DE LEESTAFEL

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Een Maandelijkse Selectie van Wetenschappelijke GE-nieuws

Coloproctologie

Kosteneffectiviteit robot chirurgie voor minimaal invasieve colectomie

Cost-effectiveness Evaluation of Laparoscopic Versus Robotic Minimally Invasive Colectomy. VV Simianu et al. Annals of Surgery, August 2020, Volume 272, Issue 2, p 334-341.
Pubmed ID: 32675547.

Objective: Evaluate the cost-effectiveness of open, laparoscopic, and robotic colectomy.
Background: The use of robotic-assisted colon surgery is increasing. Robotic technology is more expensive and whether a robotically assisted approach is cost-effective remains to be determined.
Methods: A decision-analytic model was constructed to evaluate the 1-year costs and quality-adjusted time between robotic, laparoscopic, and open colectomy. Model inputs were derived from available literature for costs, quality of life (QOL), and outcomes. Results are presented as incremental cost-effectiveness ratios (ICERs), defined as incremental costs per quality-adjusted life year (QALY) gained. One-way and probabilistic sensitivity analyses were performed to test the effect of clinically reasonable variations in the inputs on our results.
Results: Open colectomy cost more and achieved lower QOL than robotic and laparoscopic approaches. From the societal perspective, robotic colectomy costs $745 more per case than laparoscopy, resulting in an ICER of $2,322,715/QALY because of minimal differences in QOL. From the healthcare sector perspective, robotics cost $1339 more per case with an ICER of $4,174,849/QALY. In both models, laparoscopic colectomy was more frequently cost-effective across a wide range of willingness-to-pay thresholds. Sensitivity analyses suggest robotic colectomy becomes cost-effective at $100,000/QALY if robotic disposable instrument costs decrease below $1341 per case, robotic operating room time falls below 172 minutes, or robotic hernia rate is less than 5%.
Conclusions: Laparoscopic and robotic colectomy are more cost-effective than open resection. Robotics can surpass laparoscopy in cost-effectiveness by achieving certain thresholds in QOL, instrument costs, and postoperative outcomes. With increased use of robotic technology in colorectal surgery, there is a burden to demonstrate these benefits.

Afschaffen routinematig histologisch onderzoek na appendectomie vanwege appendicitis?

Routine histopathologic examination of the appendix after appendectomy for presumed appendicitis: Is it really necessary? A systematic review and meta-analysis. VP Bastiaenen et al. Surgery: August 2020 – Volume 168 – Issue 2 – p 305-312.
Pubmed ID: 32471653.

Background: Owing to substantial costs and increasing interest in the nonoperative management of appendicitis, the necessity of routine histopathologic examination of appendectomy specimens is being questioned. The aim of this study was to determine whether routine histopathologic examination after appendectomy for suspected appendicitis should still be performed.
Methods: PubMed, Embase, Web of Science, and the Cochrane Library were searched for studies listing the histopathologic diagnoses after appendectomy for suspected appendicitis. Main outcomes were the incidence of histopathologically proven aberrant findings, the ability of surgeons to recognize unexpected appendiceal pathology intraoperatively, and the percentage of aberrant findings resulting in a change of postoperative management. A meta-analysis was performed using a random-effects model.
Results: Twenty-five studies with 57,357 patients were included. The pooled percentage of aberrant findings was 2.52% (95% confidence interval 1.81-3.51). Neoplasms were found in 0.71% (95% confidence interval 0.54-0.94). Findings of the intraoperative assessment by the surgeon were reported for 82 of the 2,718 (3.0%) unexpected diagnoses, with great variation between studies. The impact on postoperative management was described for 237 of 2,718 (8.7%) aberrant findings. Of these, 166 (70.0%) resulted in a change of postoperative management.
Conclusion: Based on current evidence, it remains unclear how many of the unexpected appendiceal pathologies with clinical consequences can be identified intraoperatively by the surgeon. Until reliable data on the safety and potential cost savings of a selective policy becomes available, we advise sending appendectomy specimens routinely for histopathologic examination.

UPPER GI

Voorspeller succes definitieve chemoradiatie voor localized esophageal adenocarcinoma

Total Lesion Glycolysis Assessment Identifies a Patient Fraction With a High Cure Rate Among Esophageal Adenocarcinoma Patients Treated With Definitive Chemoradiation. K Harada et al. Annals of Surgery, August 2020, Volume 272, Issue 2, p 311-318.
Pubmed ID: 32675544.

