Gynecologic Oncology Advances in Surgery

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6th MMOF Congress, 3rd Int Congress on Oncological Sciencies,
Friday 29/11/2019, Antalya, Turkey.

Cervical Cancer

New FIGO Classification

0			Carcinoma in situ, intraepithelial
I			Carcinoma strictly confined to cervix
	IA		Preclinical tumors (i.e., diagnosed only with microscopy)
		IA1	Invasion $\leq$3 mm in depth, $\leq$7 mm horizontal
		IA2	Invasion >3 mm but $\leq$5 mm in depth, $\leq$7 mm horizontal
	IB		Confined to cervix or lesions greater than stage IA
		IB1	Clinical lesions $\leq$4 cm
		IB2	Clinical lesions >4 cm
II			Extension beyond the cervix but not to pelvic wall or lower third of vagina
	IIA		No obvious parametrial involvement
	IIB		Obvious parametrial involvement
III			Carcinoma extending to pelvic wall, lower third of vagina or causing hydronephrosis
	IIIA		Involvement of lower third of vagina, but not pelvic wall
	IIIB		Extension to pelvic wall or hydronephrosis
IV			Extension beyond true pelvis or involving mucosa of bladder or rectum
	IVA		Invasion of bladder or rectal mucosa
	IVB		Distant metastasis

Table 1
International Federation of Gynecology and Obstetrics (FIGO) Surgical Staging of Cancer of the Cervix Uteri (2018)

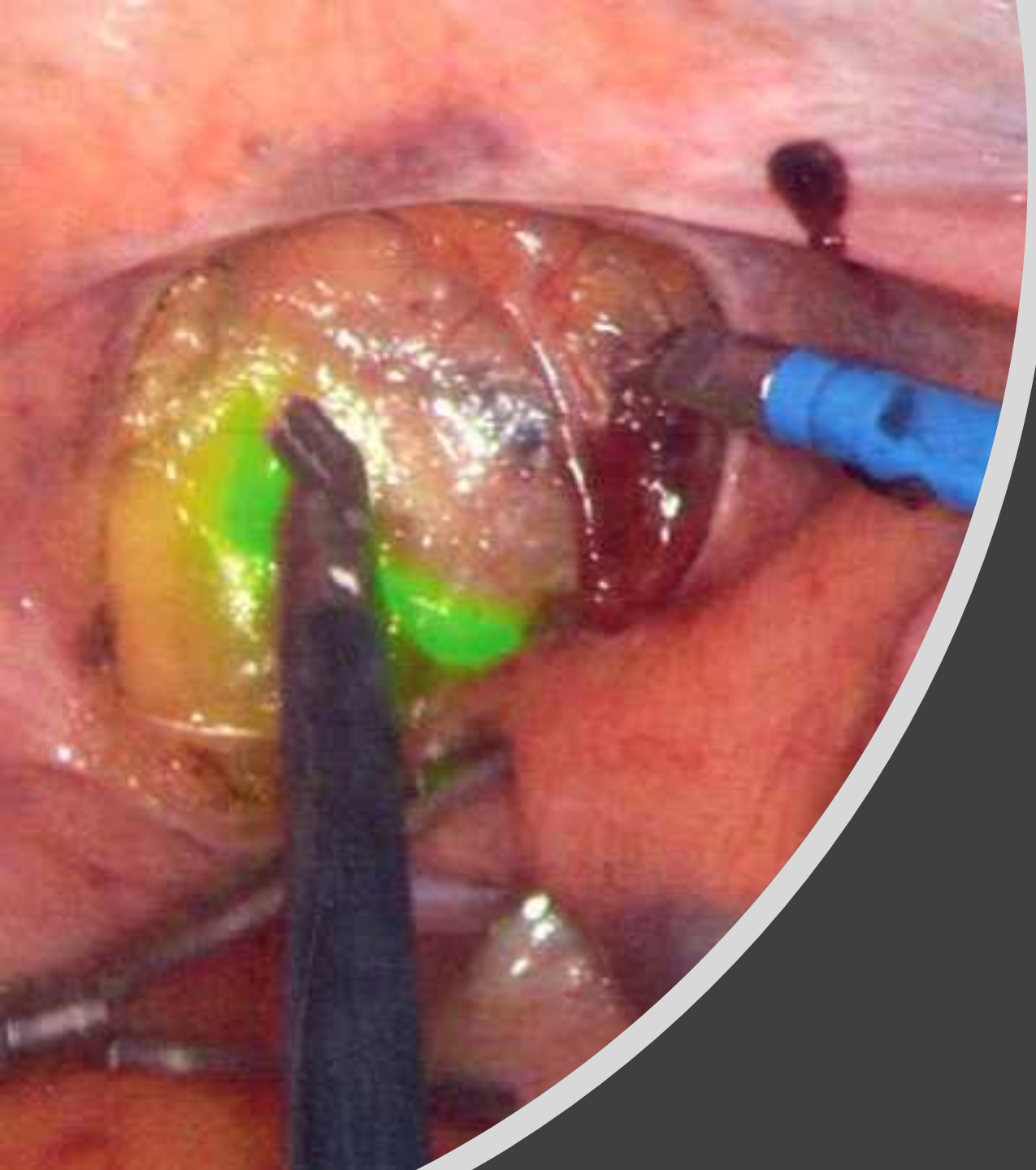
Stage	Description
I	The carcinoma is strictly confined to the cervix (extension to the uterine corpus should be disregarded)
IA	Invasive carcinoma that can be diagnosed only by microscopy, with maximum depth of invasion <5 mm[a]
IA1	Measured stromal invasion <3 mm in depth
IA2	Measured stromal invasion ≥3 mm and <5 mm in depth
IB	Invasive carcinoma with measured deepest invasion ≥5 mm (greater than Stage IA), lesion limited to the cervix uteri[b]
IB1	Invasive carcinoma ≥5 mm depth of stromal invasion, and <2 cm in greatest dimension
IB2	Invasive carcinoma ≥2 cm and <4 cm in greatest dimension
IB3	Invasive carcinoma ≥4 cm in greatest dimension
II	The carcinoma invades beyond the uterus, but has not extended onto the lower third of the vagina or to the pelvic wall
IIA	Involvement limited to the upper two-thirds of the vagina without parametrial involvement
IIA1	Invasive carcinoma <4 cm in greatest dimension
IIA2	Invasive carcinoma ≥4 cm in greatest dimension
IIB	With parametrial involvement but not up to the pelvic wall
III	The carcinoma involves the lower third of the vagina and/or extends to the pelvic wall and/or causes hydronephrosis or nonfunctioning kidney and/or involves pelvic and/or para-aortic lymph nodes[c]
IIIA	The carcinoma involves the lower third of the vagina, with no extension to the pelvic wall
IIIB	Extension to the pelvic wall and/or hydronephrosis or nonfunctioning kidney (unless known to be due to another cause)
IIIC	Involvement of pelvic and/or para-aortic lymph nodes, irrespective of tumor size and extent (with r and p notations)[c]
IIIC1	Pelvic lymph node metastasis only
IIIC2	Para-aortic lymph node metastasis
IV	The carcinoma has extended beyond the true pelvis or has involved (biopsy proven) the mucosa of the bladder or rectum. (A bullous edema, as such, does not permit a case to be allotted to Stage IV)
IVA	Spread to adjacent pelvic organs
IVB	Spread to distant organs

Differences

- Stage IA: lateral extension measurement is removed
- Stage IB has three subgroups—stage IB1: invasive carcinomas ≥5 mm and <2 cm in greatest diameter; stage IB2: tumors 2–4 cm; stage IB3: tumors ≥4 cm.
- Imaging or pathology findings may be used to assess retroperitoneal lymph nodes
- If metastatic, the case is assigned stage IIIC; if only pelvic lymph nodes, the case is assigned stage IIIC1; if para-aortic nodes are involved, the case is assigned stage IIIC2.

Bhatla et al, IJGO 2019

- Notations ‘r’ and ‘p’ will indicate the method used to derive the stage—i.e., imaging or pathology, respectively—and should be recorded.
- Routine investigations and other methods (e.g., examination under anesthesia, cystoscopy, proctoscopy, etc.) are not mandatory and are to be recommended based on clinical findings and standard of care.



Sentinel Lymph Node

Surgical algorithm for Sentinel Lymph Nodes detection in early-stage cervical cancer

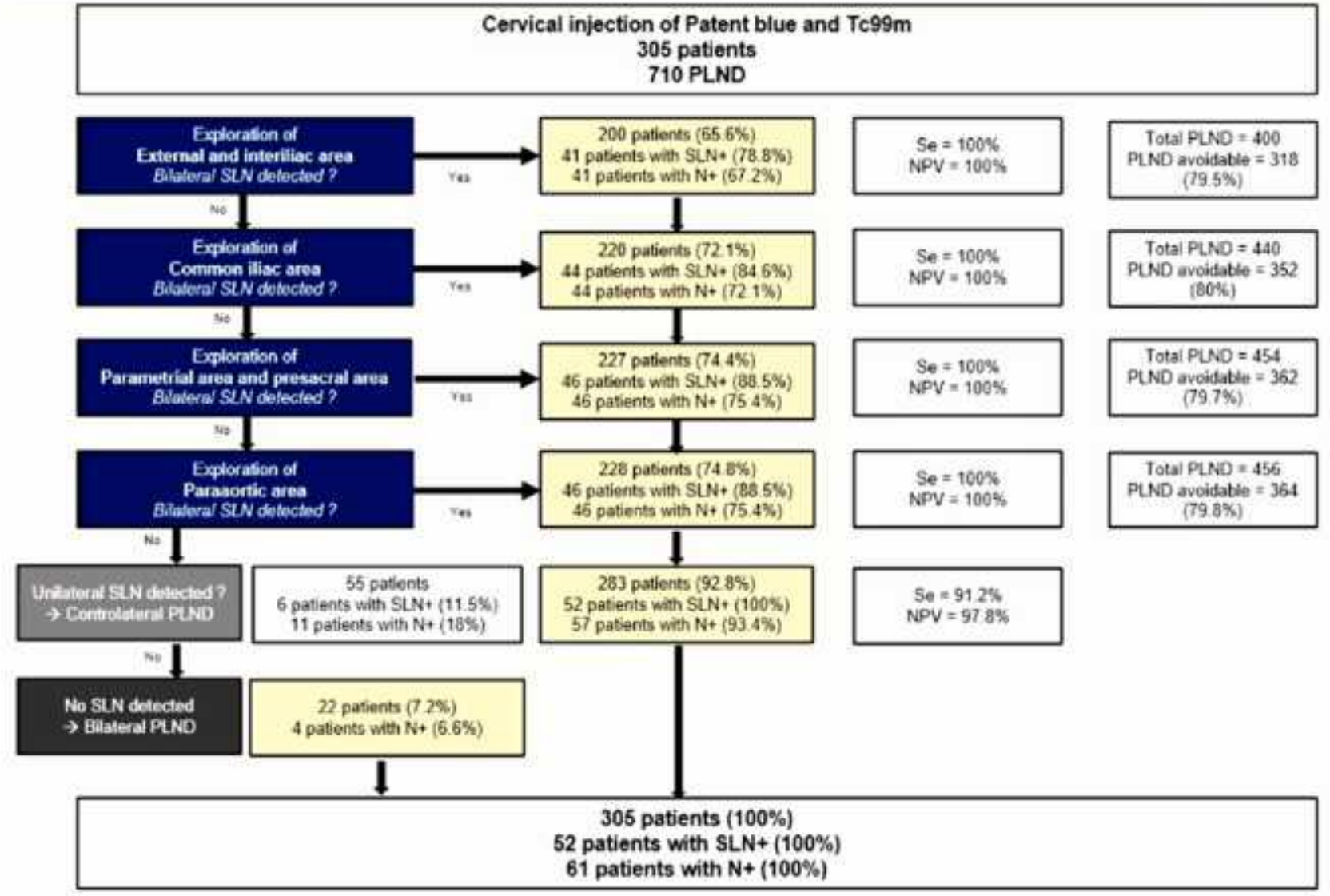
Insights of SENTICOL I and II cohorts

- Based on prospective cohorts, the aim of this study was to describe and assess a **surgical algorithm** for sentinel lymph nodes (SLN) detection in early-stage cervical cancer to improve lymph node staging.

- Ancillary analysis of data from two prospective multicentric trials on SLN biopsy for cervical cancer (SENTICOL I & II)
- 412 patients included between 2005 and 2012 from 30 French oncologic centers
- SLN detection by combined technique : Patent Blue and radioactive tracer
- Approved by the Paris Descartes Ethical Committee

Surgical algorithm for Sentinel Lymph Nodes detection in early-stage cervical cancer

Insights of SENTICOL I and II cohorts



SENTIX Trial (CEEGOG-CX01; ENGOT-CX2; NCT02494063)

- International multicentric prospective observational trial
- 46 Centers – 17 Countries - 444 cases registered in the SLN study group
- **Objective:** to proof non-inferiority of SLN vs. pelvic lymphadenectomy in early stage cervical cancer

Cibula D. Int J Gyn Cancer, 2019

SENTIX

Study Type :	Observational
Estimated Enrollment :	600 participants
Observational Model:	Cohort
Time Perspective:	Prospective
Official Title:	A Prospective Observational Trial on Sentinel Lymph Node Biopsy in Patients With Early Stage Cervical Cancer
Study Start Date :	June 2016
Estimated Primary Completion Date :	June 2021
Estimated Study Completion Date :	June 2021

SENTICOL III

- International prospective multicenter randomized trial
- « co-primary » objective regarding Disease Free Survival (DFS) and Health Related Quality of Life. The hypothesis is that SLN biopsy alone provides similar DFS and better quality of life.
- Secondary objectives are outcome of patients with ITC and micrometastases, evaluation of mapping with indocyanine green (ICG), overall survival, recurrence free survival

