

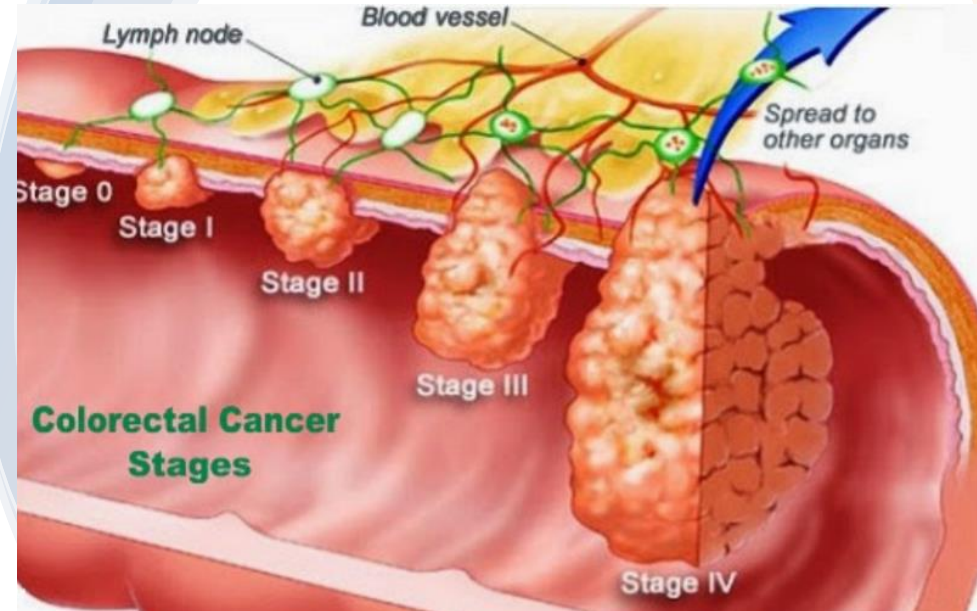
# Gateways for management of advanced colorectal cancer

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Professor of surgical  
oncology  
NCI, Cairo University.



## Advanced CRC

- T4 a/b CRC Tumor **adherent** or direct invading adjacent organ or structure.
- **10%** of all resected colon cancer
- Incidence higher in **emergent cases** than elective cases (70% vs 25%)
- Higher **positive margin rate**
- **Biologic more aggressive** MSI-H/ mucinous



# Radiological evaluation of cT4

	Accuracy	Sensitivity	Specificity
CT scan	70-77%	17-25%	82-93%
PET/CT	80-82%	50-58%	86-91%

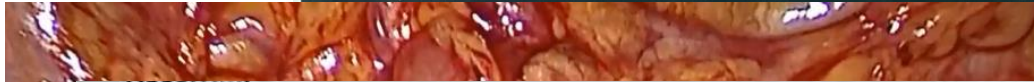
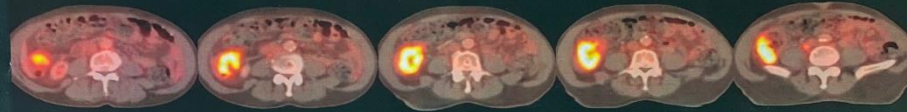


In FOxTROT trial, 47% of the radiological assessed T4 were confirmed pT4 histological, tendency of over diagnosis

# Confusing/ misleading PET

## II- Abdomen

- An irregular  
mounting to



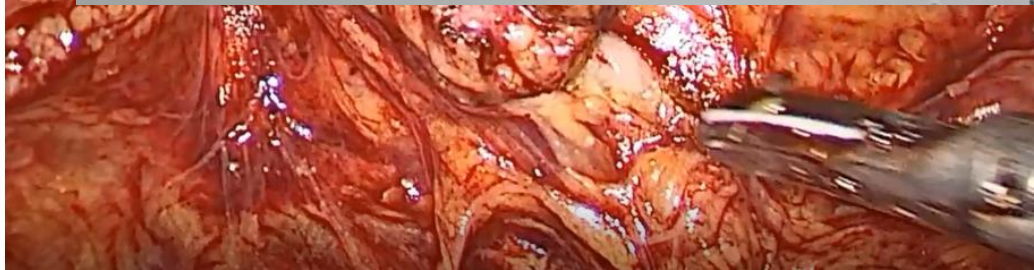
## PATHOLOGY REPORT

### Diagnosis :

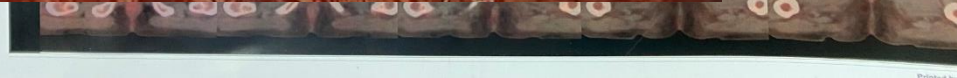
Cecal mass, Right hemicolectomy, INFILTRATING ADENOCARCINOMA GRADE III,  
FREE SURGICAL MARGINS, FREE APPENDIX, FREE OMENTUM, NO NODAL  
METASTASIS, L.N 0/25.  
- TUMOR STAGE: pT3 pN0

*Prof. Dr. Shady Elia Anis*

*Prof. Dr. Elia Anis Ishak*



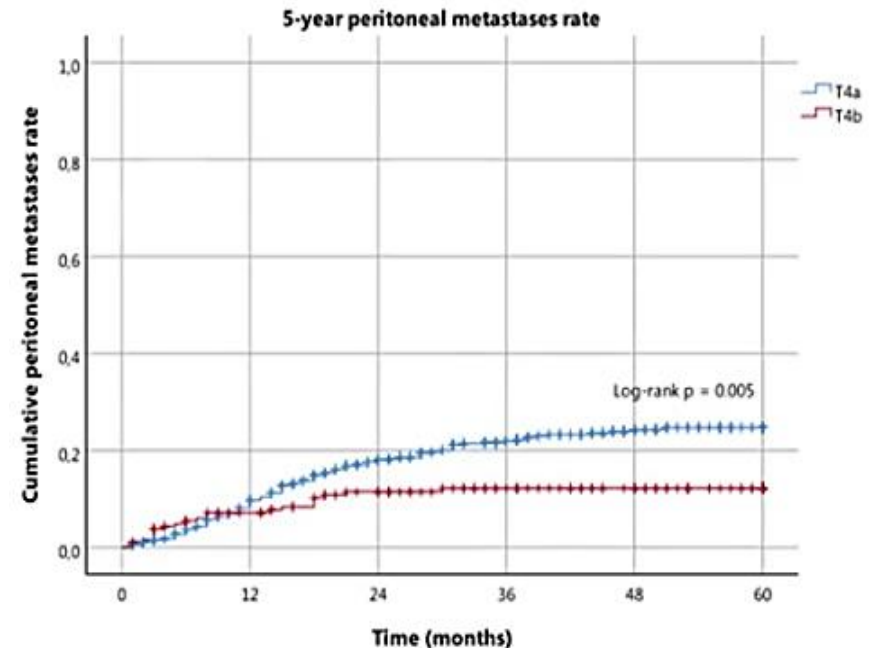
abc



# Principles Surgical Management

- **En block resection** of contiguous structure either attachment, adhesions or infiltration,
- **Don't disrupt the plane** of adhesions as 34%-84% are malignant.

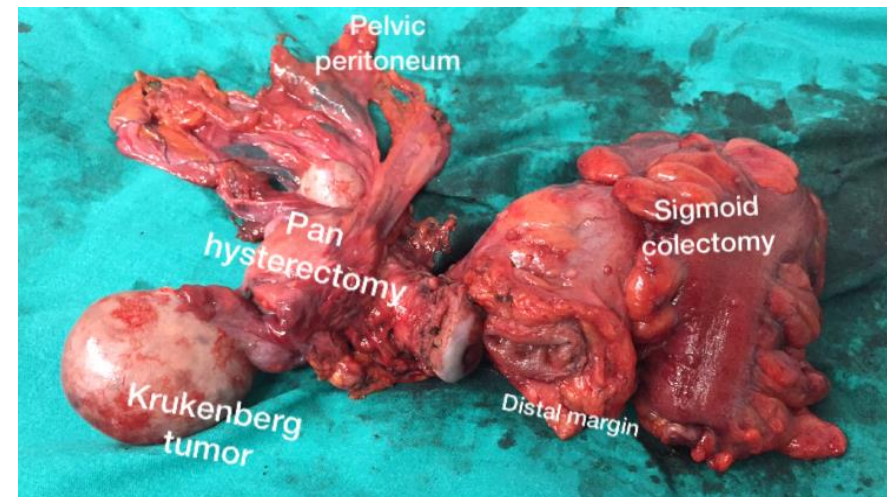
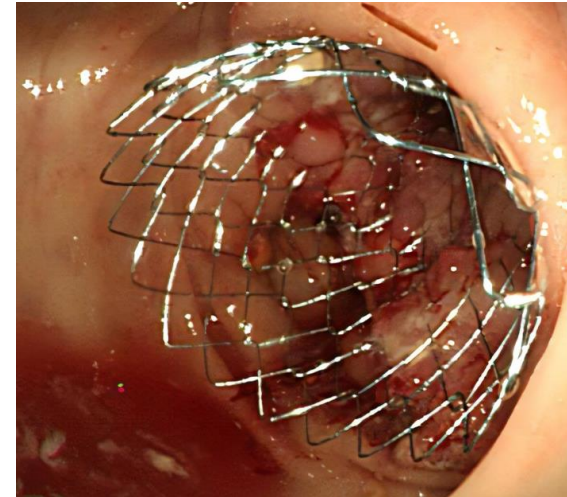
( Gezan et al. 2012, Eveno et al. 2014)



	T4a	T4b
5-Year PM rate	24.7	12.2
Bastiaenen, V. et al 2021	%	%

# Principles Surgical Management

- **Stenting** distal lesions as bridge to definitive resection.
- **MIS** approach is still an option with smart approach and higher conversion rate.
- **Post operative radiation** for resected tumors with positive margin is considered after placing surgical clips at resected tumor bed.



# Principles Surgical Management

## Journal of Clinical Oncology®

An American Society of Clinical Oncology Journal

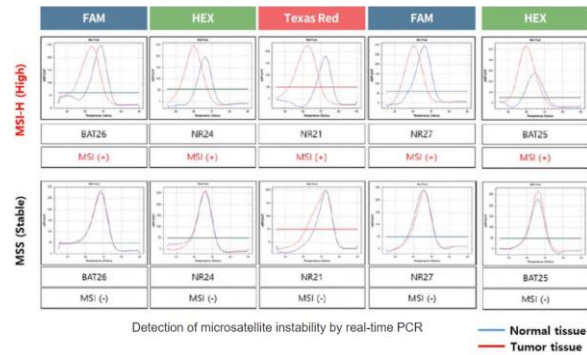
Meeting Abstract | 2019 ASCO Annual Meeting I

GASTROINTESTINAL (COLORECTAL) CANCER

**Conclusions:** Six weeks of NAC for operable CC can be delivered safely, with marked histopathological down-staging, and may result in better disease control at 2 years in pMMR disease. **28% lower event rate**

