Surgical Mx of Placenta Accreta Spectrum – Tips and Tricks from an Experienced Center

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Texas Children's Hospital
Houston, TX

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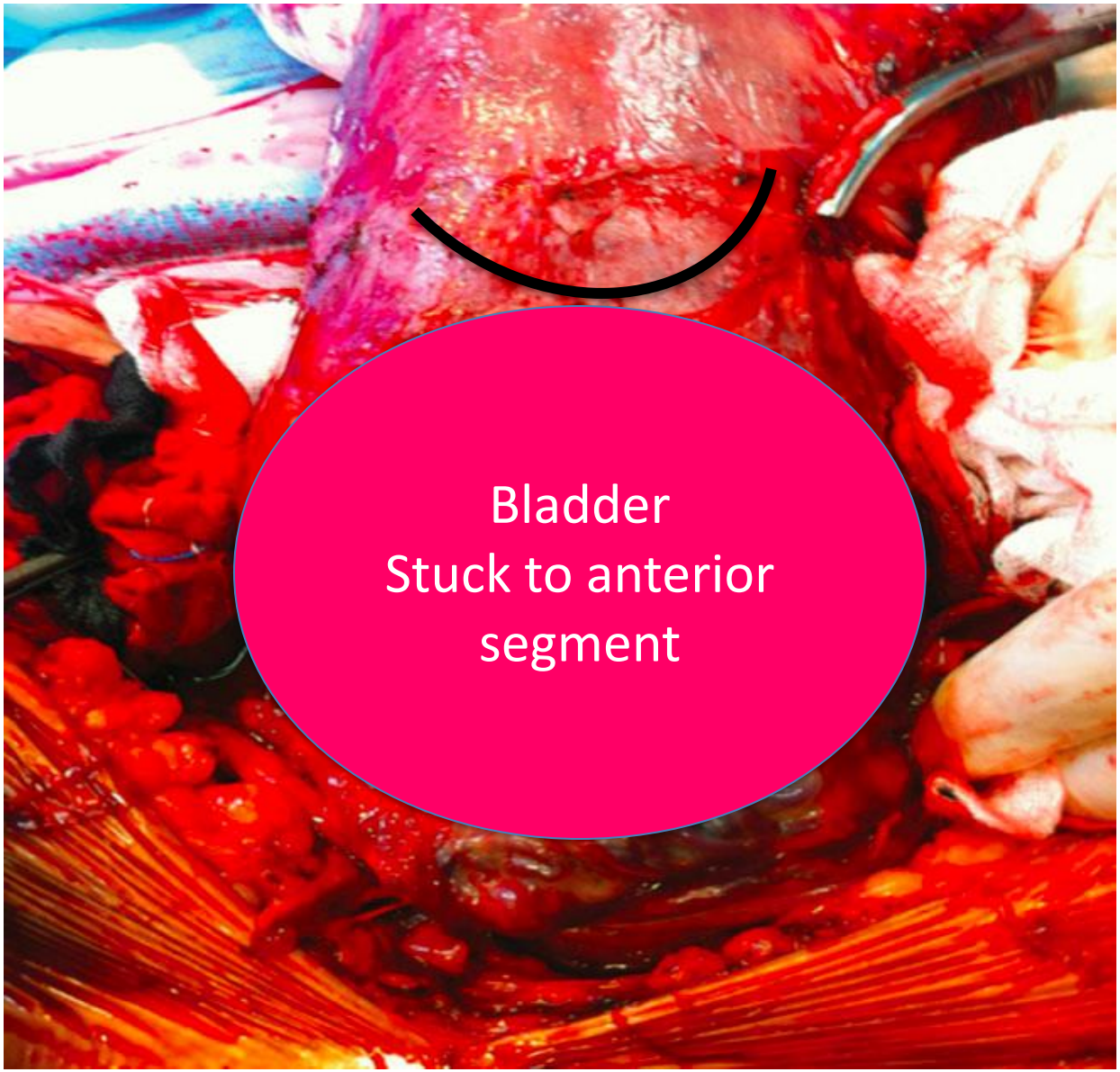
Repeat CS x 2 – No suspicion of accreta



Cali et al. Ultrasound Obstet Gynecol 2013; 41: 406–412

Possible Management: Approaches

- Conservative treatment:

  - Cesarean section, close up & wait (preservation of fertility (+/- embolization, methotrexate)

- Cesarean section with placental excision (*)
- Staged C-hysterectomy (48 hours to 14 days) with embolization of placental bed
- Cesarean hysterectomy without any attempt at placental removal – choice in USA

Conservative vs. Aggressive Treatment

Table 1. Surgical procedures and complications in 119 placenta percreta cases

Initial surgical procedure	Hysterectomy	Local resection	Placenta left in situ	*Sum*
No. of cases	66 (56%)	17 (14%)	36 (30%)	119
Mode of cesarean section				
Elective	41 (62%)	16 (94%)	20 (56%)	77 (65%)
Emergency	8 (12%)	1 (6%)	15 (42%)	24 (20%)
Unspecific	17	0	1	18
Complications				
Bladder injury/resection	11	0	6	17
Salpingo-oophorectomy	1	0	1	2
Post-operative hemorrhage	5	2	16	23
Post-operative infection	1	0	9	10
Fistula	2	0	1	3
Pulmonary embolism/cardiopulmonary arrest	1	0	3	4
Femoral pseudoaneurysm or distal thrombus	4	2	0	6
Other re-operation	1	1	3	5
Sum	26	5	39	70
Secondary hysterectomy				
Emergency	–	0	18	18
Planned	–	0	3	3
Cases with one or more complications 0–24 h	19 (30%)	2 (12%)	9 (25%)	30
Cases with one or more complications >24 h	8 (12%)	2 (12%)	22 (61%)	32

61%

Clausen et al, Acta Obstet et Gynaecol Scand 2014

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Focus today on Surgical Aspects of Mx

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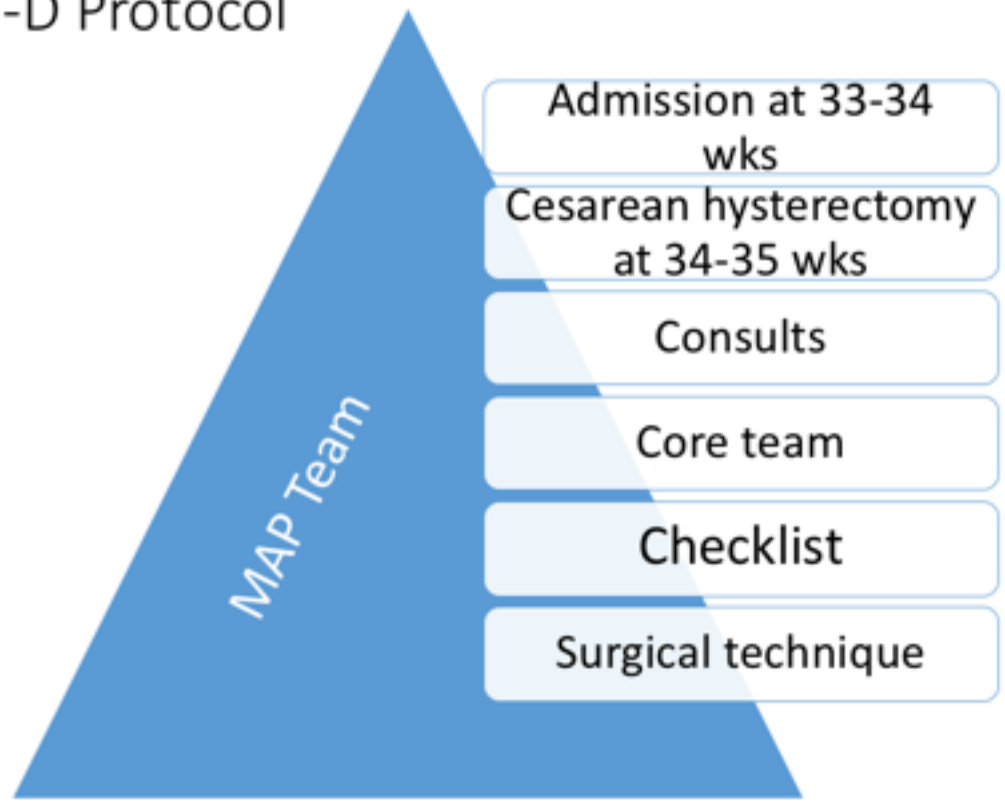
Multi-D Protocol



