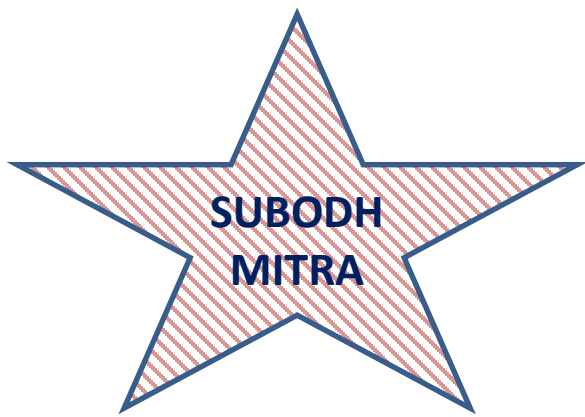


Types of Radical Hysterectomy: Q&M with Recent Updates

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HISTORY



- Clark & Reis – First Radical Hysterectomy in 1895
- Wertheim – RAH + BPLND In 1898
- Schauta – Radical vaginal hysterectomy in 1901
- Okabayashi – More radical than Wertheim's 1921
- Meigs – re-popularized the procedure in 1950's
- Kobayashi – Nerve sparing radical hysterectomy in 1961
 - Dursen P et al. The history of radical hysterectomy. J low Genit Tract Dis. 2011;15(3):235-45

Modern History

- Dargent (1987) – used laparoscopy for presurgical evaluation followed by Shauta's radical vaginal hysterectomy
- Querleu (1991) – introduced laparoscopic pelvic lymph node dissection for early cervical cancer
- Nezhat(1992)- first lap radical hysterectomy with pelvic and paraaortic lymphadenectomy
- GOG Lap 2 Trial (2009) : non –inferiority of lap vs open surgery for endometrial cancer
- LACC Trial 2018: MIS vs. Open surgery showed poorer disease free and overall survival in MIS group (91.2 % vs 97.1%, 93.8 vs 99%)

Types and Routes

'Class' of Radical hysterectomy

Piver, Rutledge & Smith (1975)

- Open

- Vaginal

'Types' of Radical Hysterectomy

Querleu & Morrow (2008, 2011, 2017)

- Laparoscopy

- Robotic

Classification of Radical hysterectomy according to Piver, Rutledge and Smith

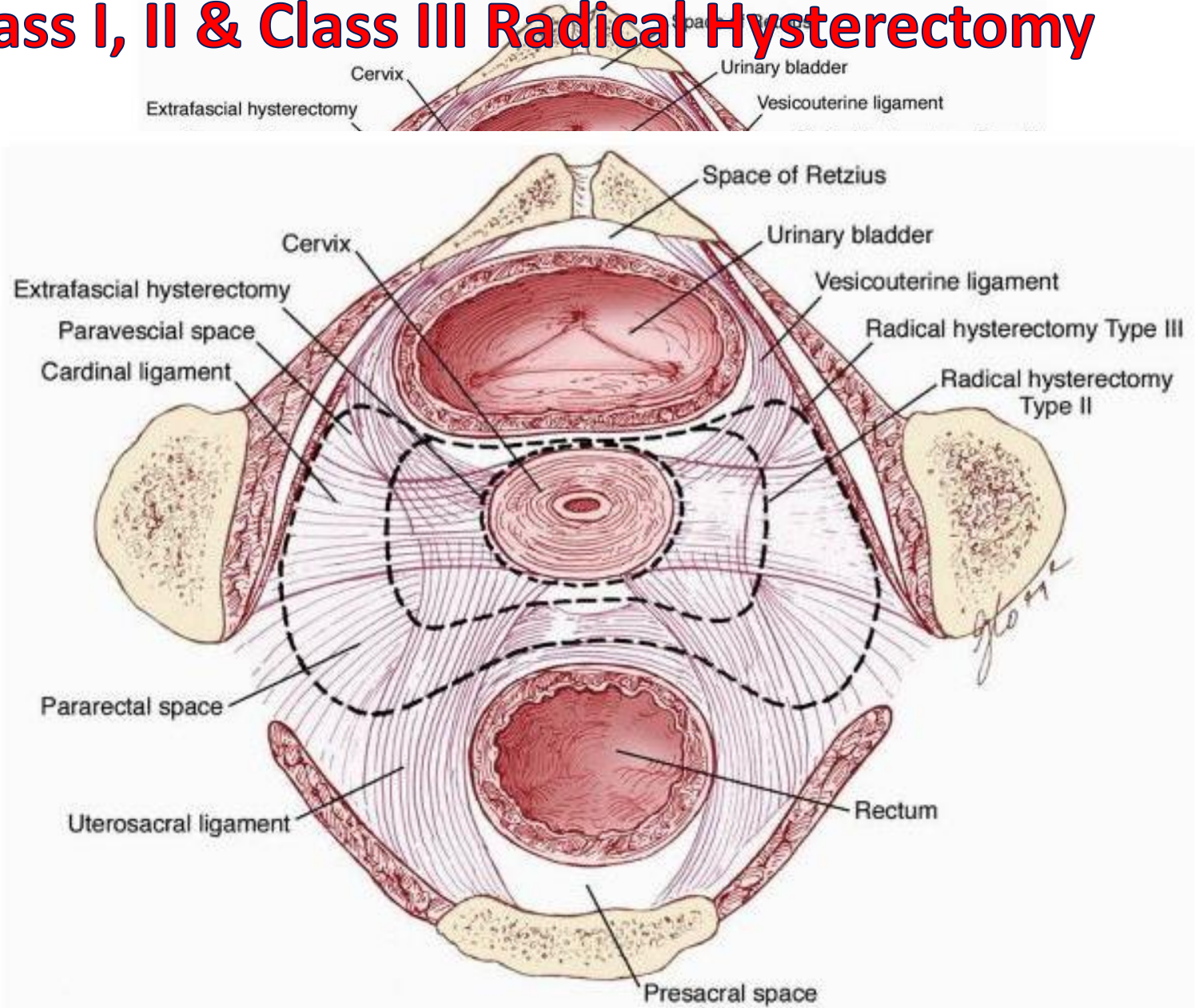
Class I : Extrafascial hysterectomy

- Deflection and retraction of the ureters without dissection of the ureteral bed
- Uterine artery, uterosacral ligament and cardinal ligament are incised close to uterus
- No vaginal cuff removed

Class II : Modified radical hysterectomy (Wertheim's)

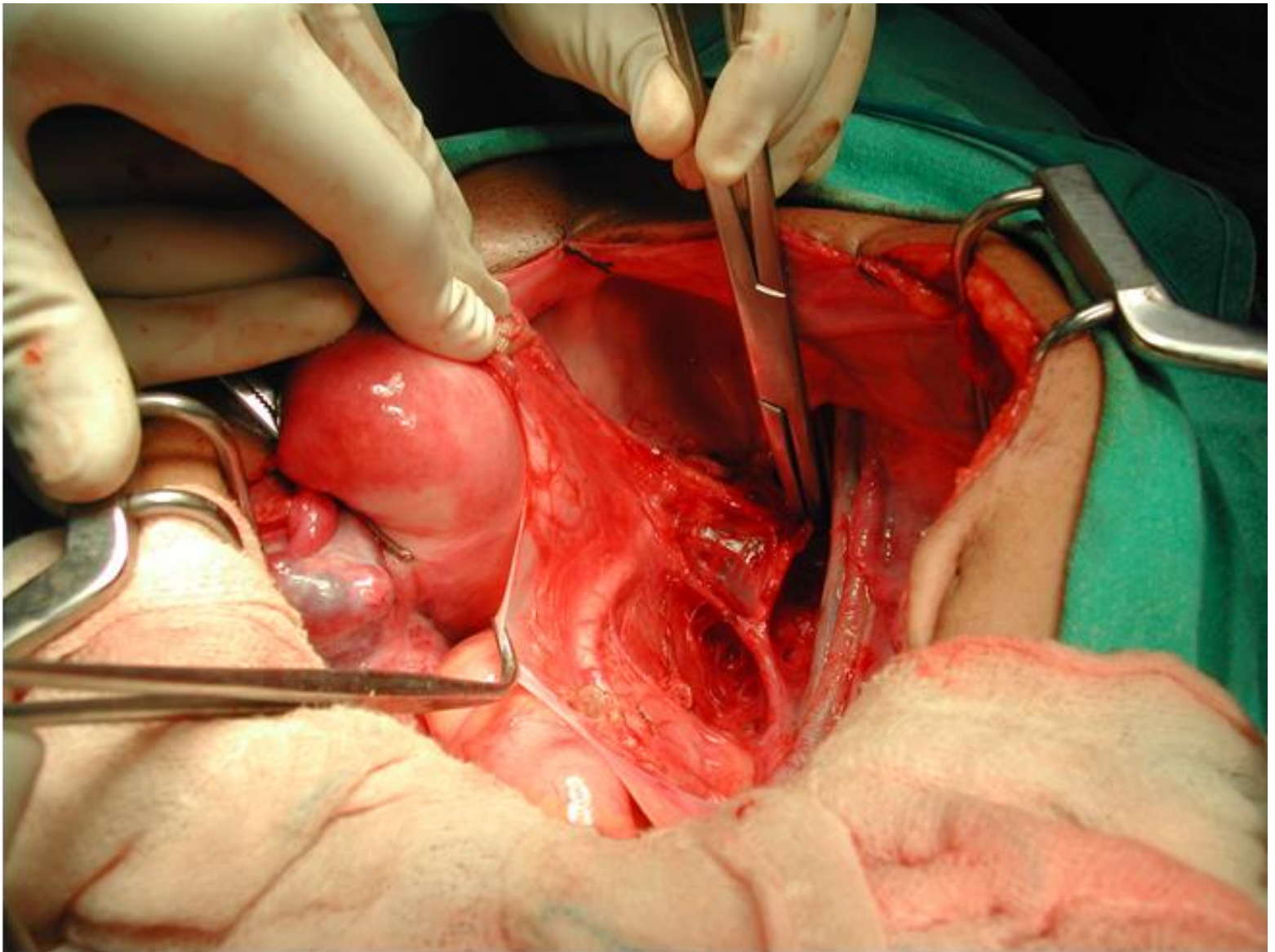
- Ureters are freed from the paracervical position but are not dissected out of the pubovesical ligament.
- Uterine arteries divided **just medial to the ureter.**
- Uterosacral ligaments resected **midway** between the uterus and their sacral attachments.
- **Medial half** of the cardinal ligaments removed.
- **Upper one-third of the vagina described but rarely necessary.**
- Routine pelvic lymphadenectomy.

