

Surgery in Advanced Ovarian Cancer

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Tumor pattern

**214 patients with primary Ovarian Cancer
(FIGO III/IV)**

➤ Peritoneum	76%
➤ Lymph node	68%
➤ Colon	52%
➤ Diaphragm	44%
➤ Mesentery	36%
➤ Ascites >500mL	30%
➤ Small bowel	27%
➤ Bursa omentalis	12%

Surgery

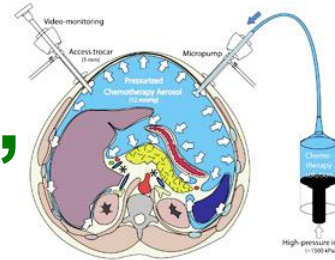
Neoadjuvant

PIPAC

Primäroperation

Intervall-OP

HIPEC



“And the Winner is?”

FIRST-LINE THERAPY

Paclitaxel/Carboplatin +
Bevacizumab

Dose dense

Intraperitoneal
Chemotherapy

Paclitaxel/Carboplatin

Salvage therapy

Tamoxifen

Topotecan

Paclitaxel

Peg. liposomal
doxorubicin

Surgery

Trabectedin +
peg. liposomal
doxorubicin

Niraparib

Olaparib

Carboplatin + Gemcitabine
+ Bevacizumab

Carboplatin +
Gemcitabine

Carboplatin + peg. lip.
doxorubicin

Carboplatin +
Paclitaxel

What is the most important prognostic factor in advanced ovarian cancer?

A= OS	Serous histology			Mucinous histology		
Parameter	HR	95%-CI	p-value	HR	95%-CI	p-value
Age [10yrs]	1.15	(1.09, 1.22)	<.0001	1.18	(0.98, 1.43)	0.0773
ECOG 2 vs. 0-1	1.22	(1.05, 1.43)	0.0117	1.98	(1.01, 3.87)	0.0456
FIGO IIIC-IV vs. IIB-IIIB	1.50	(1.29, 1.75)	<.0001	1.10	(0.65, 1.88)	0.7131
grading G2/3 vs. G1	1.67	(1.26, 2.21)	0.0004	1.95	(0.99, 3.84)	0.0523
residual tumor 1-10 mm vs. 0 mm	2.16	(1.84, 2.54)	<.0001	2.40	(1.35, 4.29)	0.0031
residual tumor > 10 mm vs. 1-10 mm	1.16	(1.03, 1.31)	0.0141	1.01	(0.62, 1.65)	0.9559
Ascites yes vs. no	1.36	(1.20, 1.55)	<.0001	1.43	(0.85, 2.40)	0.1801
B = PFS						
Age [10yrs]	1.09	(1.04, 1.14)	0.0006	1.12	(0.95, 1.32)	0.1925
ECOG 2 vs. 0-1	1.06	(0.92, 1.23)	0.4325	1.52	(0.79, 2.92)	0.2144
FIGO IIIC-IV vs. IIB-IIIB	1.50	(1.32, 1.71)	<.0001	1.22	(0.74, 2.03)	0.4355
grading G2/3 vs. G1	1.60	(1.26, 2.03)	0.0001	1.69	(0.92, 3.12)	0.0915
residual tumor 1-10 mm vs. 0 mm	2.07	(1.81, 2.37)	<.0001	2.51	(1.46, 4.30)	0.0008
residual tumor > 10 mm vs. 1-10 mm	1.22	(1.10, 1.36)	0.0003	1.09	(0.69, 1.72)	0.7221
Ascites yes vs. no	1.25	(1.12, 1.40)	<.0001	1.42	(0.88, 2.31)	

Prognostic and predictive value of the Peritoneal Cancer Index (PCI) in primary advanced epithelial ovarian cancer patients after complete cytoreductive surgery. A study of the tumor bank ovarian cancer (TOC)

Khayal Gasimli, Elena Ioana Braicu, Rolf Richter, Radoslav Chekerov, Jalid Sehouli

TABLE 3 R Cox regression analysis of tumor-free operated patients with advanced primary ovarian cancer

Variable	OS			PFS			
	HR	95 % CI	p value	Variable	HR	95 % CI	p value
The results of multivariate analysis of 80 patients							
PCI (≥ 18 vs. <18)	2.21	0.73–6.74	0.162	PCI (≥ 13 vs. <13)	2.43	1.30–4.54	0.005
Age	1.07	1.02–1.12	0.005	Age	1.03	1.00–1.06	0.110
FIGO (IV vs. III)	0.09	0.01–1.20	0.069	FIGO (IV vs. III)	1.60	0.18–14.17	0.674
Grade (I/II vs. III)	1.15	0.42–3.13	0.783	Grade (I/II vs. III)	1.12	0.56–2.23	0.749
pT (3c vs. 3b)	2.26	0.44–11.59	0.329	pT (3c vs. 3b)	1.75	0.71–4.31	0.226
cMx versus cM0	0.81	0.30–2.17	0.673	cM (x vs. 0)	1.37	0.66–2.82	0.397
cM1 versus cM0	7.29	0.57–94.03	0.128	cM (1 vs. 0)	1.01	0.11–9.04	0.997
pNx versus pN0	2.19	0.45–10.61	0.328	pN (x vs. 0)	2.00	0.69–5.79	0.202
pN1 versus pN0	3.39	1.09–10.52	0.034	pN (1 vs. 0)	2.13	0.95–4.75	0.067
The results of multivariate analysis of chemotherapy-performed 71 patients							
PCI (≥ 18 vs. <18)	1.36	0.33–5.50	0.663	PCI (≥ 13 vs. <13)	2.52	1.16–5.46	0.019
Age	1.09	1.02–1.16	0.004	Age	1.02	0.98–1.05	0.209
FIGO (IV vs. III)	0.02	0.01–0.54	0.018	FIGO (IV vs. III)	2.28	0.24–21.36	0.470
Grade (I/II vs. III)	1.54	0.36–6.51	0.556	Grade (I/II vs. III)	1.49	0.67–3.31	0.326
pT (3c vs. 3b)	1.70	0.27–10.50	0.568	pT (3c vs. 3b)	1.75	0.71–4.31	0.226
cMx versus cM0	0.63	0.20–2.02	0.446	cM (x vs. 0)	1.37	0.66–2.82	0.397
cM1 versus cM0	6.05	0.40–89.90	0.191	cM (1 vs. 0)	1.01	0.11–9.04	0.997
pNx versus pN0	2.58	0.38–17.47	0.331	pN (x vs. 0)	2.00	0.69–5.79	0.202
pN1 versus pN0	8.06	1.61–40.29	0.011	pN (1 vs. 0)	2.13	0.95–4.75	0.067
Ascites versus no ascites	1168163	0.01–2, 385E+275	0.965	Ascites	1.37	0.66–2.82	0.397
Non-responder versus responder	7.67	2.02–29.17	0.003				

HR hazard ratio, CI confidence interval

Bold values indicate significance

Predicting Platinum resistance
Cut off Sensitivity Specificity

≥ 10	100%	42,2%
≥ 15	57,1%	76,6%

**Surgical procedures performed during primary tumor debulking surgery
in 31 young patients (<35 years old) with epithelial ovarian cancer.**

Procedure performed	Patients (%)	Procedure performed	Patients (%)
Hysterectomy	11 (35.5)	Infrared Coagulation	12 (38.7)
Pelvic LND	16 (51.6)	Colostomy/ Ileostomy	2 (6.5)
Paraaortic LND	16 (51.6)	Omentectomy	24 (77.4)
Appendectomy	13 (41.9)	Partial colectomy	8 (25.8)
Intestinal Resection (small bowel)	11 (35.5)	Pelvic wall	11 (35.5)
Intestinal Resection (large bowel)	15 (48.4)	Partial Hepatectomy	2 (6.5)
Diaphragmatic Resection	11 (35.5)	Partial Gastrectomy	4 (12.9)
Peritonectomy	21 (67.7)	Splenectomy	0 (0)
Cystectomy (urinary bladder)	0 (0 %)	Omental bursa	8 (25.8)
Ureter Resection/Reimplantation	0 (0 %)	Mesenterial resection	5 (16.1)

