SURGEON VARIABILITY IN APPROACH TO HIATAL HERNIA REPAIR DURING BARIATRIC SURGERY

Catherine S Valukas, MD MS[1 2]; Joseph Sanchez, MD[1 2]; Dominic Vitello, MD[1 2]; Alan Soetikno, BS[1]; Joanne Prinz, RN BSN[2]; Alexander Nagle, MD[2]; Eric Hungness, MD[1 2]; Ezra N Teitelbaum, MD MEd[1 2]

[1]Northwestern Quality Improvement, Research and Education in Surgery, Northwestern University, Feinberg School of Medicine, Chicago, IL
[2] Department of Surgery, Northwestern University, Feinberg School of Medicine

Objectives

1) Describe the variation in preoperative assessment of hiatal hernia in bariatric surgery patients
2) Assess the variation in concomitant hiatal hernia repair during bariatric surgery

Methods

A retrospective cohort analysis was conducted using data obtained from the Metabolic and Bariatric Accreditation Quality Improvement Program (MBSAQIP) as well as institutional medical records. All adult patients who underwent primary sleeve gastrectomy (SG) or Roux-en-Y gastric bypass (RYGB) were included. Preoperative assessment of HH was defined as either EGD or upper GI/Esophagram (UGI) within one year of surgery. Surgeons were evaluated individually and by hospital. Categorical variables were assessed using Chi-Square analysis.

Results

From January 2018 to February 2023, **3,487 bariatric surgeries** were performed across 4 hospitals and 11 surgeons (2,481 SG and 1,006 RYGB). HH were concurrently repaired during 824 (24%) operations . The rate of HH repair in SG was 25% and 22% in RYGB.

Preoperatively, **41% of patients underwent EGD and 23% had an UGI.** HH was diagnosed in 22% of preoperative EGDs. The rate of HH repair in patients with a preoperatively diagnosed HH was 62%, compared with 25% of those without a preoperative diagnosis (p<0.001).

The repair rate in patients who had a preoperative EGD, was 33% and in patients who did not have a preoperative EGD it was 17% (p<0.001). The rate of **preoperative EGD utilization by surgeon varied significantly from 3 - 92%** (p<0.001). Surgeon repair rate ranged significantly as well (range 8 – 57%; p<0.001).

Even among patients **with a preoperatively diagnosed HH**, the **repair rate ranged 20 - 91%** (p<0.001) between individual surgeons. Between hospitals there were significant differences in the type of preoperative imaging obtained and the rate of HH repair. One hospital had very low utilization of preoperative EGD (3%) but obtained UGI 60% of the time. The rate of HHR for that hospital was significantly lower than other hospitals, which had higher rates of preoperative EGD (p<0.001).

Table 1. Preoperative Evaluation of Patients Undergoing Bariatric Surgery (2018-2023)

			All Bariatric Surgeries (n= 3,487)	Sleeve Gastrectomy (n=2481)	Roux en-y Gastric Bypass (n =1006)
Preoperative Imaging Obtained, n (%)*	Endoscopy		1427 (40.9)	913 (36.8)	514 (51.1)
	UGI		815 (23.4)	670 (27.0)	145 (14.4)
PREOPERATIVE ENDOSCOPY PERFORMED					
Hiatal Hernia Diagnosed, n (%)*	Yes		313 (21.9)	167 (18.3)	146 (28.4)
	No		1114 (78.1)	746 (81.7)	368 (71.6)
Hiatal Hernia Repair Performed	Preop Diagnosis*	Repaired	195 (62.3)	124 (74.3)	71 (48.6)
		No repair	118 (37.7)	43 (25.8)	75 (51.4)
	No Preop Diagnosis*	Repaired	282 (25.3)	231 (31.0)	51 (13.9)
		No Repair	832 (74.7)	515 (69.0)	317 (86.1)
PREOPERATIVE UGI PERFORMED					
Hiatal Hernia Diagnosed, n (%)*	Yes		90 (11.0)	67 (10.0)	23 (15.9)
	No		725 (89.0)	603 (90.0)	122 (84.1)
Hiatal Hernia Repair Performed*	Preop Diagnosis	Repaired	24 (26.7)	14 (20.9)	10 (43.5)
		No Repair	66 (73.3)	53 (79.1)	13 (56.5)
	No Preop Diagnosis	Repaired	95 (13.1)	64 (10.6)	31 (25.4)
		No Repair	630 (86.9)	539 (89.4)	91 (74.6)
NO PREOPERATIVE IMAGING PERFORMED					
Hiatal Hernia Repair Performed, n (%)	Yes		255 (19.3)	188 (73.7)	67 (26.3)
	No		1068 (80.7)	752 (70.4)	316 (29.6)