Objective: We aimed to determine whether tumor metabolism could be prognostic of cure in L-EAC patients who receive definitive chemoradiation.
Summary background data: Patients with inoperable localized esophageal adenocarcinoma (L-EAC) often receive definitive chemoradiation; however, biomarkers and/or imaging variables to prognosticate cure are missing.
Methods: Two hundred sixty-six patients with L-EAC who had chemoradiation but not surgery were analyzed from the prospectively maintained EAC databases in the Department of Gastrointestinal Medical Oncology at The University of Texas MD Anderson Cancer Center (Texas, USA) between March 2002 and April 2015. Maximum standardized uptake value (SUVmax) and total lesion glycolysis (TLG) from the positron emission tomography data were evaluated.

Results: Of 266 patients, 253 (95%) were men; the median age was 67 years (range 20-91 yrs) and 153 had poorly differentiated L-EAC. The median SUVmax was 10.3 (range 0-87) and the median TLG was 85.7 (range 0-3227). Both SUVmax and TLG were higher among those with: tumors >5 cm in length, high clinical stage, and high tumor and node categories by TNM staging (all P < 0.0001). Of 234 patients evaluable for cure, 60 (25.6%) achieved cure. In the multivariable logistic regression model, low TLG (but not low SUVmax) was associated with cure (continuous TLG value: odds ratio 0.70, 95% confidence interval (CI) 0.54-0.92). TLG was quantified into 4 quartile categorical variables; first quartile (Q1; <32), second quartile (Q2; 32.0-85.6), third quartile (Q3; 85.6-228.4), and fourth quartile (Q4; >228.4); the cure rate was only 10.3% in Q4 and 5.1% in Q3 but increased to 28.8% in Q2, and 58.6% in Q1. The cross-validation resulted in an average accuracy of prediction score of 0.81 (95% CI, 0.75-0.86).

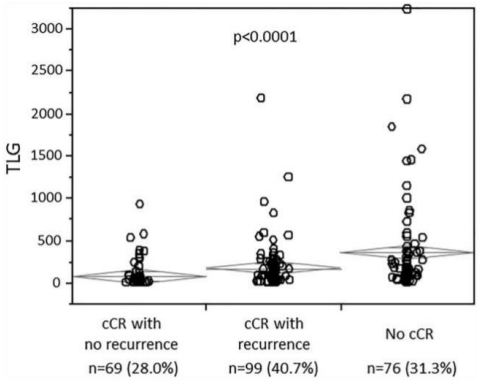

FIGURE 2. Association between clinical response to chemo-radiation and total lesion glycolysis (TLG). cCR indicates clinical complete response.

Conclusions: In this cross-validated model, 59% of patients in the 1st quartile were cured following definitive chemoradiation. Baseline TLG could be pursued as one of the tools for esophageal preservation.

HPB

PCA morfine i.p.v. epidurale pijnstilling leidt niet tot minder gastrointestinale complicaties na pancreatoduodenectomie

Gastrointestinal Complications After Pancreatoduodenectomy With Epidural vs Patient-Controlled Intravenous Analgesia; A Randomized Clinical Trial. R Klotz et al. JAMA Surg. 2020;155(7):e200794. Pubmed ID: 32459322.

Importance: Morbidity is still high in pancreatic surgery, driven mainly by gastrointestinal complications such as pancreatic fistula. Perioperative thoracic epidural analgesia (EDA) and patient-controlled intravenous analgesia (PCIA) are frequently used for pain control after pancreatic surgery. Evidence from a post hoc analysis suggests that PCIA is associated with fewer gastrointestinal complications.

Objective: To determine whether postoperative PCIA decreases the occurrence of gastrointestinal complications after pancreatic surgery compared with EDA.

Design, setting, and participants: In this adaptive, pragmatic, international, multicenter, superiority randomized clinical trial conducted from June 30, 2015, to October 1, 2017, 371 patients at 9 European pancreatic surgery centers who were scheduled for elective pancreatoduodenectomy were randomized to receive PCIA (n = 185) or EDA (n = 186); 248 patients (124 in each group) were analyzed. Data were analyzed from February 22 to April 25, 2019, using modified intention to treat and per protocol.

