

Ambulatory Bariatrics: Consideration beyond just VSGs

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Conflict of interest



- Speaker for NovoNordisk
- Educational Grant from Medtronic
- Podcast sponsor by J&J



Where come the fear of
ambulatory (day) surgery
for bariatric surgery?

Original article

Obesity surgery mortality risk score: proposal for a clinically useful score to predict mortality risk in patients undergoing gastric bypass

Eric J. DeMaria, M.D.^{a,b,*}, Dana Portenier, M.D.^b, Luke Wolfe, M.S.^a

^aVirginia Commonwealth University, Richmond, Virginia

^bDuke University Medical Center, Durham, North Carolina

Received June 11, 2006; revised January 4, 2007; accepted January 21, 2007

- Prospective data
- 2075 patients
- 1995-2004
- Mortality rate in the literature (0% to 1.5%)

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Table 2

Results of multivariate logistic regression analysis modeling risk of mortality using hypertension, BMI ≥ 50 kg/m², gender, risk of PE, and age ≥ 45 years as predictors

Risk factor	Odds ratio	95% Confidence interval
BMI ≥ 50 kg/m ²	3.600	1.442–8.988
Male gender	2.795	1.320–5.916
Hypertension	2.783	1.105–7.009
Risk of PE	2.623	1.124–6.121
Age ≥ 45 y	1.642	0.775–3.480

Abbreviations as in Table 1.



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Table 3

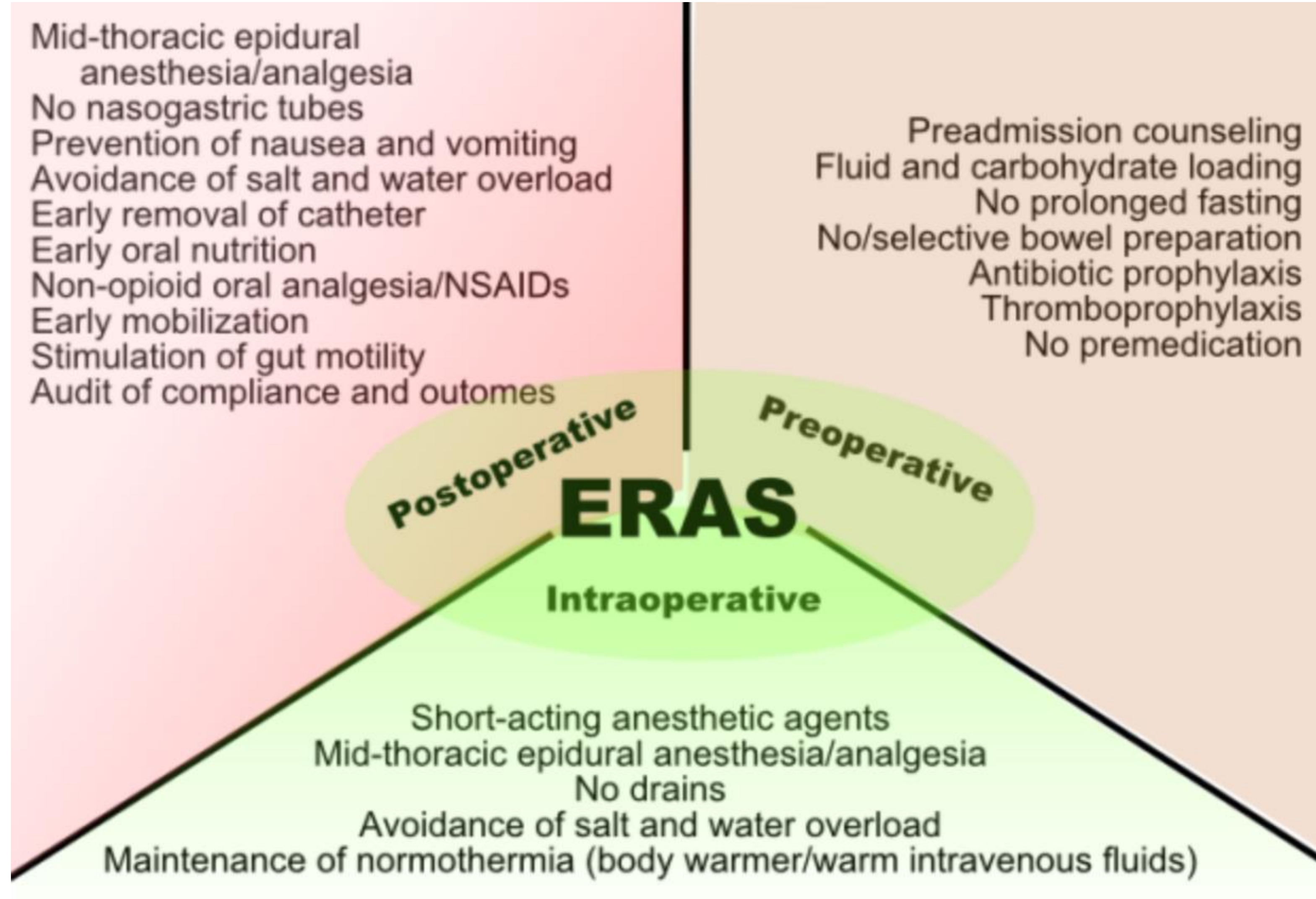
Mortality rates according to number of co-morbidities used in multivariate model

