

Introduction

- The Endoscopic functional lumen imaging probe (EndoFLIP®) uses a balloon inflated to different sizes to measure the pressure (P) and diameter (D) of the lower esophageal sphincter and the distensibility index (DI) at the gastroesophageal junction.^{1,2}
- These parameters are crucial for differentiating spastic EMDs from non-spastic EMDs.
- Non-spastic EMDs, such as Type 1 Achalasia, have lower P and higher D and DI.
- Spastic EMDs, such as Type 2 and 3 Achalasia and Jackhammer Esophagus, have high P and low D and DI.
- Sevoflurane is used for general anesthesia. Propofol is used for monitored anesthesia care.
- Sevoflurane induces a stronger neuromuscular blockade than propofol.
- In theory, the increased muscle relaxation caused by sevoflurane could lead to inaccurately lower P and higher D and DI measurements by EndoFLIP. This could interfere with EndoFLIP's ability to distinguish spastic from non-spastic EMDs.³⁻⁵
- This study compares the effect of using propofol vs sevoflurane on EndoFLIP measurements.

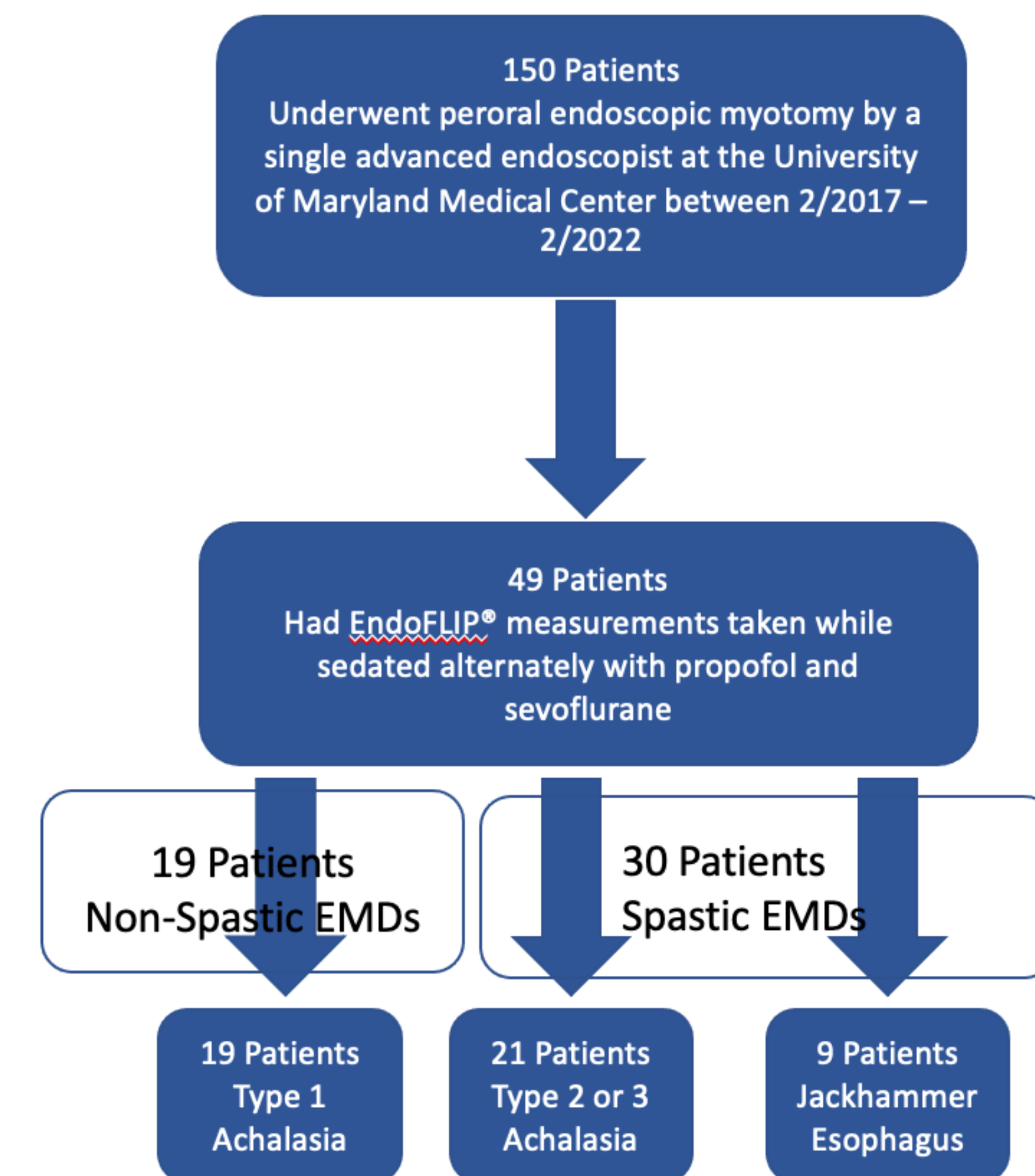
Table 1. Types of Esophageal Motility Disorders and Expected P, D, and DI