Interventions: Patients in the PCIA group received general anesthesia and postoperative PCIA with intravenous opioids with the help of a patient-controlled analgesia device. In the EDA group, patients received general anesthesia and intraoperative and postoperative EDA**.**

Main outcomes and measures: The primary end point was a composite of pancreatic fistula, bile leakage, delayed gastric emptying, gastrointestinal bleeding, or postoperative ileus within 30 days after surgery. Secondary end points included 30-day mortality, other complications, postoperative pain levels, intraoperative or postoperative use of vasopressor therapy, and fluid substitution.

Results: Among the 248 patients analyzed (147 men; mean [SD] age, 64.9 [10.7] years), the primary composite end point did not differ between the PCIA group (61 [49.2%]) and EDA group (57 [46.0%]) (odds ratio, 1.17; 95% CI, 0.71-1.95 P = .54). Neither individual components of the primary end point nor 30-day mortality, postoperative pain levels, or intraoperative and postoperative substitution of fluids differed significantly between groups. Patients receiving EDA gained more weight by postoperative day 4 than patients receiving PCIA (mean [SD], 4.6 [3.8] vs 3.4 [3.6] kg; P = .03) and received more vasopressors (46 [37.1%] vs 31 [25.0%]; P = .04). Failure of EDA occurred in 23 patients (18.5%).

Conclusions and relevance: This study found that the choice between PCIA and EDA for pain control after pancreatic surgery should not be based on concerns regarding gastrointestinal complications because the 2 procedures are comparable with regard to effectiveness and safety. However, EDA was associated with several shortcomings.

Trial registration: German Clinical Trials Register: DRKS00007784.

Table 3. Secondary Outcomes Including Postoperative Complications of the Modified Intention-to-Treat Population

Characteristic	Patients, No. (%)			*P* value
	PCIA (n = 124)	EDA (n = 124)	Total (N = 248)	
Mortality	4 (3.2)	3 (2.4)	7 (2.8)	.70
Postoperative pancreatic fistula				
Total	41 (33.1)	38 (30.6)	79 (31.9)	.68
Grade				
A	15 (12.1)	15 (12.1)	30 (12.1)	
B	7 (5.6)	6 (4.8)	13 (5.2)	
C	19 (15.3)	17 (13.7)	36 (14.5)	
Bile leakage, No./total No. (%)[a]	13/121 (10.7)	13/122 (10.7)	26/243 (10.7)	.98
Delayed gastric emptying	31 (25.0)	30 (24.2)	61 (24.6)	.88
Postoperative ileus	3 (2.4)	4 (3.2)	7 (2.8)	.70
Gastrointestinal bleeding	5 (4.0)	10 (8.1)	15 (6.0)	.18
Neuraxial hematoma	0	0	0	
Neurologic adverse effects	0	5 (4.0)	5 (2.0)	.02
Pneumonia	6 (4.8)	5 (4.0)	11 (4.4)	.94
Pulmonary embolism[b]	3 (2.4)	0	3 (1.2)	.08
Cardiac complication[b]	3 (2.4)	2 (1.6)	5 (2.0)	.65
Urinary tract infection	5 (4.0)	6 (4.8)	11 (4.4)	.76
Wound infection	9 (7.3)	14 (11.3)	23 (9.3)	.27
Intra-abdominal				
Abscess	9 (7.3)	10 (8.1)	19 (7.7)	.36
Bleeding	7 (5.6)	8 (6.5)	15 (6.0)	.79
Length of hospital stay, mean (SD), d	15.7 (7.6)	15.8 (7.7)	15.7 (7.6)	.91
No. of days in ICU or IMC, mean (SD)	3.9 (6.1)	3.8 (6.9)	3.9 (6.5)	.36
Duration of surgery, mean (SD), min	355 (97)	347 (93)	351 (95)	.56
Reoperation	19 (15.3)	21 (16.9)	40 (16.1)	.73
Readmission to hospital	14 (11.4)	8 (6.5)	22 (8.9)	.18

''*Precision Oncology*'' voor pancreascarcinoom

Precision Oncology in Surgery: Patient Selection for Operable Pancreatic Cancer. SB Dreyer et al. Annals of Surgery, August 2020, Volume 272, Issue 2, p 366-376.
Pubmed ID: 32675551.

