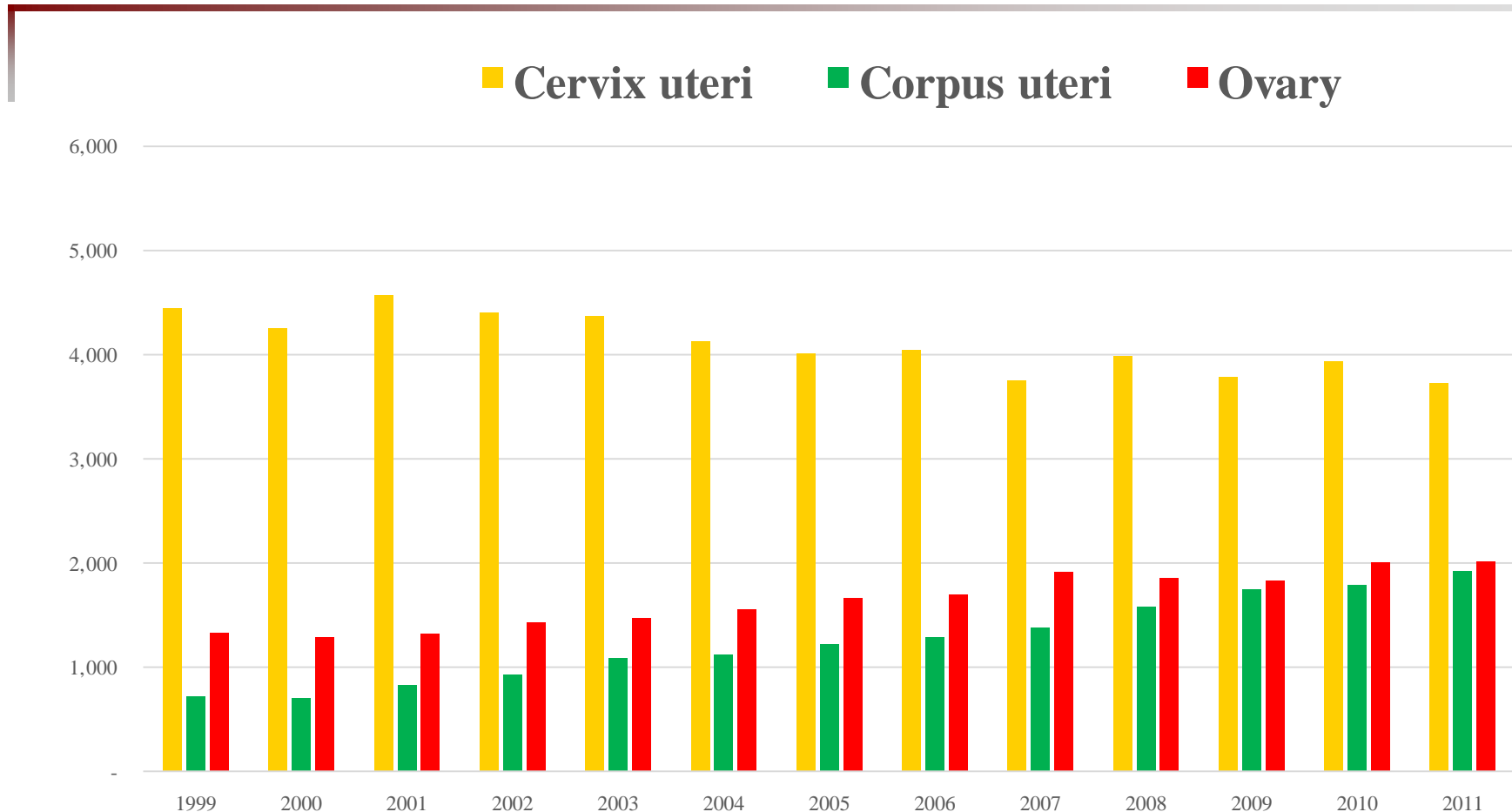


Upper abdominal surgery for the surgical management of advanced ovarian cancer

National Cancer Center Korea
Center for Uterine Cancer
Sang-Yoon Park

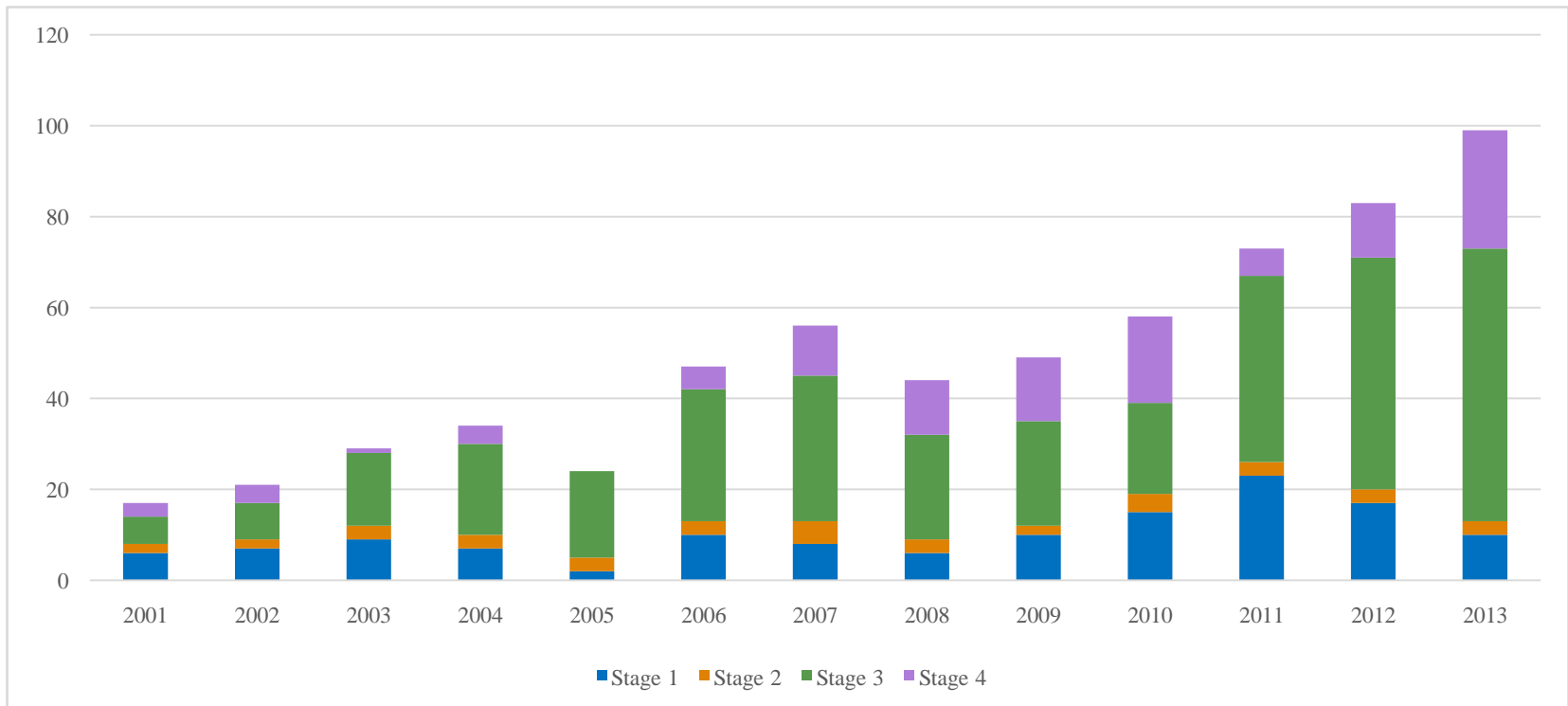


Incidence distribution of female genital cancer in Korea





Cases and stage distribution of primary epithelial ovarian cancer at NCCK



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Stage 1_2	8	9	12	10	5	13	13	9	12	19	26	20	13
Stage 3_4	9 (53%)	12 (57%)	17 (59%)	24 (71%)	19 (79%)	34 (72%)	43 (77%)	35 (79%)	37 (76%)	39 (67%)	47 (64%)	63 (76%)	86 (87%)



Why ovarian cancer is **the most important cancer** at my office?

➔ **Rapidly increasing disease**

➔ **Advanced disease**

➔ **> 80%**

➔ **Frequent recurrence**

➔ **≅80%**



Patient pooling: > 70%



Why ovarian cancer is **the most interesting cancer to me?**

- ➔ **Survival difference** according to institutional and physician's policy.
- ➔ What factors make survival difference in ovarian cancer?
 - ➔ age, stage, cell type, ascitis, chemosensitivity, etc... : **unmodifiable factor**
 - ➔ Post-op residual tumor size: **modifiable factor**



What is the optimal post-op residual tumor size?

➤ **< 2cm ?**

➤ **< 1cm ?**

➤ **No macroscopic ?**

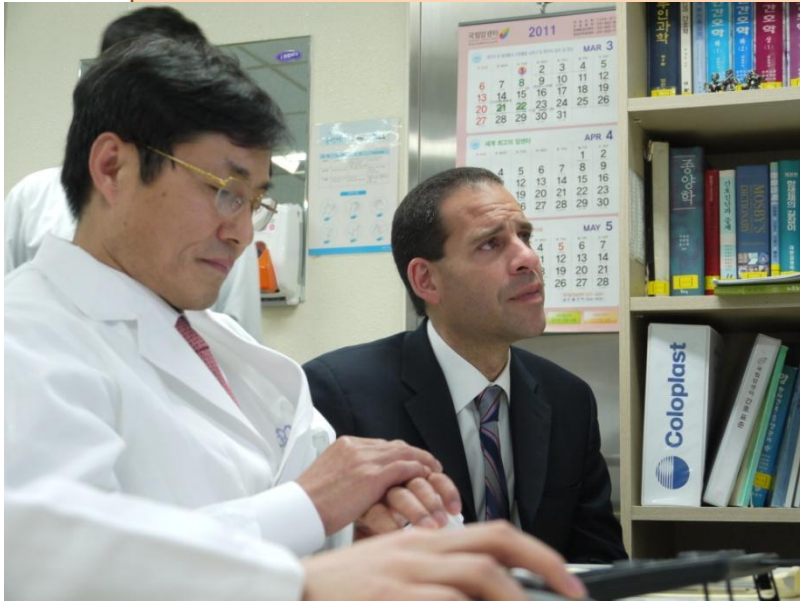


2011. 4. 27

Welcome! Prof. Bristow from UC Irvine, USA NCC Welcome Symposium

14:30-14:40 Introduction of our center
Treatment Outcome of Cervical Cancer Joo-Young Kim, NCC

14:40-15:00 Evolution of surgical treatment paradigms for advanced ovarian cancer: **Defining optimal residual disease**
Robert E. Bristow, UC Irvine



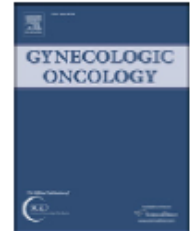


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Contents lists available at [SciVerse ScienceDirect](#)

Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno



Review

Evolution of surgical treatment paradigms for advanced-stage ovarian cancer: Redefining 'optimal' residual disease

Suk-Joon Chang ^a, Robert E. Bristow ^{b,*}

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ARTICLE INFO

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Ovarian cancer

Primary cytoreductive surgery

Optimal residual disease

ABSTRACT

Over the past 40 years, the survival of patients with advanced ovarian cancer has greatly improved due to the introduction of combination chemotherapy with platinum and paclitaxel as standard front-line treatment and the progressive incorporation of increasing degrees of maximal cytoreductive surgery. The designation of "optimal" surgical cytoreduction has evolved from residual disease ≤ 1 cm to no gross residual disease. There is a growing body of evidence that patients with no gross residual disease have better survival than those with optimal but visible residual disease. In order to achieve this, more radical cytoreductive procedures such as radical pelvic resection and extensive upper abdominal procedures are increasingly performed. However, some investigators still suggest that tumor biology is a major determinant in survival and that optimal surgery cannot fully compensate for tumor biology. The aim of this review is to outline the theoretical rationale and historical evolution of primary cytoreductive surgery, to re-evaluate the preferred surgical objective and procedures commonly required to achieve optimal cytoreduction in the platinum/taxane era based on contemporary evidence, and to redefine the concept of "optimal" residual disease within the con-



What is 'optimal' residual disease, really?

Optimal: no macroscopic (complete cytoreduction to a visibly disease-free state)

Sub-optimal: residual disease measuring ≤ 1 cm in maximal diameter

Non-optimal: residual disease measuring > 1 cm in maximal diameter

Consensused at 2010 ESGO.