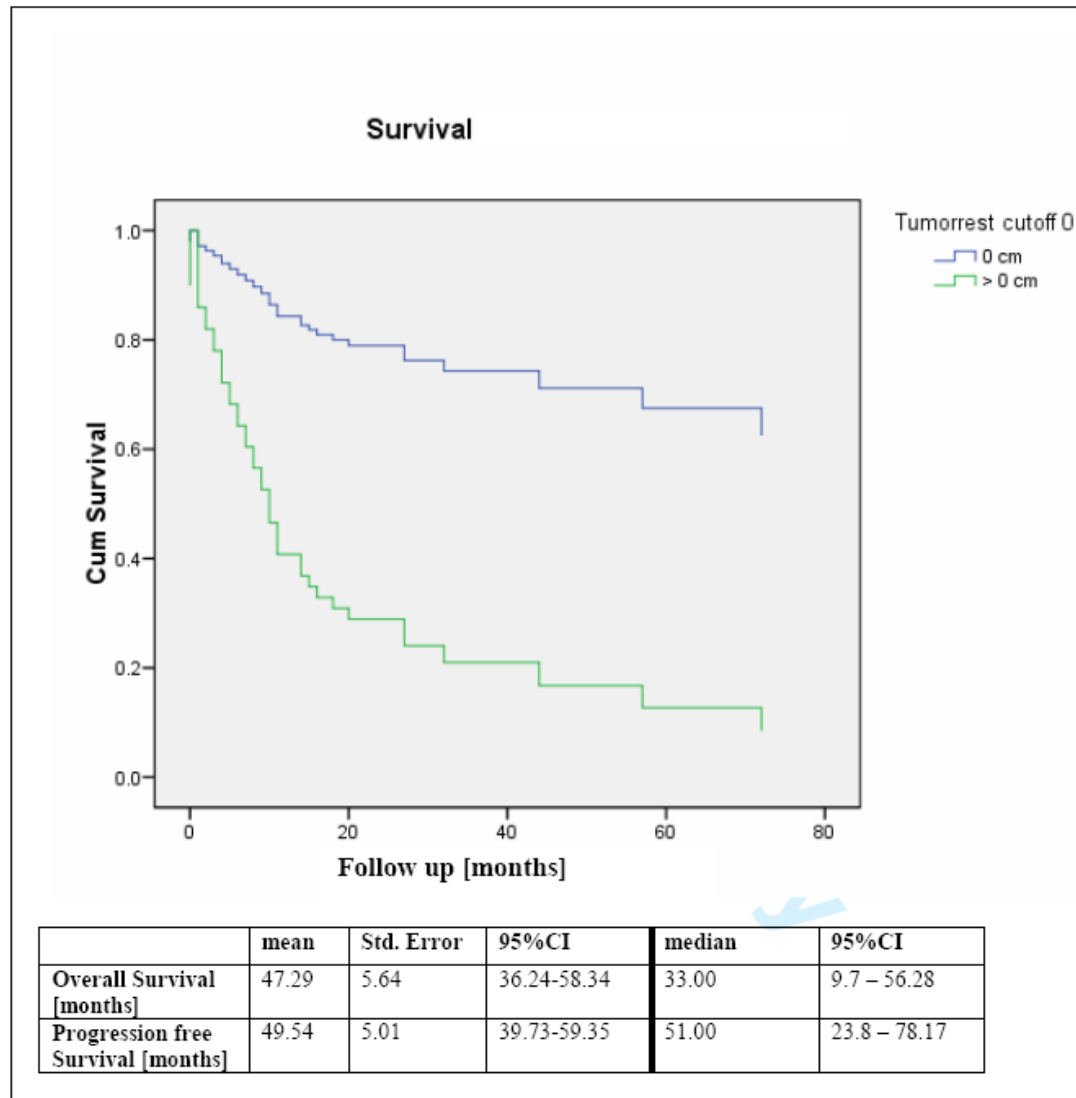


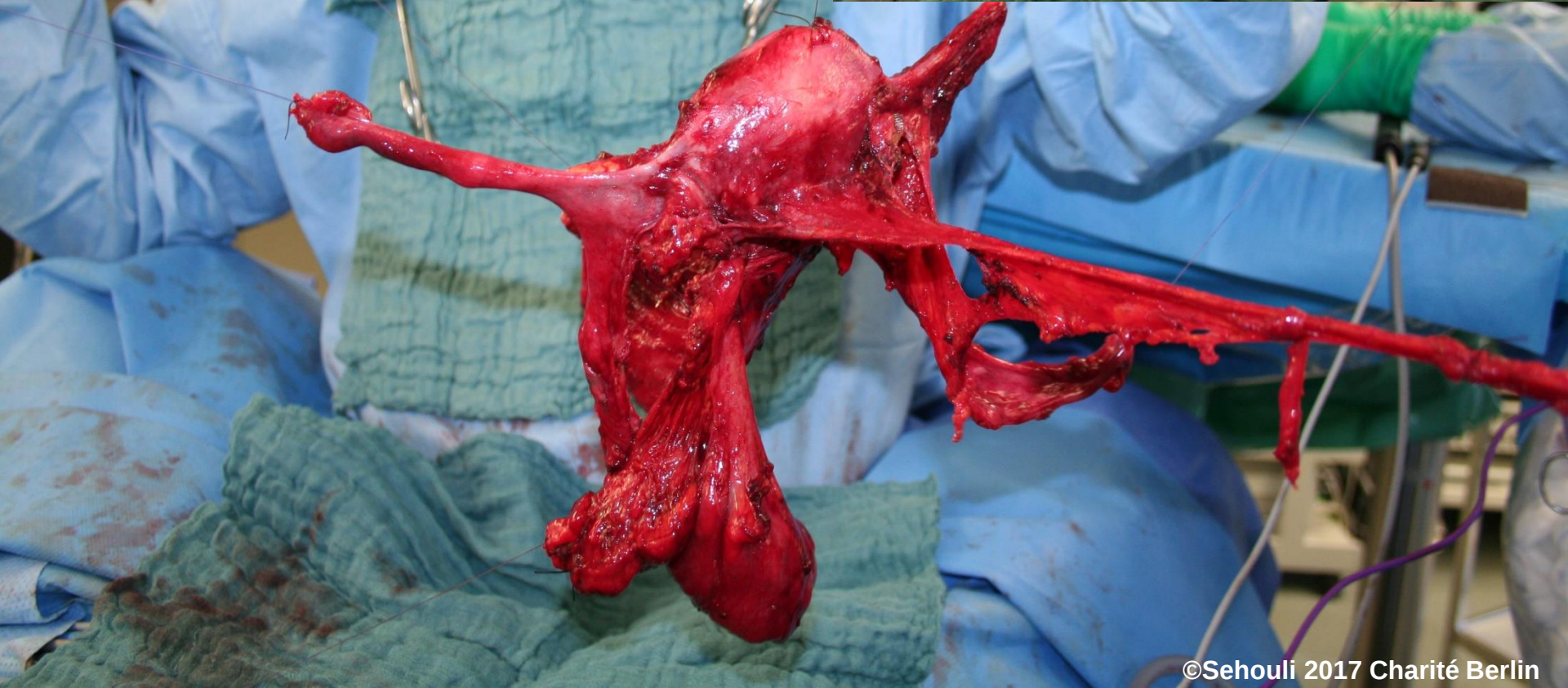
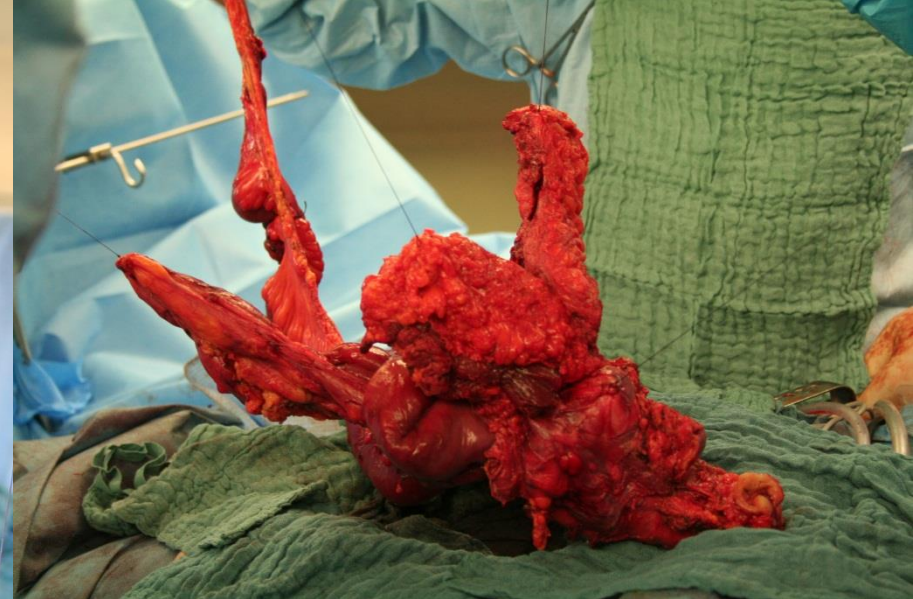
Surgical procedures performed during primary surgery in 101 elderly patients (≥ 70 years) with epithelial ovarian cancer

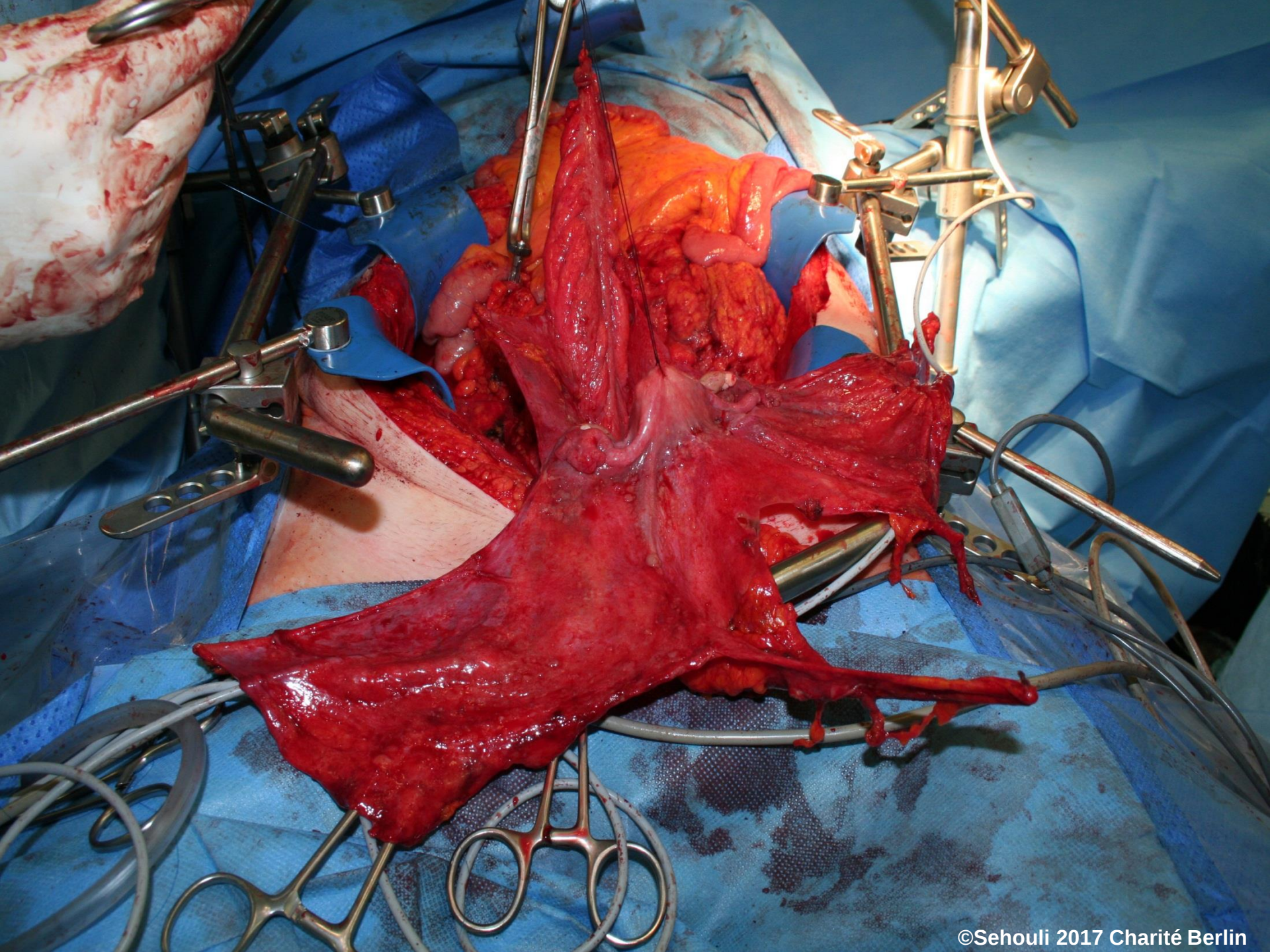
Procedure performed	Patients [%] (n= 101)	Procedure performed	Patients (n= 101)
Hysterectomy	63 [62.4]	Colostomy / Ileostomy	9 [8.9]
Pelvic LND	41 [40.6]	Pancreas resection	0 [0]
Para- aortic LND	37 [36.6]	Peritonectomy	57 [56.4]
Intestinal Resection	43 [42.6]	Splenectomy	2 [1.98]
Partial resection urinary bladder with ureter reimplantation	1 [0.99]	Partial Hepatectomy	0 [0]
Diaphragmatic Resection	1 [0.99]	Partial Gastrectomy	1 [0.99]
Organ involved	Patients [%] (n= 101)	Organ involved	Patients (n= 101)
Omentum	65 [64.4]	Liver capsule	4 [3.9]
Pouch of Douglas	21 [20.8]	Serosa of the Stomach	6 [5.9]
Pelvic wall	29 [28.7]	Diaphragma	31 [30.7]
Uterus	63 [62.4]	Abdominal wall	2 [1.98]
Serosa of the urinary bladder	13 [12.9]	Small intestine	33 [32.7]
Splenic hilus	7 [6.9]	Mesenterium	38 [37.6]
Omental bursa	18 [17.8]	Large intestine	54 [53.5]



Kaplan Meier Overall survival curve and data for overall and progression free survival for elderly patients