Objective: We aimed to define preoperative clinical and molecular characteristics that would allow better patient selection for operative resection.

Background: Although we use molecular selection methods for systemic targeted therapies, these principles are not applied to surgical oncology. Improving patient selection is of vital importance for the operative treatment of pancreatic cancer (pancreatic ductal adenocarcinoma). Although surgery is the only chance of long-term survival, 80% still succumb to the disease and approximately 30% die within 1 year, often sooner than those that have unresected local disease.

Method: In 3 independent pancreatic ductal adenocarcinoma cohorts (total participants = 1184) the relationship between aberrant expression of prometastatic proteins S100A2 and S100A4 and survival was assessed. A preoperative nomogram based on clinical variables available before surgery and expression of these proteins was constructed and compared to traditional measures, and a postoperative nomogram.

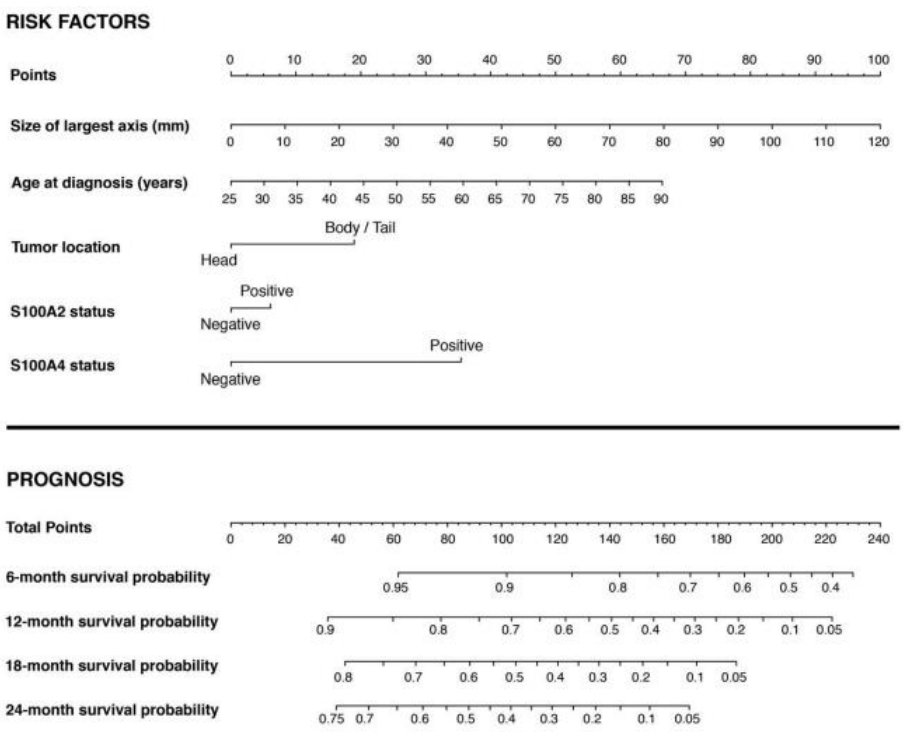

FIGURE 4. A preoperative molecular prognostic nomogram for resectable pancreatic cancer.

Results: High expression of either S100A2 or S100A4 was independent poor prognostic factors in a training cohort of 518 participants. These results were validated in 2 independent patient cohorts (Glasgow, n = 198; Germany, n = 468). Aberrant biomarker expression stratified the cohorts into 3 distinct prognostic groups. A preoperative nomogram incorporating S100A2 and S100A4 expression predicted survival and nomograms derived using postoperative clinicopathological variables.