**What kinds of procedure are
needed to achieve **no macroscopic**
in surgical management of
advanced ovarian cancer?**

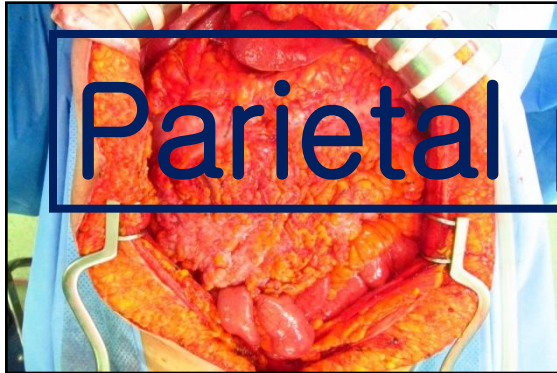




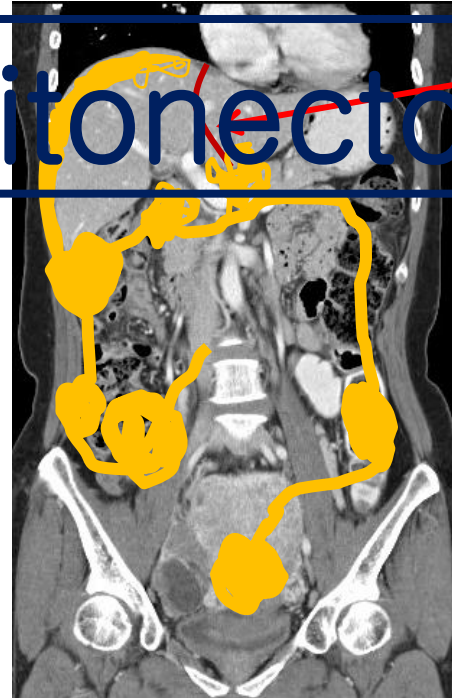
- Peritoneal cavity is a large single space.
 - Omental cake
- Tumor cells deposit at the most dependent position of parietal peritoneum.
- Tumor cells migrate clockwise due to the peristalsis of small and large bowel

Visceral peritoneectomy

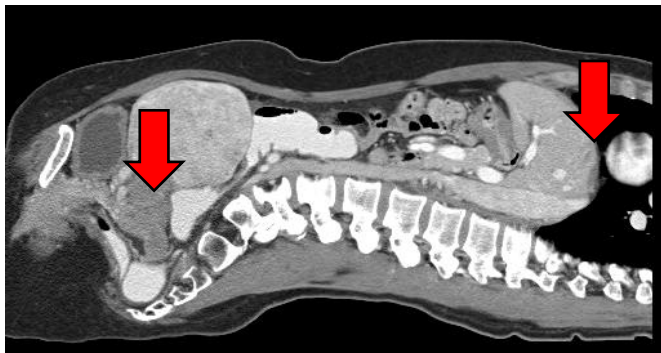
- Cecocolic area, right paracolic gutter, Morrison's pouch, right diaphragm, porta hepatis, lesser sac, left paracolic gutter, PCDS



Parietal peritoneectomy



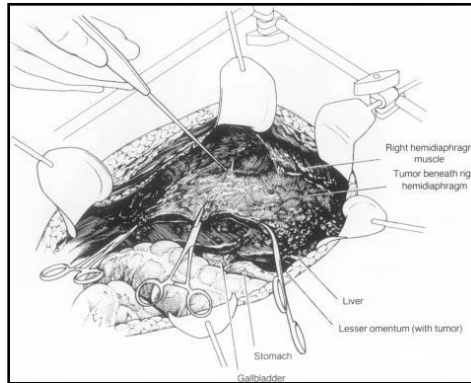
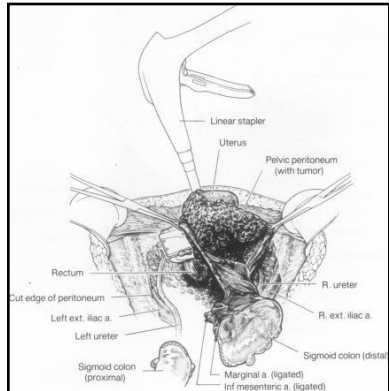
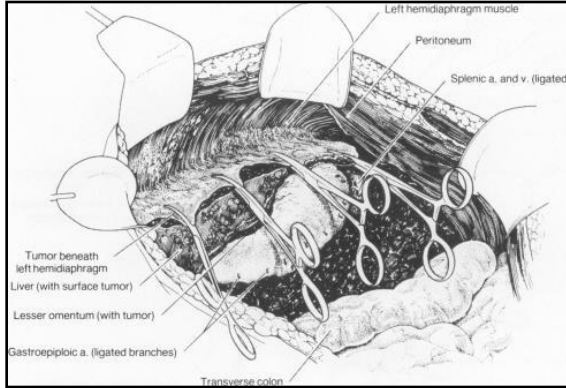
Falciparum lig.