COE - Multidisciplinary Team

- OR Staff and Blood Bank Staff
- Anesthesia
- Urology
- Generalist, MFM, GYN Oncology
- Interventional Radiology/Trauma surgery/Vascular Surgery
- Neonatology / NICU

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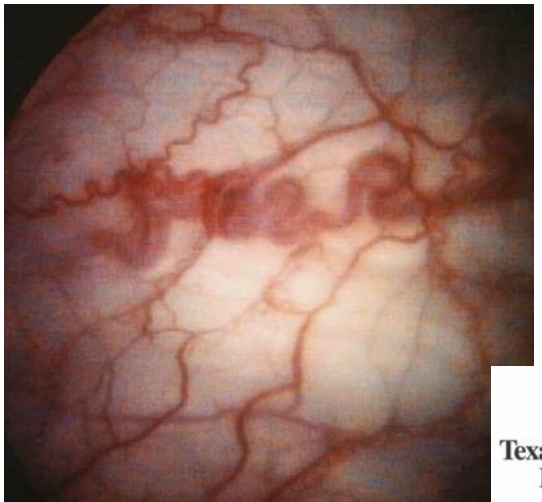
OR Preparation - Maternal Prep

- Adequate IV access, A-line, central line Quad sheath
- Blood in the room! (Massive transfusion protocol)
- General endotracheal anesthesia +/- epidural (for postop pain)
- DVT prophylaxis – SCD's
- Shock trauma blood infusers +/- cell saver
- Control OR & maternal body temperature
- 4F CFA cath for COBRA sheath
- Cystoscopy & ureteral stents

(Eller et al, BJOG 2009)



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Internal Iliac Artery Balloons make no sense

Internal Iliac Artery Balloon Occlusion for Placenta Previa and Suspected Placenta Accreta

A Randomized Controlled Trial

Meng Chen, MD, Xinghui Liu, MD, Yong You, MB, Xiaodong Wang, MD, Tao Li, MD, Hong Luo, MD, Haibo Qu, MD, and Lian Xu, MD

50 women with previa and suspected accrete randomized to IAB or none

Primary outcome = number of PRBC's used

Similar demographics

Results: No difference – 5.3+/-5.3 vs 4.7+/-5.4 (p = 0.54)

Higher costs and postop fever significantly higer in IAB group

No differences in other outcomes

CONCLUSION: Intraoperative balloon occlusion of the internal iliac arteries did not reduce the number of packed RBC units transfused in women with placenta previa and antenatally suspected placenta accreta.

CLINICAL TRIAL REGISTRATION: Chinese Clinical Trial Registry, ChiCTR-IOR-17012244.

(Obstet Gynecol 2020;135:1112–9)

