CHIRURGIA ROBOTICA: vantaggi e svantaggi

- **DR.SSA FRANCESCA BALSAMO**
- IRCCS POLICLINICO DI S. ORSOLA, BOLOGNA
- SSD CENTRO DI CHIRURGIA METABOLICA E DELL'0BESITÀ

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- Precision
- Improve dexterity
- 3-dimensional high-definition visualization
- tremor filtration,
- direct camera control by the surgeon
- wristed instruments
- ergonomic advantages for patient and surgeon
- Recent multiquadrant access
- robotic stapling

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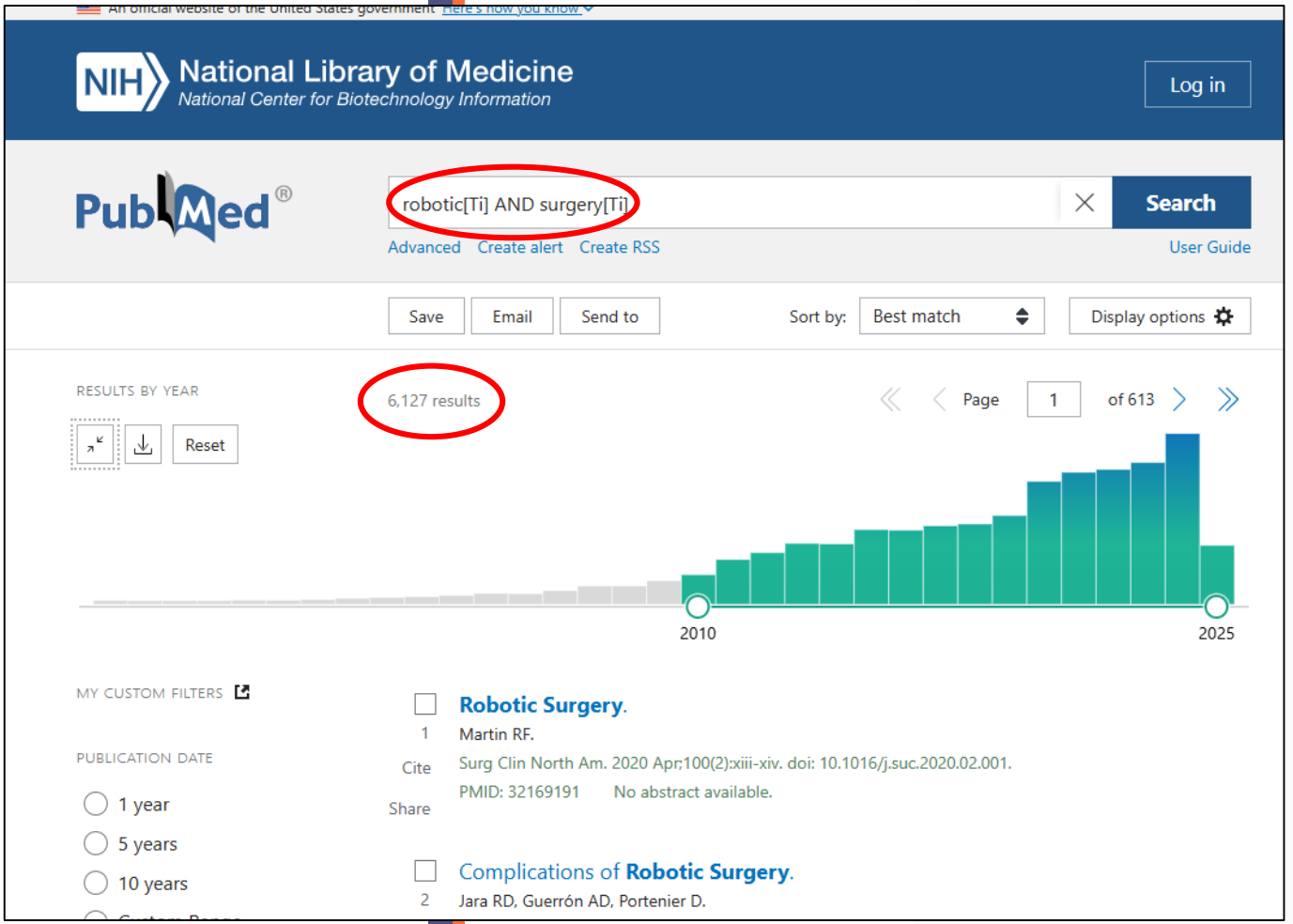
- Longer operating time
- Costs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1 Robotic Surgery.
Martin RF.
Cite
Surg Clin North Am. 2020 Apr;100(2):xiii-xiv. doi: 10.1016/j.suc.2020.02.001.
PMID: 32169191 No abstract available.
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2 Complications of Robotic Surgery.
Jara RD, Guerrón AD, Portenier D.

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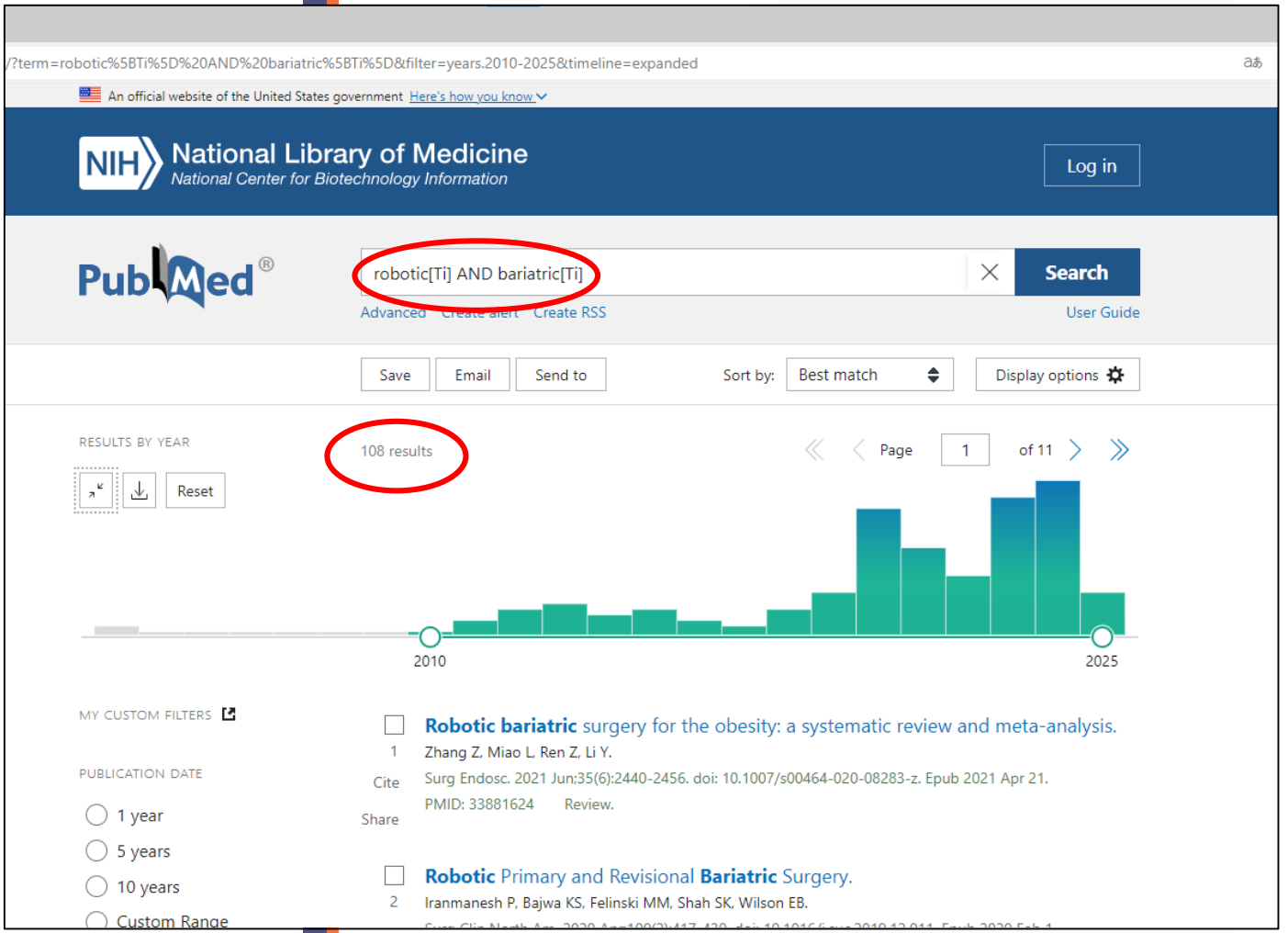

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Journal of Robotic Surgery (2024) 18:384
https://doi.org/10.1007/s11701-024-02135-x

RESEARCH

Scientific production on robotic metabolic and bariatric surgery: a comprehensive bibliometric analysis on its current world status

