EFFECT OF RESIDENT INVOLVEMENT IN LAPAROSCOPIC ROUX-EN-Y GASTRIC BYPASS SURGERY ON SHORT TERM PATIENT OUTCOMES: A META-ANALYSIS AND SYSTEMATIC REVIEW

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Introduction

Impact of resident involvement in laparoscopic Roux-en-Y gastric bypass surgery remains controversial. This study aims to systematically determine the effect of resident involvement on patient outcomes in laparoscopic Roux-en-Y gastric bypass surgery.

Results

10 studies were included in the meta-analysis, comprising 178,973 patients.

The resident-involved group had an overall higher number of patients with **diabetes** (odds ratio [OR], 1.28; [95% CI], [1.05, 1.55], 8 studies (178,322 patients), I2=96%) and **history of myocardial infarction** ([OR], 1.14; [95% CI], [1.01, 1.30], 3 studies (156,531 patients), I2=0%).

Residents were also more involved in operations where patients had an **American Society of Anesthesiologists (ASA) Class 1** ([OR], 1.64; [95% CI], [1.05, 2.56], 4 studies (156,161 patients), I2=77%) or **Class 2** score ([OR], 1.24; [95% CI], [1.20, 1.27], 5 studies (157,461 patients), I2=0%).

Post-operative outcomes with resident-involvement were found to be similar between groups. The resident-involved surgery group had similar rates of:

- Anastomotic leak/perforation
  ([OR], 0.68; [95% CI], [0.06, 7.81], 4 studies (35,692 patients), I2=85%)
- Reoperation
  ([OR], 1.04; [95% CI], [0.93, 1.16], 7 studies (46,798 patients), I2=0%)
- Urinary tract infection
  ([OR], 1.55; [95% CI], [0.88, 2.73], 3 studies (77,694 patients), I2=79%)
- Pulmonary embolism
  ([OR], 1.08; [95% CI], [0.76, 1.53], 3 studies (74,818 patients), I2=0%)
- Readmission
  ([OR], 1.07; [95% CI], [0.55, 2.09], 5 studies (46,415 patients), I2=79%)
- Pneumonia
  ([OR], 1.05; [95% CI], [0.72, 1.55], 4 studies (77,869 patients), I2=32%)
- Death
  ([OR], 0.87; [95% CI], [0.54, 1.41], 3 studies (44,639 patients), I2=0%)
- Operative time in minutes
  (mean difference [MD], 11.80; [95% CI], [-5.42, 29.02], 4 studies (75,838 patients), I2=99%)

Methods

This paper followed the Preferred Reporting Items of Systematic Reviews and Meta-Analyses guidelines. Two independent reviewers searched PubMed, Embase, and Cochrane Library to find studies assessing the impact of resident involvement on patient outcomes. 14 patient variables were compared between cohorts to investigate participant similarity. 8 outcome variables potentially impacted by resident involvement were compared via meta-analysis. Categorical data from studies were pooled to report odds ratio (OR) and 95% confidence intervals (95% CIs). Continuous data were analyzed to yield standardized mean difference (SMD) and 95% CIs. Study quality was assessed using the Newcastle-Ottawa Scale for cohort analysis and given a quality label based on Agency for Healthcare Research and Quality standards.