Class I, II & Class III Radical Hysterectomy



Class III : Classical Meigs' radical hysterectomy

- **Complete dissection of the ureter** from the pubovesicle ligament to entry in the bladder except a small lateral part so that the **superior vesicle artery is conserved.**
- Uterine vessels divided **at origin from the internal iliac artery.**
- Uterosacral ligaments resected at their **sacral attachments.**
- Cardinal ligaments resected at **the pelvic wall.**
- **Upper half of the vagina described but rarely necessary.**
- Routine pelvic lymphadenectomy.



Rajaram S, Chitrathara K, Maheshwari A. 'Cervical Cancer: Contemporary Management'. 2012, Surgical Anatomy, BK Goel

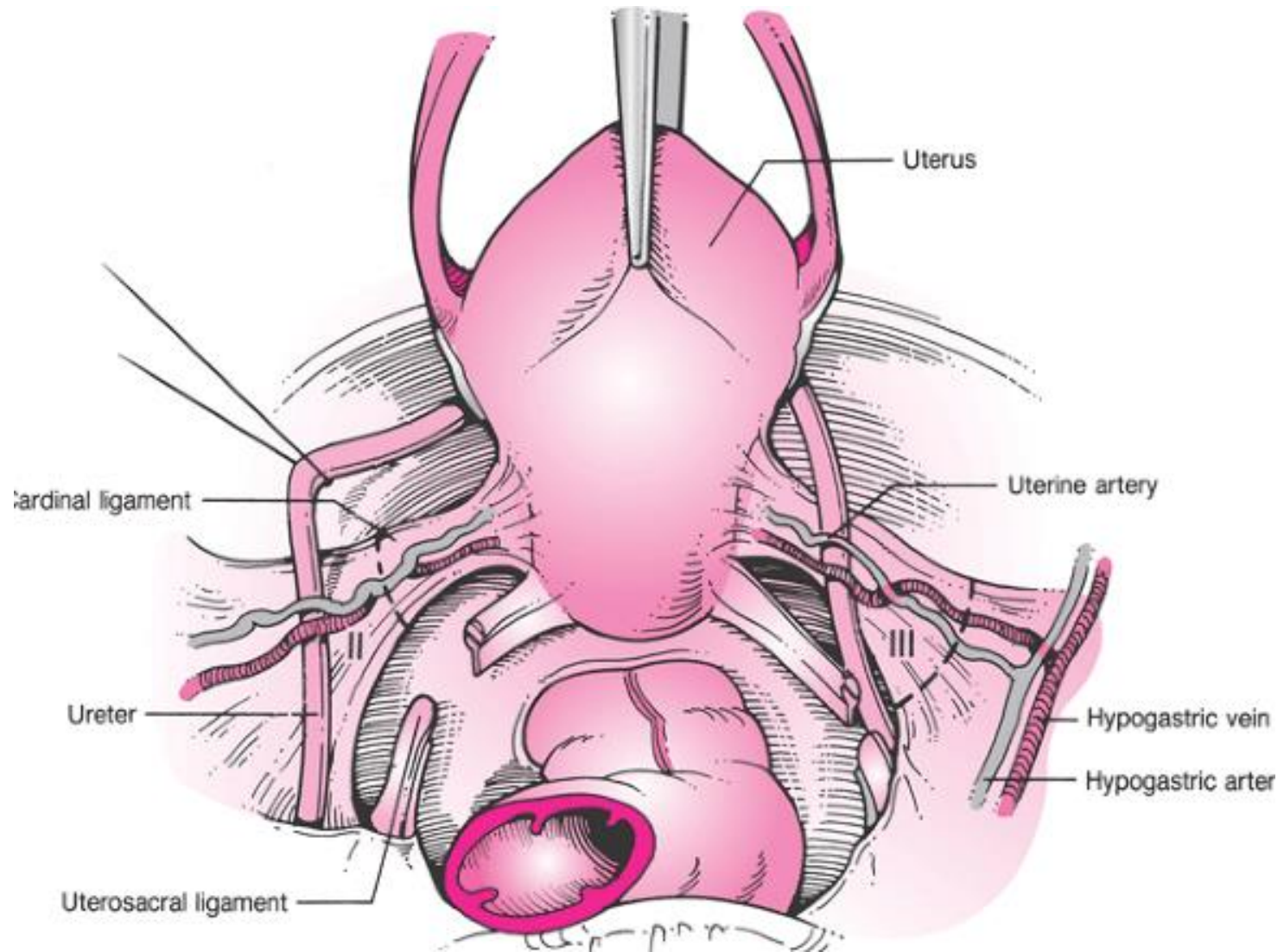
Class IV : Extended Radical Hysterectomy

- **Complete dissection of the ureter** from the pubovesical ligament.
- **The superior vesicle artery is sacrificed.**
- **Upper three-quarters of the vagina removed.**

Class V : Partial Exenteration

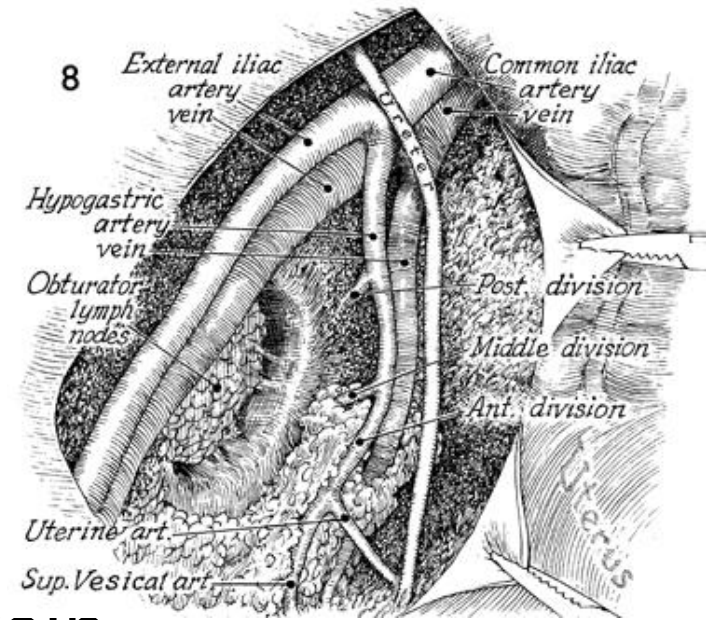
- Excision of involved portion of distal ureter or bladder and reimplantation of ureter into the bladder.