Yeisson Rivero-Moreno[1,20] · Maria Paula Corzo[2] · Aman Goyal[3] · Juan Camilo Roa-Maldonado[4] · Sophia Echevarria[5] · Steven Elzein[6] · Enrique Elli[7] · Rana Pullatt[8] · Sjaak Pouwels[9,10] · Beniamino Pascotto[11] · Juan Santiago Azagra[11] · Marco Raffaelli[12,13] · Luigi Angrisani[14] · Wah Yang[15] · Adel Abou-Mrad[16] · Rodolfo J. Oviedo[17,18,19]

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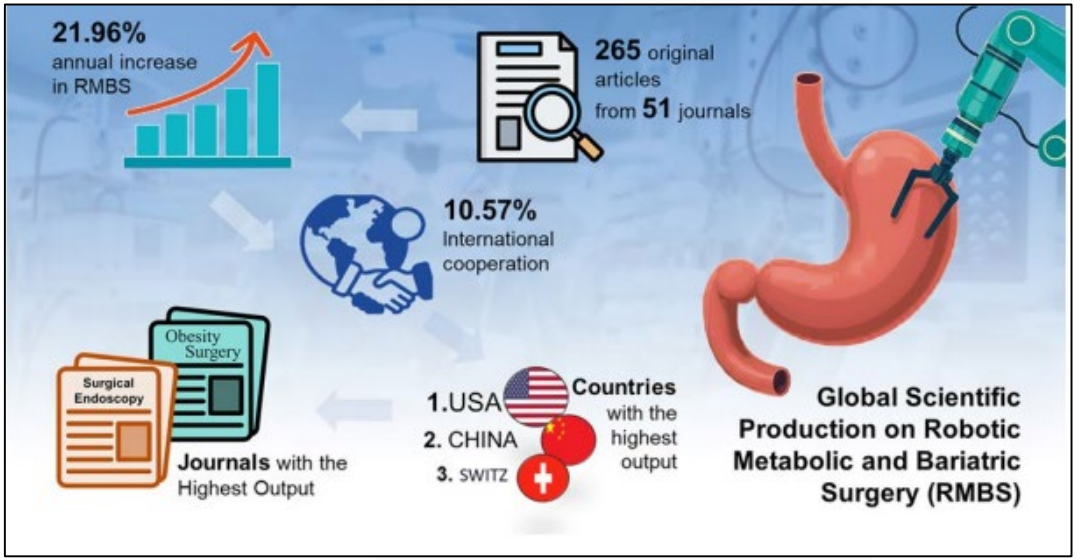
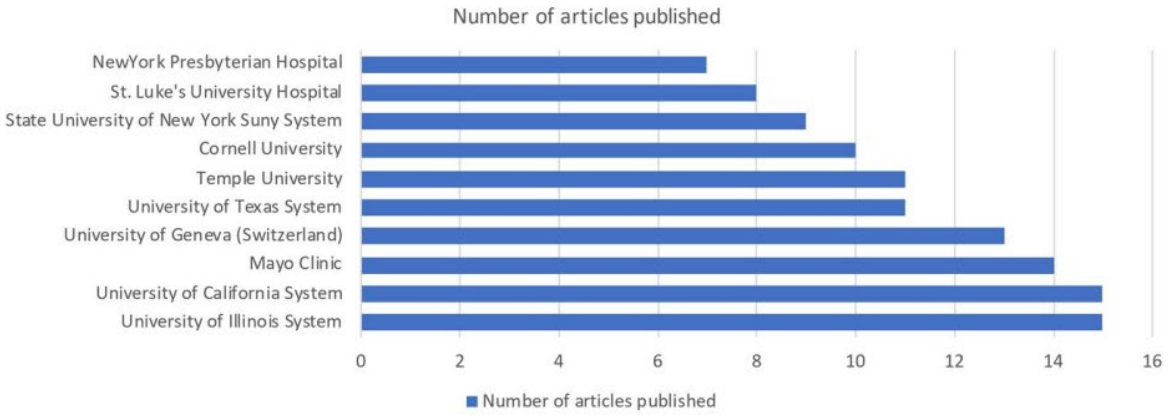


Fig. 2 Most globally common affiliations of articles related to RMBS, 2003–2023.



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Obesity Surgery (2022) 32:2341–2348
https://doi.org/10.1007/s11695-022-06082-0

IFSO

ORIGINAL CONTRIBUTIONS

Robotic vs. Laparoscopic Metabolic and Bariatric Surgery, Outcomes over 5 Years in Nearly 800,000 Patients

R. Wesley Vosburg[1,2] · Omar Haque[1,3] · Eve Roth[1,3]

Received: 27 February 2022 / Revised: 14 April 2022 / Accepted: 20 April 2022 / Published online: 2 May 2022

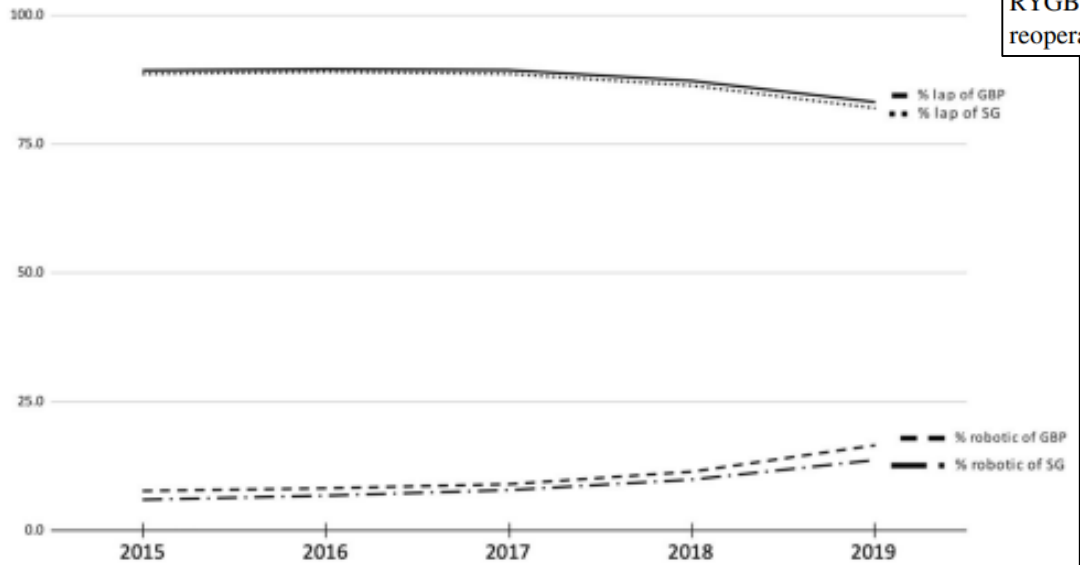
Harvard University

Conclusions

SG had an average increased operative time of about 26 min for each robotic case which representing a 37% increase over laparoscopic SG. Robotic SG does not appear to change the risk of 30-day VTE complications or organ dysfunction complications. Finally, robotic SG slightly increases the risk for 30-day readmissions and reoperations over laparoscopic SG.

Robotic RYGB cases had prolonged operative times of approximately 40 min per case representing a 33% increase over laparoscopic. Deep space SSI and organ space SSI were both lower in the robotic group. No improvements resulted from a robotic approach in terms of 30-day VTE or organ dysfunction outcomes. Transfusion rates after surgery were slightly lower in the robotic RYGB group. Finally, robotic RYGB resulted in slightly higher 30-day readmission and reoperative rates.

Fig. 1 Percentage of laparoscopic and robotic sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) between 2015 and 2019



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SURGERY FOR OBESITY AND RELATED DISEASES

Surgery for Obesity and Related Diseases 21 (2025) 372–381

ASMBS Top Papers

Robotic sleeve gastrectomy has higher complication rates compared to laparoscopic: 8-year analysis of robotic versus laparoscopic primary bariatric surgery

Graham J. Spurzem, M.D.*, Ryan C. Broderick, M.D., Emily K. Kunkel, M.D., Hannah M. Hollandsworth, M.D., Bryan J. Sandler, M.D., Garth R. Jacobsen, M.D., Santiago Horgan, M.D.

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Received 8 May 2024; accepted 23 November 2024

O.T.

Primary bariatric surgery

Table 1
Operative times for laparoscopic and robotic primary sleeve gastrectomy and Roux-en-Y gastric bypass from 2015 to 2022

Year	Operative time, mean ± SD (min)		Difference (R – L)	Operative time, mean ± SD (min)		Difference (R – L)	*P* value
	L-SG	R-SG		L-RYGB	R-RYGB		
2015	70.5 ± 34.0	97.4 ± 40.8	26.9	111.4 ± 49.2	146.7 ± 59.9	35.3	< .001
2016	68.2 ± 34.5	94.1 ± 41.2	25.9	113.4 ± 49.7	149.3 ± 59.5	35.8	< .001
2017	65.6 ± 32.4	91.7 ± 42.8	26.0	113.4 ± 49.3	156.7 ± 63.0	43.3	< .001
2018	64.7 ± 31.1	91.7 ± 38.7	27.0	115.0 ± 49.3	152.2 ± 57.9	37.2	< .001
2019	63.8 ± 31.3	85.5 ± 37.6	21.7	113.9 ± 48.6	148.9 ± 58.1	35.0	< .001
2020	63.4 ± 32.9	84.6 ± 37.4	21.2	115.5 ± 52.6	147.2 ± 56.5	31.7	< .001
2021	61.0 ± 32.2	80.9 ± 34.7	19.9	112.7 ± 52.0	140.0 ± 53.1	27.3	< .001
2022	59.2 ± 32.1	78.9 ± 33.4	19.7	111.4 ± 53.4	135.0 ± 51.3	23.6	< .001

L-SG = laparoscopic sleeve gastrectomy; R-SG = robotic sleeve gastrectomy; L-RYGB = laparoscopic Roux-en-Y gastric bypass; R-RYGB = robotic Roux-en-Y gastric bypass; SD = standard deviation.