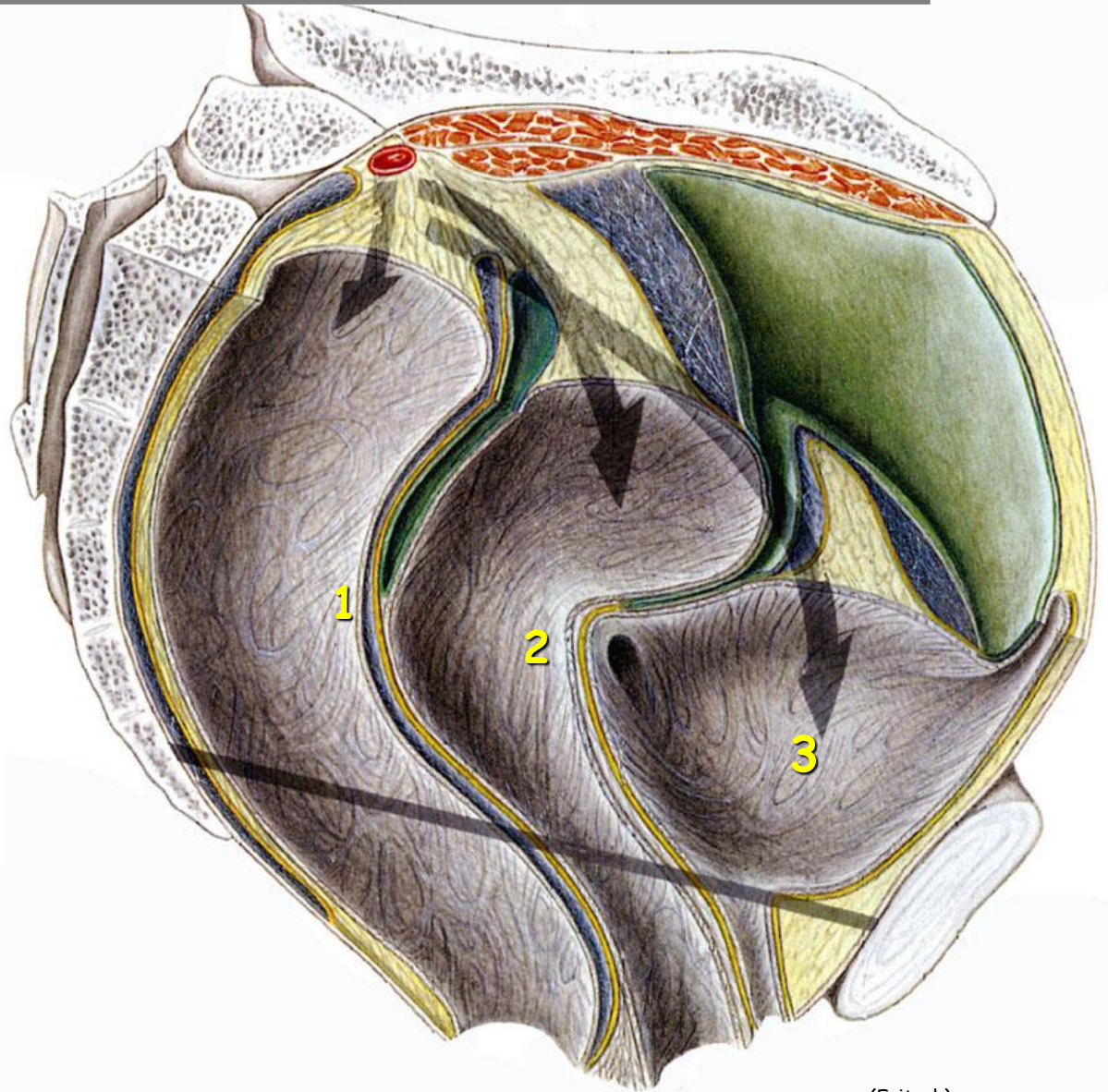


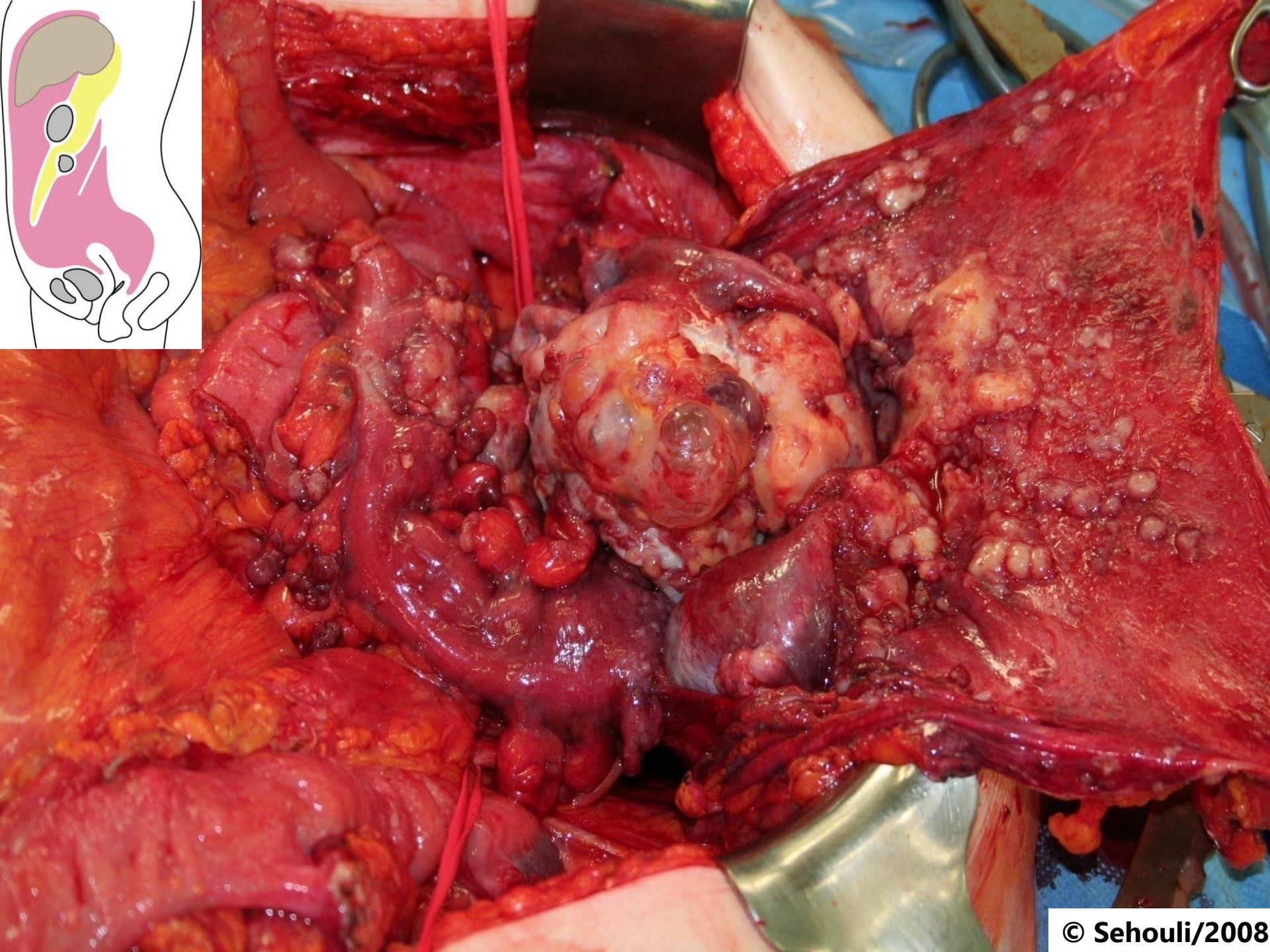
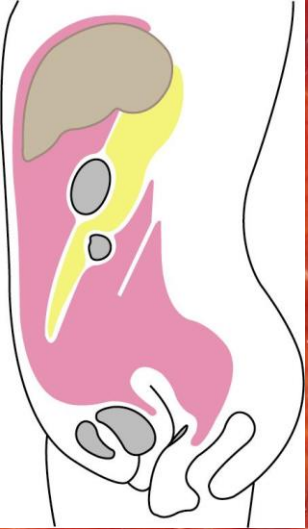
Compartments of the pelvic floor

