Procedure Volume Impacts Complications and Length of Stay Following Emergent Paraesophageal Hernia Repair

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Introduction

- Practice specialization and referral patterns → concentration of PEHRs at high-volume centers over the past 2 decades.
- Higher procedure volume associated with improved outcomes for elective PEHR.
- The aim of this study was to compare outcomes between high and low volume centers for emergent PEHR.

Methods

Nationwide Readmissions Database

- Inclusion
  - 2016-2018
  - Diagnosis and procedure ICD-10 code associated with PEHR
  - Non-elective admission
- Exclusion
  - Age < 18 years old
  - Diagnosis of upper GI malignancy
  - Concurrent bariatric procedure
- **High volume center (HVC) = top 5 percentiles (≥12 emergent PEHRs/year)**
- **Low volume center (LVC) = bottom 50 percentiles (≤2 emergent PEHRs/year)**

Results

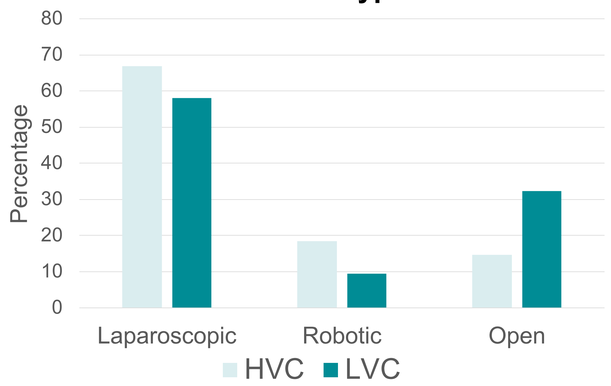
Preoperative Characteristics

	HVC N = 2,673	LVC N = 1,915	p-value
Age (Years)	67 [56, 76]	72 [61, 81]	<.001*
Sex (Female)	1,830 (68.5)	1,306 (68.2)	0.850
Obesity	453 (17.0)	242 (12.6)	<.001*
Diabetes	327 (12.2)	255 (13.3)	0.277
History of Smoking	133 (5.0)	130 (6.8)	0.009*
Chronic Pulmonary Disease	562 (21.0)	354 (18.5)	0.034*
Charlson Comorbidity Index	0 [0, 1]	1 [0, 2]	<.001*

Median [quartile 1, quartile 3]; n (%).

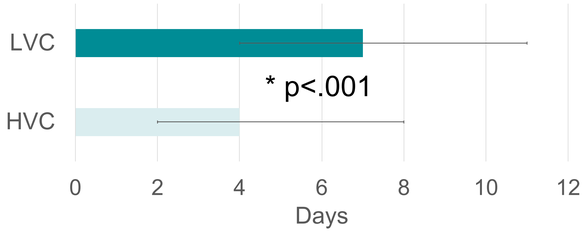
- 9,966 emergent PEHRs identified
- 26.8% at HVCs; 19.2% at LVCs
- LVC patients were older with more comorbidities

Procedure Types



- More emergent PEHRs performed with minimally invasive (MIS) approach at HVCs (p<.001)

Median Length of Stay



Multiple Linear Regression for LOS

- LVCs independently predictive of longer LOS (β = 1.819 [1.144-2.490])

Postoperative Outcomes

	HVC N = 2,673	LVC N = 1,915	p-value
Inpatient Mortality"	42 (1.6)	47 (2.5)	0.033*
Inpatient Complications			
Cardiac Complications	363 (13.6)	353 (18.4)	<.001*
Major Bleeding	3 (0.1)	5 (0.3)	0.233
VTE	44 (1.7)	48 (2.5)	0.040*
Pneumonia	81 (3.0)	116 (6.1)	<.001*
Respiratory Failure	194 (7.3)	267 (13.9)	<.001*
Esophageal Perforation	22 (0.8)	19 (1.0)	0.548
Acute Renal Failure	225 (8.4)	331 (17.3)	<.001*
Wound Infection	2 (0.1)	2 (0.1)	0.738
Sepsis	98 (3.7)	172 (9.0)	<.001*
Length of Stay (Days)	4 [2, 8]	7 [4, 11]	<.001*
Readmissions			
30-day	273 (10.2)	244 (12.7)	0.008*
Requiring Reoperation	28 (1.1)	10 (0.5)	0.053

Median [quartile 1, quartile 3]; n (%). " 100% data not available.

- HVCs protective for complications (OR = 0.800 [0.642-0.996]) on logistic regression

Conclusions

- The highest volume centers (top 5 percentiles) perform ≥12 emergent PEHRs/year.
- 50% of centers perform ≤2 emergent PEHRs/year.
- Emergent PEHR much more likely to be performed by MIS approach at HVCs.
- HVCs independently associated with shorter LOS and less inpatient complications.
- Procedure volume NOT independently predictive of mortality or readmissions.
- Transferring patients to a HVC for emergent PEHR may be helpful for decreasing morbidity and improving resource utilization.

Resources

- Schlottmann F, Strassle PD, Allaix ME, Patti MG. Paraesophageal Hernia Repair in the USA: Trends of Utilization Stratified by Surgical Volume and Consequent Impact on Perioperative Outcomes. J Gastrointest Surg. 2017;21(8):1199-1205. doi: 10.1007/s11605-017-3469-z.
- Jassim H, Seligman JT, Frelich M, et al. A population-based analysis of emergent versus elective paraesophageal hernia repair using the Nationwide Inpatient Sample. Surg Endosc. 2014;28(12):3473-8. doi: 10.1007/s00464-014-3626-3.

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