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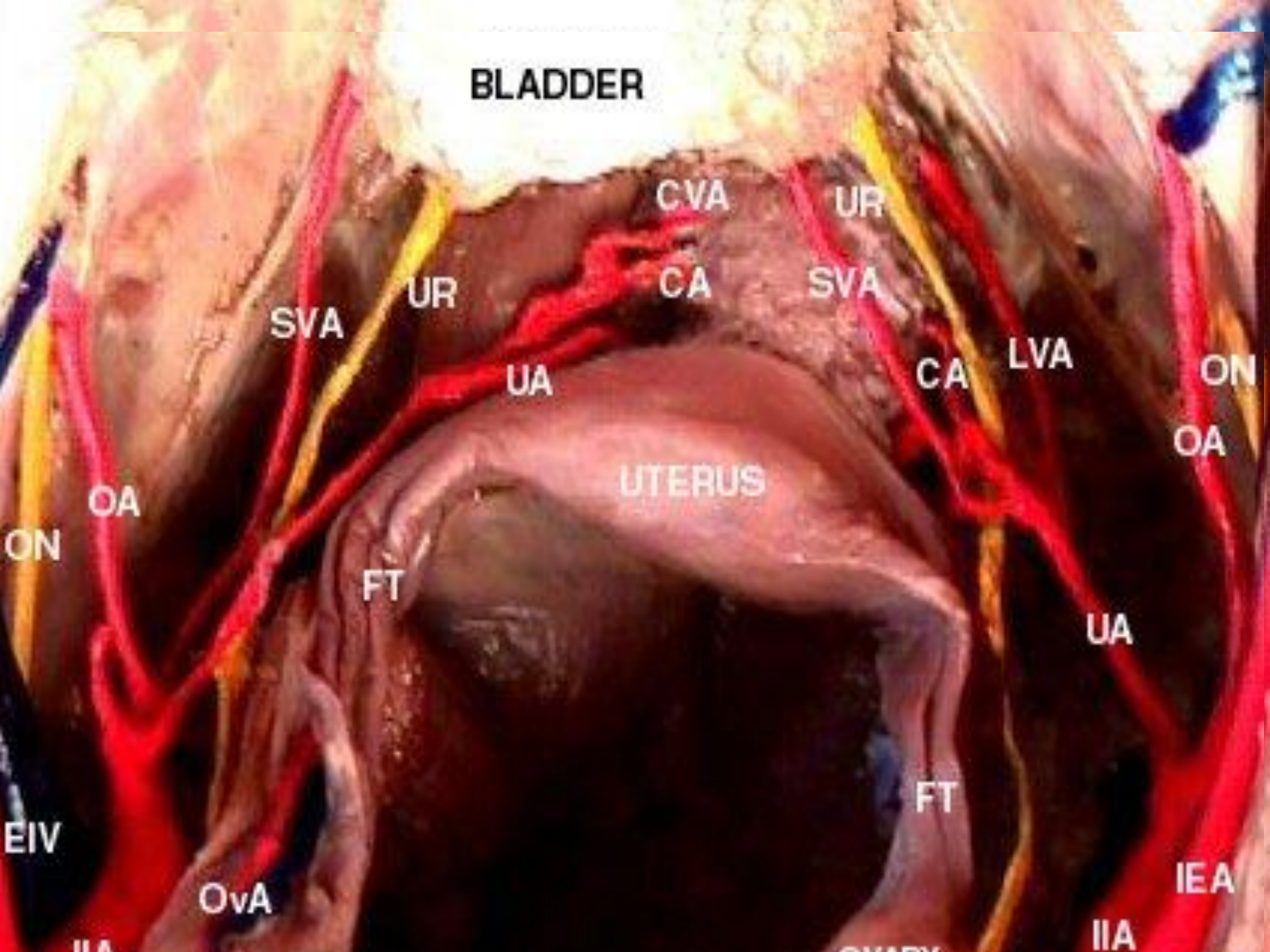
BLADDER
CVA
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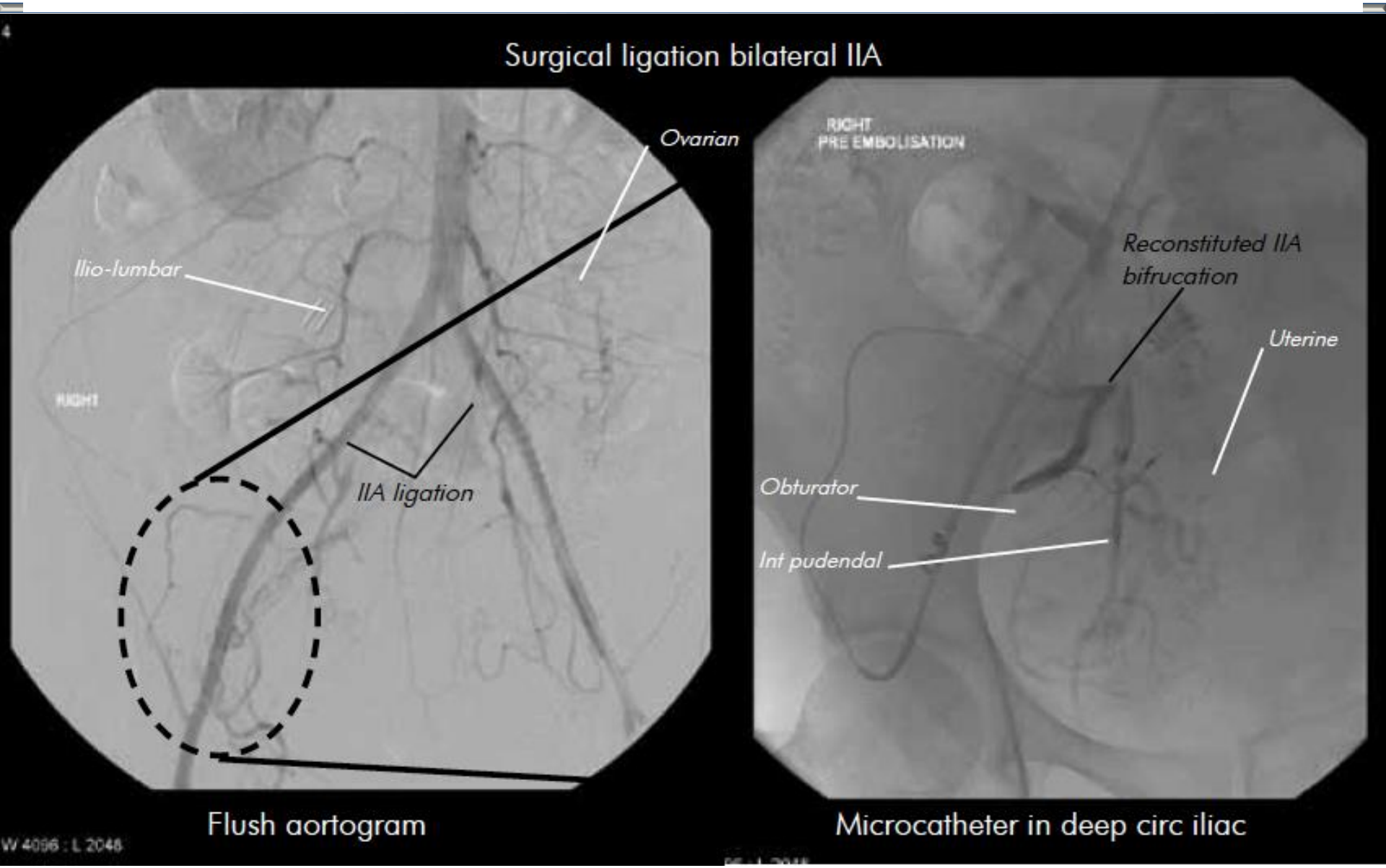
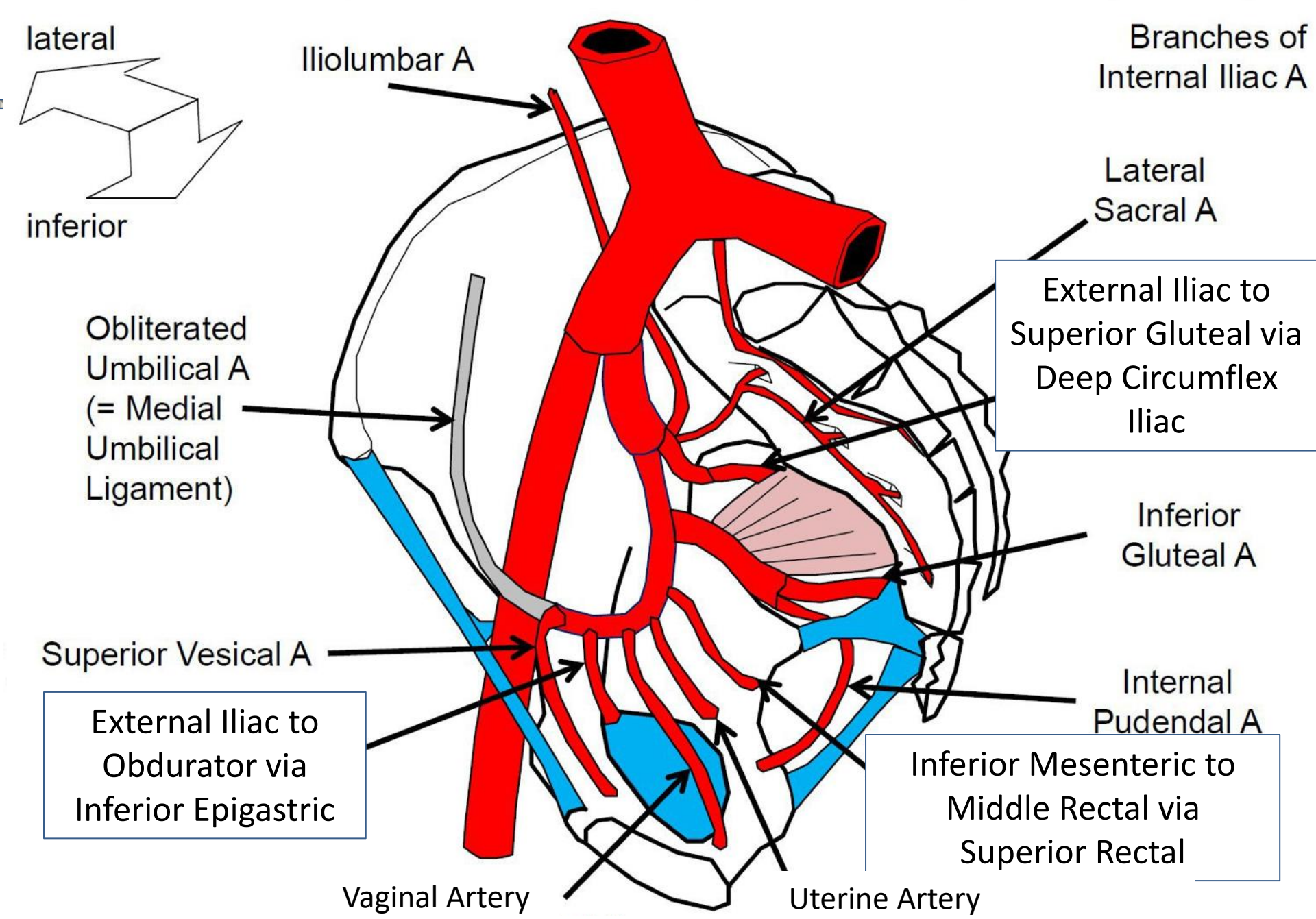
IEA
OvA
IIA