Statistically significant *P* values in bold.

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Sleeve gastrectomy

Table 2
Thirty-day postoperative outcomes for laparoscopic and robotic primary sleeve gastrectomy from 2015 to 2022 after propensity score matching

Outcome, n (%)	L-SG (N = 91,867)	R-SG (N = 91,867)	*P* value	OR (95% CI)
Overall morbidity	1941 (2.11)	2212 (2.41)	**<.001**	**1.14 (1.07-1.21)**
Aggregate leak	246 (.27)	298 (.32)	**.03**	**1.24 (1.05-1.46)**
Reoperation for leak	92 (.10)	110 (.12)	.22	1.18 (.90-1.57)
Intervention for leak	98 (.11)	103 (.11)	.74	1.05 (.79-1.38)
Readmission for leak	140 (.15)	146 (.16)	.74	1.04 (.82-1.31)
Organ/space SSI	125 (.14)	240 (.26)	**<.001**	**1.91 (1.54-2.38)**
Aggregate bleeding	234 (.25)	315 (.34)	**<.001**	**1.34 (1.13-1.58)**
Reoperation for bleeding	151 (.16)	157 (.17)	.79	1.03 (.82-1.29)
Intervention for bleeding	29 (.03)	19 (.02)	.14	.65 (.36-1.15)
Readmission for bleeding	71 (.08)	96 (.10)	.06	1.34 (.99-1.82)
Blood transfusion	428 (.47)	550 (.60)	**<.001**	**1.28 (1.13-1.45)**
Readmission	2378 (2.59)	2370 (2.58)	.87	1.00 (.94-1.06)
Reoperation	630 (.69)	661 (.72)	.45	1.04 (.94-1.16)
Reintervention	560 (.61)	564 (.61)	.87	1.01 (.90-1.14)
Mortality	35 (.04)	52 (.06)	.08	1.47 (.95-2.26)
Superficial incisional SSI	217 (.24)	265 (.29)	**.03**	**1.22 (1.02-1.46)**
Deep incisional SSI	23 (.03)	26 (.03)	.68	1.12 (.64-1.97)
Wound disruption	39 (.04)	47 (.05)	.39	1.20 (.79-1.84)
Sepsis	60 (.07)	95 (.10)	**<.01**	**1.56 (1.13-2.15)**
Septic shock	20 (.02)	37 (.04)	**.03**	**1.84 (1.06-3.17)**
Urinary tract infection	285 (.31)	259 (.28)	.25	.91 (.77-1.07)
Ventilator >48 hr	27 (.03)	44 (.05)	.06	1.60 (.99-2.59)
Unplanned intubation	56 (.06)	84 (.09)	**.02**	**1.49 (1.06-2.09)**
Pneumonia	105 (.11)	107 (.12)	.89	1.02 (.78-1.33)
Venous thrombosis requiring therapy	180 (.20)	217 (.24)	.07	1.20 (.99-1.46)
Pulmonary embolism	88 (.10)	97 (.11)	.55	1.09 (.82-1.46)
Stroke	11 (.01)	19 (.02)	.14	1.75 (.83-3.69)
Unplanned admission to ICU	389 (.42)	386 (.42)	.83	.98 (.85-1.13)
Acute renal failure requiring dialysis	32 (.03)	43 (.05)	.19	1.36 (.86-2.16)
Progressive renal insufficiency	53 (.06)	45 (.05)	.40	.84 (.57-1.25)
Cardiac arrest requiring CPR	20 (.02)	31 (.03)	.14	1.53 (.87-2.68)
Myocardial infarction	22 (.02)	17 (.02)	.38	.75 (.40-1.43)

L-SG = laparoscopic sleeve gastrectomy; R-SG = robotic sleeve gastrectomy; OR = odds ratio; CI = confidence interval; SSI = surgical site infection; GI = gastrointestinal; ICU = intensive care unit; CPR = cardiopulmonary resuscitation.

Statistically significant *P* values in bold.

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Surgery for Obesity and Related Diseases 21 (2025) 372–381

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RYGB

Table 3
Thirty-day postoperative outcomes for laparoscopic and robotic primary Roux-en-Y gastric bypass from 2015 to 2022 after propensity score matching

Outcome, n (%)	L-RYGB (N = 35,482)	R-RYGB (N = 35,482)	*P* value	OR (95% CI)
Overall morbidity	1590 (4.48)	1217 (3.43)	**<.001**	**.75 (.70-.81)**
Aggregate leak	198 (.56)	172 (.48)	.18	.87 (.71-1.07)
Reoperation for leak	67 (.19)	77 (.22)	.41	1.15 (.83-1.60)
Intervention for leak	26 (.07)	31 (.09)	.51	1.19 (.71-2.01)
Readmission for leak	49 (.14)	58 (.16)	.38	1.19 (.81-1.74)
Organ/space SSI	132 (.37)	145 (.41)	.45	1.09 (.86-1.39)
Aggregate bleeding	328 (.92)	264 (.74)	**<.01**	**.80 (.68-.94)**
Reoperation for bleeding	111 (.31)	50 (.14)	**<.001**	**.45 (.32-.63)**
Intervention for bleeding	86 (.24)	64 (.18)	.07	.74 (.53-1.02)
Readmission for bleeding	167 (.47)	130 (.37)	**.03**	**.77 (.61-.97)**
Blood transfusion	371 (1.05)	247 (.70)	**<.001**	**.66 (.56-.78)**
Readmission	1872 (5.28)	1937 (5.46)	.31	1.03 (.97-1.10)
Reoperation	671 (1.89)	673 (1.90)	.97	1.00 (.90-1.12)
Reintervention	644 (1.82)	579 (1.63)	.06	.90 (.80-1.00)
Mortality	32 (.09)	45 (.13)	.20	1.35 (.85-2.13)
Superficial incisional SSI	287 (.81)	113 (.32)	**<.001**	**.39 (.31-.49)**
Deep incisional SSI	40 (.11)	14 (.04)	**<.001**	**.35 (.19-.64)**
Wound disruption	23 (.06)	30 (.08)	.35	1.30 (.75-2.24)
Sepsis	56 (.16)	50 (.14)	.57	.89 (.61-1.31)
Septic shock	35 (.10)	41 (.12)	.49	1.17 (.75-1.84)
Urinary tract infection	186 (.52)	165 (.47)	.26	.89 (.72-1.09)
Ventilator >48 hr	33 (.09)	44 (.12)	.23	1.32 (.84-2.09)
Unplanned intubation	48 (.14)	59 (.17)	.29	1.23 (.84-1.80)
Pneumonia	109 (.31)	114 (.32)	.75	1.04 (.80-1.36)
Venous thrombosis requiring therapy	57 (.16)	48 (.14)	.40	0858 (.58-1.24)
Pulmonary embolism	49 (.14)	58 (.16)	.39	1.18 (.81-1.73)
Stroke	2 (.01)	3 (.01)	.65	1.51 (.25-9.21)
Unplanned admission to ICU	292 (.82)	276 (.78)	.43	.94 (.79-1.10)
Acute renal failure	27 (.08)	25 (.07)	.77	.92 (.53-1.59)
Progressive renal insufficiency	30 (.08)	34 (.10)	.67	1.11 (.68-1.82)
Cardiac arrest requiring CPR	11 (.03)	19 (.05)	.15	1.74 (.83-3.66)
Myocardial infarction	10 (.03)	10 (.03)	.99	1.00 (.41-2.45)

L-RYGB = laparoscopic Roux-en-Y gastric bypass; R-RYGB = robotic Roux-en-Y gastric bypass; OR = odds ratio; CI = confidence interval; SSI = surgical site infection; GI = gastrointestinal; ICU = intensive care unit; CPR = cardiopulmonary resuscitation.
Statistically significant *P* values in bold.