EMD Type	Spastic	Pressure	Diameter	Distensibility Index
Type 1 Achalasia	No	↓	↑	↑
Type 2 Achalasia	Yes	↑	↓	↓
Type 3 Achalasia	Yes	↑	↓	↓
Jackhammer Esophagus	Yes	↑	↓	↓

Methods and Materials

- All 150 Patients with non-spastic (Type 1) achalasia, spastic (Types 2 and 3) achalasia, or Jackhammer Esophagus (JE) who underwent peroral endoscopic myotomy by a single advanced endoscopist at the University of Maryland Medical Center between 2/2017 and 2/2022 were retrospectively reviewed.
- All patients who underwent EndoFLIP® while sedated with propofol and sevoflurane were included.
- 49 patients were included: 19 (39%) had Type 1, 21 (43%) had Type 2 or 3, and 9 (18%) had JE. (figure 1).
- The differences in P, D, and DI using propofol vs sevoflurane (PS-P, SP-D, SP-DI) with a 30mm and 60mm balloon were obtained. The differences were divided into terciles and compared between diagnoses.

Figure 1. Study Design .



Results

- Sevoflurane induced lower P and higher D and DI on average
- Compared to all other diagnoses, Type 1 correlated with the lower tercile PS-P at 60mm (aOR 10.0, 95%CI 2.23-45.3, p=0.003), inversely correlated with the higher tercile PS-P at 60mm (aOR 0.12 95%CI 0.02-0.70, p=0.02), and inversely correlated with the higher tercile PS-P at 30mm (aOR 0.14, 95%CI 0.02-0.76, p=0.02).
- Compared to Type 1, Types 2 and 3 correlated with the higher tercile PS-P at 30mm (aOR 6.29, 95%CI 1.03-38.4, p=0.05), inversely correlated with the lower tercile PS-P at 60mm (aOR 0.16, 95%CI 0.03-0.78, p=0.02).
- Compared to Type 1, JE correlated with the higher tercile PS-P at 30mm (aOR 18.8, 95%CI 1.40-252, p=0.03) and correlated with the higher tercile PS-P at 60mm (aOR 60.05, 95% CI 2.84-1268.37) (table 2)

Discussion

- Esophageal pressure measured by EndoFLIP® was significantly reduced when patients were sedated with sevoflurane vs propofol.
- The most important distinguishing factor for Type 1 achalasia vs spastic esophageal disorder is the pressure and spasm of the esophageal body.
- Thus, using sevoflurane for diagnostic EndoFLIP® can potentially cause spastic achalasia to be misdiagnosed as Type I achalasia.
- Therefore, propofol should be considered over sevoflurane for sedation during the diagnostic test.

Table 2. Effect of propofol vs sevoflurane on lower esophageal sphincter pressure as measured by EndoFLIP®

		Propofol			Sevoflurane			Jackhammer Esophagus Vs Type 1	Propofol		
		aOR	95% CI	p	aOR	95% CI	p		aOR	95% CI	p
Type 1 Vs All Other Diagnoses	Lower Tercile PS-P at 60mm	10.1	2.23-45.3	0.0027*	0.16	0.03-0.78	0.0238*	-----	-----	-----	
	Higher Terciles PS-P at 60mm	0.1	0.02-0.70	0.0177*	4.74	0.71-31.61	0.1079	60.05	2.84-1268.37	0.0085*	
Type 2&3 Vs Type 1	Lower Tercile PS-P at 30mm	1.1	0.31-3.73	0.9017	1.05	0.27-4.00	0.9459	0.54	0.06-4.72	0.575	
	Higher Tercile PS-P at 30mm	0.1	0.02-0.76	0.0234*	6.29	1.03-38.43	0.0463*	18.82	1.40-2.22	0.0267*	

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