Co-morbidity (n)	Patients (n)	Deaths (n)	Mortality rate (%)
0	356	0	0
1	601	3	0.50
2	596	7	1.17
3	403	12	2.98
4	101	6	5.94
5	18	3	16.67

Mortality rates significantly different from each other using Fisher's exact test.

Changes in Utilization of Bariatric Surgery in the United States From 1993 to 2016 (February 2020 Volume 271 - Issue 2 - p 201-209)

- 1 903 273 patients!
- 100% open to 98% laparoscopic
- Complications from 11.7% to 1.4%
- Mortality from 1% to 0.04%



Reason for longer hospital stay



30%	Pain
20%	Nausea
15%	Weekness
20%	Organisation

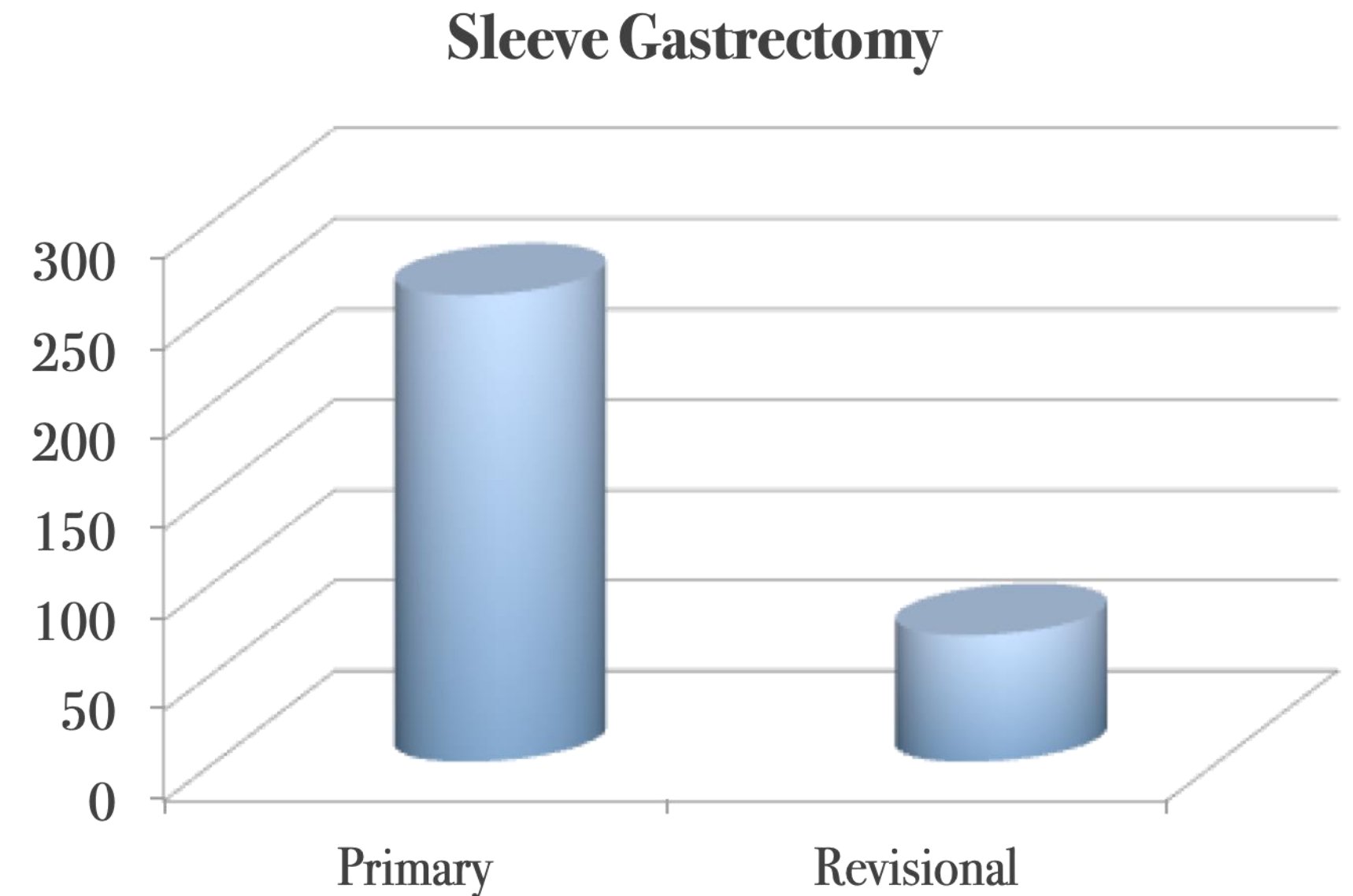


ORIGINAL CONTRIBUTIONS

Fully Ambulatory Laparoscopic Sleeve Gastrectomy: 328 Consecutive Patients in a Single Tertiary Bariatric Center

Fabio Garofalo¹ • Ronald Denis¹ • Omar Abouzahr¹ • Pierre Garneau¹ •
Radu Pescarus¹ • Henri Atlas¹

- From August 2012 to February 2015
- 980 patients underwent LSG
- 328 (33%) responded to ambulatory criteria



Exclusion Criteria

Patient characteristics

Age \geq 55 y.o.

BMI \geq 55 Kg/m²

ASA score \geq IV

OS-MRS‡ grade C

Insulin-dependent diabetes

Poorly controlled hypertension

Table 1 Patient characteristics

Characteristics	Patients (n=328)
Age (year)	38.4 (± 8.5) ^a
Body mass index (kg/m ²)	44.5 (± 5.6) ^a
ASA score	2.3 (± 0.5) ^a
Women (%)	86.6
Female/male ratio	6/1
Comorbidities (%)	54.3