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Surgery for Obesity and Related Diseases 21 (2025) 372–381

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2015-2019

Table 4
Thirty-day postoperative outcomes for laparoscopic and robotic primary bariatric surgery cases from 2015 to 2019 after propensity score matching

Outcome, n (%)	Laparoscopic (N = 45,522)	Robotic (N = 45,522)	*P* value	OR (95% CI)
Overall morbidity	1307 (2.87)	1243 (2.73)	.18	.95 (.87-1.03)
Aggregate leak	170 (.37)	282 (.62)	**<.001**	**1.67 (1.38-2.02)**
Reoperation for leak	38 (.08)	96 (.21)	**<.001**	**2.53 (1.74-3.69)**
Intervention for leak	38 (.08)	75 (.16)	**<.001**	**1.97 (1.33-2.91)**
Readmission for leak	59 (.13)	105 (.23)	**<.001**	**1.77 (1.29-2.44)**
Organ/space SSI	73 (.16)	144 (.32)	**<.001**	**1.98 (1.49-2.62)**
Drain present at 30 d	71 (.16)	82 (.18)	.31	1.18 (.86-1.62)
Aggregate bleeding	233 (.51)	190 (.42)	**.02**	**.80 (.66-.97)**
Reoperation for bleeding	126 (.28)	87 (.19)	**<.01**	**.68 (.52-.90)**
Intervention for bleeding	55 (.12)	47 (.10)	.36	.83 (.56-1.23)
Readmission for bleeding	95 (.21)	94 (.21)	.78	.96 (.72-1.28)
Blood transfusion	289 (.63)	251 (.55)	.09	.86 (.72-1.02)
Readmission	1610 (3.5)	1854 (4.1)	**<.001**	**1.16 (1.08-1.24)**
Reoperation	510 (1.12)	561 (1.23)	.12	1.10 (.98-1.24)
Reintervention	539 (1.18)	599 (1.32)	.07	1.11 (.99-1.25)
Mortality	31 (.07)	30 (.07)	.90	.97 (.58-1.61)
Superficial incisional SSI	183 (.40)	104 (.23)	**<.001**	**.56 (.44-.72)**
Deep incisional SSI	24 (.05)	9 (.02)	**.01**	**.37 (.17-.80)**
Wound disruption	17 (.04)	40 (.09)	**<.01**	**2.34 (1.33-4.13)**
Sepsis	32 (.07)	53 (.12)	**.03**	**1.65 (1.06-2.56)**
Septic shock	22 (.05)	28 (.06)	.37	1.29 (.74-2.27)
Urinary tract infection	158 (.35)	122 (.27)	**.03**	**.77 (.60-.97)**
Ventilator >48 hr	19 (.04)	38 (.08)	**.01**	**2.02 (1.16-3.52)**
Unplanned intubation	47 (.10)	68 (.15)	.05	1.45 (1.00-2.10)
Pneumonia	85 (.19)	87 (.19)	.88	1.02 (.76-1.38)
Venous thrombosis requiring therapy	85 (.19)	78 (.17)	.57	.91 (.67-1.24)
Pulmonary embolism	51 (.11)	44 (.10)	.43	.85 (.57-1.27)
Stroke	4 (.01)	8 (.02)	.27	1.98 (.59-6.63)
Unplanned admission to ICU	283 (.62)	285 (.63)	.99	1.00 (.85-1.18)
Acute renal failure	33 (.07)	30 (.07)	.70	.91 (.55-1.49)
Progressive renal insufficiency	29 (.06)	23 (.05)	.39	.79 (.45-1.36)
Cardiac arrest requiring CPR	12 (.03)	18 (.04)	.28	1.50 (.72-3.12)
Myocardial infarction	10 (.02)	7 (.02)	.45	.69 (.26-1.82)

OR = odds ratio; CI = confidence interval; SSI = surgical site infection; GI = gastrointestinal; ICU = intensive care unit; CPR = cardiopulmonary resuscitation.

Statistically significant *P* values in bold.

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2020-2022
Una questione di
“learning curvature”?

Table 5
Thirty-day postoperative outcomes for laparoscopic and robotic primary bariatric surgery cases from 2020 to 2022 after propensity score matching

Outcome, n (%)	Laparoscopic (N = 81,827)	Robotic (N = 81,827)	*P* value	OR (95% CI)
Overall morbidity	2102 (2.57)	2186 (2.67)	.26	1.03 (.97-1.10)
Aggregate leak	159 (.19)	195 (.24)	.06	1.22 (.99-1.51)
Reoperation for leak	73 (.09)	91 (.11)	.17	1.24 (.91-1.68)
Intervention for leak	48 (.06)	59 (.07)	.30	1.22 (.83-1.79)
Readmission for leak	95 (.12)	99 (.12)	.78	1.04 (.79-1.38)
Organ/space SSI	196 (.24)	241 (.29)	**.04**	**1.23 (1.01-1.48)**
Anastomotic/staple line leak	115 (.14)	144 (.18)	.08	1.25 (.98-1.59)
Aggregate bleeding	406 (.50)	389 (.48)	.45	.95 (.82-1.09)
Reoperation for bleeding	135 (.16)	120 (.15)	.32	.88 (.69-1.13)
Intervention for bleeding	47 (.06)	36 (.04)	.21	.76 (.49-1.17)
Readmission for bleeding	122 (.15)	132 (.16)	.61	1.07 (.83-1.37)
GI tract bleeding	318 (.39)	305 (.37)	.50	.95 (.81-1.11)
Blood transfusion	503 (.61)	546 (.67)	.23	1.08 (.95-1.22)
Readmission	2235 (2.7)	2453 (3.0)	**<.01**	**1.10 (1.03-1.16)**
Reoperation	694 (.85)	773 (.94)	.05	1.10 (1.00-1.23)
Reintervention	540 (.66)	544 (.66)	.96	1.00 (.89-1.13)
Mortality	51 (.06)	64 (.08)	.29	1.22 (.84-1.77)
Superficial incisional SSI	304 (.37)	274 (.33)	.20	.90 (.76-1.06)
Deep incisional SSI	35 (.04)	31 (.04)	.57	.87 (.54-1.41)
Wound disruption	40 (.05)	37 (.05)	.73	.92 (.59-1.45)
Sepsis	70 (.09)	92 (.11)	.10	1.30 (.95-1.77)
Septic shock	31 (.04)	50 (.06)	**.045**	**1.58 (1.01-2.48)**
Urinary tract infection	324 (.40)	302 (.37)	.39	.93 (.80-1.09)
Ventilator >48 hr	38 (.05)	50 (.06)	.26	1.28 (.84-1.95)
Unplanned intubation	54 (.07)	75 (.09)	.08	1.37 (.97-1.95)
Pneumonia	128 (.16)	134 (.16)	.79	1.03 (.81-1.32)
Venous thrombosis requiring therapy	169 (.21)	187 (.23)	.36	1.10 (.90-1.36)
Pulmonary embolism	103 (.13)	111 (.14)	.60	1.07 (.82-1.40)
Stroke	11 (.01)	14 (.02)	.62	1.22 (.55-2.70)
Unplanned admission to ICU	340 (.42)	377 (.46)	.25	1.09 (.94-1.26)
Acute renal failure	33 (.04)	38 (.05)	.66	1.11 (.69-1.78)
Progressive renal insufficiency	49 (.06)	56 (.07)	.60	1.11 (.75-1.63)
Cardiac arrest requiring CPR	34 (.04)	32 (.04)	.76	.93 (.57-1.51)
Myocardial infarction	25 (.03)	20 (.02)	.45	.80 (.44-1.44)

OR = odds ratio; CI = confidence interval; SSI = surgical site infection; GI = gastrointestinal; ICU = intensive care unit; CPR = cardiopulmonary resuscitation.

Statistically significant *P* values in bold.

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Robotic bariatric surgery reduces morbidity for revisional gastric bypass when compared to laparoscopic: outcome of 8-year MBSAQIP analysis of over 40,000 cases

Graham J. Spurzem[1] · Ryan C. Broderick[1] · Emily K. Kunkel[1] · Hannah M. Hollandsworth[1] · Bryan J. Sandler[1] · Garth R. Jacobsen[1] · Santiago Horgan[1]

R-sleeve gastrectomy

Table 3 30-Day outcomes for laparoscopic and robotic revisional sleeve gastrectomy