Collateral Vessels and Anastomoses

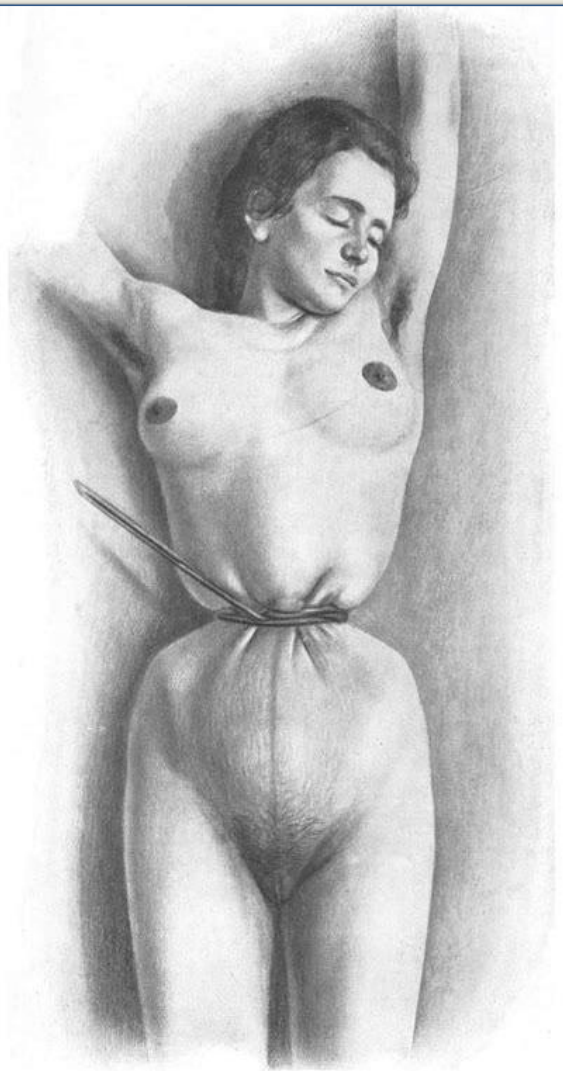


Buckley 2010


lateral
inferior
Iliolumbar A
Branches of Internal Iliac A
Lateral Sacral A
External Iliac to Superior Gluteal via Deep Circumflex Iliac
Obliterated Umbilical A (= Medial Umbilical Ligament)
Inferior Gluteal A
Superior Vesical A
Internal Pudendal A
External Iliac to Obdurator via Inferior Epigastric
Inferior Mesenteric to Middle Rectal via Superior Rectal
Vaginal Artery
Uterine Artery

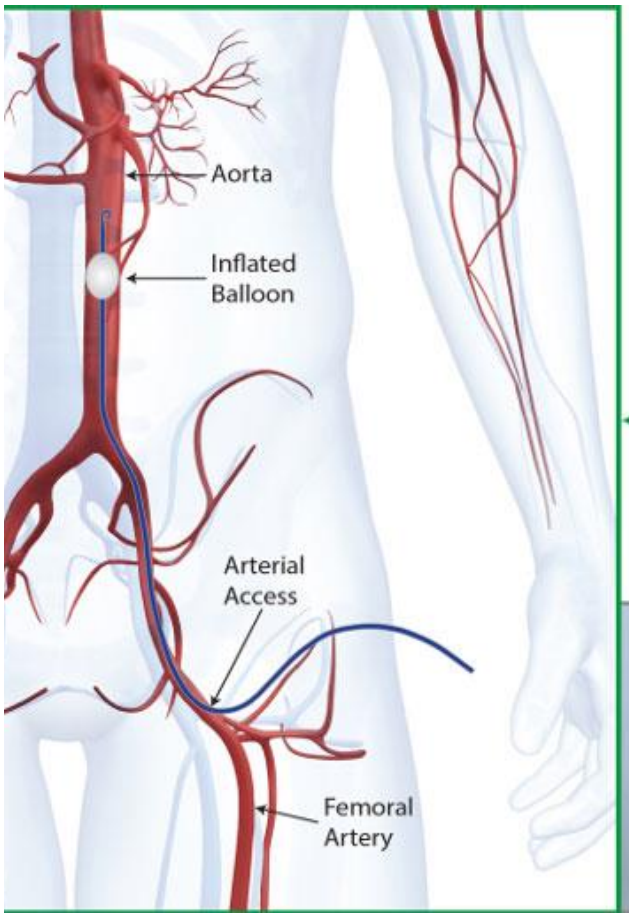
MJW 2011

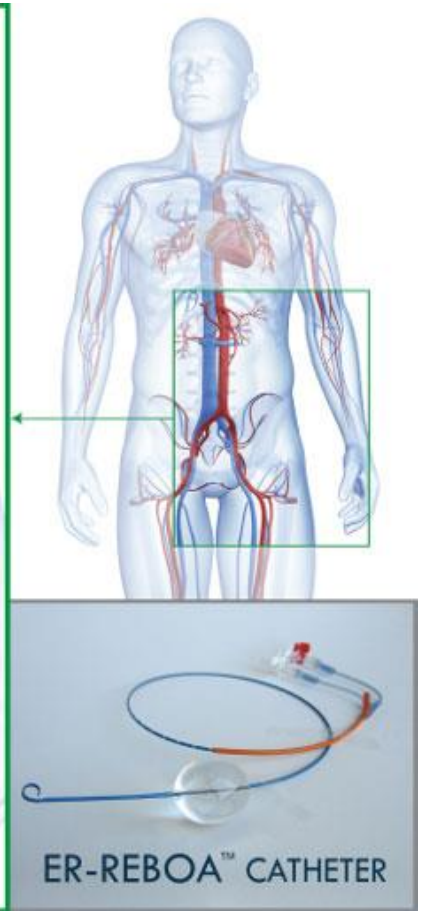
Aortic Occlusion



665

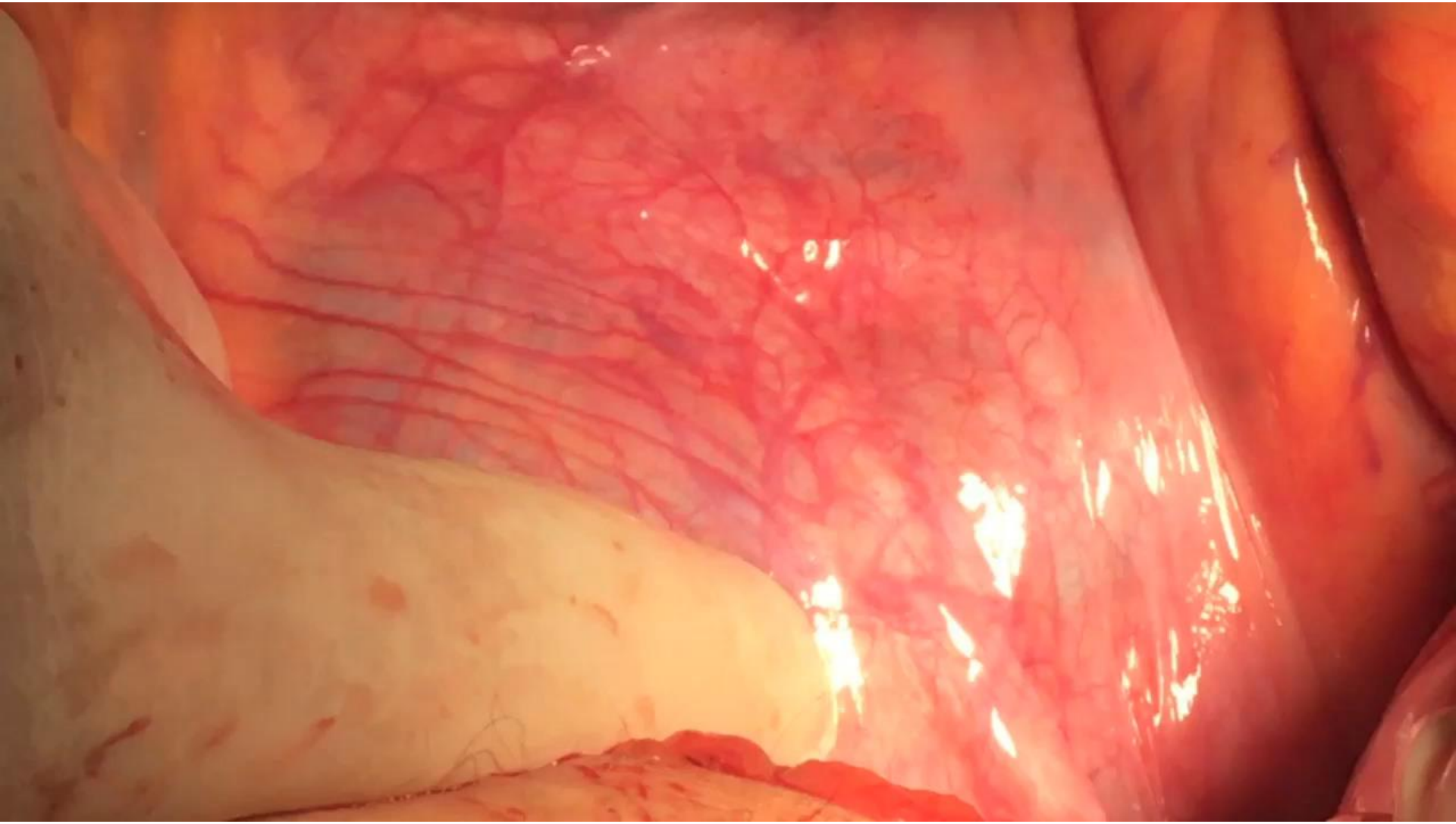
Fig. 530.
Momburgsche Blutleere bei einer Frischentbundenen.
Der Schlauch wird so fest angezogen, dass der Puls in der Art. femoralis verschwindet.