ANATOMY



PELVIC LYMPH NODE DISSECTION

- Lateral: genitofemoral nerve
- Medial: internal iliac artery
- Inferior: deep circumflex iliac vein
- Superior: bifurcation of common iliac artery

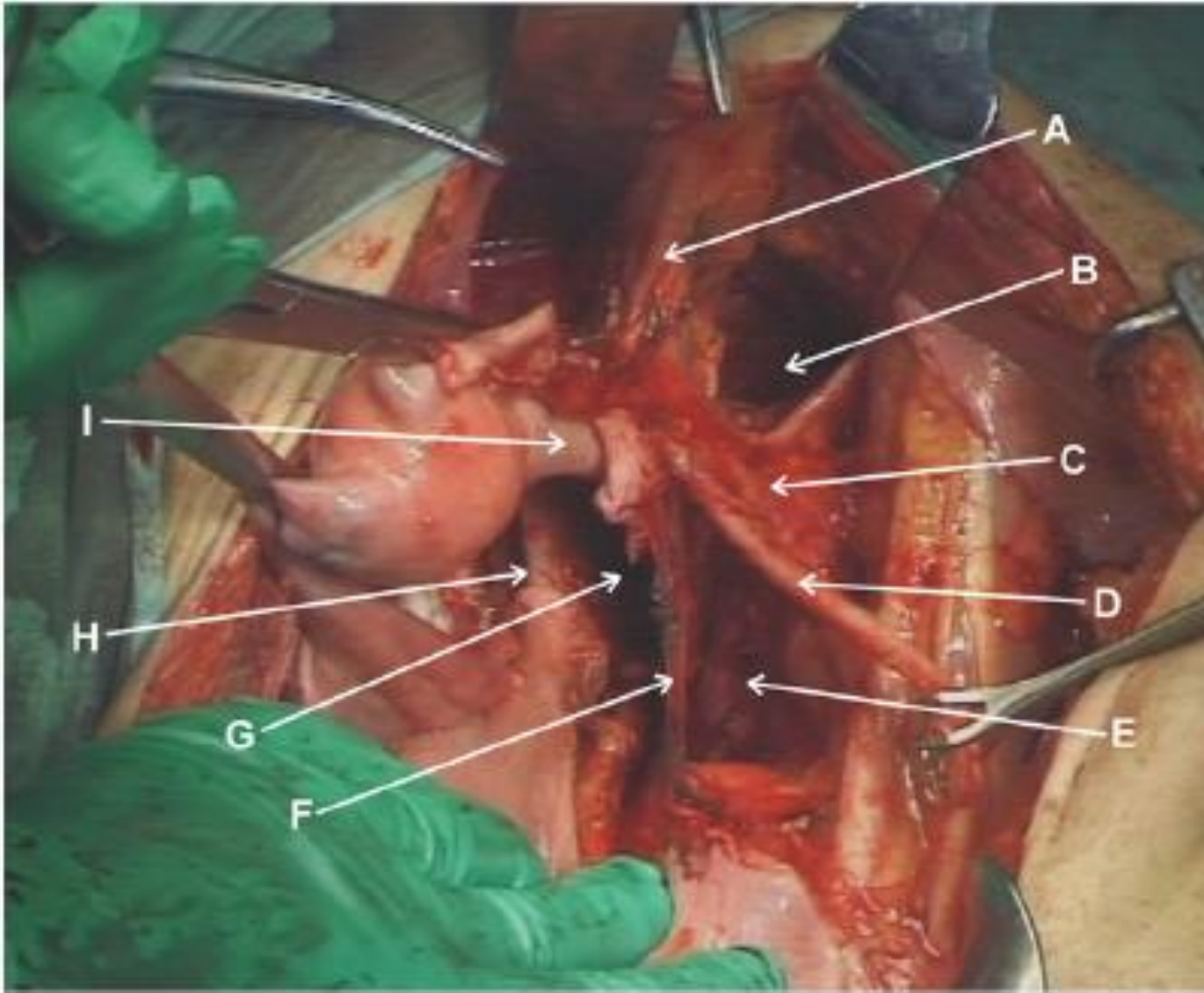


Querleu & Morrow's Classification(2008) & Update (2011, 2017)

- ✓ 'Class' replaced by 'Type', numbers by letters
- ✓ Extent of parametrial resection is key parameter between types of hysterectomy
- ✓ Previous terminology changed
- ✓ Anatomical landmarks to classify parametrial extent
- ✓ Includes nerve-sparing hysterectomy
- ✓ Lymph nodes are dealt with separately

Terminology & Landmarks

- Parametrium re-introduced, in original Q&M was called 'paracervix'
- **Ventral** parametrium (vesico-uterine and vesico-vaginal ligaments), **lateral** parametrium (paracervix) and **dorsal** parametrium (recto-uterine and recto-vaginal ligaments)
- Ventral parametrium divided into 2 parts by **ureter** – cranial (above ureter) and caudal below ureter
- Two spaces described dorsally: sacro- uterine space (medial para-rectal space) between rectum and dorsal parametrium and pararectal fossa (pararectal space) between dorsal parametrium and iliac vessels
- **Deep uterine vein** (vaginal vein) important landmark in lateral parametrium: 1-2 cm from below uterine artery and vein



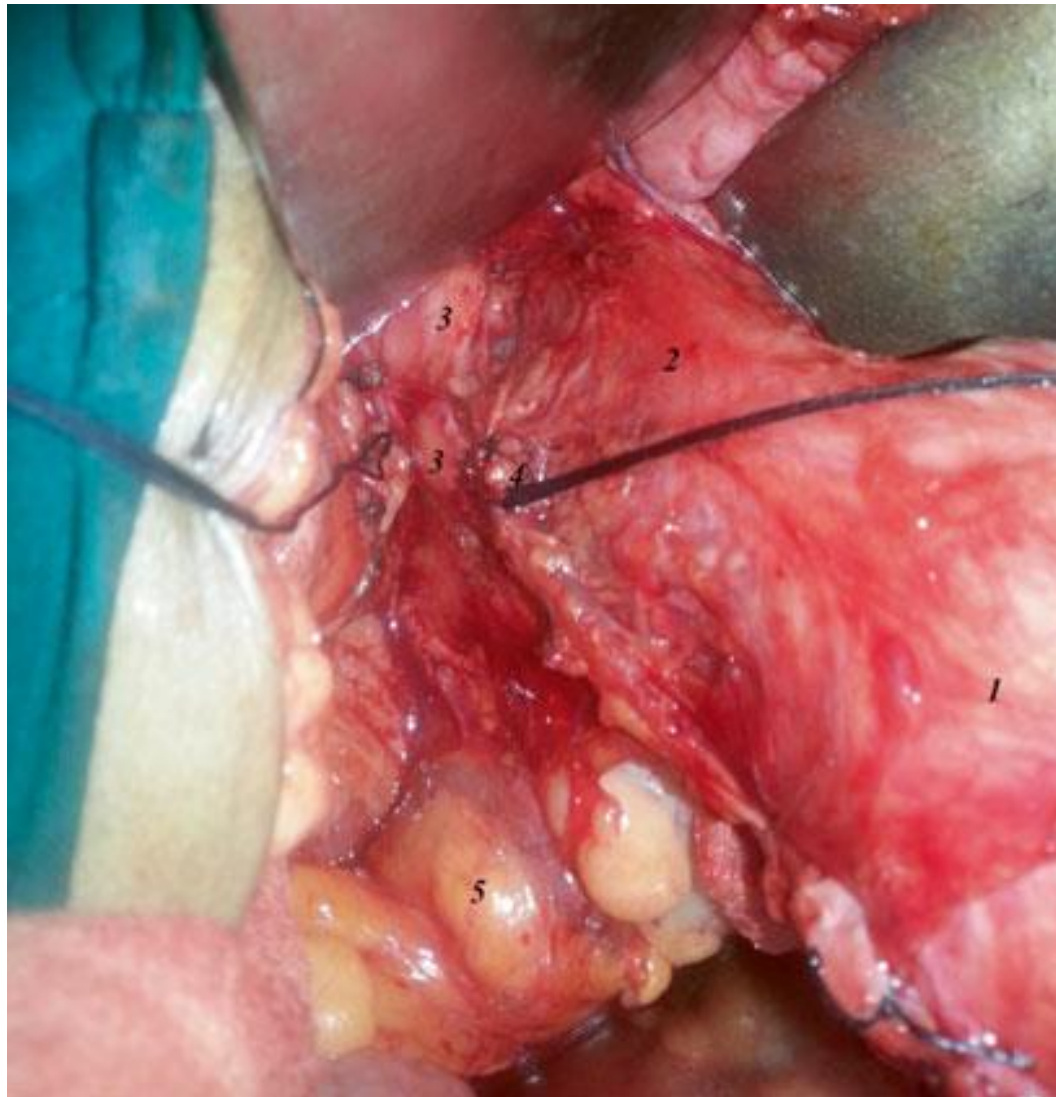
With permission from Prof D Cibula. Fig 1. New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection *Gynecologic Oncology* 122 (2011) 264–268

Classification of radical hysterectomy according to Querleu and Morrow

Type A : Minimum resection of paracervix, Limited radical hysterectomy

- Visualization after opening ureteric tunnel (abdominal or lap surgery) or palpation of the ureters without dissection of the ureteral bed (radical vaginal hysterectomy)
- Paracervix transected medial to ureter but lateral to cervix
- Uterine artery, uterosacral ligament and cardinal ligament are not transected at a distance from the uterus.
- Minimal vaginal cuff removed (<10 mm).