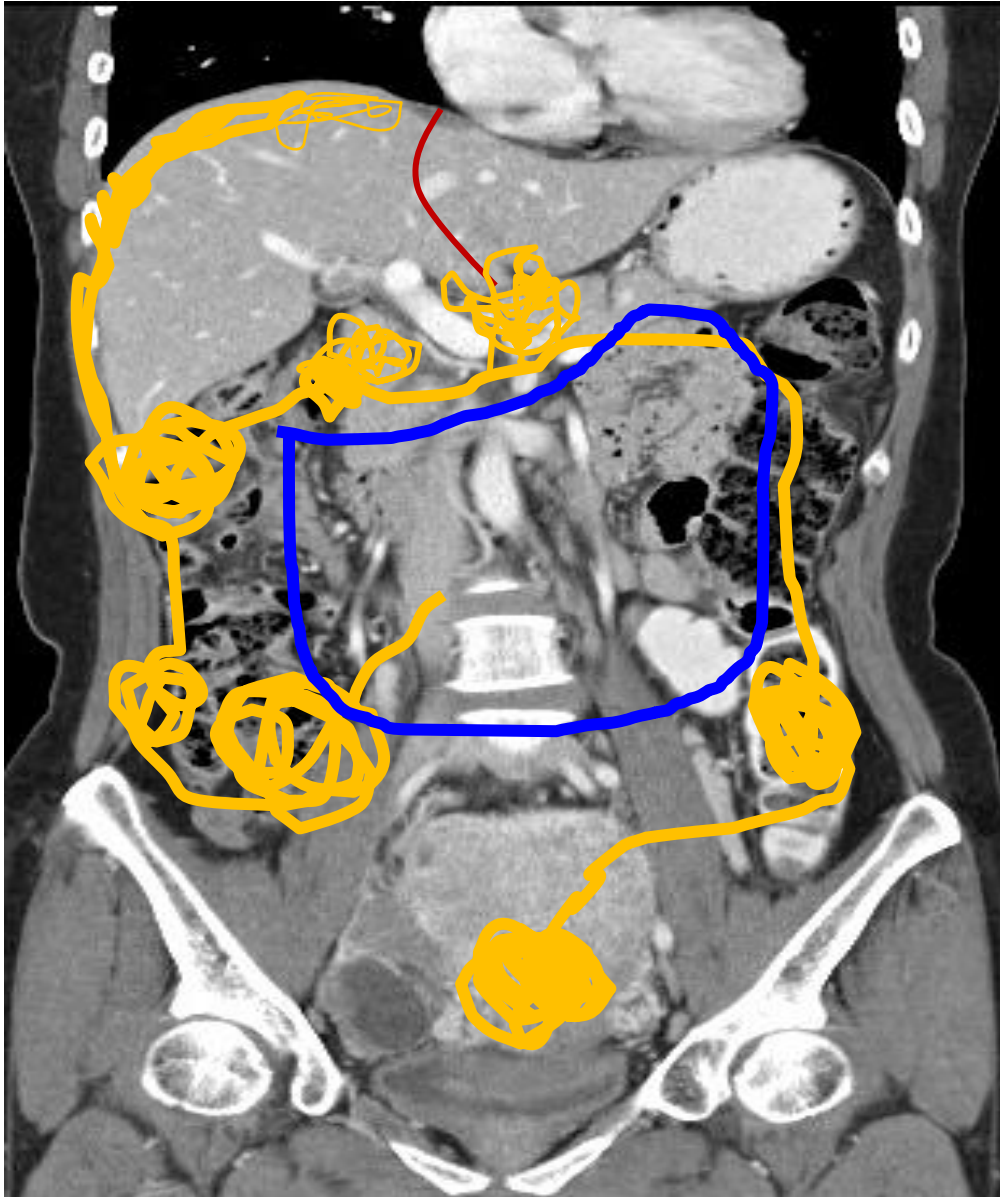
Peritonectomy procedure

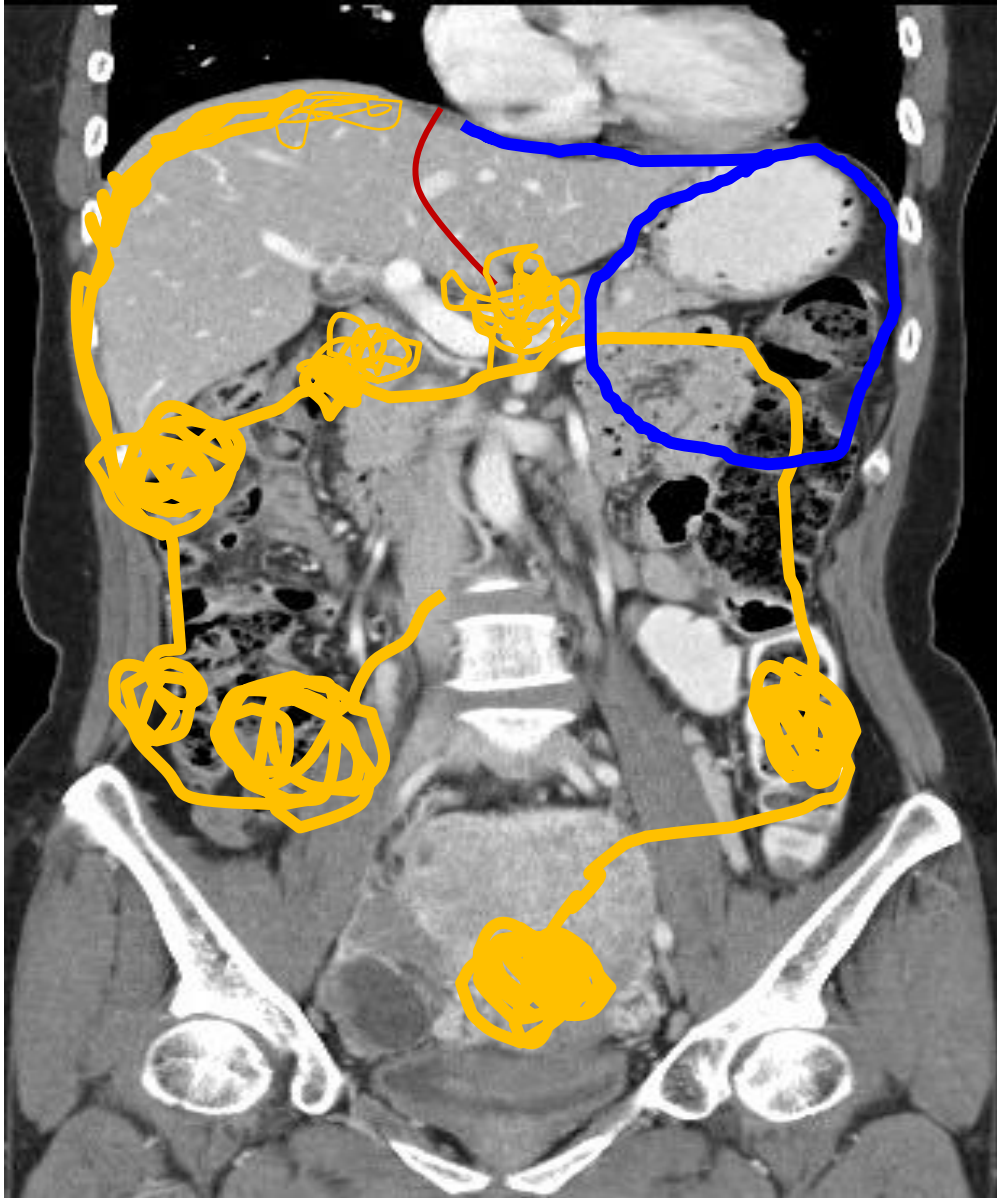
Pseudomyxoma peritonei

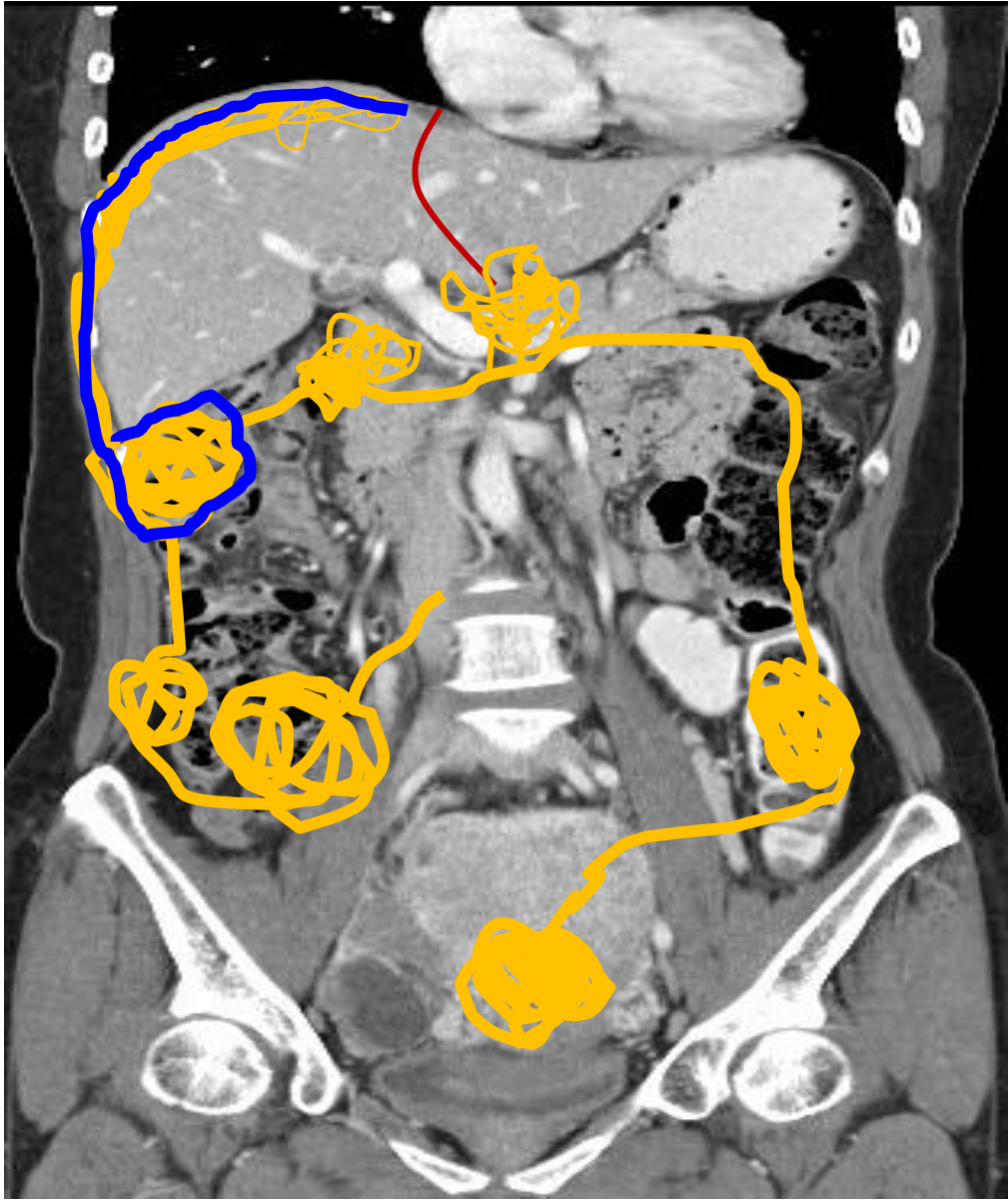


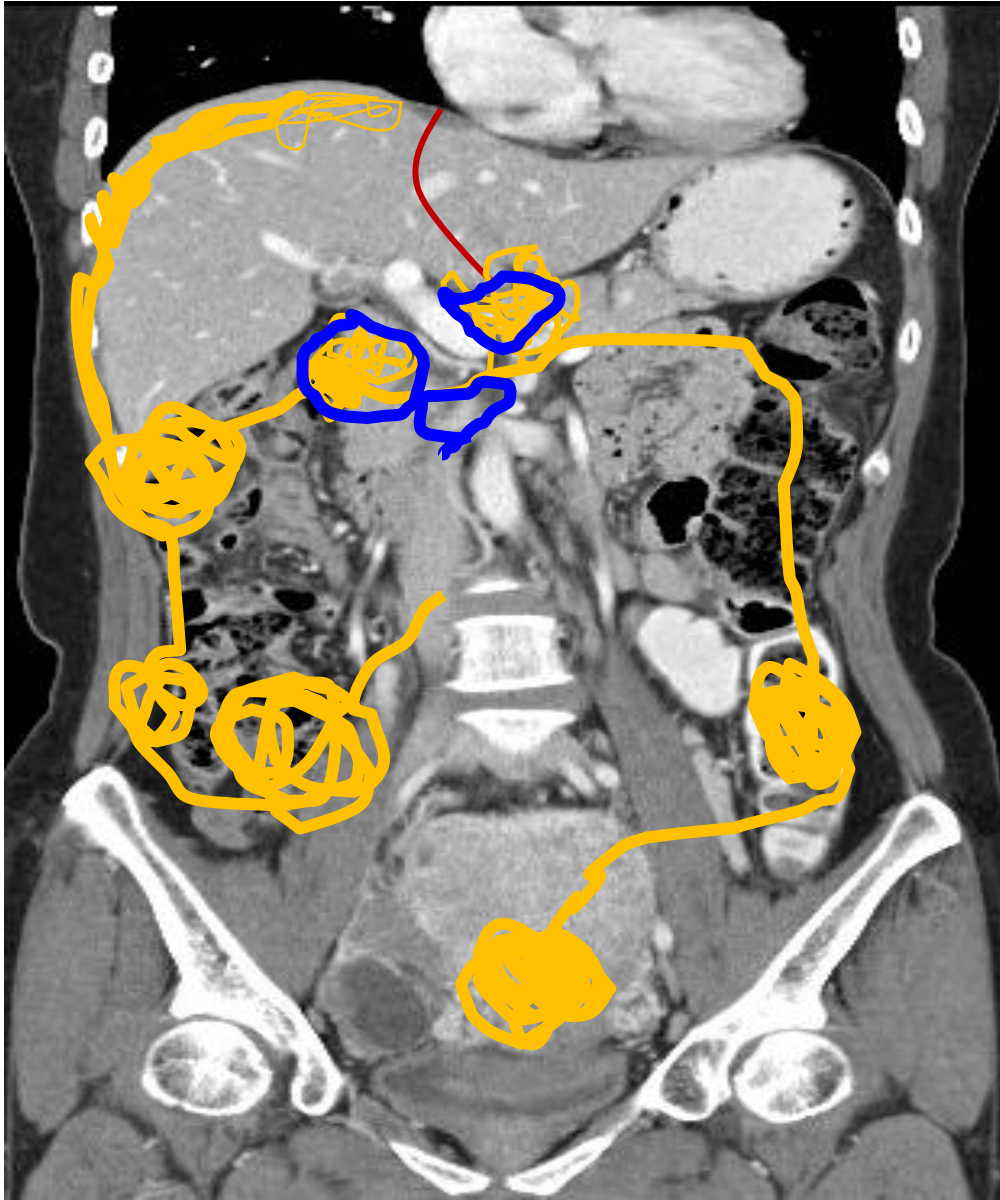
Sugarbaker PH: Ann Surg
(1995) Jan;221:29-42

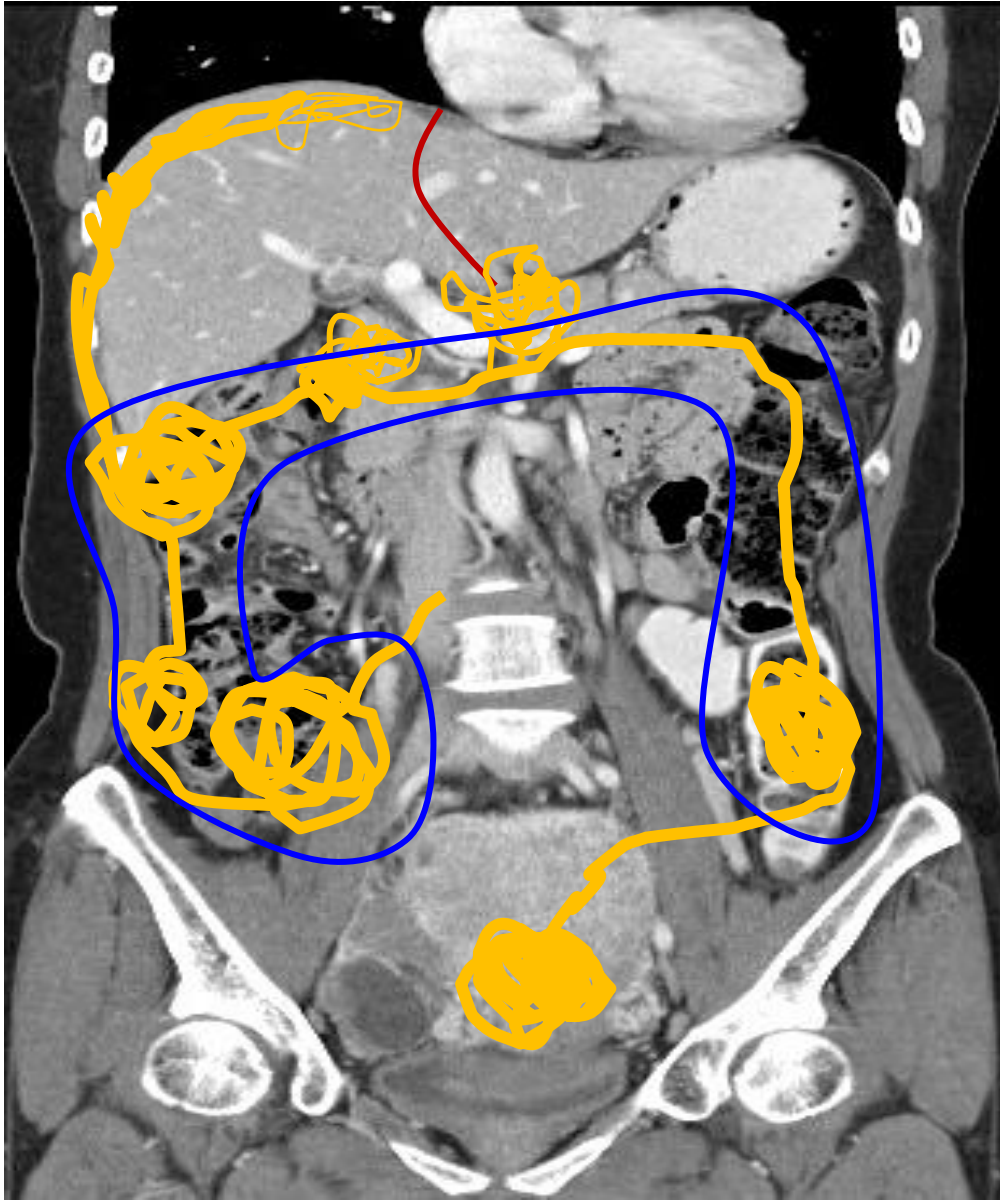
Washington Cancer
Center: 1997. 6. 9 – 7. 4

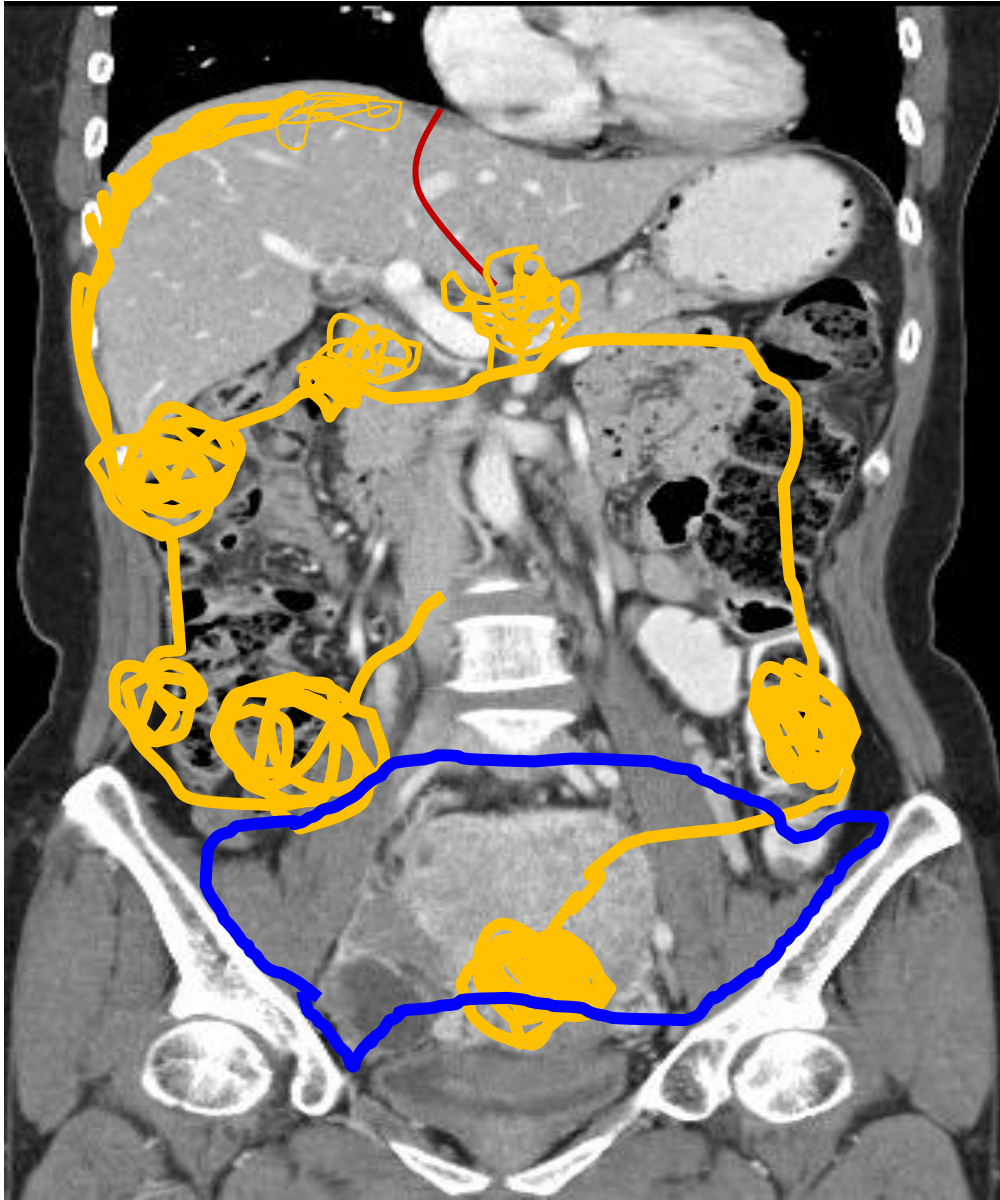














Patient preparation at OR

➤ Skin disinfection

- Upper margin of breast to both knee joint
- Down to flank which contact with operation table