1 Posterior C.
Anorectal

2 Medial c.
Uterovaginal

3 Anterior C:
Vesicourethral

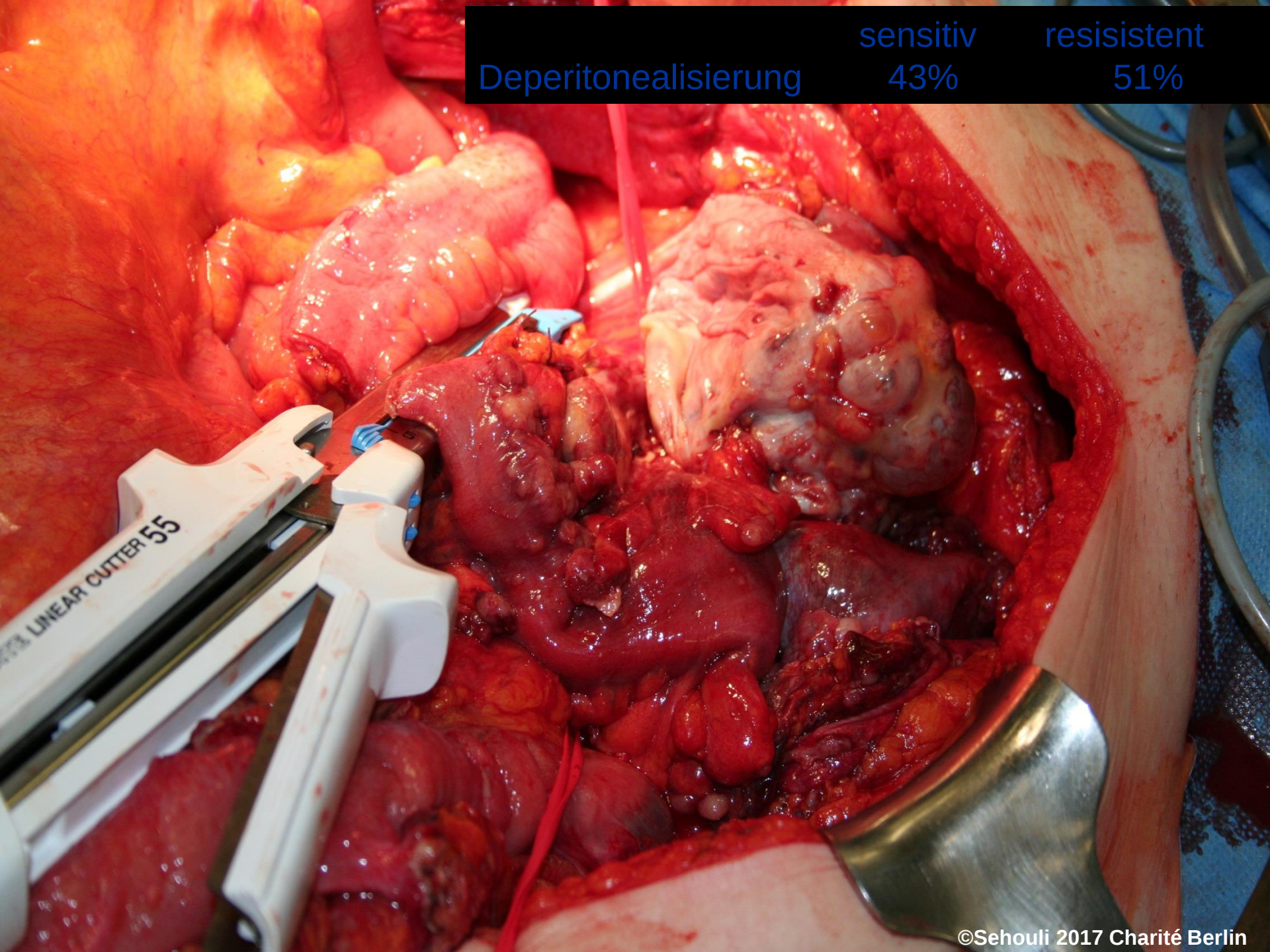


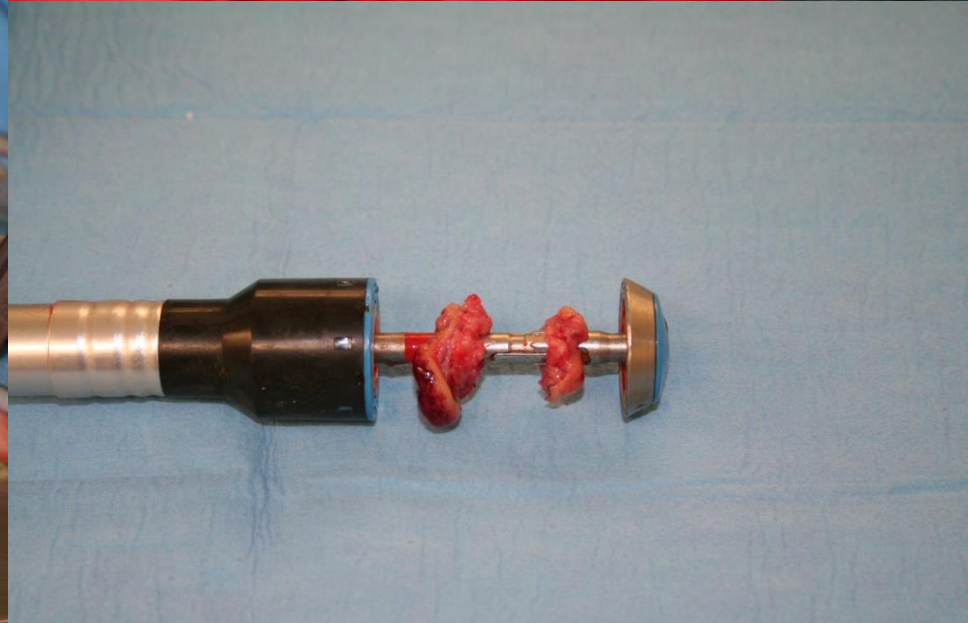
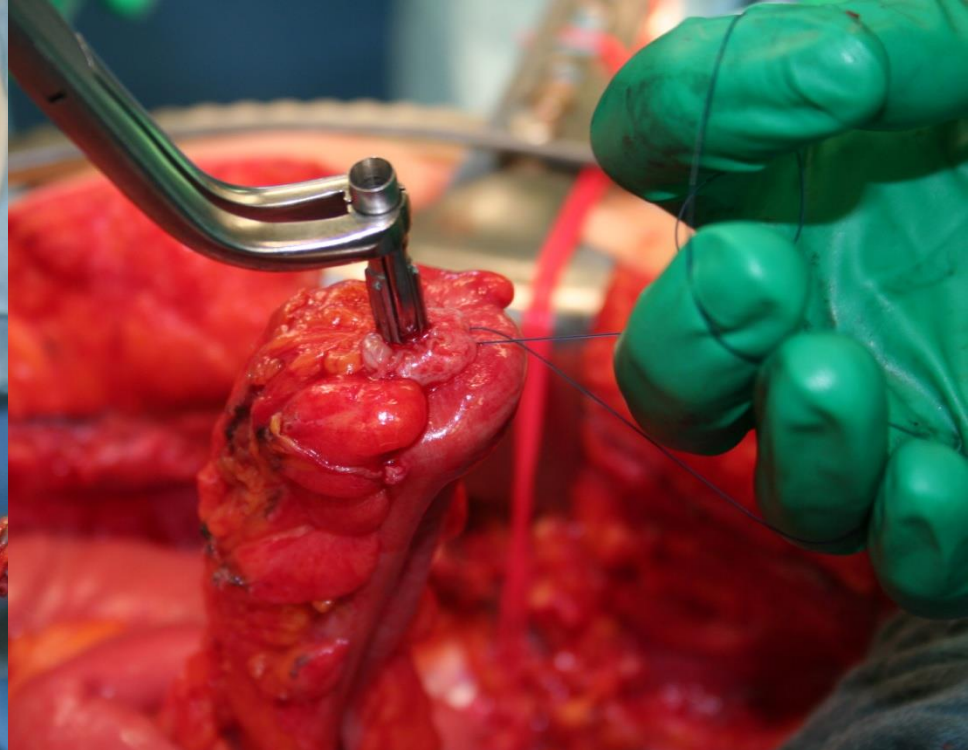
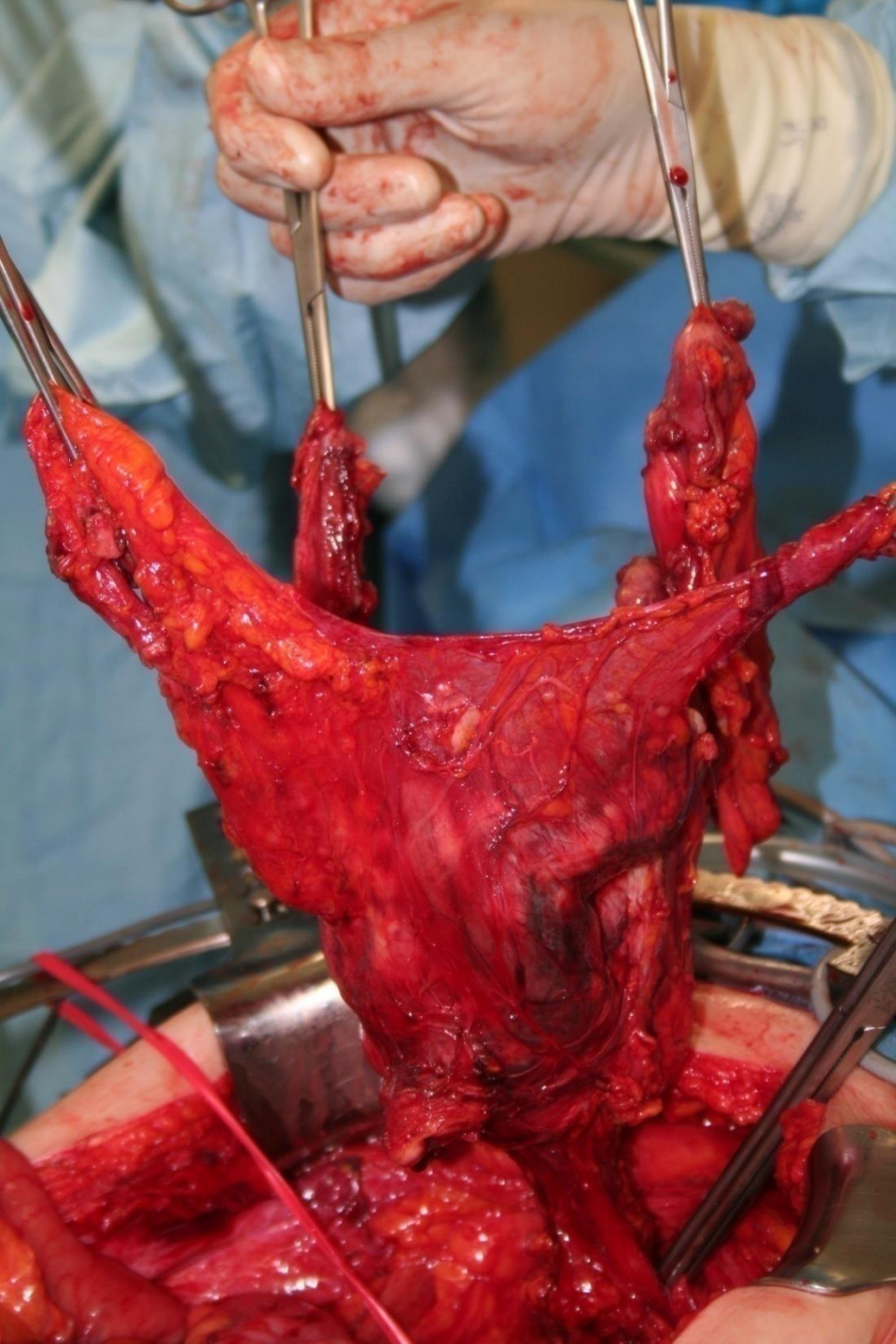


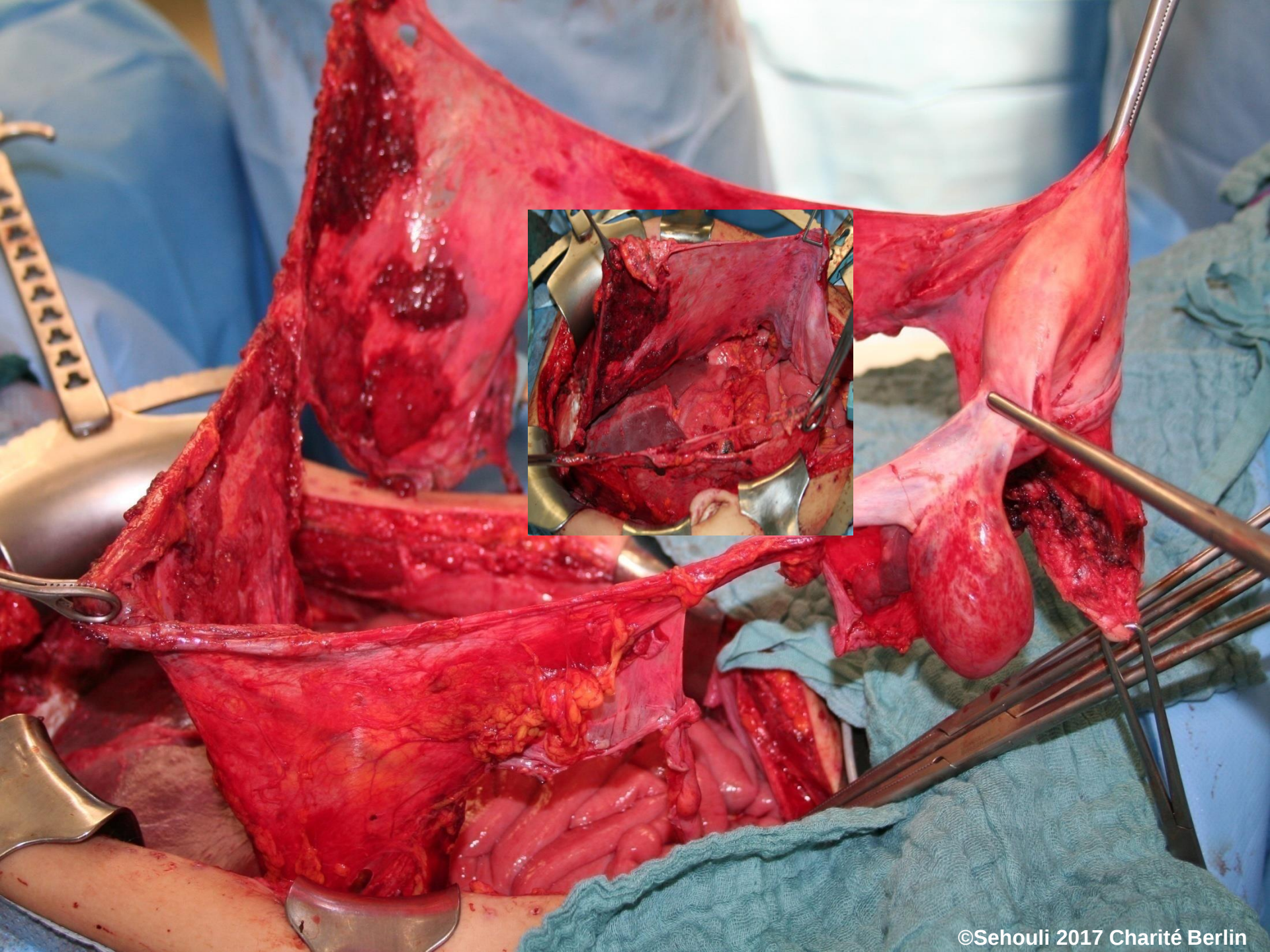
Deperitonealisierung

sensitiv
43%

resistent
51%







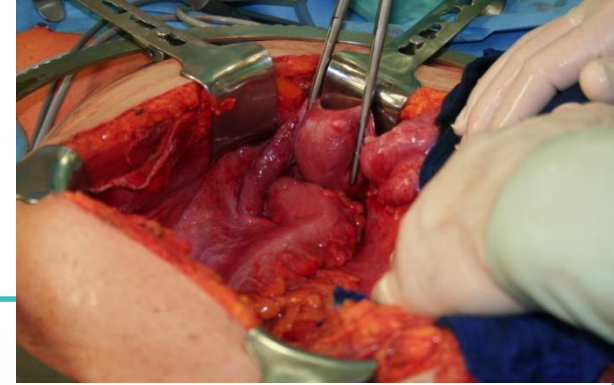
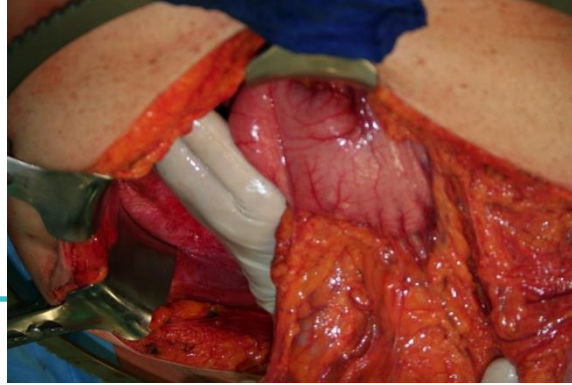
Surgery

- **Preoperative management**
- **Intraoperative management**
- **Postoperative management**

What are the drivers in complication?