Lecuru et al, JCO, 2018

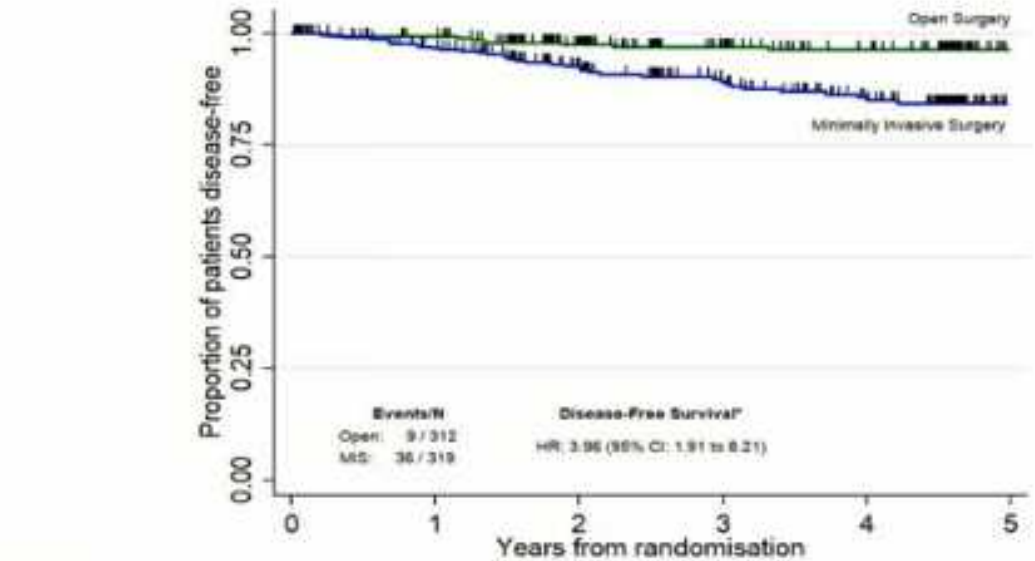
Mode of Operation in Cervical Ca

The NEW ENGLAND JOURNAL of MEDICINE

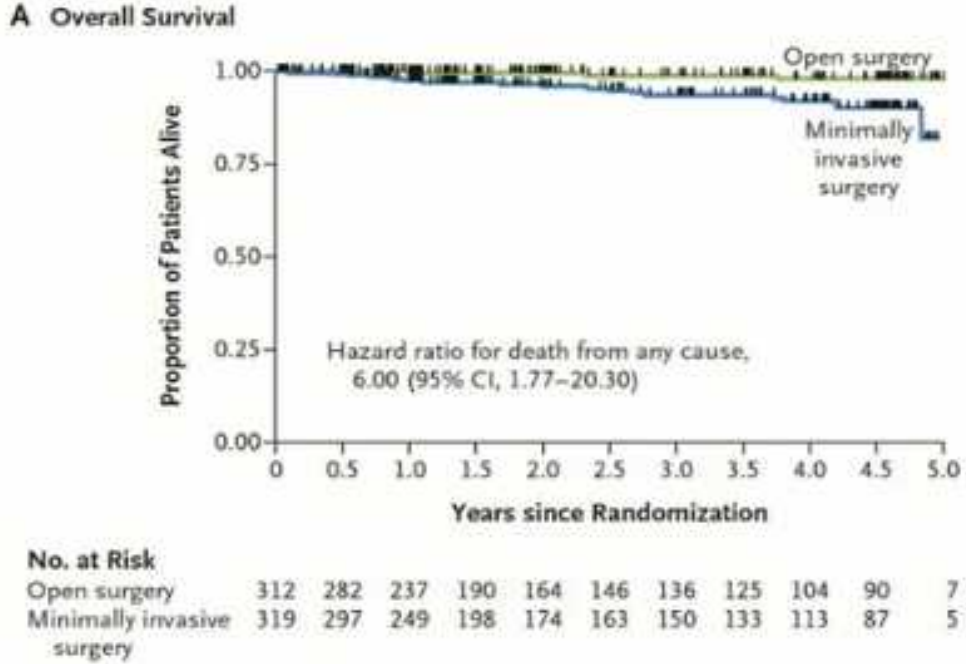
ORIGINAL ARTICLE

Minimally Invasive versus Abdominal Radical Hysterectomy for Cervical Cancer

Pedro T. Ramirez, M.D., Michael Frumovitz, M.D., Rene Pareja, M.D., Aldo Lopez, M.D., Marcelo Vieira, M.D., Reitan Ribeiro, M.D., Alessandro Buda, M.D., Xiaojian Yan, M.D., Yao Shuzhong, M.D., Naven Chetty, M.D., David Isla, M.D., Mariano Tamura, M.D., Tao Zhu, M.D., Kristy P. Robledo, Ph.D., Val Gebski, M.Stat., Rebecca Asher, M.Sc., Vanessa Behan, B.S.N., James L. Nicklin, M.D., Robert L. Coleman, M.D., and Andreas Obermair, M.D.

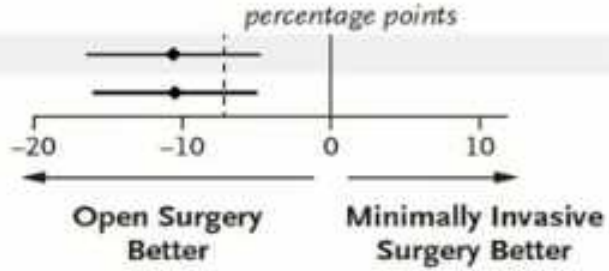


*DFS defined as disease recurrence or death due to cervical cancer

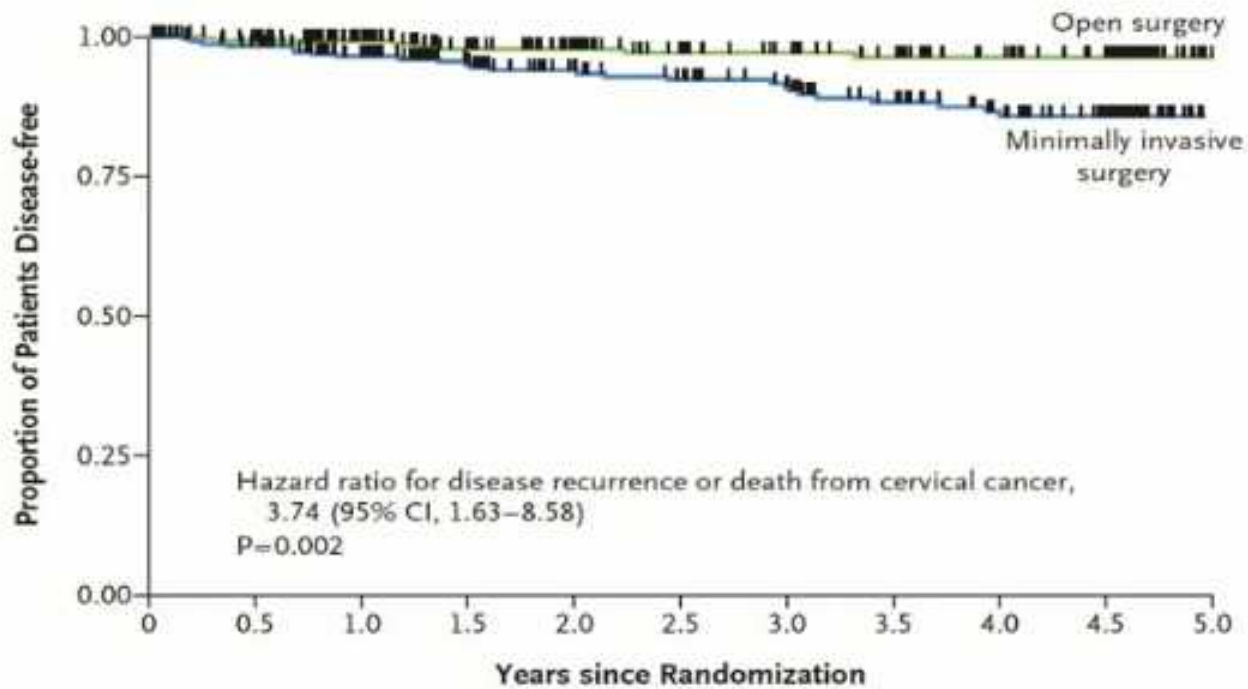


A

Population	Disease-free Survival Rate at 4.5 Yr (95% CI)		Difference (95% CI)	P Value for Noninferiority
	Minimally Invasive Surgery	Open Surgery		
	percent		*percentage points*	
Intention-to-treat population	86.0 (79.7–90.4)	96.5 (92.7–98.4)		0.87
Per-protocol population	87.1 (81.0–91.3)	97.6 (94.1–99.0)		0.88



B



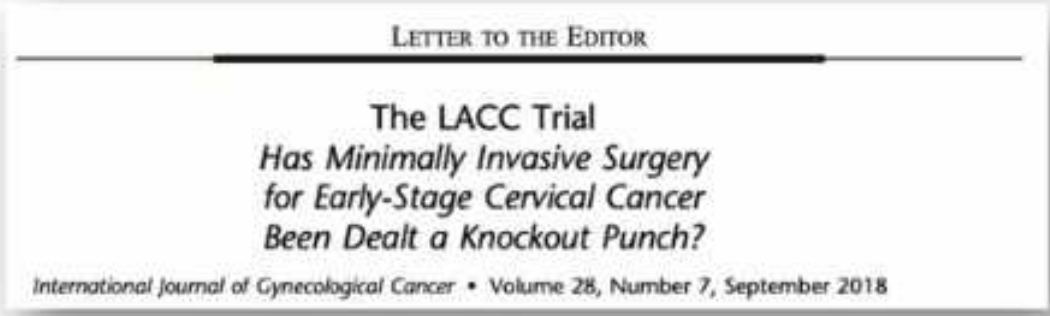
No. at Risk

Open surgery	312	280	236	187	163	144	134	123	104	90	7
Minimally invasive surgery	319	292	244	192	167	155	142	121	102	80	5

Expert Opinion

Unexpected result of minimally invasive surgery for cervical cancer

Hiroyuki Kanao, Yoichi Aoki, Nobuhiro Takeshima



LETTER TO THE EDITOR

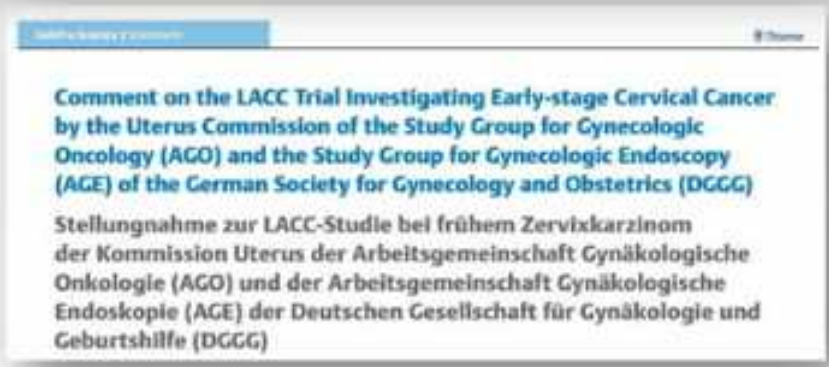
The LACC Trial
Has Minimally Invasive Surgery for Early-Stage Cervical Cancer Been Dealt a Knockout Punch?

International Journal of Gynecological Cancer • Volume 28, Number 7, September 2018

Expert Opinion

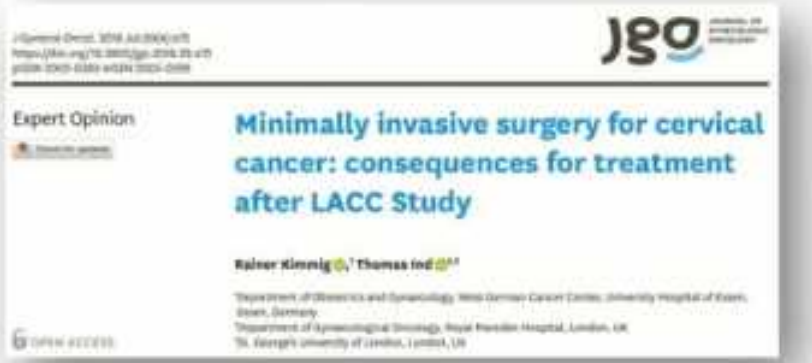
How should gynecologic oncologists react to the unexpected results of LACC trial?

Joong Yeol Park, Joo-Hyun Nam



Comment on the LACC Trial Investigating Early-stage Cervical Cancer by the Uterus Commission of the Study Group for Gynecologic Oncology (AGO) and the Study Group for Gynecologic Endoscopy (AGE) of the German Society for Gynecology and Obstetrics (DGGG)

Stellungnahme zur LACC-Studie bei frühem Zervixkarzinom der Kommission Uterus der Arbeitsgemeinschaft Gynäkologische Onkologie (AGO) und der Arbeitsgemeinschaft Gynäkologische Endoskopie (AGE) der Deutschen Gesellschaft für Gynäkologie und Geburtshilfe (DGGG)



Expert Opinion

Minimally invasive surgery for cervical cancer: consequences for treatment after LACC Study

Rainer Kimmig, Thomas Ind

Correspondence

Rethinking the next step after unexpected results associated with minimally invasive radical hysterectomy for early cervical cancer

Seung Yeon Pyeon, Yun Jung Hur, Jung Min Lee

Editorial

Minimally Invasive Radical Hysterectomy Has Many Benefits Compared with Open Radical Hysterectomy: Will the LACC Trial Cause the Premature Demise of This Procedure?

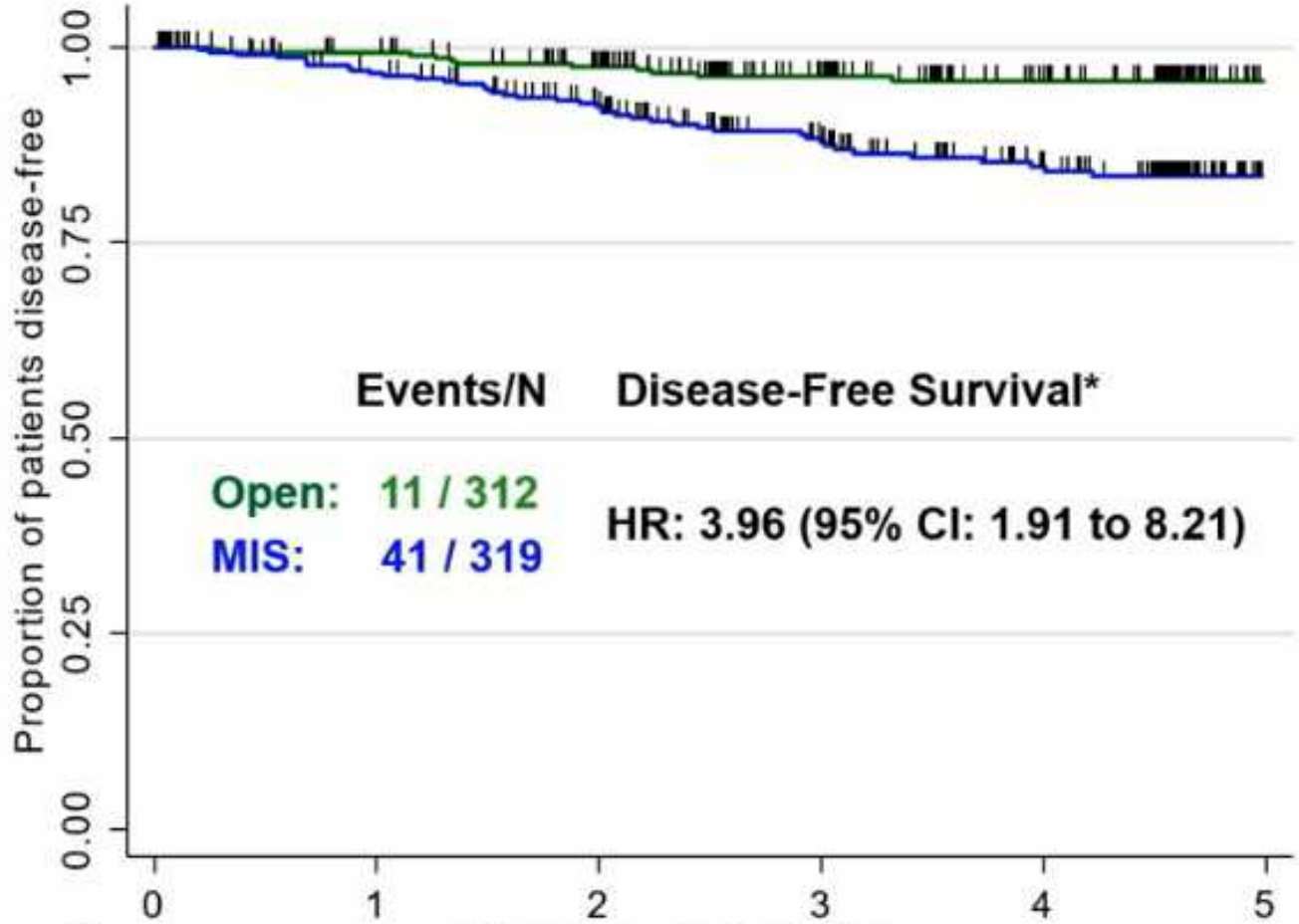
LACC Trial Update October 2019

Disease free survival	
Median FU time years (min-max)	4.0 (0.0-7.4)
Completeness at 4.5 years (%)	316/548 (57.7%)
Information available at 4.5 years	**84.2%**