- Consider **neoadjuvant chemotherapy** in clinical T4b

# Microsatellite status



MSI

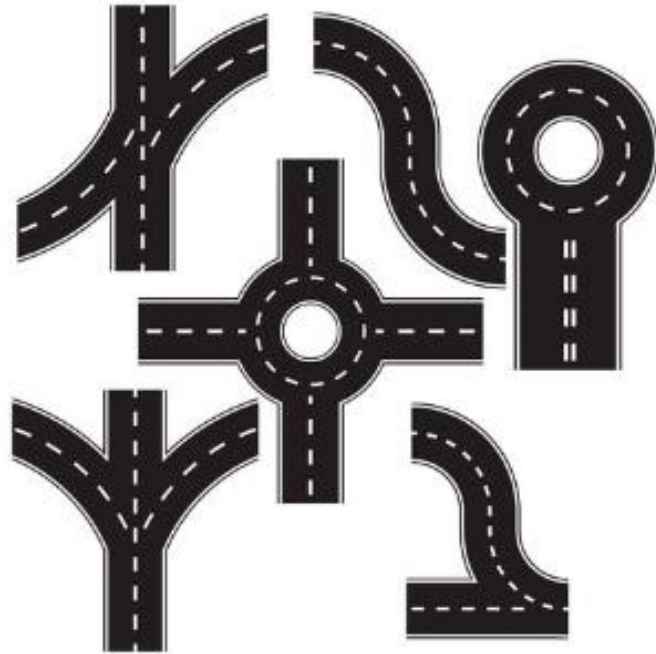
MSS



MSI-H

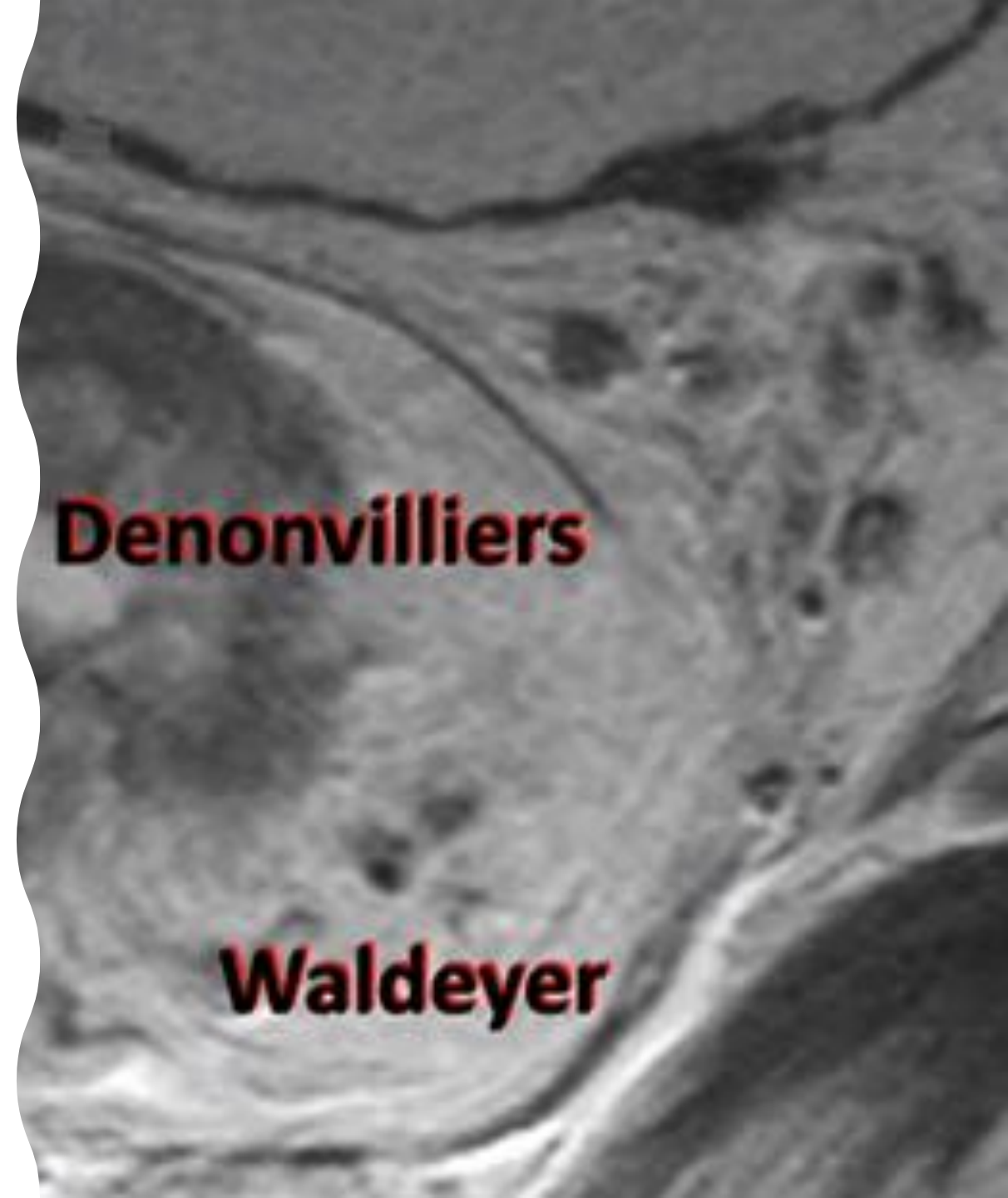


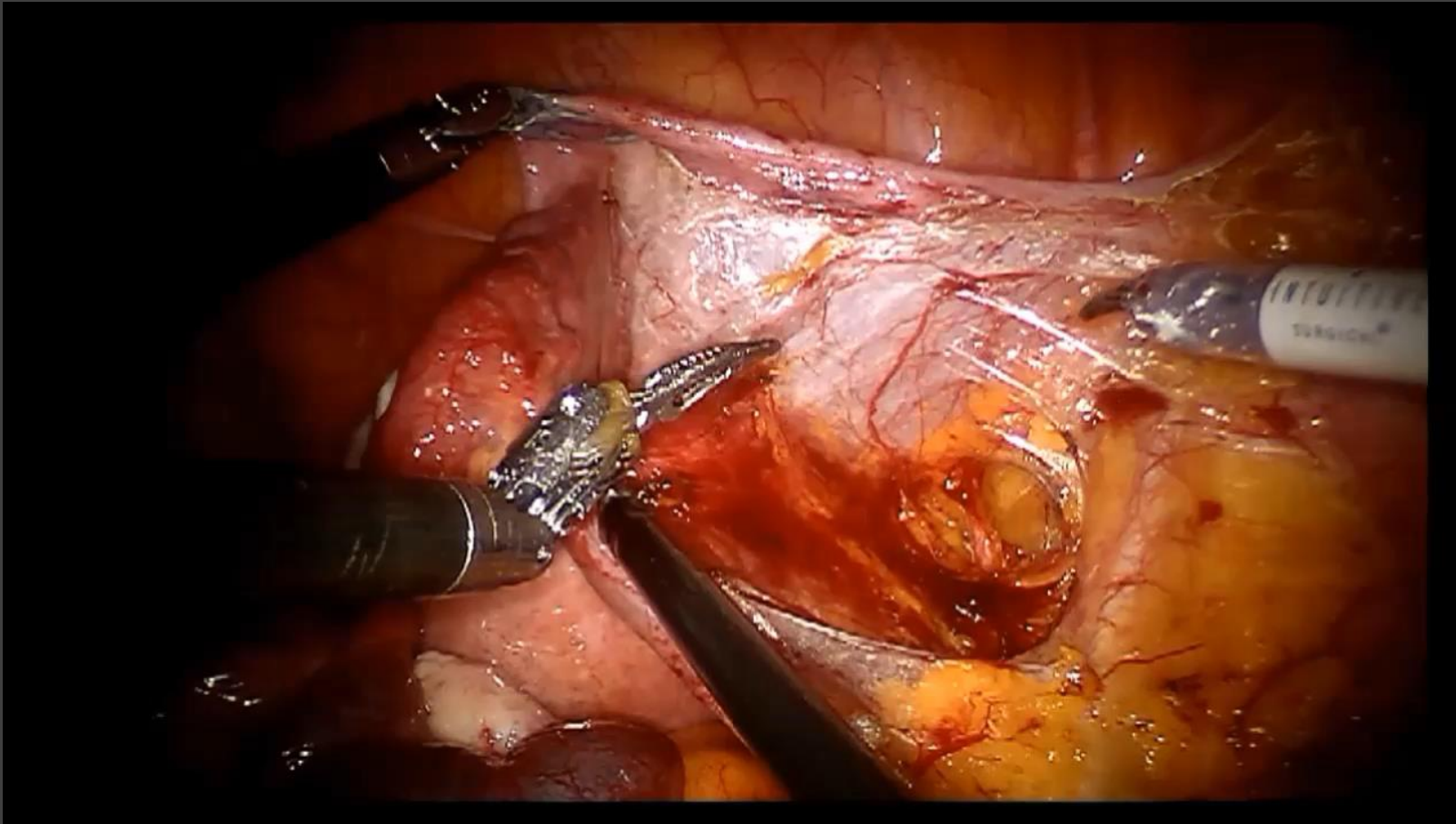
## Gateways for locally advanced tumors



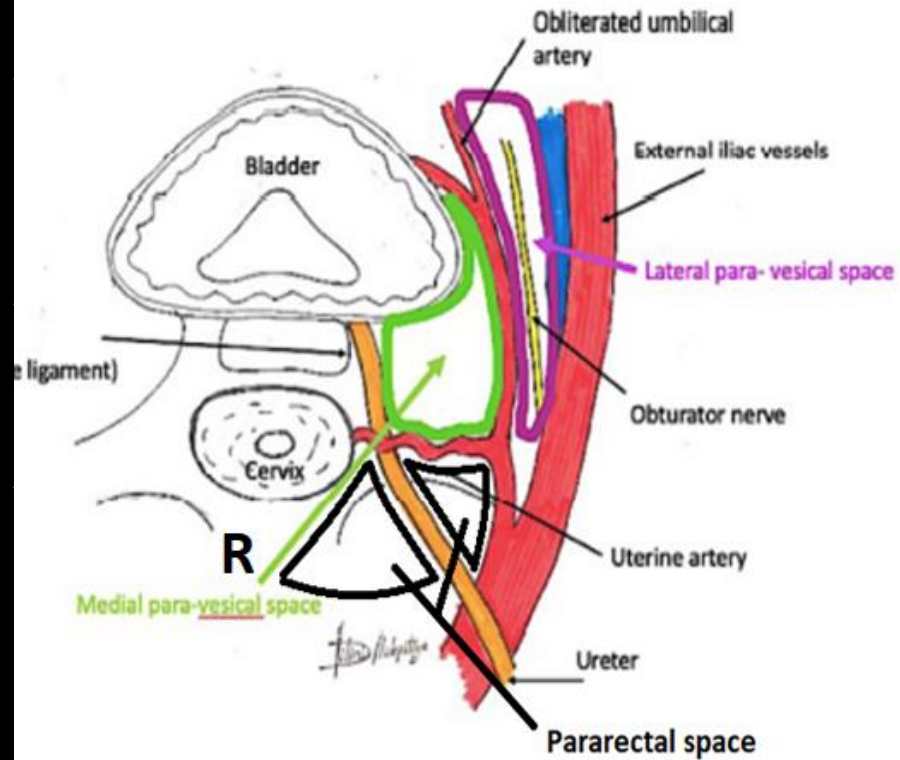
# Lateral Pelvic Pathways

- 1- Pararectal space divided by the ureter
- 2-Paravesical space divided by the obliterated umbilical artery
- 3-Triangle of Marcille





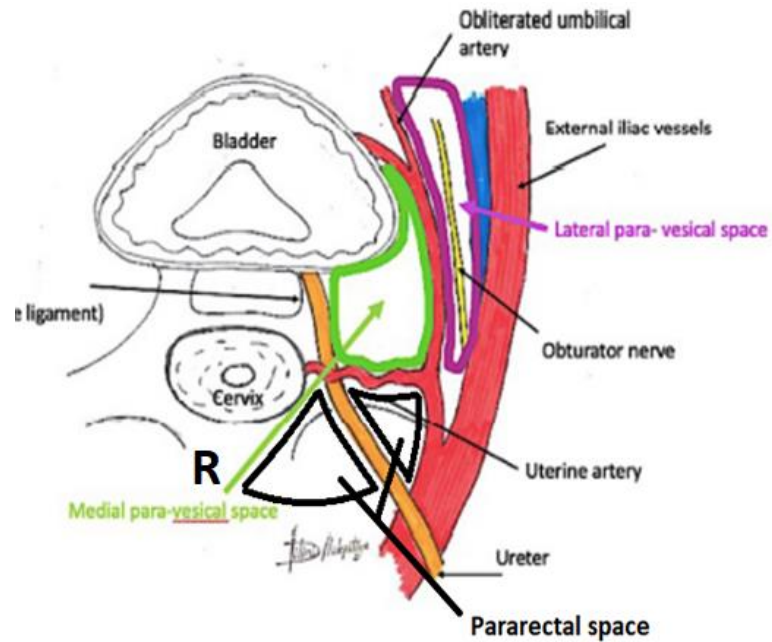
**Urogenital  
hypogastric  
fascia** |



**Pararectal space:** divided by the ureter

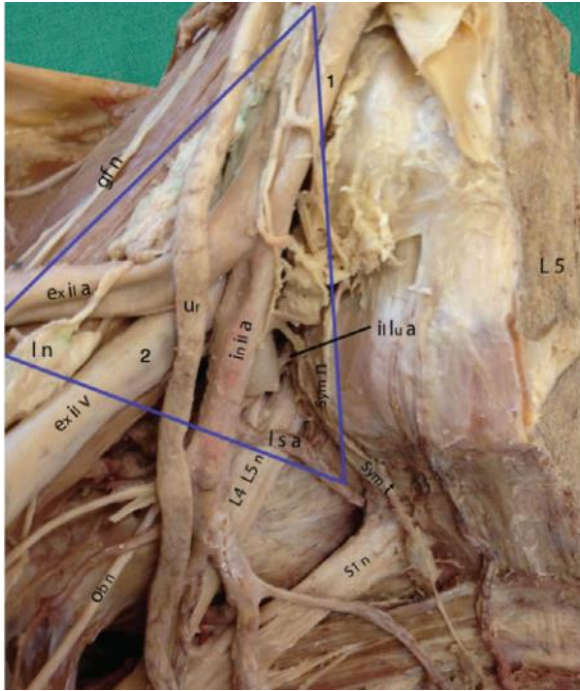
**The medial pararectal space Okabayashi space** contains the superior hypogastric nerve .