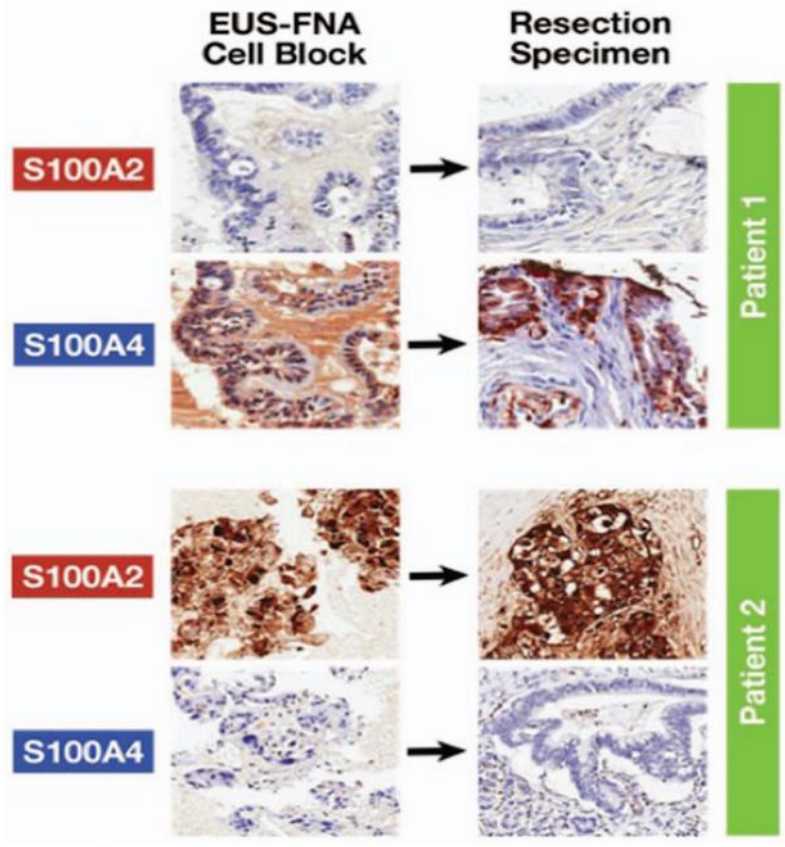

FIGURE 5. Immunohistochemistry of EUS-FNA versus resection specimen in 2 patients.

Conclusions: Of those patients with a poor preoperative nomogram score, approximately 50% of patients died within a year of resection. Nomograms have the potential to improve selection for surgery and neoadjuvant therapy, avoiding surgery in aggressive disease, and justifying more extensive resections in biologically favorable disease.

Adjuvante chemotherapie voor pancreatobiliar en mixed subtype papilcarcinoom

Gemcitabine‐based adjuvant chemotherapy in subtypes of ampullary adenocarcinoma: international propensity score‐matched cohort study. A.L. Moekotte et al. BJS, Aug 2020 – Volume 107 – Issue 9, pages 1171-1182.
Pubmed ID: 32259295.

Background: Whether patients who undergo resection of ampullary adenocarcinoma have a survival benefit from adjuvant chemotherapy is currently unknown. The aim of this study was to compare survival between patients with and without adjuvant chemotherapy after resection of ampullary adenocarcinoma in a propensity score-matched analysis.

Methods: An international multicentre cohort study was conducted, including patients who underwent pancreatoduodenectomy for ampullary adenocarcinoma between 2006 and 2017, in 13 centres in six countries. Propensity scores were used to match patients who received adjuvant chemotherapy with those who did not, in the entire cohort and in two subgroups (pancreatobiliary/mixed and intestinal subtypes). Survival was assessed using the Kaplan-Meier method and Cox regression analyses.

Results: Overall, 1163 patients underwent pancreatoduodenectomy for ampullary adenocarcinoma. After excluding 187 patients, median survival in the remaining 976 patients was 67 (95 per cent c.i. 56 to 78) months. A total of 520 patients (53·3 per cent) received adjuvant chemotherapy. In a propensity score-matched cohort (194 patients in each group), survival was better among patients who received adjuvant chemotherapy than in those who did not (median survival not reached versus 60 months respectively; P = 0·051). A survival benefit was seen in patients with the pancreatobiliary/mixed subtype; median survival was not reached in patients receiving adjuvant chemotherapy and 32 months in the group without chemotherapy (P = 0·020). Patients with the intestinal subtype did not show any survival benefit from adjuvant chemotherapy.

Conclusion: Patients with resected ampullary adenocarcinoma may benefit from gemcitabine-based adjuvant chemotherapy, but this effect may be reserved for those with the pancreatobiliary and/or mixed subtype.

