

CURRENT MANAGEMENT OF OVARIAN CANCER

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Disclosure

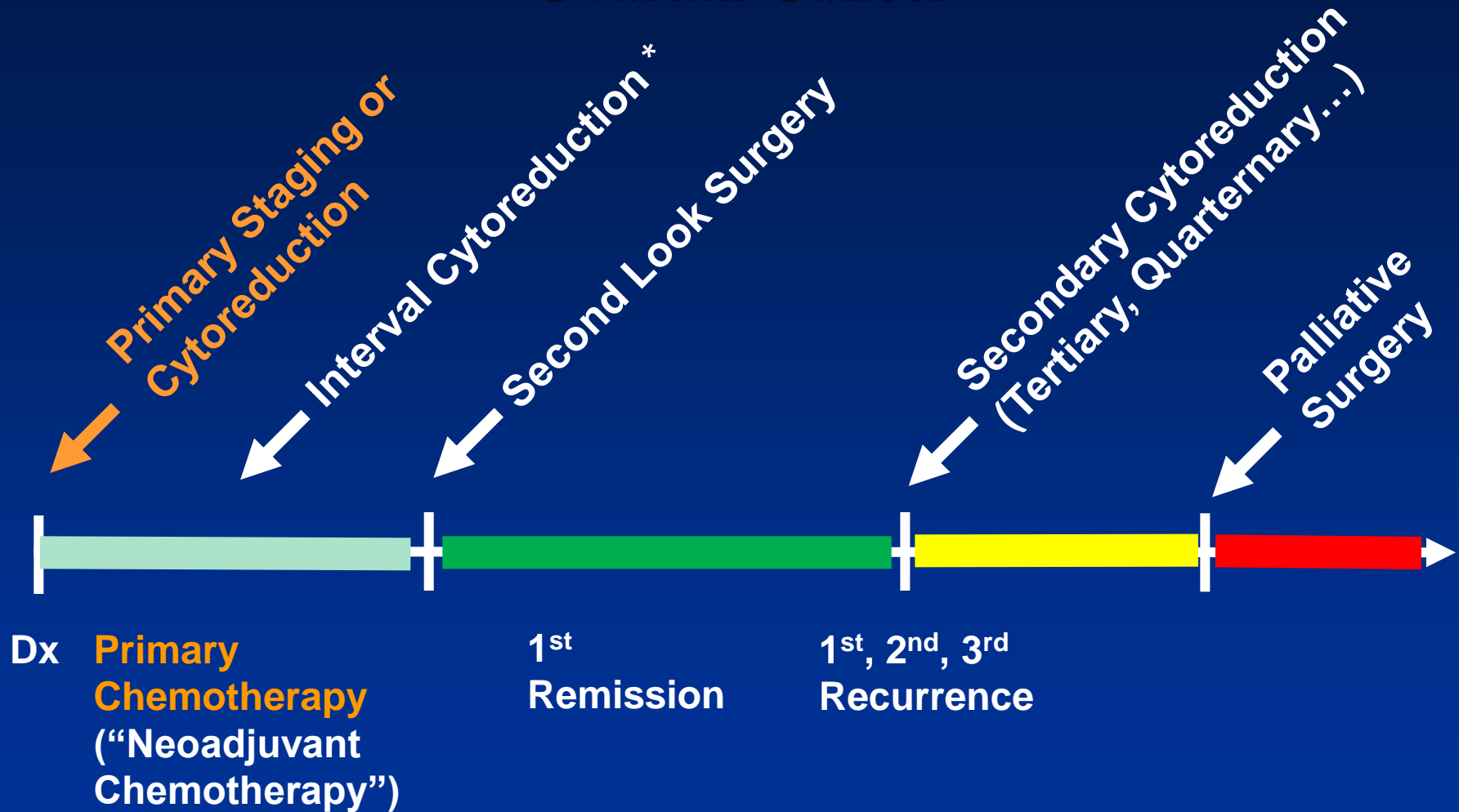
This speaker has no conflicts of interest to disclose relative to the contents of this presentation.

Objectives

At the end of this presentation, participants should be able to:

- Explain the rationale for surgical staging
- Understand the role of cytoreductive surgery
- Summarize the utilization of chemotherapy

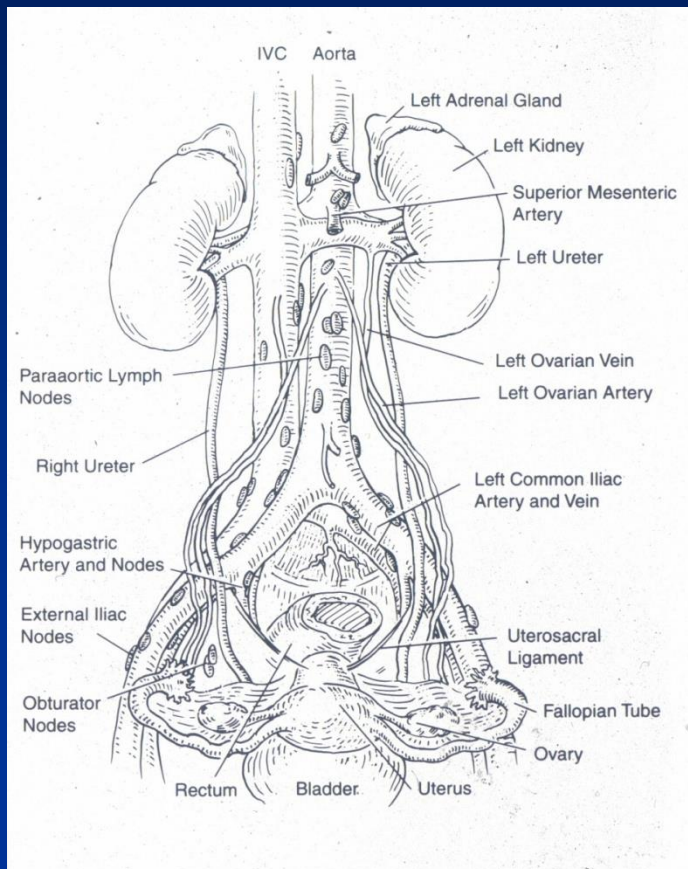
Natural History and Management of Ovarian Cancer



*Also, setting for first cytoreduction after "neoadjuvant chemotherapy"

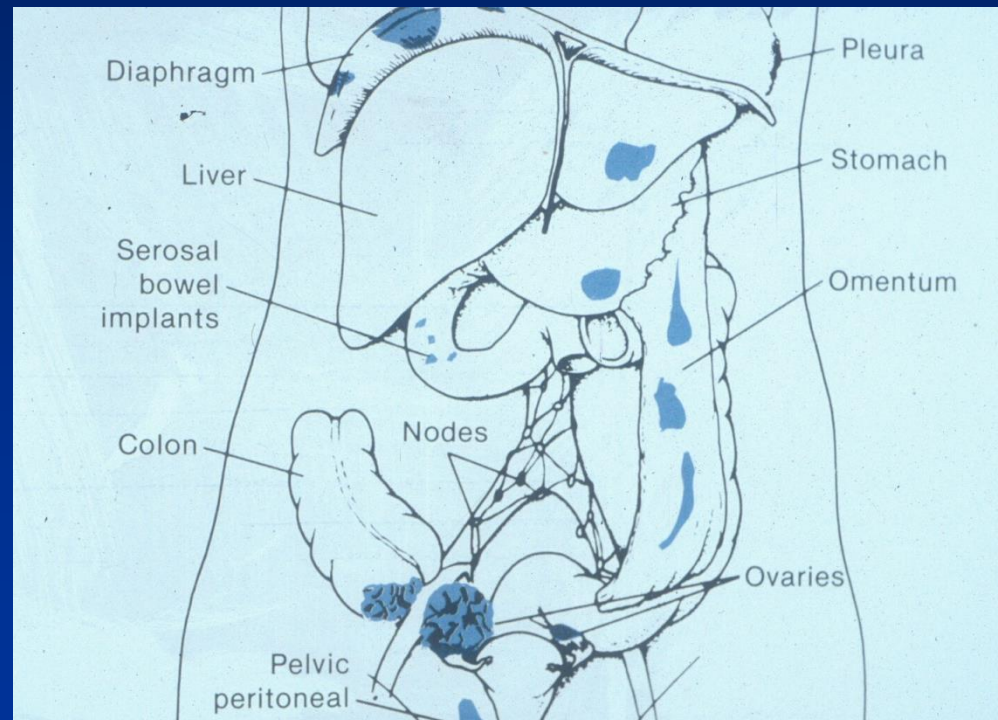
Patterns of Spread of Epithelial Ovarian Cancer

1) Lymphatics



2) Direct extension

3) Exfoliation of clonogenic cells



FIGO Ovarian Cancer Staging

Effective Jan 1, 2014

FIGO Ovarian Cancer Staging
Effective Jan. 1, 2014

(Changes are in *italics*.)

STAGE I: Tumor confined to ovaries			
OLD		NEW	
IA	Tumor limited to 1 ovary, capsule intact, no tumor on surface, negative washings/ascites.	IA	Tumor limited to 1 ovary, capsule intact, no tumor on surface, negative washings.
IB	Tumor involves both ovaries otherwise like IA.	IB	Tumor involves both ovaries otherwise like IA.
IC	Tumor involves 1 or both ovaries with any of the following: capsule rupture, tumor on surface, positive washings/ascites.	IC Tumor limited to 1 or both ovaries	
		IC1	<i>Surgical spill</i>
		IC2	<i>Capsule rupture before surgery or tumor on ovarian surface.</i>
		IC3	<i>Malignant cells in the ascites or peritoneal washings.</i>

STAGE II: Tumor involves 1 or both ovaries with pelvic extension (below the pelvic brim) or primary peritoneal cancer			
OLD		NEW	
IIA	Extension and/or implant on uterus and/or Fallopian tubes	IIA	Extension and/or implant on uterus and/or Fallopian tubes
IIB	Extension to other pelvic intraperitoneal tissues	IIB	Extension to other pelvic intraperitoneal tissues
IIC	IIA or IIB with positive washings/ascites.	No IIC	

Old stage IIC has been eliminated

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

OLD		NEW	
IIIA	Microscopic metastasis beyond the pelvis.	IIIA (Positive retroperitoneal lymph nodes and/or microscopic metastasis beyond the pelvis)	
		IIIA1	Positive retroperitoneal lymph nodes only
		IIIA1(i)	<i>Metastasis ≤ 10 mm</i>
		IIIA1(ii)	<i>Metastasis > 10 mm</i>
		IIIA2	<i>Microscopic, extrapelvic (above the brim) peritoneal involvement ± positive retroperitoneal lymph nodes</i>
IIIB	Macroscopic, extrapelvic, peritoneal metastasis ≤ 2 cm in greatest dimension.	IIIB	<i>Macroscopic, extrapelvic, peritoneal metastasis ≤ 2 cm ± positive retroperitoneal lymph nodes. Includes extension to capsule of liver/spleen.</i>
IIIC	Macroscopic, extrapelvic, peritoneal metastasis ≤ 2 cm in greatest dimension and/or regional lymph node metastasis.	IIIC	<i>Macroscopic, extrapelvic, peritoneal metastasis > 2 cm ± positive retroperitoneal lymph nodes. Includes extension to capsule of liver/spleen.</i>

STAGE IV: Distant metastasis excluding peritoneal metastasis

OLD		NEW	
IV	Distant metastasis excluding peritoneal metastasis. Includes hepatic parenchymal metastasis.	IVA	Pleural effusion with positive cytology
		IVB	Hepatic and/or splenic parenchymal metastasis, metastasis to extra-abdominal organs (including inguinal lymph nodes and lymph nodes outside of the abdominal cavity)

“Simplified” FIGO Staging of Ovarian Carcinoma

Stage	Criteria
I	Tumor confined to the ovaries
II	Extension to other pelvic structures
III	Abdominal or lymph node involvement
IV	Distant metastases

Distribution and Five-Year Survival By FIGO Stage for Ovarian Carcinoma

N= 4116

Stage	Distribution	Five-Year Survival
I	27%	78-90%
II	10%	68-79%
III	50%	29-49%
IV	13%	13%

Pecorelli S et al. Int J Gyn Obstet 2003

Results of Repeat Staging in Apparent Stage I and II Ovarian Cancer

Initial Stage	No. Patients	Upstaged
IA	37	16%
IB	10	30%
IC	2	0%
IIA	4	100%
IIB	38	39%
IIC	9	33%
Total	100	31%

Young RC et al. JAMA 1983

Results of Complete Surgical Staging in Pts Thought to Have Stage I or II Ovarian Cancer

Site of Biopsy	Positive
Para-aortic lymph nodes	12%
Omentum	11%
Pelvic lymph nodes	9%
Random abdominal biopsies	9%
Random pelvic biopsies	9%
Cul-de-sac	6%
Diaphragm	3%

Young RC et al. JAMA 1983

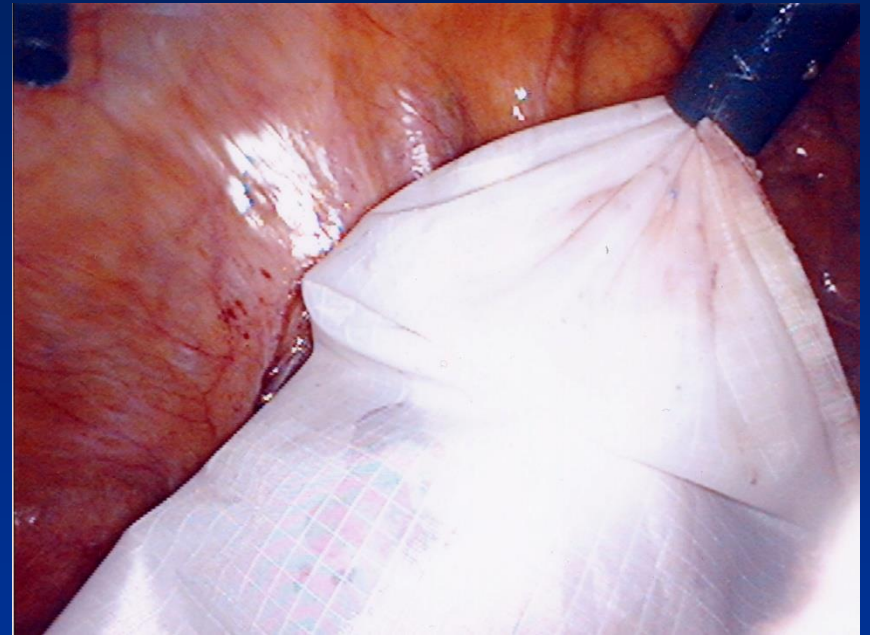
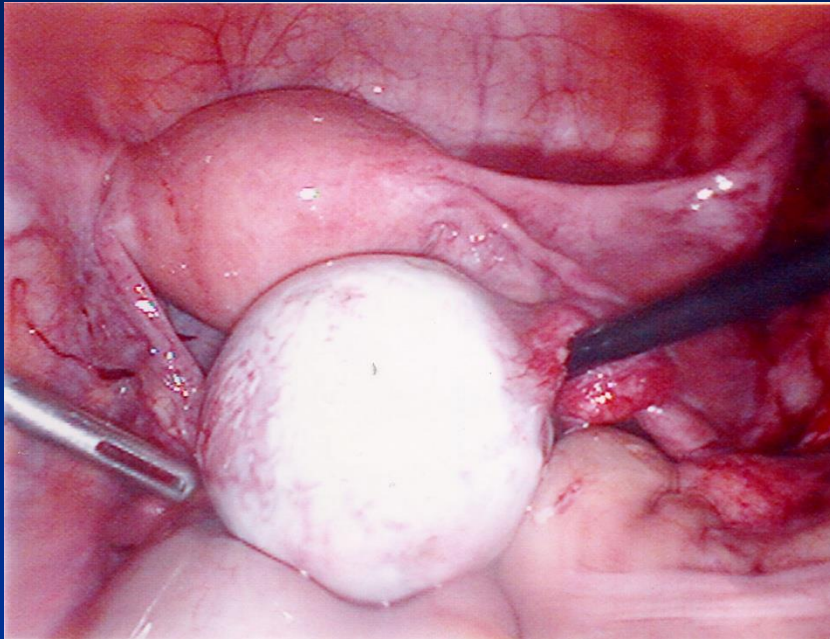
Standard Surgical Staging of Apparent Early Stage Ovarian Carcinoma

- Cytologic washings
- Intact tumor removal
- TAH/BSO (USO in selected cases)
- Infracolic omentectomy
- Random peritoneal biopsies
- Biopsy all adhesions and suspicious lesions
- Bilateral pelvic and para-aortic lymph node sampling

Can Comprehensive Staging be Performed Minimally Invasively?