Overall survival	
Median FU time years (min-max)	4.0 (0.0-7.4)
Completeness at 4.5 years (%)	304/548 (55.5%)
Information available at 4.5 years	**77.9%**

Data updated 23rd October 2019

LACC Trial Update October 2019

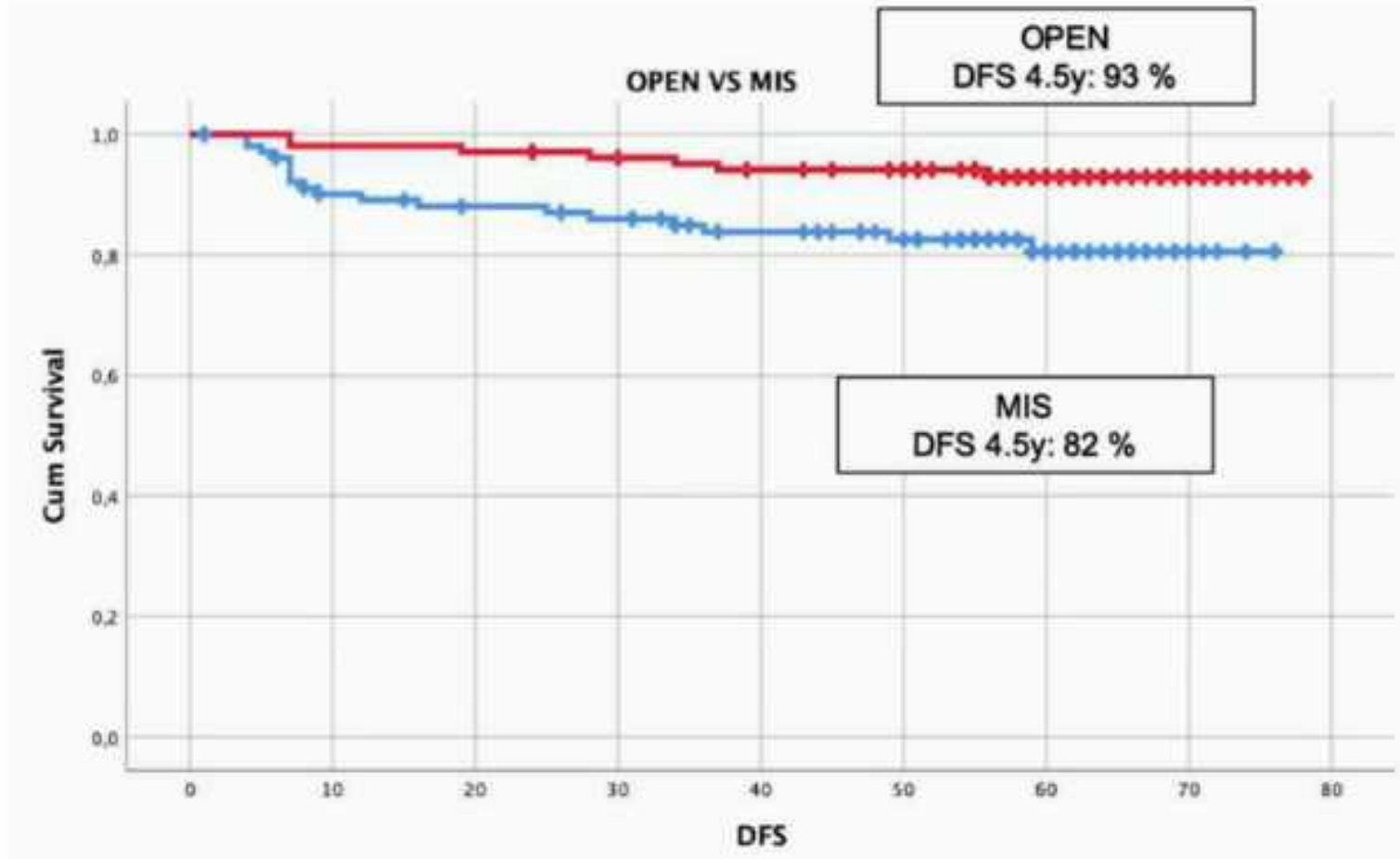


Number at risk (DFS events)

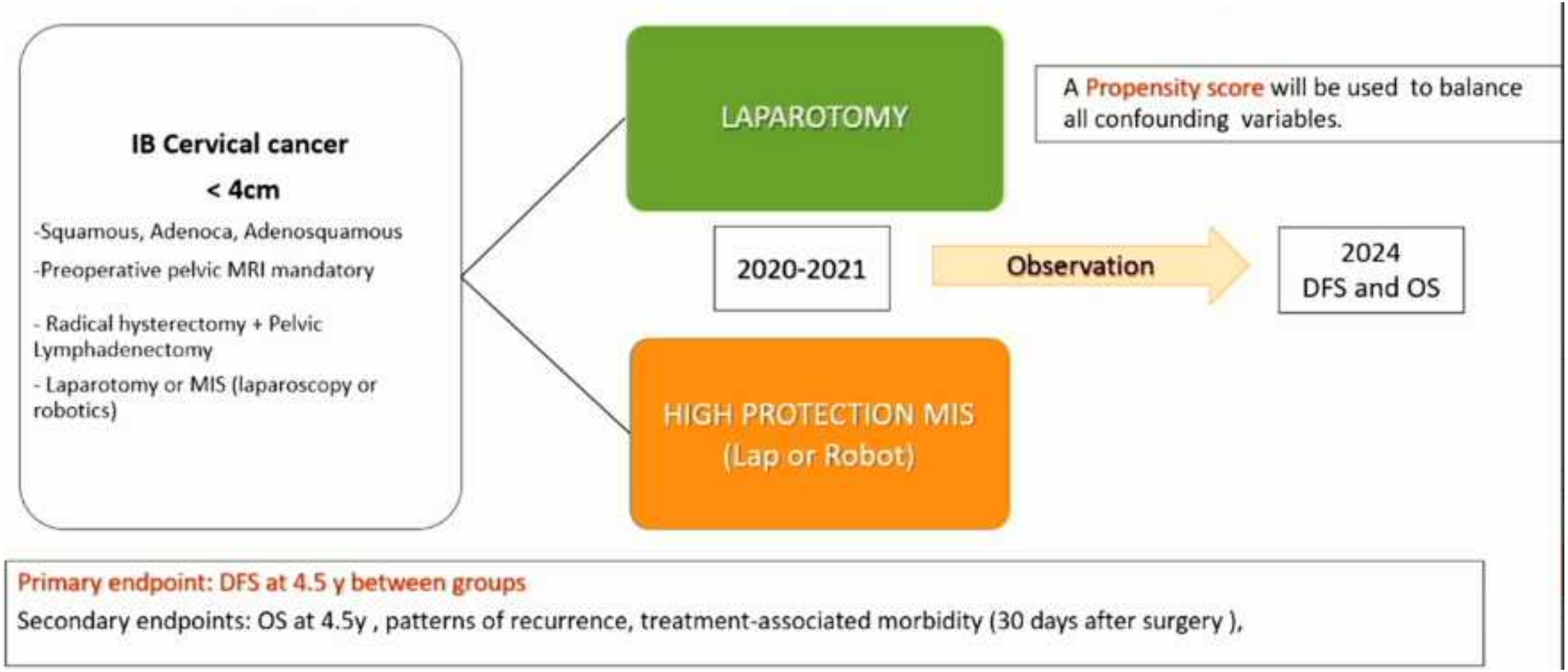
Open surgery	312	(2)	280	(5)	255	(3)	188	(1)	142	(0)	11
Minimally invasive surgery	319	(10)	285	(12)	251	(11)	186	(6)	143	(2)	12

Data updated 23rd October 2019

SUCCOR Study. An International European Cohort Observational Study comparing minimally invasive surgery versus open abdominal Radical Hysterectomy in patients with stage IB1 (FIGO 2009,< 4 cm) cervical cancer operated in 2013-2014.



SuccoProtective Study



Uterine Cancer

National Comprehensive Cancer Network®

NCCN Guidelines Version 4.2019
Endometrial Carcinoma

NCCN Guidelines Index
Table of Contents
Discussion

PRINCIPLES OF EVALUATION AND SURGICAL STAGING

Principles of Surgical Staging for Endometrial Cancer[1-15]

- TH/BSO,and lymph node assessment is the primary treatment of apparent uterine-confined endometrial carcinoma, unless patients desire (and are candidates for) fertility-sparing options (See ENDO-8).[1-3] Select patients with metastatic endometrial carcinoma are also candidates for hysterectomy. (See Principles of Pathology [ENDO-A])
- Endometrial carcinoma should be removed en bloc to optimize outcomes; intraperitoneal morcellation or tumor fragmentation should be avoided.
- TH/BSO and lymph node assessment may be performed by any surgical route (eg, laparoscopic, robotic, vaginal, abdominal), although the standard in those with apparent uterine-confined disease is to perform the procedure via a minimally invasive approach. Randomized trials, a Cochrane Database Systematic Review, and population-based surgical studies support that minimally invasive techniques are preferred in this setting due to a lower rate of surgical site infection, transfusion, venous thromboembolism, decreased hospital stay, and lower cost of care, without compromise in oncologic outcome.[4-9]
- The lymph node assessment includes evaluation of the nodal basins that drain the uterus, and often comprises a pelvic nodal dissection with or without para-aortic nodal dissection. This continues to be an important aspect of surgical staging in women with uterine-confined endometrial carcinoma, as the procedure provides important prognostic information that may alter treatment decisions.
- Pelvic lymph nodes from the external iliac, internal iliac, obturator, and common iliac nodes are frequently removed for staging purposes.
- Para-aortic nodal evaluation from the inframesenteric and infrarenal regions may also be utilized for staging in women with high-risk tumors such as deeply invasive lesions, high-grade histology, and tumors of serous carcinoma, clear cell carcinoma, or carcinosarcoma.
- Sentinel lymph node (SLN) mapping may be considered. (See pages 2–6 of ENDO-C)[15]
- Excision of suspicious or enlarged lymph nodes in the pelvic or aortic regions is important to exclude nodal metastasis.
- Some patients may not be candidates for lymph node dissection.
- Visual evaluation of the peritoneal, diaphragmatic, and serosal surfaces with biopsy of any suspicious lesions is important to exclude extrauterine disease.
- While peritoneal cytology does not impact staging, FIGO and AJCC nonetheless recommend that surgeons continue to obtain this during the TH/BSO.
- Omental biopsy is commonly performed in those with serous carcinoma, clear cell carcinoma, or carcinosarcoma histologies.

Endometrial Cancer Staging with SLN Algorithm

1. Women with endometrial cancer should be treated by Gynecologic Oncologists.
2. Staging with the **SLN Algorithm** results in bilateral pelvic nodes on the vast majority of cases.
3. **SLN Algorithm** with bilateral pelvic SLN detection is superior to historical pelvic lymphadenectomy data in detecting metastatic pelvic nodal metastasis.
    - Increased precision
    - Enhanced pathology

Published in 2012
Included in the NCCN Principles of Surgical Staging 2014

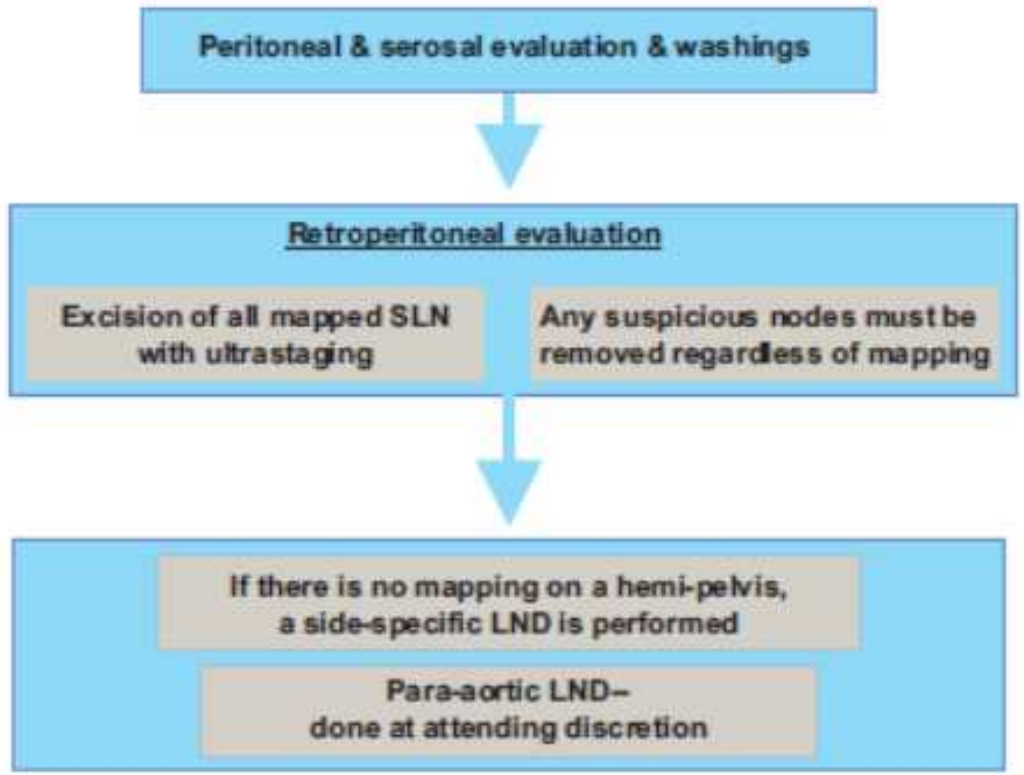
National Comprehensive Cancer Network®

NCCN Guidelines Version 1.2014
Endometrial Carcinoma

NCCN Guidelines Index
Uterine Neoplasms TOC
Discussion

PRINCIPLES OF EVALUATION AND SURGICAL STAGING WHEN SLN MAPPING IS USED

Figure 4. The SLN algorithm for surgical staging of endometrial cancer*



Barlin JN, et al. (MSKCC). Gynecol Oncol 2012.
Abu-Rustum NR (MSKCC). JNCCN 2014.