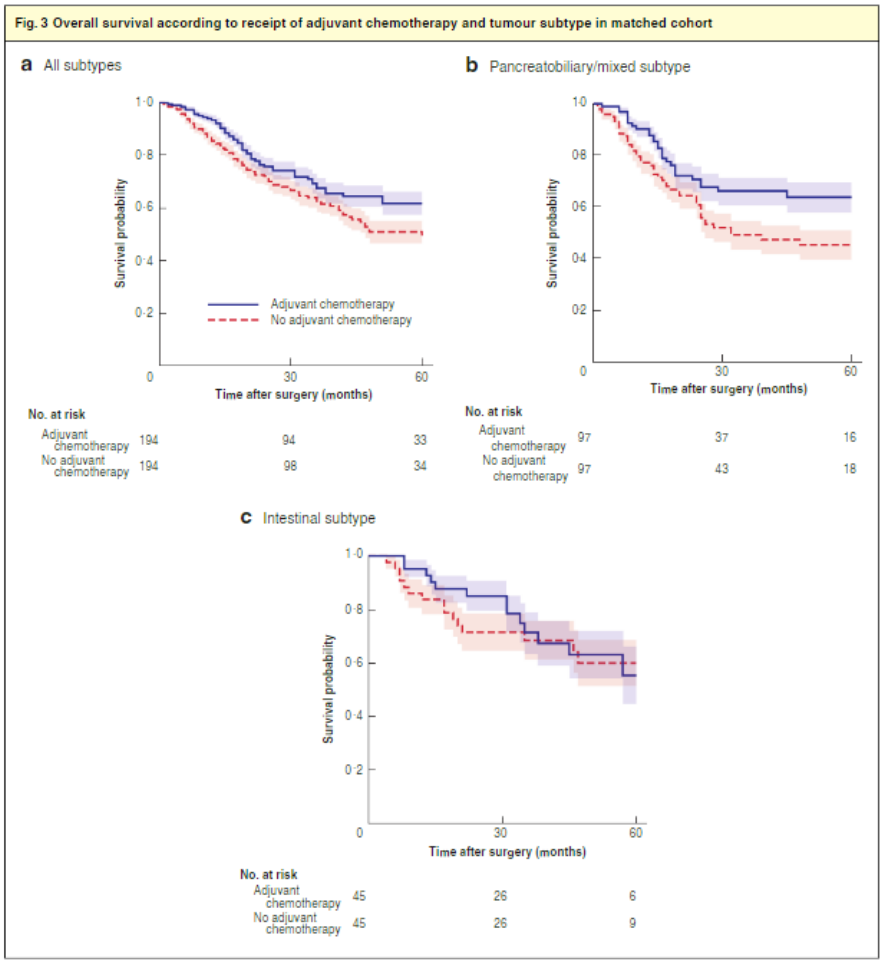

Fig. 3 Overall survival according to receipt of adjuvant chemotherapy and tumour subtype in matched cohort

a All subtypes, b pancreatobiliary/mixed subtype and c intestinal subtype. a P = 0·051, b P = 0·020, c P = 0·719 (log rank test).

LEVERCHIRURGIE

''Radiological Simultaneous Portohepatic Vein Embolization (RASPE)''

Radiological Simultaneous Portohepatic Vein Embolization (RASPE) Before Major Hepatectomy: A Better Way to Optimize Liver Hypertrophy Compared to Portal Vein Embolization. C. Christophe et al. Annals of Surgery, August 2020, Volume 272, Issue 2, p199-205.
Pubmed ID: 32675481.

Objective: The aim of this retrospective study was to compare portal vein embolization (PVE) and radiologica simultaneous portohepatic vein embolization (RASPE) for future liver remnant (FLR) growth in terms of feasibility, safety, and efficacy.

Summary of background data: After portal vein embolization (PVE), 15% of patients remain ineligible for hepatic resection due to insufficient hypertrophy of the FLR. RASPE has been proposed to induce FLR growth.

Materials and methods: Between 2016 and 2018, 73 patients were included in the study. RASPE was proposed for patients with a ratio of FLR to total liver volume (FLR/TLV) of <25% (RASPE group). This group was compared to patients who underwent PVE for a FLR/TLV <30% (PVE group). Patients in the 2 groups were matched for age, sex, type of tumor, and number of chemotherapy treatments. FLR was assessed by computed tomography before and 4 weeks after the procedure.