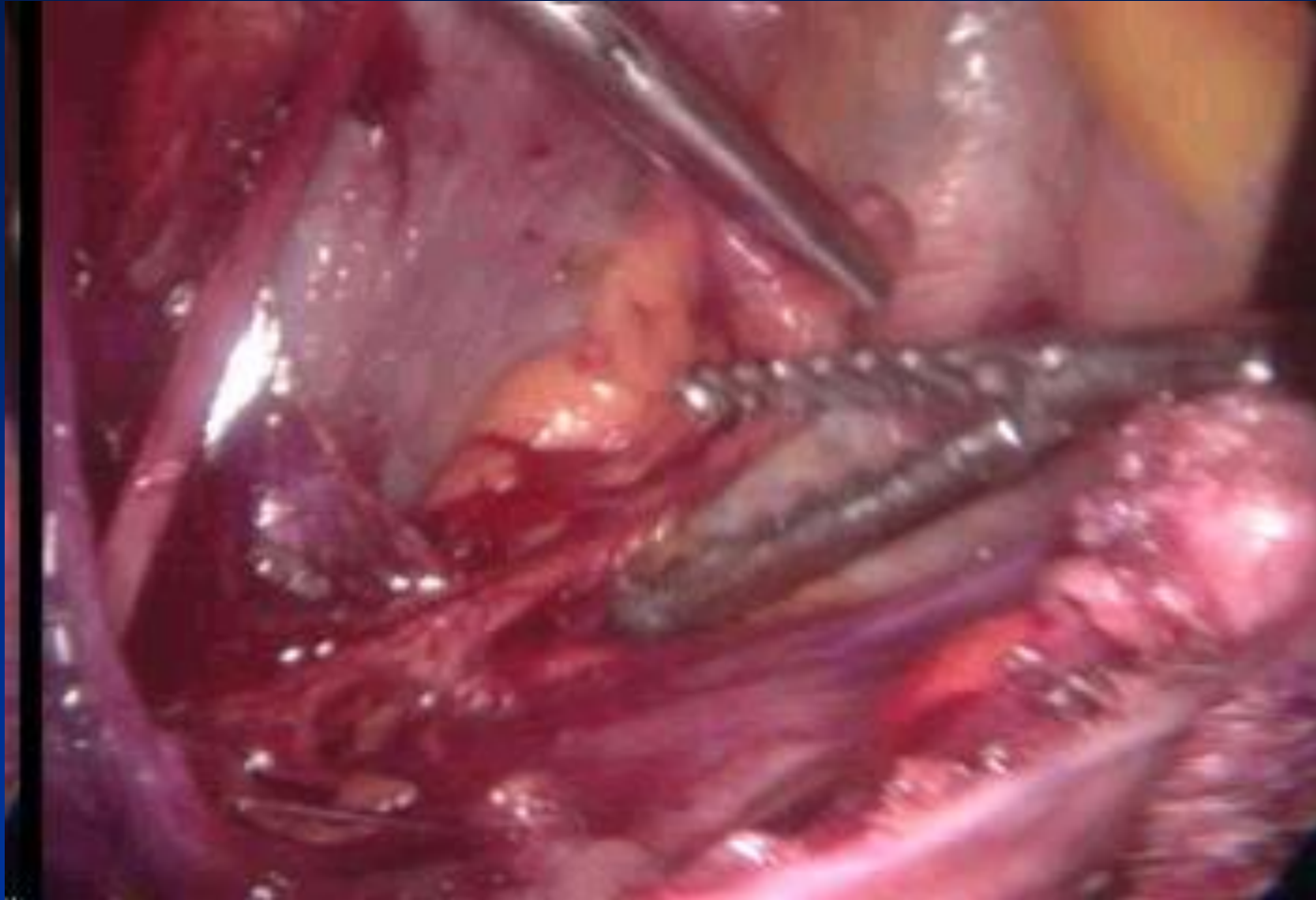
Laparoscopic Removal of Right Ovarian Cancer Without Intraperitoneal Capsule Rupture



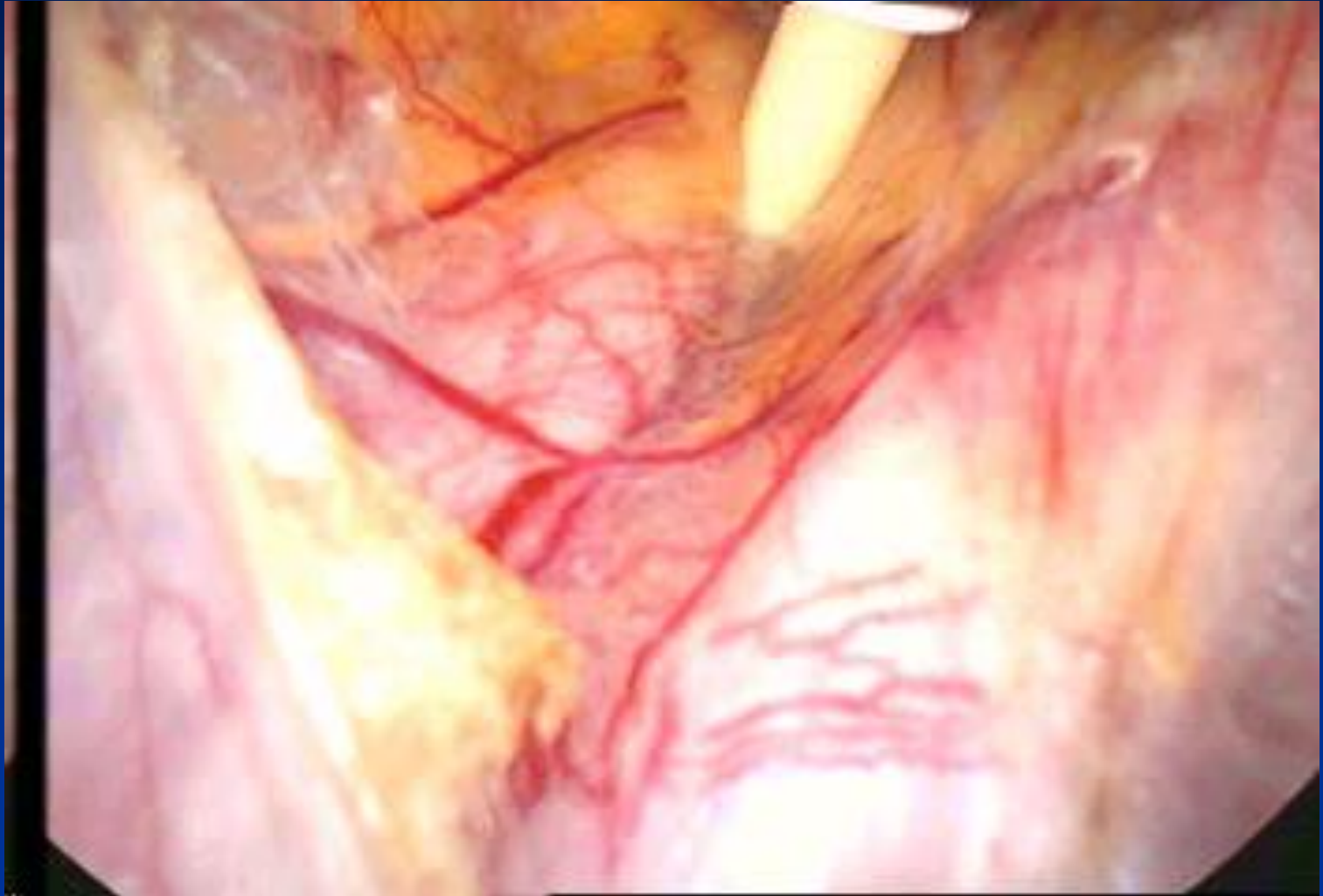
LSC Right External Iliac LND



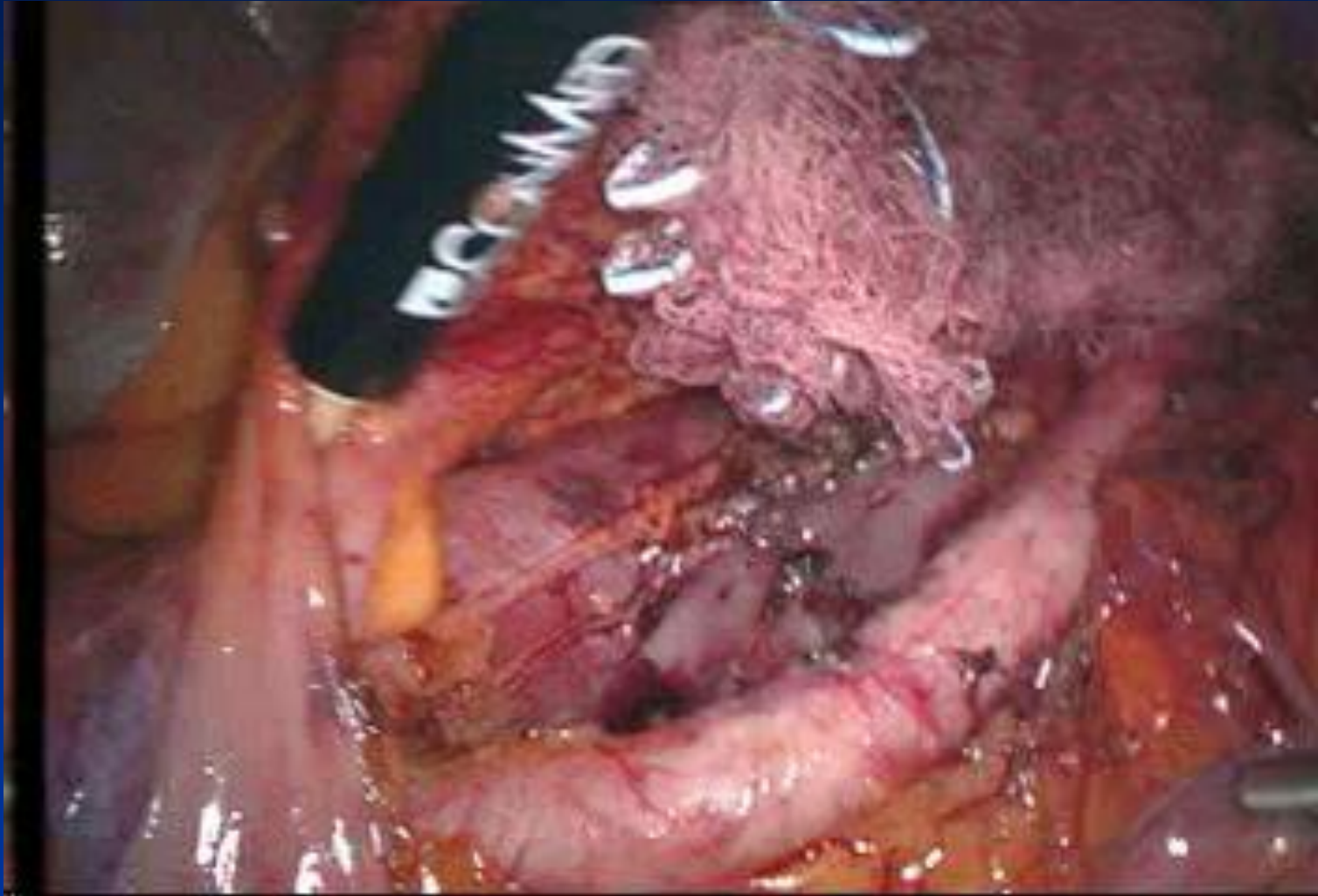
LSC Left Obturator and Hypogastric LND



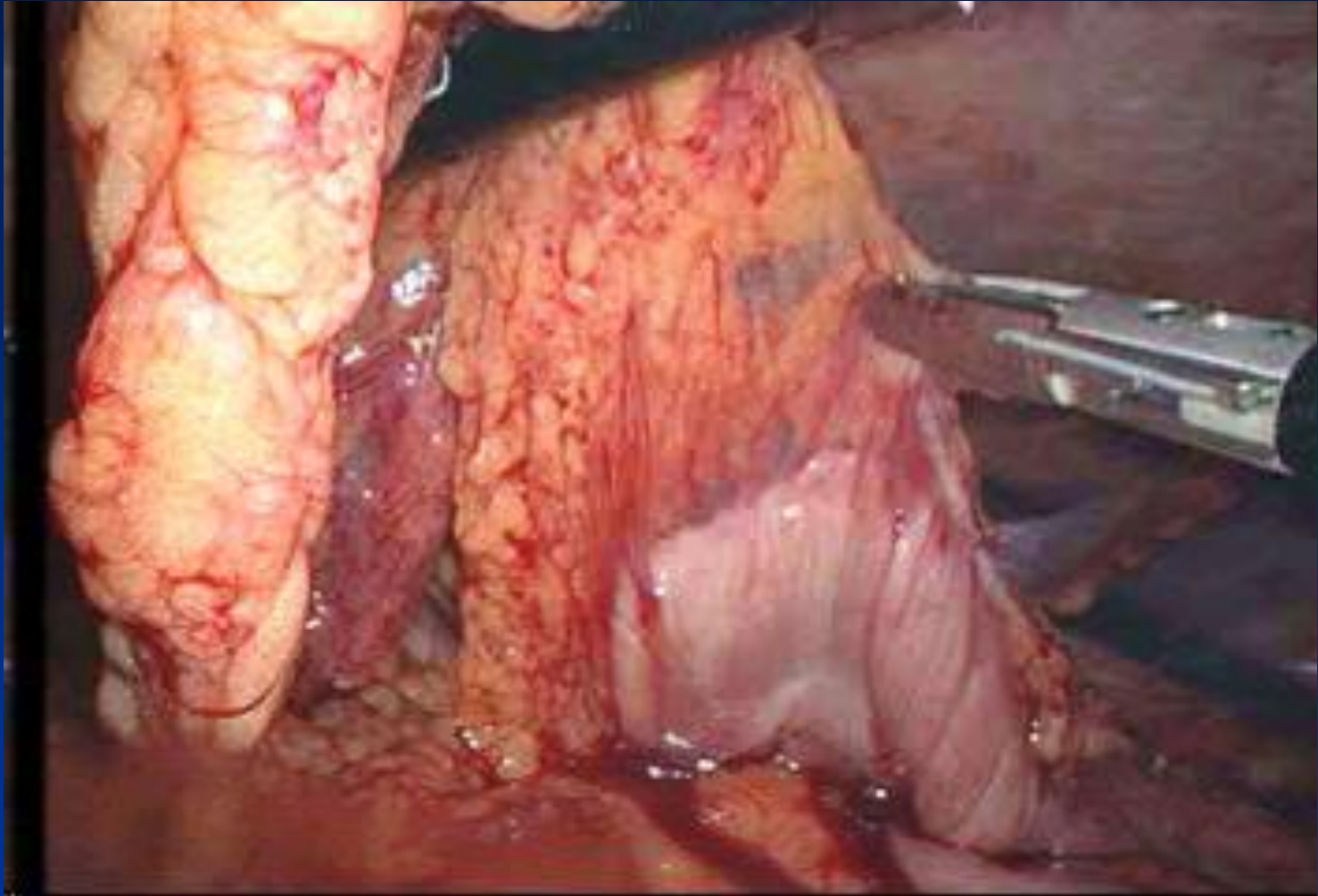
LSC Right PAN Dissection



Completed PAN Dissection



Laparoscopic Omentectomy



Staging laparoscopy for the management of early-stage ovarian cancer: a metaanalysis

Hyun Jong Park, MD; Dong Wook Kim, PhD; Ga Won Yim, MD; Eun Ji Nam, MD, PhD; Sunghoon Kim, MD, PhD; Young Tae Kim, MD, PhD

TABLE 1
Patient characteristics and study designs in 11 enrolled observational studies