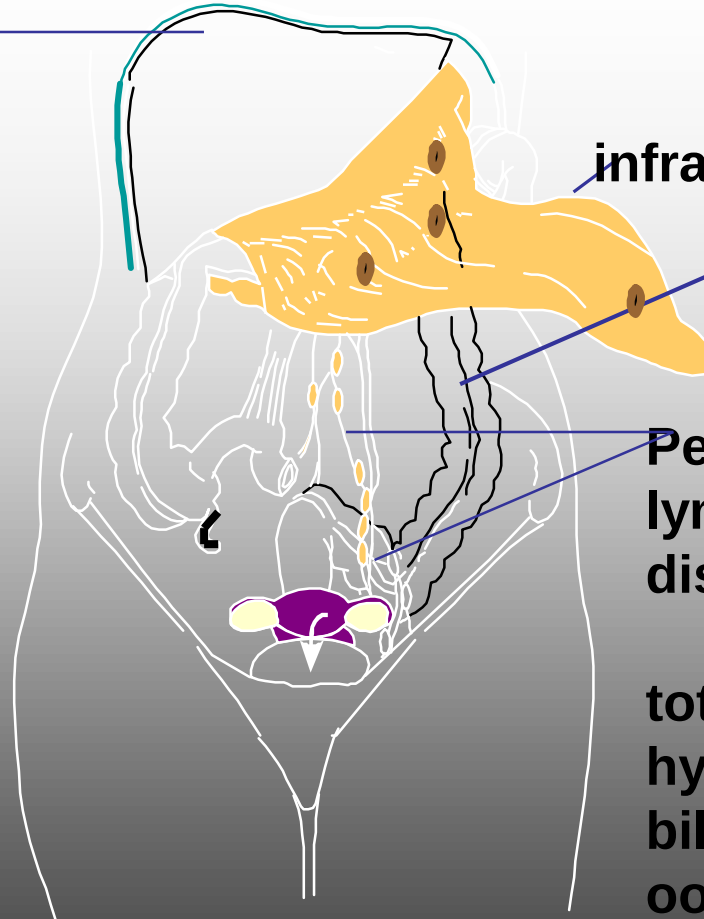
Surgical Technique and complication depend on various factors;

- **therapy**
- **tumor biology/tumor pattern**
- **health status, comorbidities, comedication, nutrition status**
- **cervical cancer, endometrial cancer, ovarian previous therapy (eg radiation, surgery, chemotherapy, complications)**
- **health status of the patients (prior, during and after surgery)**
- **infrastructure of the clinic**
- **experience of the surgeon(s) and the whole medical team**
- **luck**



**Peritonectomy /
Infrared
contactcoag.**

**detailed
exploration of the
abdomen**



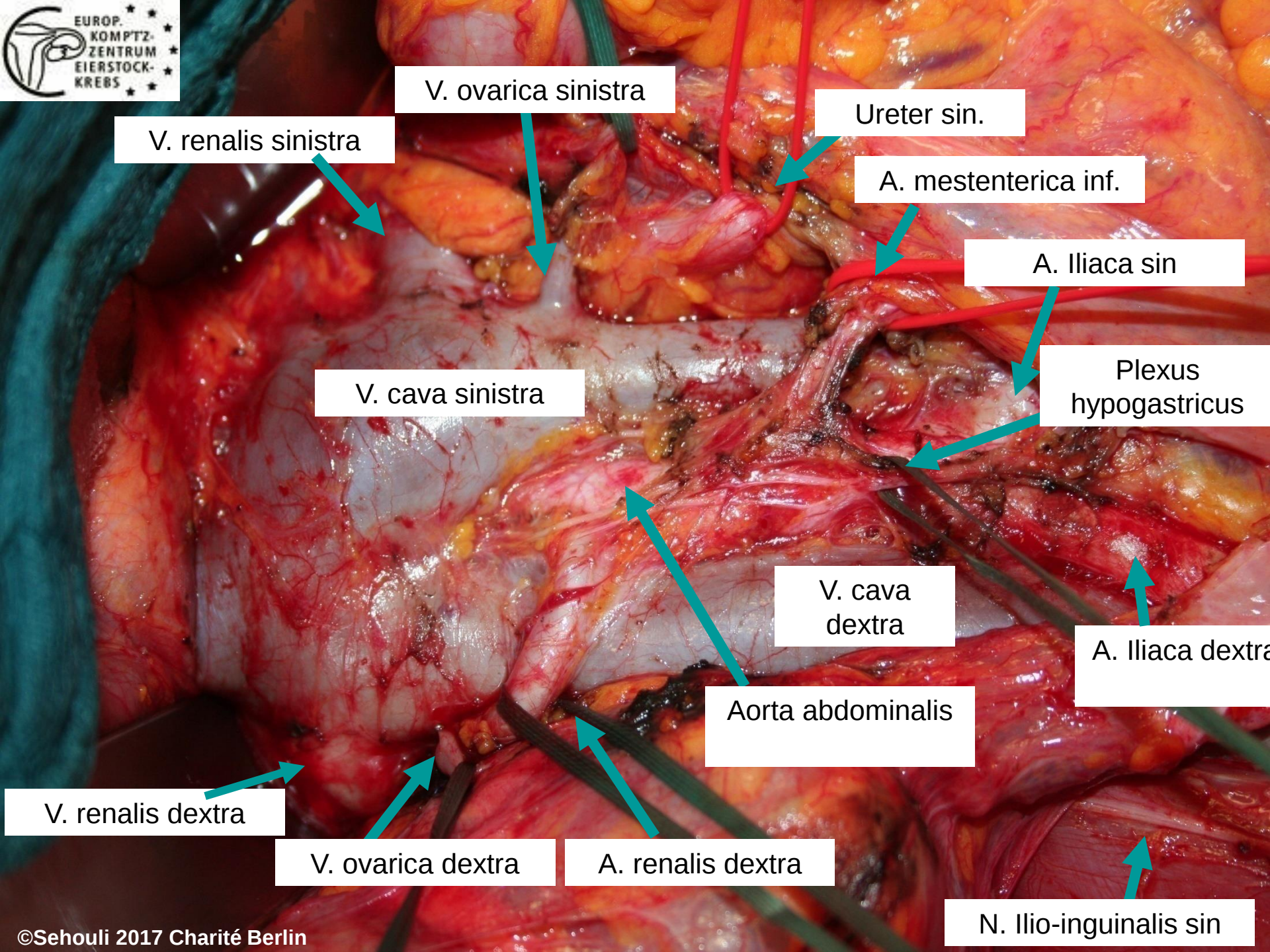
infragastr. omentectomy

**Indication for
bowel resection**

**Pelvic / paraaortal
lymph node
dissection**

**total
hysterectomy,
bilateral salpingo-
oophorectomy**

Sehouli/ 2006



V. ovarica sinistra

Ureter sin.

