cause of GIB is not found, a capsule endoscopy or push enteroscopy (PE) is then pursued to evaluate for small intestinal bleeding, an area not accessible by EGD and colonoscopy.
- ▶ The traditional management strategy requires **considerable time and effort** leading to a **significant length of hospital stay**. It also exposes the patient to **multiple procedures** with additive potential **adverse effects and cost**.

# Aim and Goal

- ▶ Our goal is to **compare** the traditional work up/management of GIB with an innovative approach of performing PE at the **FIRST** diagnostic/ therapeutic procedure to assess if the latter is able to shorten length of hospital stay, decrease all-cause mortality and increase diagnostic yield of GIB site detection with fewer procedures per hospital admission.

# Methods

- ▶ A **retrospective study** was performed in Henry Ford Hospital in Detroit, MI.
- ▶ ICD-9 and ICD-10 diagnosis codes were used to generate a list of LVAD patients who were admitted with an **overt GIB or worsening anemia** in the period from **1/1/2013 to 12/25/2018**.
- ▶ **Primary outcomes:** the rate of detection of GIB lesion/site and all-cause mortality.
- ▶ **Secondary outcomes:** the number of packed red blood cell (pRBC) units transfused during the hospitalization and the length of hospitalization.

# Methods

- ▶ **Inclusion Criteria:** Age 18 or older, history of LVAD implantation prior to GIB, performance of GIB diagnostic/ management procedure (eg EGD, PE, colonoscopy)
- ▶ **Exclusion Criteria:** Unable to undergo GIB work up due to any reason (eg. hemodynamic instability, refusal to consent for a procedure), patients < 18 years of age, obvious lower GIB (who needs a colonoscopy as an initial test per GI service), pregnancy, Incarceration at the time of GIB
- ▶ Chi-square, Fisher exact, paired-T tests and Pearson correlation were used for statistical analysis.
- ▶ The study protocol was **approved** by the hospital's IRB.

# Results

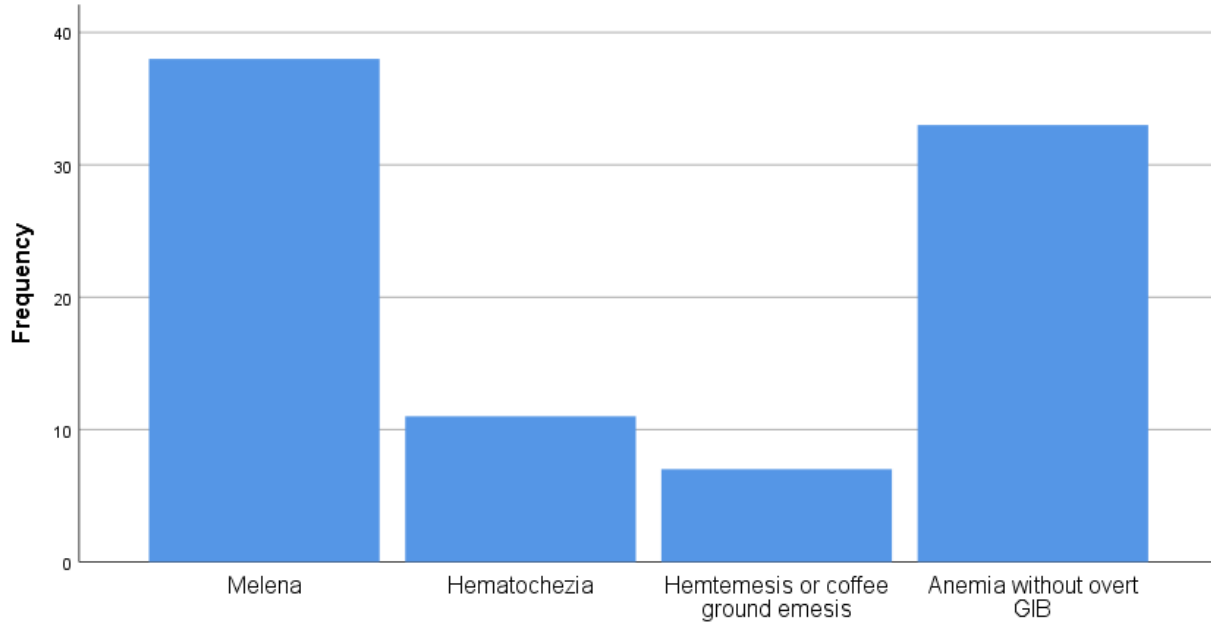
- ▶ A total of 227 patients were reviewed and **89 patients** were included (18 Push, 71 traditional).
- ▶ Mean age was 61.36 years-old (61.22 Push, 61.39 traditional).
- ▶ The majority of patients (75.28%) were > 55 years-old
- ▶ 70.78% of patients were males.
- ▶ All patients were on anticoagulation and 53 patients were on antiplatelets as well.