❖ Operation table that perineal approach accessible

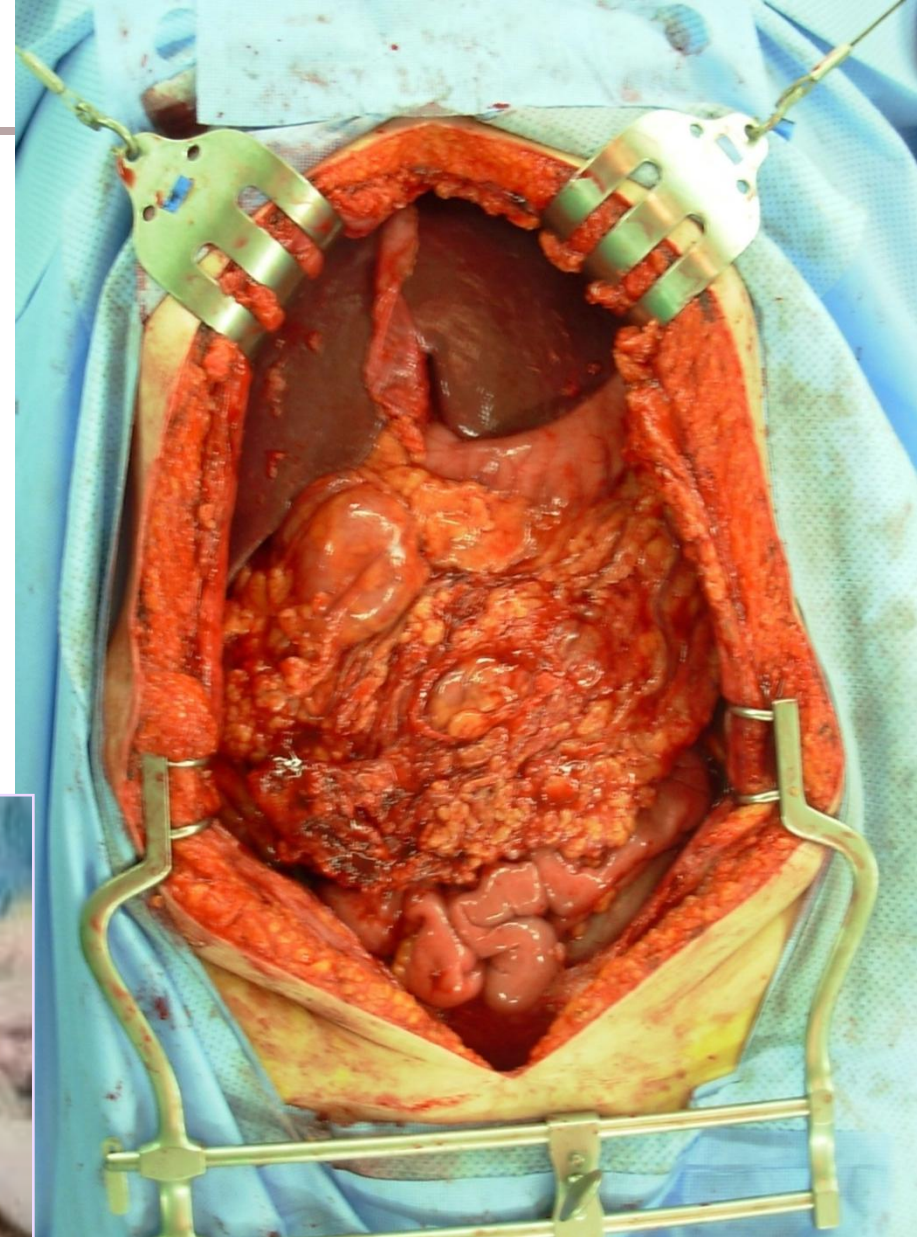




Peritoneal exposure

- **Upper part**
 - u Kent retractor
- **Lower part**
 - u Balfour retractor

❖ Good light source

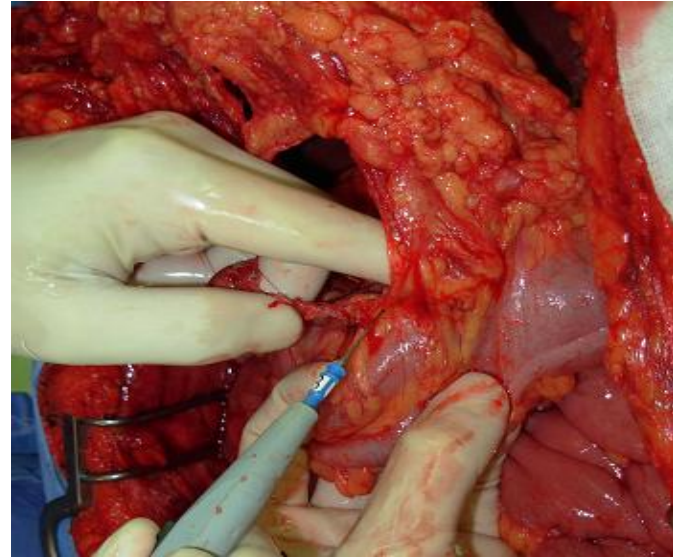


Illuminator

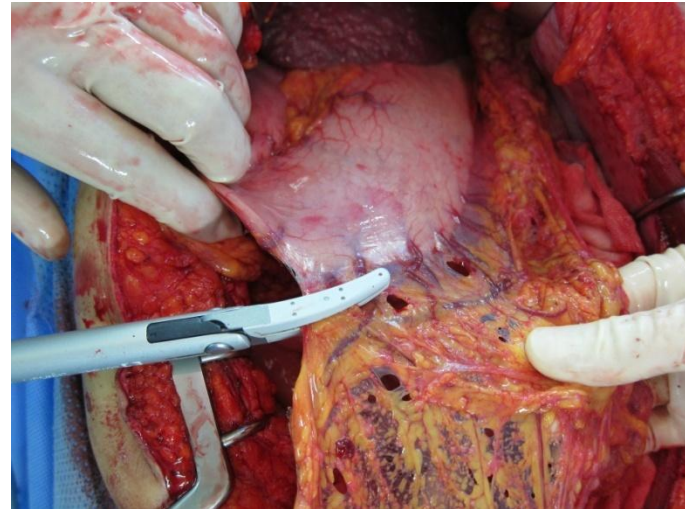


Omentectomy

1. Division from transverse colon to exposure of lesser sac with monopolar electrocautery



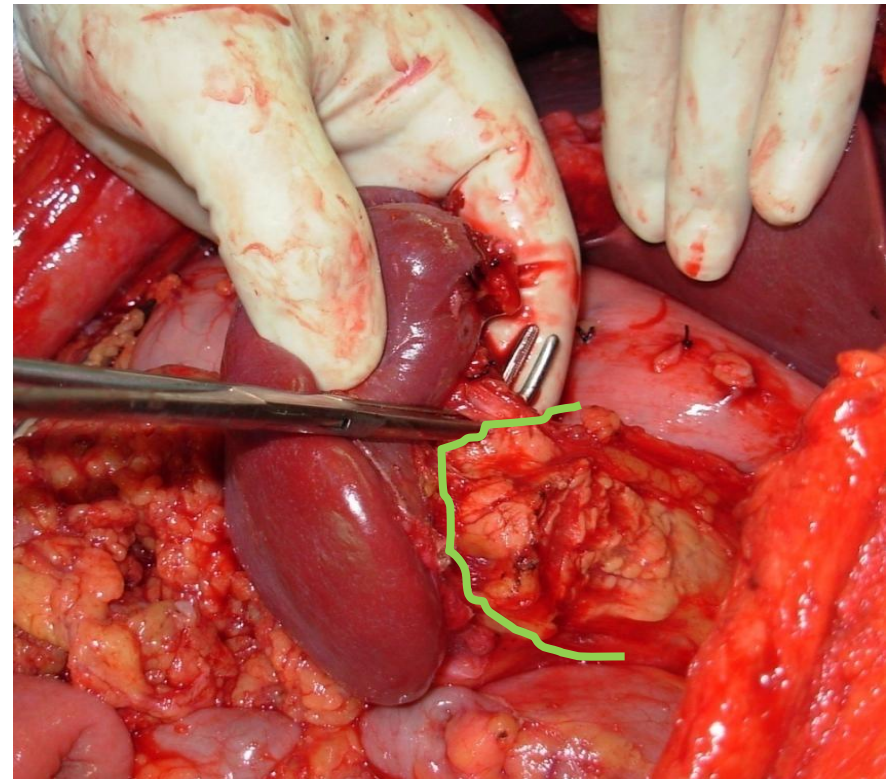
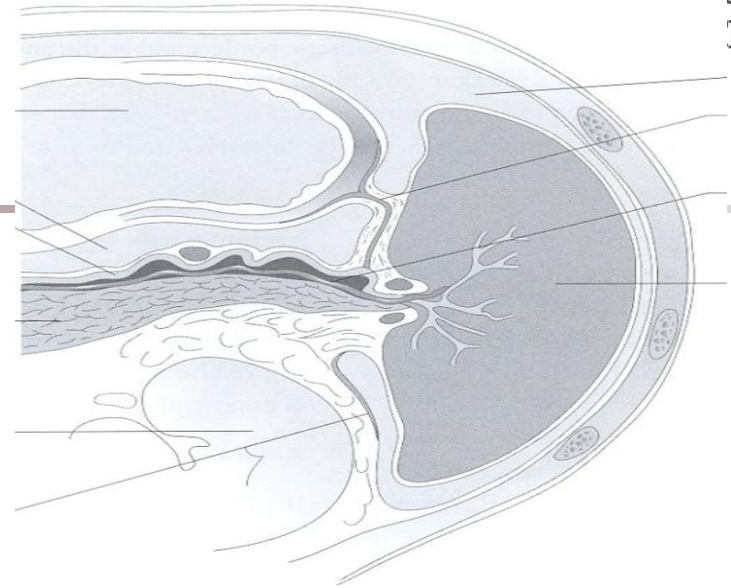
2. Division from greater curvature of stomach with Ligasure® application at gastroepiploic arteries





Splenectomy

1. Division of ligaments
2. Division of splenic artery and vein
3. Detachment from pancreas tail





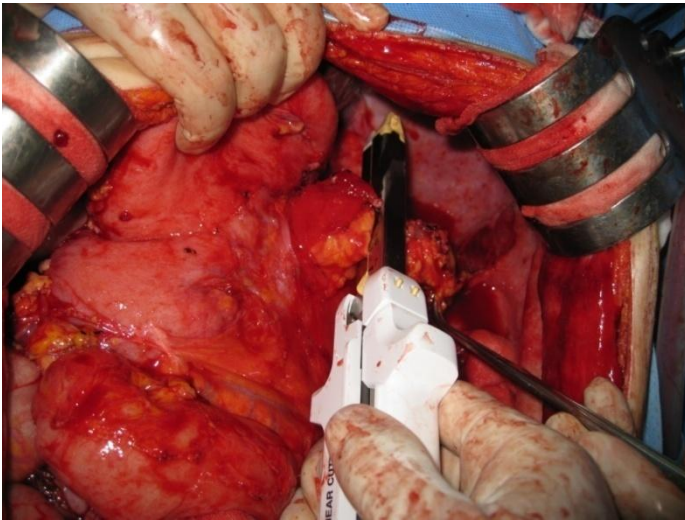
NCC results

- Duration: 2001. 4 – 2013. 7 (**12yr 3 mo**)
- No. of patients
 - Primary: **> 194 pts**
- Splenic vaccine prophylaxis
 - After clinical complete remission
 - Pneumococci, Meningococci, H-influenza
- There were **no recognized late complications** (overwhelming post-splenectomy infection: OPSI) related to splenectomy interrupting patient's survival and QOL.