V. renalis sinistra

A. mestenterica inf.

A. Iliaca sin

V. cava sinistra

Plexus
hypogastricus

V. cava
dextra

A. Iliaca dextra

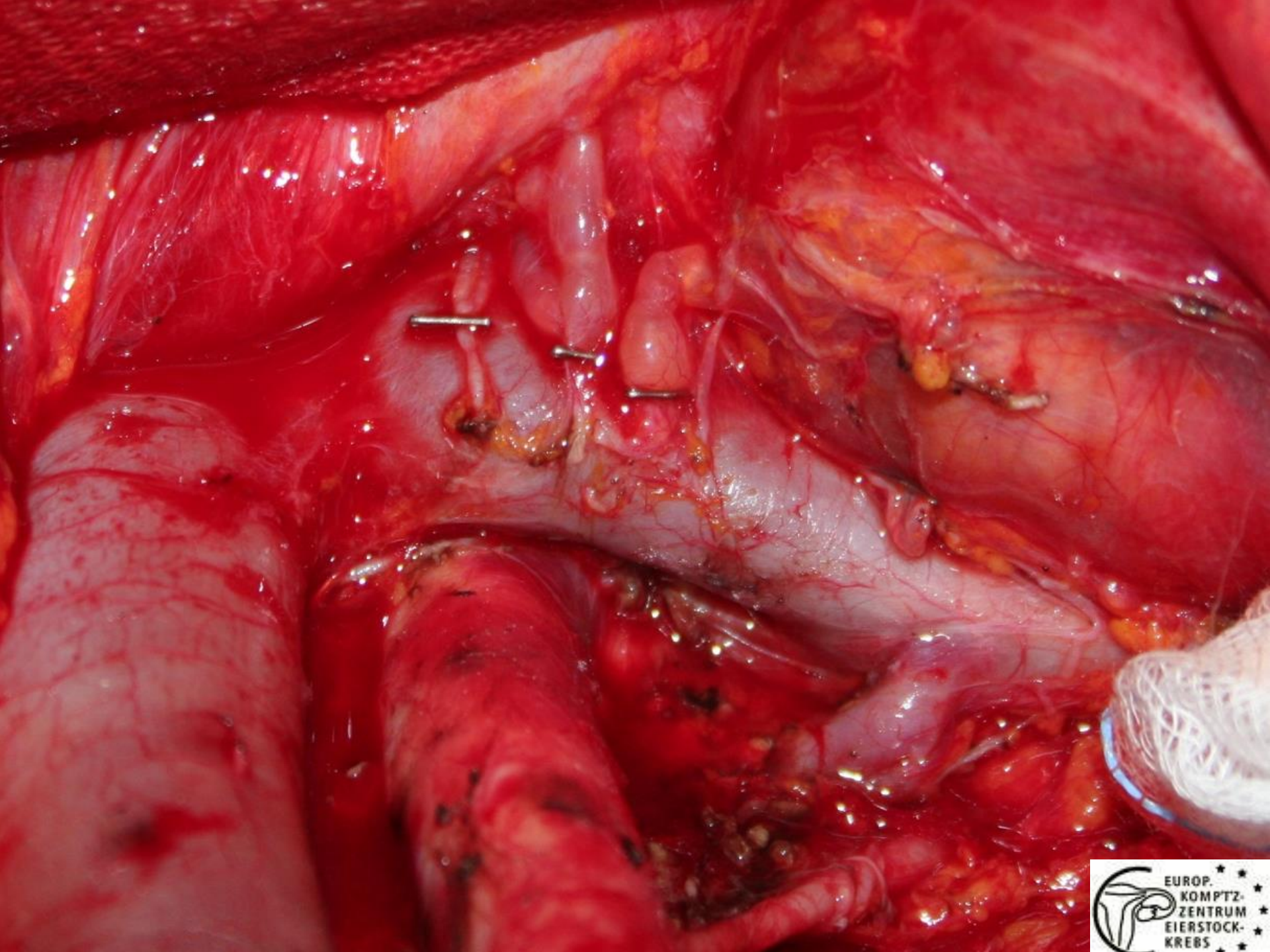
Aorta abdominalis

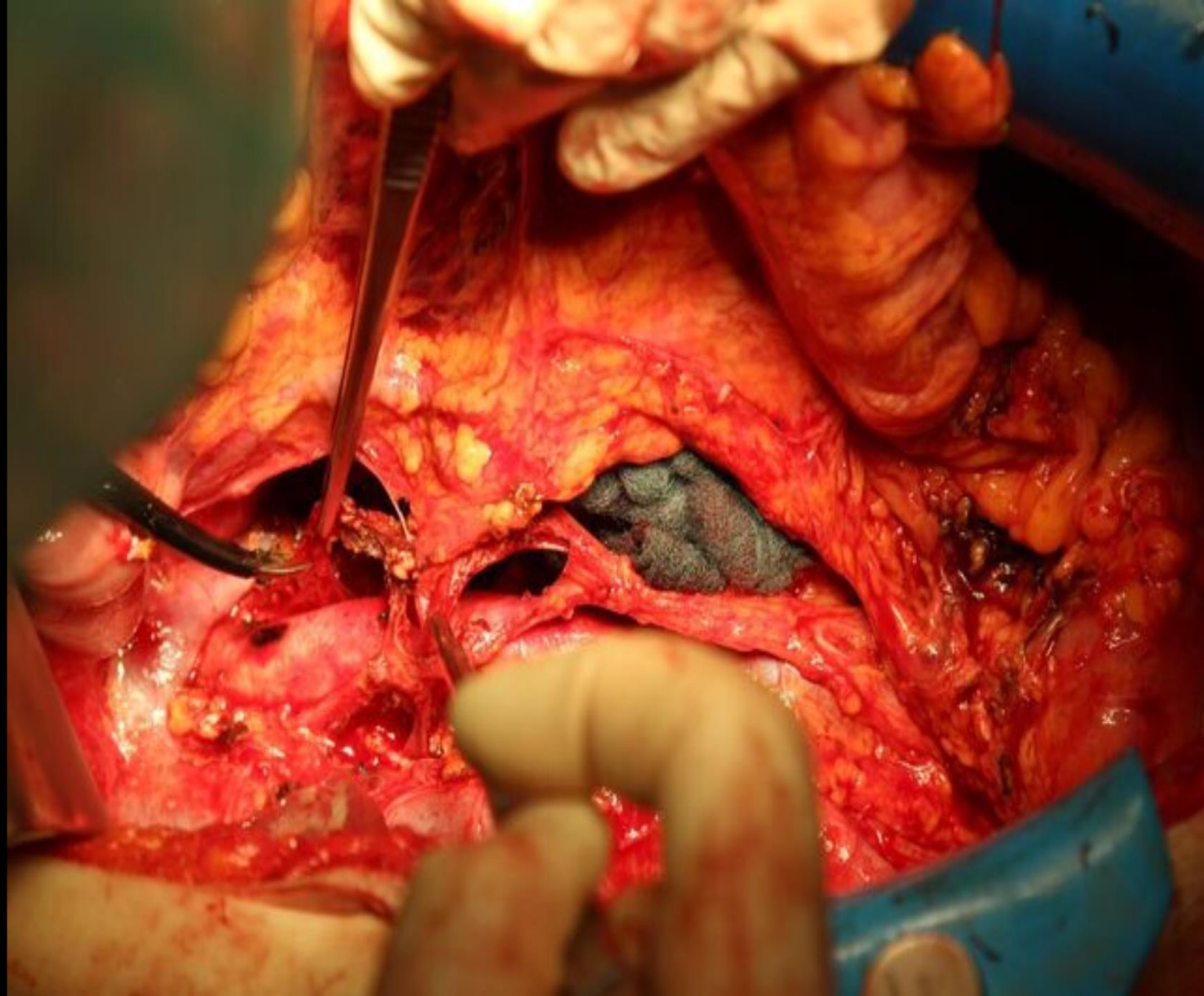
V. renalis dextra

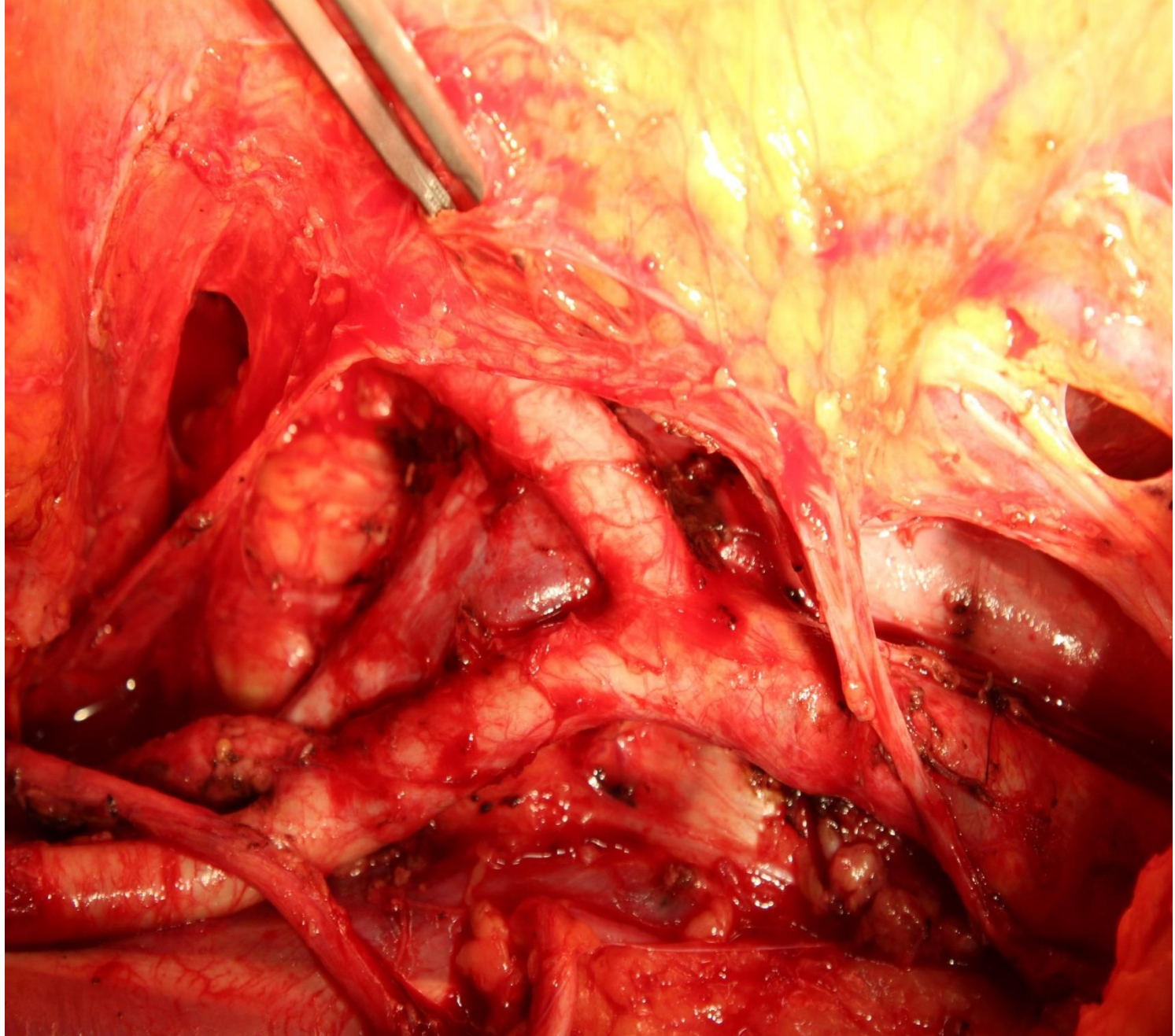
V. ovarica dextra

A. renalis dextra

N. Ilio-inguinalis sin









ORIGINAL ARTICLE – GYNECOLOGIC ONCOLOGY

Lymph Node Involvement Pattern and Survival Differences of FIGO IIIC and FIGO IIIA1 Ovarian Cancer Patients After Primary Complete Tumor Debulking Surgery: A 10-Year Retrospective Analysis of the Tumor Bank Ovarian Cancer Network

Khayal Gasimli^{1,2}, Elena Ioana Braicu, MD^{1,2}, Mani Nassir², Rolf Richter, MPH^{1,2}, Aygun Babayeva², Radoslav Chekerov, MD^{1,2}, Silvia Darb-Esfahani, MD, PhD³, Jalid Sehouli, MD, PhD^{1,2}, and Mustafa Zelal Muallem, MD¹

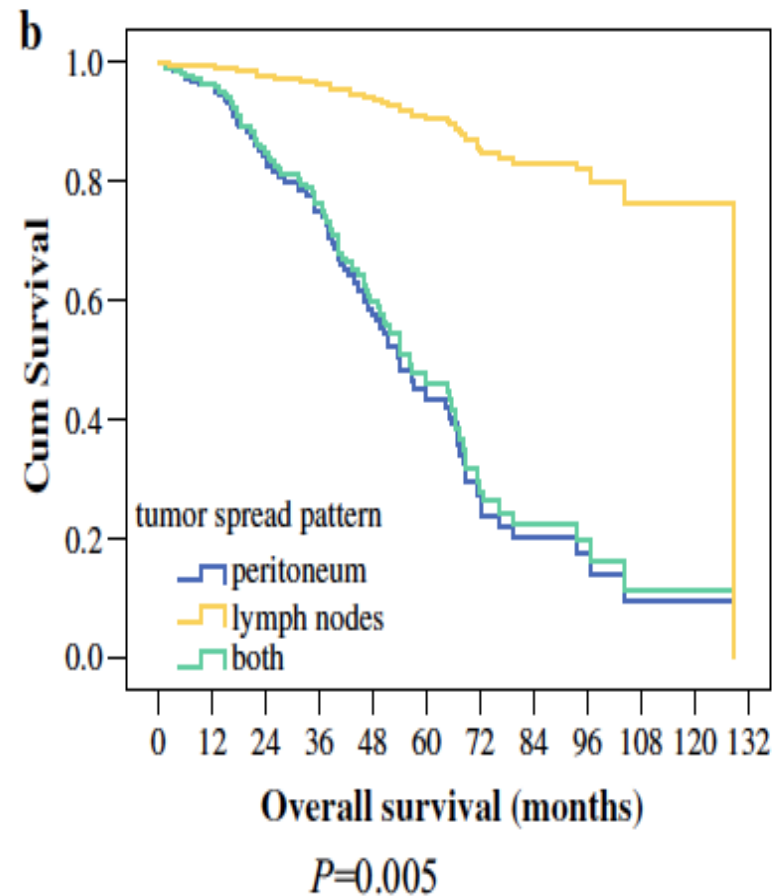
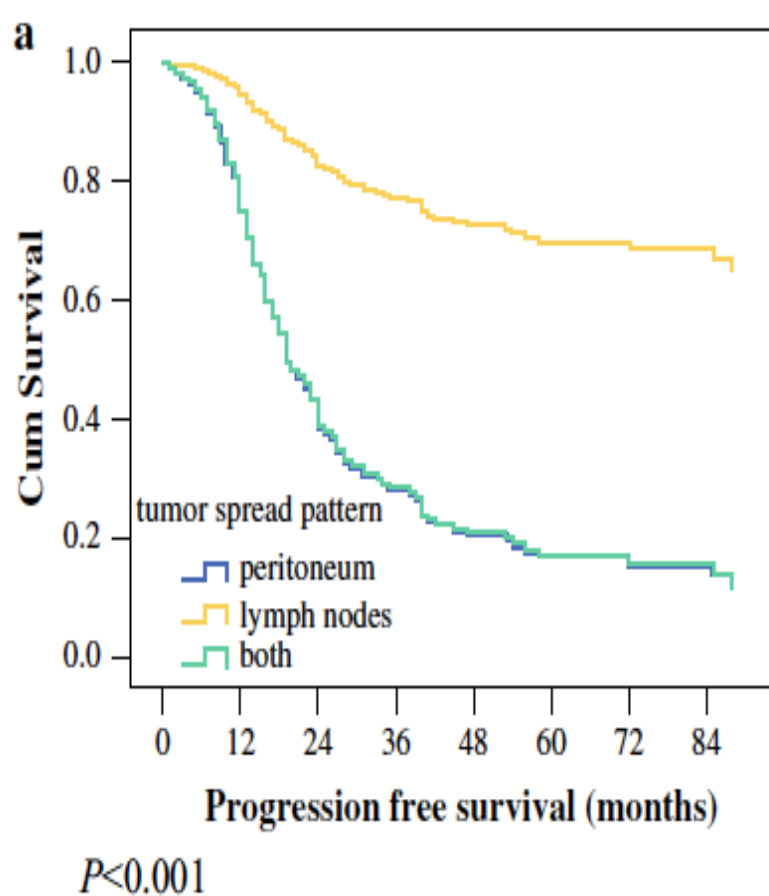


FIG. 1 Survival analysis of groups according to their tumor spread pattern. *Cum* cumulative

Risk factors for mortality – multivariate analysis (Cox regression) in operated patients with primary ovarian cancer under systemic chemotherapy.
in 76 out of 2743 patients.

Variable	Hazard ratio	95% Confidence interval	p-value
Age (35-81y) /10yrs	1.17	1.11 – 1.23	< 0.001
FIGO stage IIIc or higher (vs. FIGO < IIIc)	1.68	1.46 – 1.93	< 0.001
Chemotherapy* (yes vs. no)	0.48	0.27 – 0.88	0.017
Incomplete tumor resection (i.e. tumor residuals >0mm) (yes vs. no)	2.76	2.41 – 3.16	< 0.001
Pulmonary embolism (yes vs. no)	2.86	1.82 – 4.50	< 0.001

*Fotopoulou, duBois et
Sehouli
J Clin Oncol. 2008 Jun
1;26(16):2683-9*

Abstr. 5500: LION – LYMPHADENECTOMY IN OVARIAN NEOPLASMS.

A prospective randomized AGO Study Group led Gynecologic Cancer Intergroup trial. AGO OVAR OP3/ENGOT-ov31.