**The lateral pararectal space Latzko space** is the best space for dissection of the uterine artery



## The para vesical space divided by OUA

Paravesical space is divided by umbilical artery into lateral ( obturator space ) and medial spaces and separated from the pararectal space by the uterine artery



### Triangle of Marcille

#### Vessels:

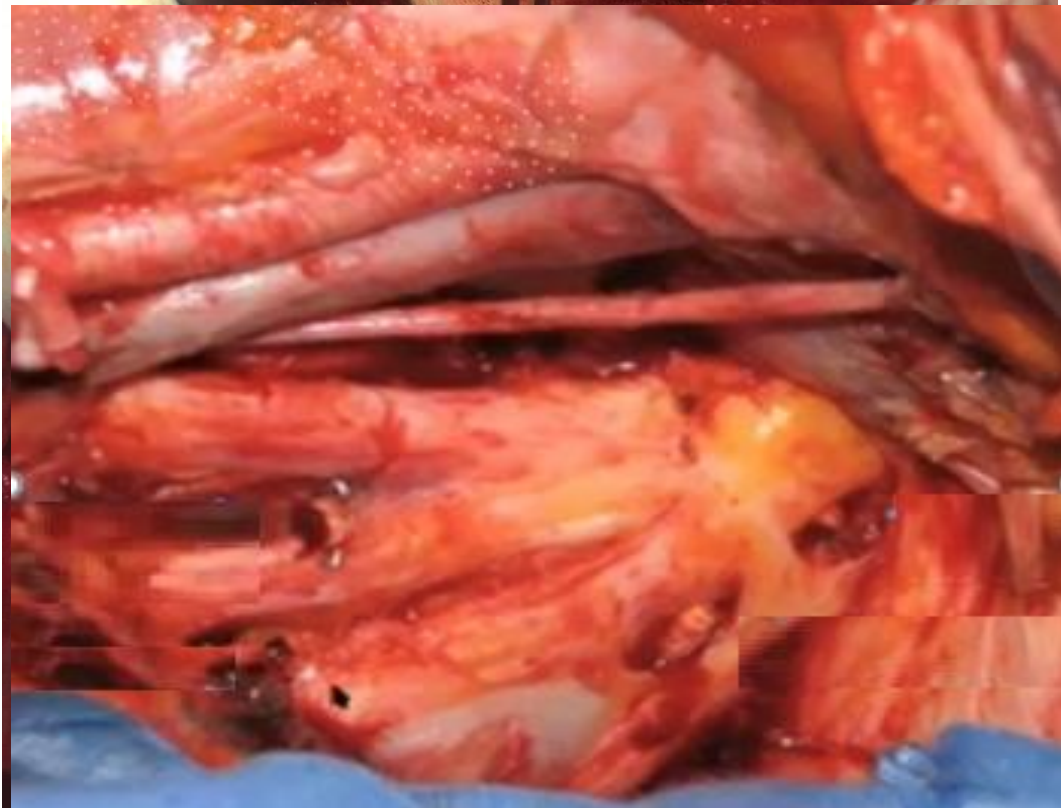
- 1. common iliac artery
- 1- common iliac artery
- ex il a- external iliac artery
- in il a- internal iliac artery
- 2/ex il v- external iliac vein
- ill u a- iliohypogastric artery
- l s a- lateral sacral artery

#### Nerves:

- L4 L5 n- Lumbosacral trunk
- S1- First sacral nerve meets Lumbosacral trunk (inferior to the triangle)
- Ob n- obturator nerve
- gf n- genitofemoral
- sym t- sympathetic trunk
- sym n- sympathetic nerve from the trunk to the superior hypogastric plexus

#### Other:

- Ur Ureter
- L5- 5<sup>th</sup> lumbar vertebra



( Triangle of Marcille)

An aerial photograph of a winding road through a dense forest covered in snow. The road is dark and curves through the white landscape. A small red horizontal bar is located at the top left of the page.

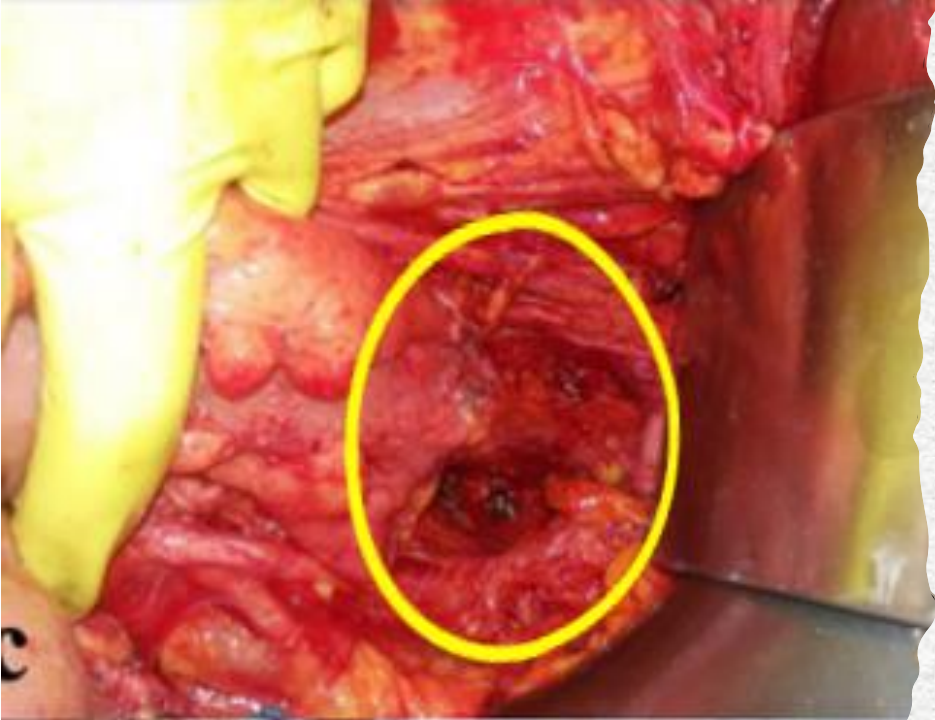
# Anterior Pelvic Pathways

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1- Vesicouterine

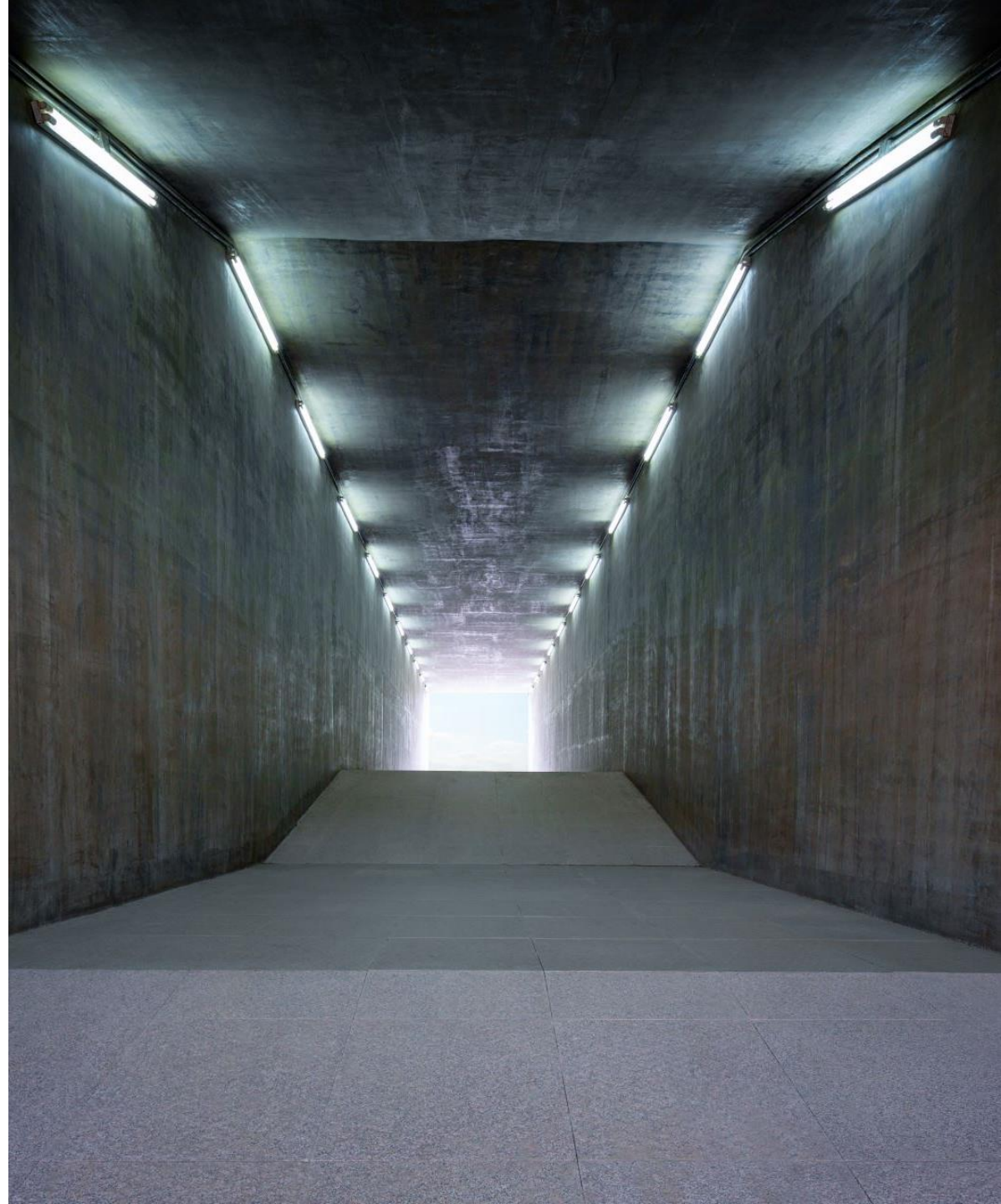
2- Rectouterine

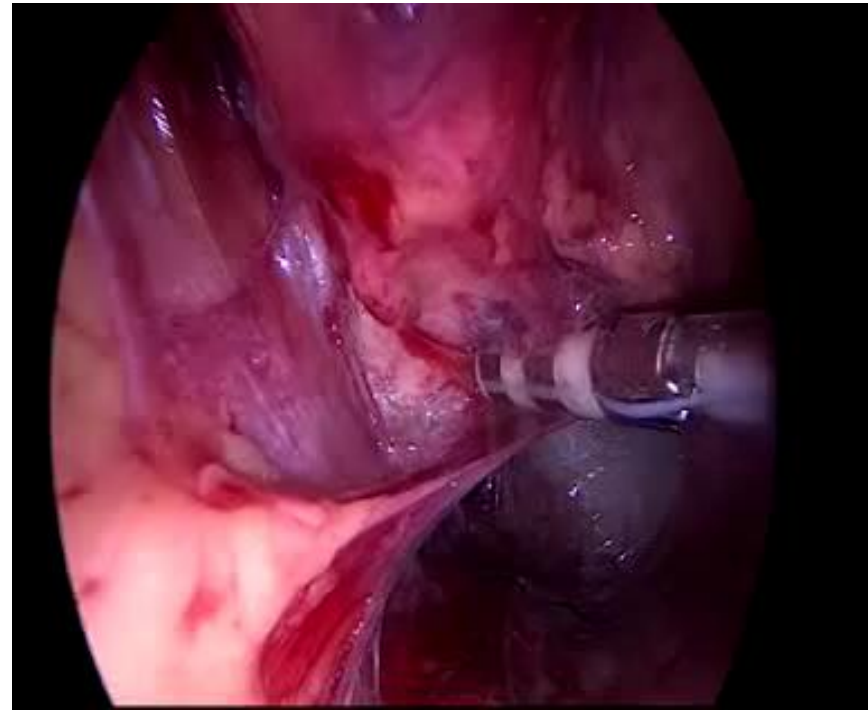
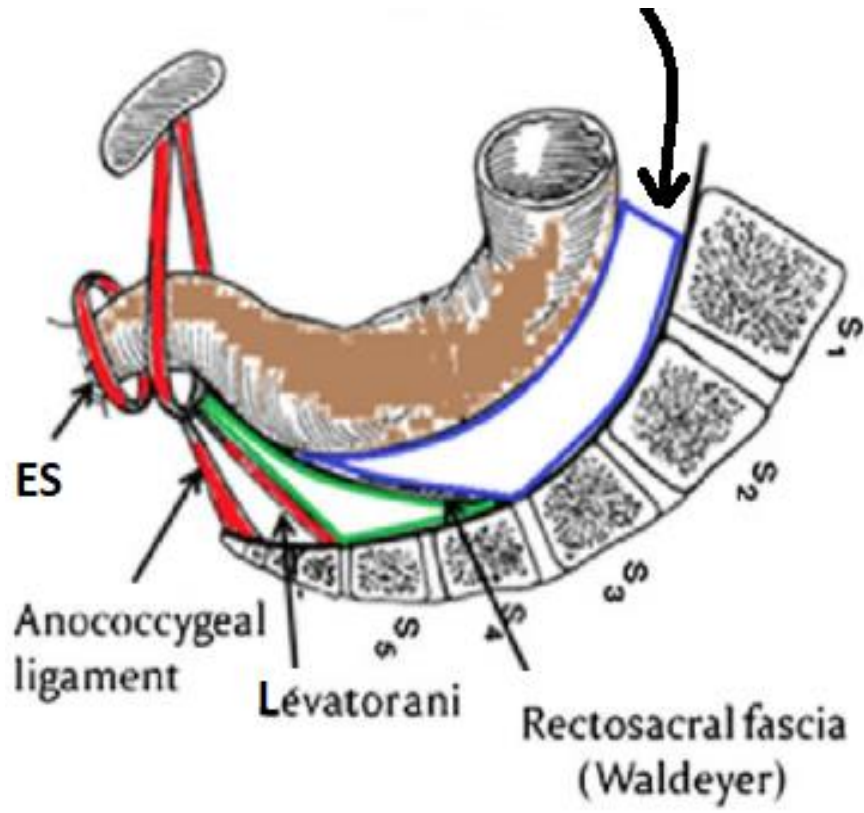