Study (period)	Total patients, mean age, y (SD) [range]	Median follow-up, mo [range]	Method of data collection	Diagnosis of disease stage	Fertility-sparing surgery, n/total (%)	Incomplete staging at initial surgery, ^a n/total (%)	Invasive epithelial carcinoma, n/total (%)	Conducting rate of AC, n/total (%)
Leblanc et al, ¹³ 2004 (1991 through 2001)	n = 53, 41.3 (13.9) [18–63]	54 [8–116]	Retrospective	Clinical ^b	9/53 (17.0)	53/53 (100)	44/53 (83.0)	19/53 (35.8)
Chi et al, ¹⁴ 2005 (2000 through 2003)	n = 20, 47.3 (11.2)	Not reported	LSARC	Clinical ^b	Not reported	13/20 (65.0)	17/20 (85.0)	Not reported
Park, ¹⁵ 2008 (2001 through 2006)	n = 17, 43.2 (12.3)	19 [5–56]	LSARC	Clinical ^b	Not reported	6/17 (35.3)	17/17 (100.0)	10/17 (58.8)
Park, ¹⁶ 2008 (2004 through 2007)	n = 19, 43.9 (9.8)	17 [2–40]	LSARC	Clinical ^b	3/19 (15.8)	7/19 (36.8)	19/19 (100.0)	15/19 (78.9)
Nezhat et al, ² 2009 (1995 through 2007)	n = 36, 47.8 [17–89]	55.9	Retrospective	Clinical ^b	11/36 (30.6)	9/36 (25.0)	20/36 (55.6)	10/36 (27.8)
Lee et al, ¹⁷ 2011 (2005 through 2010)	n = 26, 42.2 (10.8)	12 [1–42]	Retrospective	Clinical ^b	Not reported	9/26 (34.6)	22/26 (84.6)	17/26 (65.4)
Schreuder et al, ¹⁸ 2012 (2001 through 2009)	n = 25, 49.7 [18–79]	43 [1–116]	Retrospective	Clinical ^b	Not reported	24/25 (96.0)	20/25 (80.0)	14/25 (56.0)
Tozzi et al, ¹² 2004 (1996 through 2003)	n = 24, 36.8 [19–76]	46.4 [2–72]	Prospective	Pathologic ^c	10/24 (41.7)	11/24 (45.8)	18/24 (75.0)	5/24 (20.8)
Colomer et al, ¹⁹ 2008 (2003 through 2008)	n = 20, 42.8 [16–67]	24.7 [1–61]	Prospective	Clinical ^b	8/20 (40.0)	17/20 (85.0)	11/20 (55.0)	12/20 (60.0)
Jung et al, ²⁰ 2009 (2004 through 2007)	n = 24, 52.8 (11.3)	10 [2–39]	Prospective	Clinical ^b	1/24 (4.2)	5/24 (20.8)	16/24 (66.7)	21/24 (87.5)
Ghezzi et al, ⁵ 2012 (not suggested)	n = 82, 56 [13–80]	28.5 [3–86]	Prospective	Clinical ^b	14/82 (17.1)	19/82 (23.2)	75/82 (91.5)	64/82 (78.0)

Staging laparoscopy for the management of early-stage ovarian cancer: a metaanalysis

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Sunghoon Kim, MD, PhD; Young Tae Kim, MD, PhD

- EBL for LSC sig lower than for LAP
- Overall upstaging rate: 22.6%
- Overall conversion from LSC to LAP: 3.7%
- Overall rate of recurrence 9.9%
- Operative outcomes of LSC comparable to LAP

NCCN Guidelines for Primary Surgery



National
Comprehensive
Cancer
Network®

NCCN Guidelines Version 3.2014 Epithelial Ovarian Cancer/ Fallopian Tube Cancer/ Primary Peritoneal Cancer

[NCCN Guidelines Index](#)
[Ovarian Cancer TOC](#)
[Discussion](#)

PRINCIPLES OF SURGERY (1 of 2)¹

General considerations

- In most instances, a vertical midline abdominal incision should be used in patients with a suspected malignant ovarian/Fallopian tube/primary peritoneal neoplasm in whom a surgical staging procedure, a primary debulking procedure, an interval debulking procedure, or secondary cytoreduction is planned.
- Intraoperative pathologic evaluation with frozen sections may assist in management.
- For select patients, a minimally invasive surgical approach may be employed by an experienced surgeon to achieve the surgical staging and debulking principles subsequently described. In addition, minimally invasive surgical approaches may be useful when evaluating whether maximum cytoreduction can be achieved in patients with newly diagnosed or recurrent ovarian cancer.
- Surgeons should quantify and document the extent of initial and residual disease in operative notes.
- It is recommended that a gynecologic oncologist perform the appropriate surgery.

The following surgical procedures should be considered for patients with newly diagnosed invasive epithelial ovarian cancer apparently confined to an ovary or to the pelvis

- On entering the abdomen, aspiration of ascites or peritoneal lavage should be performed for peritoneal cytologic examinations.
- All peritoneal surfaces should be visualized, and any peritoneal surface or adhesion suspicious for harboring metastasis should be selectively excised or biopsied. In the absence of any suspicious areas, random peritoneal biopsies should be taken from the pelvis, paracolic gutters, and undersurfaces of the diaphragm (diaphragm scraping for Papanicolaou stain is an acceptable alternative).
- **Bilateral salpingo-oophorectomy (BSO)** and hysterectomy should be performed with every effort to keep an encapsulated mass intact during removal.
- For selected patients desiring to preserve fertility, unilateral salpingo-oophorectomy (USO) may be considered.
- Omentectomy should be performed.
- Para-aortic lymph node dissection should be performed by stripping the nodal tissue from the vena cava and the aorta bilaterally to at least the level of the inferior mesenteric artery and preferably to the level of the renal vessels.
- The preferred method of dissecting pelvic lymph nodes is bilateral removal of lymph nodes overlying and anterolateral to the common iliac vessel, overlying and medial to the external iliac, overlying and medial to the hypogastric vessels, and from the obturator fossa at a minimum anterior to the obturator nerve.²

The following surgical procedures should be considered as part of the surgical management for patients with newly diagnosed invasive epithelial ovarian cancer involving the pelvis and upper abdomen:

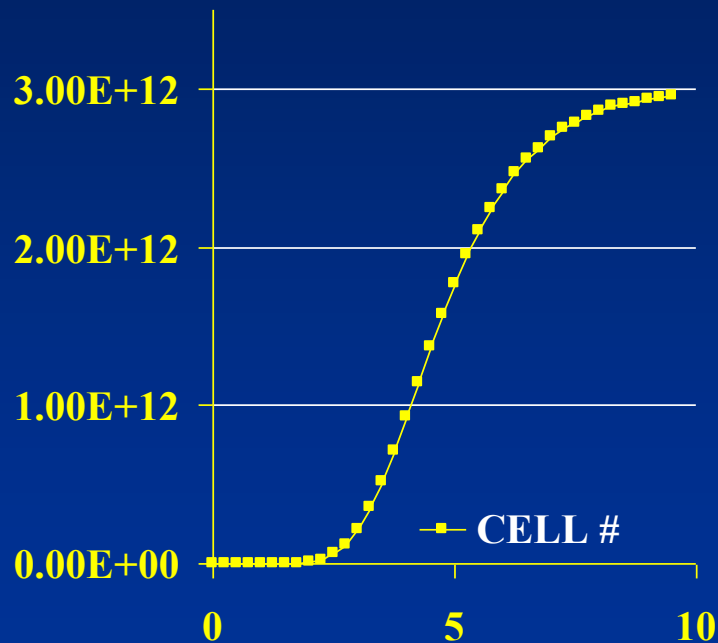
- In general, every effort should be made to achieve maximum cytoreduction. Residual disease <1 cm defines optimal cytoreduction; however, maximal effort should be made to remove all gross disease since this offers superior survival outcomes.³
- Aspiration of ascites (if present) should be performed for peritoneal cytologic examinations. All involved omentum should be removed.
 - Suspicious and/or enlarged nodes should be resected, if possible.
 - Those patients with tumor nodules outside the pelvis ≤ 2 cm (presumed stage IIIB) should have bilateral pelvic and para-aortic lymph node dissection as previously described.
 - Procedures that may be considered for optimal surgical cytoreduction (in all stages) include bowel resection and/or appendectomy, stripping of the diaphragm or other peritoneal surfaces, splenectomy, partial cystectomy and/or ureteroneocystotomy, partial hepatectomy, partial gastrectomy, cholecystectomy, and/or distal pancreatectomy.
 - Select patients with low-volume residual disease after surgical cytoreduction for invasive epithelial ovarian or peritoneal cancer are potential candidates for IP therapy. In these patients, consideration should be given to placement of IP catheter with initial surgery.



Surgical Cytoreduction

- Also known as “tumor debulking”
- Resection of as much visible and palpable tumor as possible
- For most solid tumors, not justified
- Theoretical and clinical benefits demonstrated for ovarian carcinoma

Theoretical Benefits of Optimal Cytoreductive Surgery for Advanced Ovarian Carcinoma



- Nearly all rapid proliferation of tumor cells is in the preclinical phase
- Bulky tumors respond poorly to chemotherapy due to poor blood supply
- Removal of large bulky tumors improves the sensitivity of residual masses to postoperative chemotherapy by shifting to rapid growth phase of the cell cycle
- With less tumor volume, there is a greater likelihood of tumor eradication before chemoresistance develops
- Tumor burden of 3×10^{12} is lethal

Clinical Benefits of Optimal Cytoreductive Surgery For Advanced Ovarian Carcinoma

- Improved pt comfort/GI function/nutrition
- Better response rate to chemotherapy
- Higher percentage of negative second-look surgeries
- Prolonged progression free interval
- Improved overall survival

Residual Disease

- The *maximum* diameter of the largest tumor mass remaining after cytoreductive surgery
- By convention, measured in cm
- Optimal versus suboptimal cytoreduction or debulking refers to the amount of residual disease in relation to a certain cutoff point (eg 1.0, 1.5, 2.0, or 3.0 cm)

What is the optimal goal of primary cytoreductive surgery for bulky stage IIIC epithelial ovarian carcinoma (EOC)?[☆]

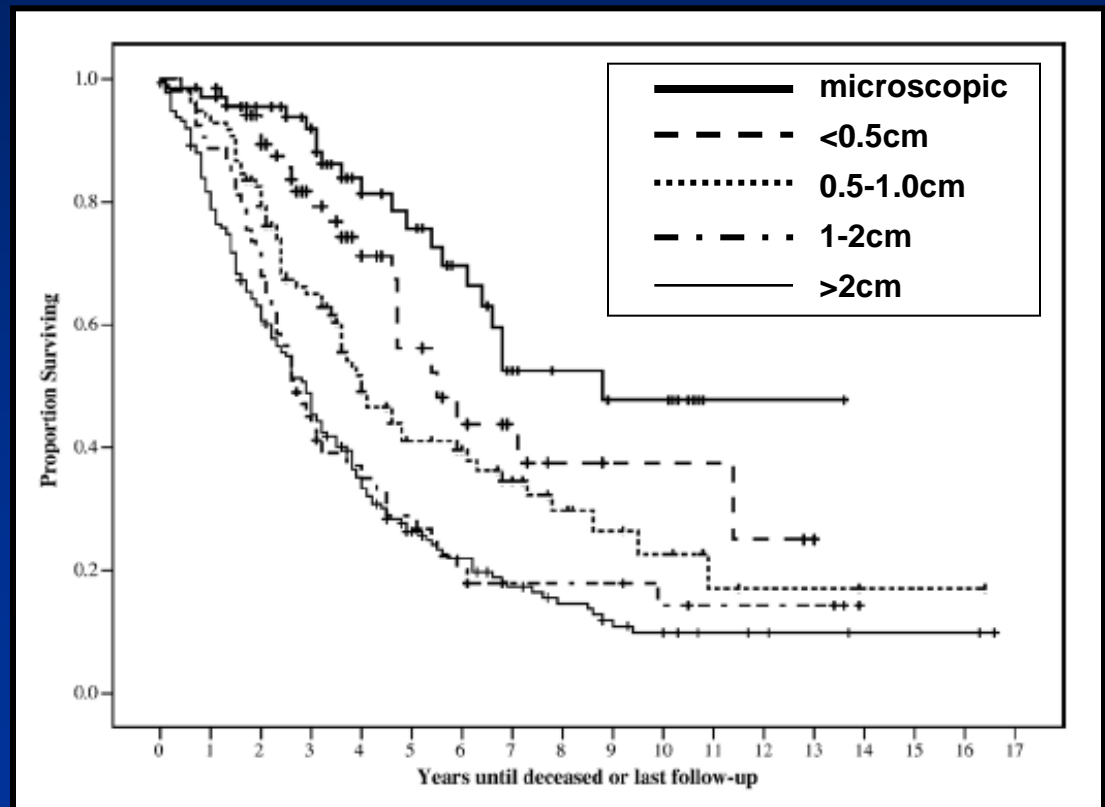
D.S. Chi ^{*}, E.L. Eisenhauer, J. Lang, J. Huh, L. Haddad, N.R. Abu-Rustum,
Y. Sonoda, D.A. Levine, M. Hensley, R.R. Barakat

- Review of 465 consecutive patients (1/89-12/03)
- No pts were stage IIIC based solely on lymph node metastasis
- 13 factors analyzed for prognostic significance
- Multivariate analysis:
 - Age
 - Ascites
 - Residual disease

What is the optimal goal of primary cytoreductive surgery for bulky stage IIIC epithelial ovarian carcinoma (EOC)?[☆]

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Residual Disease	Pts	Median OS (mo)
Micro	67	106
< 0.5 cm	70	66
0.5 – 1 cm	99	48
1 - 2 cm	53	33
> 2 cm	176	34



What is the optimal goal of primary cytoreductive surgery for bulky stage IIIC epithelial ovarian carcinoma (EOC)?[☆]

D.S. Chi ^{*}, E.L. Eisenhauer, J. Lang, J. Huh, L. Haddad, N.R. Abu-Rustum,
Y. Sonoda, D.A. Levine, M. Hensley, R.R. Barakat

- Cytoreduction to > 1 cm residual has no benefit on overall survival
- There is a survival benefit associated with cytoreduction to ≤ 1 cm residual
- Within the gross residual but ≤ 1 cm category, the closer to no gross residual, the longer the median survival

Optimal Cytoreduction Rates in Advanced Ovarian Carcinoma with Standard Surgical Techniques

Author	Year	No. Pts	Optimally Cytoreduced
Smith	1979	792	24%
Wharton	1984	395	39%
Neijt	1993	265	46%
Makar	1995	455	27%
Chi	2001	282	25%
Total		2189	30%

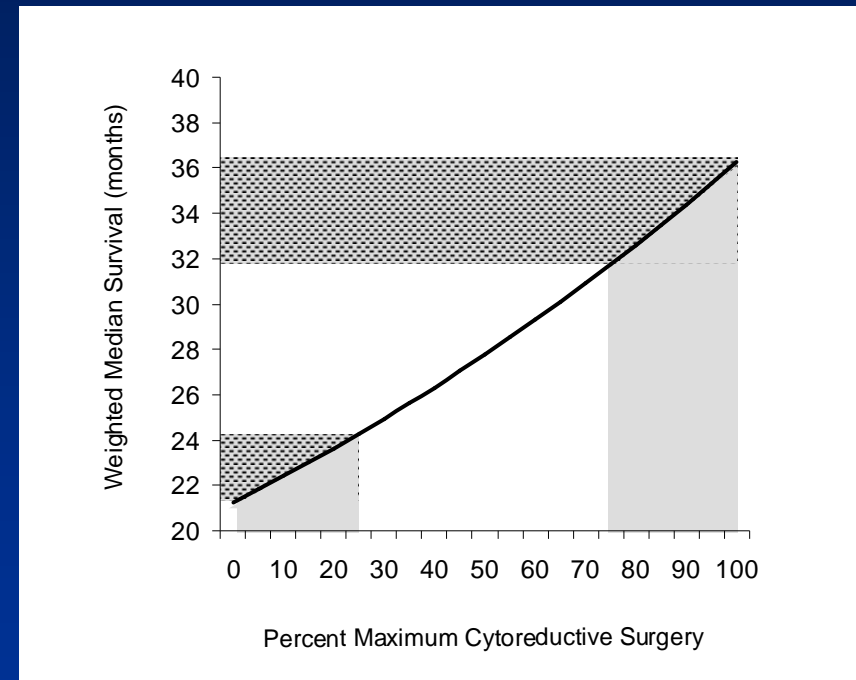
Primary Cytoreduction: Meta-Analysis

- Study selection
 - Medline database 1989 – 1998
 - Stage III-IV ovarian cancer: Surgery + Platinum
 - “Maximum cytoreduction” = % patients “optimal”
- 6,885 patients in 81 patient cohorts
- Mean weighted median survival - 29.0 months
- Multiple linear regression analysis
 - each 10% increase in maximum cytoreductive surgery was associated with a 5.5% increase in median survival time