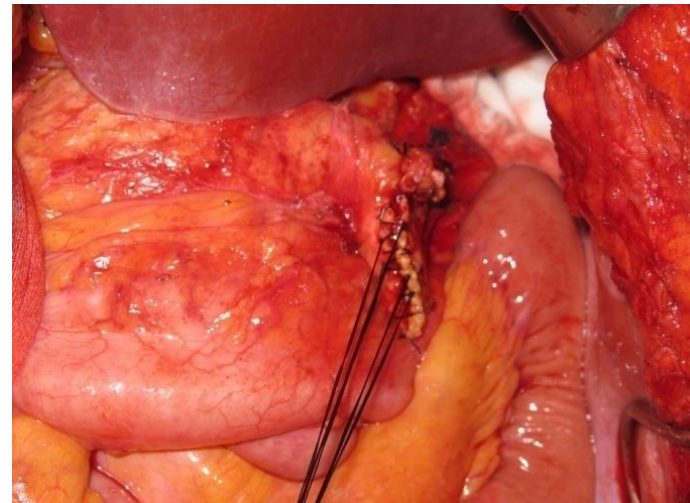


Distal pancreatectomy

❖ Apply gold TLC



❖ Interrupted suture



❖ Occlusion of pancreatic duct of Wirsung

❖ Apply fibrin glue



NCC results

- ➔ **Duration: 2001. 4 – 2013. 7 (12yr 3 mo)**
- ➔ **No. of patients**
 - ➔ Primary: >17 pts
 - ➔ Drain should be keep to prevent pseudocyst.
- ➔ **There were no late complications related to distal pancreatectomy interrupting patient's survival and QOL.**

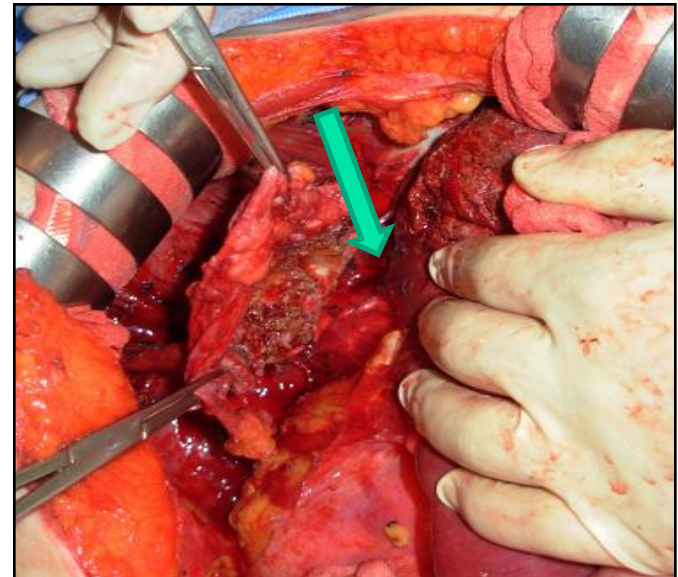


Diaphragmatic peritonectomy

- ➔ Maximal elevation of costal margin with Kent self-retractor



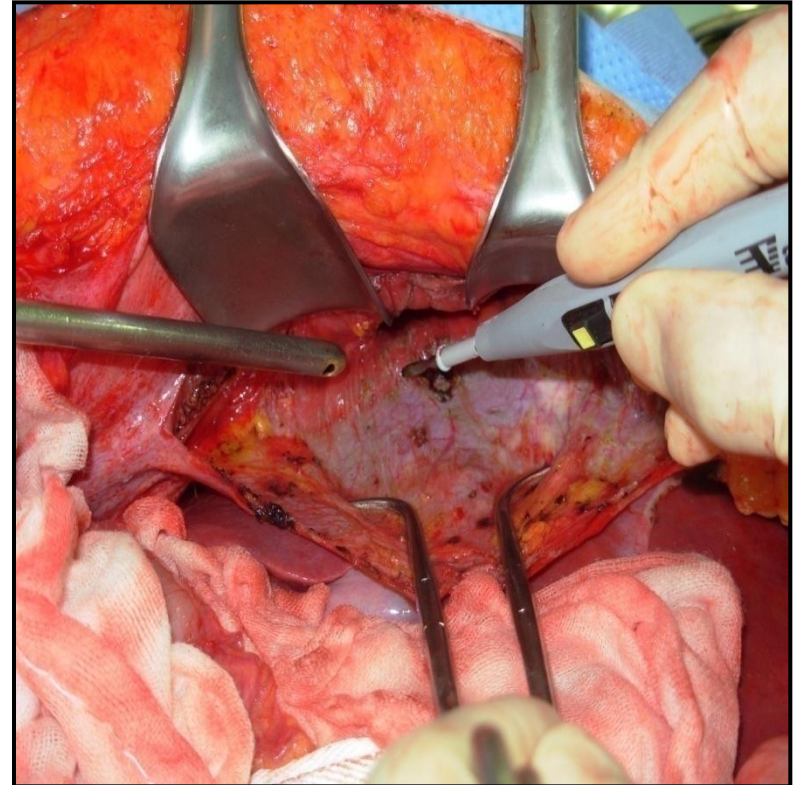
- Full mobilization of liver
 - division of coronary and triangular ligament
 - Preservation of hepatic vein





Diaphragmatic peritonectomy

- Initiating the dissection at the free margin of gross disease
 - Monopolar electrocautery
- Counter traction of free peritoneal edge
 - Right angle clamp
 - Sponge stick...





Diaphragmatic resection

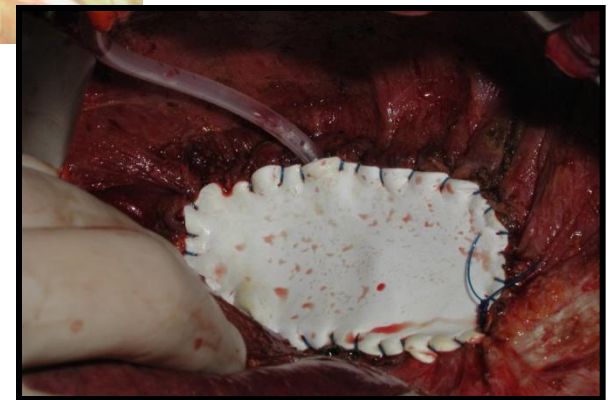
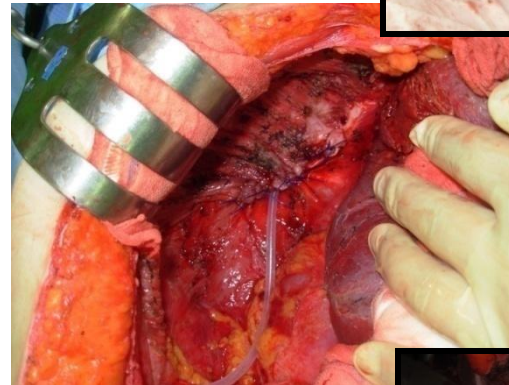
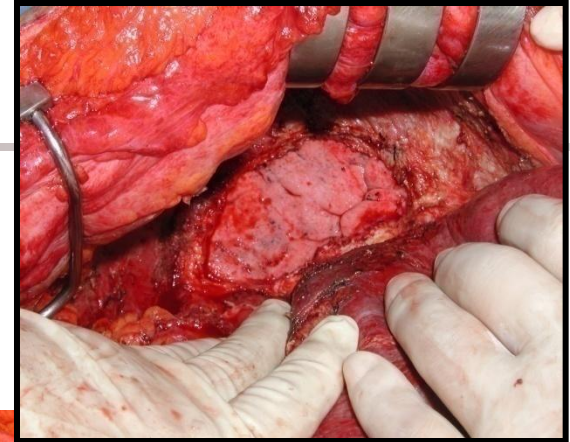
- Invasion of diaphragmatic muscle and/or central tendon

- Usual defect
 - primary suture
 - Ex) 1-0 Prolene ®

- Very large defect
 - Prosthetic material
 - Ex) Gore Tex mash®

- Suction with catheter with large volume ventilation by anesthesiologist

- Drain may be remained



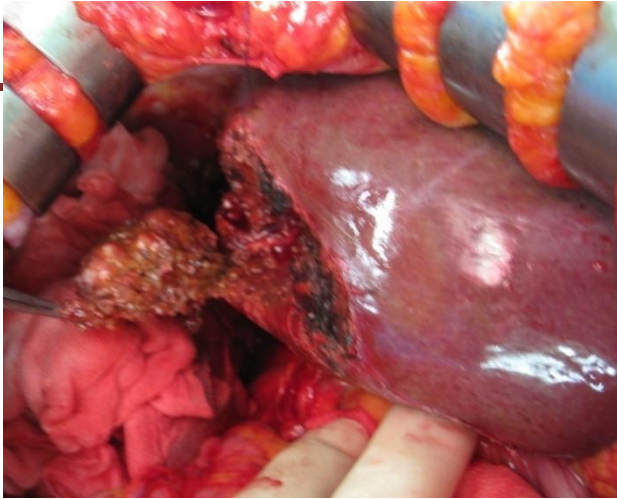


NCC results

- **Duration: 2001. 4 – 2013. 7 (12yr 3 mo)**
- **No. of patients:**
 - **Primary: > 257 pts**
- **There were no late complications related to diaphragmatic peritonectomy and/or resection interrupting patient's survival and QOL.**



Hepatic resection



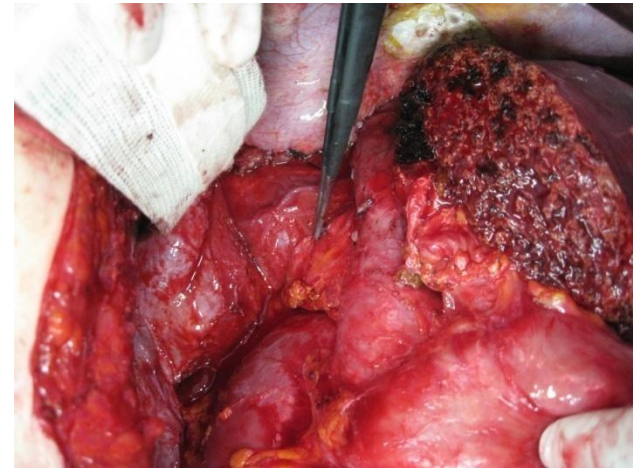
Wedge resection



Right inferior segmentectomy



Right posterior sectionectomy



Right hepatectomy

Performed by hepato-pancreatico-duodenal surgeon



NCC results

- **Duration: 2001. 4 – 2013. 7 (12yr 3 mo)**
- **No. of patients:**
 - **Primary: > 41 pts**
- **There were no late complications related to hepatic resection interrupting patient's survival and QOL.**



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Gynecologic Oncology 112 (2009) 28–34

Gynecologic
Oncology

www.elsevier.com/locate/ygyno

The clinical significance of hepatic parenchymal metastasis in patients with primary epithelial ovarian cancer

Myong Cheol Lim^{a,b}, Sokbom Kang^a, Kyung Soo Lee^a, Sung-Sik Han^c, Sang-Jae Park^c,
Sang-Soo Seo^a, Sang-Yoon Park^{a,*}

^a Center for Uterine Cancer, Research Institute and Hospital, National Cancer Center, 111, Jungbalsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, South Korea

^b Department of Obstetrics and Gynecology, Kyunghee University Medical College, Seoul, Korea

^c Center for Liver Cancer, Research Institute and Hospital, National Cancer Center, 111, Jungbalsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, South Korea

Received 5 August 2008

Available online 17 November 2008

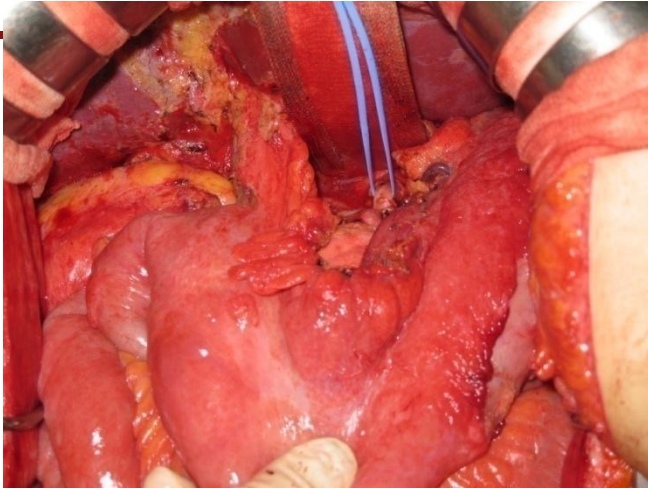
Abstract

Objective. The objective of this study was to determine the clinical significance of hepatic parenchymal metastasis on survival in patients with advanced epithelial ovarian cancer.