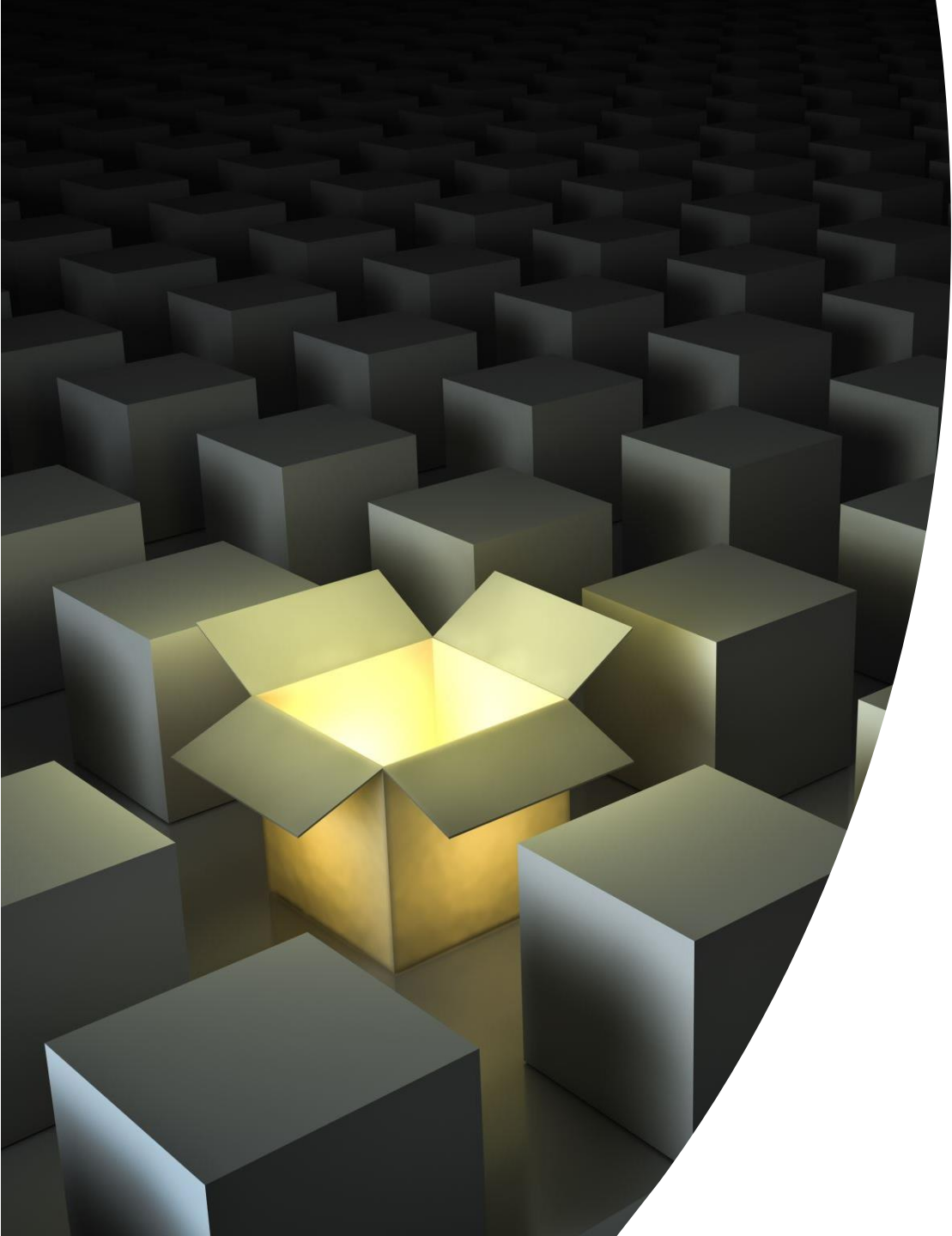
Rectovaginal  
space  
Rectovesical  
pouch

# Posterior pelvic Pathway





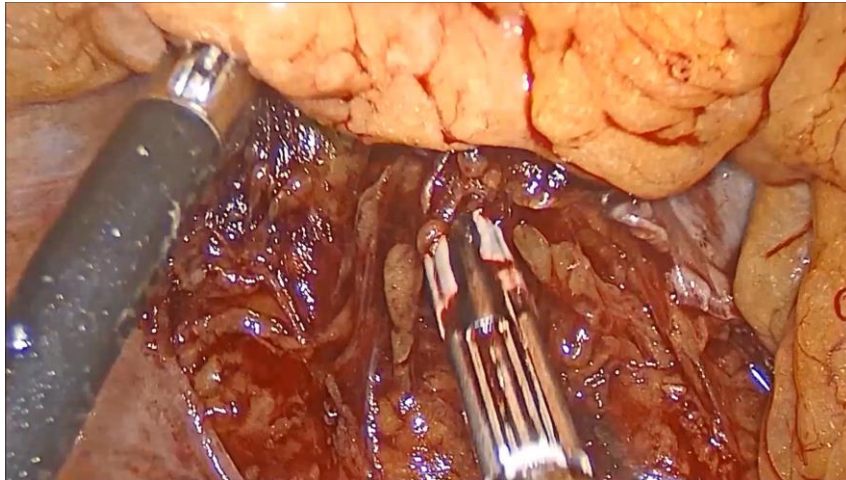
Presacral Space



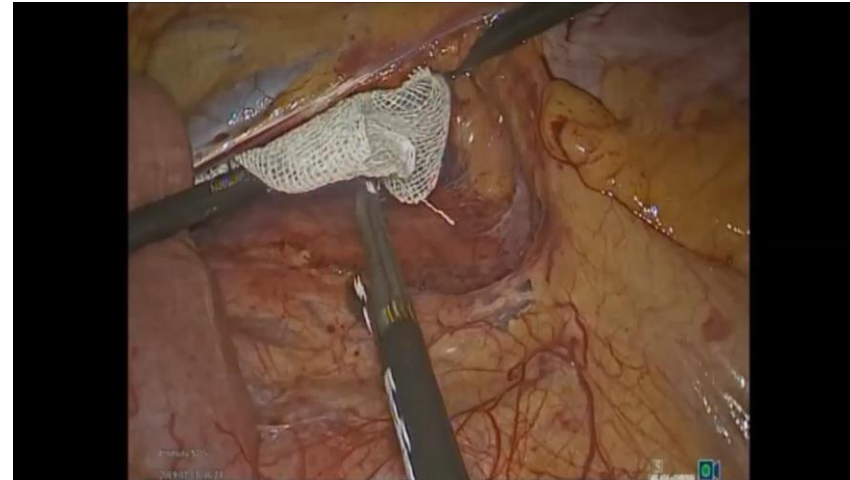
# **Laparoscopic approach**

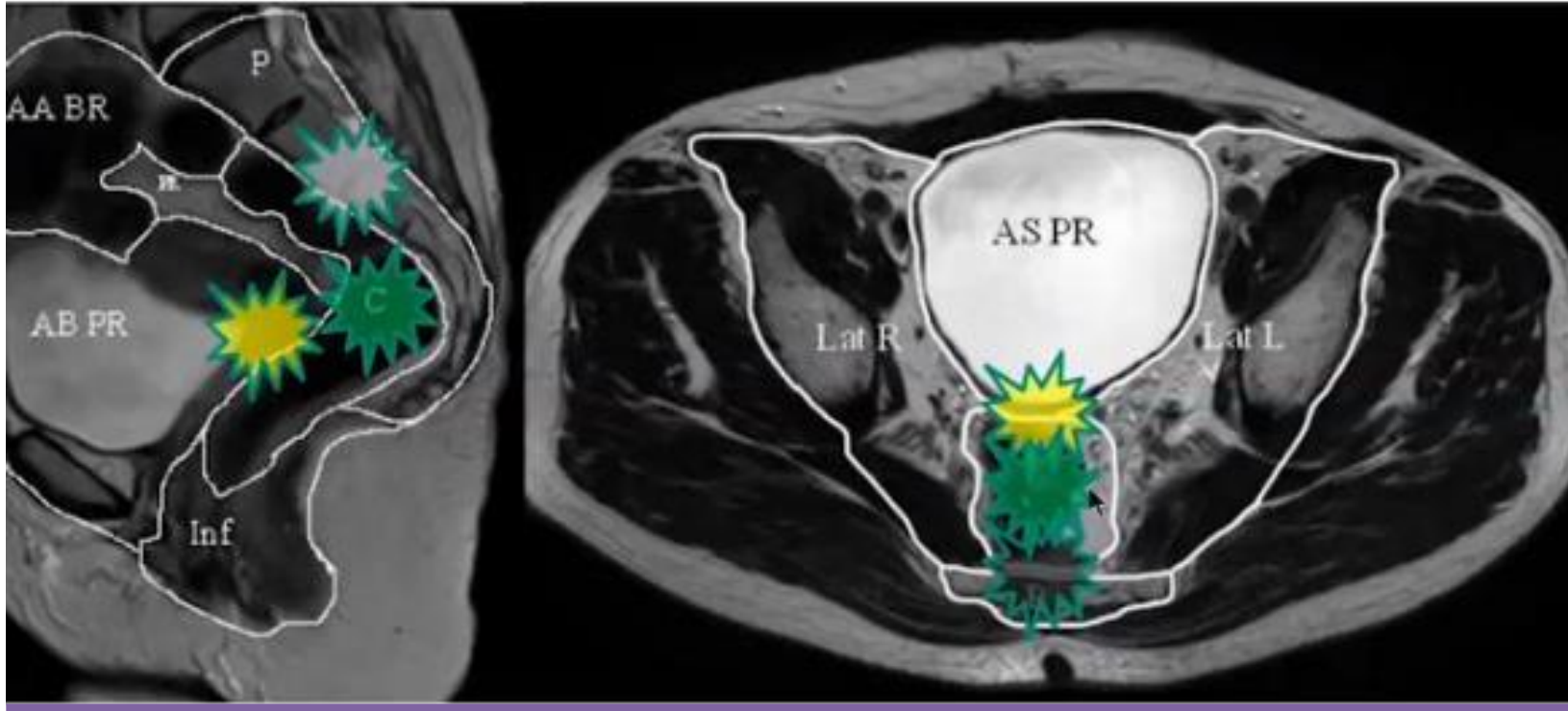
# The laparoscopic approach

Below the IC pedicle



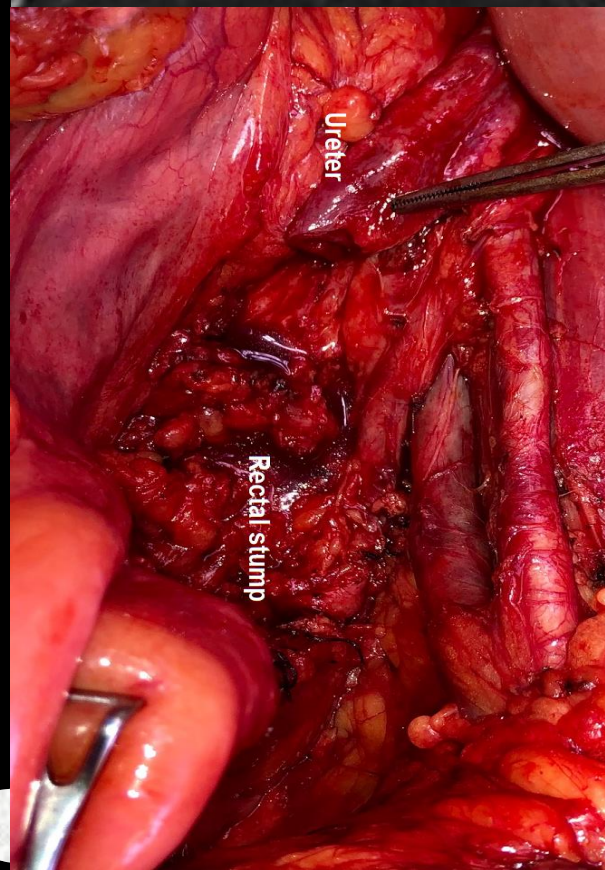
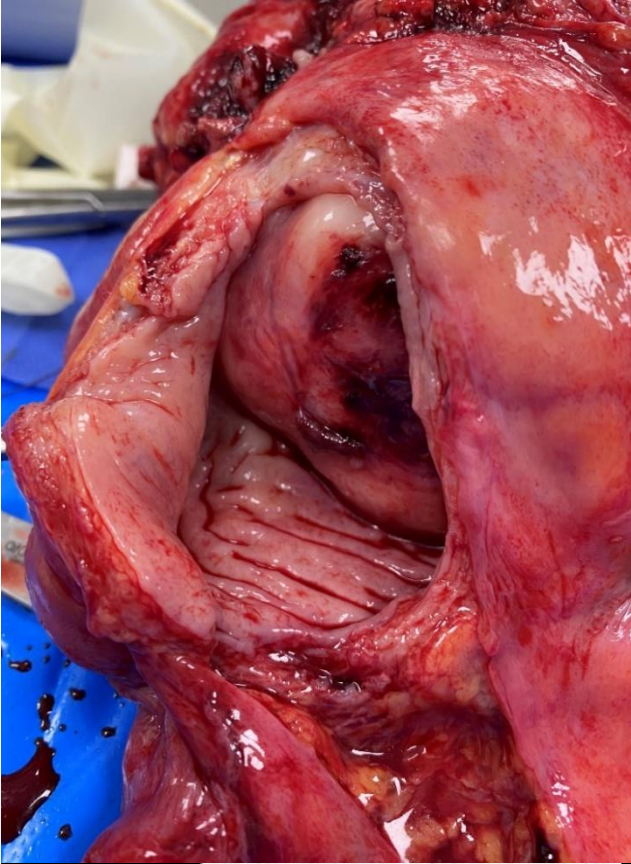
Below the IMV





**Beyond TME**  
**Don't force**  
**dissection**  
**plane**

- The situation where the tumor extends **beyond the TME plane**, so TME is not enough, enblock resection with urinary bladder, ureter, distal sacrum or lateral pelvic wall, otherwise you will declare **the operation as non-curative**, as you **come across tumor** that you was not expecting to see.



# Exentrations

# T4 risk of PC

Independent predictors for metachronous PC	HR	95% CI	P=
<b>T4</b>	<b>9.98</b>	<b>3.10-32.11</b>	<b>&lt;0.001</b>
<b>N2 with &lt;12 nodes exam</b>	<b>7.41</b>	<b>4.78-11.51</b>	<b>&lt;0.001</b>
<b>R2 resection</b>	<b>2.75</b>	<b>2.10-3.61</b>	<b>&lt;0.001</b>
<b>Right side</b>	<b>1.77</b>	<b>1.31-2.39</b>	<b>0.002</b>
<b>Emergency surgery</b>	<b>2.11</b>	<b>1.66-2.69</b>	<b>&lt;0.001</b>
<b>Age &gt;70</b>	<b>0.69</b>	<b>0.55-0.87</b>	<b>0.003</b>



## Magnitude of the problem

10 % of cases present with synchronous carcinomatosis.