1. Microinvasive cancer Stage IA2 and Stage IB1 < 2cm with negative nodes, no lymphovascular space invasion
2. completion surgery after chemo/radiotherapy



1. Body of uterus
2. Cervix
3. Ureter
4. Ligated and cut uterine artery
5. Sigmoid Colon

Rajaram S, Chitrathara K, Maheshwari A Eds Uterine Cancer: Diagnosis and Treatment, Springer, 2015. In Surgery for Endometrial Cancer, Chitrathara K, TJ Simi Raj

Transverse / Coronal section of pelvis

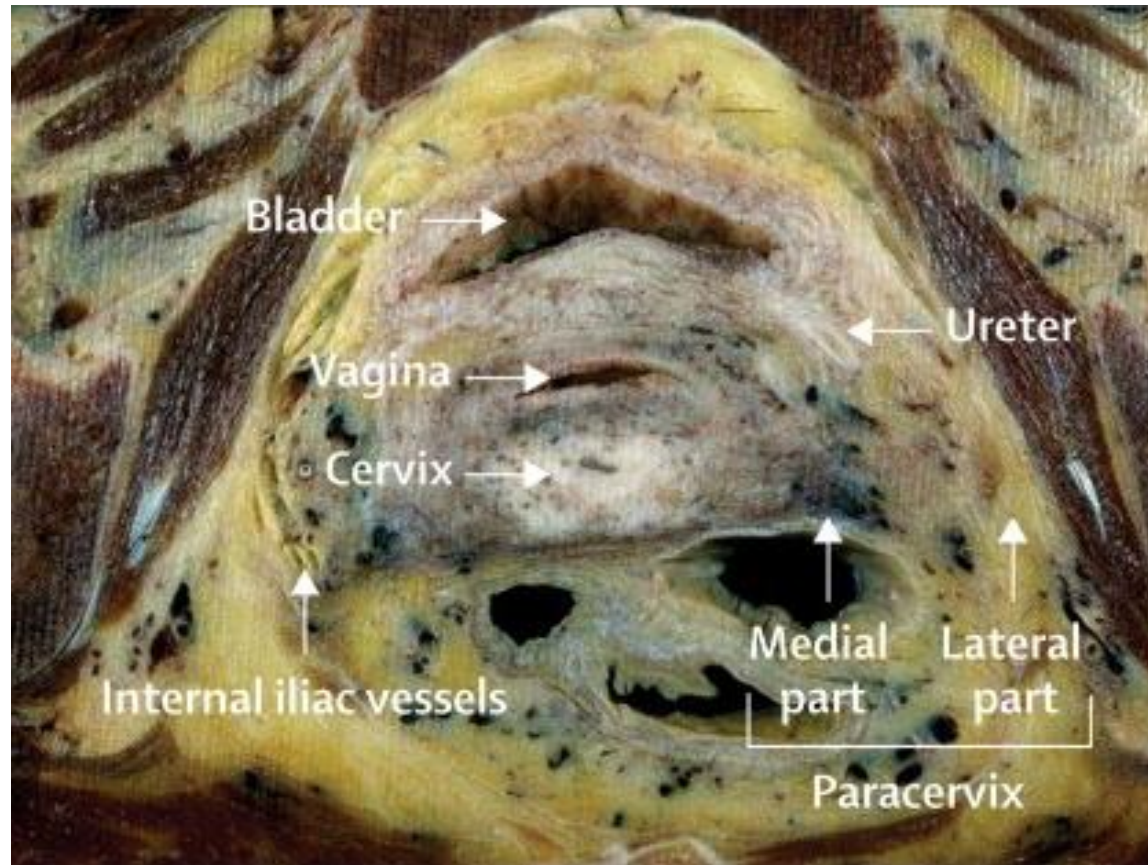
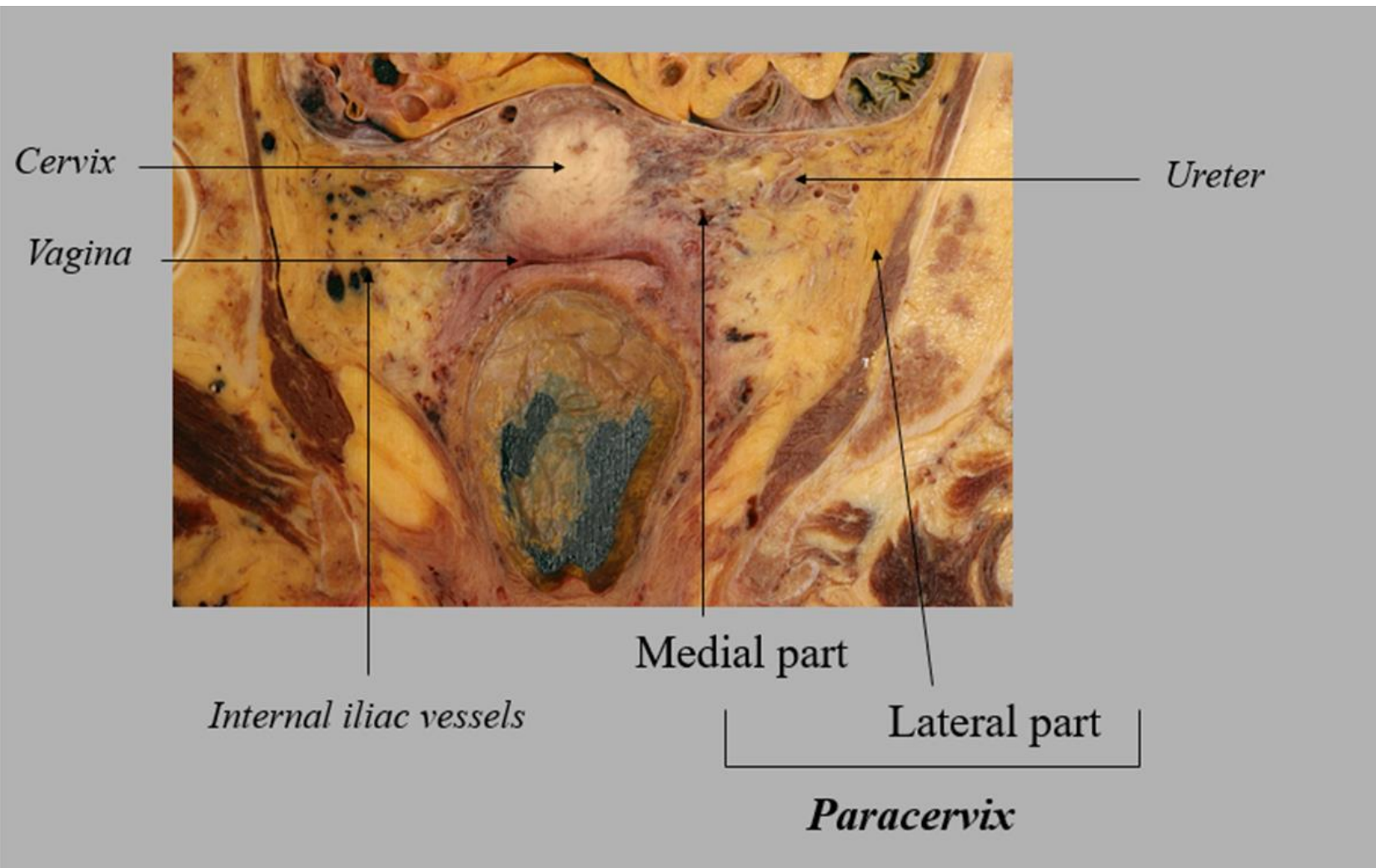


Figure with permission from Prof D Querleu
Paracervix= parametrium, Ureter landmark for extent of
medial and lateral parametrium



Coronal Section of pelvis. Figure - With permission from Prof. D Querleu

Type A Radical Hysterectomy



Extent of Type A Radical hysterectomy. Figure - With permission from Prof. D Querleu

Type B Hysterectomy: Resection of paracervix at the ureter

- Ureters are unroofed and rolled laterally.
- **Partial resection** of uterosacral peritoneal fold of rectouterine ligament and vesicouterine ligaments.
- Vesicovaginal ligament not transected
- Transection of the paracervix **at the level of the ureteric tunnel.**
- At least **10 mm of the vagina** from the cervix or tumor is resected.