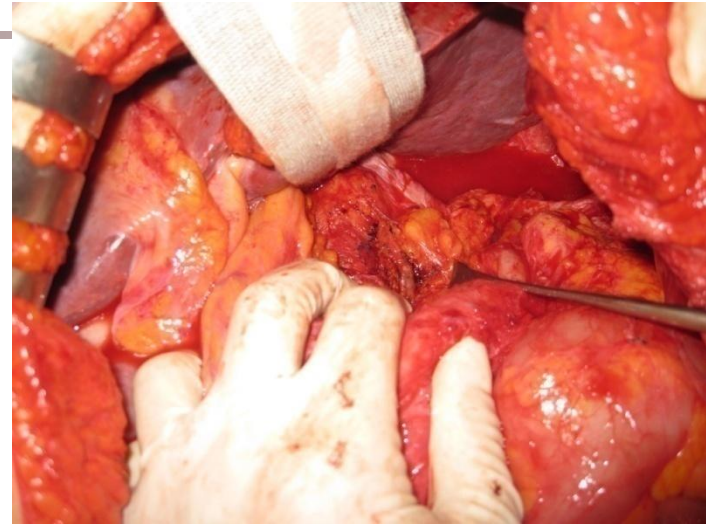
Methods. We conducted a retrospective review of ovarian cancer patients with stages IIIc and IV hepatic parenchymal metastasis who were treated at the National Cancer Center in Korea between January 2001 and January 2008. Hepatic metastases were divided into segmental



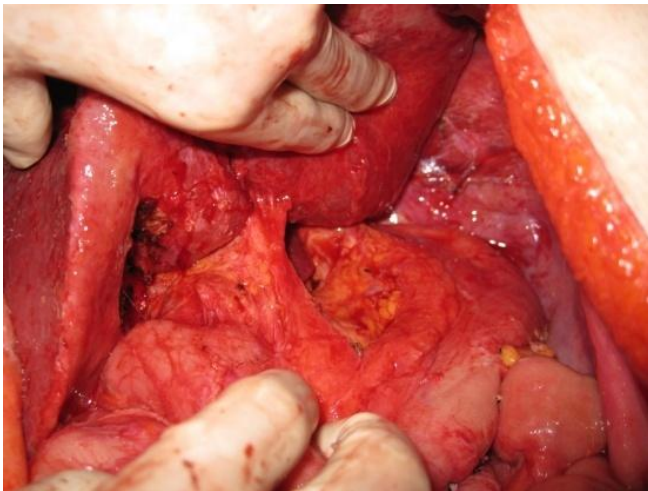
Tumor resection of portal hepatis and lesser sec



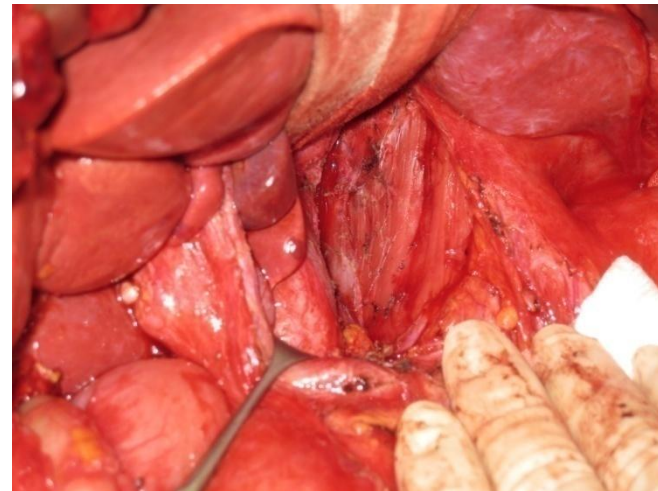
2010.5.26



2010.4.28



2010.6.30



2010.4.6

Performed by hepato-pancreatico-duodenal surgeon



NCC results

- **Duration: 2007. 8 ~ 2009. 6 (1yr 10mo)**
- **No. of patients:**
 - **11** (primary; 2, 2nd ; 9)
- **There was no significant morbidity** related to tumor resection of the porta hepatis and mortality associated with surgery.



Extended cytoreduction of tumor at the porta hepatis by an interdisciplinary team approach in patients with epithelial ovarian cancer

Yong Jung Song^{a,1}, Myong Cheol Lim^a, Sokbom Kang^a, Sang-Soo Seo^a, Seong Hoon Kim^b,
Sung-Sik Han^{b,*}, Sang-Yoon Park^{a,*}

^a Center for Uterine Cancer, Research Institute and Hospital, National Cancer Center, 323 Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea

^b Center for Liver Cancer, Research Institute and Hospital, National Cancer Center, 323 Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea

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Cytoreductive surgery

Porta hepatis

Ovarian cancer

Residual disease

ABSTRACT

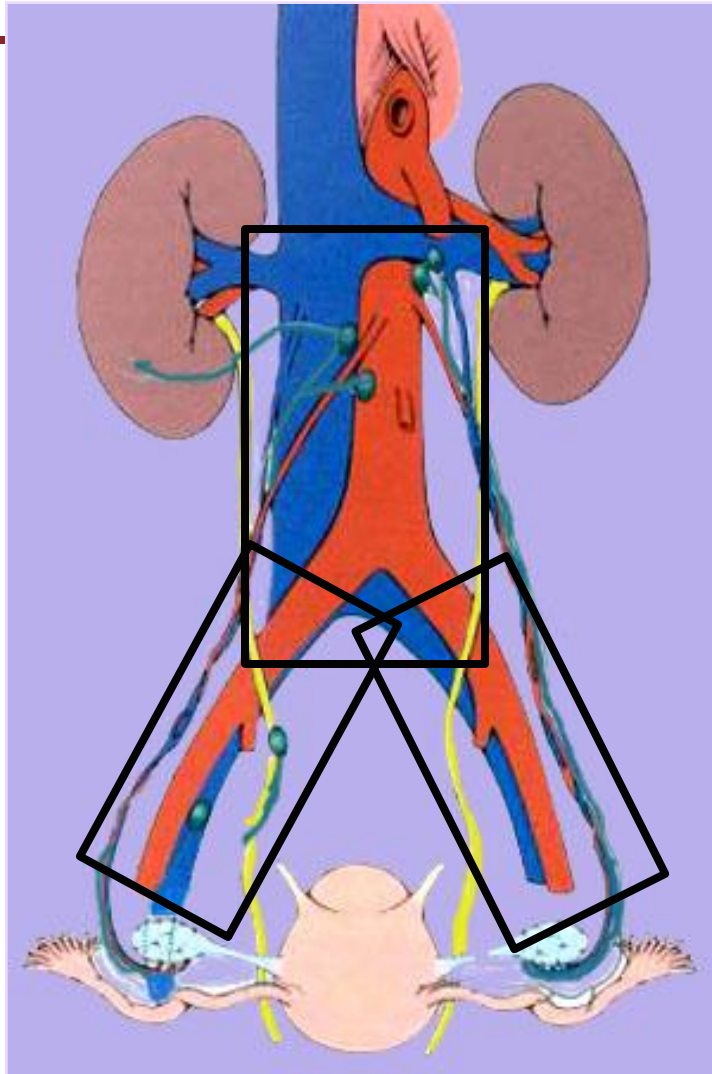
Objective. The objective of this study was to describe the development and experience in resection of tumor at the porta hepatis in patients with ovarian cancer by an interdisciplinary team approach.

Methods. From August 2007 to June 2009, 11 women (2 primary and 9 recurrent ovarian cancers) underwent extended cytoreductive surgery including resection of tumor at the porta hepatis by hepatobiliary surgeons.

Results. Tumor resection at the porta hepatis was required in 7.1% of the patients (11/155) during the study period. The median tumor size of the porta hepatis was 2.0 cm (range, 0.7–4 cm). All visible tumors at the porta hepatis were completely resected with co-operation of hepatobiliary surgeons. Optimal cytoreduction was achieved in all patients. There was no significant morbidity related to tumor resection



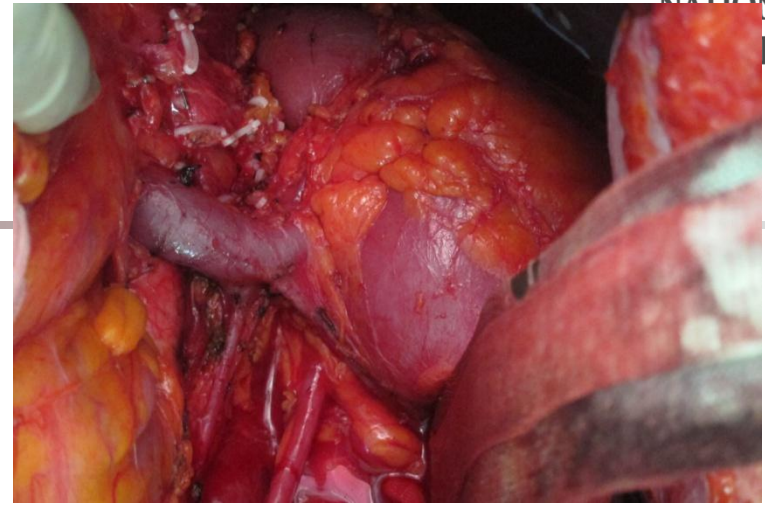
Pelvic & para-aortic LN dissection



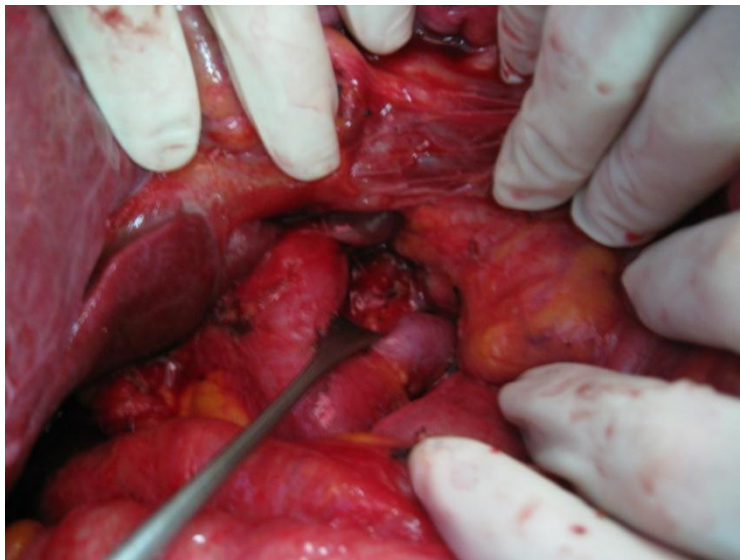
(Greer BE, et al. Atlas of Clinical Gynecology 1999)