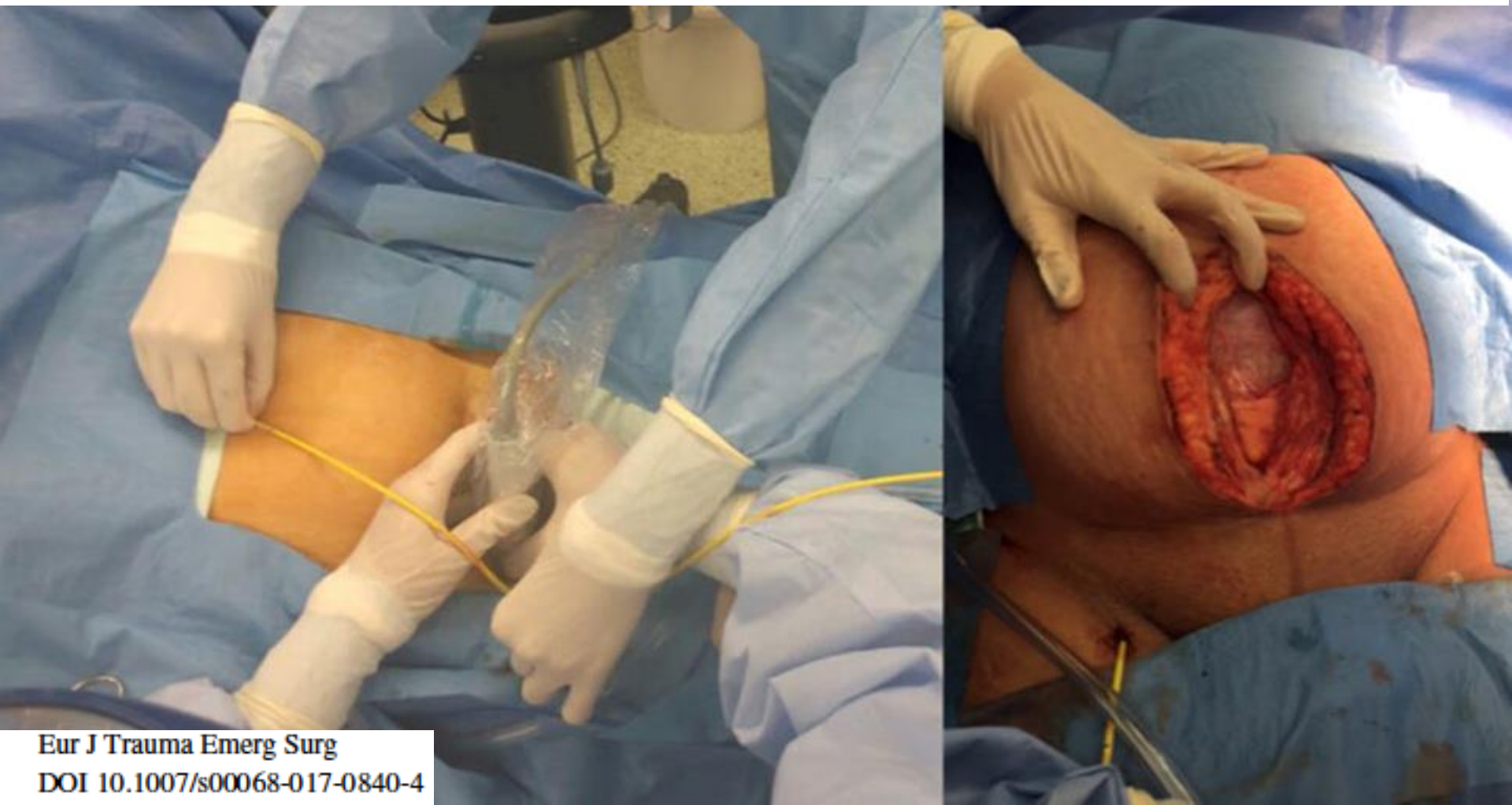
Bumm, E. Grunriss zum Studium der Geburtshilfe
Springer-Verlag 1922

Courtesy: Prof. Ismail Celik - Turkey



Expanding the field of acute care surgery: a systematic review of the use of resuscitative endovascular balloon occlusion of the aorta (REBOA) in cases of morbidly adherent placenta

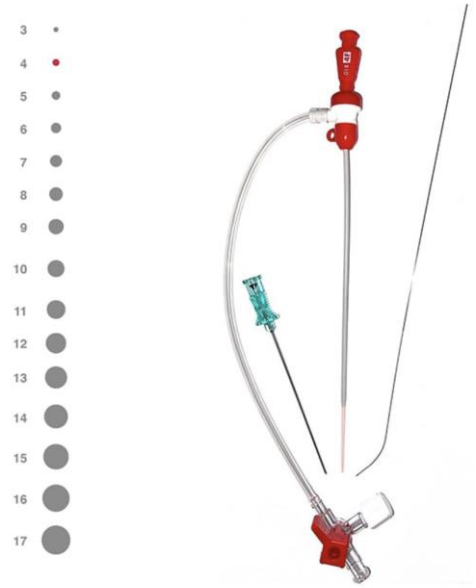
R. Manzano-Nunez[1,2] · M. F. Escobar-Vidarte[3] · M. P. Naranjo[1,2] · F. Rodriguez[2] · P. Ferrada[5] · J. D. Casallas[1,3] · C. A. Ordoñez[2,4]