Hypertension (%)	21.6
Type II diabetes (%)	12.5
Sleep apnea (%)	10.1
Hyperlipidemia (%)	6.4
Ambulatory surgery	
Length of stay (hours)	8.1 (6–10) ^b
Overnight hospitalization (%)	1.8
Readmission (%)	8.5

^a Mean \pm standard deviation

^b Mean and range



Surgical Phase

Preoperative Phase

Patients selection

Inclusion criteria
Exclusion criteria

Patients preparation

Low-calorie diet (2 weeks)
Nutritional course
Counseling

Anesthesia protocol

Induction: Propofol (200/250 mg)
Maintenance: Desflurane (1 MAC)
Muscular relaxant: Rocoronium (50 mg)
Reverse: Neostigmine (2.5 mg)
Glycopyrolate (0.5 mg)
Narcotics: Morpine (15 mg)
Fentanyl (250 mcg)
Antiemetics: Ondansetron (8 mg)
Dexamethasone (8 mg)

Surgical protocol

Antibiotic prophylaxis (Cefazolin 2 g)
Heparine 5000 UI sc before surgery
Pneumatic compression stockings
Experienced surgeon
Standardized laparoscopic technique
Local anesthesia (Bupivacaine 0.5%)

Postoperative Phase

Recovery room

Vital signs
Pneumatic compression stockings
IPP: Pantoloc (40 mg)
Antalgia: Hydromorphone (1-2 mg)
Antiemetics: Dimenhydrinate (50 mg)
Ondansetron (4 mg)

Discharge protocol

PACU* modified criteria: score >10/14
Prescription: Enoxaparine (40 mg)
Hydromorphone (2 mg)
Dimenhydrinate (50 mg)
Docusate sodium (200 mg)
Pantoprazole (40 mg)
Telephone contact 24 hours post-op.