Figures

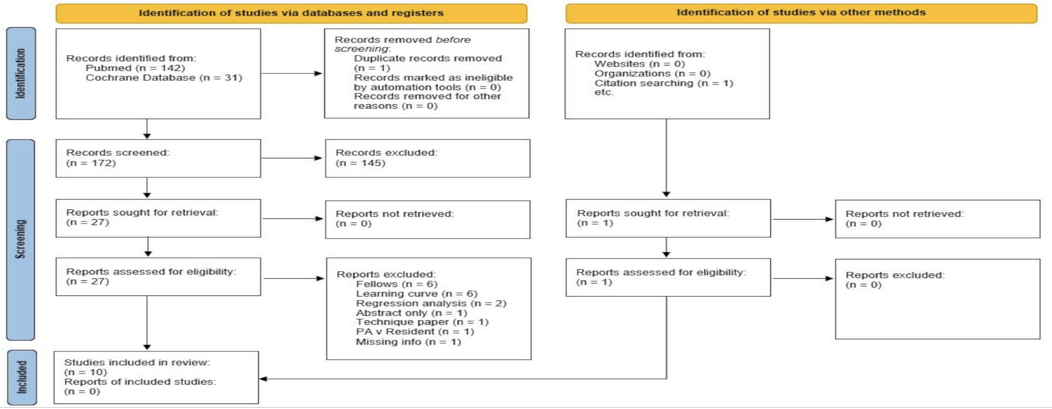


Figure 1. *PRISMA flow diagram for systematic review and meta analysis*

Study	Primary Source	Year	Location	Resident (n)	No Resident (n)	Newcastle-Ottawa Score: Selection	Comparability	Outcome	NOS to AHRQ
Doyon et al.	PubMed	2016	USA	22189	21288	**	*	***	Fair quality
Goldberg et al.	PubMed	2019	USA	21257	90810	**	*	***	Fair quality
Hsu et al.	Goldberg et al.	2005	USA	158	84	**	*	***	Fair quality
Iordens et al.	PubMed	2012	Netherlands	83	326	**	*	***	Fair quality
Krell et al.	PubMed	2014	USA	7601	9456	**	*	***	Fair quality
Major et al.	PubMed	2017	Poland	81	84	**	*	***	Fair quality
Sebastián-Tomás et al.	PubMed	2021	Spain	67	141	**	*	***	Fair quality
Sommer et al.	PubMed	2011	Denmark	300	1000	**	*	***	Fair quality
van Rijswijk et al.	PubMed	2018	Netherlands	361	2690	**	*	***	Fair quality
Zambare et al.	PubMed	2021	USA	844	143	**	*	***	Fair quality

Figure 2. *Newcastle-Ottawa Scale for cohort analysis and given a quality label based on Agency for Healthcare Research and Quality standards.*

Search Terms: ((("outcome"[All Fields] OR "outcomes"[All Fields] OR (comparison"[All Fields] OR "comparisons"[All Fields]) OR ("efficacies"[All Fields] OR "efficacious"All Fields] OR "efficaciously"[All Fields] OR "efficaciousness"[All Fields] OR "efficacy" [All Fields]) OR "complications"[All Fields] OR "Treatment Outcome"[MESH Terms) AND "Gastric Bypass surgery"[Title/Abstract) OR "Laparoscopic Bariatric Procedure"[Title/Abstract| OR "Laparoscopic Bariatric Procedures"Title/Abstract] OR "Gastric Bypass surgeries"[Title/Abstract] OR "Bariatric Surgery"[Title/Abstract] OR "Bariatric Surgeries"[Title/Abstract] OR "Roux-en-Y" [Title/Abstract] OR "laparoscopic roux en y"[Title/Abstract] OR "laparoscopic gastric bypass"[Title/Abstract]) AND (Resident physician"[Title/Abstract] OR "Resident"[Title/Abstract OR "Trainee"[Title/Abstract OR "Trainees"[Title/Abstract] OR "Internship and Residency"[MeSH Terms] OR "education, medical, graduate"[MeSH Terms] OR "Residency"[Title/Abstract] OR "consultants"[Title/Abstract] OR "Attending physician"[Title/Abstract])

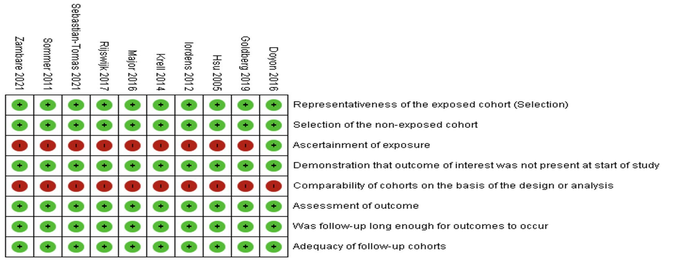


Figure 3. *Risk of Bias Plot. Green represents low risk of bias. Red represents high risk of bias.*

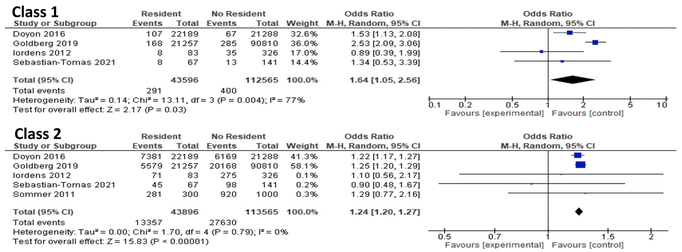


Figure 4. *Class 1 and 2 American Society of Anesthesiologists (ASA) scores resident vs. no resident group. Residents more involved in Class 1 and 2 ASA cases.*

Conclusion

Resident involvement in laparoscopic Roux-en-Y gastric bypass surgery seems to have no negative effect on patient outcomes. However, resident involvement was associated in cases with healthier patients according to ASA scores. This could lead to an underestimation of any potentially negative impact resident involvement might have. Data is limited due to the lack of high-quality, propensity-scored studies. With significant heterogeneity present in few select outcomes, further investigation is warranted to confirm and elucidate these findings.

Selected References

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