Primary Cytoreduction: Meta-Analysis

Conclusions

- Percent Maximum Cytoreduction
 - Independent determinant of survival
- “Expert” vs. less-experienced centers
 - $\leq 25\%$ maximal cytoreduction:
weighted median OS: **22.7 months**
 - $> 75\%$ maximal cytoreduction:
weighted median OS: **33.9 months**
 - **increase of 50%**



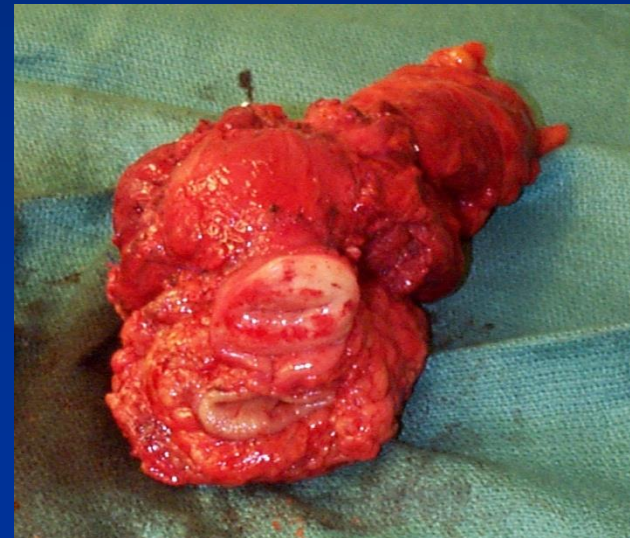
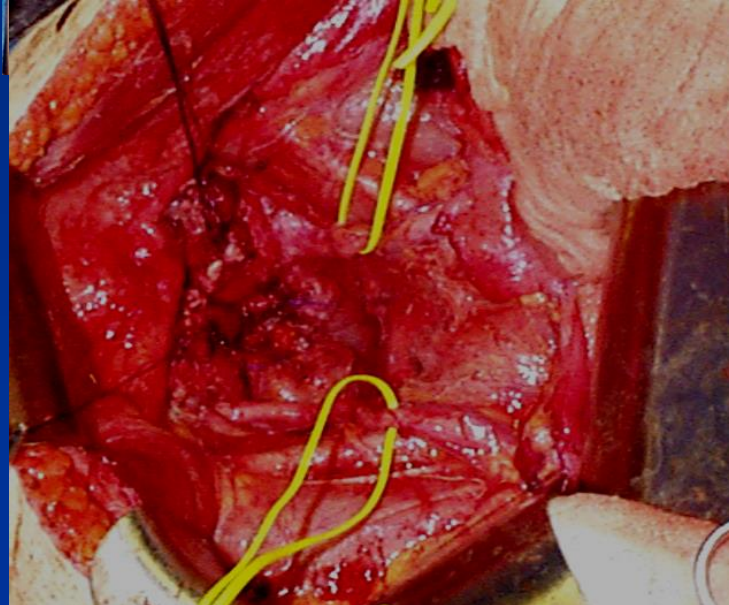
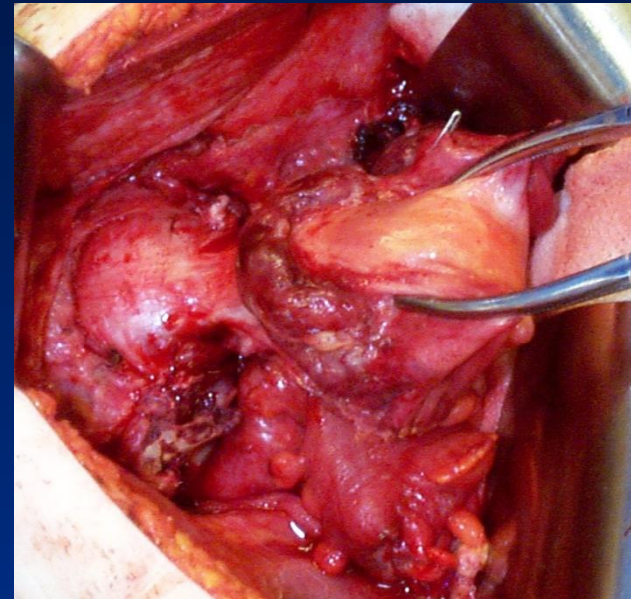
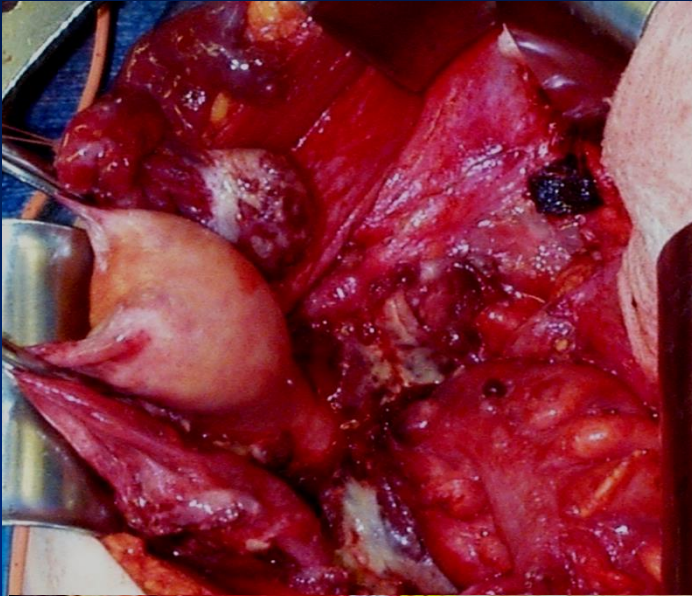
Studies with $\geq 75\%$ Maximal Cyto-reduction Rate in Bristow Meta-Analysis

Author/Year	No. Pts	Cutoff Maximal Cyto-reduction	Maximal Cyto-reduction	Chemotherapy Study?
Omura /1989	349	≤ 1 cm	100%	Yes
Piver/1991*	61	≤ 2 cm	79%	No
Gershenson/1992	116	≤ 2 cm	100%	Yes
Marchetti/1993 *	70	≤ 2 cm	91%	No
Baker/1994 **	136	≤ 2 cm	83%	No
Alberts/1996	546	≤ 2 cm	100%	Yes
Meerpohl/1997	158	≤ 2 cm	100%	Yes
Vallejos/1997	30	< 1 cm	87%	Yes
Eisenkop/1998	163	≤ 1 cm	99%	No

*studies from SUNY Buffalo, **40% maximal cyto-reduction rate for ≤ 1 cm cutoff

“Clearing the Pelvis”

Modified Posterior Exenteration (MPE, 1997-current)



The impact of bulky upper abdominal disease cephalad to the greater omentum on surgical outcome for stage IIIC epithelial ovarian, fallopian tube, and primary peritoneal cancer

474 stage IIIC patients between 1989-2005 stratified by UAD

Zivanovic O et al. Gynecol Oncol 2007

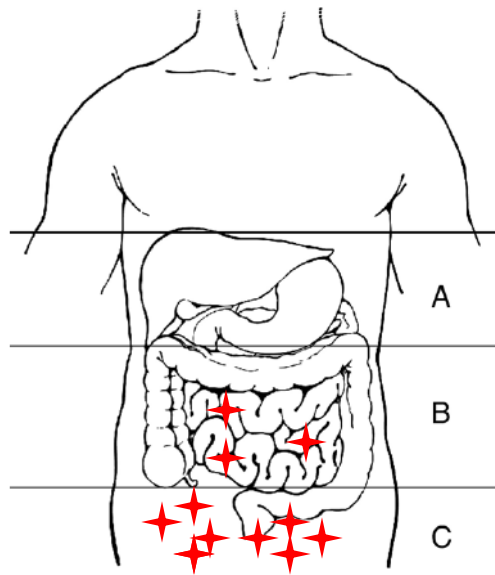


Fig. 1. Abdominopelvic regions. (A) Upper abdomen cephalad to the greater omentum. (B) Mid-abdomen. (C) Pelvis.

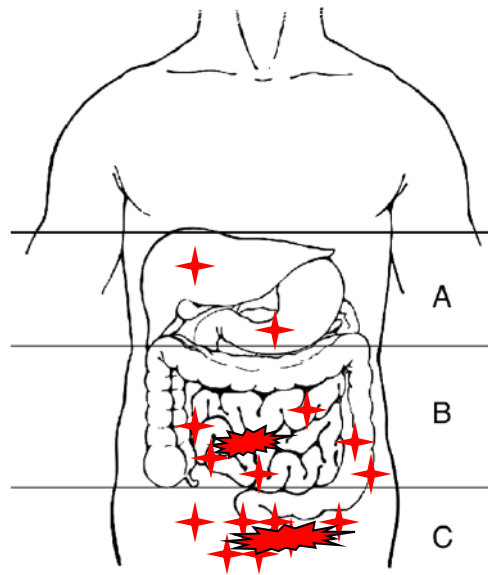


Fig. 1. Abdominopelvic regions. (A) Upper abdomen cephalad to the greater omentum. (B) Mid-abdomen. (C) Pelvis.

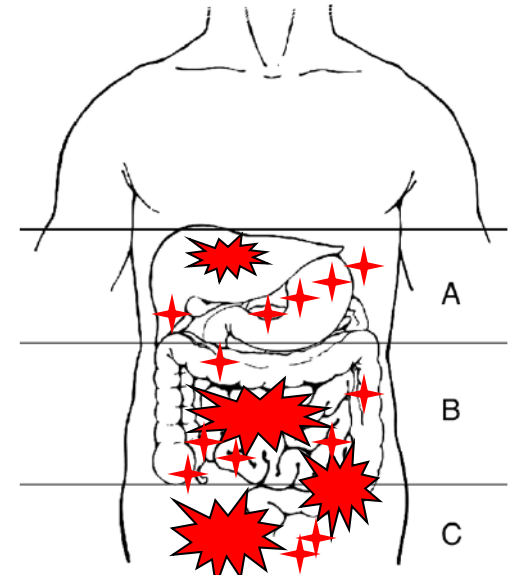


Fig. 1. Abdominopelvic regions. (A) Upper abdomen cephalad to the greater omentum. (B) Mid-abdomen. (C) Pelvis.

No UAD
116 (24%)

Minimal UAD (<1cm)
161 (34%)

Bulky UAD
197 (42%)

Role of Extensive Cytoreductive Procedures

What Are the Current Surgical Objectives, Strategies, and Technical Capabilities of Gynecologic Oncologists Treating Advanced Epithelial Ovarian Cancer?

Scott M. Eisenkop, M.D.,*.¹ and Nick M. Spirtos, M.D.†

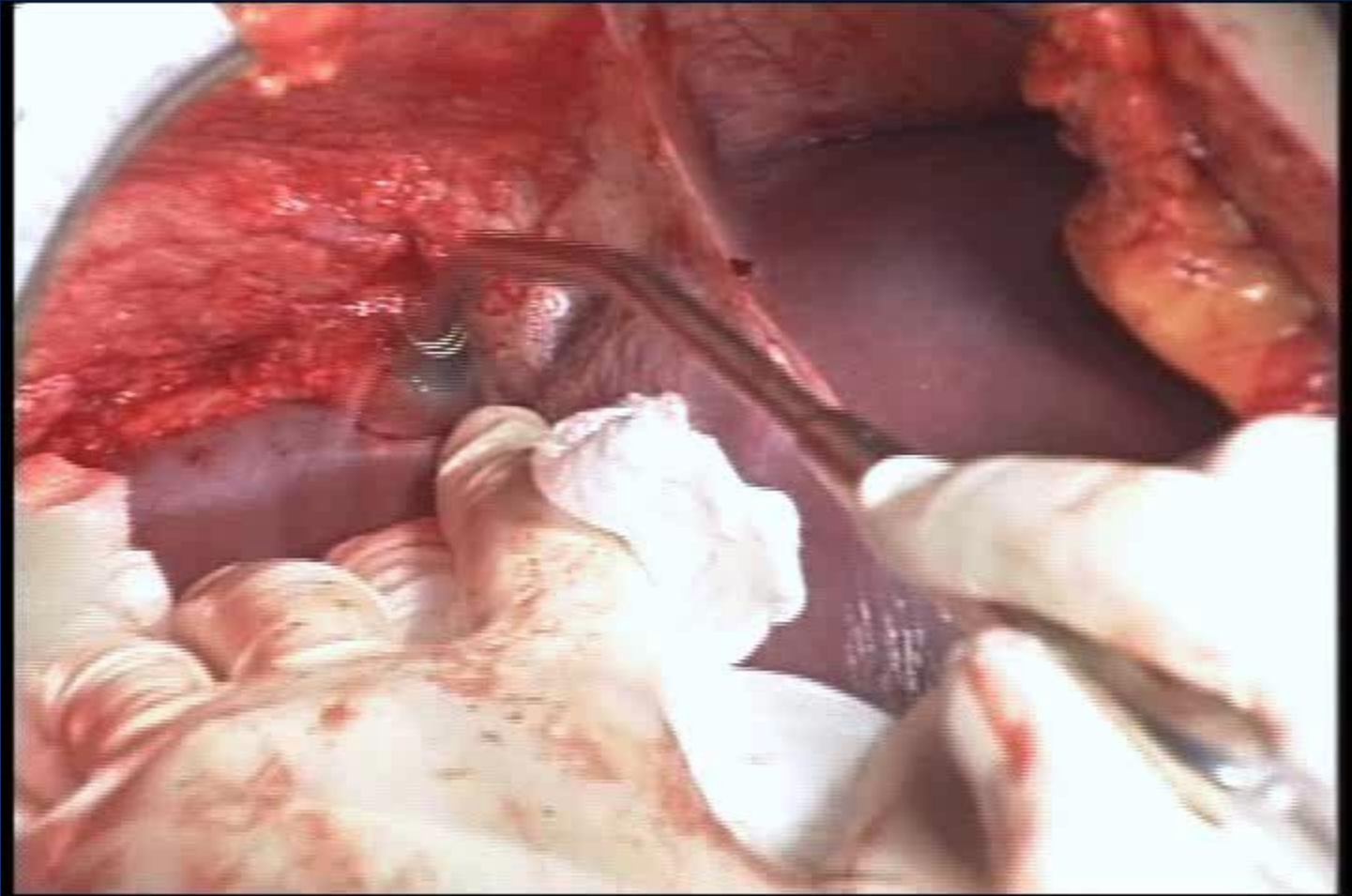
**Womens' Cancer Center, Encino-Tarzana, 5525 Etiwanda Avenue, Suite 311, Tarzana, California 91356; and*

†Womens' Cancer Center, Palo Alto, 900 Welch Road, Suite 300, Palo Alto, California 94304-1800