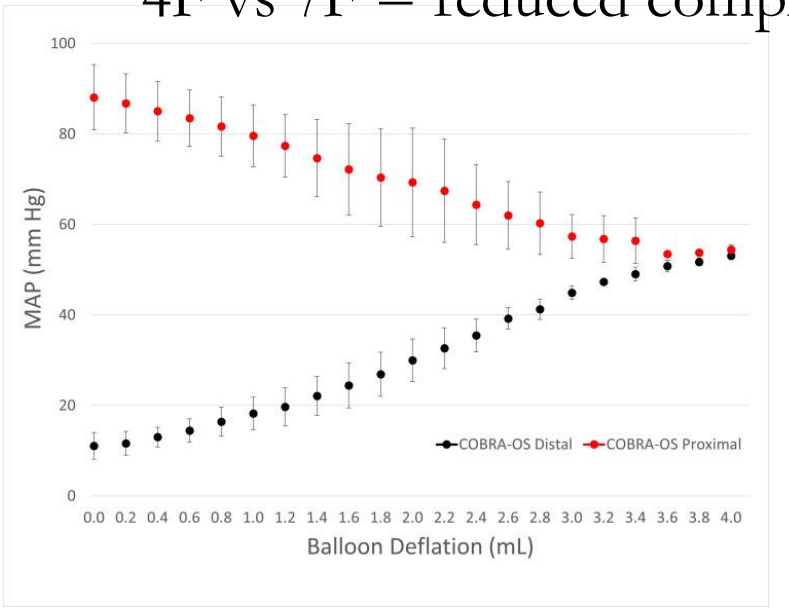
Eur J Trauma Emerg Surg
DOI 10.1007/s00068-017-0840-4

Control of Bleeding, Resuscitation, Arterial Occlusion System

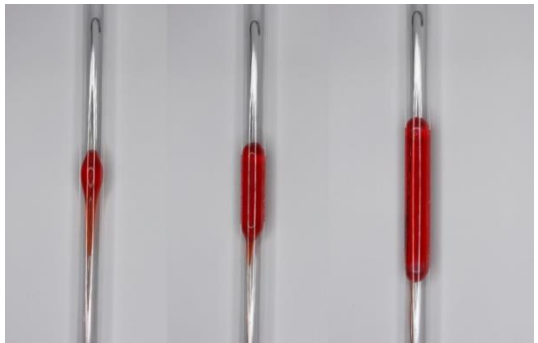
4F vs 7F = reduced complications



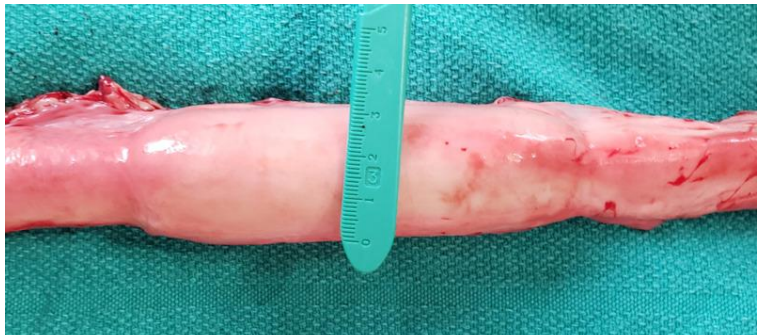
French Catheter Scale / COBRA-OS® Access Kit Components

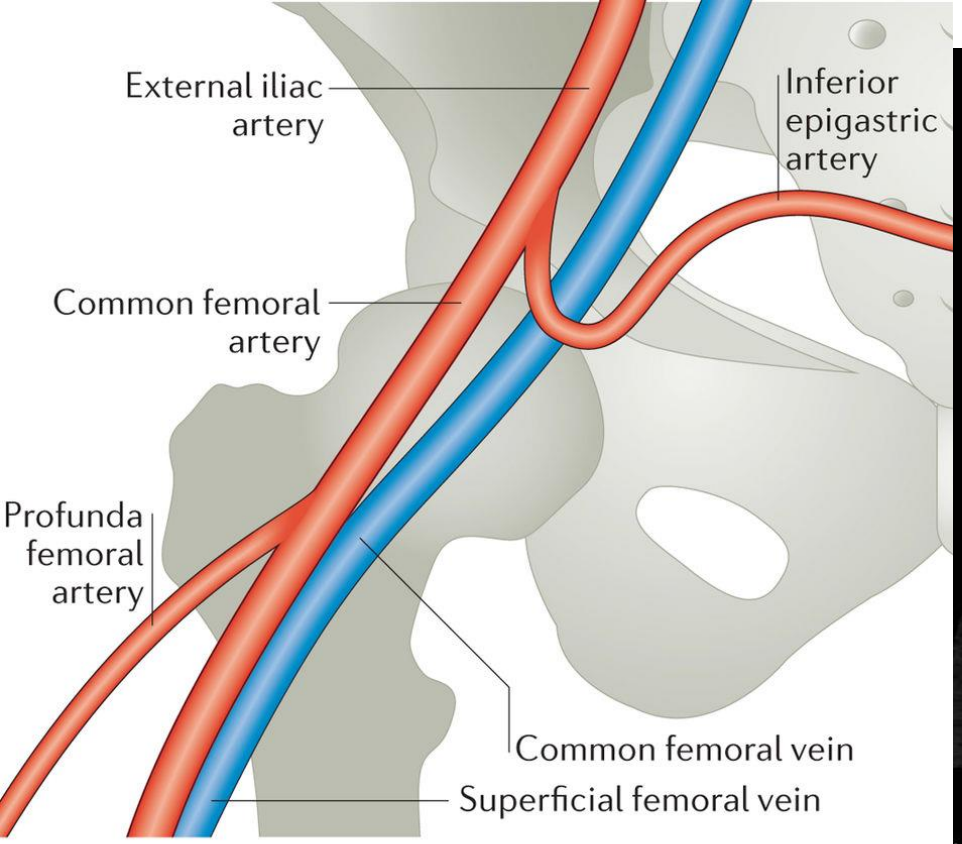


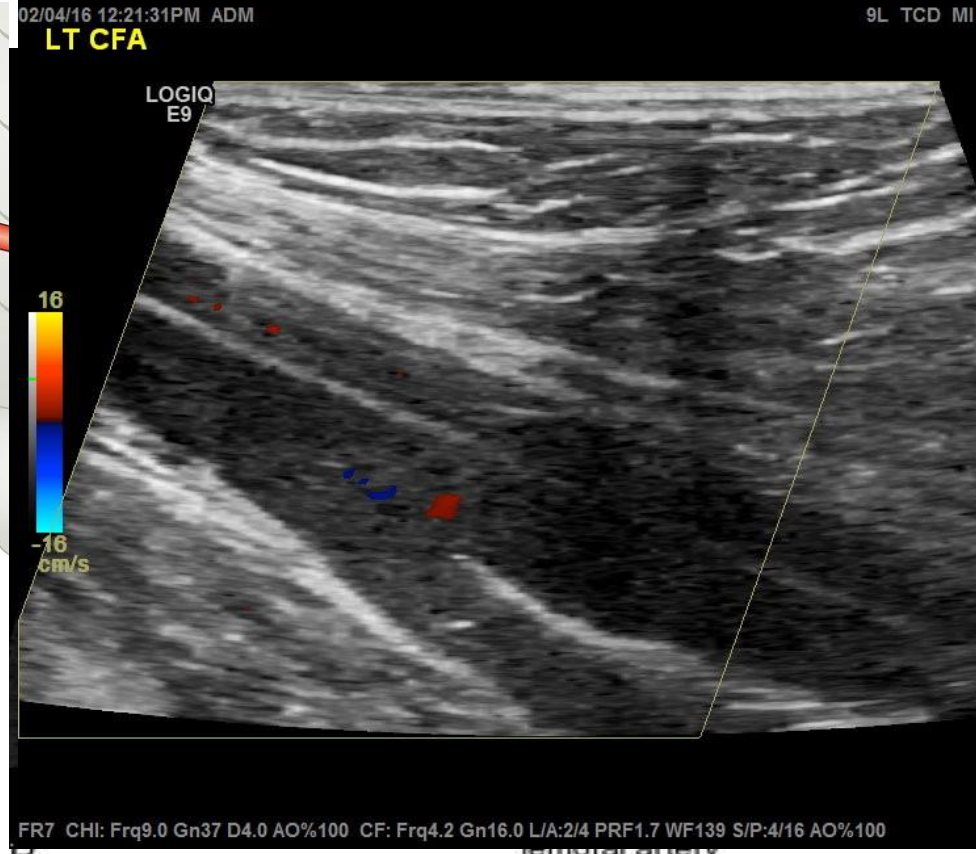
COBRA-OS® Syringe / COBRA-OS® Access Kit

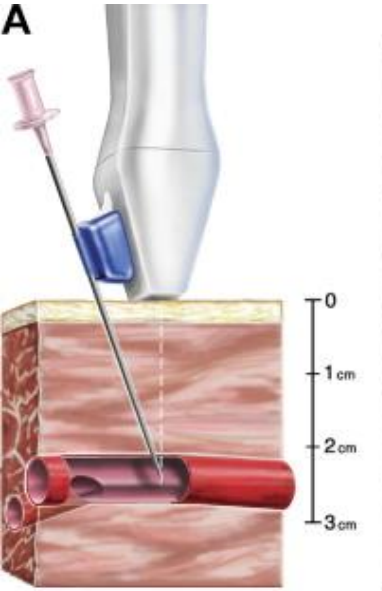


Power A et al. Trauma Surg Acute Care Open 2022:14;7:e000948.