20 % of patients will develop metachronous disease at follow up.

5 % PC is the sole pattern of recurrence.

# Solution of the problem

Median survival of 6 months in untreated cases

Modern chemotherapy and targeted agents the median overall survival has dramatically improved up to 24 months.

CRS and HIPEC improved median survival up to 40-60 months.

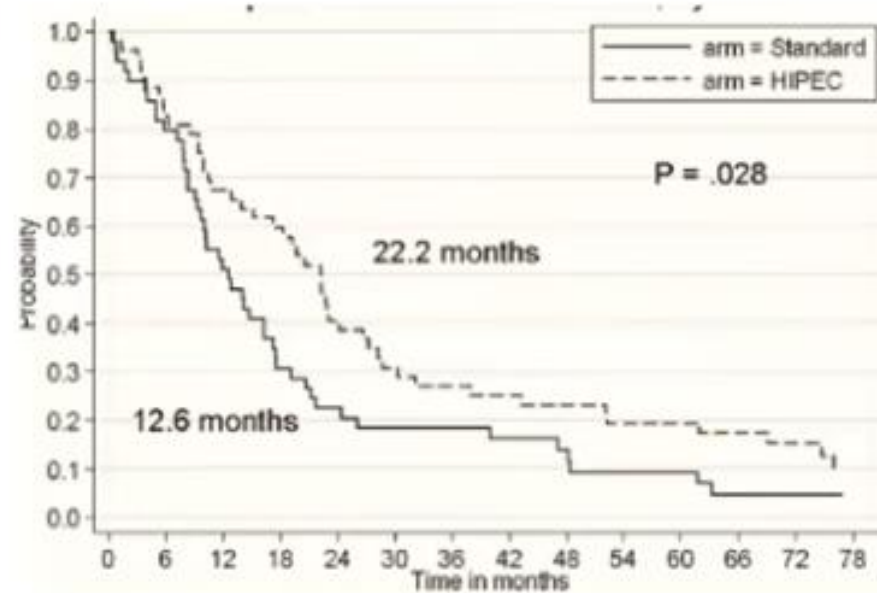
# Evolution of median survival PC of CRC

		Median survival
<b>Before 1990</b>	<b>Systemic chemotherapy</b>	<b>6 months</b> <i>16 months with modern chemotherapy</i>
<b>1990-2000</b>	<b>Verwal 2003 Glehan 2004</b>	<b>20 months</b>
<b>2000-2010</b>	<b>Elias 2010</b>	<b>30 months</b>
<b>2010-2020</b>	<b>Quenet ASCO 2018</b>	<b>40 months</b>



# (CRS & HIPEC) vs Systemic

A randomized study



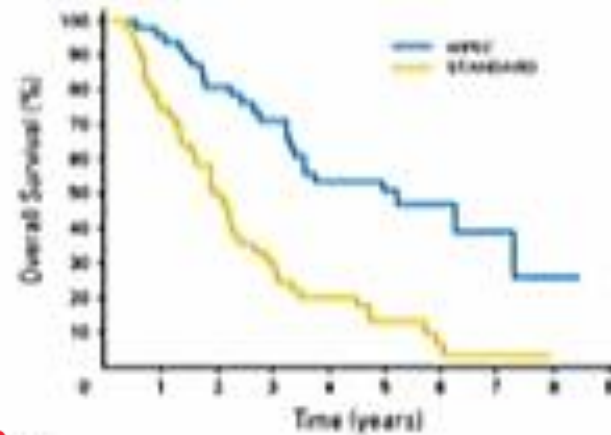
Surgery + HIPEC > Systemic chemotherapy

Verwall et al. J Clin Oncol 2003, Ann Surg 2008

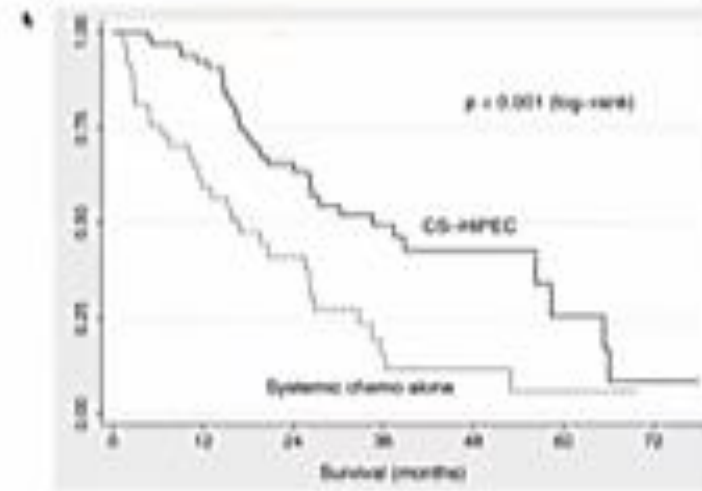


# (CRS & HIPEC) vs Systemic chemotherapy

- Elias et al. (*J Clin Oncol* 2008)
- Cytoreduction + HIPEC vs Modern systemic chemotherapy
- Limited PM
- Median survival of 62 vs 24 months



- Franco et al. (*Cancer* 2010)
- Cytoreduction + HIPEC vs Modern systemic chemotherapy
- More extended PM
- Median survival of 35 vs 17 months



# (CRS & HIPEC) vs Systemic chemotherapy

## Peritoneal Surface Disease Severity Score (PSDSS)

American Society of Peritoneal Surface Malignancies  
1 013 patients  
Median Survival (months)

PSDSS	Chemotherapy alone	Cytoreductive surgery and HIPEC
PSDSS 1	45	86
PSDSS 2	19	43
PSDSS 3	8	29
PSDSS 4	6	28

Ann Surg Oncol 2014

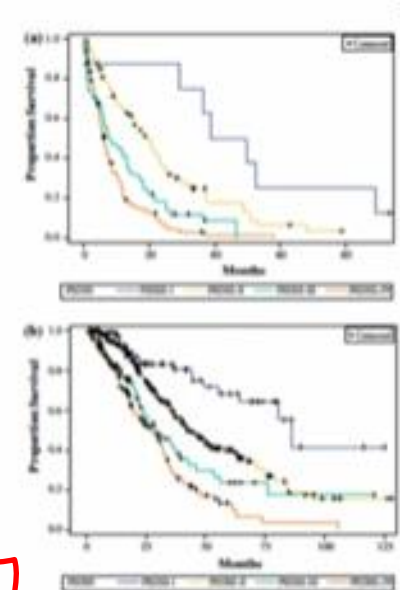
## American Society of Peritoneal Surface Malignancies

1 013 patients

Clinical	CTC PCI	Staging
No symptoms	PCI < 10 (Low)	CI CI N- L- V-
Mild symptoms	PCI 10-20 (Medium)	CI No and/or L- and/or V-
Severe symptoms	PCI > 20 (High)	CI Signet Ring

Score	Stage
3.3	Stage I
4.7	Stage II
6.0	Stage III
>10	Stage IV

Median survival > 60 months



Ann Surg Oncol 2014



# Cure 16%

Peritoneal metastasis from colorectal cancer

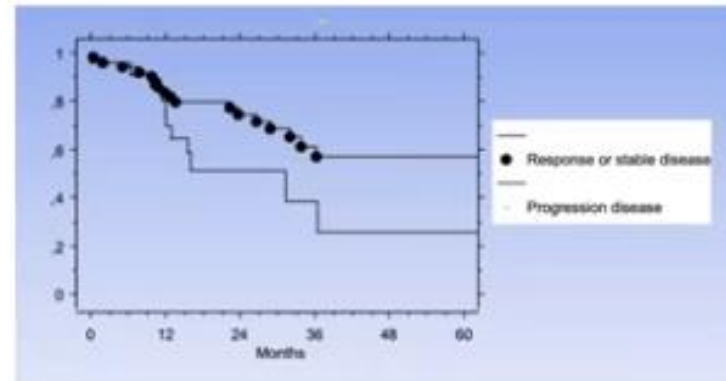
- **Survival at 5 years without recurrence : 16%**
  - We can cure PM from colorectal cancer

*Goere et al Ann Surg 2012*



- **Median survival > 60 months**
  - Strict selection of patients
  - Systemic chemotherapy

*Passot et al. Ann Surg 2012*



**Selection of patients with ( localized disease, well differentiated, no clinical symptoms) CRS and HIPEC do better**

# Is it CRS or HIPEC

## Unicancer Prodiges 7 trial design



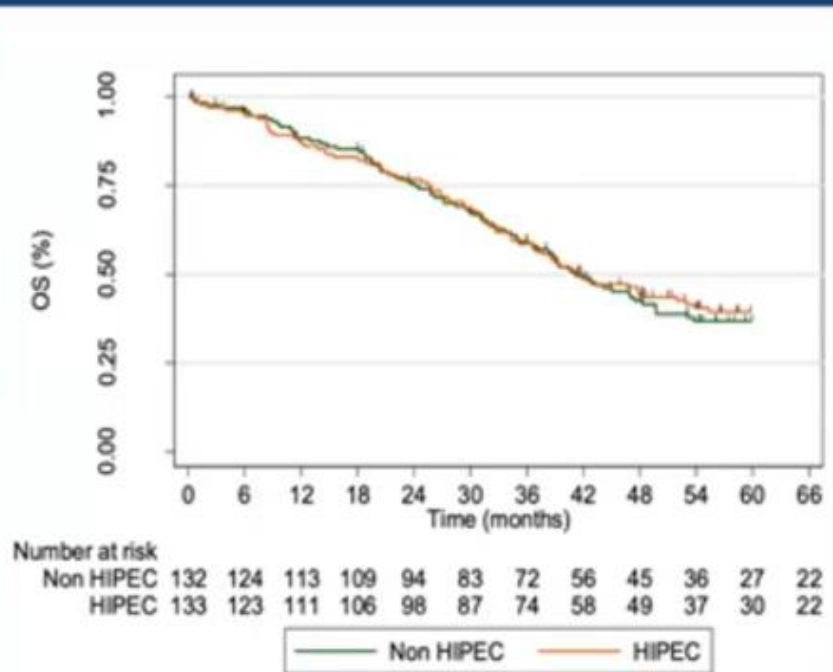
### Stratification :

- Centre
- Residual tumor status (R0/R1 vs R2  $\leq 1$  mm)
- Prior regimens of systemic chemotherapy
- Neoadjuvant Chemotherapy



# Positive Lessons from Negative trial

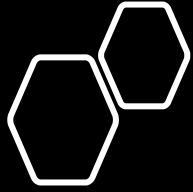
## Overall survival (ITT)



Median Follow Up: 64 months [95% CI:58.9-69.8]

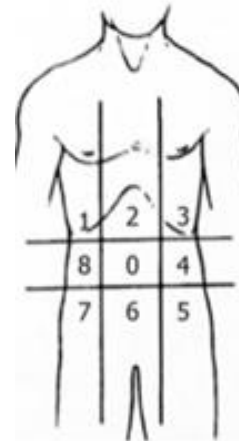
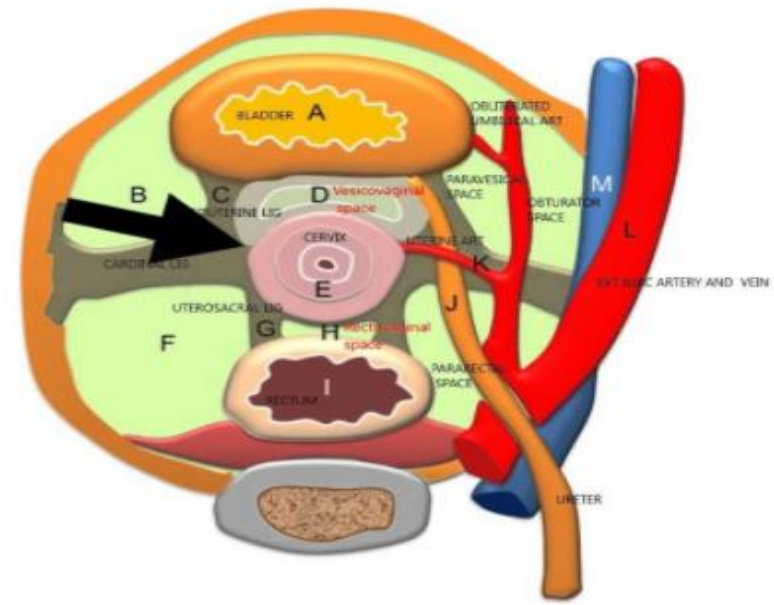
	HIPEC	Non-HIPEC	P-value
Median Survival (months) [95% CI]	41.7 [36.2-52.8]	41.2 [35.1-49.7]	0.995
1-year Survival	86.9%	88.3%	
5-year Survival	39.4%	36.7%	

HR=1.00: 95%CI [0.73 - 1.37] p=0.995



# Conclusion

- **Pelvic spaces** are gate ways to navigate safely during advanced oncologic procedures.
- Familiarity and surgical competence in dealing with **cytoreductive procedures** are prerequisite before dealing with advanced CRC.
- **Neoadjuvant treatment** or postoperative irradiation may improve outcome in selected cases.