Philipp Harter¹, J. Sehouli², D. Lorusso³, A. Reuss⁴, I. Vergote⁵, C. Marth⁶, JW Kim⁷, F. Raspagliesi⁸, B. Lampe⁹, F. Landoni¹⁰, W. Meier¹¹, D. Cibula¹², A. Mustea¹³, S. Mahner¹⁴, I. Runnebaum¹⁵, B. Schmalfeldt¹⁶, A. Burges¹⁴, R. Kimmig¹⁷, U. Wagner¹⁸, A. du Bois¹

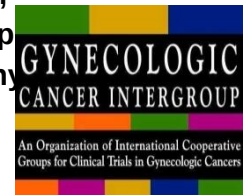
¹ AGO & Essen, Germany, ² AGO & Berlin, Germany, ³ MITO & Milan, Italy, ⁴ KKS Marburg, Germany;

⁵ BGOG & Leuven, Belgium, ⁶ AGO-Austria & Innsbruck, Austria, ⁷ KGOG & Seoul, South Korea, ⁸ MITO & Milan, Italy,

⁹ AGO & Düsseldorf, Germany, ¹⁰ MaNGO & Milan, Italy, ¹¹ AGO & Düsseldorf, Germany, ¹² AGO & Prague, Czech Rep

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¹⁷ AGO & Essen, Germany, ¹⁸ AGO & Marburg, Germany



The “LION” Study: Characteristics of surgery

Bilateral Salpingo-oophorectomy*	319 (98.8)	320 (98.8)	0.99
Hysterectomy*	321 (99.4)	322 (99.4)	0.99
Omentectomy	319 (98.8)	322 (99.4)	0.41
(Partial) peritonectomy	291 (90.1)	291 (89.8)	0.99
•Pelvis	276 (85.5)	278 (85.8)	
•Paracolic	193 (59.8)	208 (64.2)	
•Diaphragm	173 (53.6)	196 (60.5)	
Gastrointestinal tract resection	169 (52.3)	167 (51.5)	0.84
Stoma	34 (10.5)	24 (7.4)	0.17
Splenectomy	62 (19.2)	56 (17.3)	0.53
Porta hepatis/lesser omentum	61 (18.9)	69 (21.3)	0.44
Partial pancreatectomy	7 (2.1)	7 (2.1)	0.99
Partial hepatectomy	27 (8.4)	28 (8.6)	0.90
Pleurectomy	20 (6.2)	24 (7.4)	0.54
Complete resection	321 (99.4)	322 (99.4)	0.99

The “LION-Study”: Characteristics of surgery

	LNE (%)	No LNE (%)	Difference	p-value
Study procedure according to randomisation	320 (99.1)	313 (96.6)		
Resected LN total (median, IQR)	57 (45-73)			
Para-aortic LN	22 (16-33)			
Pelvic LN	35 (26-43)			
Lymph node metastases	180 (55.7)			
Duration (median, IQR) [min]	340 (270-420)	280 (210-360)	+ 1 hour	<0.001
Blood loss (median, IQR) [ml]	650 (400-1000)	500 (300-900)	+ 150 ml	<0.001
Transfusions	205 (63.7)	181 (56.0)	+ 8%	0.005
Massive transfusions (> 10 RBC/24h)	7 (2.2)	2 (0.6)		0.09
Fresh-frozen plasma	117 (36.3)	96 (29.7)	+ 7%	0.07
Intermediate/Intensive Care Unit	250 (77.6)	223 (69.4)	+ 8%	0.01

LION: Post-surgical outcome

	LNE (%)	No LNE (%)	p-value
Infections requiring antibiotics	83 (25.8)	60 (18.6)	0.03
Fever > 38.0° Celsius	41 (12.7)	32 (9.9)	0.21
Sepsis	6 (1.9)	3 (0.9)	0.31
Thrombosis	7 (2.2)	5 (1.6)	0.56
Pulmonary embolism	12 (3.7)	15 (4.6)	0.56
Secondary wound healing	31 (9.6)	19 (5.9)	0.12
Prolonged ileus (conservative management)	15 (4.6)	17 (5.3)	0.72
Peripheral sensoric neurologic event	7 (2.2)	7 (2.2)	0.99
Peripheral motoric neurologic event	10 (3.1)	8 (2.5)	0.63
Asymptomatic lymph cysts	14 (4.4)	1 (0.3)	<0.001
Symptomatic lymph cysts	10 (3.1)	0	0.001
Fistula	5 (1.6)	7 (2.2)	0.56
Readmission rate	40 (12.4)	27 (8.3)	0.09
Rate of re-laparotomy for complications	40 (12.4)	21 (6.5)	0.01
60 day postoperative mortality	10 (3.1)	3 (0.9)	0.049
Platinum + Taxan i.v.	257 (79.6)	274 (84.6)	0.09

More than 20 years „Fast track stories“...but

British Journal of Anaesthesia 1997; 78: 606–617

Multimodal approach to control postoperative pathophysiology and rehabilitation

H. KEHLET

REVIEW ARTICLE

Enhanced Recovery After Surgery (ERAS) for gastrointestinal surgery, part 2: consensus statement for anaesthesia practice

A. Feldheiser¹, O. Aziz², G. Baldini³, B. P. B. W. Cox⁴, K. C. H. Fearon⁵, L. S. Feldman⁶, T. J. Gan⁷, R. H. Kennedy⁸, O. Ljungqvist⁹, D. N. Lobo¹⁰, T. Miller⁷, F. F. Radtke¹, T. Ruiz Garces¹¹, T. Schricker¹², M. J. Scott¹³, J. K. Thacker¹⁴, L. M. Ytrebø¹⁵ and F. Carli³

**Acta Anaesthesiologica
Scandinavica**

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AN INTERNATIONAL JOURNAL OF ANAESTHESIOLOGY AND INTENSIVE CARE, PAIN AND EMERGENCY MEDICINE

Differences in observing and interpretation

liberal



Surgical view

Restrictiv



Anesthetic view



Restrictive Volume-Management!!!

TABLE 3. Number of Patients With Complications (Per-Protocol Analysis)

	Blinded Assessment		<i>P</i> value
	Restricted Group	Standard Group	
Overall complications	21	40	0.003
Major complications [†]	8	18	0.040
Minor complications [†]	15	36	0.000
Tissue-healing complications [†]	11	22	0.040
Cardiopulmonary complications [†]	5	17	0.007

Brandstrup, B. et al., Ann Surg, 2003



The „Charité-Experience“

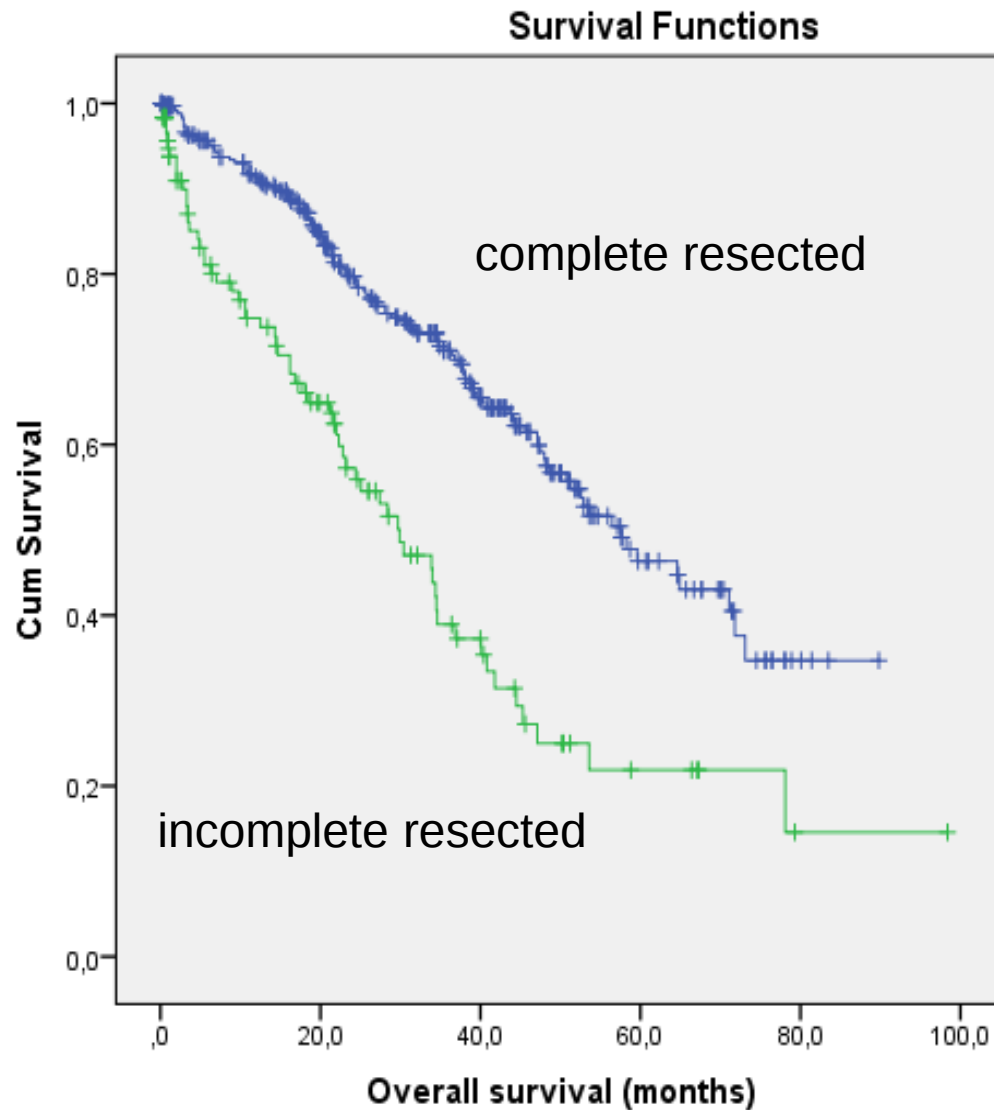
(n=536 pts)