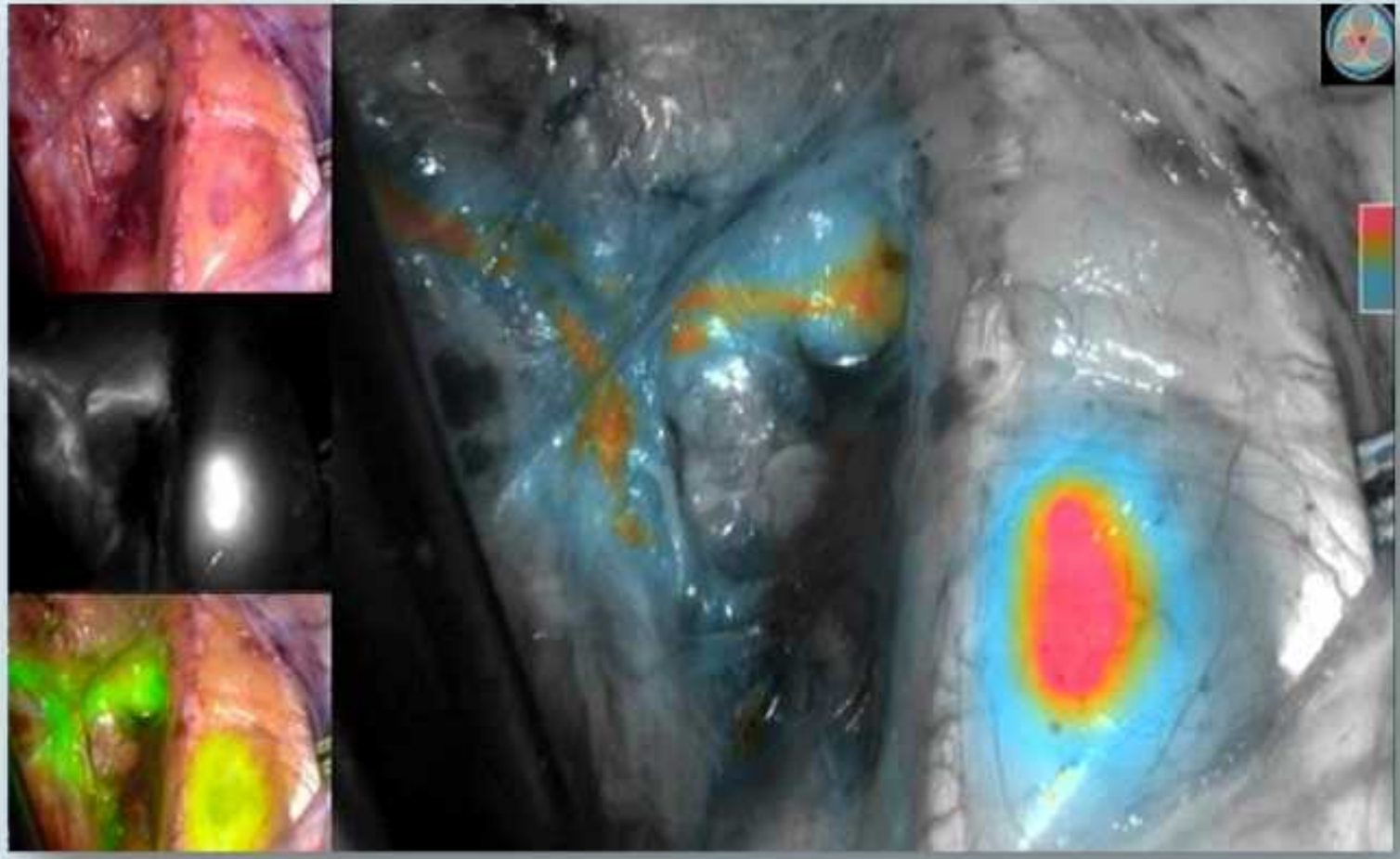
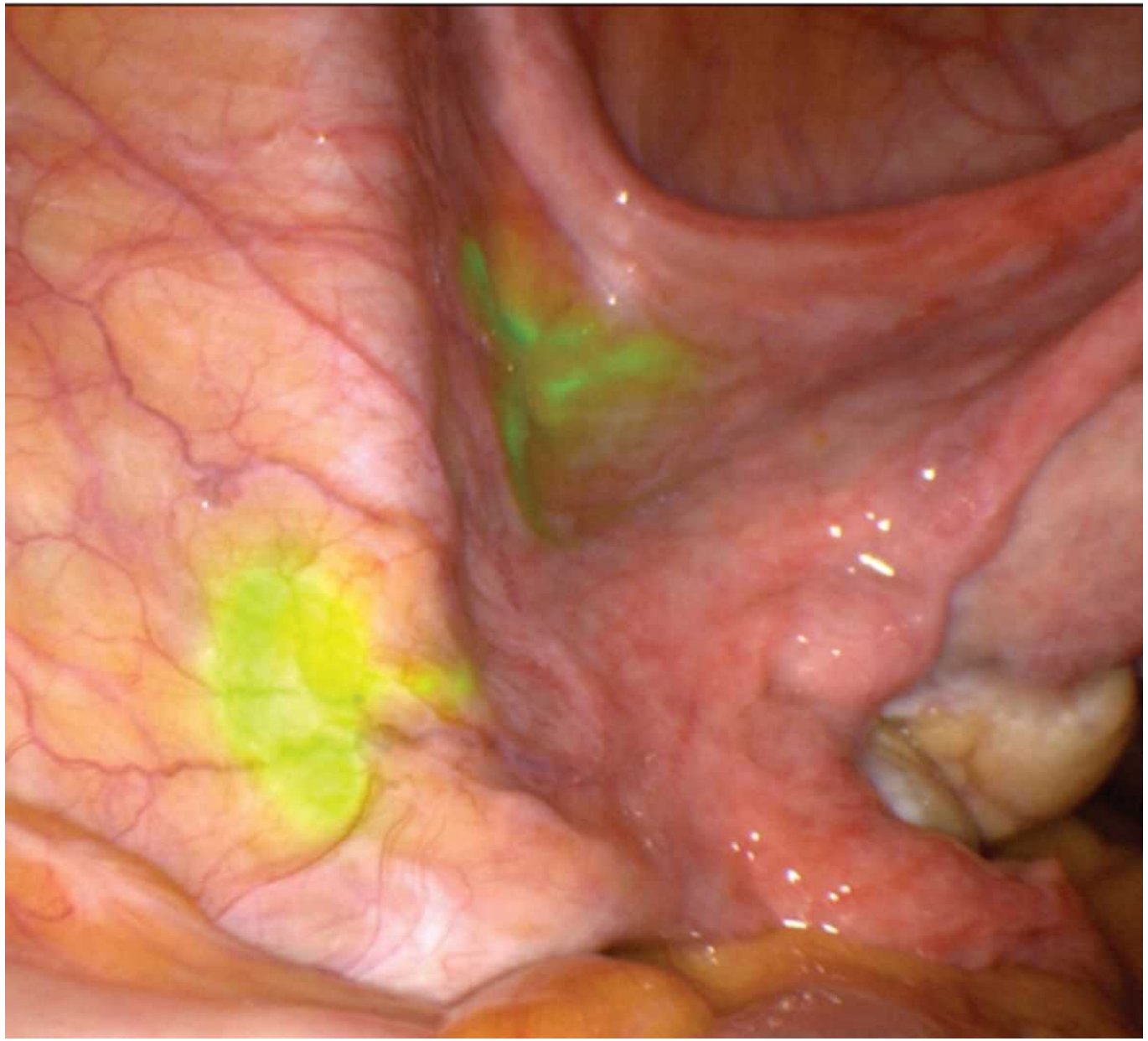


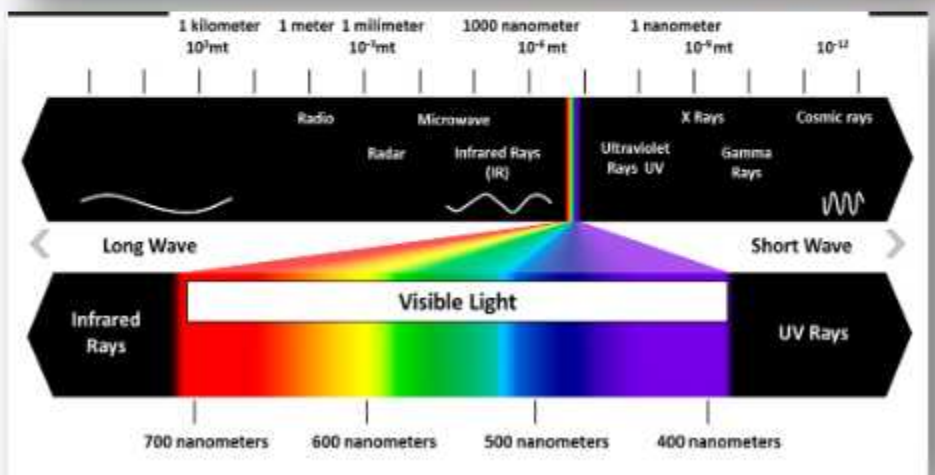
Image Guided Precision Surgery with Enhanced Pathology

"Beyond White Light & the Naked Eye"

ICG Sentinel Node

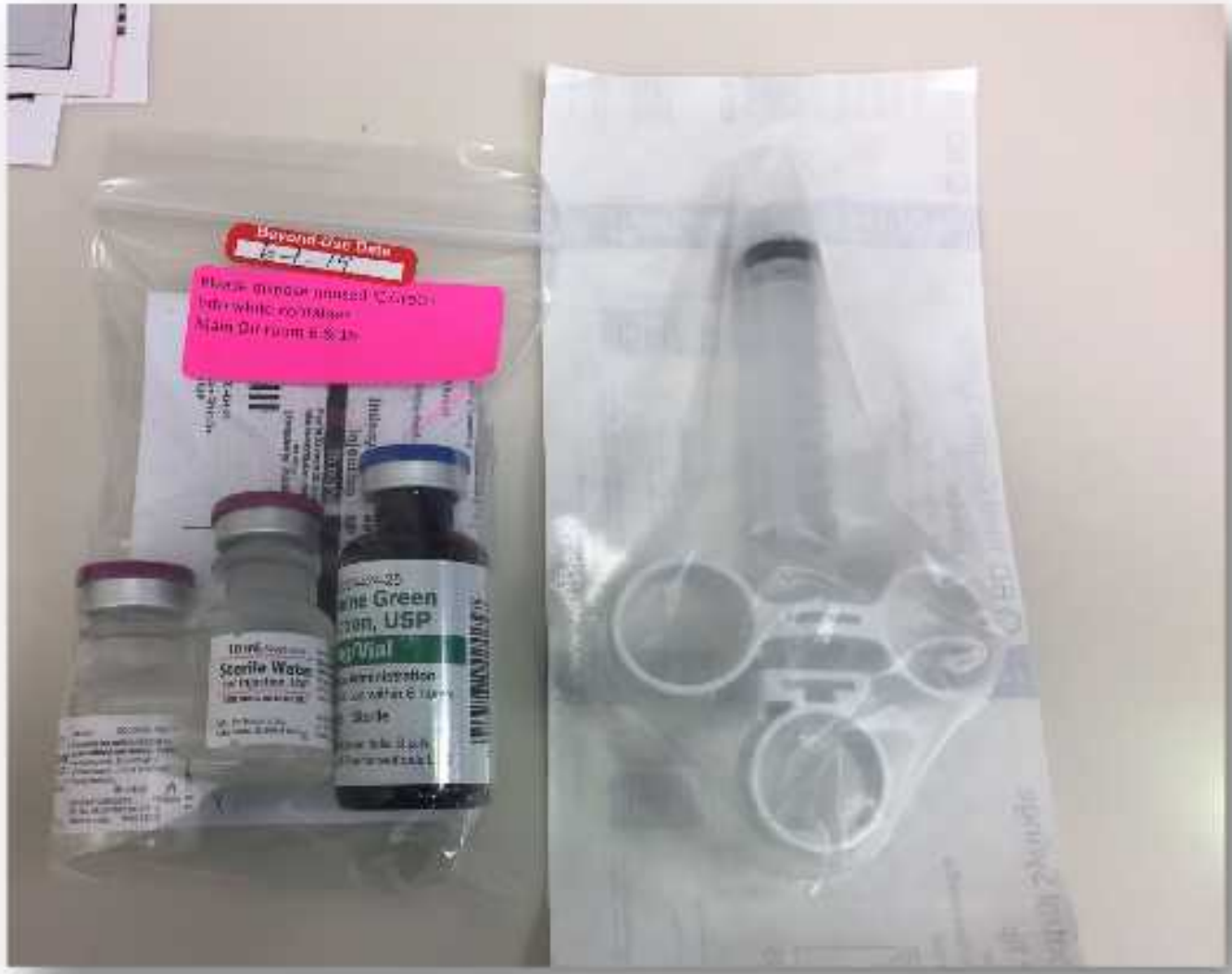


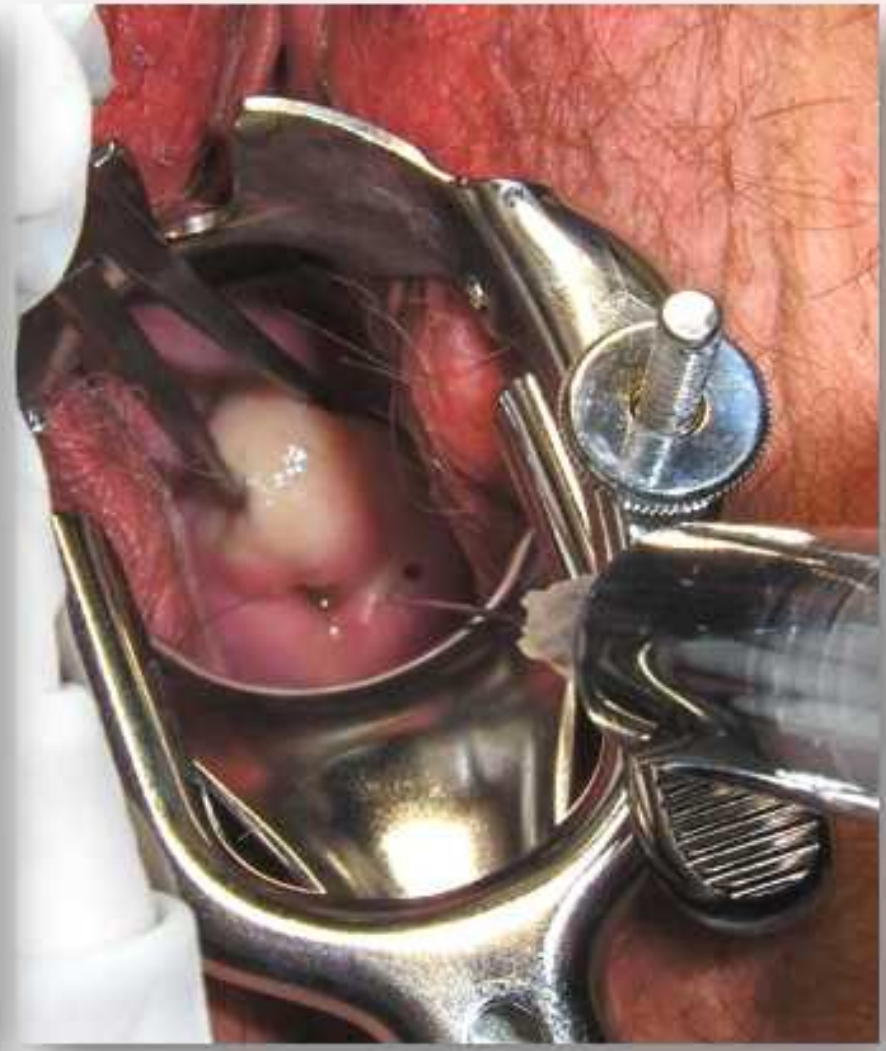
Fluorescence Imaging Systems
Indocyanine Green