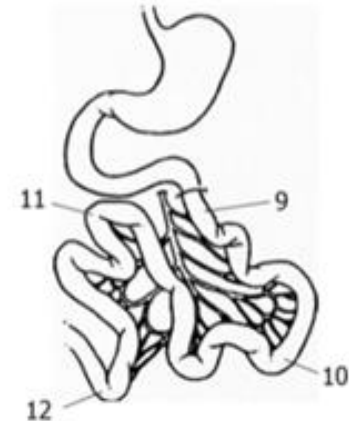


## Regions

- 0 Central
- 1 Right upper
- 2 Epigastrium
- 3 Left upper
- 4 Left flank
- 5 Left lower
- 6 Pelvis
- 7 Right lower
- 8 Right flank

## Lesion size score

- LS 0 No tumor seen
- LS 1 Tumor up to 0.5 cm
- LS 2 Tumor up to 5.0 cm
- LS 3 Tumor > 5.0 cm or confluence

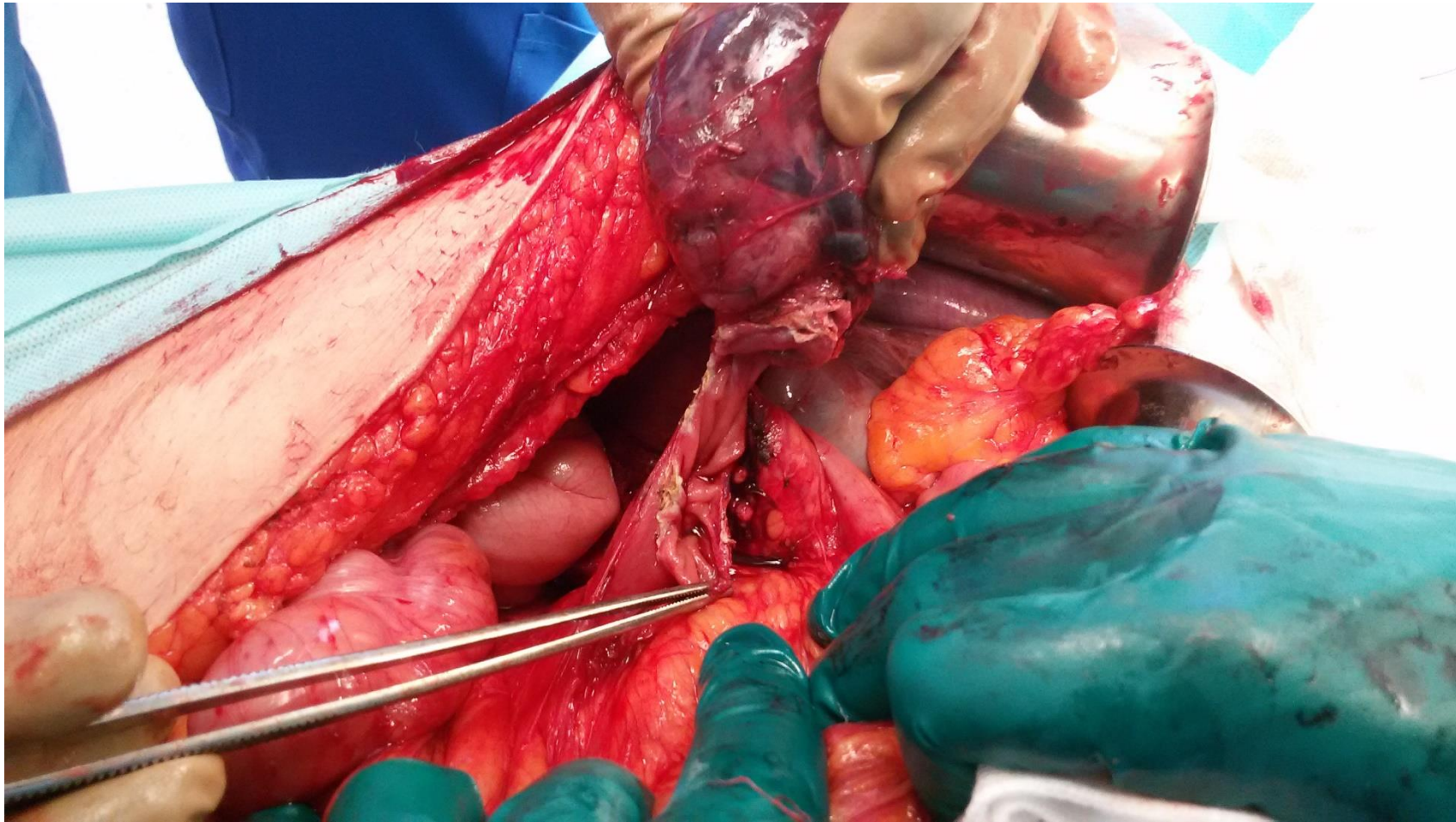


A photograph of an ancient Egyptian temple corridor. The walls are covered in hieroglyphs and papyrus motifs. A person in a white robe is walking away in the distance, illuminated by a bright light source at the end of the corridor. A small red horizontal bar is located in the top left corner of the image.

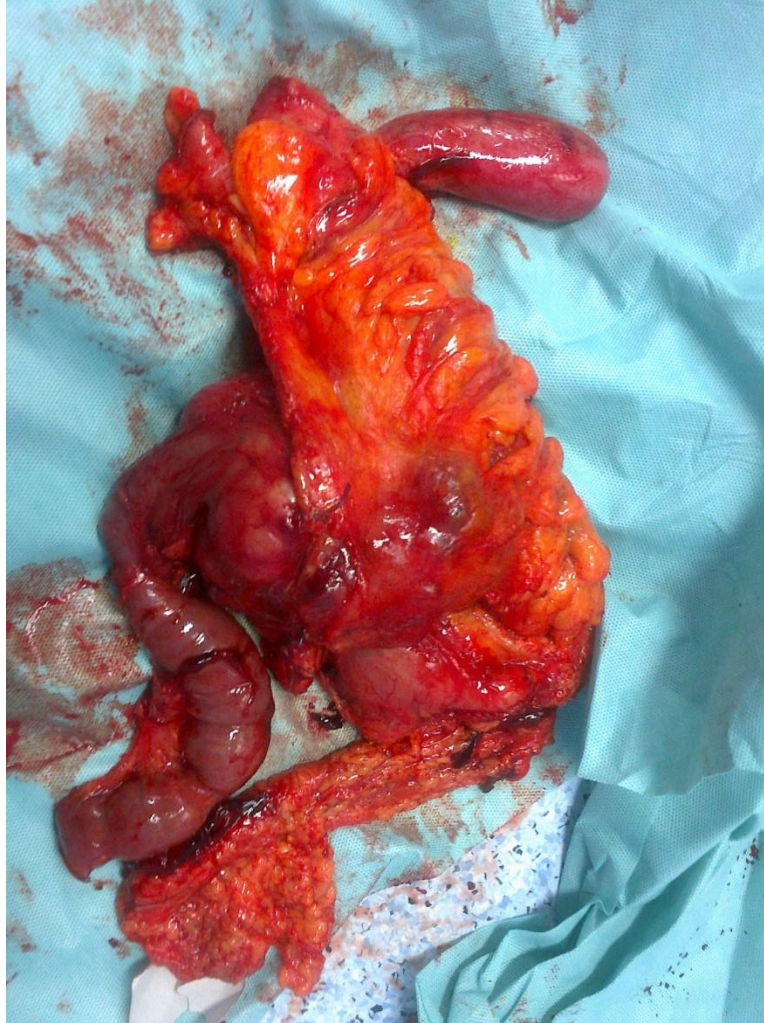
Thank you

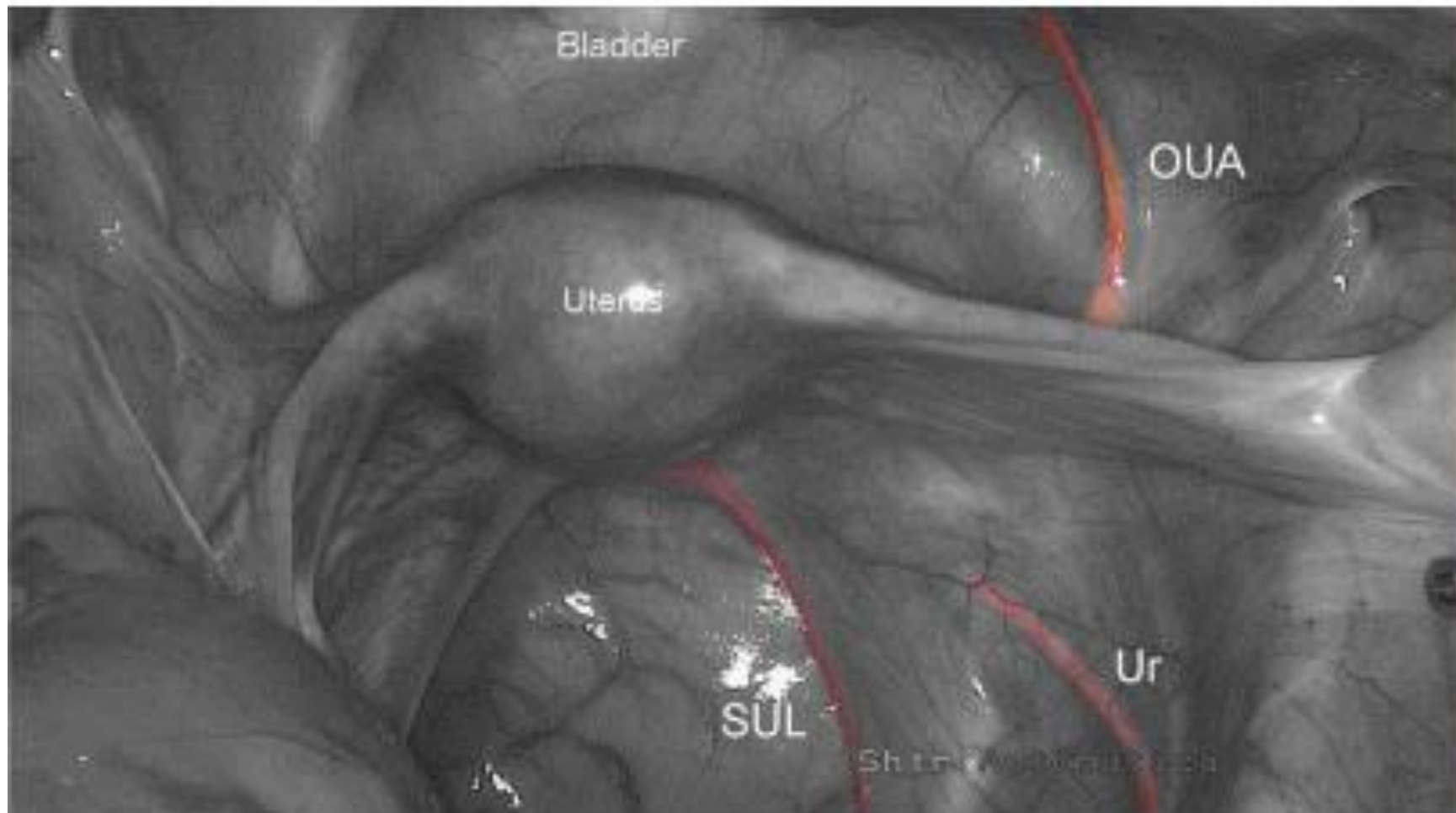
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# duodenum