Table 1: Basic demographic characteristics, medical history and medications

		Push enteroscopy pathway	Traditional pathway	Total
Age group (Years)	<b>18-35</b>	1	0	1
	<b>36-55</b>	3	18	21
	<b>&gt;55</b>	14	53	67
Gender	<b>Male</b>	9	54	63
	<b>Female</b>	9	17	26
Race	<b>White</b>	13	36	49
	<b>African American</b>	5	28	33
	<b>Hispanic</b>	0	7	7
CKD	<b>None</b>	6	29	38
	<b>Stage I</b>	0	1	1
	<b>Stage II</b>	1	0	1
	<b>Stage III</b>	6	30	36
	<b>Stage IV</b>	4	6	10
	<b>Stage V, dialysis</b>	1	5	6
Presentation	<b>Melena</b>	6	32	38
	<b>Hematochezia</b>	2	9	11
	<b>Hematemesis</b>	1	6	7
	<b>Anemia</b>	9	24	33
Antiplatelet	<b>Yes</b>	13	40	53
	<b>No</b>	5	31	36
Anticoagulation	<b>Yes</b>	18	71	89
	<b>No</b>	0	0	0

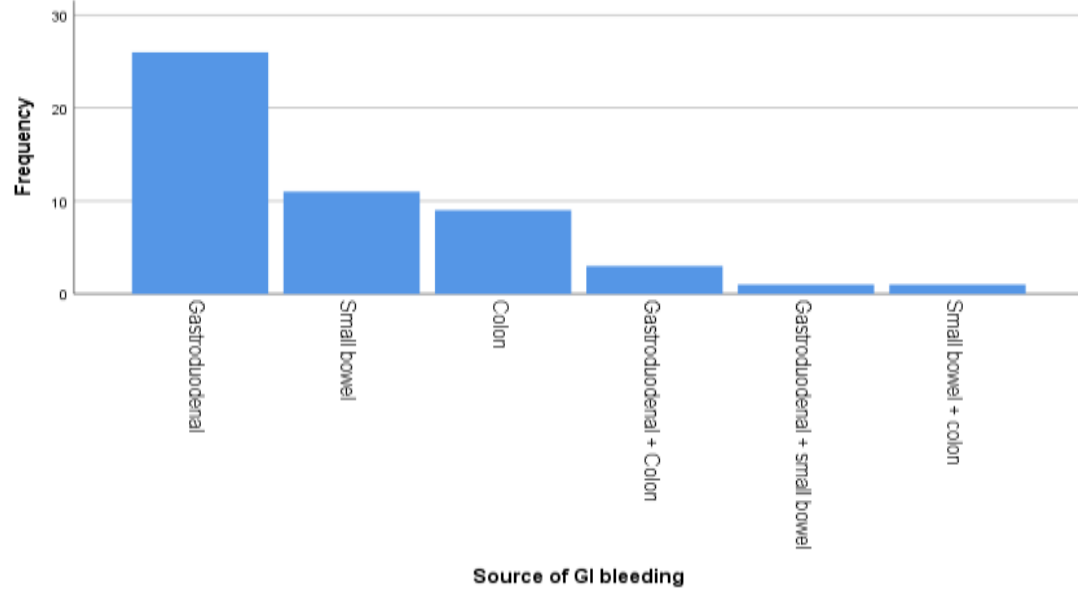


**Presentation**

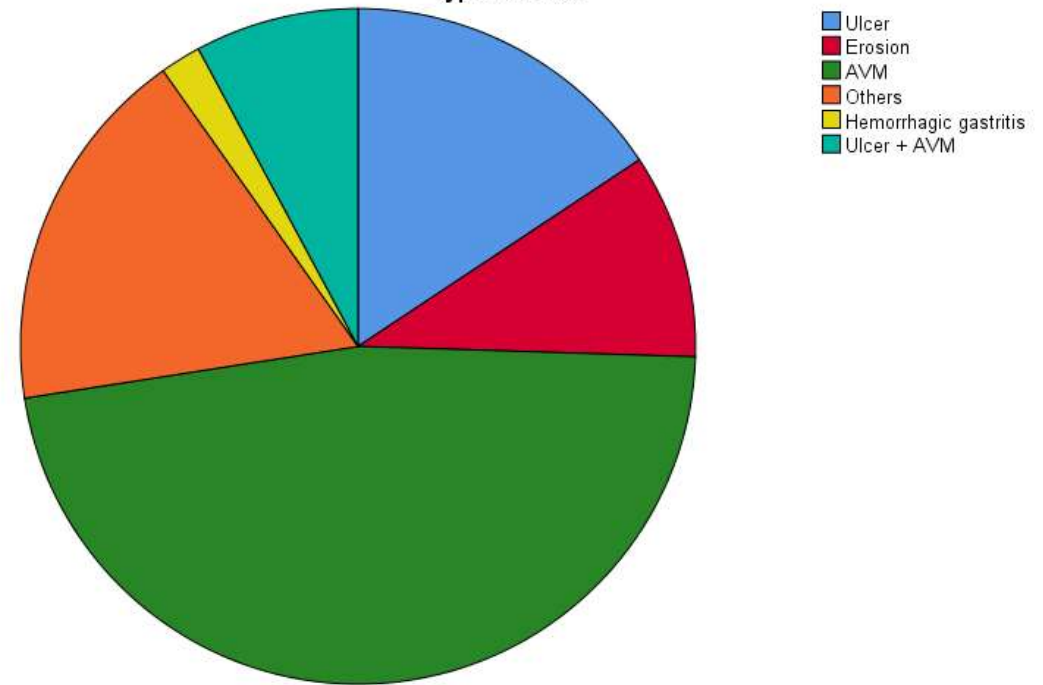


**Presentation**

**Source of GI bleeding**

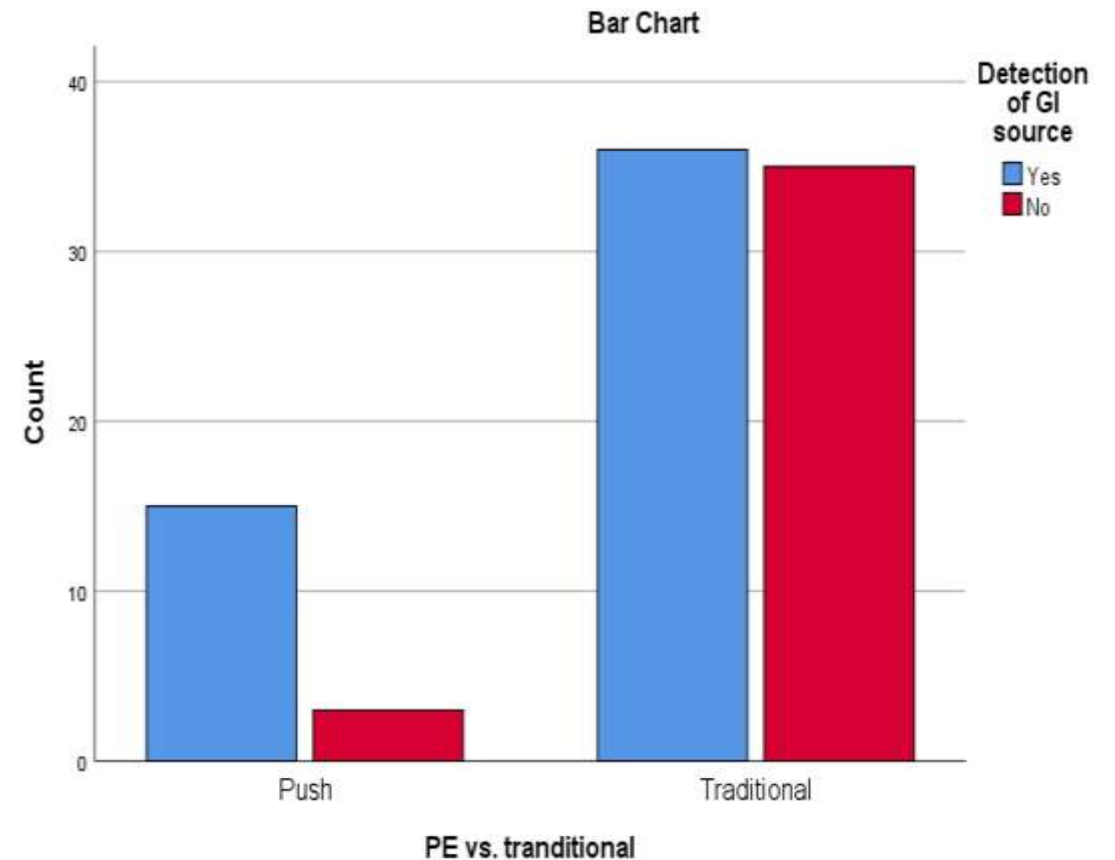


**Type of lesion**



# Results - Primary outcomes

- ▶ The source of bleeding was detected on first index endoscopy in 51 cases (15 push (out of 18) and 36 traditional (out of 71))