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Discharge: PACU modified criteria



Modified Criteria	Points
Oxygenation*	
SpO2 > 92% on room air	2
SpO2 > 90% on oxygen	1
SpO2 < 90% on oxygen	0
Circulation	
BP +/- 20% of normal	2
BP +/- 20-50% of normal	1
BP > 50% of normal	0
Consciousness*	
Fully awake	2
Arousable on calling	1
Not responsive	0
Nausea & vomiting	
None or mild: tx with antiemetics PO	2
Moderate: tx with antiemetics IV	1
Severe: persistent with Tx	0
Pain*	
None or mild pain (VAS: 0-4)	2
Moderate pain (VAS: 5 -7)	1
Severe pain (VAS: 7-10)	0

Modified Criteria	Points
Wound	
Dressing clean	2
Dressing stained (minimal bleeding)	1
Dressing soaking wet (active bleeding)	0
Miction	
Miction	2
Anuric, comfortable	1
Anuric, uncomfortable	0

DISCHARGE: score >10

Oxygenation
Consciousness
Pain

Score must be 2 for discharge

Aldrete JA, J Clin Anesth 1995



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ORIGINAL CONTRIBUTIONS

Fully Ambulatory Laparoscopic Sleeve Gastrectomy: 328 Consecutive Patients in a Single Tertiary Bariatric Center

Fabio Garofalo¹ · Ronald Denis¹ · Omar Abouzahr¹ · Pierre Garneau¹ · Radu Pescarus¹ · Henri Atlas¹

Length of stay (hours)	8.1 (6-10)
Overnight hospitalisation	6 (1.8%)
Readmission	28 (8.5%)



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Reason for readmissions



Table 2 Cause for readmissions within 30 days postoperatively

Cause of readmission	Number of patients
Nausea/vomiting	13 (3.9 %)
Abdominal pain	7 (2.1 %)
Pneumonia	2 (0.6 %)
Pancreatitis	1 (0.3 %)
Urinary tract infection	1 (0.3 %)
Pain related to intra-abdominal hematoma	3 (0.9 %)
Gastric staple line leak	2 (0.6 %)

Dindo-Clavien Classification	Type of complications	Patients (n=33/328)
Grade I		27 (8.2%)
	Nausea and vomiting	16 (4.9%)
	Abdominal pain	7 (2.1%)
	Intra-abdominal hematoma	2 (0.6%)
	Somnolence	1 (0.3%)
	Acute pancreatitis	1 (0.3%)
Grade II		3 (0.9%)
	Pneumonia	2 (0.6%)
	Urinary tract infection	1 (0.3%)
Grade IIIa		2 (0.6%)
	Gastric leak	2 (0.6%)
Grade IIIb		1 (0.3%)
	Intra-abdominal bleeding	1 (0.3%)
Grade IV		None
Grade V		None

Primary LSG: 258 (78%)
Revisional LSG: 70 (22%)



Garofalo F, Denis R, Abouzahr O, Pescarus R, Garneau P, Atlas H; **Obes Surg 2015**



[J Minim Invasive Surg Sci](#). In press(In press):e44931.

doi: [10.5812/minsurgery.44931](https://doi.org/10.5812/minsurgery.44931).

Published online 2017 February 25.

Research Article

Neuromuscular Blockade, Bariatric Surgeon Satisfaction, and Quality of Patient Recovery

Pierre Y. Garneau,^{1,*} Fabio Garofalo,¹ Valerie Deslauriers,¹ Simon L. Bacon,² Ronald Denis,¹ Radu

Pescarus,¹ Henri Atlas,¹ Marc Delisle,³ and Isabelle Tremblay⁴

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³Rockland MD Surgical Centre, Montreal, Quebec, Canada

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Method

- Prospective study
- From January to August 2015
- 50 ambulatory patients with laparoscopic sleeve gastrectomy
- Revision surgery were excluded

Demographic



Characteristics	Patients (n=50)
Age (year)	38.8
BMI(Kg/m ²)	43.9
ASA score	2.3
Female	84%
OS-MRS class A	41 (82 %)
OS-MRS class B	9 (8%)
Comorbidities (total)	46%
Hypertension	26%
Type II DM	2%
Sleep Apnea	24%
Hyperlipidemia	8%