Outcome, *n* (%)	L-SG (*N* = 12,680)	R-SG (*N* = 1,794)	*p* value	AOR (95% CI)
Overall morbidity	408 (3.2)	69 (3.8)	0.19	1.23 (0.95–1.60)
Aggregate leak	131 (1.0)	15 (0.8)	0.51	0.91 (0.53–1.57)
Reoperation for leak	45 (0.35)	4 (0.22)	0.49	0.67 (0.24–1.87)
Intervention for leak	40 (0.32)	3 (0.17)	0.40	0.57 (0.18–1.84)
Readmission for leak	61 (0.48)	6 (0.33)	0.50	0.72 (0.31–1.67)
Organ/space SSI	88 (0.69)	16 (0.89)	0.44	1.35 (0.79–2.32)
Drain present at 30 days*	34 (0.41)	5 (0.72)	0.23	–
Anastomotic/staple line leak**	26 (0.59)	4 (0.36)	0.49	–
Aggregate bleeding	45 (0.35)	2 (0.11)	0.12	0.30 (0.07–1.24)
Reoperation for bleeding	29 (0.23)	1 (0.06)	0.17	0.24 (0.03–1.78)
Intervention for bleeding	5 (0.04)	0	0.87	–
Readmission for bleeding	8 (0.06)	0	0.61	–
GI tract bleeding**	18 (0.41)	1 (0.09)	0.15	–
Blood transfusion	62 (0.49)	9 (0.50)	0.99	1.05 (0.52–2.12)
Readmission	451 (3.6)	57 (3.2)	0.45	0.89 (0.67–1.17)
Reoperation	189 (1.5)	25 (1.4)	0.83	0.95 (0.62–1.44)
Reintervention	154 (1.2)	22 (1.2)	0.99	1.05 (0.67–1.65)
Mortality	10 (0.08)	0	0.62	–
Superficial incisional SSI	51 (0.4)	11 (0.6)	0.28	1.54 (0.80–2.98)
Deep incisional SSI	9 (0.07)	3 (0.17)	0.18	2.33 (0.63–8.66)
Wound disruption	5 (0.04)	0	0.87	–
Sepsis	27 (0.21)	7 (0.39)	0.18	1.77 (0.77–4.07)
Septic shock	9 (0.07)	2 (0.11)	0.64	1.50 (0.32–7.01)
Urinary tract infection	36 (0.3)	9 (0.5)	0.19	1.86 (0.89–3.88)
Ventilator > 48 h	8 (0.06)	3 (0.17)	0.15	2.52 (0.66–9.61)
Unplanned intubation	10 (0.08)	4 (0.22)	0.09	2.58 (0.80–8.28)
Pneumonia	26 (0.21)	7 (0.39)	0.18	1.80 (0.78–4.18)
Venous thrombosis requiring therapy	30 (0.24)	9 (0.50)	0.05	2.20 (1.04–4.67)
Pulmonary embolism	10 (0.08)	5 (0.28)	**0.03**	**3.72 (1.25–10.99)**
Stroke	1 (0.01)	1 (0.06)	0.23	7.55 (0.43–134.26)
Unplanned admission to ICU	78 (0.6)	10 (0.6)	0.89	0.89 (0.46–1.73)
Acute renal failure requiring dialysis	8 (0.06)	0	0.61	–
Progressive renal insufficiency	11 (0.09)	1 (0.06)	0.99	0.57 (0.07–4.47)
Cardiac arrest requiring CPR	7 (0.06)	0	0.99	–
Myocardial infarction	2 (0.02)	0	0.99	–
Length of stay, mean ± SD (days)	1.49 (1.41)	1.49 (1.98)	0.96	–

*variable only present in 2015–2019 datasets; **variable only present in 2020–2022 datasets

L-SG Laparoscopic sleeve gastrectomy, *R-SG* robotic sleeve gastrectomy, *AOR* adjusted odds ratio, *CI* confidence interval, *SSI* surgical site infection, *GI* gastrointestinal, *ICU* intensive care unit, *CPR* cardiopulmonary resuscitation

Bold values indicate statistical significance

S.I.C.OB. EVENTI

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Robotic bariatric surgery reduces morbidity for revisional gastric bypass when compared to laparoscopic: outcome of 8-year MBSAQIP analysis of over 40,000 cases

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R-RYGB

Table 4 30-Day outcomes for laparoscopic and robotic revisional Roux-en-Y gastric bypass

Outcome, n (%)	L-RYGB (N = 21,755)	R-RYGB (N = 5175)	*p* value	AOR (95% CI)
Overall morbidity	1341 (6.2)	246 (4.8)	**< 0.001**	**0.80 (0.70–0.93)**
Aggregate leak	262 (1.2)	54 (1.0)	0.37	1.00 (0.74–1.35)
Reoperation for leak	101 (0.46)	25 (0.48)	0.95	1.12 (0.72–1.75)
Intervention for leak	52 (0.24)	12 (0.23)	0.99	1.11 (0.59–2.10)
Readmission for leak	71 (0.33)	21 (0.41)	0.45	1.38 (0.84–2.26)
Organ/space SSI	193 (0.89)	49 (0.95)	0.74	1.11 (0.81–1.53)
Drain present at 30 days*				–
Anastomotic/staple line leak**				–
Aggregate bleeding	207 (0.95)	51 (0.99)	0.88	1.09 (0.80–1.49)
Reoperation for bleeding	76 (0.35)	10 (0.19)	0.10	0.61 (0.31–1.19)
Intervention for bleeding	48 (0.22)	7 (0.14)	0.29	0.64 (0.29–1.42)
Readmission for bleeding	73 (0.34)	23 (0.44)	0.29	1.37 (0.85–2.20)
GI tract bleeding**				
Blood transfusion	329 (1.5)	54 (1.0)	**< 0.05**	**0.74 (0.55–0.99)**
Readmission	1495 (6.9)	386 (7.5)	0.14	1.10 (0.98–1.24)
Reoperation	685 (3.1)	166 (3.2)	0.86	1.07 (0.90–1.27)
Reintervention	532 (2.4)	112 (2.2)	0.25	0.91 (0.74–1.12)
Mortality	23 (0.11)	9 (0.17)	0.29	1.87 (0.85–4.13)
Superficial incisional SSI	270 (1.2)	19 (0.4)	**< 0.001**	**0.30 (0.19–0.47)**
Deep incisional SSI	58 (0.27)	7 (0.14)	0.12	0.54 (0.25–1.20)
Wound disruption	19 (0.09)	3 (0.06)	0.79	0.68 (0.19–2.32)
Sepsis	70 (0.32)	16 (0.31)	0.99	1.01 (0.58–1.75)
Septic shock	35 (0.16)	15 (0.29)	0.08	1.93 (0.98–3.58)
Urinary tract infection	115 (0.53)	19 (0.37)	0.17	0.66 (0.41–1.08)
Ventilator > 48 h	32 (0.15)	15 (0.29)	**< 0.05**	**1.98 (1.06–3.70)**
Unplanned intubation	41 (0.19)	18 (0.35)	**< 0.05**	**2.08 (1.18–3.67)**
Pneumonia	102 (0.47)	27 (0.52)	0.70	1.12 (0.73–1.72)
Venous thrombosis requiring therapy	38 (0.17)	13 (0.25)	0.33	1.49 (0.79–2.82)
Pulmonary embolism	45 (0.21)	10 (0.19)	0.98	1.05 (0.53–2.11)
Stroke	1 (0.005)	1 (0.02)	0.35	5.96 (0.33–108.97)
Unplanned admission to ICU	248 (1.1)	54 (1.0)	0.60	0.97 (0.72–1.30)
Acute renal failure	13 (0.06)	3 (0.06)	0.99	1.16 (0.32–4.12)
Progressive renal insufficiency	12 (0.06)	4 (0.08)	0.53	1.54 (0.48–4.87)
Cardiac arrest requiring CPR	15 (0.07)	5 (0.10)	0.57	1.56 (0.56–4.37)
Myocardial infarction	5 (0.02)	2 (0.04)	0.63	1.35 (0.26–7.03)
Length of stay, mean ± SD (days)	1.87 (2.09)	1.76 (2.17)	**< 0.001**	–

*variable only present in 2015–2019 datasets; **variable only present in 2020–2022 datasets

L-RYGB Laparoscopic Roux-en-Y gastric bypass, *R-RYGB* robotic Roux-en-Y gastric bypass, *AOR* adjusted odds ratio, *CI* confidence interval, *SSI* surgical site infection, *GI* gastrointestinal, *ICU* intensive care unit, *CPR* cardiopulmonary resuscitation

Bold values indicate statistical significance

S.I.C.OB. EVENTI

Journal of Robotic Surgery (2023) 17:2041–2045
https://doi.org/10.1007/s11701-023-01611-0

RESEARCH

Check for updates

Changes in utilization of robotic bariatric surgery and effect on patient outcomes from 2015–2020

Eva Koeller[1] · Andrew R. Luhrs[1] · Marcoandrea Giorgi[1]

Received: 6 December 2022 / Accepted: 23 April 2023 / Published online: 5 May 2023

- Over our study's time period the utilization of robotic bariatric surgery has more than tripled. In this same time period the rate of complications and hospital length of stay have both significantly decreased.From 2015 to 2020, the average operative time also significantly decreased.

- Despite the benefits of robotic surgery, our results showed that laparoscopic bariatric surgery still has a significantly lower risk of complications. That being said, patients undergoing robotic surgery had a higher average BMI and were more likely to have had previous bariatric surgery. This also suggests that there may be specific high-risk populations in which surgeons are choosing a robotic approach

- . Additionally, in cases where there are no differences in outcomes then the benefits to the surgeon may make the robotic approach superior to conventional laparoscopy.