Results: The technical success rate in both groups was 100%. Morbidity post-embolization, and the time between embolization and surgery were similar between the groups. In the PVE group, the FLR/TLV ratio before embolization was 31.03% (range: 18.33%-38.95%) versus 22.91% (range: 16.55-32.15) in the RASPE group (P < 0.0001). Four weeks after the procedure, the liver volume increased by 28.98% (range: 9.31%-61.23%) in the PVE group and by 61.18% (range: 23.18%-201.56%) in the RASPE group (P < 0.0001). Seven patients in the PVE group, but none in the RASPE group, had postoperative liver failure (P = 0.012).

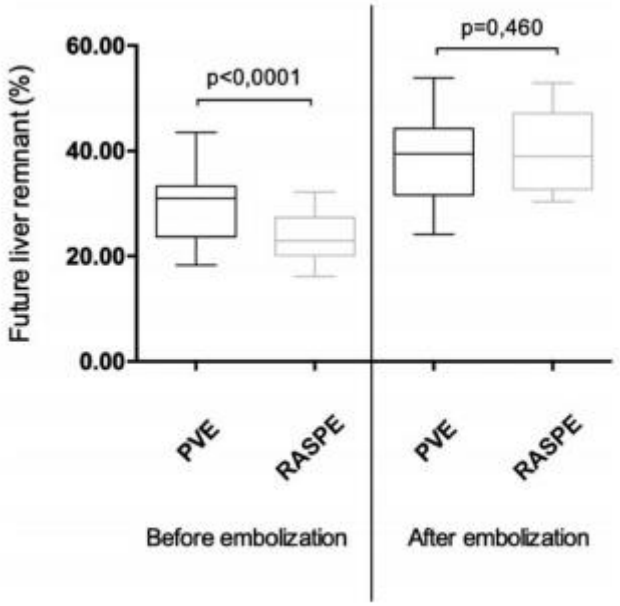

FIGURE 3. Comparative FLR in PVE and RASPE groups.

Conclusions: RASPE can be considered as "radiological associating liver partition and portal vein ligation for staged hepatectomy." RASPE induced safe and profound growth of the FLR and was more efficient than PVE. RASPE also allowed for extended hepatectomy with less risk of post-operative liver failure.

BARIATRISCHE CHIRURGIE

Gastric bypass versus sleeve gastrectomy: 47.101 patienten uit Zweden, Noorwegen en Nederland

Gastric Bypass Versus Sleeve Gastrectomy: Patient Selection and Short-term Outcome of 47,101 Primary Operations From the Swedish, Norwegian, and Dutch National Quality Registries. Y.Q.M. Poelemeijer et al. Annals of Surgery, August 2020, Volume 272, Issue 2, p 326-333.
Pubmed ID: 30921054.

Objective: The aim of this study was to compare the use and short-term outcome of Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) in Sweden, Norway, and the Netherlands**.**

Background: Although bariatric surgery is performed in high volumes worldwide, no consensus exists regarding the choice of bariatric procedure for specific groups of patients.

Methods: Data from 3 national registries for bariatric surgery were used. Patient selection, perioperative data (severe complications, mortality, and rate of readmissions within 30 days), and 1-year results (follow-up rate and weight loss) were studied.

Results: A total of 47,101 primary operations were registered, 33,029 (70.1%) RYGB and 14,072 (29.9%) SG. Patients receiving RYGB met international guidelines for having bariatric surgery more often than those receiving SG (91.9% vs 83,0%, P < 0.001). The 2 procedures did not differ in the rate of severe complications (2.6% vs 2.4%, P = 0.382), nor 30-day mortality (0.04% vs 0.03%, P = 0.821). Readmission rates were higher after RYGB (4.3% vs 3.4%, P < 0.001).One-year post surgery, less RYGB-patients were lost-to follow-up (12.1% vs 16.5%, P < 0.001) and RYGB resulted in a higher rate of patients with total weight loss of more than 20% (95.8% vs 84.6%, P < 0.001). While the weight-loss after RYGB was similar between hospitals, there was a great variation in weight loss after SG.

Conclusion: This study reflects the pragmatic use and short-term outcome of RYGB and SG in 3 countries in North-Western Europe. Both procedures were safe, with RYGB having higher weight loss and follow-up rates at the cost of a slightly higher 30-day readmission rate.