Type B1: Without removal of lateral paracervical lymph nodes.

Type B2: With additional removal of lateral paracervical lymph nodes.

Type B Radical Hysterectomy



Extent of Type B Radical hysterectomy. Figure - With permission from Prof. D Querleu

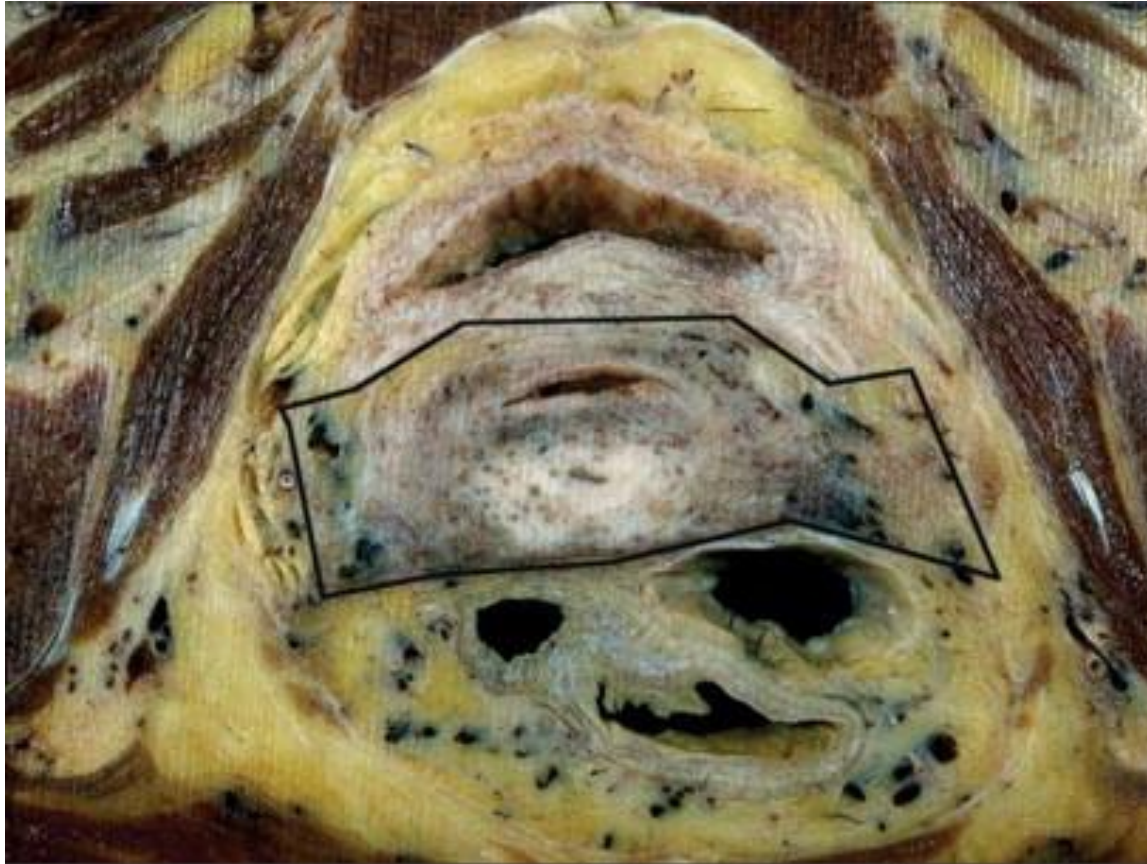
Type C Hysterectomy

- Ureters are completely mobilized.
- Transection of the uterosacral ligament **at the rectum.**
- Transection of the vesicouterine ligament at the bladder.
- **Complete transection** of the paracervix.
- 15–20 mm of the vagina from the cervix or tumor and the corresponding paracolpos is resected routinely.

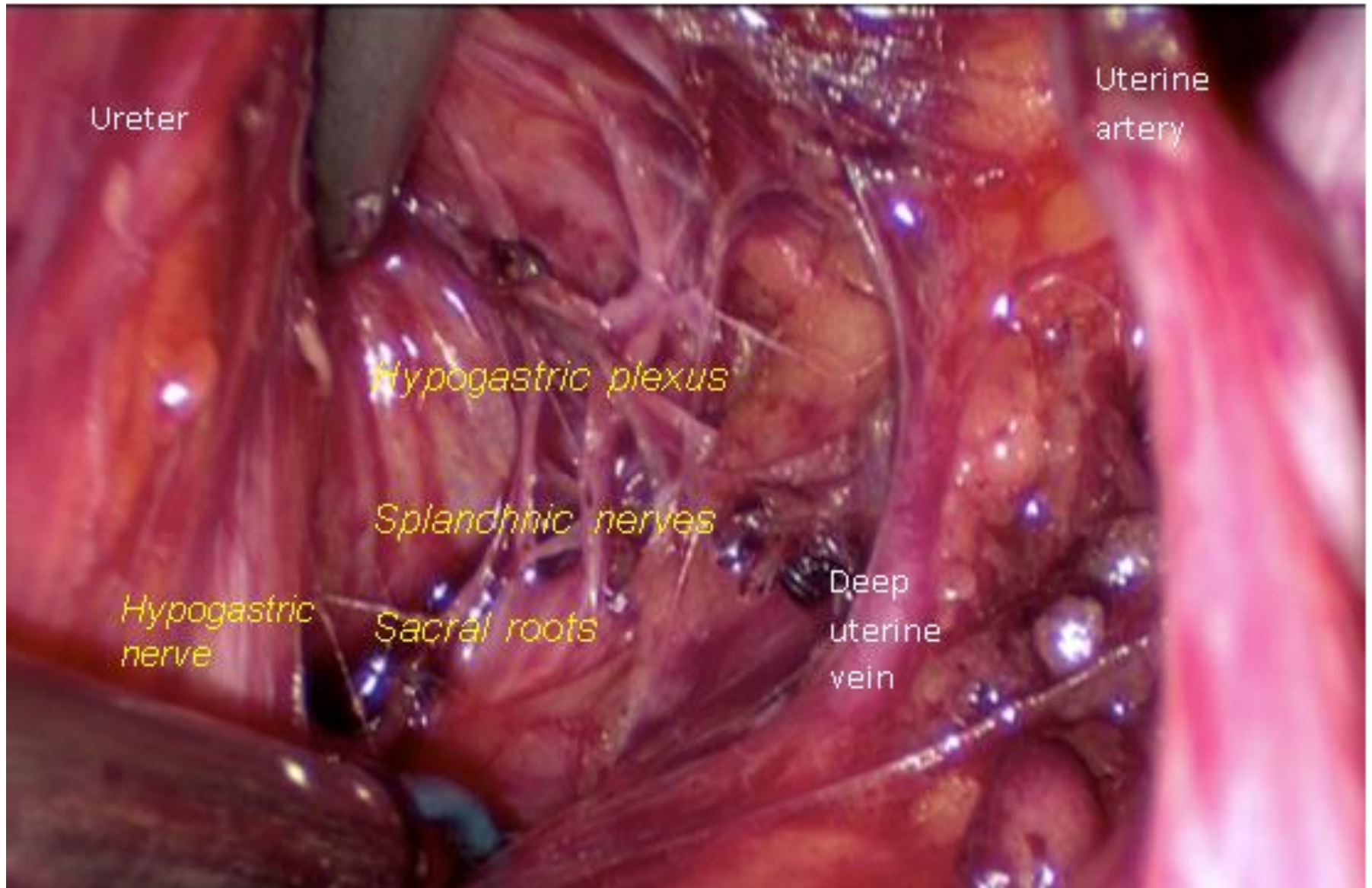
Type C1: **With** preservation of autonomic nerves