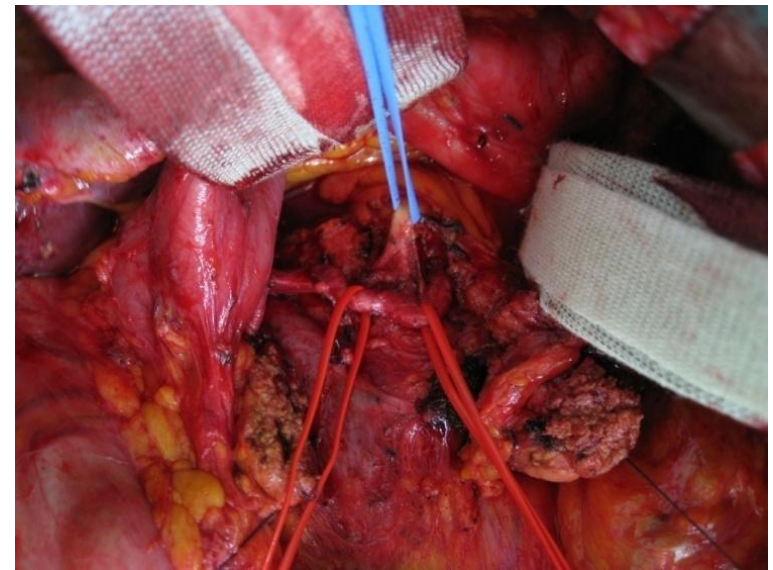
Supra-renal LND



2012.01.24



2010.03.03



2010.04.16

Performed by hepato-pancreatico-duodenal surgeon

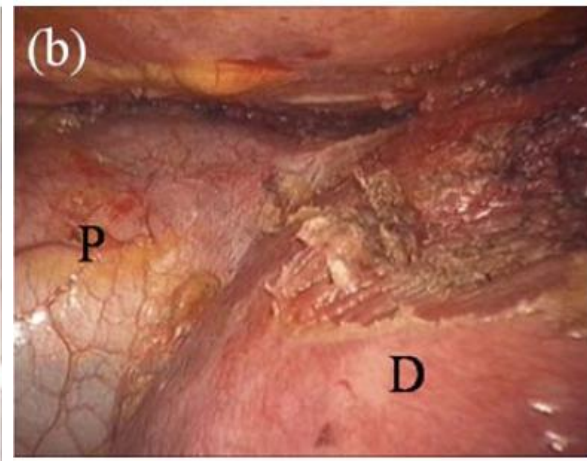
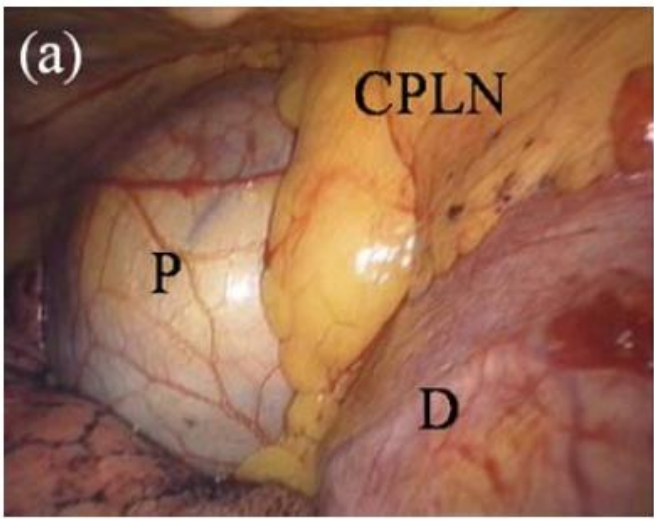
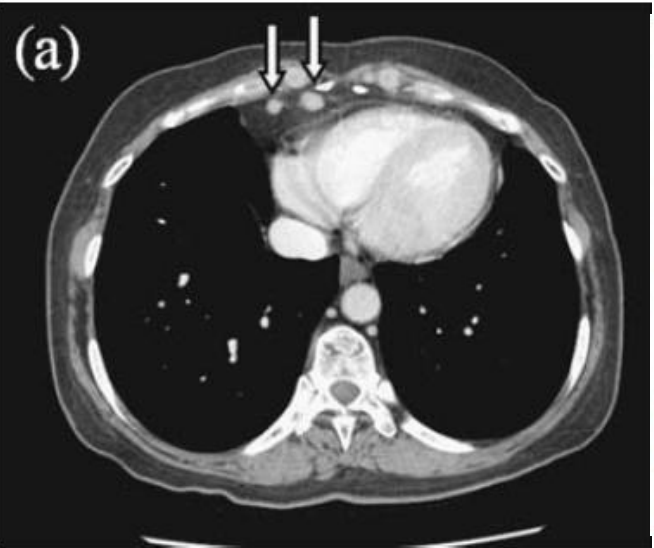
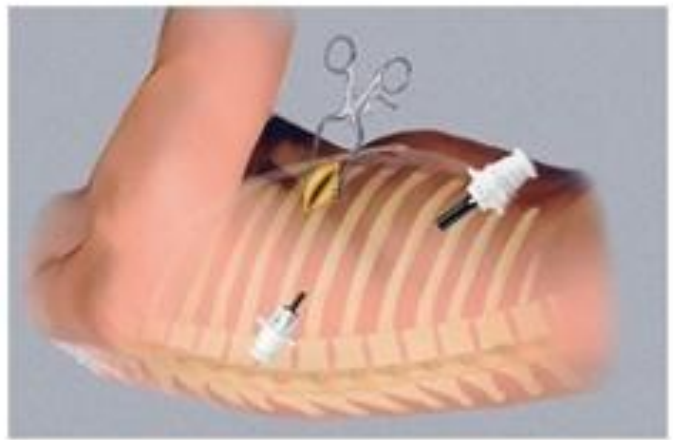


NCC results

- **Duration: 2007. 1 – 2012. 1 (5 yr)**
- **No. of patients: primary > 16**
- **Suprarenal LND can be performed safely to achieve the optimal cytoreduction in the surgical management of primary and recurrent ovarian cancer.**



Video-assisted thoracic surgery (VATS)





NCC results

- ➔ **Duration: 2007.6 – 2008.10 (1yr 4 mo)**
- ➔ **No. of patients: 13**
 - ➔ **Suspicious CPLN: 9 pts**
 - ➔ **Suspicious pleural metastasis: 4 pts**
- ➔ **VATS can be performed **safely** for exact pathological diagnosis and resection of intrathoracic pleural metastasis and CPLN metastasis.**



Pathological Diagnosis and Cyto-reduction of Cardiophrenic Lymph Node and Pleural Metastasis in Ovarian Cancer Patients Using Video-Assisted Thoracic Surgery

Myong Cheol Lim, MD^{1,4}, Hyun-Sung Lee, PhD², Dae Chul Jung, PhD³, Ji Young Choi, MD^{1,5}, Sang-Soo Seo, PhD¹, and Sang-Yoon Park, MD, PhD¹

¹Center for Uterine Cancer, Research Institute and Hospital, National Cancer Center, Goyang, Gyeonggi, Korea; ²Center for Lung Cancer, Research Institute and Hospital, National Cancer Center, Goyang, Gyeonggi, Korea; ³Department of Radiology, Research Institute and Hospital, National Cancer Center, Goyang, Gyeonggi, Korea; ⁴Department of Obstetrics and Gynecology, Kyung Hee University, Seoul, Korea; ⁵Department of Obstetrics and Gynecology, Seoul National University Hospital, Seoul, Korea

ABSTRACT

Background. The aim of this study was to assess the benefit of video-assisted thoracic surgery (VATS) in pathological diagnosis and intrathoracic cyto-reduction of cardiophrenic lymph node (CPLN) and pleural metastasis on computed tomography (CT) in patients with ovarian cancer.

Methods. We reviewed a database of ovarian cancer patients who underwent VATS from June 2007 to

visible intrathoracic diseases were completely resected without major complications, and VATS did not delay planned treatment.

Conclusion. VATS enables the accurate pathological diagnosis and intrathoracic resection of pleural and CPLN metastasis in patients with ovarian cancer with acceptable morbidity. Further studies are needed to confirm the impact of VATS on survival in patients with ovarian cancer.

Ann Surg Oncol (2009) 16:1990–1996.
IF; 2.787

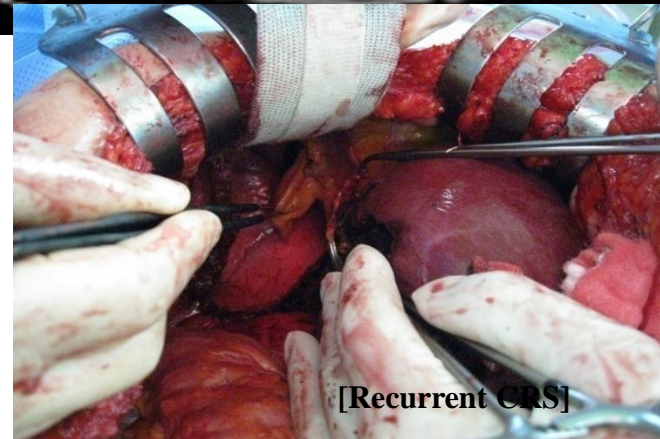
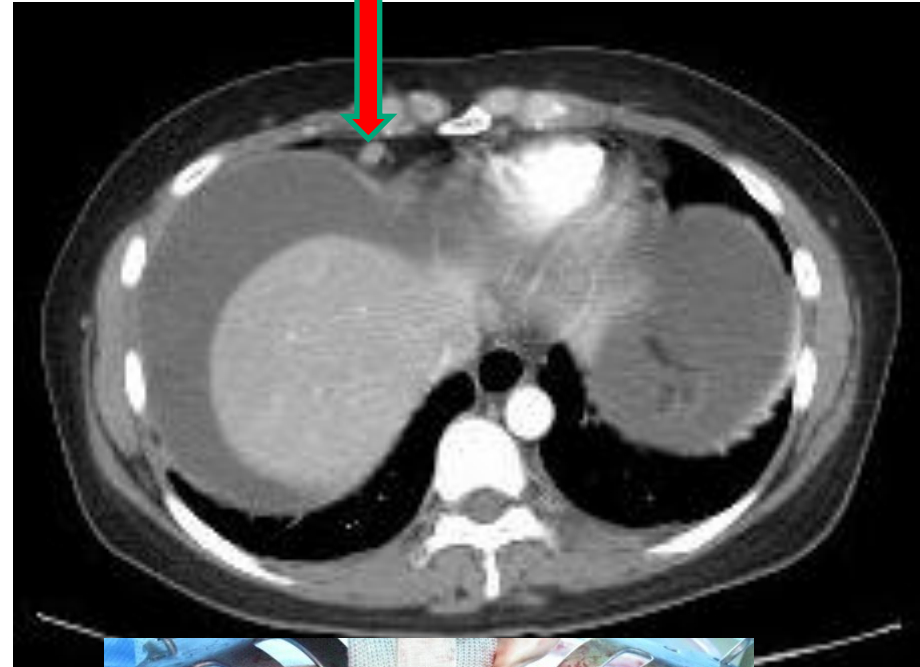


Trans-diaphragmatic thoracic metastatectomy

Typical Case (Dec 10, 2010)

2008. 12. 8

Biennial NCC Cadaveric study





NCC results

- ➔ **Duration: 2008.11 – 2011.12 (3yr 1 mo)**
- ➔ **No. of patients:**
 - ➔ **Primary: > 45 pts**
- ➔ **CPLND trans-diaphragmatic approach is **feasible** as parts of primary or secondary cytoreductive surgery without significant morbidities.**



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Gynecologic Oncology

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Transabdominal cardiophrenic lymph node dissection (CPLND) via incised diaphragm replace conventional video-assisted thoracic surgery for cytoreductive surgery in advanced ovarian cancer

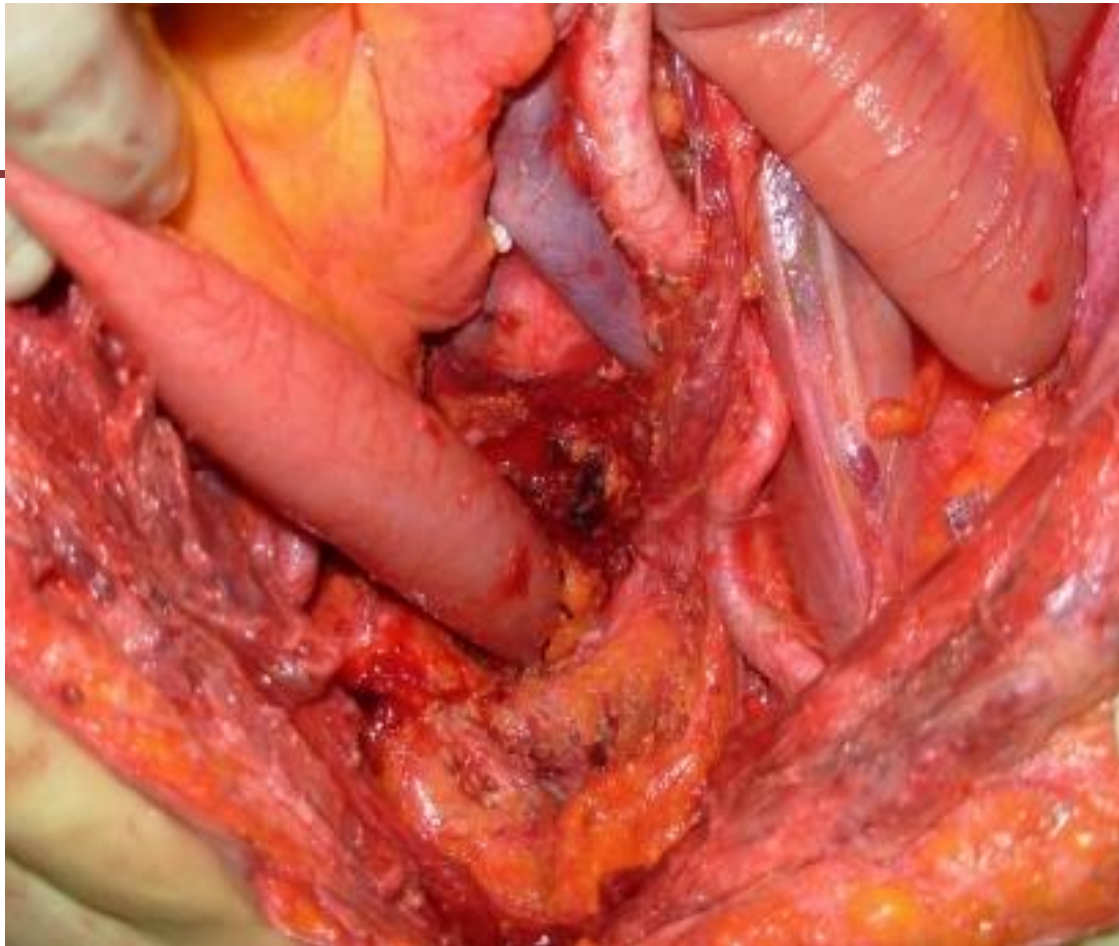
Heon Jong Yoo^{a,1}, Myong Cheol Lim^{a,1}, Yong Jung Song^{a,2}, Yuh-Seock Jung^{b,2}, Sun Ho Kim^{a,3}, Chong Woo Yoo^{a,4}, Sang-Yoon Park^{a,*}

^a Center for Uterine Cancer, Research Institute and Hospital, National Cancer Center, 323, Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea

^b Research Institute and Hospital, National Cancer Center, 323, Ilsan-ro, Ilsandong-gu, Goyang-si, Gyeonggi-do, 410-769, Republic of Korea

HIGHLIGHTS

- ▶ We approach a new procedure for ovarian cancer.
- ▶ New procedure is a part of the cytoreductive surgery.
- ▶ This can be acquired by gynecology oncologist without significant morbidities.



Total colectomy : ileo-rectal anastomosis



Total colectomy

- **Duration: 2003. 1 - 2007. 12 (4yr 11m)**
- **Patients:**
 - **Total colectomy: 22**
 - **Permanent ileostomy: 1**
 - **Ileorectal anastomosis; 21**
 - **Prophylactic ileostomy: 2**
- **Total colectomy is **feasible** as parts of primary or secondary cytoreductive surgery without significant morbidities.**



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Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno



Total colectomy as part of primary cytoreductive surgery in advanced Müllerian cancer

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Hyo Seong Choi^b, Sang-Yoon Park^{a,*}

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ABSTRACT

Objective. To investigate morbidities and surgical outcomes of total colectomy conducted during primary cytoreductive surgery in advanced Müllerian cancer.

