Assessing the role of intraoperative upper endoscopy and intraoperative staple line leak test during laparoscopic sleeve gastrectomy

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BACKGROUND

The routine use of intraoperative upper endoscopy (IOE) and intraoperative staple line leak test (IOLT) during sleeve gastrectomy (SG) is not a universal requirement but has long been considered a useful adjunct by many surgeons to inspect for leaks and bleeding. While some prior single institutional studies have indicated that IOE and IOLT may be associated with lower rates of postoperative complications[1], others have found that complications such as leaks and hemorrhages are not commonly seen intraoperatively and thus question the use of these practices. We aimed to determine if IOE and IOLT led to a decrease in postoperative complications following sleeve gastrectomy.

METHODS

In this retrospective observational cohort study using the 2020-2023 MBSAQIP database, we compared the outcomes in adult patients over the age of 18, who received IOE and/or IOLT with those who did not during primary laparoscopic sleeve gastrectomy.

Primary outcome was 30-day postoperative staple line leak (PSL). Secondary outcomes were procedure duration, as well as rates of 30-day postoperative complications, which included GI tract bleed, sepsis, septic shock, organ space surgical site infection, reoperation, and readmission.

RESULTS

A total of 460,395 patients underwent laparoscopic sleeve gastrectomy between 2020 and 2023. Of these, 26.96% were robotic assisted.

A larger percentage of patients underwent IOLT with 66.8%, while 16.4% underwent an IOE. The operative length was 75.80±37.93 minutes vs. 68.00±35.46 minutes (P-value <0.0001) in those who underwent IOE vs. those who did not. For those who underwent an IOLT, the operative length was 71.77±36.92 minutes vs. 64.26±33.50 minutes (P-value <0.0001) in those who did not undergo IOLT.

PSL occurred in 594 (0.13%) patients. A chi-squared analysis did not find a statistically significant difference in PSL between the IOE and no IOE groups nor the IOLT and no IOLT groups (Table 1 and Table 2). However, GI tract bleed was found to be more likely in patients who did not undergo IOLT on univariate analysis (0.23% vs. 0.30%, P-value <0.0001) (Table 2).

On multivariate analysis using a logistic regression model, while IOE was not significantly associated with any of the postoperative adverse outcomes listed (Table 3), undergoing IOLT was found to be significantly associated with about 20% lower odds of developing a GI tract bleed as well as an organ space surgical site infection (Table 4).

	IOE (n=75727)	No IOE (n=384668)	OR (95% CI)	P-Value
Staple line leak	99 (0.13%)	495 (0.13%)	1.02 (0.82-1.26)	0.89
Organ space surgical site infection	163 (0.22%)	767 (0.20%)	1.08 (0.91-1.28)	0.37
GI tract bleed	180 (0.24%)	983 (0.26%)	0.93 (0.79-1.09)	0.37
Sepsis	59 (0.08%)	273 (0.07%)	1.10 (0.83-1.45)	0.52
Septic Shock	22 (0.03%)	110 (0.03%)	1.02 (0.64-1.61)	0.95
Reoperation in 30 days	468 (0.62%)	2332 (0.61%)	1.02 (0.92-1.13)	0.70
Readmission in 30 days	1713 (2.26%)	8572 (2.23%)	1.02 (0.96-1.07)	0.57

Table 1. Postoperative Adverse Events Occurrence Rates in Patients Who Underwent IOE Compared with Patients Who Did Not

	IOLT (n=307678)	No IOLT (n=152717)	OR (95% CI)	P-Value
Staple line leak	393 (0.13%)	201 (0.13%)	0.97 (0.82-1.15)	0.73
Organ space surgical site infection	599 (0.19%)	331 (0.22%)	0.90 (0.79-1.03)	0.12
GI tract bleed	**797 (0.23%)**	**456 (0.30%)**	**0.77 (0.68-0.87)**	**<0.0001**
Sepsis	215 (0.07%)	117 (0.08%)	0.91 (0.73-1.14)	0.42
Septic Shock	90 (0.03%)	42 (0.03%)	1.06 (0.74-1.53)	0.74
Reoperation in 30 days	**1815 (0.59%)**	**985 (0.64%)**	**0.91 (0.85-0.99)**	**0.02**
Readmission in 30 days	6851 (2.23%)	3434 (2.25%)	0.99 (0.95-1.03)	0.64

Table 2. Postoperative Adverse Events Occurrence Rates in Patients Who Underwent IOLT Compared with Patients Who Did Not

	OR (95% CI)	P-Value
Staple line leak	0.85 (0.60-1.20)	0.35
Organ space surgical site infection	1.17 (0.88-1.55)	0.28
GI tract bleed	0.91 (0.77-1.08)	0.29
Sepsis	1.06 (0.78-1.43)	0.73
Septic Shock	0.98 (0.61-1.57)	0.93
Reoperation in 30 days	1.03 (0.92-1.15)	0.66
Readmission in 30 days	1.01 (0.96-1.07)	0.70

Table 3. Is IOE Associated with a Decreased Rate of Postoperative Complications? – Multivariate Analysis

	OR (95% CI)	P-Value
Staple line leak	1.25 (0.95-1.65)	0.12
Organ space surgical site infection	**0.79 (0.63-0.99)**	**0.043**
GI tract bleed	**0.80 (0.66-0.98)**	**0.028**
Sepsis	0.98 (0.77-1.25)	0.89
Septic Shock	1.17 (0.80-1.70)	0.42
Reoperation in 30 days	0.97 (0.89-1.06)	0.49
Readmission in 30 days	1.01 (0.97-1.05)	0.67

Table 4. Is IOLT Associated with a Decreased Rate of Postoperative Complications? – Multivariate Analysis

CONCLUSIONS

Despite the widespread practice of IOE and IOLT during SG, recent studies have shown that both practices may not be so beneficial in preventing PSL in the adult population[2, 3]. However, they have been found to be protective in preventing other complications such as postoperative stenosis and GI tract bleed[1, 2].

In this study, both IOE and IOLT significantly increased operative time in patients undergoing a primary SG, with the IOLT cohort having shorter operative times than the IOE cohort. Furthermore, the act of undergoing IOE was not associated with a decrease in any of the postoperative adverse outcomes listed in this study. However, our findings show that the routine use of IOLT is associated with a decreased rate of reoperation in 30 days on univariate analysis, decreased odds of developing organ space surgical site infection on multivariate analysis, and decreased odds of developing GI tract bleed on both univariate and multivariate analysis.

While IOLT appears to be beneficial in patients undergoing primary SG, IOE does not seem to provide much benefit despite higher costs and increased operative times.

REFERENCES

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