# Pancreas





Bladder

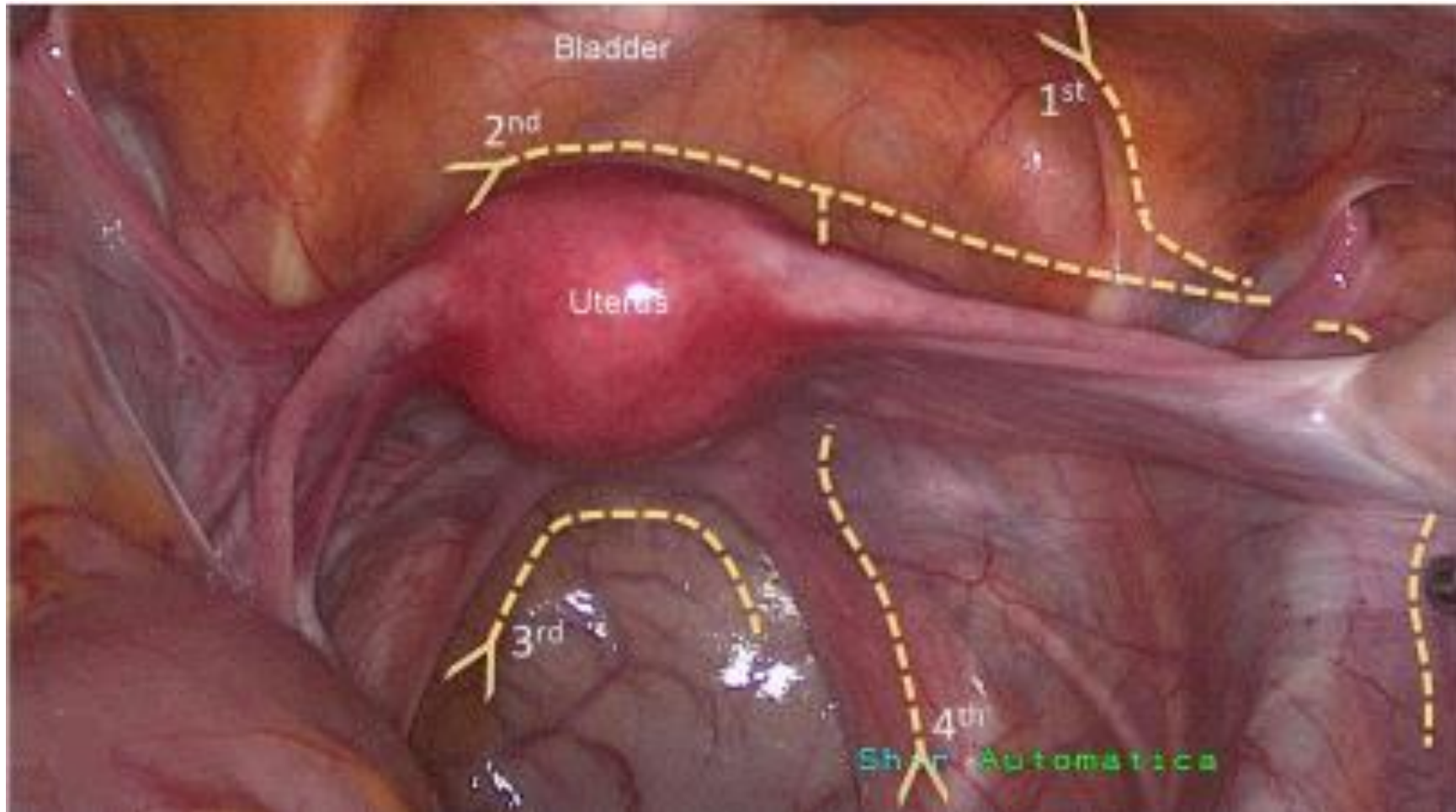
OUA

Uterus

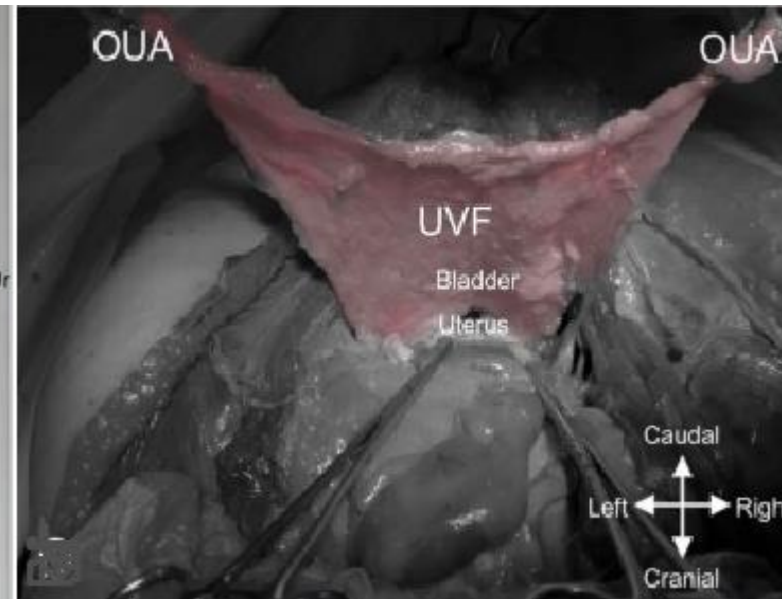
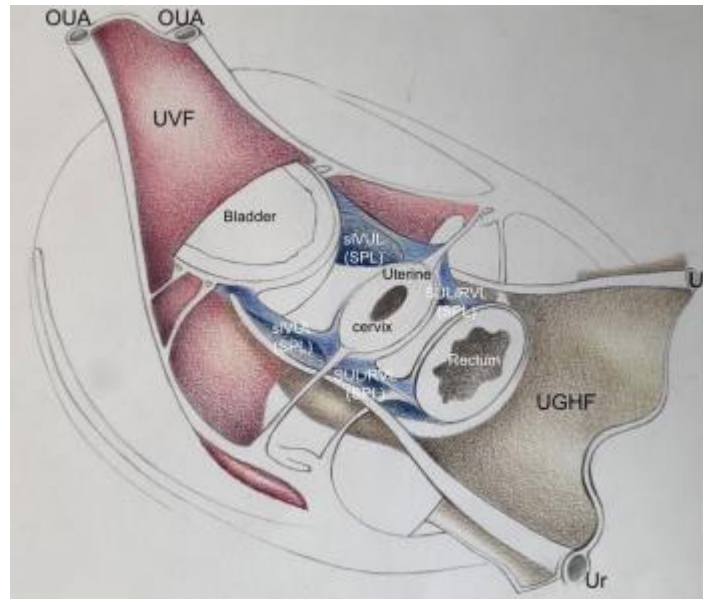
Ur

SUL

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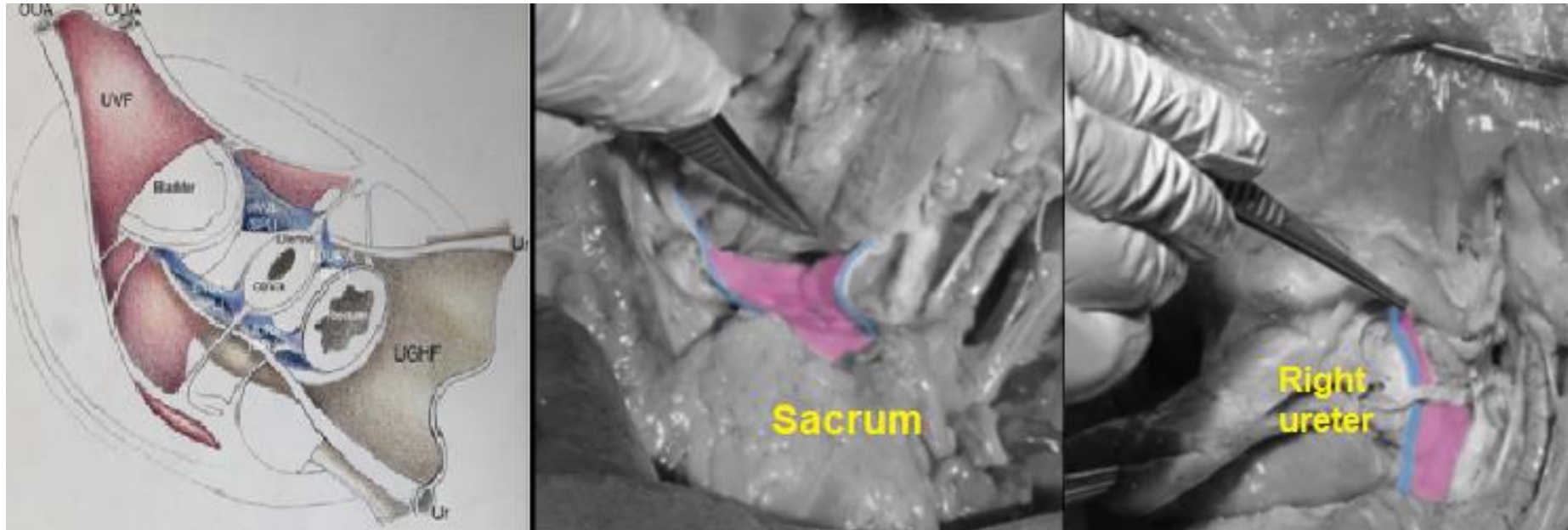


# Umbilicovesical fascia (UVF)

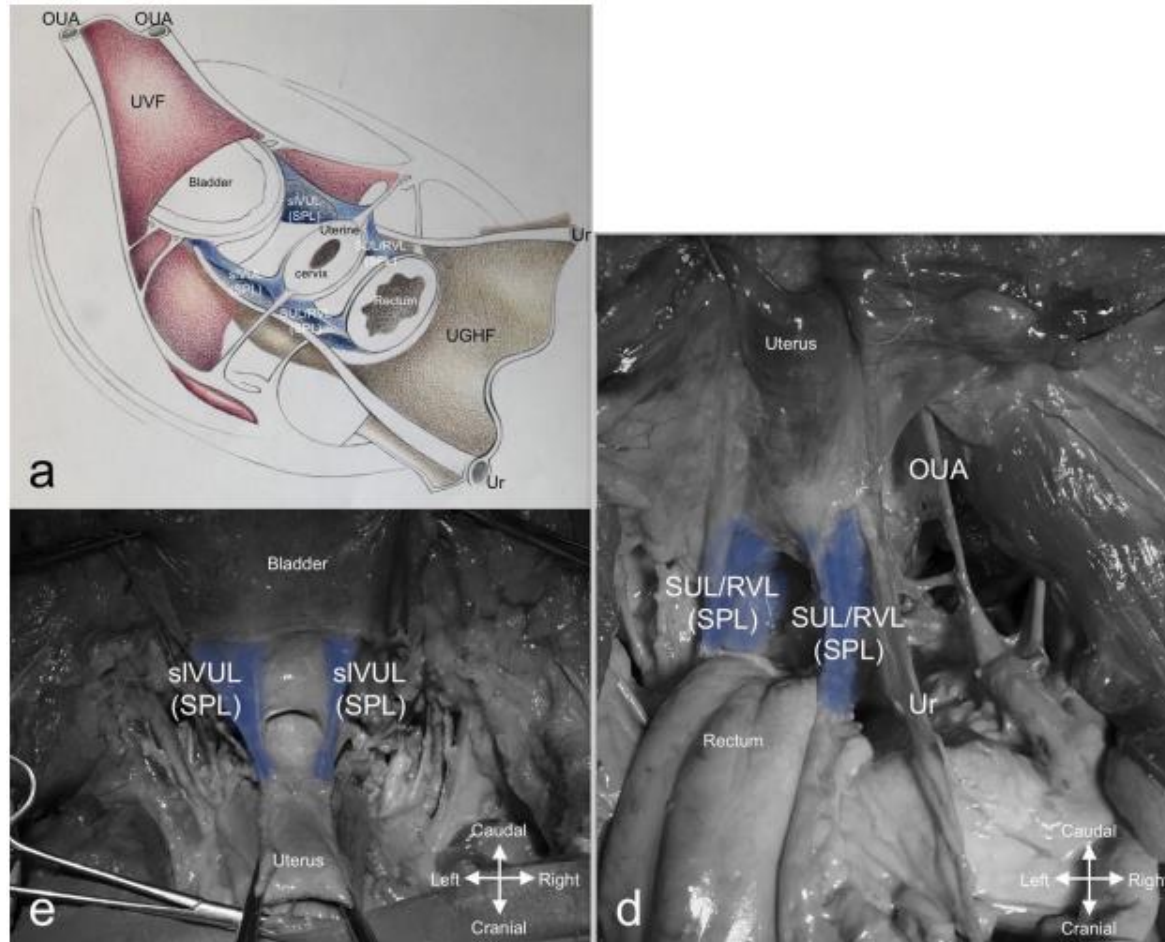




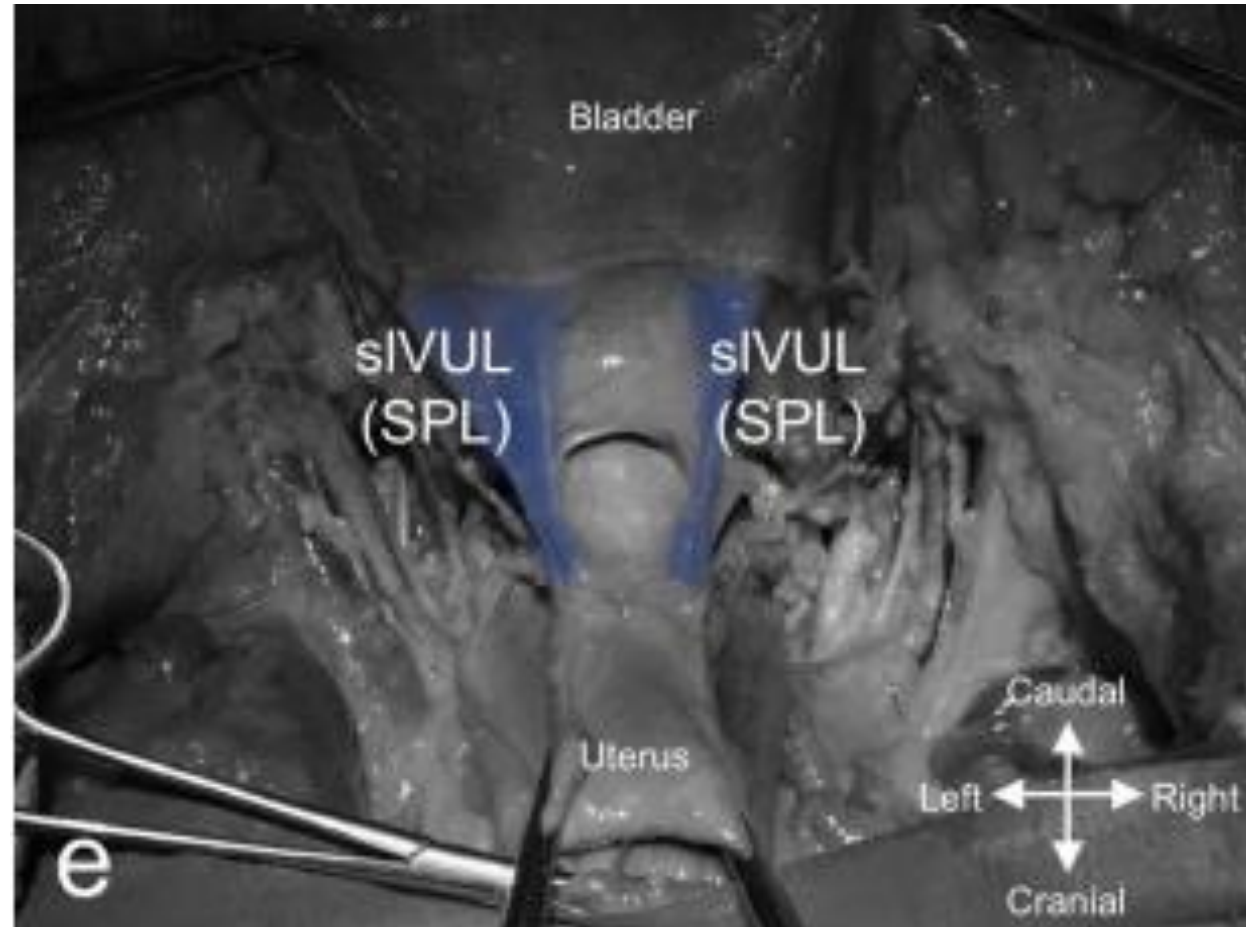
# Urogenital-hypogastric fascia ( UGHF)