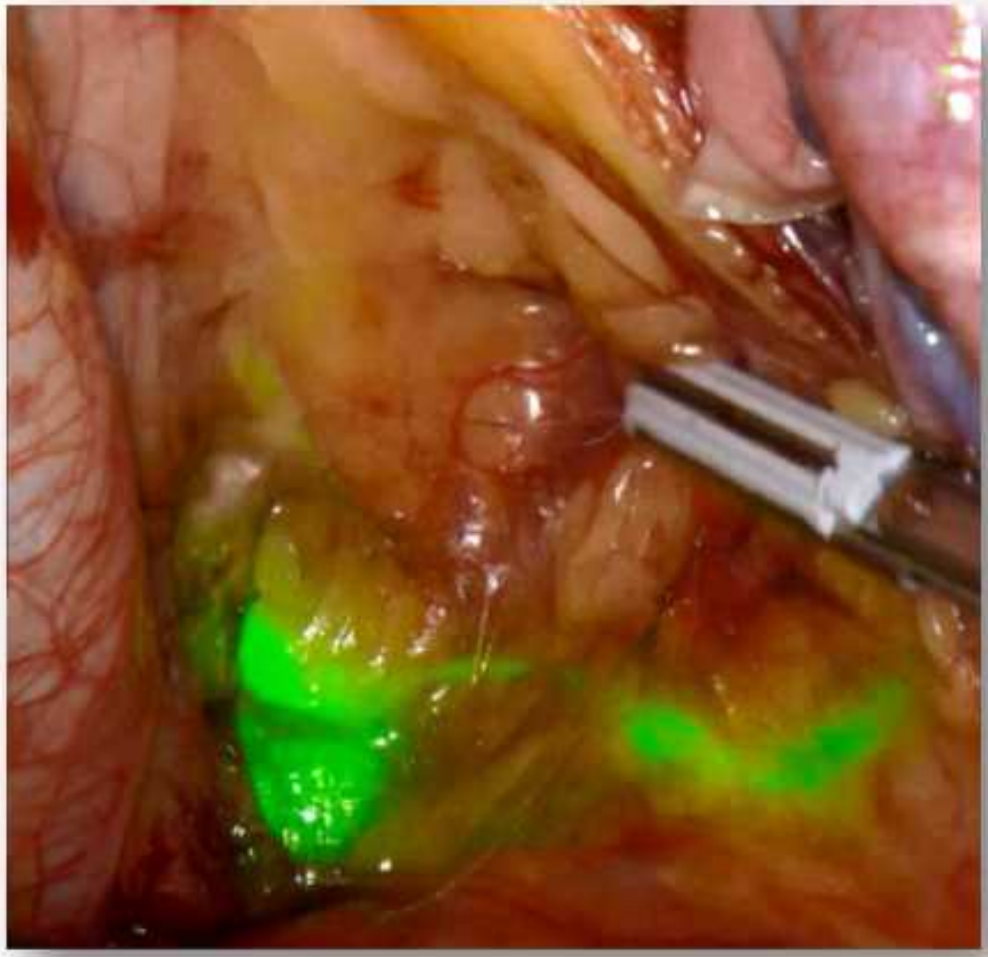
Near Infrared (NIR)

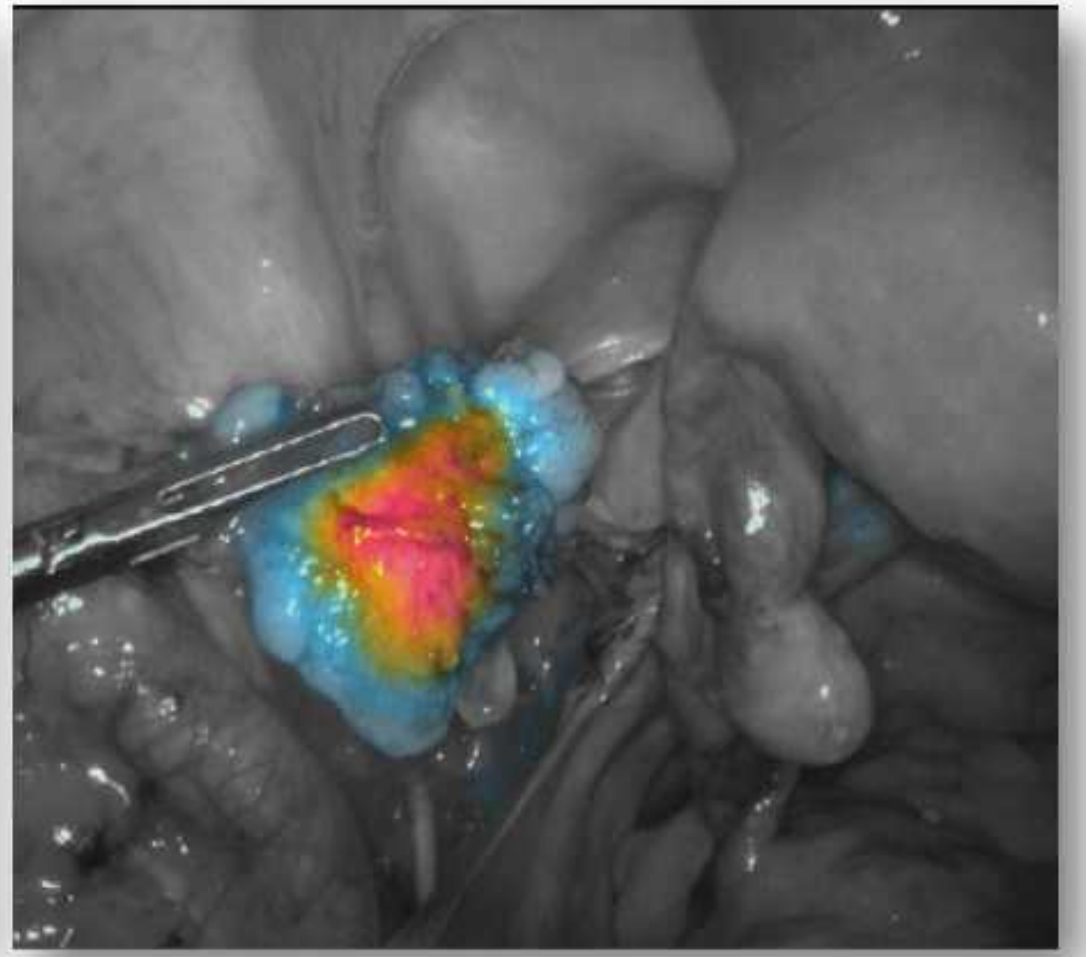
Image Guided Precision Surgery





Main Lymphatic Drainage
Cervical Injection





ICG Identifies ≥ 1 SLN and Bilateral SLNs More Often

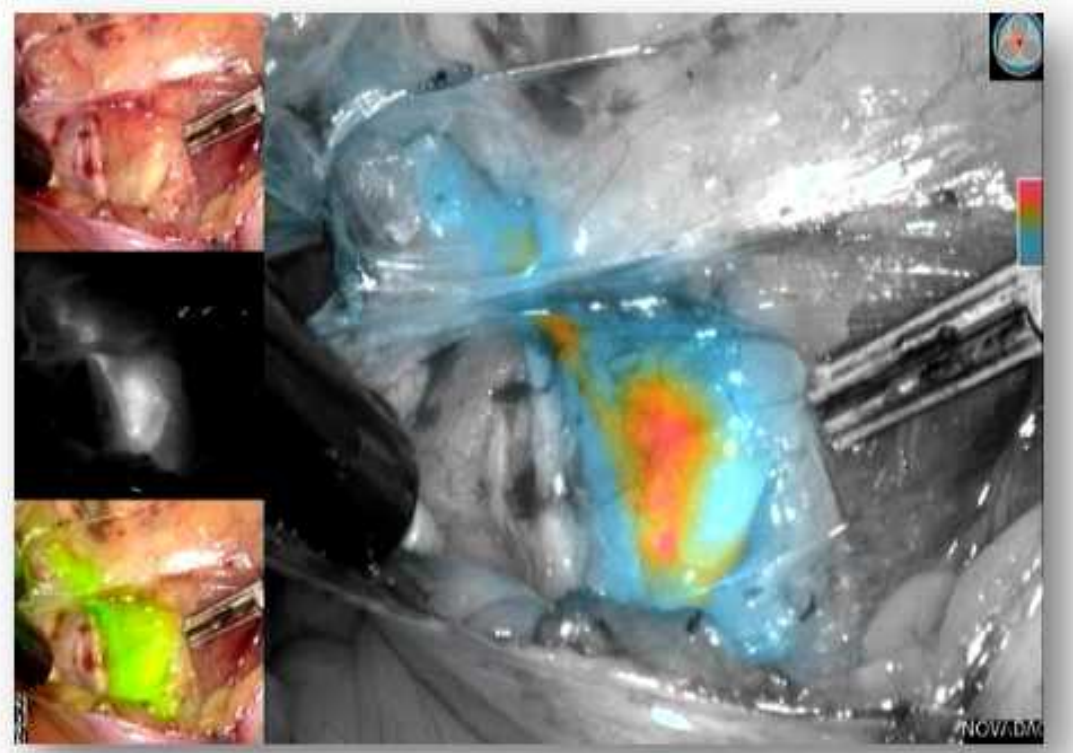
	Blue	Green	p-value
≥ 1 SLN	74.4%	95.5%	< 0.001
Bilateral SLNs	30.7%	78.4%	<0.001

Randomization Arm Did Not Affect Ability of Blue Dye or ICG to Detect Any or Bilateral SLNs

Frumovitz M, Abu-Rustum NR. Lancet Oncology 2018

FILM STUDY SUMMARY

- ICG is superior to blue dye in identifying SLNs
  - $\geq$ 1 SLN and bilateral SLNs
- ICG + blue dye is not better than ICG alone
- ICG identifies all metastatic nodes
- Interstitial injection of ICG is safe
- 5-6% of "SLN" have no nodes



Frumovitz M, Abu-Rustum NR. Lancet Oncology 2018

Ovarian Cancer

New FIGO Classification 2018

I	Tumor confined to ovaries or fallopian tube(s)	T1
IA	Tumor limited to one ovary (capsule intact) or fallopian tube, No tumor on ovarian or fallopian tube surface No malignant cells in the ascites or peritoneal washings	T1a
IB	Tumor limited to both ovaries (capsules intact) or fallopian tubes No tumor on ovarian or fallopian tube surface No malignant cells in the ascites or peritoneal washings	T1b
IC	Tumor limited to one or both ovaries or fallopian tubes, with any of the following: IC1 Surgical spill intraoperatively IC2 Capsule ruptured before surgery or tumor on ovarian or fallopian tube surface IC3 Malignant cells present in the ascites or peritoneal washings	T1c
II	Tumor involves one or both ovaries or fallopian tubes with pelvic extension (below pelvic brim) or peritoneal cancer (Tp)	T2
IIA	Extension and/or implants on the uterus and/or fallopian tubes/and/or ovaries	T2a
IIB	Extension to other pelvic intraperitoneal tissues	T2b
III	Tumor involves one or both ovaries, or fallopian tubes, or primary peritoneal cancer, with cytologically or histologically confirmed spread to the peritoneum outside the pelvis and/or metastasis to the retroperitoneal lymph nodes	T3
IIIA	Metastasis to the retroperitoneal lymph nodes with or without microscopic peritoneal involvement beyond the pelvis	T1,T2,T3aN1
IIIA1	Positive retroperitoneal lymph nodes only (cytologically or histologically proven)	
IIIA1(i)	Metastasis ≤ 10 mm in greatest dimension (note this is tumor dimension and not lymph node dimension)	T3a/T3aN1
IIIA1(ii)	Metastasis > 10 mm in greatest dimension	
IIIA 2	Microscopic extrapelvic (above the pelvic brim) peritoneal involvement with or without positive retroperitoneal lymph nodes	T3a/T3aN1
IIIB	Macroscopic peritoneal metastases beyond the pelvic brim ≤ 2 cm in greatest dimension, with or without metastasis to the retroperitoneal lymph nodes	T3b/T3bN1
III C	Macroscopic peritoneal metastases beyond the pelvic brim > 2 cm in greatest dimension, with or without metastases to the retroperitoneal nodes (Note 1)	T3c/T3cN1
IV	Distant metastasis excluding peritoneal metastases	
	Stage IV A: Pleural effusion with positive cytology	Any T, Any N,
	Stage IV B: Metastases to extra-abdominal organs (including inguinal lymph nodes and lymph nodes outside of abdominal cavity) (Note 2)	M1
	(Note 1: includes extension of tumor to capsule of liver and spleen without parenchymal involvement of either organ)	T3c/T3cN1)
	(Note 2: Parenchymal metastases are Stage IV B)	

Notes:

1. Includes extension of tumor to capsule of liver and spleen without parenchymal involvement of either organ.
2. Parenchymal metastases are Stage IV B.