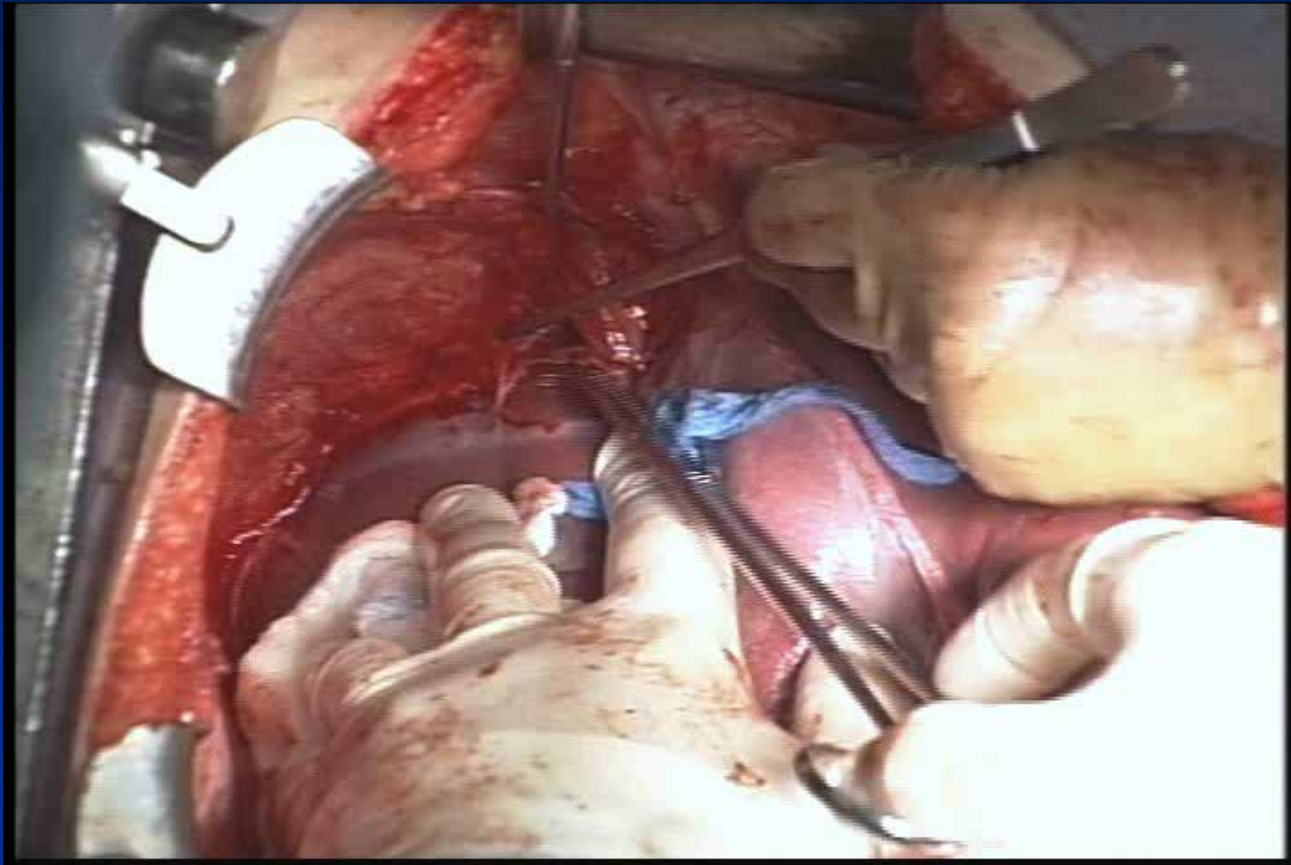
Received December 7, 2000; published online August 1, 2001

- Survey mailed to SGO membership with 61% response
- Reasons for suboptimal cytoreduction:
 - Unresectable upper abd metastases 85%
- Disease sites precluding optimal cytoreduction:
 - Disease involving base of mesentery 83%
 - Portal triad disease 77%
 - Bulky diaphragmatic metastases 76%

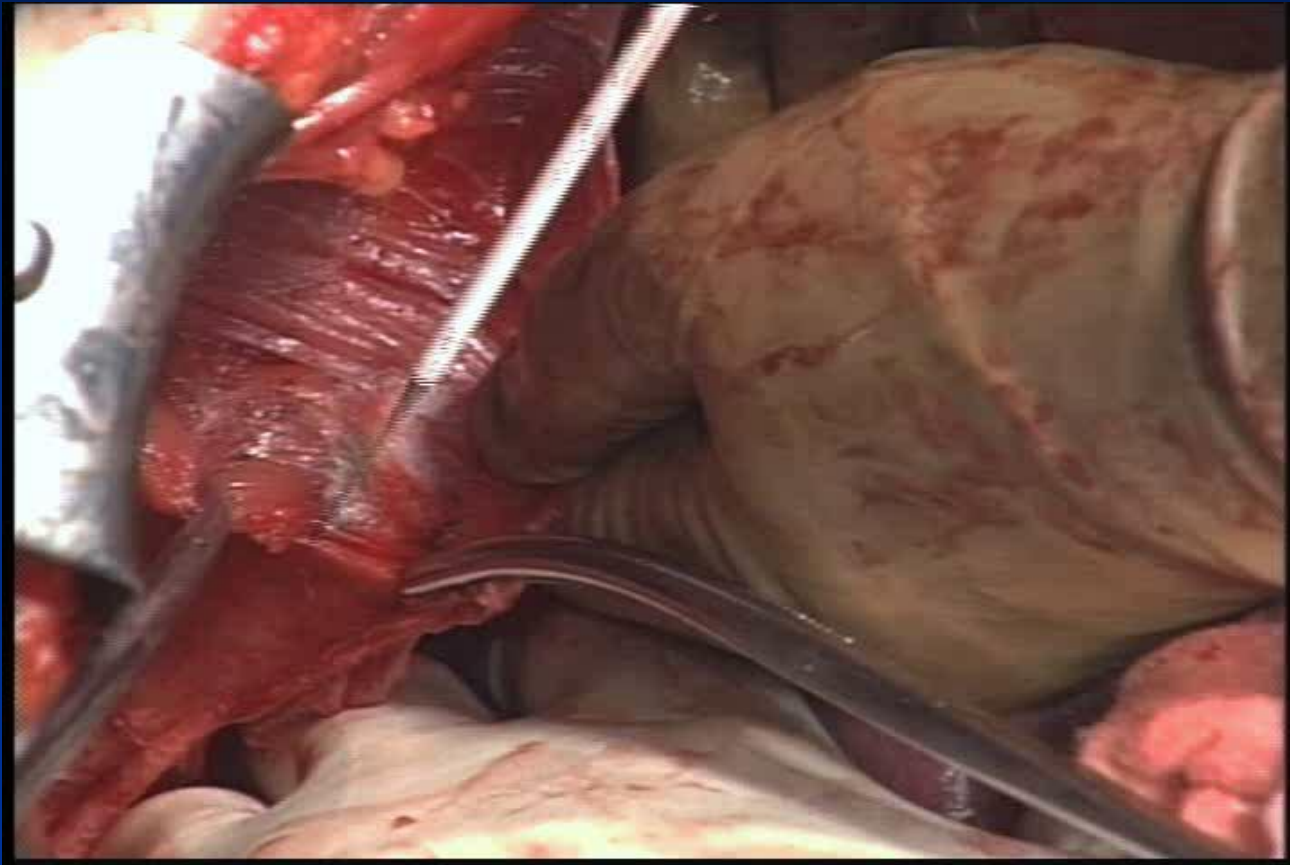
Dissection of Tumor and Peritoneum off Right Hepatic Vein



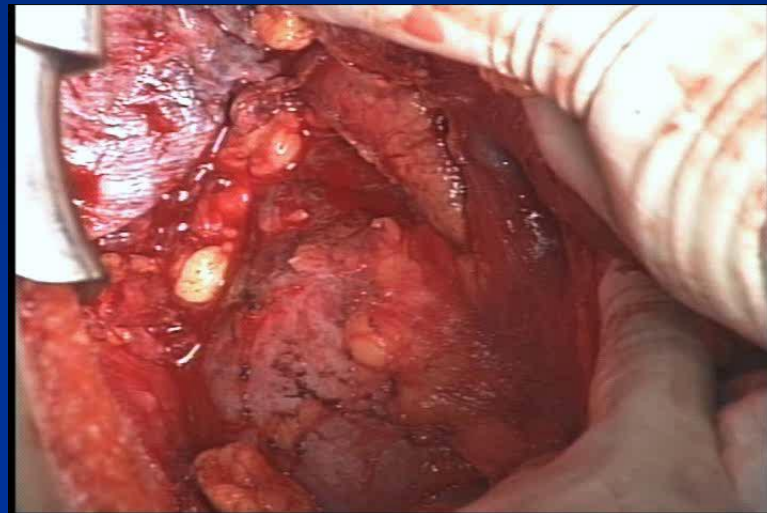
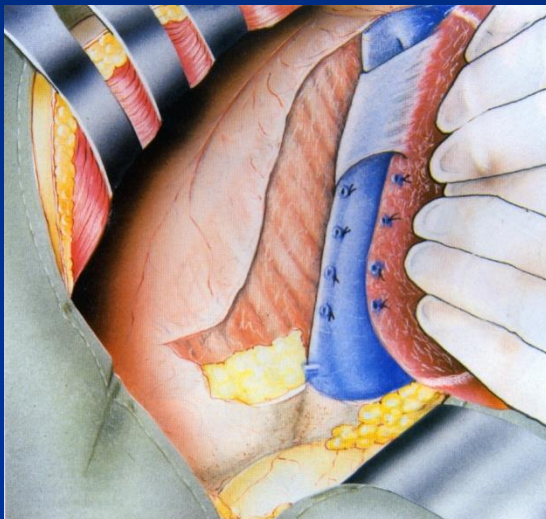
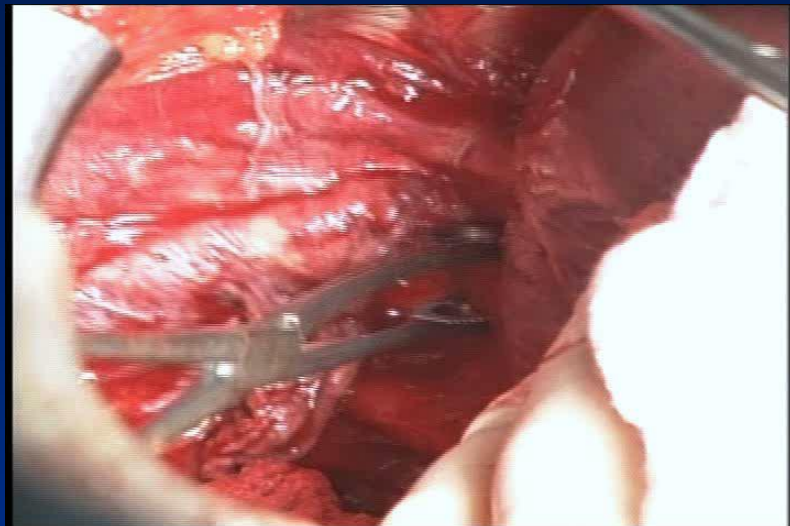
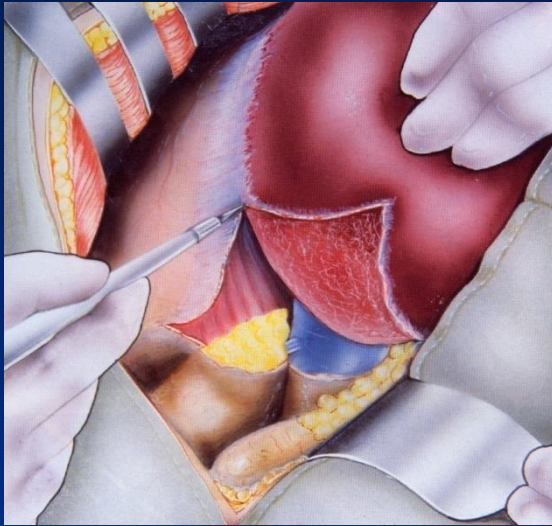
Continuation of Dissection Laterally



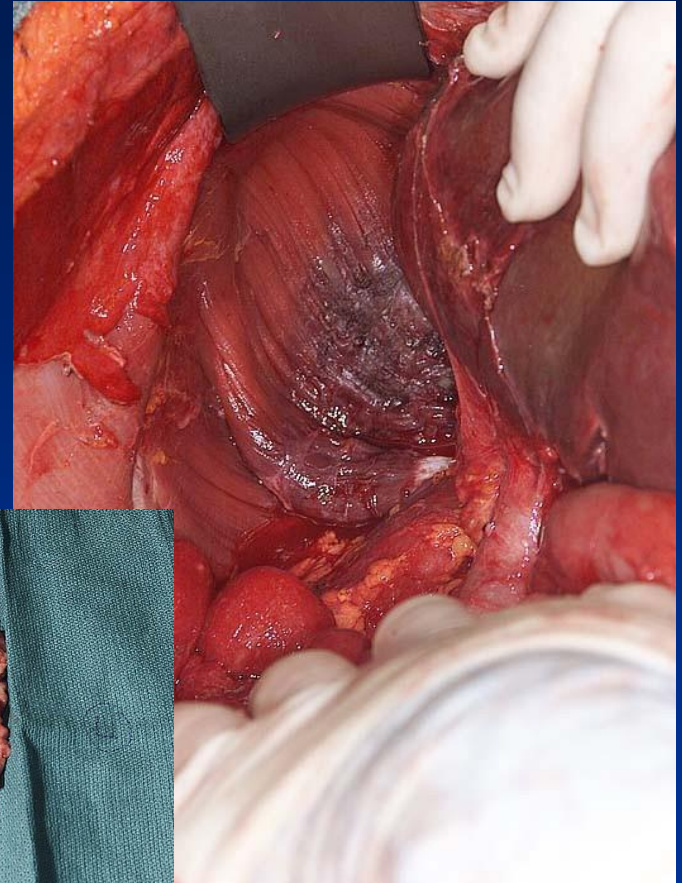
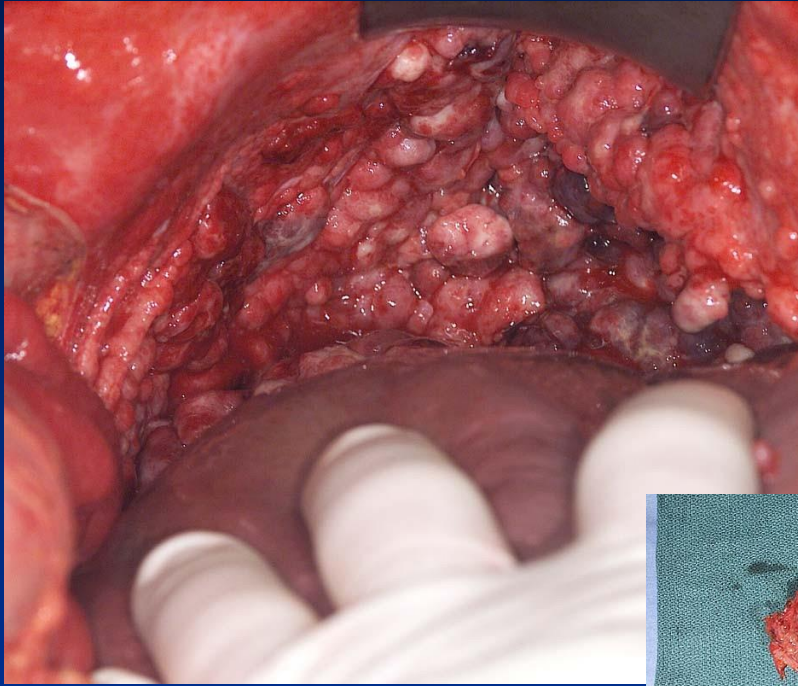
Right Diaphragm Peritonectomy