External iliac artery
Inferior epigastric artery
Common femoral artery
Profunda femoral artery
Common femoral vein
Superficial femoral vein


02/04/16 12:21:31PM ADM
9L TCD MI
LT CFA
LOGIQ E9
16
-16 cm/s
FR7 CHI: Frq9.0 Gn37 D4.0 AO%100 CF: Frq4.2 Gn16.0 L/A:2/4 PRF1.7 WF139 S/P:4/16 AO%100


A
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1 cm
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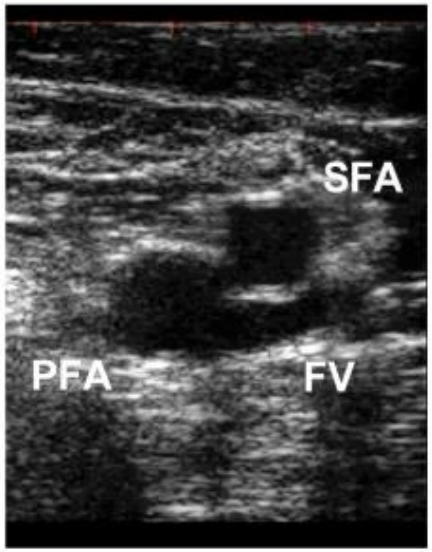
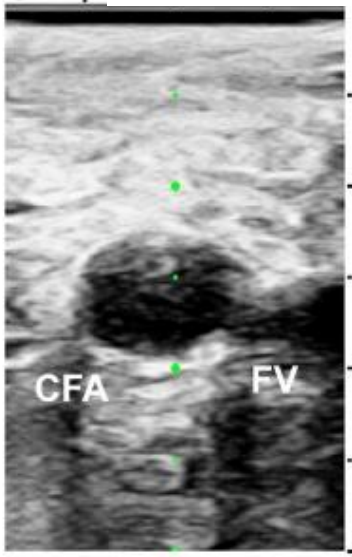

B
SFA
PFA
FV


C
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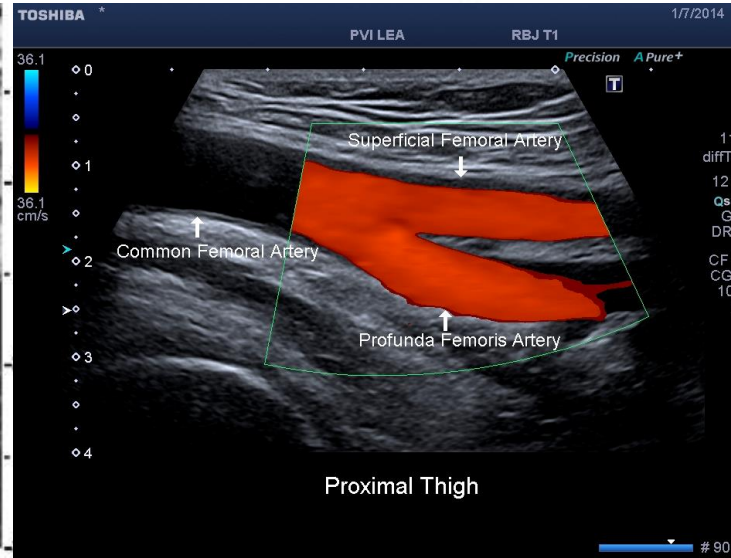

TOSHIBA
1/7/2014
PVI LEA
RBJ T1
Precision
A Pure+
36.1
36.1 cm/s
Superficial Femoral Artery
Common Femoral Artery
Profunda Femoris Artery
Proximal Thigh

RESEARCH ARTICLE Open Access

Clinical evaluation of prophylactic abdominal aortic balloon occlusion in patients with placenta accreta: a systematic review and meta-analysis

Li Chen[1,2,3], Xiaodan Wang[1], Hengyu Wang[1], Qin Li[1], Nan Shan[1,2,3*] and Hongbo Qi[1,2,3*]

Results: We retrieved 776 articles and eventually included 11 clinical studies. Meta-analysis showed that AABO significantly reduced the blood loss volume (MD – 1480 ml, 95% CI -1806 to – 1154 ml, $P < 0.001$) and blood transfusion volume (MD – 1125 ml, 95% CI -1264 to – 987 ml, $P < 0.001$). Similarly, obvious reductions in the hysterectomy rate (OR 0.30, 95% CI 0.19 to 0.48, $P < 0.001$), hospitalization duration (MD – 1.35 days, 95% CI -2.40 to – 0.31 days, $P = 0.01$), and operative time (MD – 29.23 min, 95% CI -46.04 to – 12.42 min, $P < 0.001$) were observed in the AABO group.