	FIGO 1988	FIGO 2014
Stage I	**Growth limited to ovaries**	
IA	Growth limited to one ovary; no tumour on the external surface, capsule intact, no ascites	
IB	Growth limited to both ovaries; no tumour on the external surface, capsule intact, no ascites	
IC	Tumour with IA or IB but with tumour on the external surface, capsule ruptured; ascites containing malignant cells or positive peritoneal washing	Tumor limited to one or both ovaries
		IC1 Surgical spill
		IC2 Capsule rupture before surgery or tumor on ovarian surface
		IC3 Malignant cells in the ascites or peritoneal washings

	FIGO 1988	FIGO 2014
Stage II	**Growth involving one or both ovaries with pelvic extension**	
IIA	Extension and/or metastasis to tubes and/or uterus	
IIB	Extension to other pelvic tissues	
IIC	Tumour with IIA or IIB but with tumour on the external surface, capsule ruptured; ascites containing malignant cells or positive peritoneal washing	No IIC

	FIGO 1988	FIGO 2014
Stage III	**Tumor involves 1 or both ovaries with cytologically or histologically confirmed spread to the peritoneum outside the pelvis and/or metastasis to the retroperitoneal lymph nodes**	
IIIA	Tumour grossly limited to true pelvis with negative nodes But histologically confirmed microscopic seeding of abdominal peritoneal surface	Positive retroperitoneal lymph nodes and /or microscopic metastasis beyond the pelvis IIIA1 Positive retroperitoneal lymph nodes only (cytologically or histologically proven): IIIA1 (i) Metastasis up to 10 mm in greatest dimension IIIA1(ii) Metastasis more than 10 mm in greatest dimension IIIA2 Microscopic extrapelvic (above the pelvic brim) peritoneal involvement with or without positive retroperitoneal lymph nodes
IIIB	Abdominal implants ≤2 cm diameter, nodes negative	Abdominal implants ≤2 cm diameter, nodes positive/ negative
IIIC	Abdominal implants more than 2 cm diameter And/or retroperitoneal or inguinal lymph nodes or both	Abdominal implants more than 2 cm diameter, nodes positive/ negative

	FIGO 1988	FIGO 2014
Stage IV	Distant metastasis excluding peritoneal metastasis	
		IVA Pleural effusion with positive cytology
		IVB Parenchymal metastases and metastases to extra-abdominal organs (including inguinal lymph nodes and lymph nodes outside of the abdominal cavity)

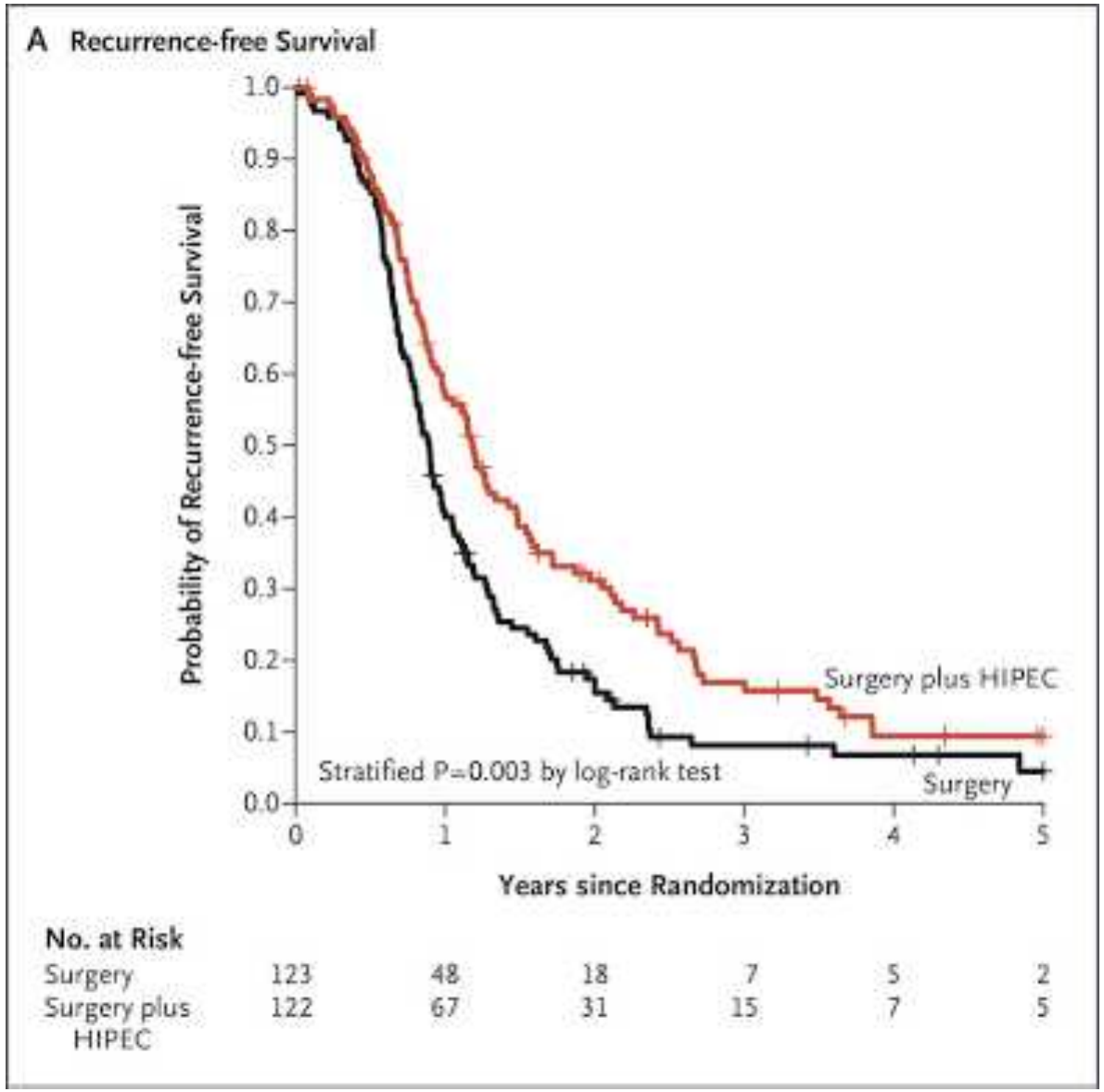
HIPEC improves overall survival in advanced ovarian cancer—by a lot

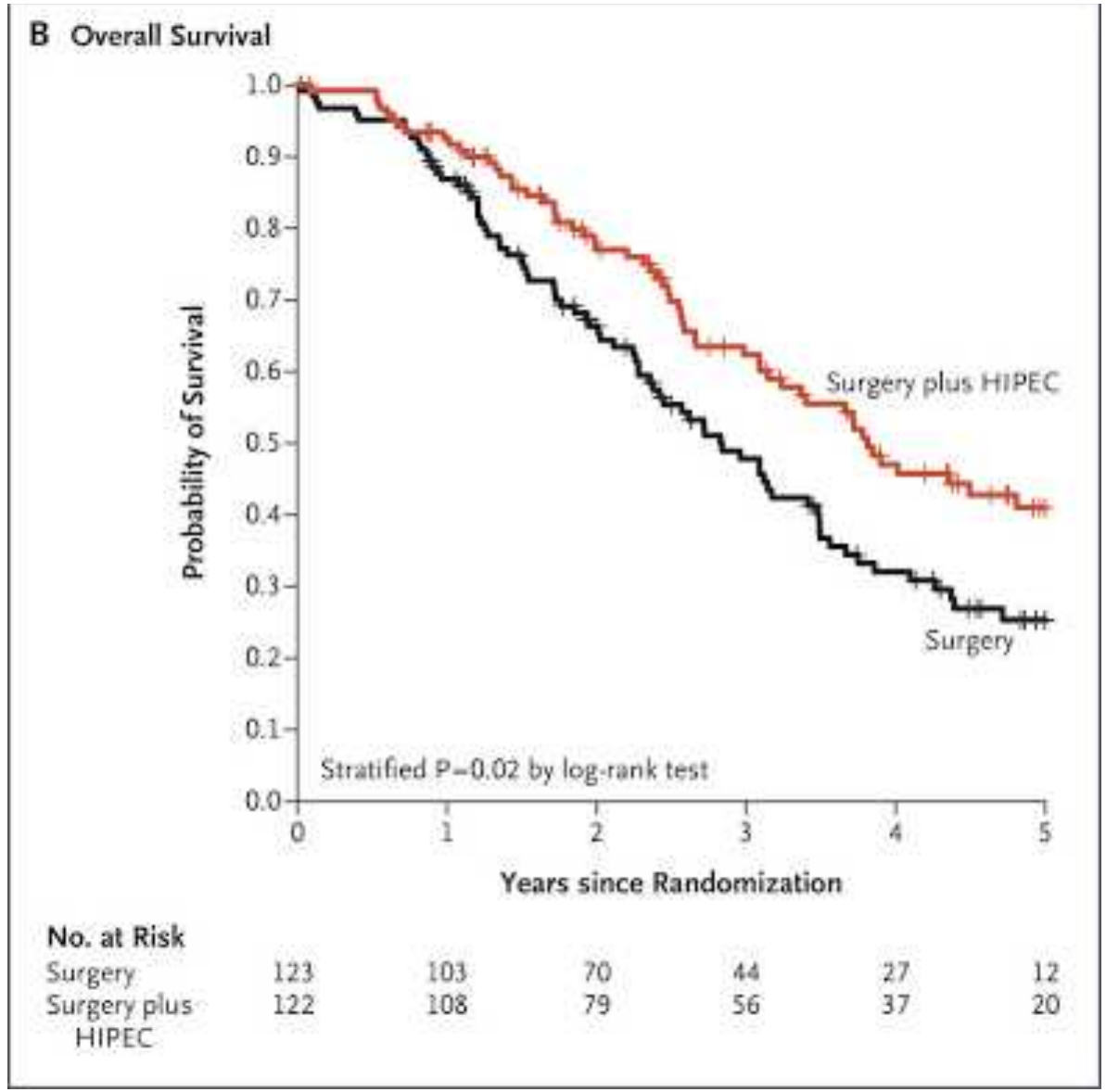
Van Driel WJ, Koole SN, Sikorska K, et al. Hyperthermic intraperitoneal chemotherapy in ovarian cancer. N Engl J Med. 2018;378:230-240.

245 pts, RCT, after 3cycles of CXT and SD, partial R or CR

Results. Treatment with HIPEC was associated with a 3.5-month improvement in recurrence-free survival compared with surgery alone (14.2 vs 10.7 months) and a 12-month improvement in overall survival (45.7 vs 33.9 months). After a median follow-up of 4.7 years, 62% of patients in the surgery group and 50% of the patients in the HIPEC group had died.

Adverse events. Rates of grade 3 and 4 adverse events were similar for both treatment arms (25% in the surgery group vs 27% in the HIPEC plus surgery group), and there was no significant difference in hospital length of stay (8 vs 10 days, which included a mandatory 1-night stay in the intensive care unit for HIPEC-treated patients).


A Recurrence-free Survival
Probability of Recurrence-free Survival
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
1
2
3
4
5
Surgery plus HIPEC
Stratified P=0.003 by log-rank test
Surgery
Years since Randomization
No. at Risk
Surgery 123 48 18 7 5 2
Surgery plus HIPEC 122 67 31 15 7 5

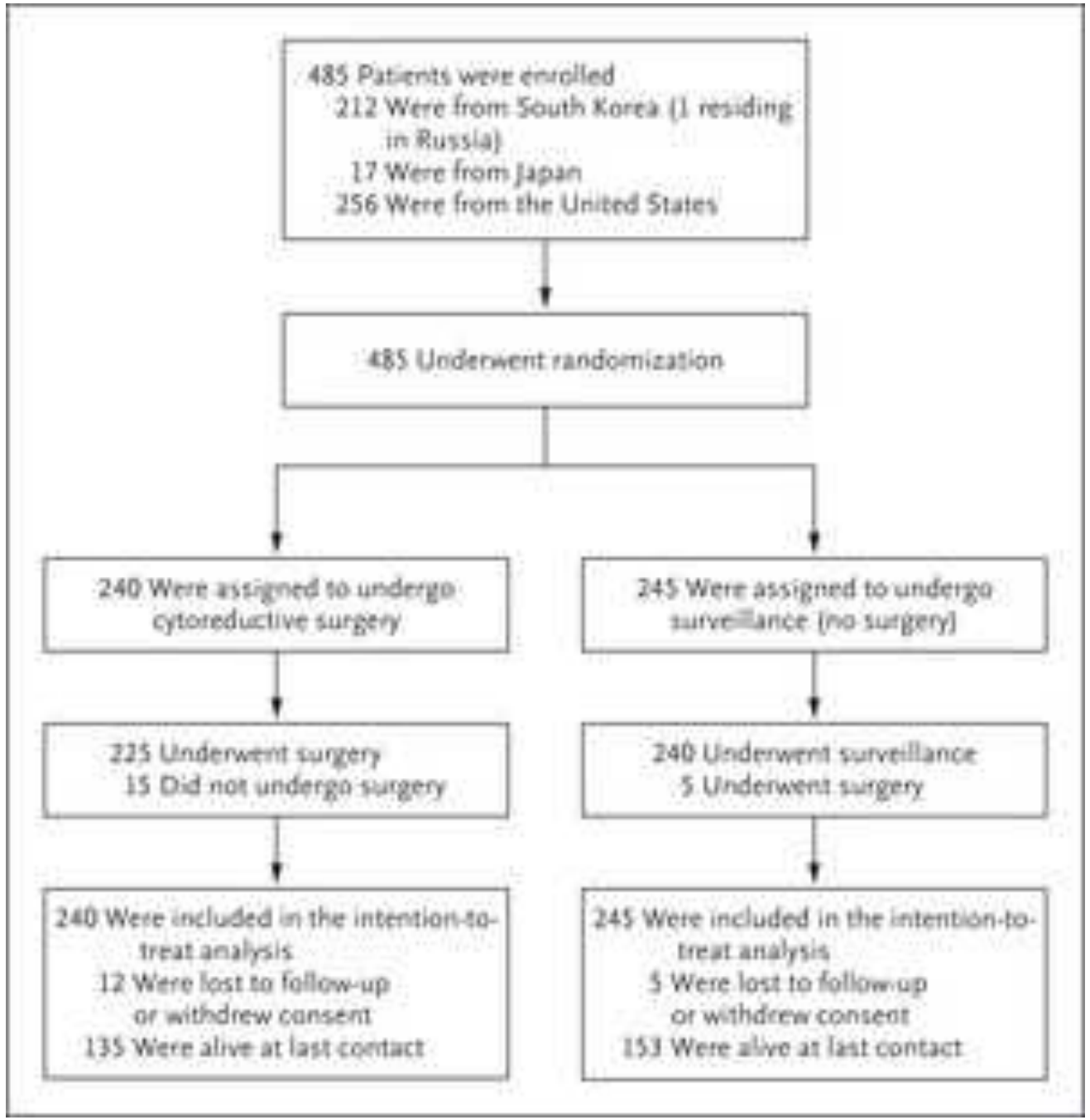

B Overall Survival
Probability of Survival
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0
1
2
3
4
5
Surgery plus HIPEC
Surgery
Stratified P=0.02 by log-rank test
Years since Randomization
No. at Risk
Surgery 123 103 70 44 27 12
Surgery plus HIPEC 122 108 79 56 37 20

The NEW ENGLAND JOURNAL of MEDICINE

Secondary Surgical Cytoreduction for Recurrent Ovarian Cancer

Robert L. Coleman, M.D., Nick M. Spirtos, M.D., Danielle Enserro, Ph.D., Thomas J. Herzog, M.D., Paul Sabbatini, M.D., Deborah K. Armstrong, M.D., Jae-Weon Kim, M.D., Sang-Yoon Park, M.D., Byoung-Gie Kim, M.D., Joo-Hyun Nam, M.D., Keiichi Fujiwara, M.D., Joan L. Walker, M.D., et al.

November 14, 2019
N Engl J Med 2019; 381:1929-1939
DOI: 10.1056/NEJMoa1902626


485 Patients were enrolled
212 Were from South Korea (1 residing in Russia)
17 Were from Japan
256 Were from the United States
485 Underwent randomization
240 Were assigned to undergo cytoreductive surgery
245 Were assigned to undergo surveillance (no surgery)
225 Underwent surgery
15 Did not undergo surgery
240 Underwent surveillance
5 Underwent surgery
240 Were included in the intention-to-treat analysis
12 Were lost to follow-up or withdrew consent
135 Were alive at last contact
245 Were included in the intention-to-treat analysis
5 Were lost to follow-up or withdrew consent
153 Were alive at last contact

RESULTS A total of 485 patients underwent randomization, 240 to secondary cytoreduction before chemotherapy and 245 to chemotherapy alone. The median follow-up was 48.1 months. Complete gross resection was achieved in 67% of the patients assigned to surgery who underwent the procedure. Platinum-based chemotherapy with bevacizumab followed by bevacizumab maintenance was administered to 84% of the patients overall and was equally distributed between the two groups. The hazard ratio for death (surgery vs. no surgery) was 1.29 (95% confidence interval [CI], 0.97 to 1.72; P=0.08), which corresponded to a median overall survival of 50.6 months and 64.7 months, respectively. Adjustment for platinum-free interval and chemotherapy choice did not alter the effect. The hazard ratio for disease progression or death (surgery vs. no surgery) was 0.82 (95% CI, 0.66 to 1.01; median progression-free survival, 18.9 months and 16.2 months, respectively). Surgical morbidity at 30 days was 9%; 1 patient (0.4%) died from postoperative complications. Patient-reported quality of life decreased significantly after surgery but did not differ significantly between the two groups after recovery.