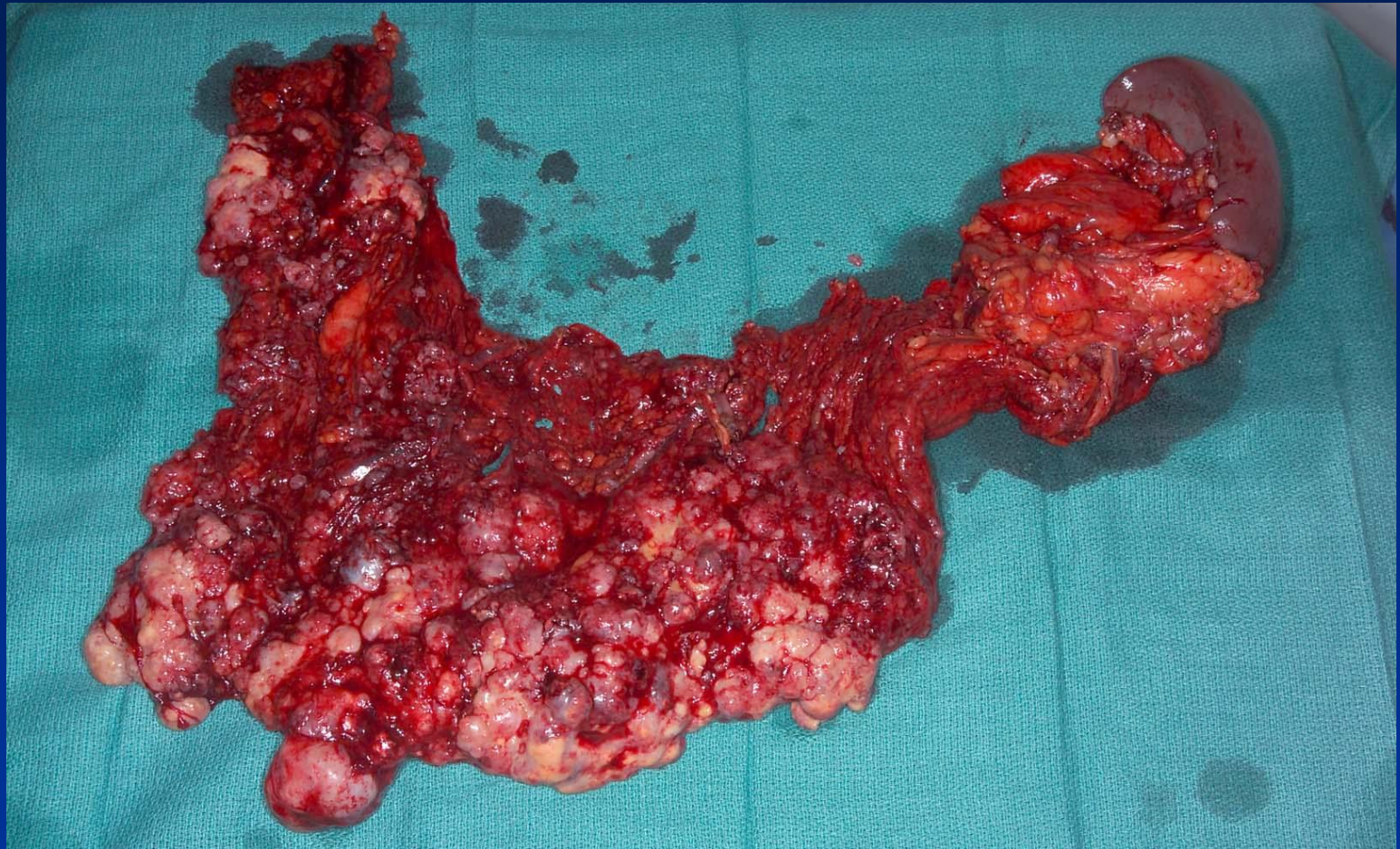
Medial Mobilization of Liver with Identification of Right Kidney, Adrenal Gland and Retro-Hepatic IVC



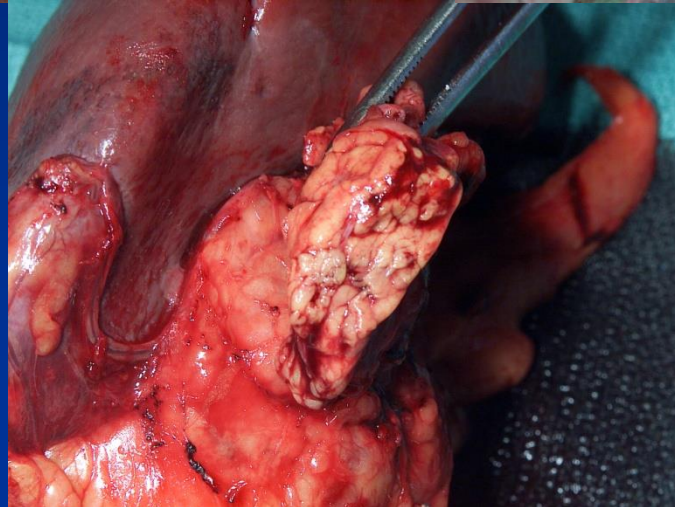
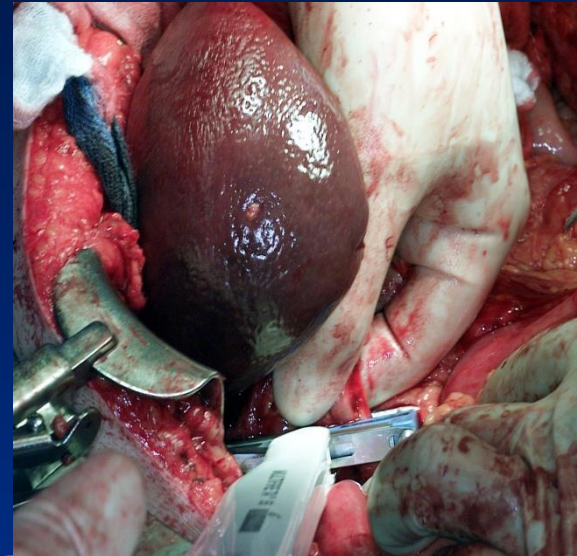
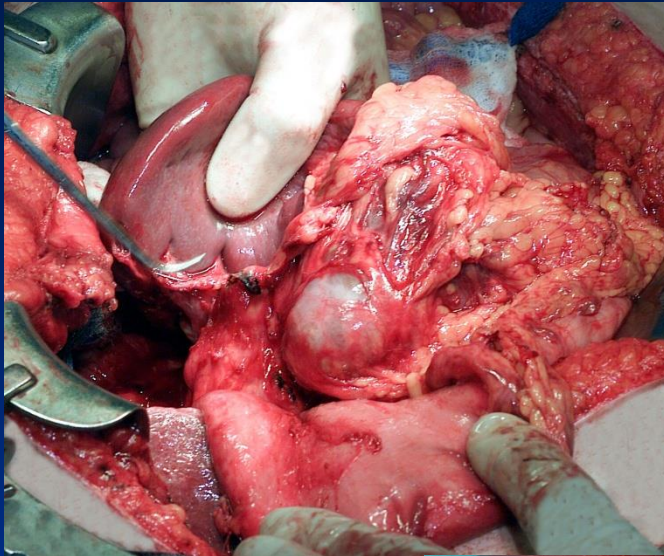
Right Diaphragm Peritonectomy



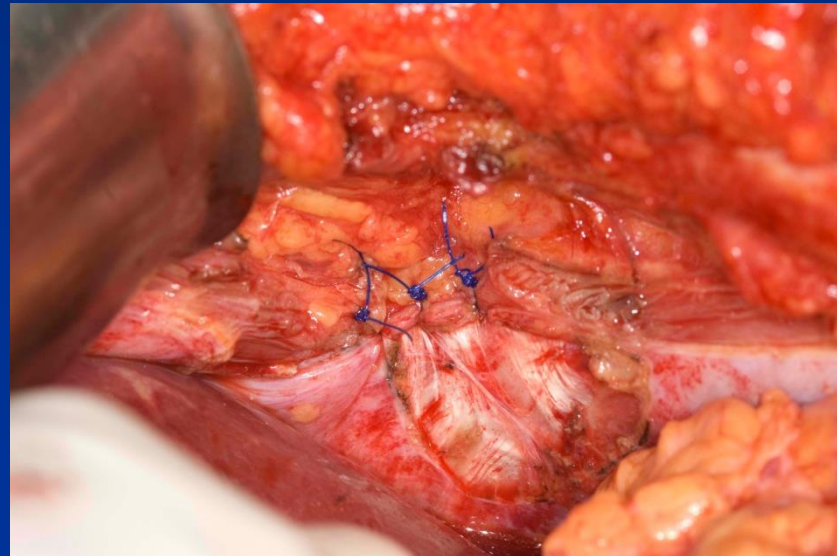
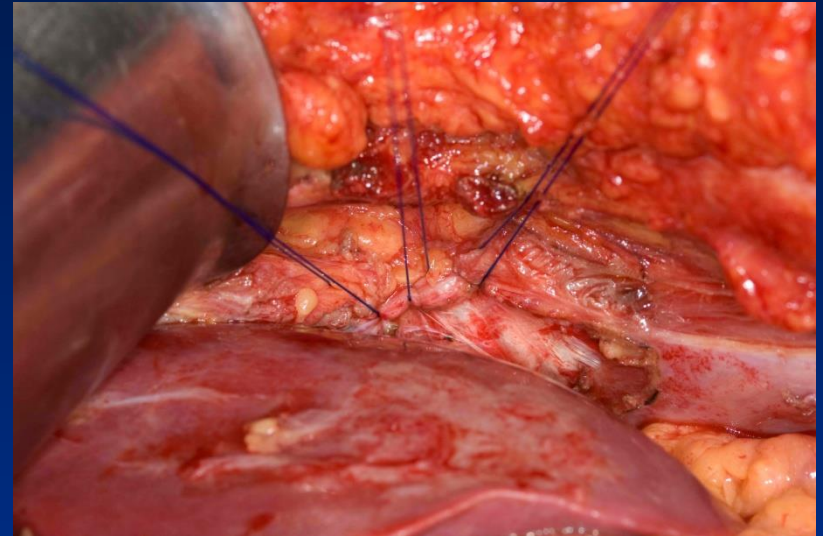
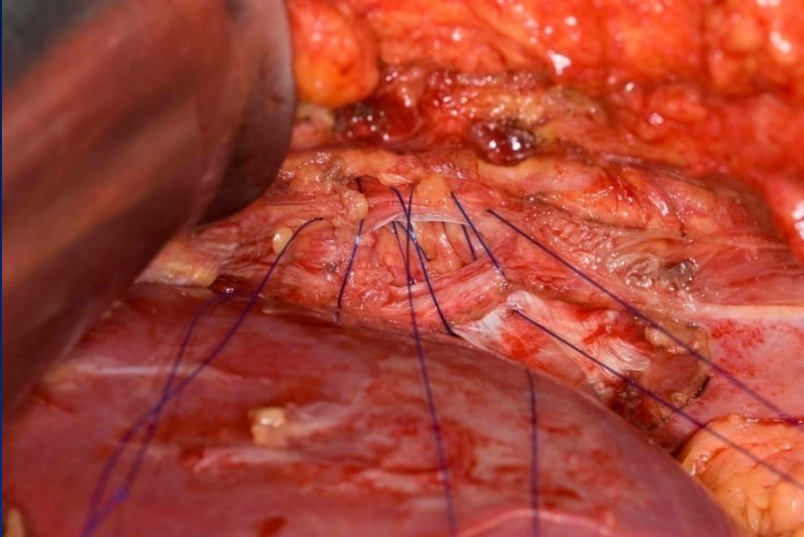
En bloc Omentectomy & Splenectomy



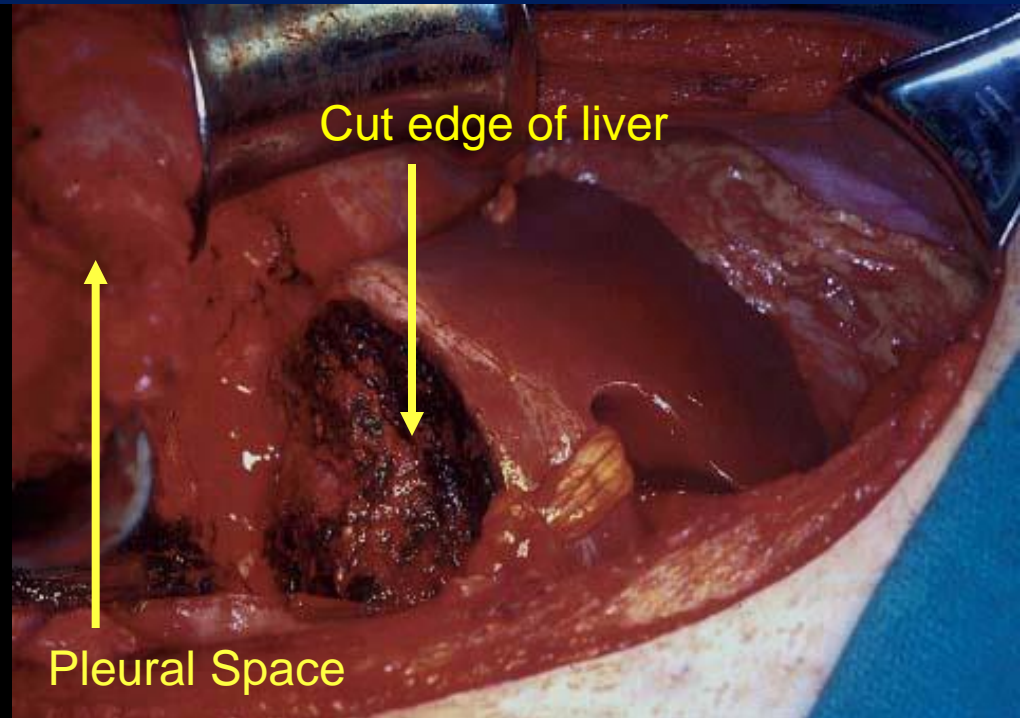
Splenectomy & Distal Pancreatectomy



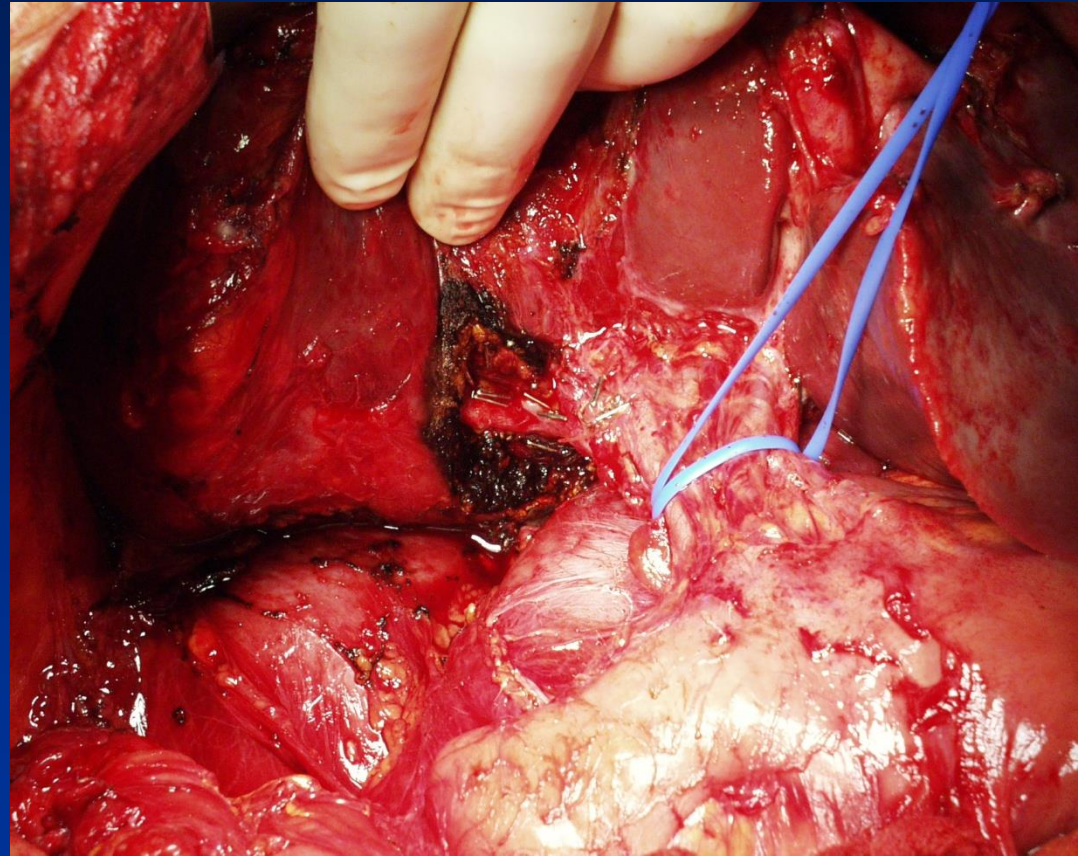
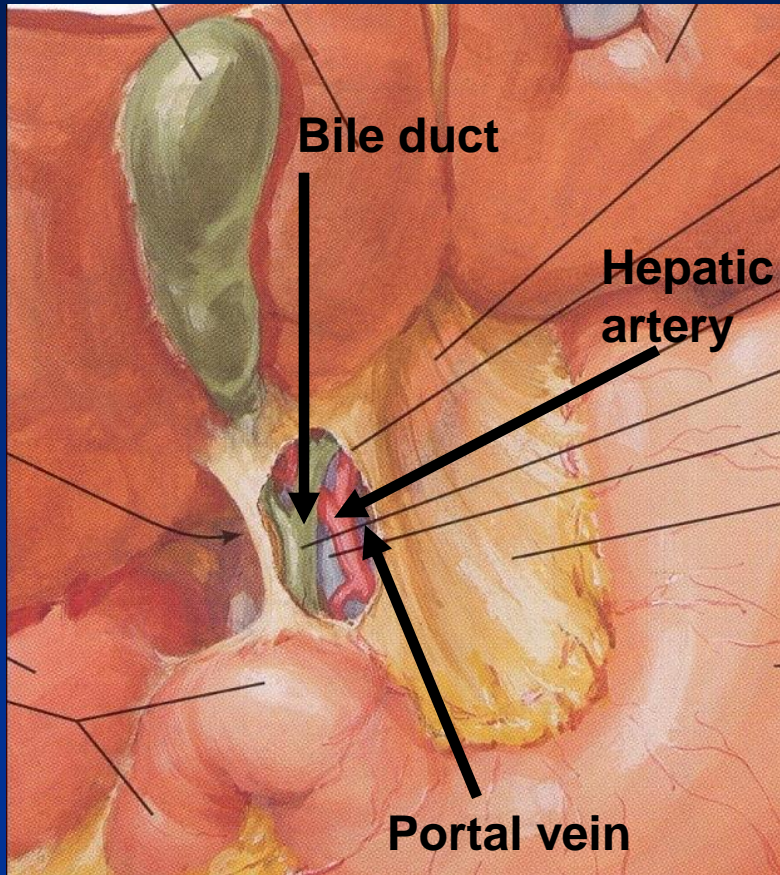
Resection of Portion of Left Diaphragm with Pericardium