S.I.C.OB. EVENTI

Journal of Robotic Surgery (2024) 18:303
https://doi.org/10.1007/s11701-024-02063-w

RESEARCH

Comparison between DaVinci® and Hugo™-RAS Roux-en-Y Gastric Bypass in bariatric surgery

Francesco Pennestrì[1,2] · Giuseppe Marincola[1] · Priscilla Francesca Procopio[1,2] · Pierpaolo Gallucci[1] · Giulia Salvi[1] · Luigi Ciccoritti[1] · Francesco Greco[1] · Marco Raffaelli[1,2]

Table 2 Clinicopathologic characteristics, intraoperative and postoperative outcomes of Hugo™-RAS RYGB ($n=45$) vs DaVinci®-SS RYGB ($n=45$) after propensity matching score analysis

Variable	Hugo™-RAS $N=45$	DaVinci®-SS $N=45$	p-value
Age, years (mean ± SD)	48.1 ± 10.8	46.3 ± 10.1	0.416
Gender, (M:F)	20:25	18:27	0.671
BMI, kg/m^2 (mean ± SD)	42.1 ± 4.2	43.5 ± 5.2	0.163
Weight, Kg (mean ± SD)	121.9 ± 21.1	126.7 ± 23.2	0.307
Comorbidity, (*n*, %)	36 (80%)	30 (66.7%)	0.155
OSAS, (*n*, %)	8 (17.8%)	6 (13.3%)	0.563
Hypertension, (*n*, %)	18 (40%)	22 (48.9%)	0.398
Type 2 Diabetes Mellitus, (*n*, %)	10 (22.2%)	13 (28.9%)	0.509
NAFLD, (*n*, %)	25 (55.6%)	24 (53.3%)	0.833
Previous abdominal surgery			
Laparoscopic, (*n*, %)	6 (3.3%)	13 (28.9%)	0.075
Open, (*n*, %)	13 (28.9%)	6 (3.3%)	
Intra-operative complications (*n*, %)	1 (2.2%)	2 (4.4%)	1
Mean docking time (mean ± SD), min	5.6 ± 1.2	5.4 ± 0.5	0.176
Mean console time (mean ± SD), min	131.6 ± 34.8	144.4 ± 46.9	0.678
Mean total operative time (mean ± SD), min	166.9 ± 39.9	179.8 ± 47.1	0.229
Post-operative ICU, (*n*, %)	1 (2.2%)	2 (4.4%)	1
Post-operative hospital stay, days (Median, IQR)	2 (1–2)	2 (2–2)	0.052
Post-operative NRS (mean ± SD)	3.6 ± 1.8	3.6 ± 1.6	1
Patients with early complications, (*n*, %)	3 (6.7%)	3 (6.7%)	1
Readmission, (*n*, %)	2 (4.4%)	1 (2.2%)	1

RYGB Roux-en-Y Gastric Bypass; *RAS* robotic-assisted surgery; *SS* surgical systems; *SD* standard deviation; *IQR* 75% interquartile Range; *BMI* body mass index; *OSAS* obstructive sleep apnea syndrome; *NRS* numeric rating scale

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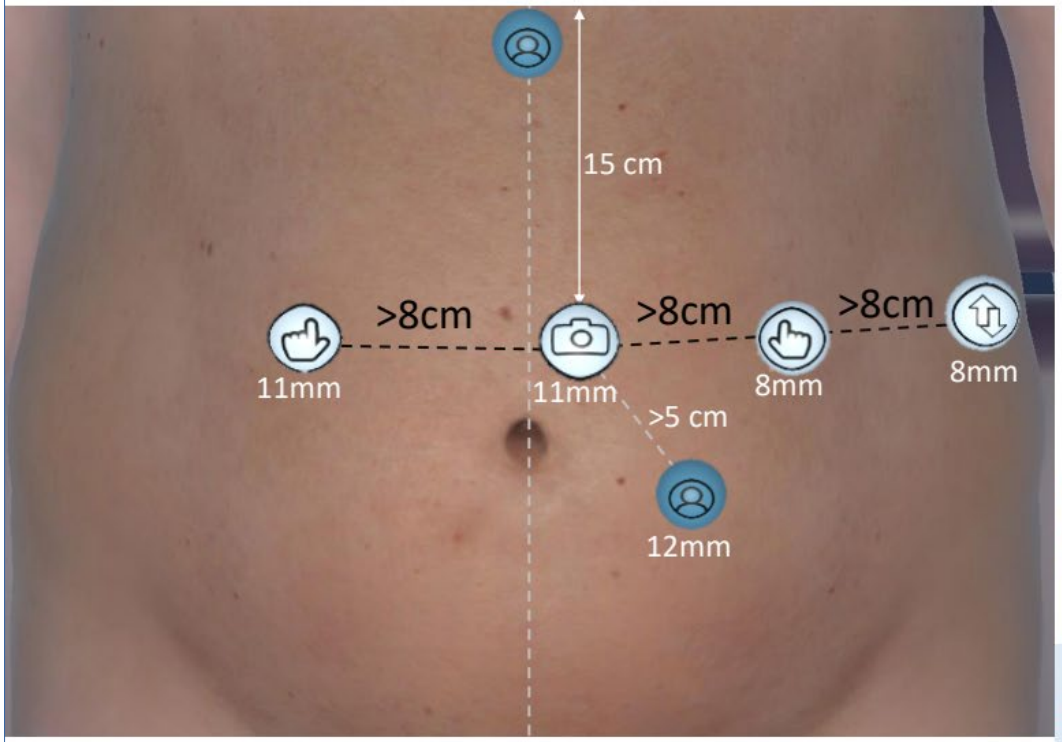
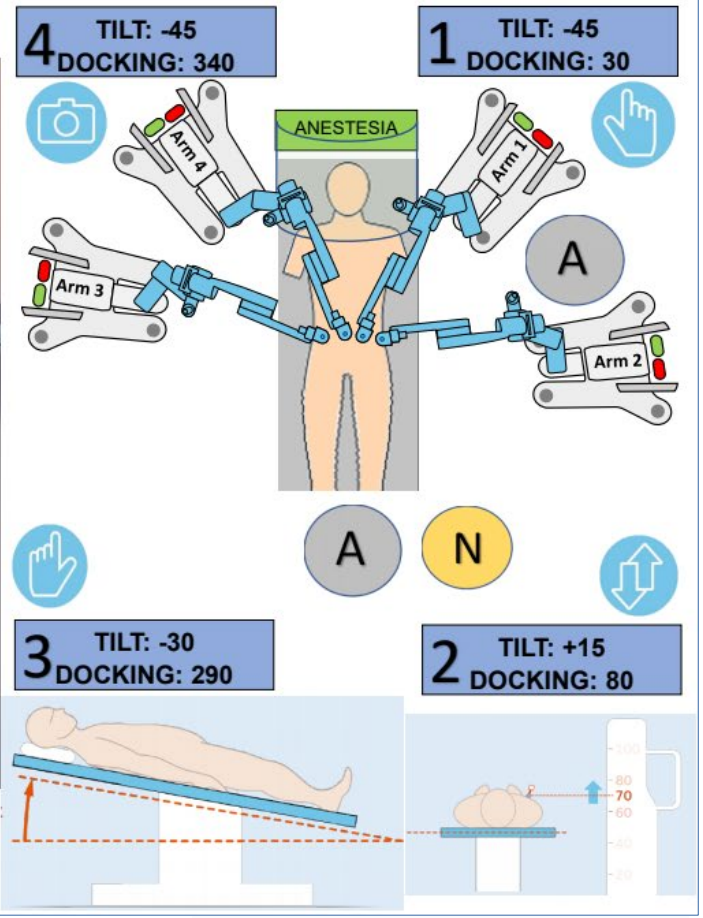
La nostra esperienza:

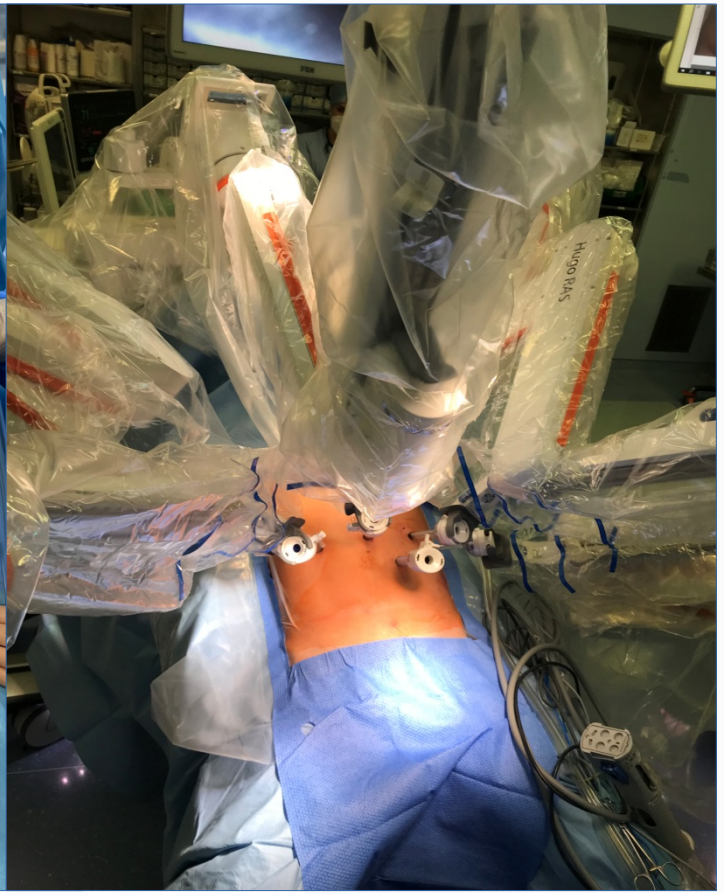
BOLOGNA BARIATRIC CENTER

Procedure bariatriche robotiche				**60**
HUGO RAS				53
	Chirurgia primaria			31
		Sleeve gastrectomy	4	
		RYGB	26	
		OAGB	1	
	Chirurgia revisionale			22
		AGB in RYGB	8	
		AGB in OAGB	1	
		Sleeve in RYGB	7	
		Sleeve in OAGB	4	
		GPV in rygb	1	
		OAGB in RYGB	1	
Da Vinci Xi				7
		Sleeve+ IAB	6	
		AGB in sleeve + IAB	1	