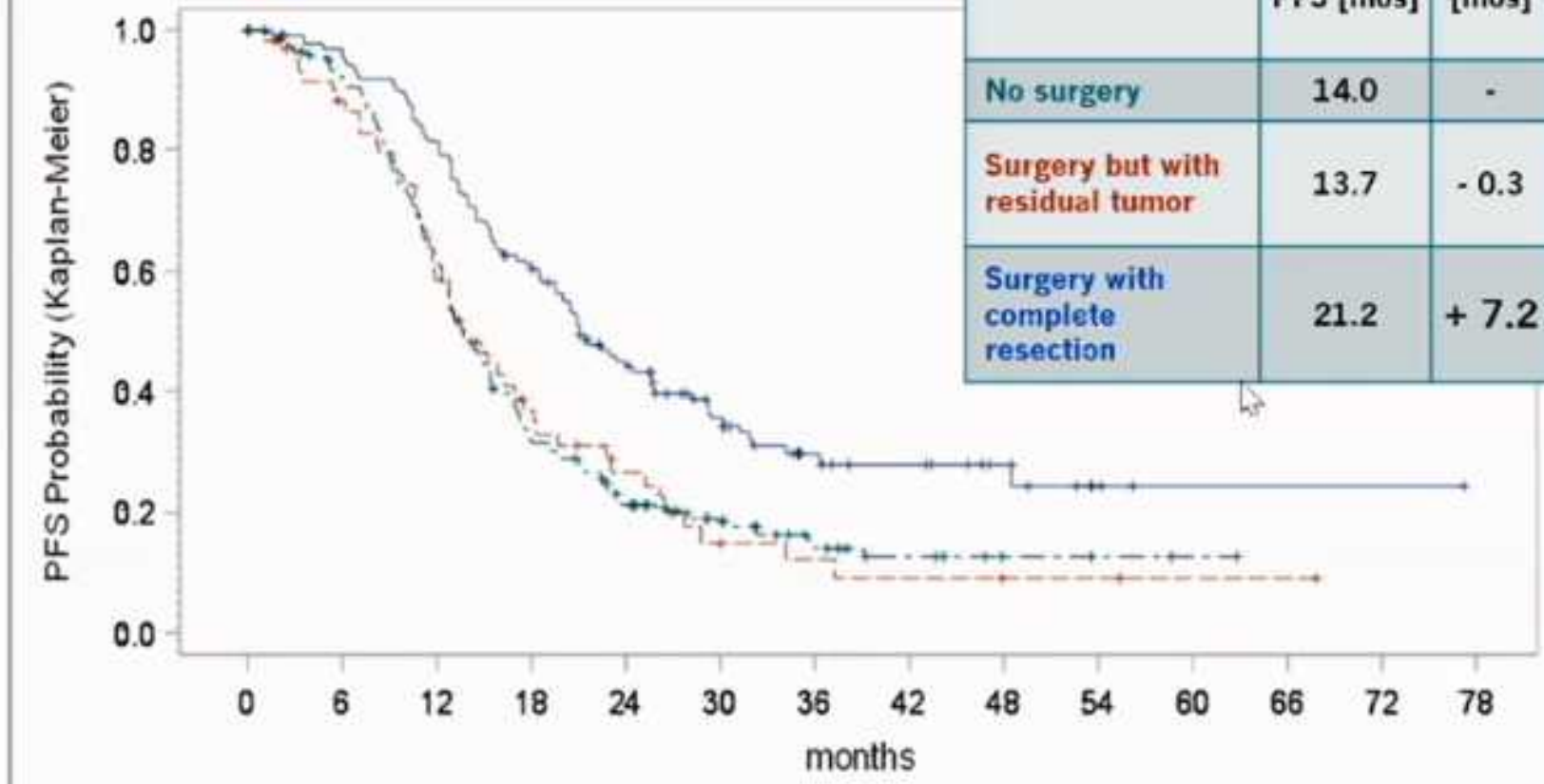
CONCLUSIONS In this trial involving patients with platinum-sensitive, recurrent ovarian cancer, secondary surgical cytoreduction followed by chemotherapy did not result in longer overall survival than chemotherapy alone. (Funded by the National Cancer Institute and others; GOG-0213 ClinicalTrials.gov number, NCT00565851.)

AGO DESKTOP III: PFS by surgical outcome

(AGO–OVAR OP.4; ENGOT-ov20; NCT01166737)

Complete resection rate: 72.5%

	Median PFS [mos]	Δ PFS [mos]	HR (95% CI)	P-value Wald-test
No surgery	14.0	-	1	-
Surgery but with residual tumor	13.7	- 0.3	0.98 (0.71 – 1.35)	0.8952
Surgery with complete resection	21.2	+ 7.2	0.56 (0.43 – 0.72)	< 0.0001



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Lymphadenectomy in Patients with Advanced Ovarian Neoplasms

Philipp Harter, M.D., Ph.D., Jalid Sehouli, M.D., Ph.D., Domenica Lorusso, M.D., Alexander Reuss, M.Sc., Ignace Vergote, M.D., Ph.D., Christian Marth, M.D., Ph.D., Jae-Weon Kim, M.D., Ph.D., Francesco Raspagliesi, M.D., Ph.D., Björn Lampe, M.D., Ph.D., Giovanni Aletti, M.D., Werner Meier, M.D., Ph.D., David Cibula, M.D., Ph.D., et al.

February 28, 2019
N Engl J Med 2019; 380:822-832
DOI: 10.1056/NEJMoa1808424

LION: Study Design

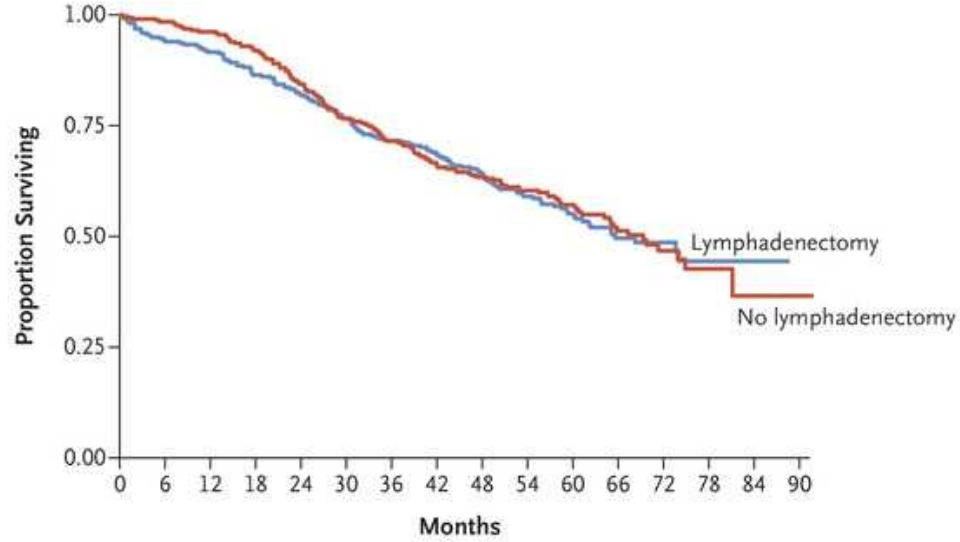
- Multicenter, prospective, randomized, open-label phase III trial
  - All centers required to demonstrate surgical skill prior to participation

- Primary endpoint: OS
- Secondary endpoints: PFS, QoL, number of resected LN

Harter P, et al. ASCO 2017. Abstract 5500.

Slide credit: clinicaloptions.com

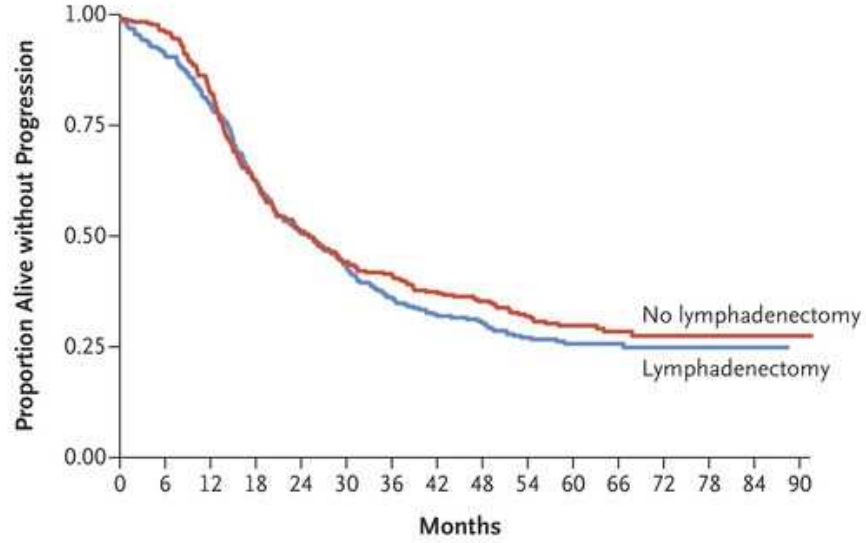
A Overall Survival



No. at Risk

Lymphadenectomy	323	289	271	248	227	210	194	184	167	135	93	55	28	11	3	0
No lymphadenectomy	324	308	297	282	252	228	208	187	170	144	105	66	30	10	4	3

B Progression-free Survival



No. at Risk

Lymphadenectomy	323	282	239	183	143	120	100	89	82	65	45	31	14	6	2	0
No lymphadenectomy	324	303	256	193	155	133	122	109	97	78	55	33	14	5	2	2

RESULTS

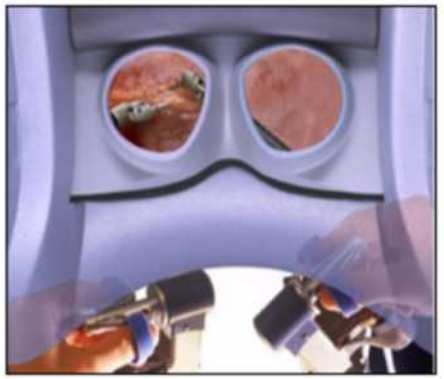
A total of 647 patients underwent randomization from December 2008 through January 2012, were assigned to undergo lymphadenectomy (323 patients) or not undergo lymphadenectomy (324), and were included in the analysis. Among patients who underwent lymphadenectomy, the median number of removed nodes was 57 (35 pelvic and 22 paraaortic nodes). The median overall survival was 69.2 months in the no-lymphadenectomy group and 65.5 months in the lymphadenectomy group (hazard ratio for death in the lymphadenectomy group, 1.06; 95% confidence interval [CI], 0.83 to 1.34; P=0.65), and median progression-free survival was 25.5 months in both groups (hazard ratio for progression or death in the lymphadenectomy group, 1.11; 95% CI, 0.92 to 1.34; P=0.29). Serious postoperative complications occurred more frequently in the lymphadenectomy group (e.g., incidence of repeat laparotomy, 12.4% vs. 6.5% [P=0.01]; mortality within 60 days after surgery, 3.1% vs. 0.9% [P=0.049]).

Prospectives in Gynecologic Oncology Surgery

Visualisation

(Ultra)HD, 3D, Magnification, 0/30 Degree, Camerarotation,
Autonomous control by the surgeon

„Subcortical navigation“



Instrumentation and Surgeons Autonomy

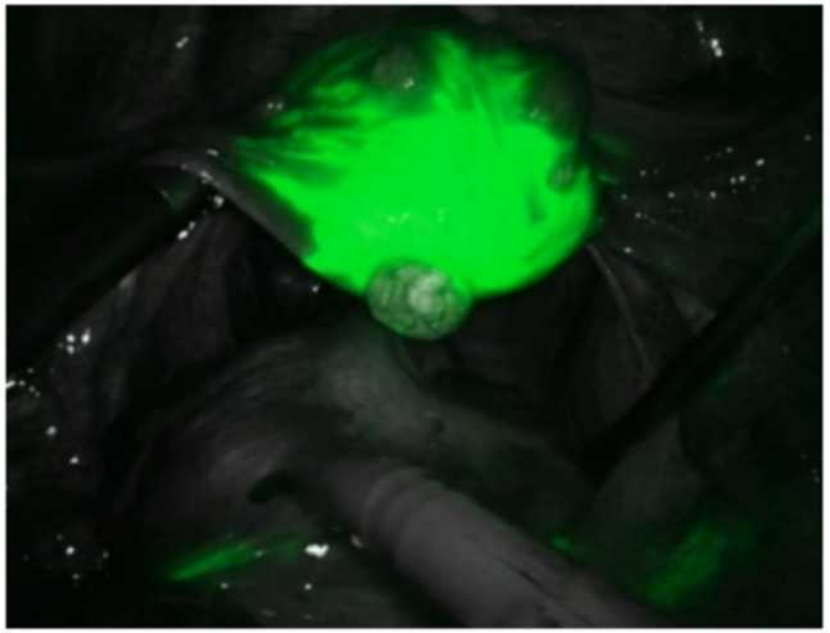
Wristed Instruments with seven degrees of freedom and complete lack of tremor, modern electrosurgery implemented

Coordinated by the surgeon only

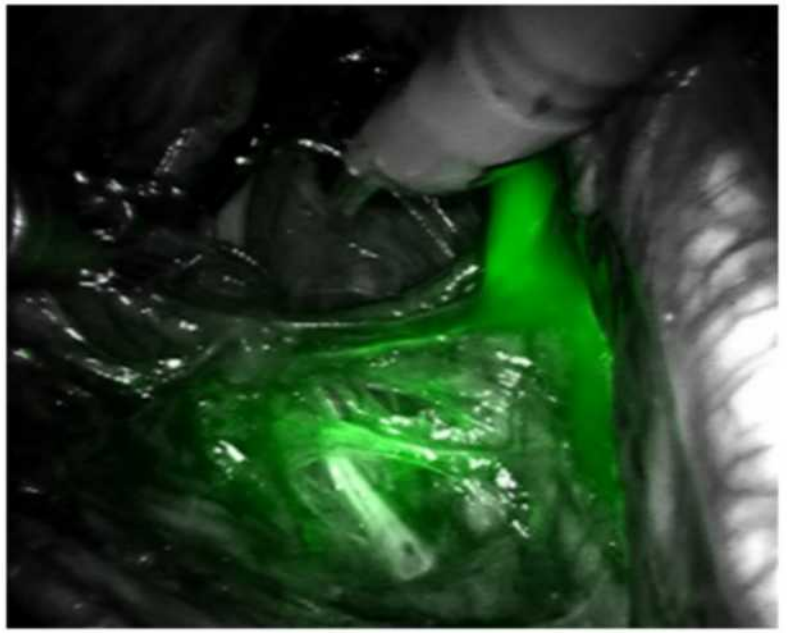
No dependence on quality of assistance

Targeting

Live Targeting for of anatomical and functional structures by autofluorescence, dyes, antibodies etc.