Laparoscopic time



Two groups

- 11 patients (22%) in deep NMB
- 39 patients (78%) in moderate NMB

Neuromuscular blockade



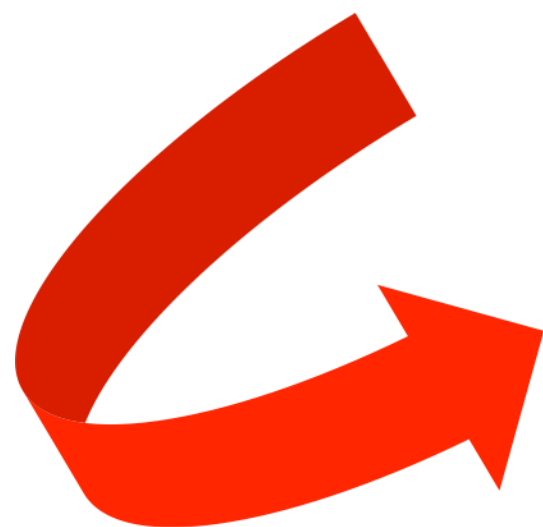
Adjusted (age, sex, BMI)	Moderate NMB	Deep NMB	P value
Laparoscopy time	53.5 (± 2.8)	35.8 (± 5.2)	.005
Total surgical time	67.2 (± 2.8)	48.6 (± 5.2)	.003
Additional doses of blocker	0.69 (± 0.14)	0.06 (± 0.27)	.048

Mean total surgical time was 63 minutes (range: 35 to 128)

Nausea



- ❖ Women had more episodes of nausea (mean=1) compared to men (mean=0.14) ($p=0.004$).
- ❖ Women took more anti-nausea drugs (mean=1.24) vs men (mean=0.13) ($p=0.006$)
- ❖ Younger individuals took more anti-nausea drugs compared to older individuals ($p=0.015$).



Young women should potentially be placed as first case during an ambulatory surgery day



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Resultats



Length of stay (hours)	7.25* (6 - 11)**
Overnight hospitalisation	0%
Readmission	0%

* Mean and ** Range



OK, whats next after > 4000 sleeves as a day surgery?

RESEARCH

Open Access

Fully ambulatory robotic single anastomosis duodeno-ileal bypass (SADI): 40 consecutive patients in a single tertiary bariatric center



Anne-Sophie Studer^{1*}, Henri Atlas¹, Marc Belliveau², Amir Sleiman¹, Alexis Deffain¹, Pierre Y Garneau¹, Radu Pescarus¹ and Ronald Denis¹

Fully ambulatory robotic single anastomosis duodeno-ileal bypass (SADI): 40 consecutive patients in a single tertiary bariatric center



Anne-Sophie Studer^{1*}, Henri Atlas¹, Marc Belliveau², Amir Sleiman¹, Alexis Deffain¹, Pierre Y Garneau¹, Radu Pescarus¹ and Ronald Denis¹

- Started in April 2021
- 37 F, 3 M
- Mean age 40.3
- Medium time after sleeve 54 months (21-146)
- Mean operative time 128 minutes





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Table 1 Eligibility criteria for ambulatory management

Inclusion criteria

Age < 55 yo with BMI \leq 50 kg/m²
 Age < 45 yo with BMI \geq 50 and < 55 kg/m²
 ASA score I or II, or III if cleared by internist,
 Moderate or severe obstructive sleep apnea syndrome if well controlled with CPAP
 Obesity Surgery Mortality Risk [24, 25] score grade A or B
 Residence within 40 km from hospital

Exclusion criteria

Age \geq 55yo and BMI > 50 kg/m²
 Age \geq 45 yo and BMI \geq 55 kg/m²
 ASA score \geq IV
 Obesity Surgery Mortality Risk [24, 25] score grade C
 Insulin-dependent diabetes
 Poorly controlled hypertension
 Complex previous abdominal surgeries

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Bariatric history:

Gastric lapband

7 (17.5%)

Gastric plication

1 (2.5%)

LSG

40 (100%)

Ambulatory /Overnight hospitalisation

27/13 (67.5/32.5%)

Median delay between SG and SADI

54 months (min-max: 21-146)

Mean pre-operative BMI before SG

47.7 (± 7.1) min-max 31-66



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Table 2 Institution's protocol for ambulatory intraoperative medication and management