Bypass – Sleeve Set – Gastrectomy






HUGO RAS

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La nostra esperienza:

Preparation time (mean)		90,7 min (55-175 min)
Docking time (mean)		6,6 min (5-9 min)
Operating time (mean)		203,17 min (100-400 min)
	RYGB	191,3 min(135-290 min)
	Sleeve	197,4 min (100-400 min)
	Revisional surgery	221,1 min (125-375 min)

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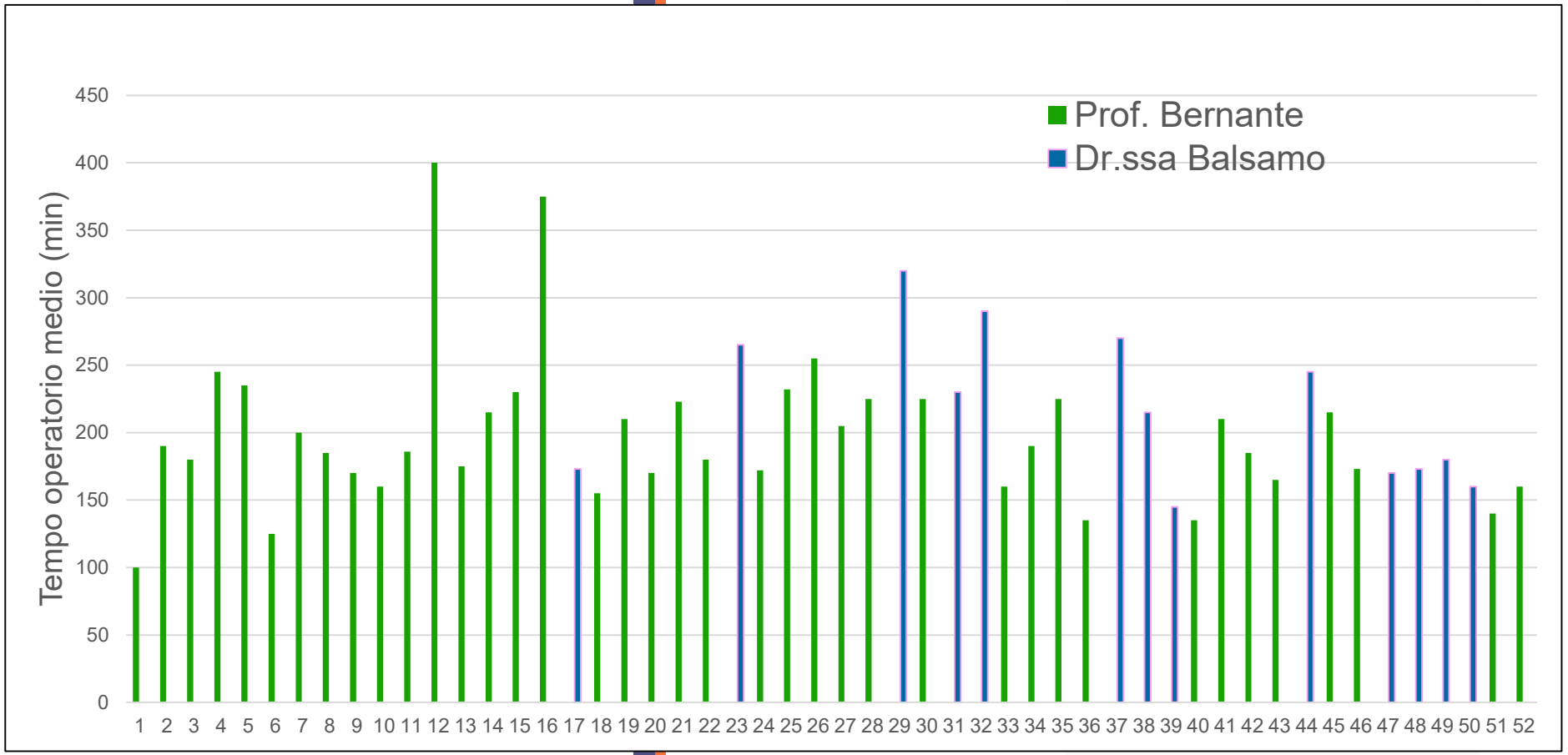
La nostra esperienza:



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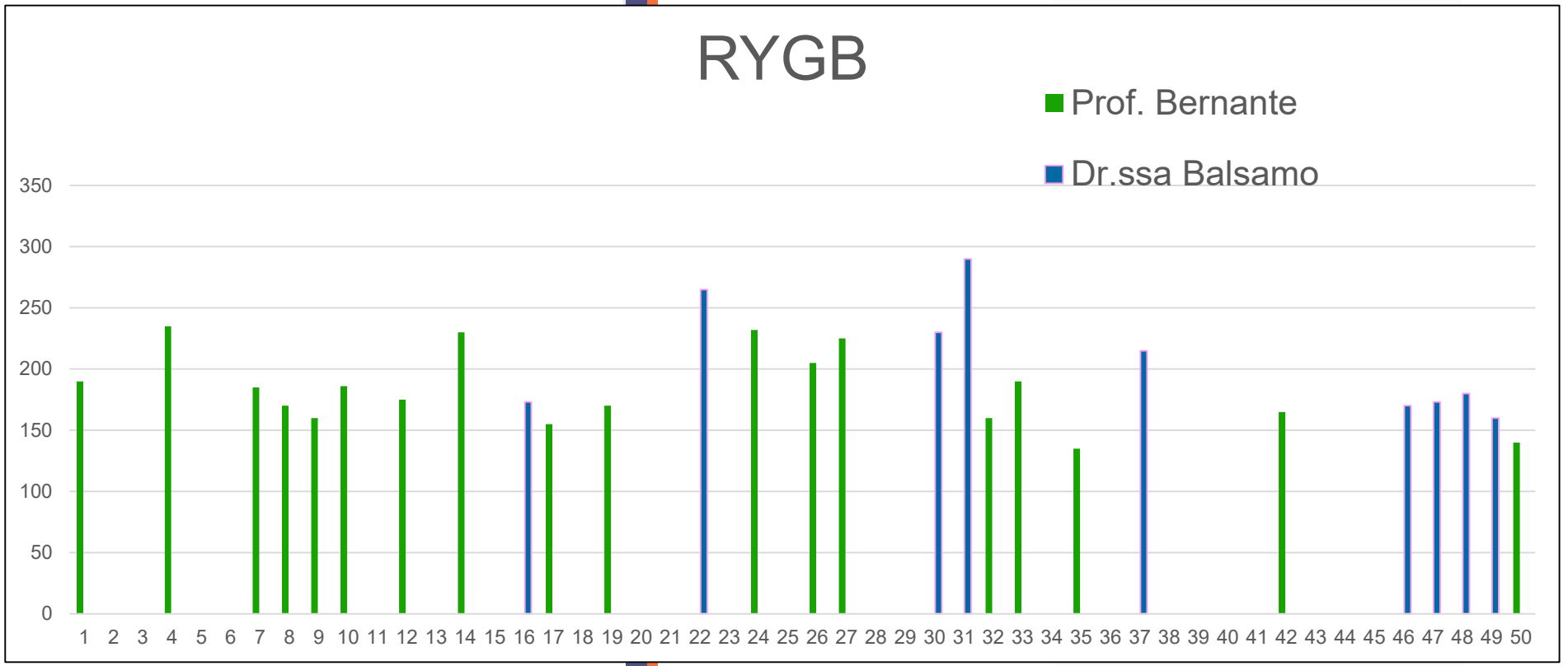
La nostra esperienza:



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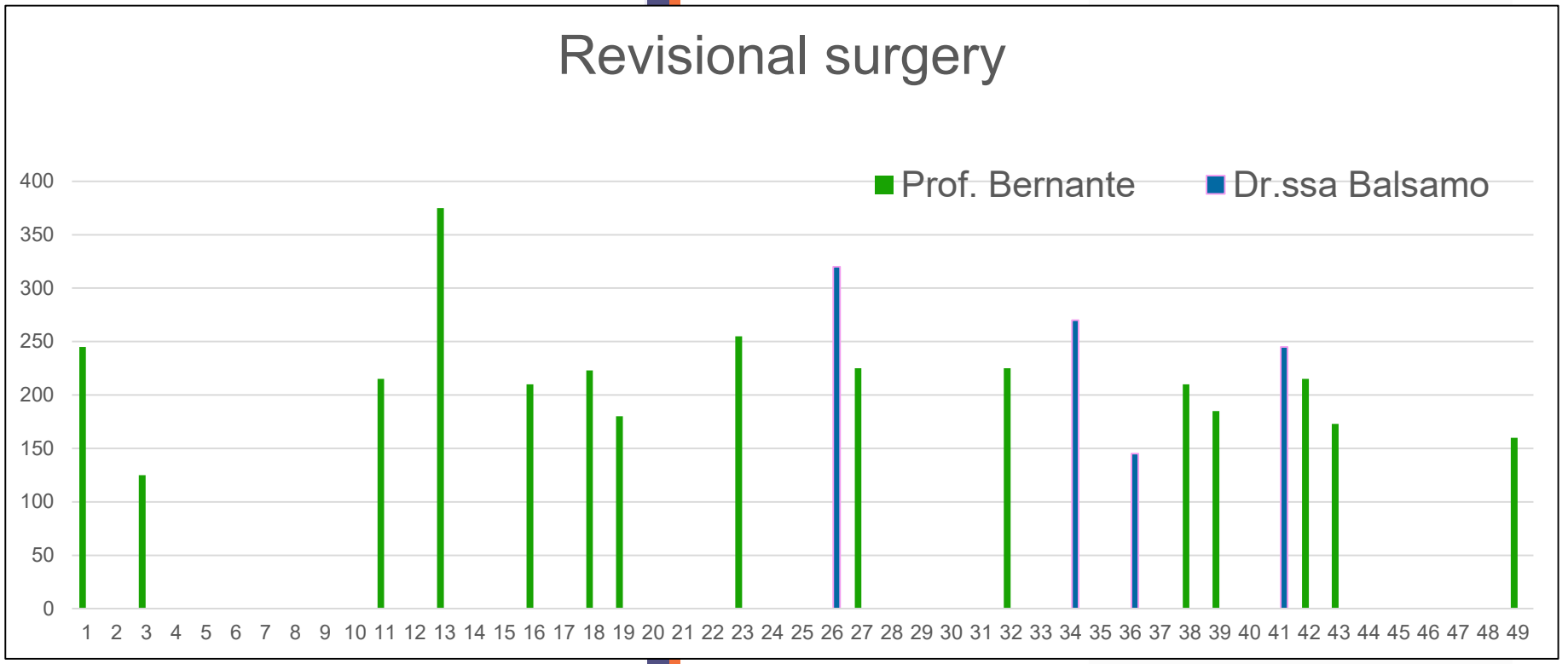
La nostra esperienza:



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La nostra esperienza:

Le complicanze:

- 2 stenosi anastomosi piè d'ansa < 10 °GPO -> reintervento
- 1 perforazione intraoperatoria di ansa digiunale nella transposizione antecolica: raffia immediata
- 1 ematoma intraepatico
- 1 polmonite
- 1 ulcera anastomosi G-D con sanguinamento a 12 mesi (pz in cardioasa)

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La nostra esperienza:

Outcome precoci • degenza post-op • Analgesia • ematoma di parete • rx tubo-digerente 1°GPO	comparabili alla laparoscopia
Outcome tardivi • laparocele su trocar • calo ponderale	comparabili alla laparoscopia

S.I.C.OB. EVENTI

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Combined robotic surgery for concomitant treatment of endometrial cancer and obesity

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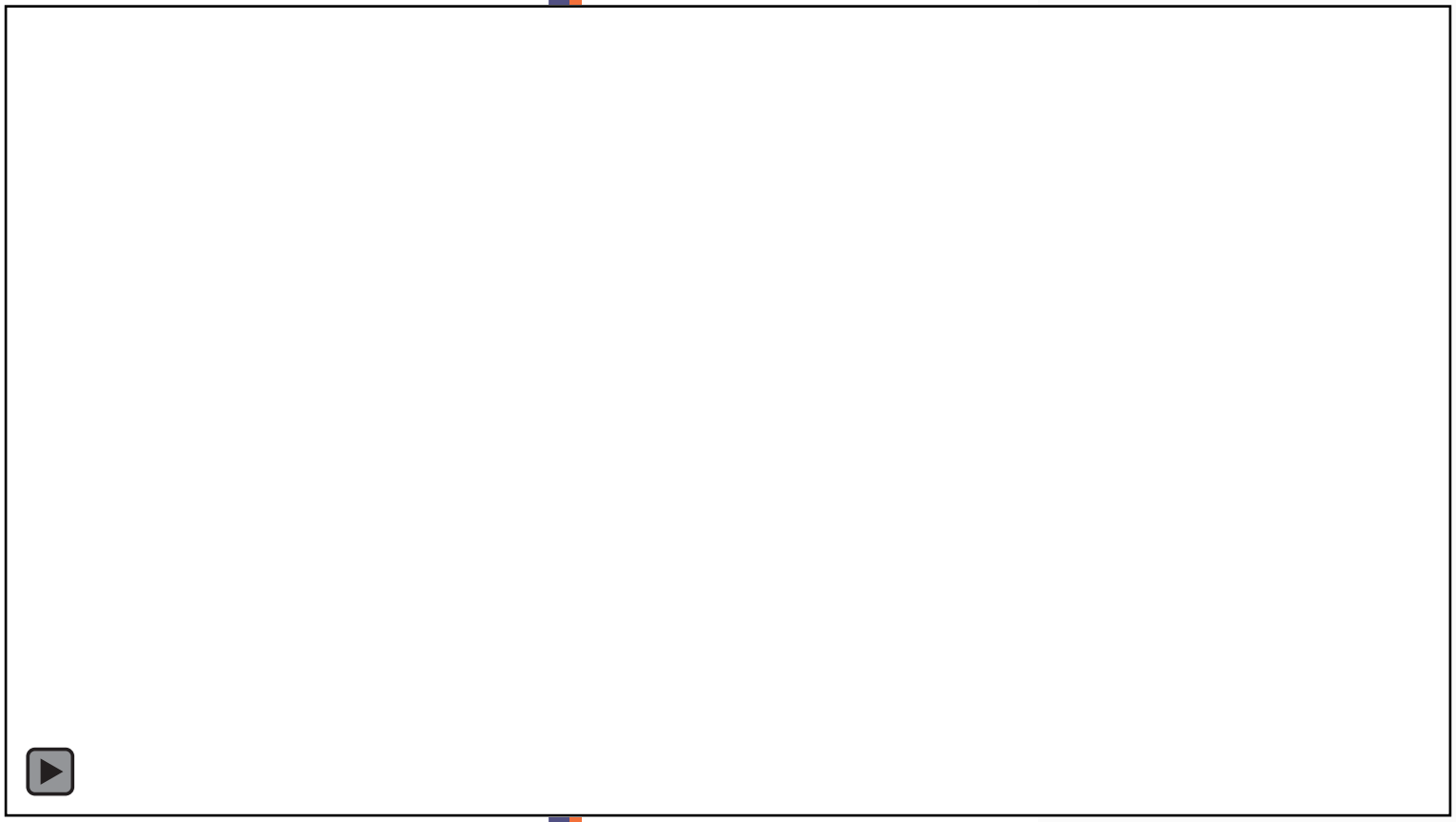

S.I.C.OB. EVENTI

In generale……

- Non ancora dimostrata netta supremazia negli outcome post-operatori rispetto alla laparoscopia.
- Dopo oltre 15 anni dall'avvento della chirurgia robotica i tempi operatori e i costi elevati non si sono ancora significativamente ridotti
- Nel paziente obeso, vantaggi ergonomici per paziente e chirurgo
- Può costituire un discreto vantaggio nella chirurgia revisionale e forse nei BMI proibitivi
- Può costituire un netto vantaggio negli interventi dove risulta indispensabile il confezionamento di anastomosi manuali (ad es. SADI's)

S.I.C.OB. EVENTI

In generale……

- Nella nostra esperienza l'utilizzo della piattaforma robotica, dopo un iniziale curva di apprendimento, costituisce una valida alternativa alla laparoscopia soprattutto per RYGB e chirurgia revisionale.

- In ottica di ottimizzazione delle risorse può essere preso in considerazione per interventi combinati multiorgano senza significative ripercussioni sugli outcome precoci o tardivi.

S.I.C.OB. EVENTI

RICCIONE, SABATO 12 APRILE 2025

CHIRURGIA DELL'OBESITA: DAL TRATTAMENTO INTEGRATO AL WELLNESS

Resp. Scientifico
Andrea Lucchi

iscriviti all'evento sicobriccione.cloud

Grazie