Jumana Almuheimid, Zelal Muallem, Jalid Sehouli et al

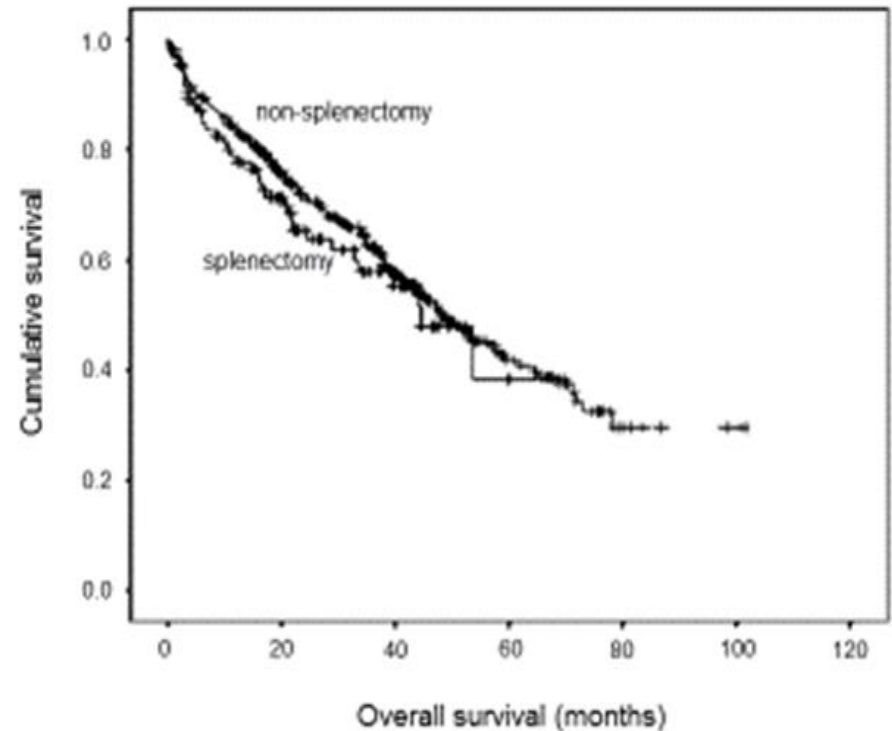
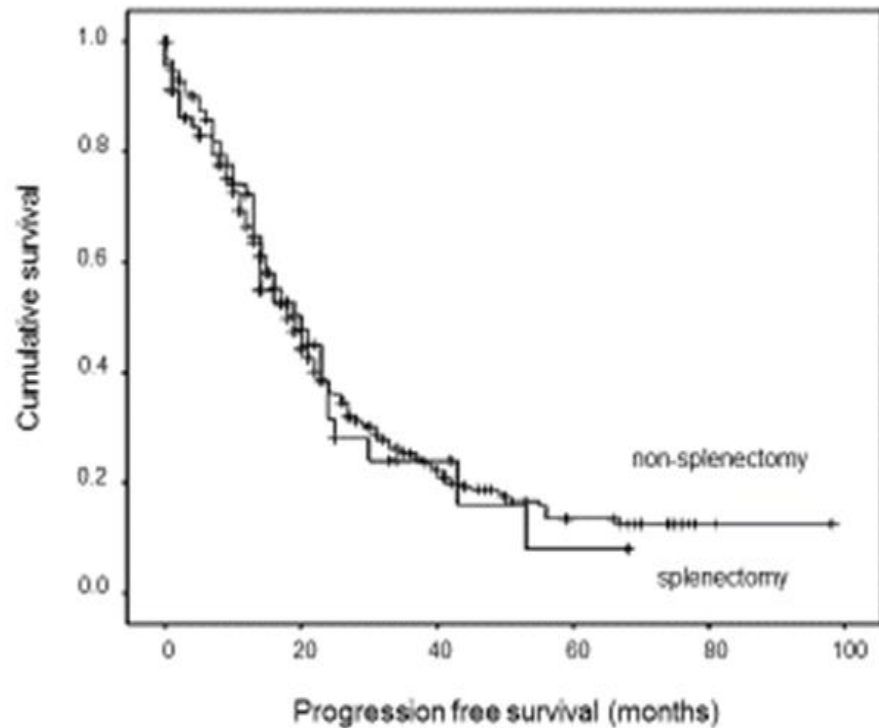
Characteristics		All patients n=536 (%)	Diaphragmatic surgery n=268 (%)	Without diaphragmatic surgery n=268 (%)	p-value
Residual tumour	No residual	354 (66%)	176 (65.7%)	178 (66.4%)	
	< 10 mm	122 (22.8%)	73 (27.2%)	49 (18.3%)	
	≥ 10 mm	52 (9.7%)	17 (6.3%)	35 (13%)	
	Unknown	8 (1.5%)	2 (0.7%)	6 (2.2%)	
Op-duration [Minutes]		Median 265 (30-592)	Median 282,5 (30-592)	Median 244 (30-540)	<0,001 *
Bowel resection		318 (59.3%)	191 (71.3%)	127 (47.4%)	<0,001 *
Atypical liver resection		12 (2.2%)	8 (3%)	4 (1.5%)	
Partial Resection of liver capsule		63 (11.8%)	49 (18.4%)	14 (5.2%)	<0,001
Cholecystectomy		40 (7.5%)	27 (10.1%)	13 (4.9%)	0.03
Splenectomy		86 (16%)	65 (24.3%)	21 (7.8%)	<0,001
Stomach partial resection		8 (1.5%)	7 (2.6%)	1 (0.4%)	0.068
Lung partial resection		1 (0.2%)	1 (0.4%)	0	
Anus praetor		71 (13.2%)	36 (13.4%)	35 (13.1%)	
Postoperative complications		237 (44.2%)	133 (49.6%)	104 (38.8%)	0.04
Thrombo -embolic events		27 (5%)	18 (6.7%)	9 (3.35%)	
Postoperative infection		55 (10.3%)	36 (13.4%)	19 (7%)	0.02
Postoperative sepsis		13 (2.4%)	4 (1.5%)	9 (3.3%)	
Postoperative Pneumonia		21 (3.9%)	12 (4.5%)	9 (3.3%)	
Postoperative pleura effusion		106 (19.8%)	68 (25.4%)	38 (14.2%)	0.002
Postoperative lung oedema		2 (0.3%)	0	2 (0.6%)	

Postoperative pneumothorax	10 (1.9%)	5 (1.9%)	5 (1.9%)	
Postoperative ileus	18 (3.35%)	10 (3.7%)	8 (3%)	
Bowel perforation	7 (1.3%)	5 (1.9%)	2 (0.75%)	
Anastomosis insufficiency	17 (3.2%)	12 (4.5%)	5 (1.9%)	
Wound dehiscence	21 (3.9%)	10 (3.7%)	11 (4.1%)	
Postoperative cardiac arrhythmia	29 (5.4%)	16 (6%)	13 (4.9%)	
Postoperative bleeding	16 (3%)	5 (1.9%)	11 (4.1%)	
Neurologic complications	24 (4.5%)	16 (6%)	8 (3%)	
Postoperative organ failure	18 (3.35%)	8 (3%)	10 (3.7%)	
Postoperative fistula	6 (1.1%)	4 (1.5%)	2 (0.75%)	
30 day Mortality	16 (2.99%)	5 (1.9%)	11 (4.1%)	

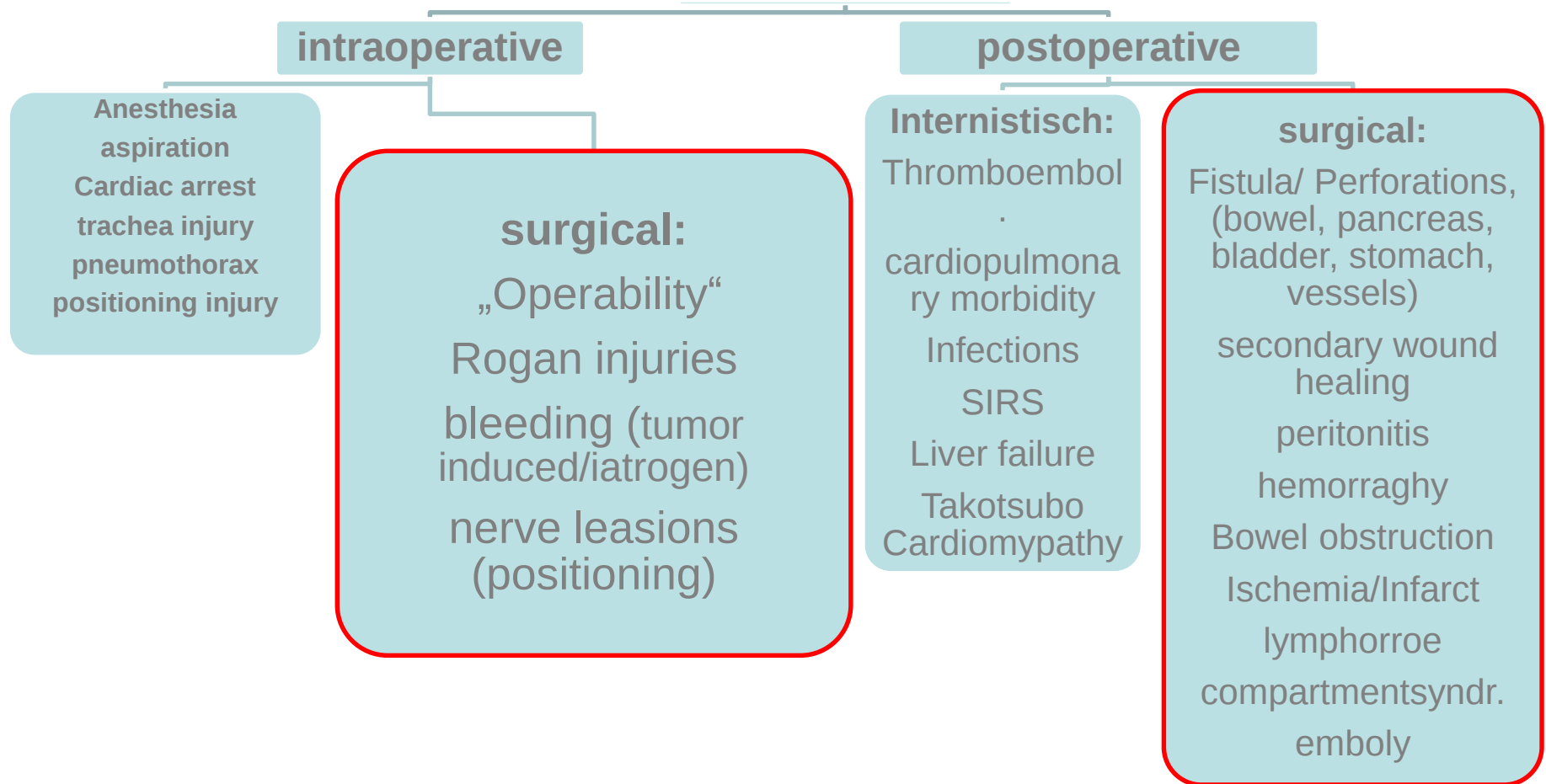
Overall Survival



PROGRESSION FREE SURVIVAL AND OVERALL SURVIVAL IN PATIENTS WITH ADVANCED OVARIAN CANCER UNDERGOING PRIMARY CYTOREDUCTIVE SURGERY



COMPLICATIONS



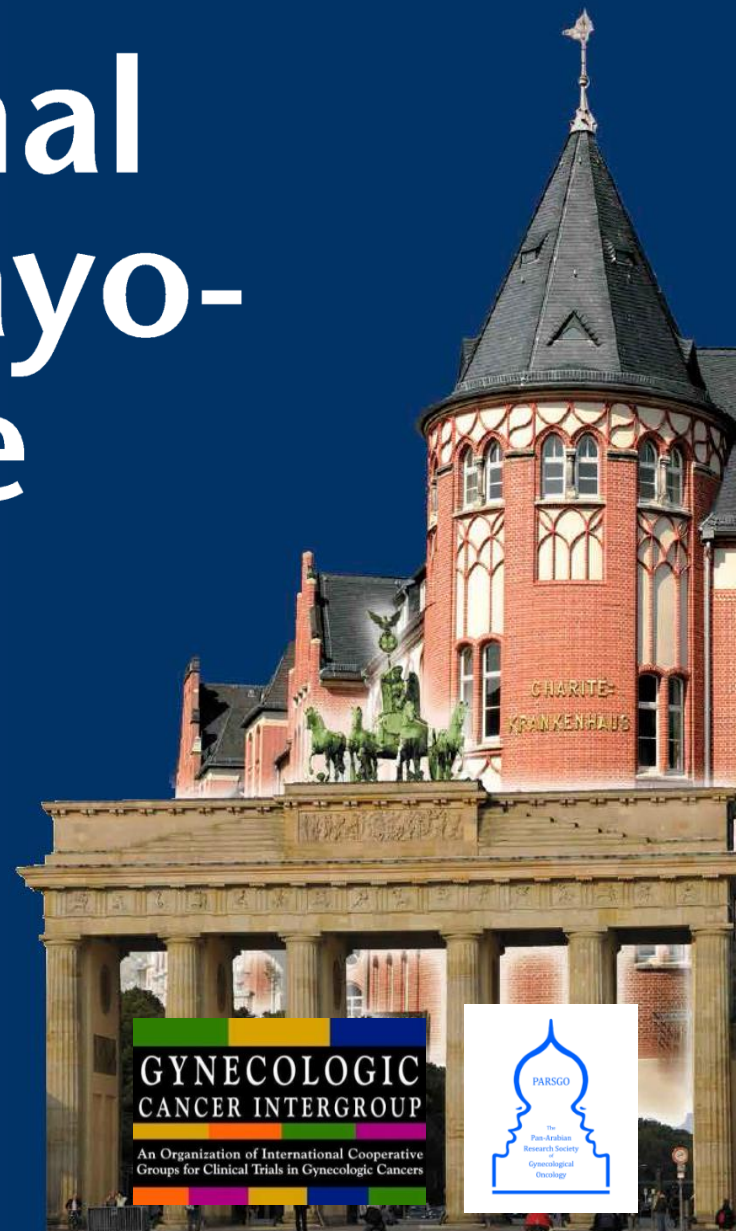
MORBIDITY - MORTALITY



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