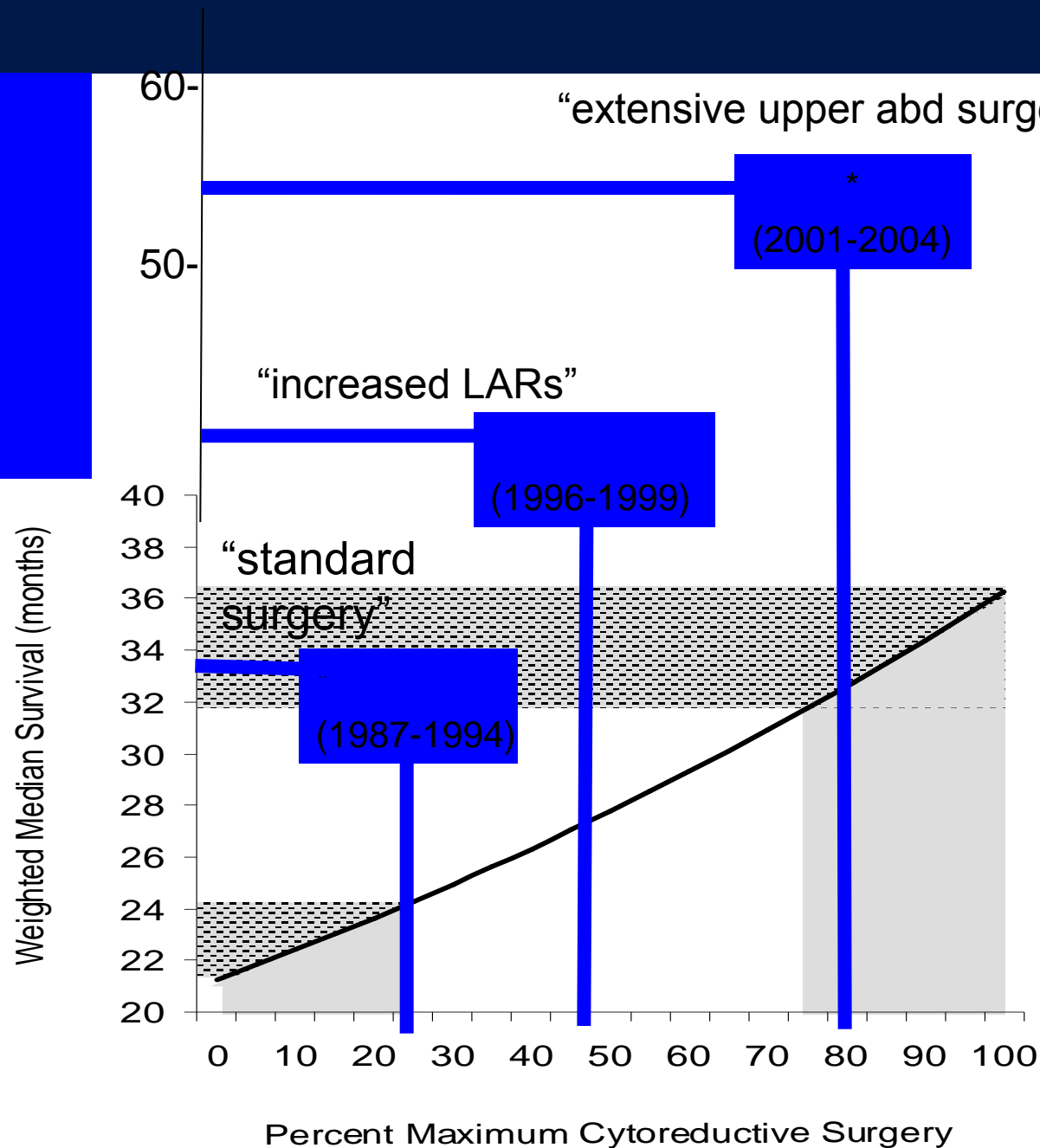
Liver and Diaphragm Resection



Cholecystectomy and Porta Hepatis Dissection

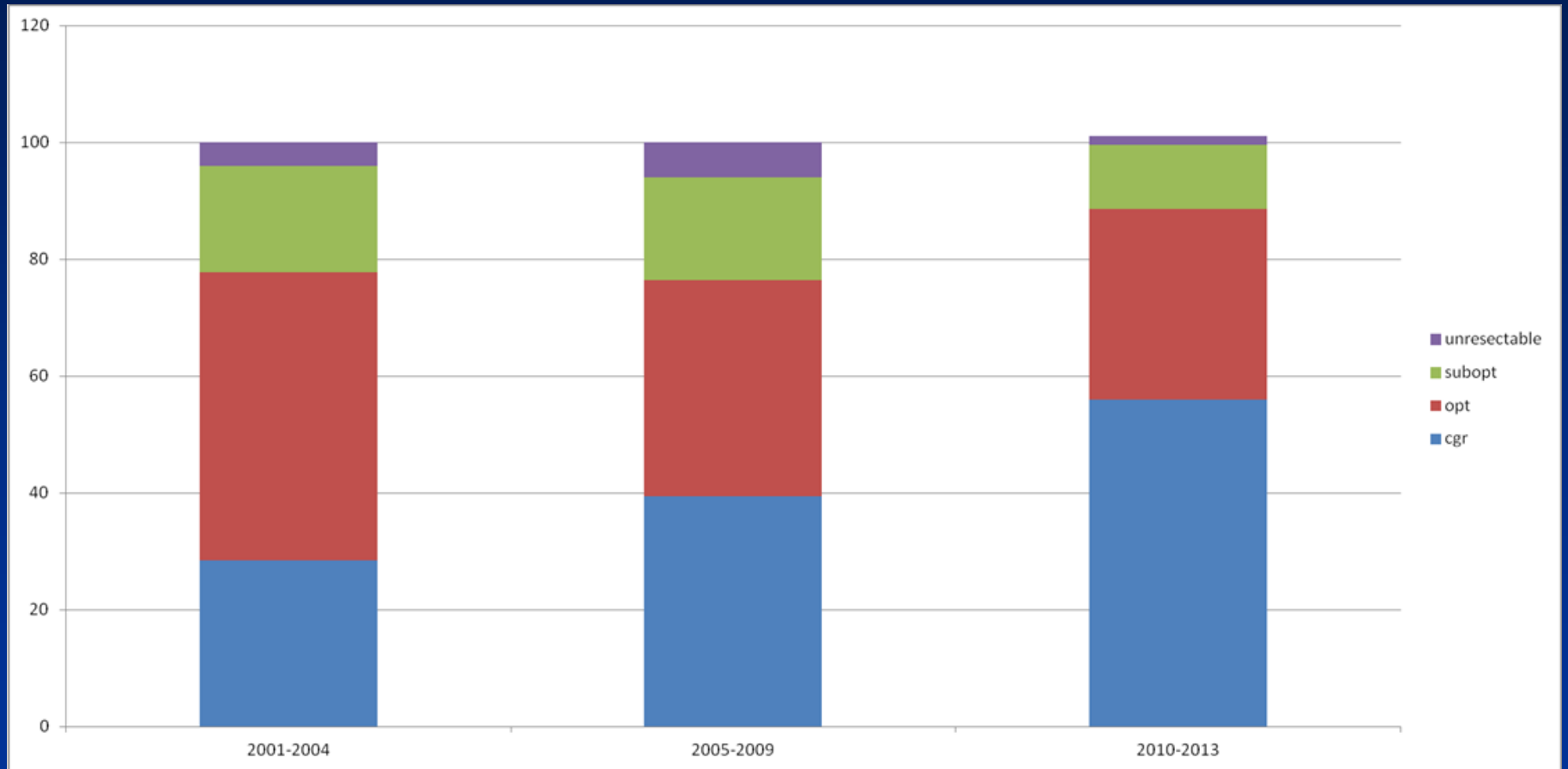


Survival
Adv Ovary
Cancer
MSKCC
1987-2004

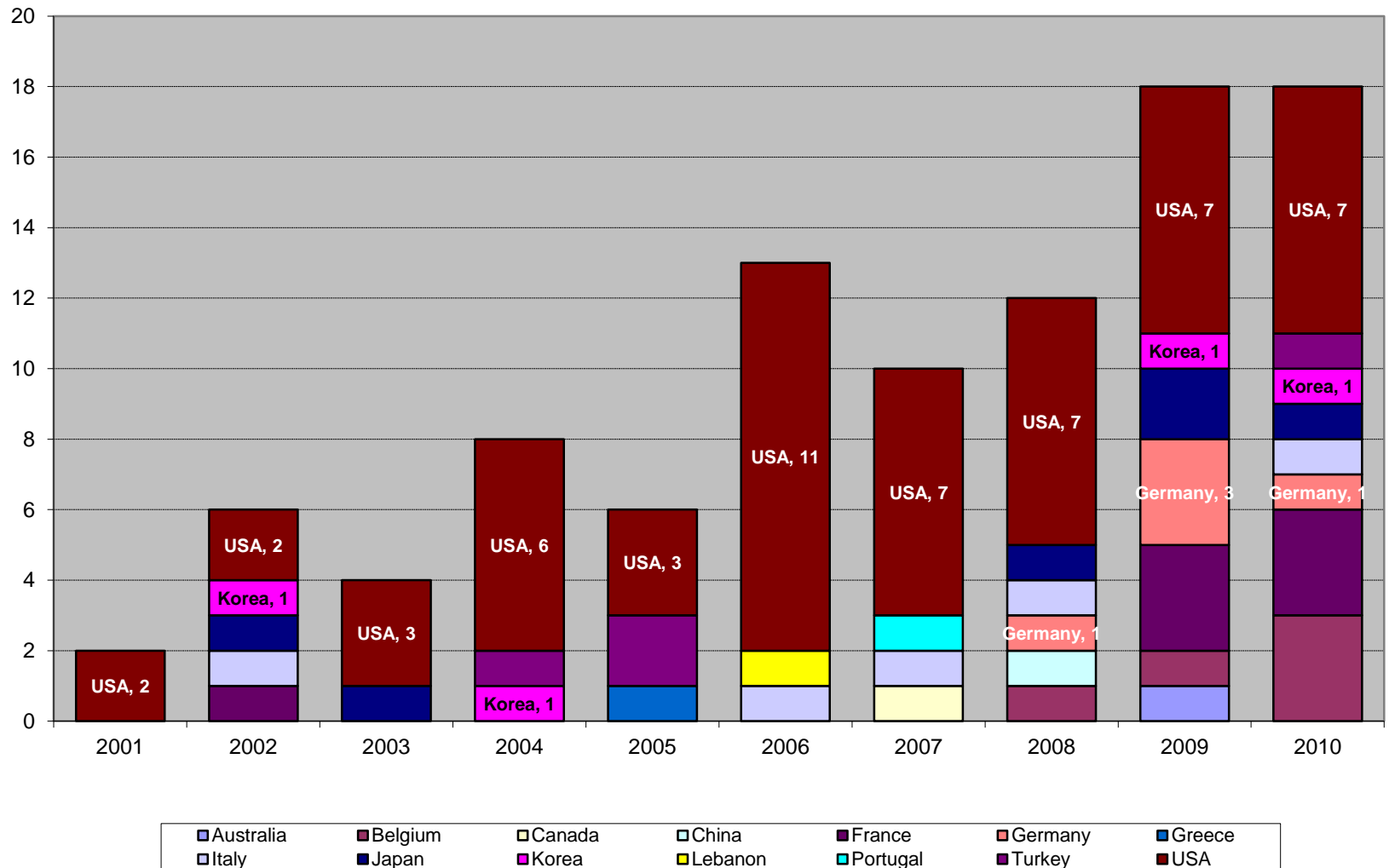


Chi DS et al.
Gynecol
Oncol 2009

Complete Gross Resection Rates at MSKCC 2001-2013



Upper Abdominal Surgery at Primary Debulking for Advanced Ovarian Cancer Publications by Year and Country



NCCN Guidelines



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NCCN Guidelines Version 3.2014 Epithelial Ovarian Cancer/ Fallopian Tube Cancer/ Primary Peritoneal Cancer

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PRINCIPLES OF SURGERY (1 of 2)¹

General considerations

- In most instances, a vertical midline abdominal incision should be used in patients with a suspected malignant ovarian/Fallopian tube/primary peritoneal neoplasm in whom a surgical staging procedure, a primary debulking procedure, an interval debulking procedure, or secondary cytoreduction is planned.
- Intraoperative pathologic evaluation with frozen sections may assist in management.
- For select patients, a minimally invasive surgical approach may be employed by an experienced surgeon to achieve the surgical staging and debulking principles subsequently described. In addition, minimally invasive surgical approaches may be useful when evaluating whether maximum cytoreduction can be achieved in patients with newly diagnosed or recurrent ovarian cancer.
- Surgeons should quantify and document the extent of initial and residual disease in operative notes.
- It is recommended that a gynecologic oncologist perform the appropriate surgery.

The following surgical procedures should be considered for patients with newly diagnosed invasive epithelial ovarian cancer apparently confined to an ovary or to the pelvis

- On entering the abdomen, aspiration of ascites or peritoneal lavage should be performed for peritoneal cytologic examinations.
- All peritoneal surfaces should be visualized, and any peritoneal surface or adhesion suspicious for harboring metastasis should be selectively excised or biopsied. In the absence of any suspicious areas, random peritoneal biopsies should be taken from the pelvis, paracolic gutters, and undersurfaces of the diaphragm (diaphragm scraping for Papanicolaou stain is an acceptable alternative).
- **Bilateral salpingo-oophorectomy (BSO)** and hysterectomy should be performed with every effort to keep an encapsulated mass intact during removal.
- For selected patients desiring to preserve fertility, unilateral salpingo-oophorectomy (USO) may be considered.
- Omentectomy should be performed.
- Para-aortic lymph node dissection should be performed by stripping the nodal tissue from the vena cava and the aorta bilaterally to at least the level of the inferior mesenteric artery and preferably to the level of the renal vessels.
- The preferred method of dissecting pelvic lymph nodes is bilateral removal of lymph nodes overlying and anterolateral to the common iliac vessel, overlying and medial to the external iliac, overlying and medial to the hypogastric vessels, and from the obturator fossa at a minimum anterior to the obturator nerve.²

The following surgical procedures should be considered as part of the surgical management for patients with newly diagnosed invasive epithelial ovarian cancer involving the pelvis and upper abdomen:

In general, every effort should be made to achieve maximum cytoreduction. Residual disease <1 cm defines optimal cytoreduction; however, maximal effort should be made to remove all gross disease since this offers superior survival outcomes.³

- Aspiration of ascites (if present) should be performed for peritoneal cytologic examinations. All involved omentum should be removed.
- Suspicious and/or enlarged nodes should be resected, if possible.
- Those patients with tumor nodules outside the pelvis ≤ 2 cm (presumed stage IIIB) should have bilateral pelvic and para-aortic lymph node dissection as previously described.
- **Procedures that may be considered for optimal surgical cytoreduction (in all stages) include bowel resection and/or appendectomy, stripping of the diaphragm or other peritoneal surfaces, splenectomy, partial cystectomy and/or ureteroneocystotomy, partial hepatectomy, partial gastrectomy, cholecystectomy, and/or distal pancreatectomy.**
- Select patients with low-volume residual disease after surgical cytoreduction for invasive epithelial ovarian or peritoneal cancer are potential candidates for IP therapy. In these patients, consideration should be given to placement of IP catheter with initial surgery.