TABLE 2. Morbidity and Mortality After Primary Sleeve Gastrectomy and Gastric Bypass Procedure

	Netherlands				Norway				Sweden				All				
	Roux-en-Y Gastric Bypass		Sleeve Gastrectomy		Roux-en-Y Gastric Bypass		Sleeve Gastrectomy		Roux-en-Y Gastric Bypass		Sleeve Gastrectomy		Roux-en-Y Gastric Bypass		Sleeve Gastrectomy		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	P*
Number of procedures	21,055	77.0%	6292	23.0%	1365	43.0%	1809	57.0%	10,609	64.0%	5971	36.0%	33,029	70.1%	14,072	29.9%	< 0.001
Perioperative complications	420	2.0%	131	2.1%	66	4.8%	32	1.8%	284	2.7%	57	1.0%	770	2.3%	220	1.6%	< 0.001
Gastrointestinal perforation	135	0.6%	7	0.1%	24	1.8%	1	0.1%	121	1.1%	3	0.1%	280	0.8%	11	0.1%	
Bleeding	64	0.3%	44	0.7%	5	0.4%	0	0.0%	10	0.1%	12	0.2%	79	0.2%	56	0.4%	
Spleen injury	31	0.1%	21	0.3%	4	0.3%	8	0.4%	11	0.1%	17	0.3%	46	0.1%	46	0.3%	
Hepatic injury	44	0.2%	11	0.2%	0	0.0%	0	0.0%	16	0.2%	8	0.1%	60	0.2%	19	0.1%	
Major vascular injury	1	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.0%	1	0.0%	
Postoperative complications	1046	5.0%	347	5.5%	80	5.9%	94	5.2%	753	7.1%	309	5.2%	1879	5.7%	750	5.3%	< 0.001
Bleeding	314	1.5%	129	2.1%	25	1.8%	25	1.4%	123	1.2%	66	1.1%	462	1.4%	220	1.6%	
Leakage	109	0.5%	46	0.7%	9	0.7%	16	0.9%	80	0.8%	30	0.5%	198	0.6%	92	0.7%	
Intra-abdominal infection	29	0.1%	15	0.2%	5	0.4%	11	0.6%	64	0.6%	22	0.4%	98	0.3%	48	0.3%	
Wound infection	28	0.1%	11	0.2%	4	0.3%	11	0.6%	54	0.5%	45	0.8%	86	0.3%	67	0.5%	
Intestinal obstruction	63	0.3%	10	0.2%	16	1.2%	0	0.0%	113	1.1%	7	0.1%	192	0.6%	17	0.1%	
Cardiac events	38	0.2%	12	0.2%	0	0.0%	5	0.3%	6	0.1%	3	0.1%	44	0.1%	20	0.1%	
Pulmonary events	71	0.3%	22	0.3%	5	0.4%	1	0.1%	33	0.3%	17	0.3%	109	0.3%	40	0.3%	
Thrombotic events	8	0.0%	4	0.1%	1	0.1%	2	0.1%	9	0.1%	2	0.0%	18	0.1%	8	0.1%	
Other	427	2.0%	115	1.8%	40	2.9%	46	2.5%	327	3.1%	164	2.7%	794	2.4%	325	2.3%	
Overall	506	2.4%	205	3.3%	29	2.1%	31	1.7%	315	3.0%	105	1.8%	850	2.6%	341	2.4%	< 0.001
Reintervention CD-grade IIIb	346	1.6%	163	2.6%	27	2.0%	28	1.5%	294	2.8%	99	1.7%	667	2.0%	290	2.1%	
IC/ICU admission CD-grade IV	148	0.7%	38	0.6%	2	0.1%	3	0.2%	20	0.2%	6	0.1%	170	0.5%	47	0.3%	
Mortality CD-grade V	12	0.1%	4	0.1%	0	0.0%	0	0.0%	1	0.0%	0	0.0%	13	0.0%	4	0.0%	
Length of stay and readmission																	
Readmissions (<30 d)	572	2.7%	158	2.5%	87	4.6%	87	4.8%	752	7.1%	240	4.0%	1411	4.3%	485	3.4%	< 0.001
Hospital stay (mean, d, SD)	1.6	±2.9	1.6	±2.7	1.7	±3.4	2.0	±2.2	1.5	±4.6	1.6	±2.3	1.6	±3.5	1.7	±2.5	< 0.001

CD indicates Clavien-Dindo Classification; IC, intensive care; ICU, intensive care unit; N/A, not available.
*P values compared all 3 different countries together.

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