Type C2: **Without** preservation of autonomic nerves

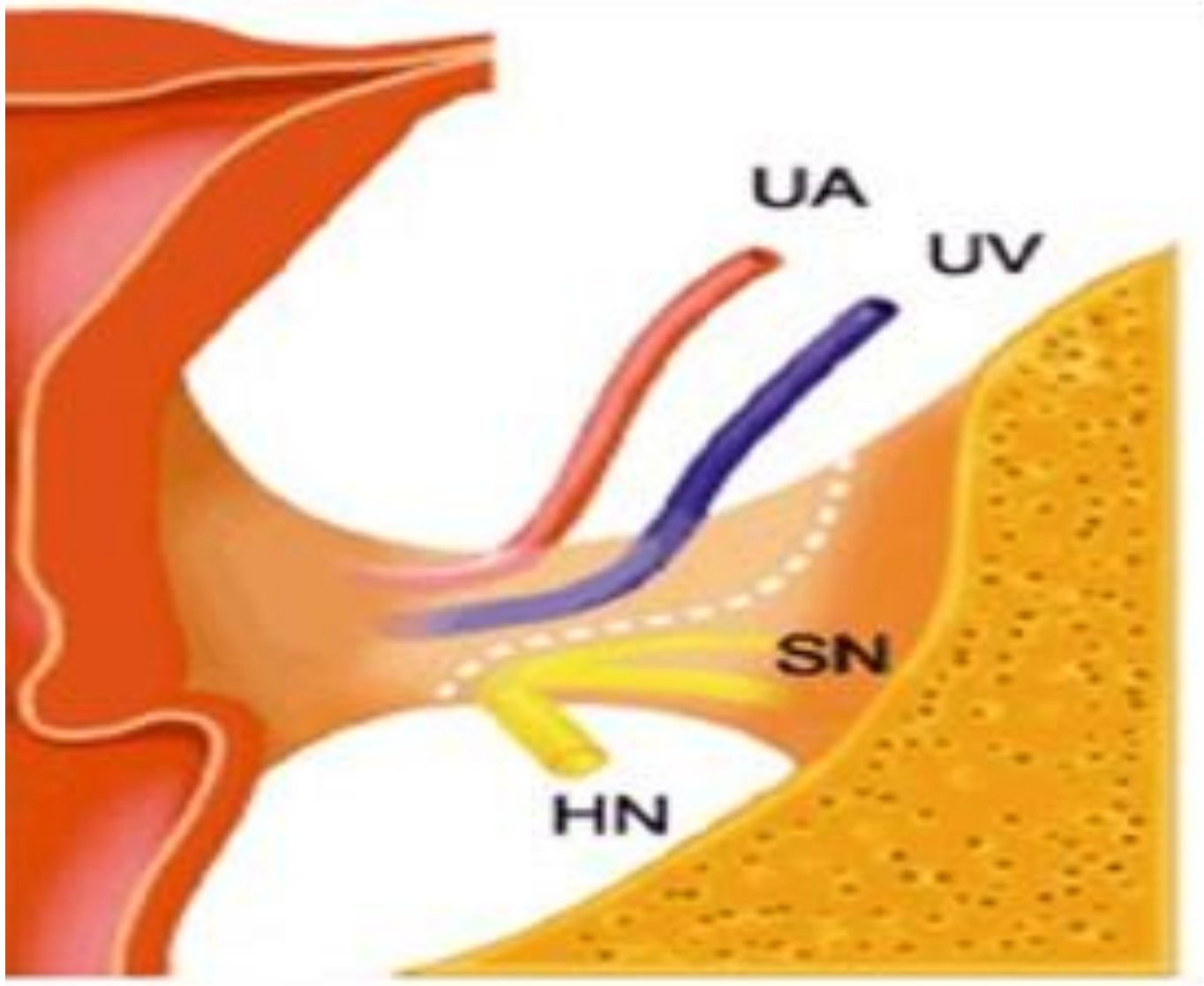
Type C Radical Hysterectomy



Extent of Type C Radical hysterectomy. Figure -
With permission from Prof. D Querleu



Shalini Rajaram_Masterclass in Gynecologic
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Creation of Medial Pararectal space

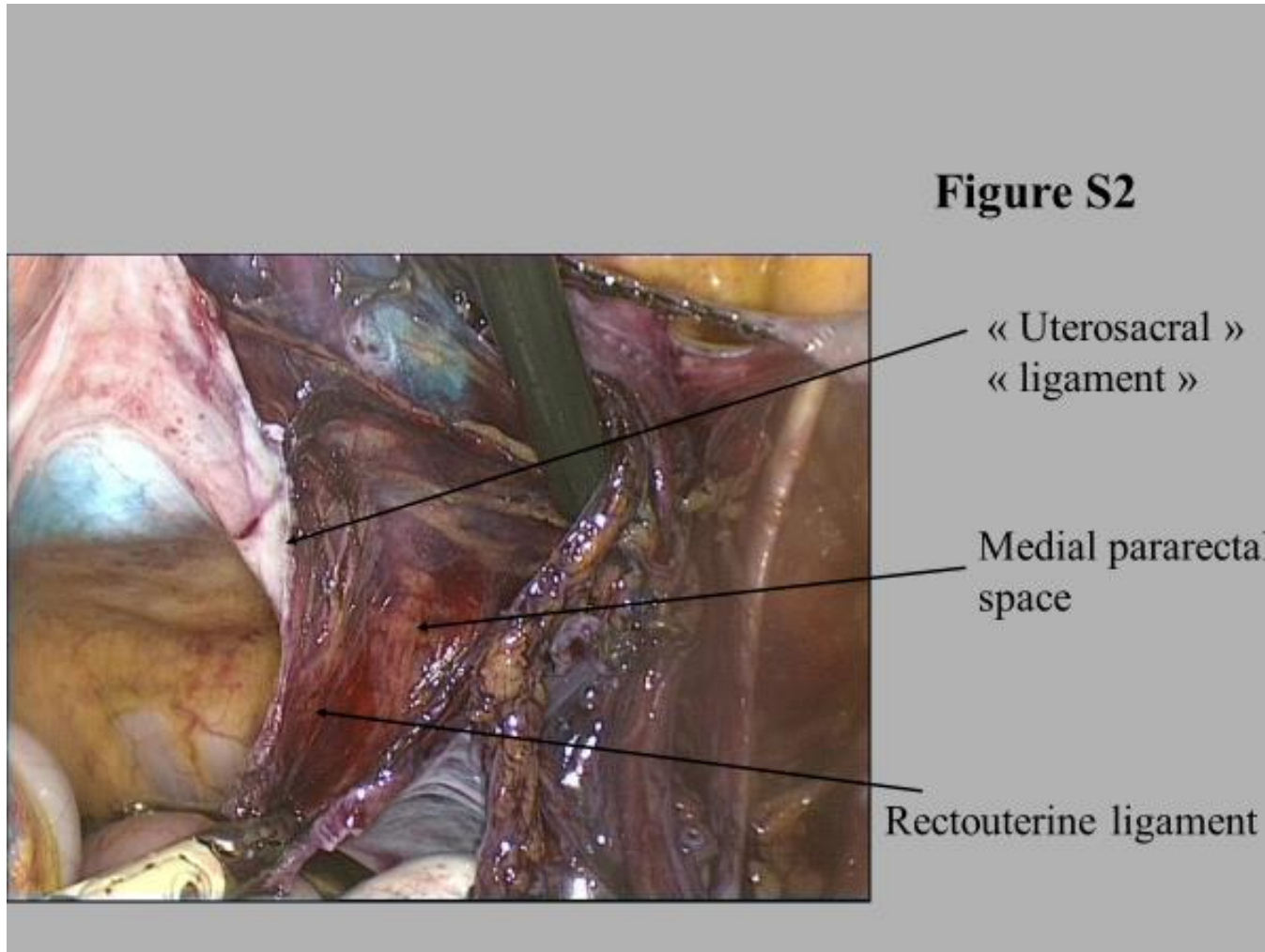
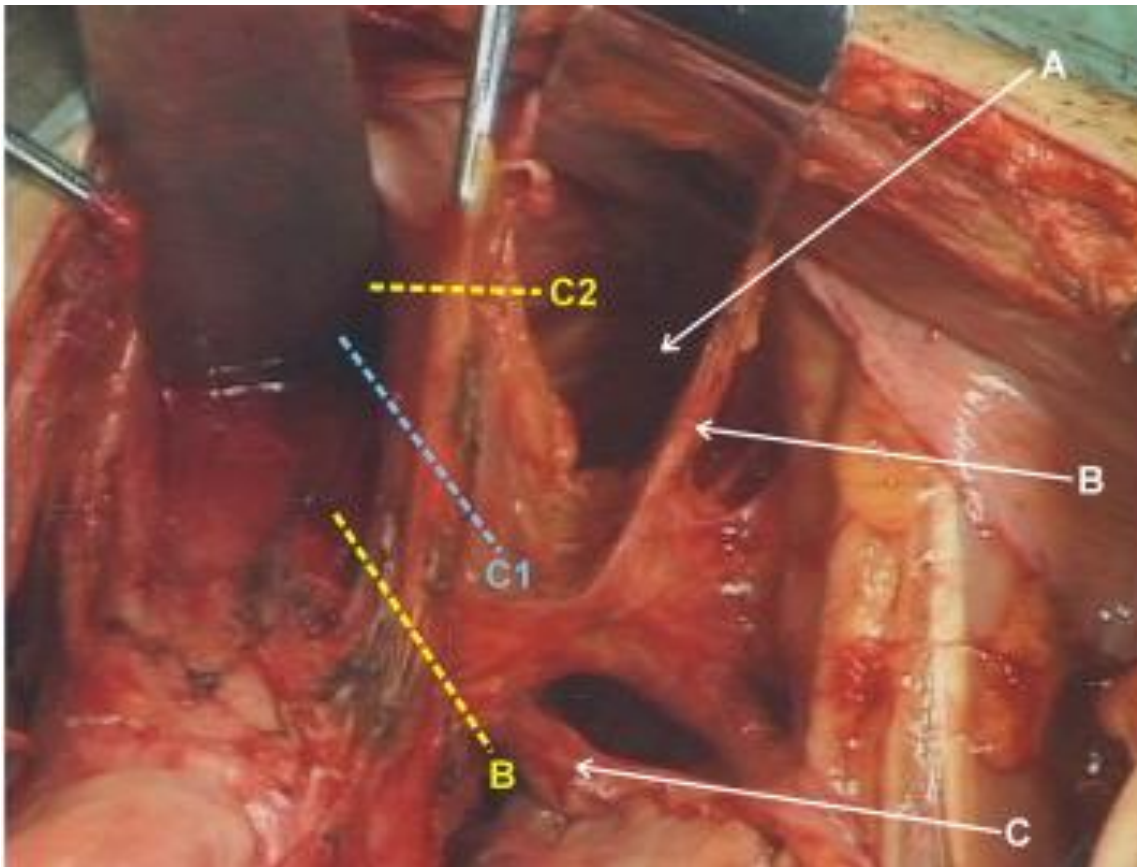