Postoperative Chemotherapy Early Stage

Available online at www.sciencedirect.com

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Gynecologic Oncology 102 (2006) 432–439

Gynecologic Oncology

www.elsevier.com/locate/ygyno

Randomized phase III trial of three versus six cycles of adjuvant carboplatin and paclitaxel in early stage epithelial ovarian carcinoma: A Gynecologic Oncology Group study

Jeffrey Bell ^{a,*}, Mark F. Brady ^b, Robert C. Young ^c, Janice Lage ^d, Joan L. Walker ^e, Katherine Y. Look ^f, G. Scott Rose ^g, Nick M. Spirtos ^h

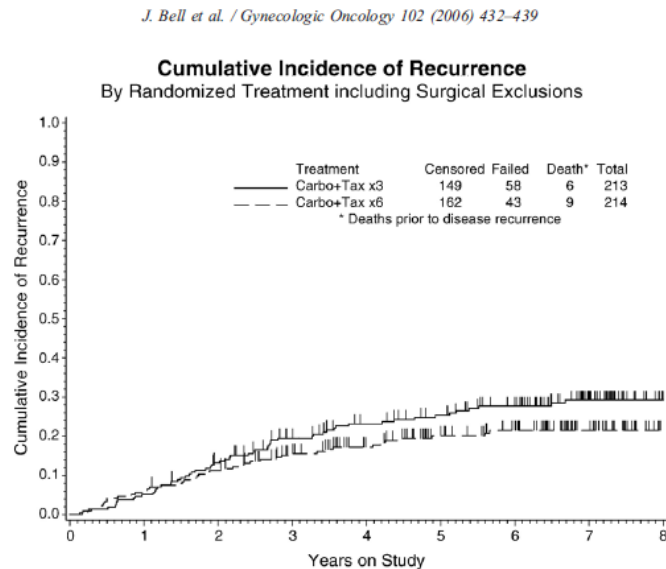


Fig. 1. Cumulative incidence of recurrence by randomized treatment.

Gynecologic Oncology 116 (2010) 307–311

Contents lists available at ScienceDirect

Gynecologic Oncology

[journal homepage: www.elsevier.com/locate/ygyno](http://www.elsevier.com/locate/ygyno)

Survival after recurrence in early-stage high-risk epithelial ovarian cancer: A Gynecologic Oncology Group study

John K. Chan ^{a,*}, Chunqiao Tian ^b, Deanna Teoh ^a, Bradley J. Monk ^c, Thomas Herzog ^d, Daniel S. Kapp ^e, Jeffrey Bell ^f

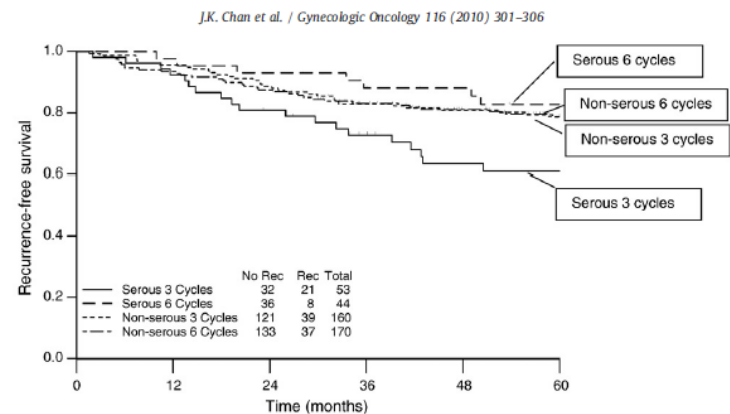


Fig. 2. Recurrence-free survival of serous and non-serous ovarian cancer patients treated with six versus three cycles of chemotherapy (n = 427).

Postoperative Chemotherapy Advanced Stage

THE NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Intraperitoneal Cisplatin and Paclitaxel in Ovarian Cancer

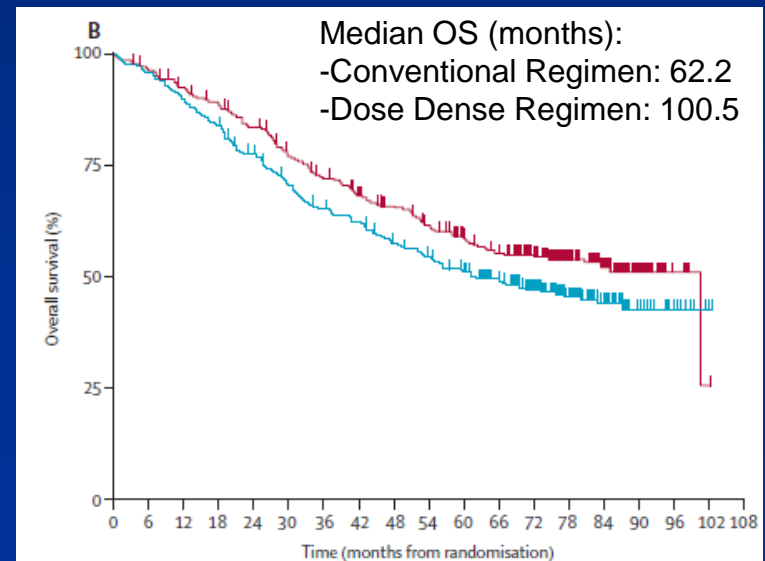
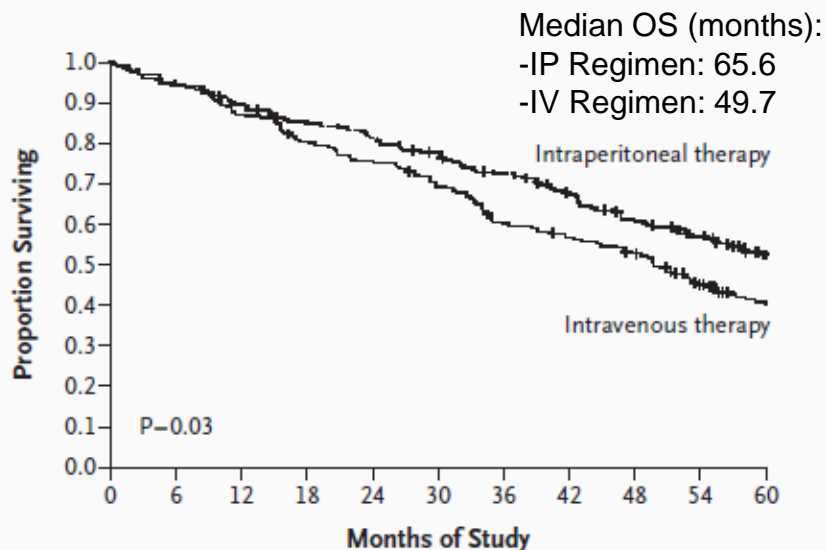
Deborah K. Armstrong, M.D., Brian Bundy, Ph.D., Lari Wenzel, Ph.D.,
Helen Q. Huang, M.S., Rebecca Baergen, M.D., Shashikant Lele, M.D.,
Larry J. Copeland, M.D., Joan L. Walker, M.D., and Robert A. Burger, M.D.,
for the Gynecologic Oncology Group*



Long-term results of dose-dense paclitaxel and carboplatin
versus conventional paclitaxel and carboplatin for treatment
of advanced epithelial ovarian, fallopian tube, or primary
peritoneal cancer (JGOG 3016): a randomised, controlled,
open-label trial

Noriyuki Katsumata, Makoto Yasuda, Seiji Isonishi, Fumiaki Takahashi, Hirofumi Michimae, Eizo Kimura, Daisuke Aoki, Toshiko Jobo,
Shoji Kodama, Fumitoshi Terauchi, Toru Sugiyama, Kazunori Ochiai, for the Japanese Gynecologic Oncology Group*

Lancet Oncol 2013; 14: 1020-26



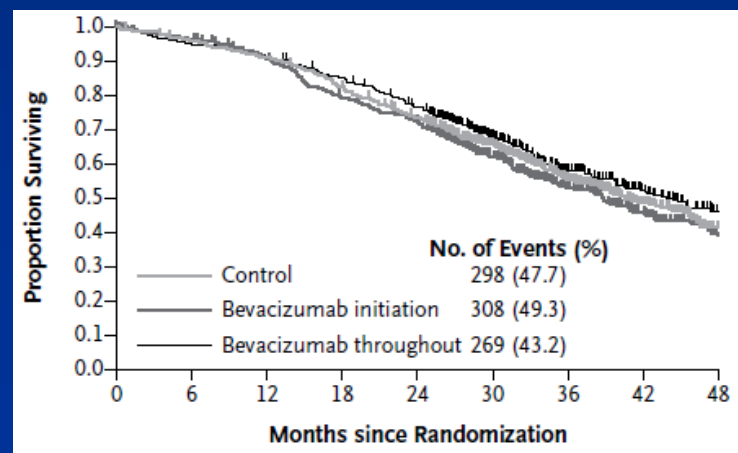
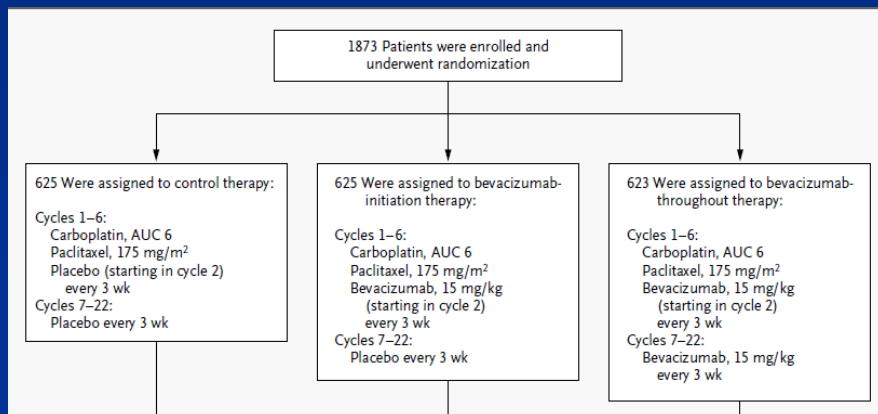
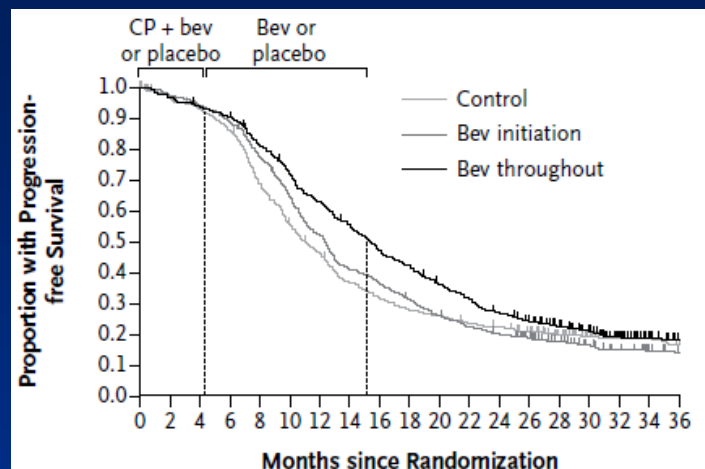
Postoperative Chemotherapy Advanced Stage

THE NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Incorporation of Bevacizumab in the Primary Treatment of Ovarian Cancer

Robert A. Burger, M.D., Mark F. Brady, Ph.D., Michael A. Bookman, M.D., Gini F. Fleming, M.D., Bradley J. Monk, M.D., Helen Huang, M.S., Robert S. Mannel, M.D., Howard D. Homesley, M.D., Jeffrey Fowler, M.D., Benjamin E. Greer, M.D., Matthew Boente, M.D., Michael J. Birrer, M.D., Ph.D., and Sharon X. Liang, M.D., for the Gynecologic Oncology Group*



NCCN Guidelines for Postoperative Chemotherapy



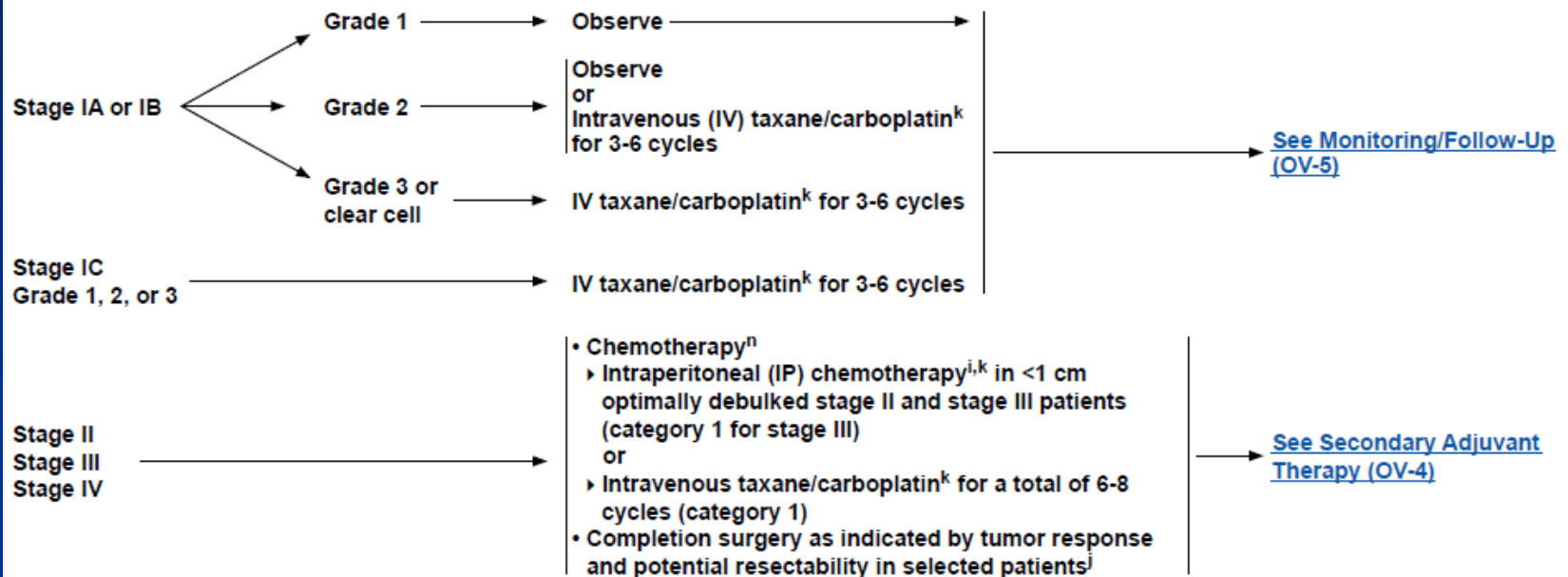
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PATHOLOGIC STAGING

PRIMARY CHEMOTHERAPY/PRIMARY ADJUVANT THERAPY^m



Current Management of Ovarian Cancer

Summary

Stage	Surgery	Chemotherapy
IA, IB (grade 1, 2)	TAH/BSO (USO for < 40 yo), staging procedure	None
IA, IB (grade 3), IC	TAH/BSO (USO for < 40 yo), staging procedure	IV Taxol/Carbo x 3-6
II-IIIC, IV(intraperitoneal)	PDS including TAH/BSO or NACT with IDS	IV/IP Taxol, IP Cisplatin x 6 or IV Taxol/Carbo x 6
IV (extraperitoneal)	PDS including TAH/BSO or NACT with IDS	IV Taxol/Carbo X 6
Platinum Sensitive Recurrence	Consider repeat debulking	IV platinum-based doublet
Platinum-Resistant Recurrence	Only for palliation (eg bowel obstruction)	IV or oral single agent therapy based on toxicity

Acknowledgements

- ACOG District XII
- John Diaz
- Rick Estape
- Robert Yelverton
- Karen Harris
- Guy Benrubi
- Colleen Filbert
- Allison Filbert
- Shelly Holmstrom
- Richard Barakat
- Carol Brown
- Nadeem Abu-Rustum
- Yukio Sonoda
- Doug Levine
- Mario Leitao
- Ginger Gardner
- Elizabeth Jewell
- Oliver Zivanovic

THANK YOU!!!