- ▶ There was a **statistically significant association** between doing PE at first index endoscopy and detection of GI lesion (Chi square and Fisher exact test, alpha 0.05)
  - ▶ P value = 0.012, OR 4.861, 95% CI (1.293-18.271)
- ▶ This was true, especially when the presentation is **with worsening anemia with no overt bleeding** (Subgroup analysis, Chi square and Fisher exact test, alpha 0.05)
  - ▶ P value = 0.015, OR 11.2, 95% CI (1.202-104.329)
- ▶ There was **no statistically significant difference** in all cause mortality between both pathways (Chi square and Fisher exact test, alpha 0.05)
  - ▶ P value= 0.163



# Results - Secondary outcomes

- ▶ Starting with PE was **associated with a shorter hospital stay** but no significant difference on number of pRBCs (paired T-test, alpha 0.05)
  - ▶ Length of stay
    - ▶ Push Mean (SD) LOS 10.78 (13.97), VS. Traditional Mean (SD) LOS 18.8 (25.577)
    - ▶ P value = 0.034 (comparing mean hospital stay in days between both groups)
  - ▶ #pRBCs
    - ▶ Push Mean (SD) #pRBC 2.72 (4.599) VS. Traditional Mean (SD) # pRBCs 4.6 (8.00)
    - ▶ P value = 0.121
- ▶ Higher INR on presentation **was not associated** with higher risk of all cause mortality P = 0.905 (Paired T-test, alpha 0.05)
- ▶ INR on presentation **doesn't correlate with statistical significance with number of pRBCs and LOS** as per Pearson correlation
  - ▶ pRBCs  $r = 0.037$ , P 0.839
  - ▶ LOS  $r = -0.083$ , P = 0.644

# Conclusions, Criticism and future plans

- ▶ **Conclusion:** PE is a safe procedure. It increases the GIB site detection and shortens the length of hospital stay when considered on the initial evaluation of LVAD patients presenting with GIB in general and worsening anemia in specific.
- ▶ **Criticism:** This was a retrospective study. Recall bias and insufficient documentation are not uncommon.
- ▶ **Future plans:** Submission to the American College of Gastroenterologist annual meeting 2019 and completing a full manuscript.