* Indicates P <0.05

Figure 1. Process Map of Study

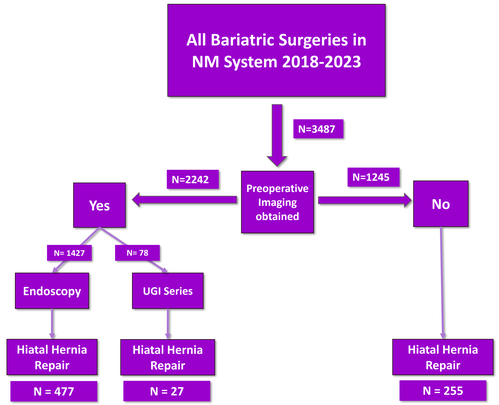
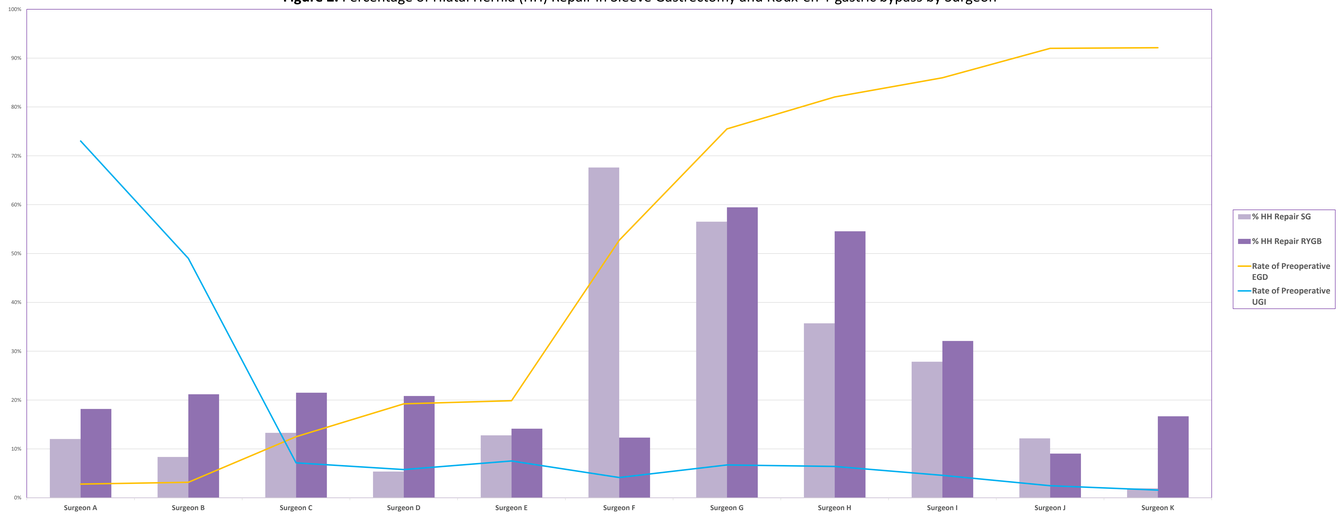


Table 2. Hiatal Hernia Repair Rate by Surgeon & ANOVA Results

	Total Number of Bariatric Surgery (Primary), n (%)	Average Rate of Hiatal Hernia Repair
Surgeon A	371 (10.64)	0.29
Surgeon B	459 (13.16)	0.51
Surgeon C	78 (2.24)	0.41
Surgeon D	104 (2.98)	0.13
Surgeon E	6 (0.17)	0.17
Surgeon F	393 (11.27)	0.13
Surgeon G	792 (22.71)	0.10
Surgeon H	280 (8.03)	0.16
Surgeon I	325 (9.32)	0.11
Surgeon J	146 (4.19)	0.14
Surgeon K	127 (3.64)	0.07
Surgeon L	343 (9.84)	0.57
Overall	3487 (100)	0.24

Source	SS	Df	F-statistic	P
Between groups	109.1	11	65.44	<0.01
Within groups	516.7	10341225		

Figure 2. Percentage of Hiatal Hernia (HH) Repair in Sleeve Gastrectomy and Roux-en-Y gastric bypass by Surgeon



Conclusions

Within a healthcare system there is significant heterogeneity in the approach to assessment and repair of HH during bariatric surgery. Variability in performance of concurrent hiatal hernia repair appears to be mediated by multiple factors, including utilization of preoperative studies, individual surgeon differences, as well as differences between hospitals. Further study is needed to understand how these variations in practice affect long-term patient outcomes.

References

1. Lewis KH, Callaway K, Argetsinger S, et al. Concurrent hiatal hernia repair and bariatric surgery: outcomes after sleeve gastrectomy and Roux-en-Y gastric bypass. Surg Obes Relat Dis 2021;**17**(1):72-80 doi: 10.1016/j.soard.2020.08.035 [published Online First: 20200903].
2. Imam A, Asfour G, Imam R, et al. Hiatal Hernia Evaluation Before Bariatric Surgery: Should It Be Routinely Done? Obes Surg 2021;**31**(3):1013-20 doi: 10.1007/s11695-020-05092-0 [published Online First: 20201101].
3. Chan DL, Wong SK, Lok HT, et al. Accuracy of hiatal hernia diagnosis in bariatric patients: Preoperative endoscopy versus intraoperative reference. JGH Open 2020;**4**(6):1074-78 doi: 10.1002/jgh3.12388 [published Online First: 20200730].
4. Repair Is more Common in Laparoscopic Sleeve Gastrectomy than During Laparoscopic Roux-en-Y Gastric Bypass: an Analysis of 130,772 Cases. Obes Surg 2019;**29**(2):744-46 doi: 10.1007/s11695-018-3594-0.
5. Hutopila I, Copaescu C. Hiatal Hernia is More Frequent than Expected in Bariatric Patients. Intraoperative Findings during Laparoscopic Sleeve Gastrectomy. Chirurgia (Bucur) 2019;**114**(6):779-89 doi: 10.21614/chirurgia.114.6.779.