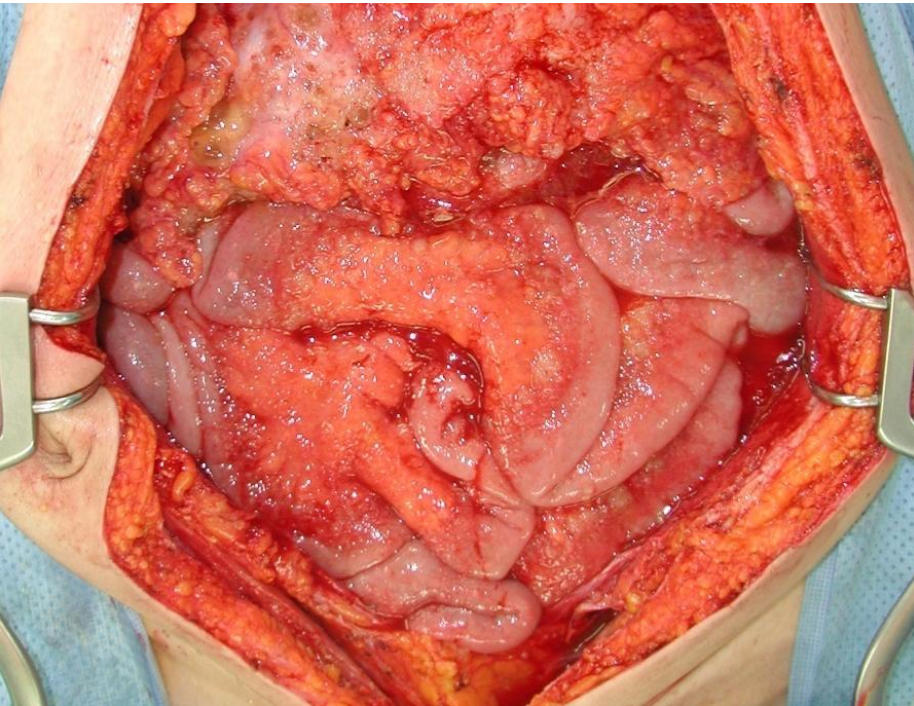
Methods. The authors reviewed the medical records of 22 patients with stage IIIc or IV advanced

Gynecologic Oncology (2009) 114:183–7.



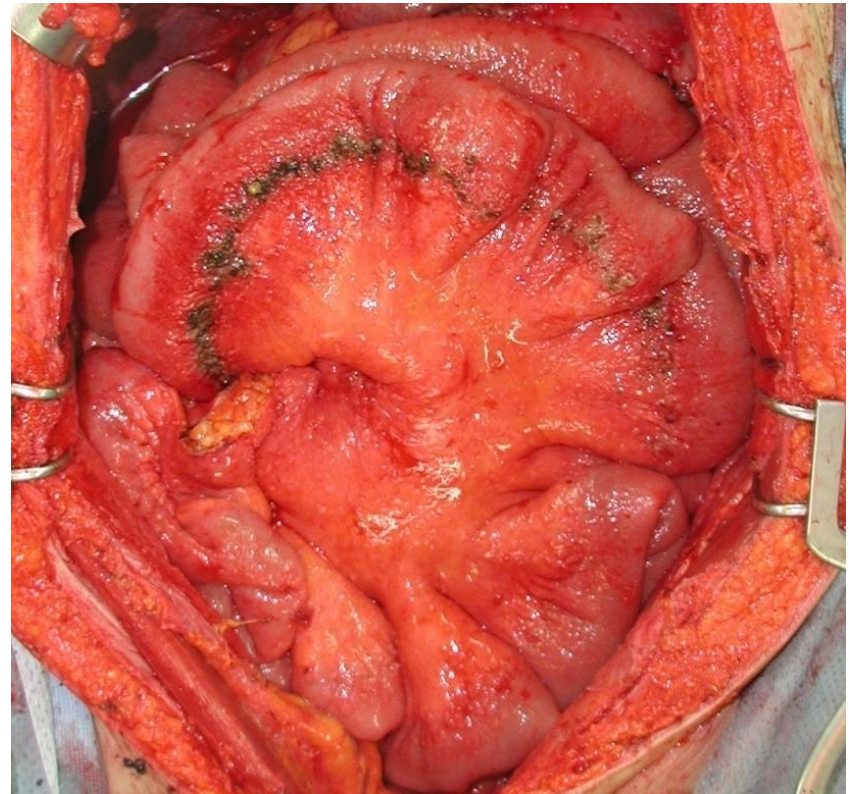
Visceral peritonectomy

Preop. Finding

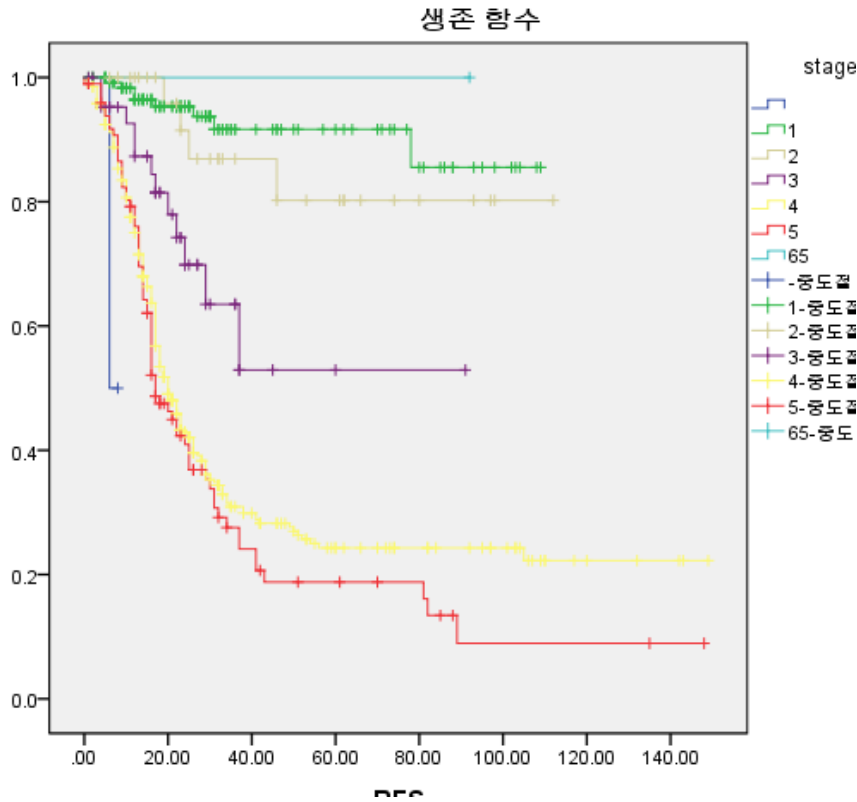


Tumor implant on mesentery

Postop. Finding



Visceral peritonectomy and fulguration



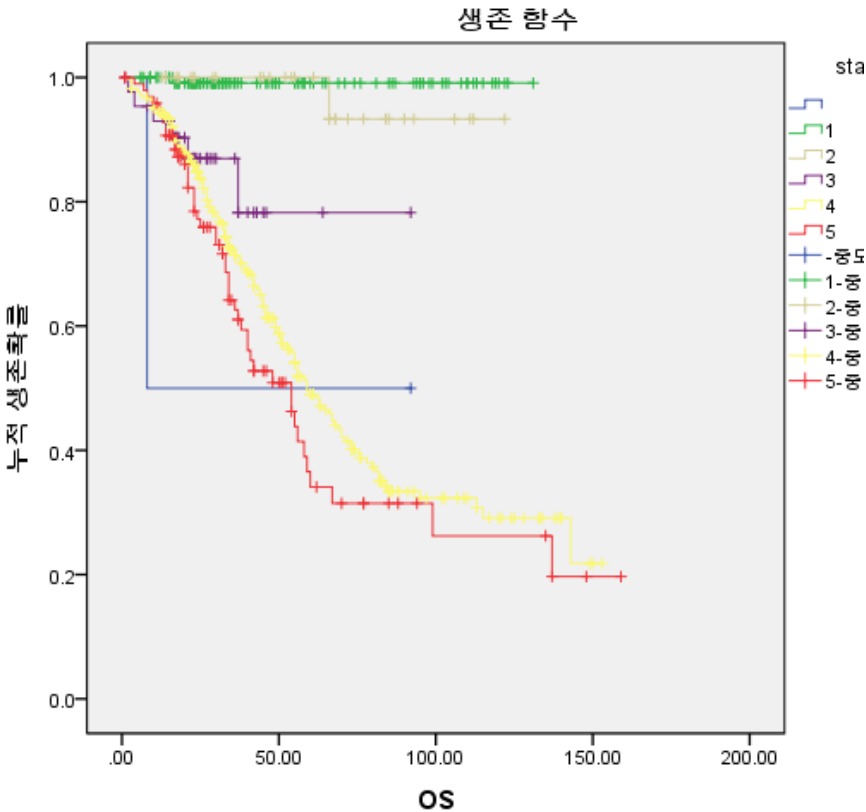
Median f/u 33Mo
2001-2013.06 (N=622)

5yr PFS

Stage 1: 95.%
Stage 2: 80.2%
Stage 3a&b: 52.9%
Stage 3c: 24.5
Stage 4: 18.8%

Median PFS

Stage 1: NR
Stage 2: NR
Stage 3a&b: 36Mo
Stage 3c: 20Mo
Stage 4: 17Mo



Median f/u 33Mo
2001-2013.06 (N=622)

5yr OS

Stage 1: 99.1%
 Stage 2: 93.3%
 Stage 3a&b: 78.3%
 Stage 3c: 49.6%
 Stage 4: 34.1%

Median OS

Stage 1: NR
 Stage 2: NR
 Stage 3a&b: NR
 Stage 3c: 59Mo
 Stage 4: 54Mo

Summary

- **What is the goal of surgical treatment in advanced ovarian cancer?**
 - **No macroscopic residual**
- **What kind of surgery are needed?**
 - **Visceral and pelvic peritonectomy including multiple organ resection**
- **But, postop. complications interrupting chemotherapy should be avoided.**



➤ **In order to perform these jobs**

➤ **Knowledge of anatomy**

➤ **Acquirement of surgical skill for intraperitoneal organs**

➤ **Application of up-to-date surgical apparatus**

➤ **Experiences for postop. management**

❖ **Rapport with patients and her relatives**

❖ **Institutional support**



❖ Multi-disciplinary approach

- **Intramural**
 - **Fellows, residents, interns**
- **Extramural**
 - **GS (colorectal, hepatic, gastric)**
 - **CS, OS**
 - **Anesthesia**
 - **Nursing staff**

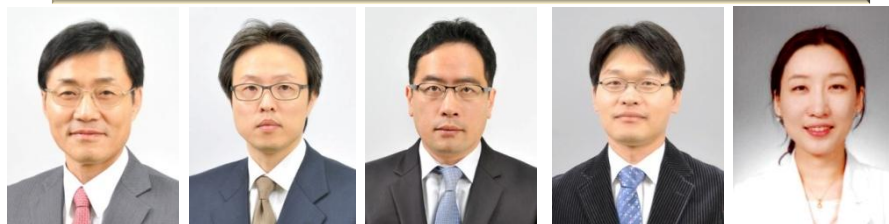


unfailing
faith~

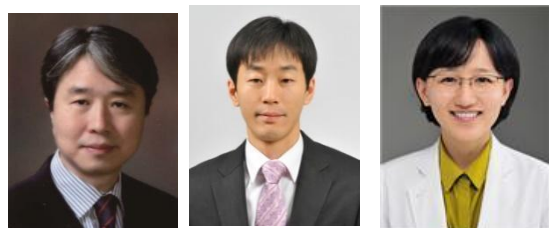
- ❖ **Courage**
- ❖ **Endurance**

ACKNOWLEDGEMENT

Gynecologic Oncology



Colorectal Surgeon



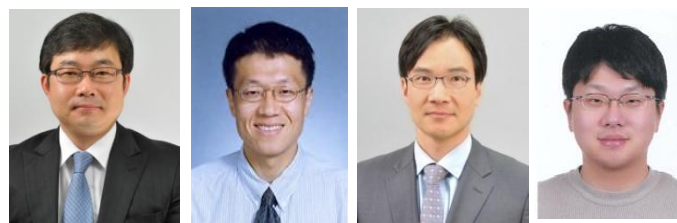
Urologic surgeons



Thoracic surgeons



Hepatobiliary Surgeon



Clinical Research Nurses & Researchers





➡ **Video presentation:**

➡ **[Upper abdominal surgery for advance ovarian cancer, 6 min](#)**

➡ **If you want to see around our system, visit National Cancer Center Korea which located near to Seoul international airport.**

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Comparison of OS (stage IIIc, IV)

	No. of pts	Duration of tx	Median PFS	OS
EORTC	632	98.9 - 06.12	12	30
MSKCC	285	98.9 - 06.12	17	50
NCCK	297	01.1 - 11. 4	20	56

1: Vergote I, et al. NEJM (2010) 2; 363:943-53

2: Chi DS, et al. Gynecol Oncol (2012) 124:10-4