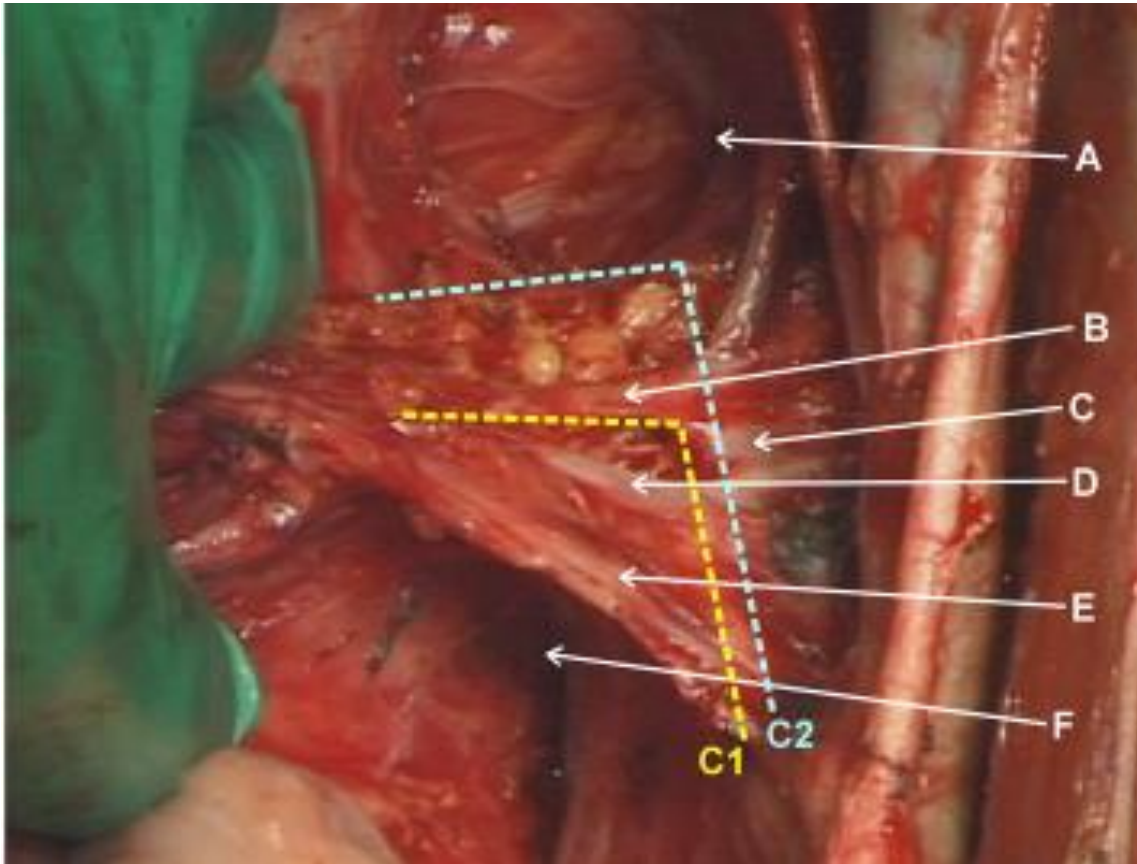
Figure - With permission from Prof. D Querleu



**A— paravesical
space**
**B—umbilical
artery**
C—ureter

Perioperative picture of horizontal resection lines on the ventral parametrium.

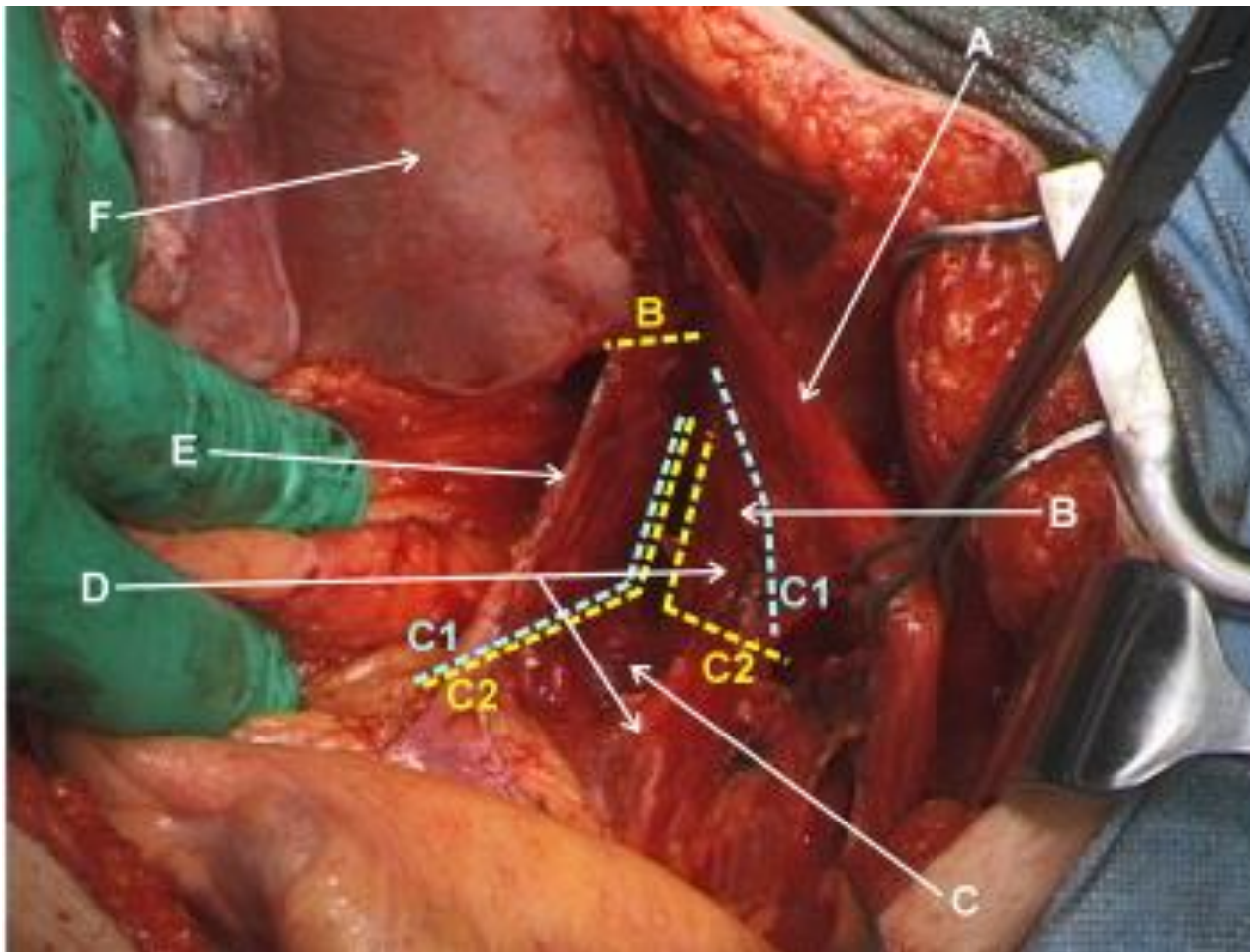
With permission from Prof D Cibula. Fig 3. New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection *Gynecologic Oncology* 122 (2011) 264–268



- A—paravesical space**
- B—deep uterine vein (vaginal vein)**
- C—internal iliac vein**
- D—uterine vein**
- E—uterine artery**
- F—pararectal fossa**

Perioperative picture of resection lines on the lateral parametrium.