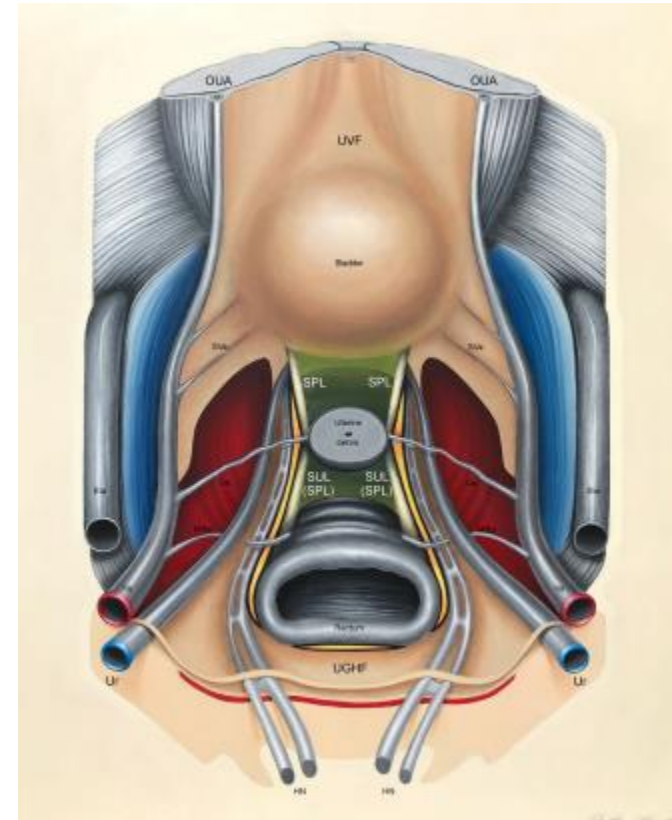
# Sacro-recto-genito-pubic ligament SPL

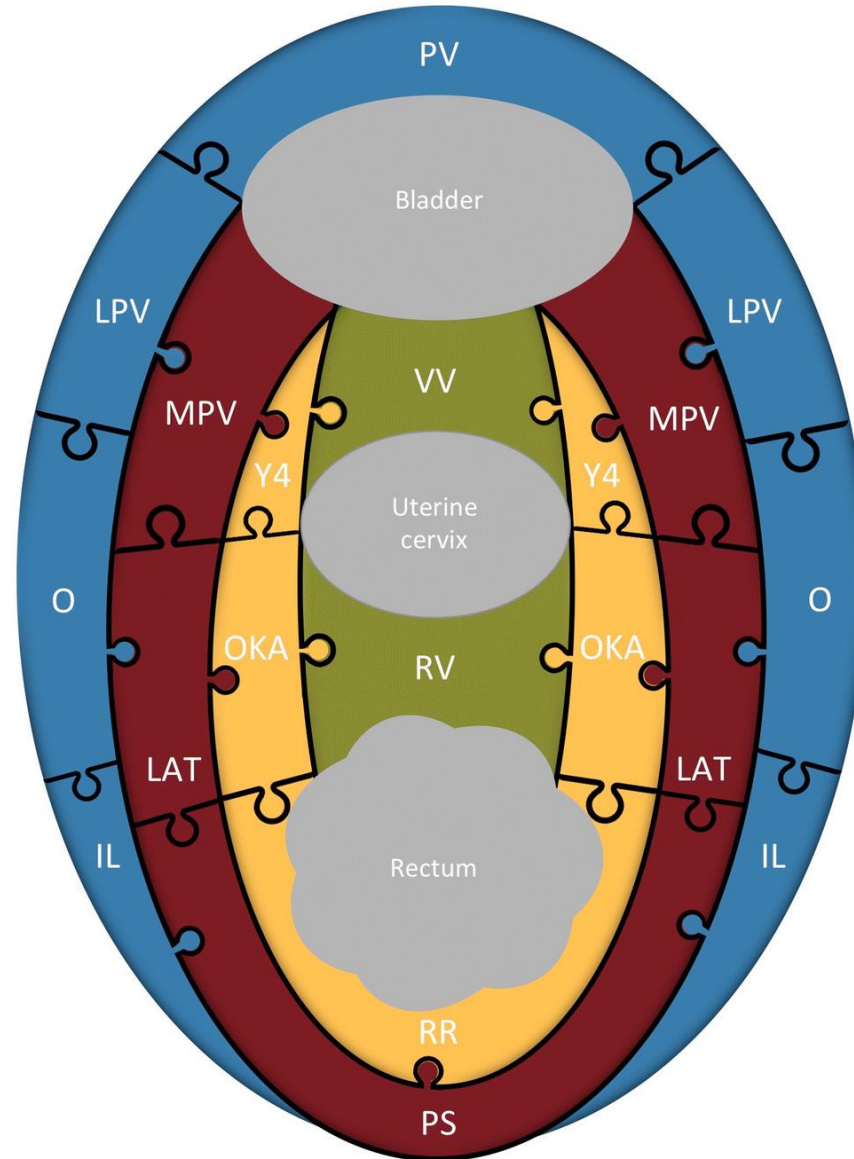


the superficial layer of the vesicouterine ligament (sIVUL) between the vagina and bladder



- Schematic illustration of the four pelvic retroperitoneal compartments. The parietal compartment is indicated in blue; the vascular compartment in red; the neural compartment in yellow; the visceral compartment in green. Ela external iliac artery, Ila internal iliac artery, MRa middle rectal artery, OUA obliterated umbilical artery, SPL sacropubic ligament, SUL sacrouterine ligament, SVa superior vesical artery, Ua Uterine artery, UGHF urogenital-hypogastric fascia, Ur ureter, UVF umbilicovesical fascia, VUL vesicouterine ligamen





# The visceral compartment

- The *visceral* compartment is so-called as it contains the pelvic organs (Fig. [5](#)). It is linear in shape and lies in the center of the pelvis between the two sacropubic ligaments (Fig. [6](#)).
- The visceral compartment includes the rectovaginal and vesicovaginal spaces from classical surgical anatomy

# The neural compartment

- The neural compartment, so-called because of the presence of the organ-specific afferent and efferent vegetative bundles, extends from the UGHF to the bladder and is crescent shaped with its concavity tilted towards the rectum (Fig. 6). It is bordered:

Dorsolaterally, by the UGHF extending along the mesoureter;

Medially, by the portion of the SPL stretched between the rectum and the bladder

Ventrally, by the bladder

- In a dorso-ventral direction, the neural compartment includes the following spaces from classical surgical anatomy:

Heald's retrorectal space (Heald 1988),

Okabayashi's pararectal space (Okabayashi 1921)

Yabuki's fourth space (Yabuki et al. 2000)



# The vascular compartment

- The *vascular* compartment, so-called because of the presence of the internal iliac vessels and their collaterals to the organs, extends from the sacrum to the UVF is crescent shaped like the parietal compartment but with a ventral concavity.
- It is bordered: anterolaterally, by the UVF and by its dorsal extension along the OUA up to the internal iliac artery; medially, by the UGHF and its ventral development along the mesoureter; and dorsally, by the sacrum.
- In a dorso-ventral direction, the vascular compartment includes the following spaces from classical surgical anatomy:
  - The presacral,
  - The Latzko's pararectal
  - Medial paravesical spaces (Fig. [6](#)).

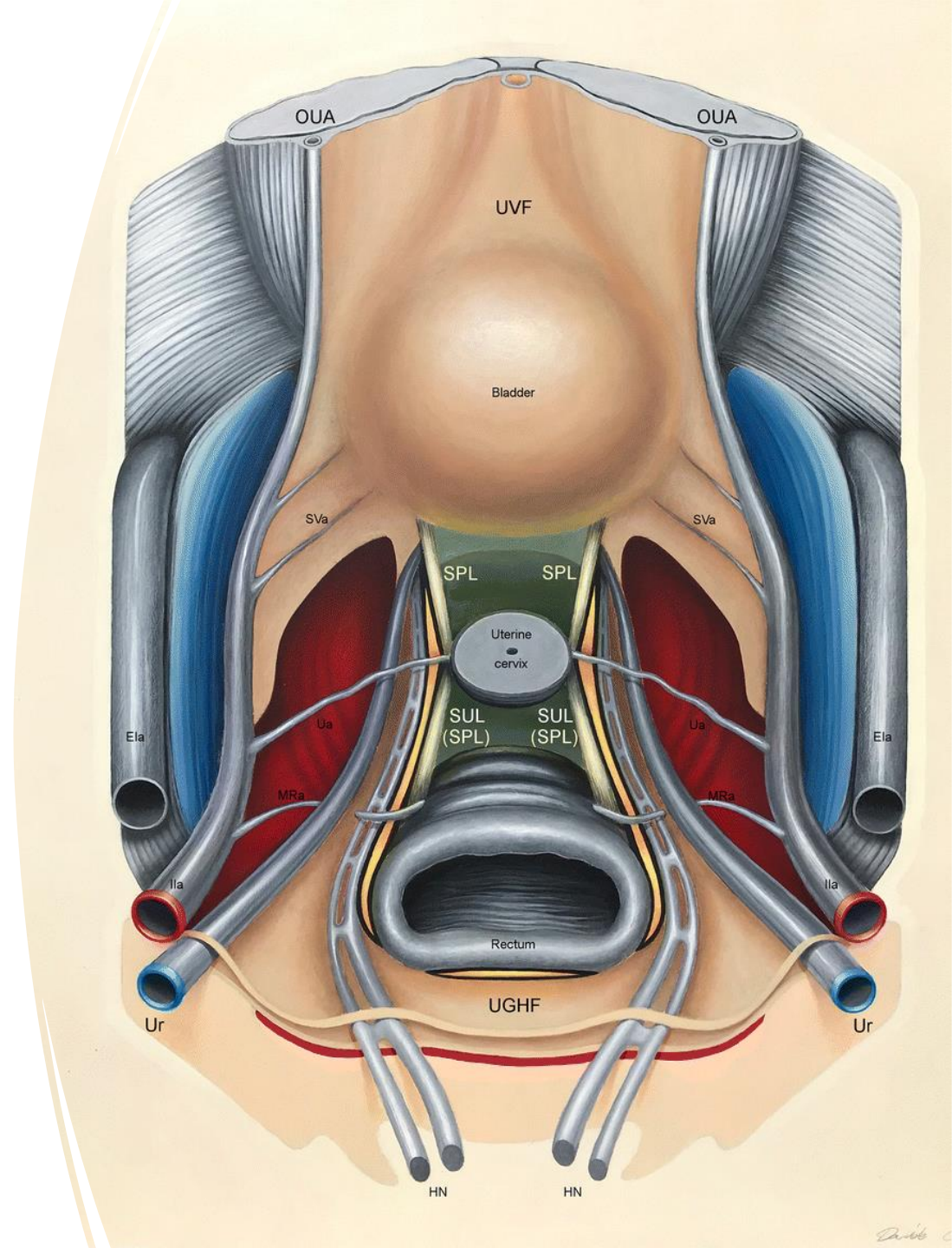


# The parietal compartment

- The parietal compartment is crescent shaped with a dorsal concavity and includes a single uninterrupted space, extending from the lateral portions of the sacral wings to the retropubic area.

- It is bordered:

laterally, in a dorso-ventral direction, by the piriformis and internal obturator muscles and the pubic insertion of the levator ani muscles; medially, by the internal iliac artery and the Umbilicovesical fascia UVF extending along the OUA; and dorsally, by the sacral wings





## Systematic review of outcomes following pelvic exenteration for the treatment of primary and recurrent locally advanced rectal cancer

E. Platt<sup>1</sup> · G. Dovell<sup>1</sup> · S. Smolarek<sup>1</sup>

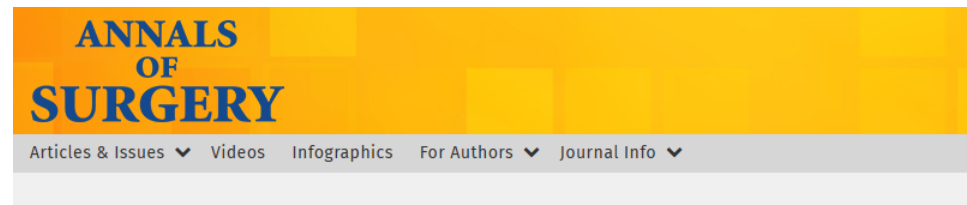
Review > Dis Colon Rectum. 2013 Apr;56(4):519-31. doi: 10.1097/DCR.0b013e31827a7868.

## Pelvic exenteration for rectal cancer: a systematic review

Timothy X Yang<sup>1</sup>, David L Morris, Terence C Chua

Affiliations + expand

PMID: 23478621 DOI: 10.1097/DCR.0b013e31827a7868



### ORIGINAL ARTICLES

## What Constitutes a Clear Margin in Patients With Locally Recurrent Rectal Cancer Undergoing Pelvic Exenteration?

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