Anesthesia Protocol	Surgical Protocol	Recovery Room Protocol	Discharge Protocol
<p>Induction: Propofol 200-400 mg Ketamine 0.5 mg/kg Dexmedetomidine 0.3–0.5 mcg/kg Lidocaine 2 mg/kg Magnesium 30 mg/kg</p> <p>Maintenance: Sevoflurane(1MAC) or BIS guided TIVA*</p> <p>Muscle relaxant: Rocuronium (70-120 mg)</p> <p>Reverse: Neostigmine 2.5 mg-4 mg) Glycopyrolate 0.5 mg-1.2 Or Sugammadex 2 mg/kg</p> <p>Narcotics: Dilaudid 0.5–1.5 Morphine 2-5 mg Fentanyl 0-150mcg</p> <p>Antiemetics: Ondansetron 4 mg Dexamethasone 10 mg</p> <p>Cristalloids: Bolus 15 cc/kg</p>	<p>Antibiotic prophylaxis: Cefazolin 2 g</p> <p>Antithrombotics: Heparin 5000 UI SC before surgery</p> <p>Intermittent compression stockings 2 experimented surgeons available</p> <p>Standardised Laparoscopic & Robotic technique</p> <p>Local anesthesia: Bupivacaine 0.5%</p>	<p>Vital Signs</p> <p>Intermittent compression stockings</p> <p>PPI: Pantoloc 40 mg</p> <p>Analgesia: Acetaminophen 975 mg Hydromorphone 1-2 mg</p> <p>Antiemetics: Dimenhydrate 50 mg Ondansetron 4 mg</p>	<p>PACU** modified criteria: score > 10/14</p> <p>Prescription: Enoxaparine 40 mg daily Hydromorphone 1 mg every 6 h if needed (max 7days) Dimenhydrinate 50 mg (every 6 h if needed max 7 days) Docusate sodium 200 mg (twice a day, if needed max 7 days) Pantoprazole 40 mg daily, for 1 month)</p> <p>Vitamin supplements</p> <p>Telephone contact 24 h post-op</p>

* Bispectral Index Monitoring guided Total Intravenous Anesthesia ** Post-Anesthesia Care Units



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Table 5 Dindo-Clavien's classification of surgical complications

Grade	Type of complication	Length of stay (days)	<i>n</i> counts (%)
I	Abdominal pain	0	3 (7.5%)
	Nausea and vomiting	NA	0 (0%)
II	Parietal cellulitis	0	1 (2.5%)
IIIa	Infected intra-abdominal hematoma	10	1 (2.5%)
IIIb	Duodenal leak and peritonitis	24	1 (2.5%)

NA: Not Applicable



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Original article

Anastomotic metabolic and bariatric surgeries with same-day discharge: 30-day outcomes of a cohort from a high-volume center in Canada

Alexis Deffain, M.D.^{a,*}, Ronald Denis, M.D.^a, Heba Alfaris, M.D.^a, Karim Ataya, M.D.^a,
Samah Melebari, M.D.^a, Marc Belliveau, M.D.^b, Adam Di Palma, M.D.^a,
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Received 2 May 2024; accepted 8 August 2024



- Between April 2021 and November 2023
- 208 patients (191 F, 17 M)
- 76% had a previous sleeve
- Mean age 41.4
- Mean BMI 41.9

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	SADI	RYGB	OAGB	SASI
# cases	92	72	35	9
BMI	50	44	51	42
Revisional	100%	33%	94%	100%
Robotic	76%	7%	54%	100%
Operative time	133 min.	109 min.	89 min.	113 min.
HH repair	26%	25%	20%	22%
Overnight stay	5.4%	1.4%	5.4%	0
Readmission	5.4%	6.9%	2.9%	11%
Leak	1			
Bowel obstruction		2		
Hematoma	1			



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Highlights

- Codified strategy for same-day discharge (SDD) anastomotic metabolic and bariatric surgeries (MBS) contributes to favorable early outcomes.
- To obtain SDD management, patient selection criteria must be strictly adhered to.
- SDD seems feasible for anastomotic MBS if performed at a high-volume center.
- SDD management expands access to surgical care in the era of enhanced recovery after bariatric surgery.



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Do we have new concept
to improve intra-operative
care?