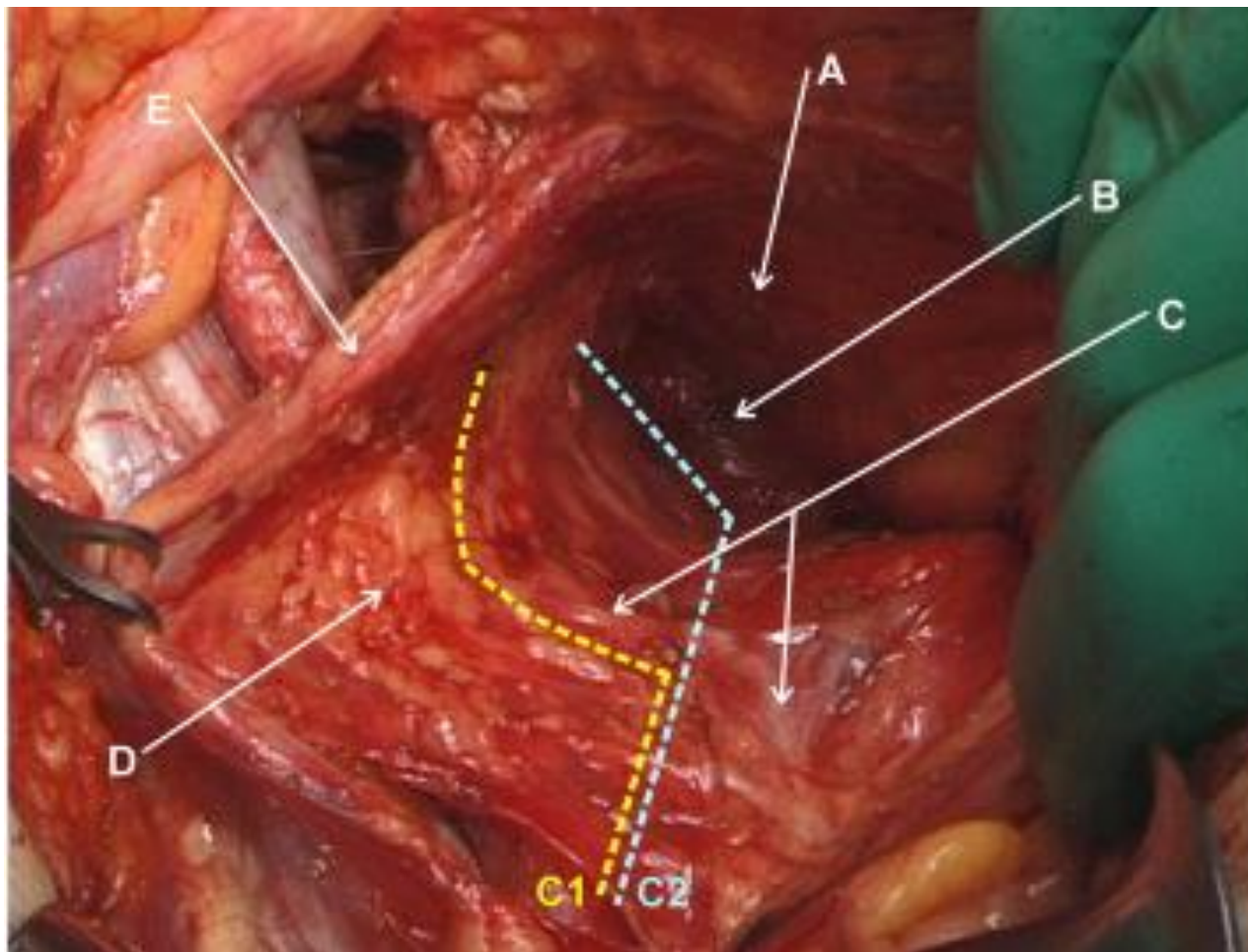
With permission from Prof D Cibula. Fig 2. New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection *Gynecologic Oncology* 122 (2011) 264–268



- A—ureter;
- B—mesoureter
- C—space between the recto-uterine ligament and mesoureter (hypogastric plexus)
- D—branches of the hypogastric plexus
- E—recto-uterine ligament
- F—cervix

Perioperative picture of resection lines on the dorsal parametrium.

With permission from Prof D Cibula. Fig 5. New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection *Gynecologic Oncology* 122 (2011) 264–268



- A—rectouterine ligament**
- B—space between the recto-uterine ligament and mesoreter (hypogastric plexus)**
- C—branches of the hypogastric plexus**
- D—mesoreter**
- E—ureter**

Perioperative picture of resection lines on the mesoreter (left side).

With permission from Prof D Cibula. Fig 6. New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection *Gynecologic Oncology* 122 (2011) 264–268

- C1 hysterectomy- associated with **faster recovery of bladder function** and lesser degree of bowel dysfunction.
- **Sympathetic fibres (Superior hypogastric plexus and 2 hypogastric nerves)**: Bladder compliance, urinary continence and small muscle contractions at orgasm.
- **Parasympathetic fibres (Pelvic splanchnic nerve – S2,3,4)** : detrusor contractility, vaginal swelling and lubrication during sexual arousal.

Critical steps in C1 hysterectomy

- **Dissection of uterosacral ligament**
 - **Hypogastric nerves** run 1-2 cm dorsal to ureter here. These are dissected and lateralized before cutting the uterosacrals.
- **Dissection of parametrium**
 - **Inferior hypogastric plexus** is situated in dorsal parametrium and caudal vesicouterine ligament and this must be identified and preserved.
 - The plexus is preserved by dissecting only the parametrium **above the deep uterine vein.**

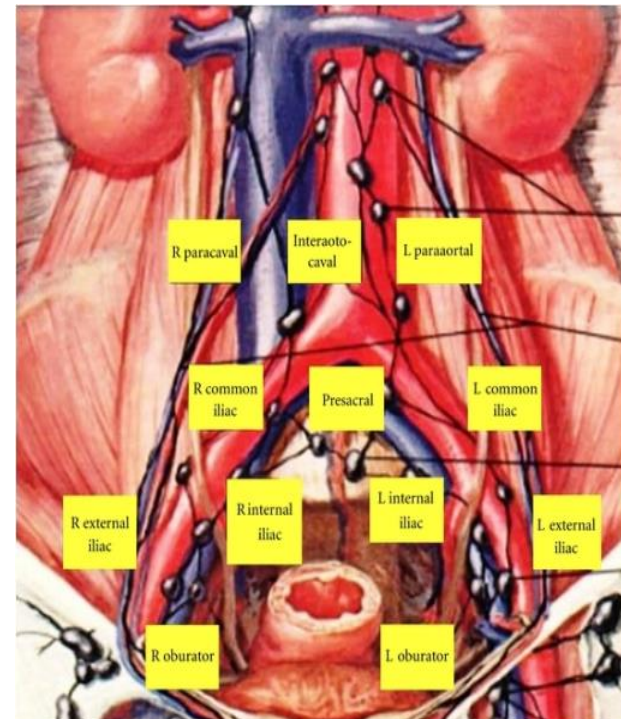
Type D Hysterectomy

Type D1: resection of the entire paracervix at the pelvic side wall together with the hypogastric vessels, exposing the roots of the sciatic nerve. Corresponds to Palfalvi- Ungar laterally extended parametrectomy (stage IIB tumors)

Type D2: type D1 plus resection of the entire paracervix with the hypogastric vessels and adjacent fascial or muscular structures (**LEER** – Laterally extended endopelvic resection described by Hockel).

Lymph node dissection

- Lymphadenectomy is described separately according to **four levels** and **radicality** (sentinel node sampling, random sampling, removal of enlarged nodes only, systematic lymph node dissection or debulking)
- **Level 1**—External and internal iliac
- **Level 2**—Common iliac
(including presacral)
- **Level 3**—Aortic inframesenteric
- **Level 4**—Aortic infrarenal



Operative Report: Radical Hysterectomy

- ✓ All parts of definition of Type of Hysterectomy
- ✓ Mode of management of uterine artery
- ✓ Surgical and pathological length of ventral, dorsal & lateral parametrium
- ✓ Surgical and pathological length of vagina removed
- ✓ Approach or route of hysterectomy/ lymph node dissection
- ✓ Use of preoperative radiotherapy, brachytherapy, chemotherapy or combinations

ORIGINAL ARTICLE – GYNECOLOGIC ONCOLOGY

2017 Update on the Querleu–Morrow Classification of Radical Hysterectomy

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New classification system of radical hysterectomy: Emphasis on a three-dimensional anatomic template for parametrial resection[☆]

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