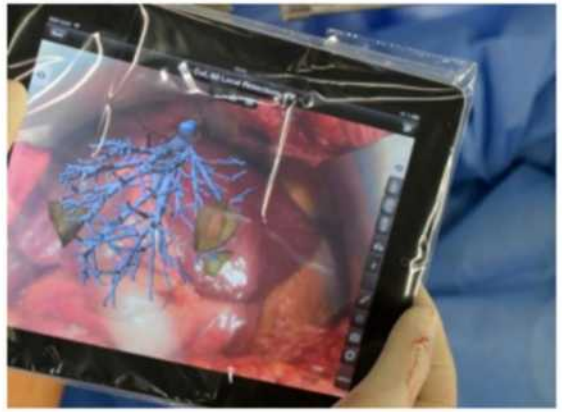


EC - ICG corporal injection



Pelvic sentinel region right

Augmented Reality



Tuesday, 20-08-2013

Tablet PC Supports Liver Surgeons - New app from Fraunhofer MEVIS tested for the first time during an operation in Germany

www.nature.com/scientificreports

SCIENTIFIC REPORTS

OPEN

Autofluorescence lifetime augmented reality as a means for real-time robotic surgery guidance in human patients

Received: 30 November 2017
Accepted: 27 November 2018
Published online: 04 February 2019

D. Gorpas[1,4], J. Phipps[1], J. Bec[1], D. Ma[1], S. Dochow[2,3,4], D. Yankelevich[1,4], J. Sorger[1], J. Popp[2,3], A. Bewley[5], R. Gandour-Edwards[7], L. Marcu[1] & D. G. Farwell[6]

Due to loss of tactile feedback the assessment of tumor margins during robotic surgery is based only on visual inspection, which is neither significantly sensitive nor specific. Here we demonstrate time-resolved fluorescence spectroscopy (TRFS) as a novel technique to complement the visual inspection of oral cancers during transoral robotic surgery (TORS) in real-time and without the need for exogenous contrast agents. TRFS enables identification of cancerous tissue by its distinct autofluorescence signature that is associated with the alteration of tissue structure and biochemical profile. A prototype TRFS instrument was integrated synergistically with the da Vinci Surgical robot and the combined system was validated in swine and human patients. Label-free and real-time assessment and

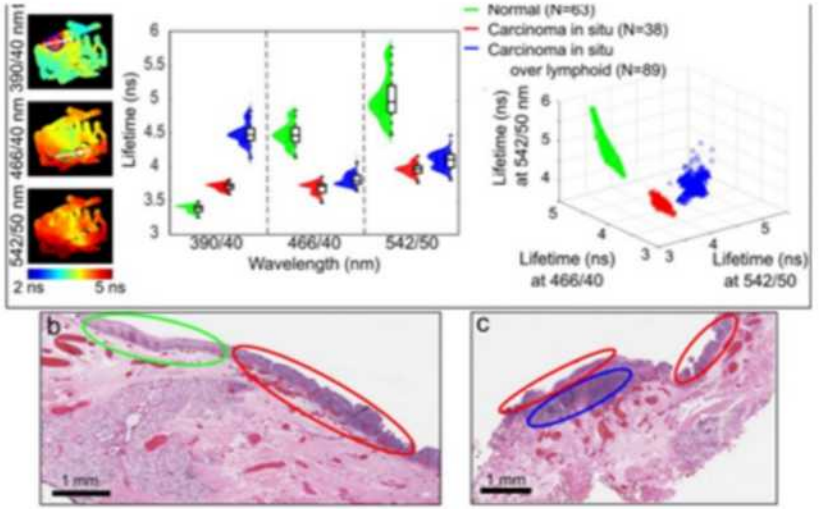


Figure 4. Discrimination of different tissue types through measurements with the ms-TRFS system i

Navigation

Techniques in Coloproctology (2019) 23:53–63
https://doi.org/10.1007/s10151-018-1914-y

MULTIMEDIA ARTICLE

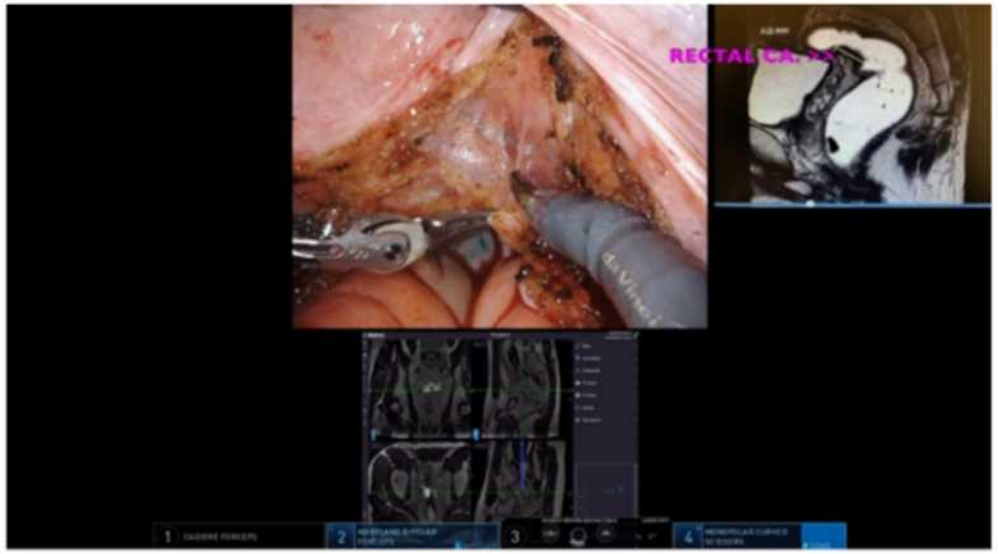
Robotic-assisted stereotactic real-time navigation: initial clinical experience and feasibility for rectal cancer surgery

S. Atallah[1] · E. Parra-Davila[2] · A. G. F. Melani[3] · L. G. Romagnolo[4] · S. W. Larach[1] · J. Marescaux[5]

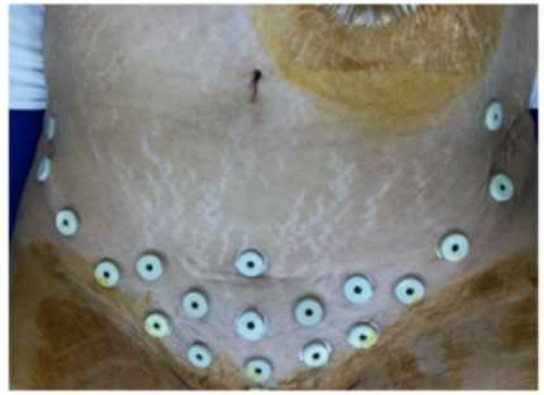
Received: 5 December 2018 / Accepted: 15 December 2018 / Published online: 17 January 2019

Abstract

Background Real-time stereotactic navigation for transanal total mesorectal excision has been demonstrated to be feasible in small pilot series using laparoscopic techniques. The possibility of real-time stereotactic navigation coupled with robotics has not been previously explored in a clinical setting.



Rectal Cancer, TME 2019



Ergonomy

Ann Surg. 2017 Dec;266(6):905-920. doi: 10.1097/SLA.0000000000002223.

Prevalence of Musculoskeletal Disorders Among Surgeons Performing Minimally Invasive Surgery: A Systematic Review.

Alleblas CCJ[1], de Man AM, van den Haak L, Vierhout ME, Jansen FW, Nieboer TE.

up to 74%

RS may may reduce surgeons morbidity
And prolong surgeons professional live

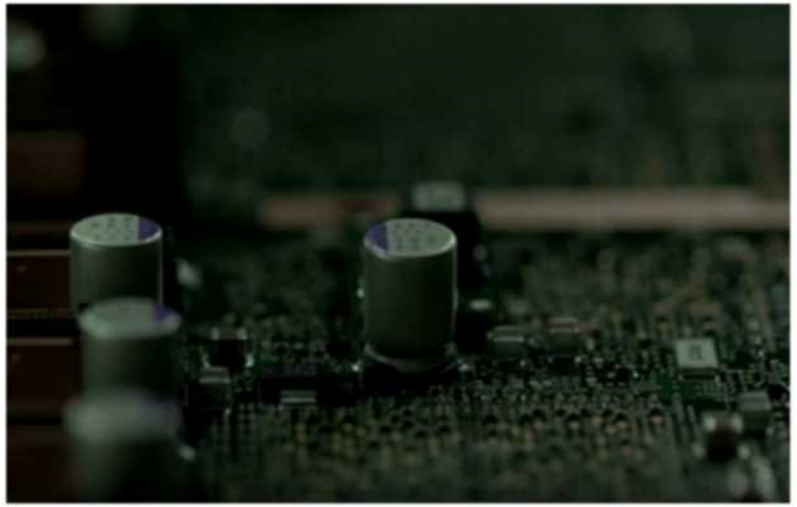
J Robot Surg. 2019 Mar 12. doi: 10.1007/s11701-019-00933-2. [Epub ahead of print]

Experience implication in subjective surgical ergonomics comparison between laparoscopic and robot-assisted surgeries.

Mendes V[1,2], Bruyere F[3,4], Escoffre JM[5], Binet A[3,6], Lardy H[3,6], Marret H[7,3], Marchal F[8], Hebert T[7].

Predominantly experienced surgeons

Documentation and Analysis



Exchange of **„Big data“** by plug in **„the Connector“** to the digital world

„Automatical“ data storage, analysis and preparation by specialized software and sufficient server capacity for **documentation, trouble shooting, education and research!**

Education-Simulation-Pilots School

Ann Transl Med. 2016 Dec; 4(23): 453.
doi: 10.21037/atm.2016.12.24

PMCID: PMC5220028
PMID: 28090509

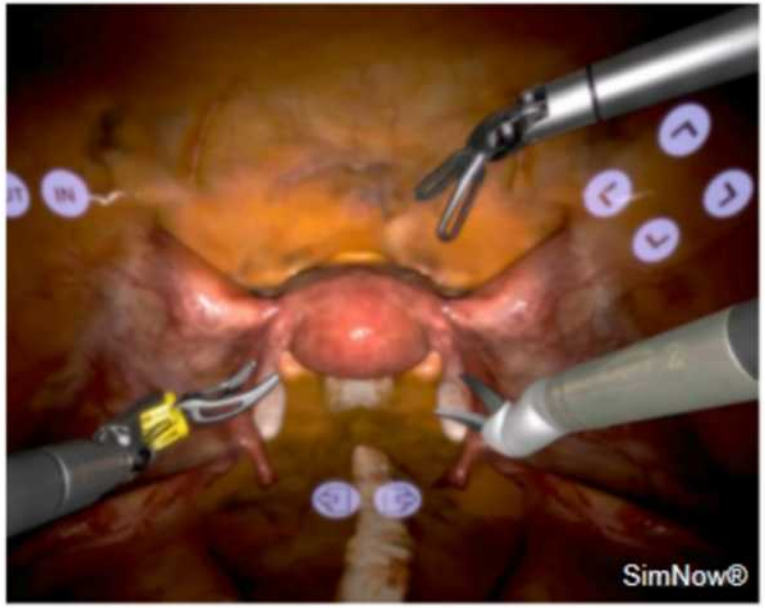
Innovations in surgery simulation: a review of past, current and future techniques

Ido Badash,[✉1] Karen Burtt,[1] Carlos A. Solorzano,[1] and Joseph N. Carey[2]

Simulation training:

Faster learning curve
Shorter operating time
Less errors
Less complications
Better outcome

Simulation tools may integrated to the robotic system (close to Reality)



Education- Dual Console- Drivers School

Tech Coloproctol. 2017 Sep;21(9):721-727. doi: 10.1007/s10151-017-1687-8. Epub 2017 Sep 19.

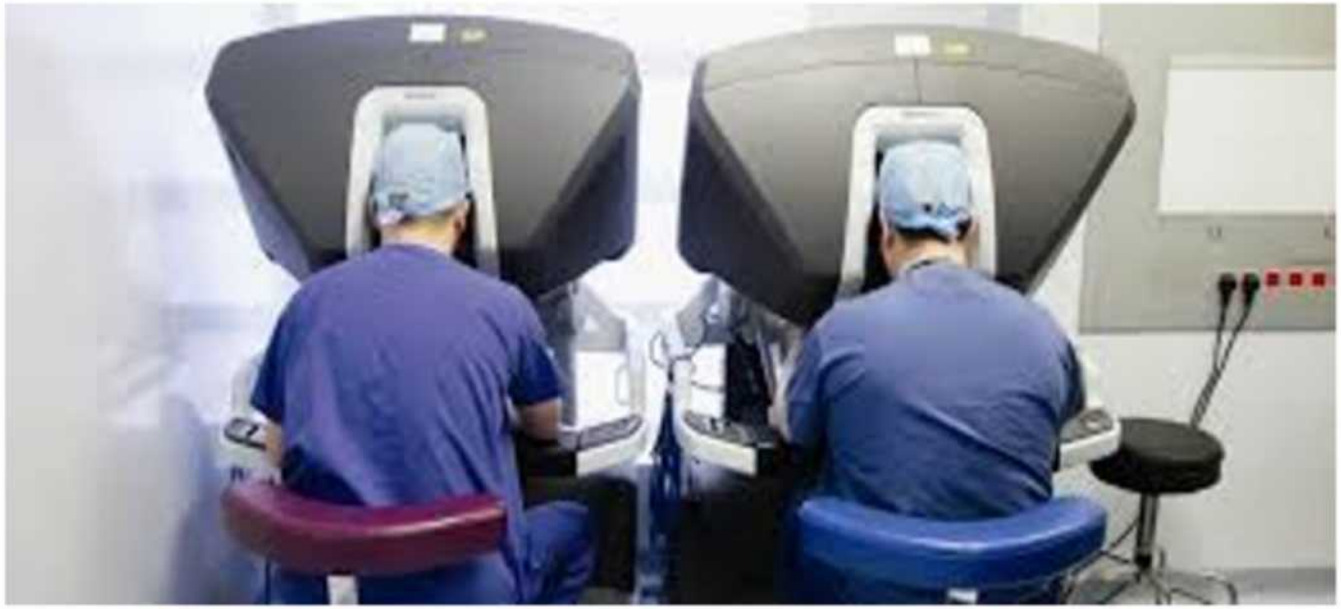
Initial experience with a dual-console robotic-assisted platform for training in colorectal surgery.

Bolger JC[1], Broe MP[2], Zarog MA[1], Looney A[2], McKevitt K[1], Walsh D[3], Giri S[2], Peirce C[1], Coffey JC[4,5].

Acad Med. 2019 Oct;94(10):1532-1538. doi: 10.1097/ACM.0000000000002751.

Integrating Robotic Technology Into Resident Training: Challenges and Recommendations From the Front Lines.

Green CA[1], Mahuron KM, Harris HW, O'Sullivan PS.



Telemedicine

Telementoring and Telesurgery, Teleteaching

First projects of telementoring (teleproctoring) were initiated

Telesurgery has been already done, but requires safe data lines and also medicolegal acceptance/safety

Location-independent scientific and educational exchange,
Live Surgery e.g. via connected Platform with global transmission:
WRSE (World Wide Robotic Surgery Transmission 4Health -TV)

ESGO
European Society of Gynaecological Oncology

GROUP EUROCLINIC
Placing you in the center!