Low-pressure versus standard-pressure pneumoperitoneum for laparoscopic cholecystectomy: a systematic review and meta-analysis

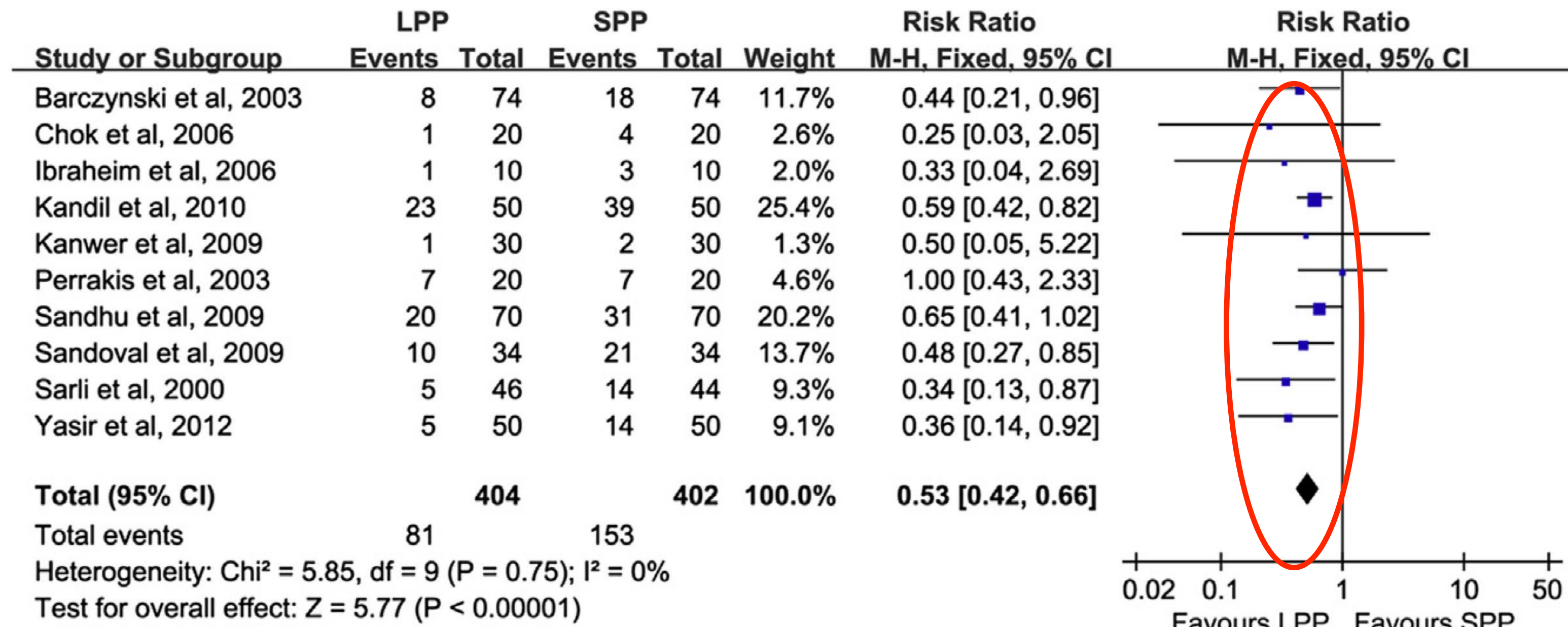


Jie Hua, M.D.^{a,b,1}, Jian Gong, M.D.^{a,1}, Le Yao, M.D.^a, Bo Zhou, M.D.^a,
Zhenshun Song, M.D., Ph.D.^{a,*}

The American Journal of Surgery (2014)

- 1263 patients
- Surgical outcome measure
 - traditional intra-abdominal pressure (12-15 mmHg)
 - low pressure (<10 mmHg)

Post-op shoulder pain



- **20% if low pressure**
- **38% if standard pressure**



Preoperative Transversus Abdominis Plane (TAP) Block with Liposomal Bupivacaine for Bariatric Patients to Reduce the Use of Opioid Analgesics

Rena C. Moon¹ · Linda Lastrapes¹ · Jameson Wier¹ · Mark Nakajima² · Wyatt Gaskins¹ · Andre F. Teixeira¹ · Muhammad A. Jawad¹ 

	TAP block	No block	p
Intravenous hydromorphone	69%	96%	p <0.0001
Oral opioid	47%	75%	p <0.0001

Conclusion

- Ambulatory bariatric surgery is safe and secure in selected patient, even for surgery with anastomosis
- Young women require more anti-nausea drug
- Low abdominal pressure decrease post op abdominal pain
- Preoperative TAP decrease the amount of post op opioids



Thank you
(Merci!)