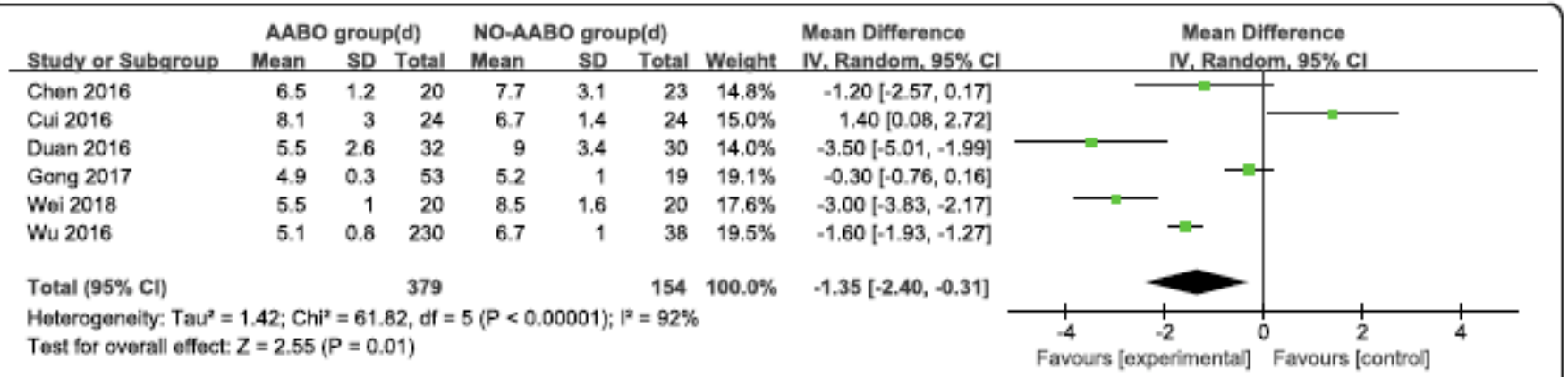
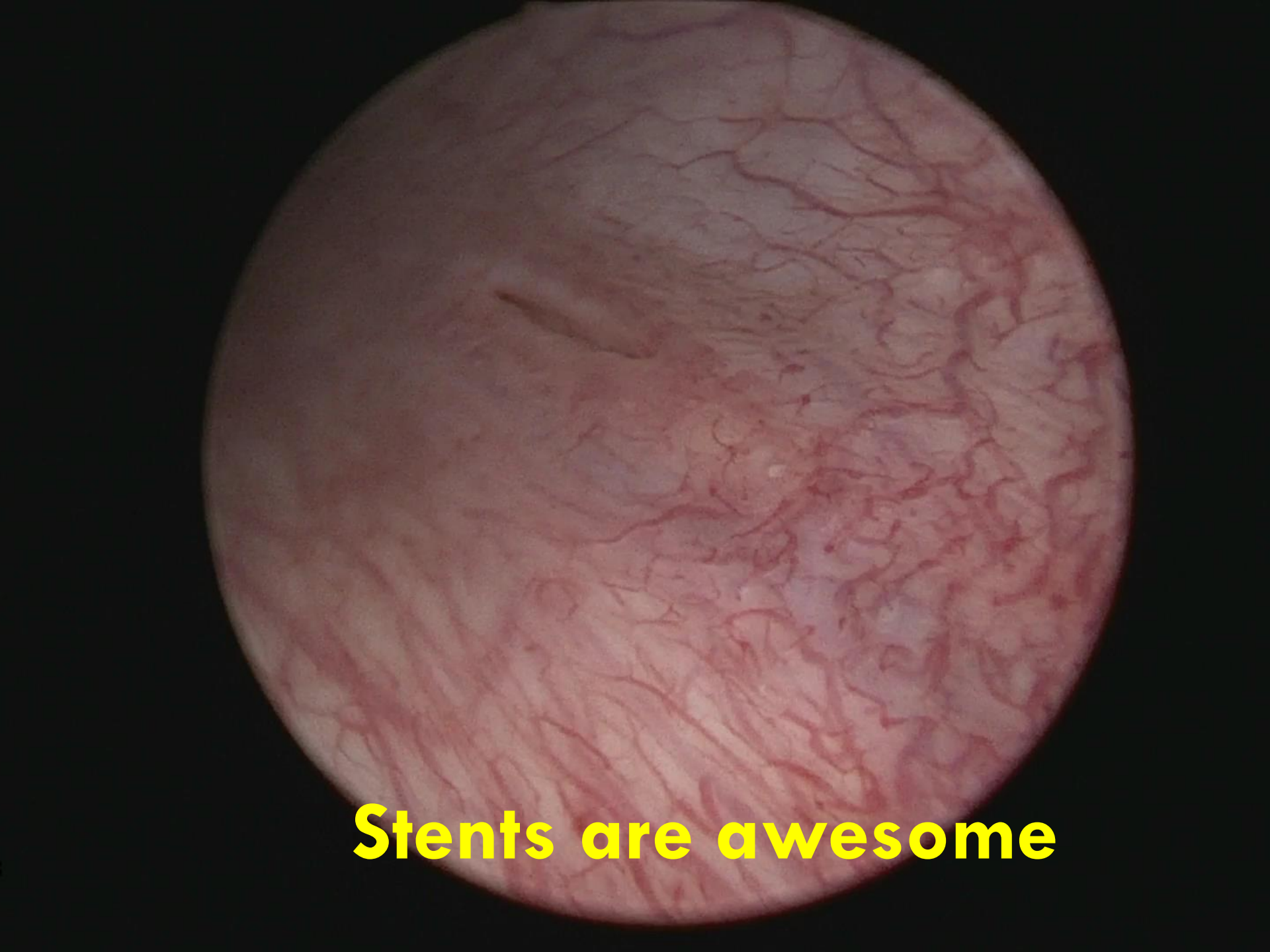
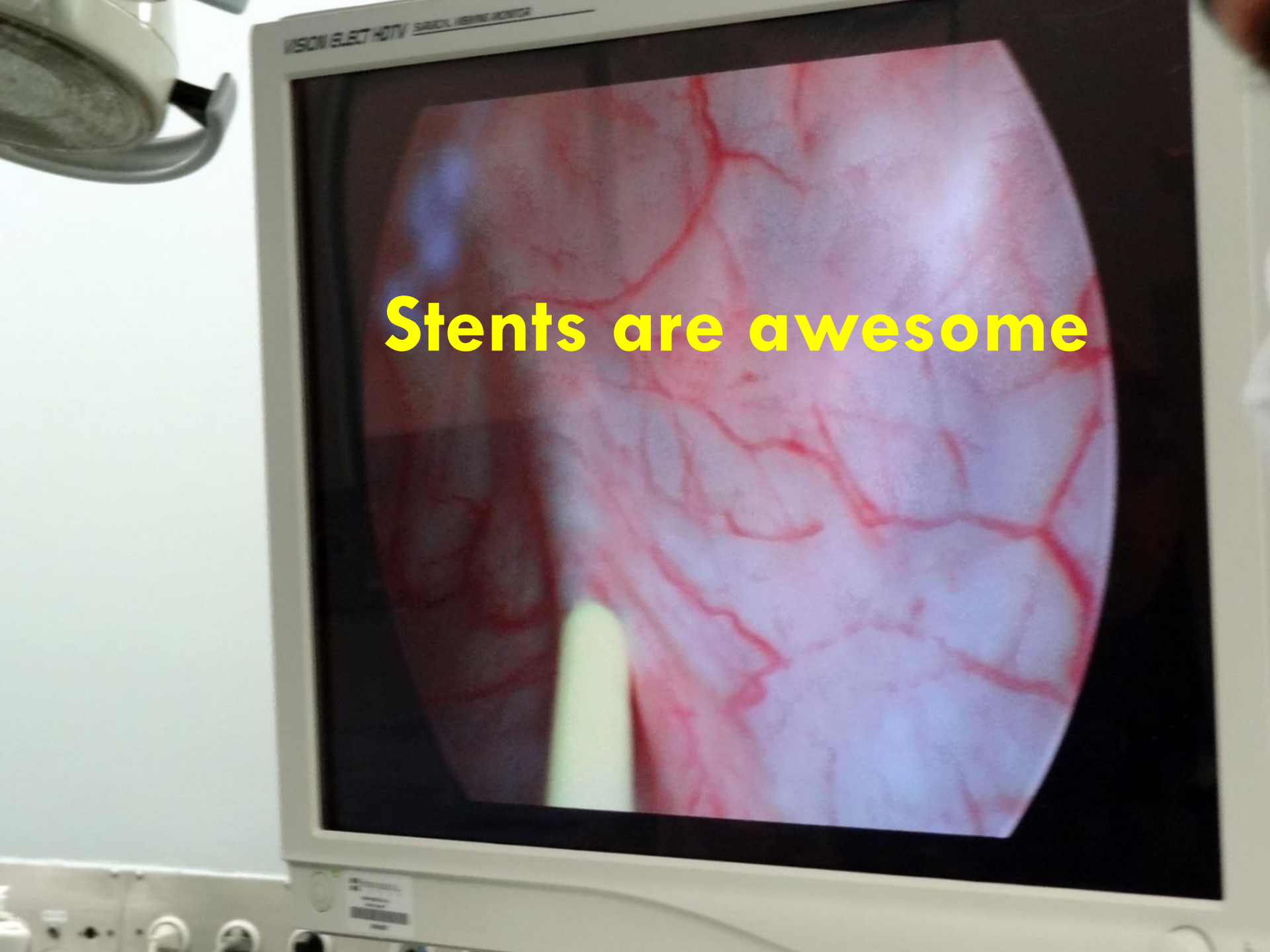


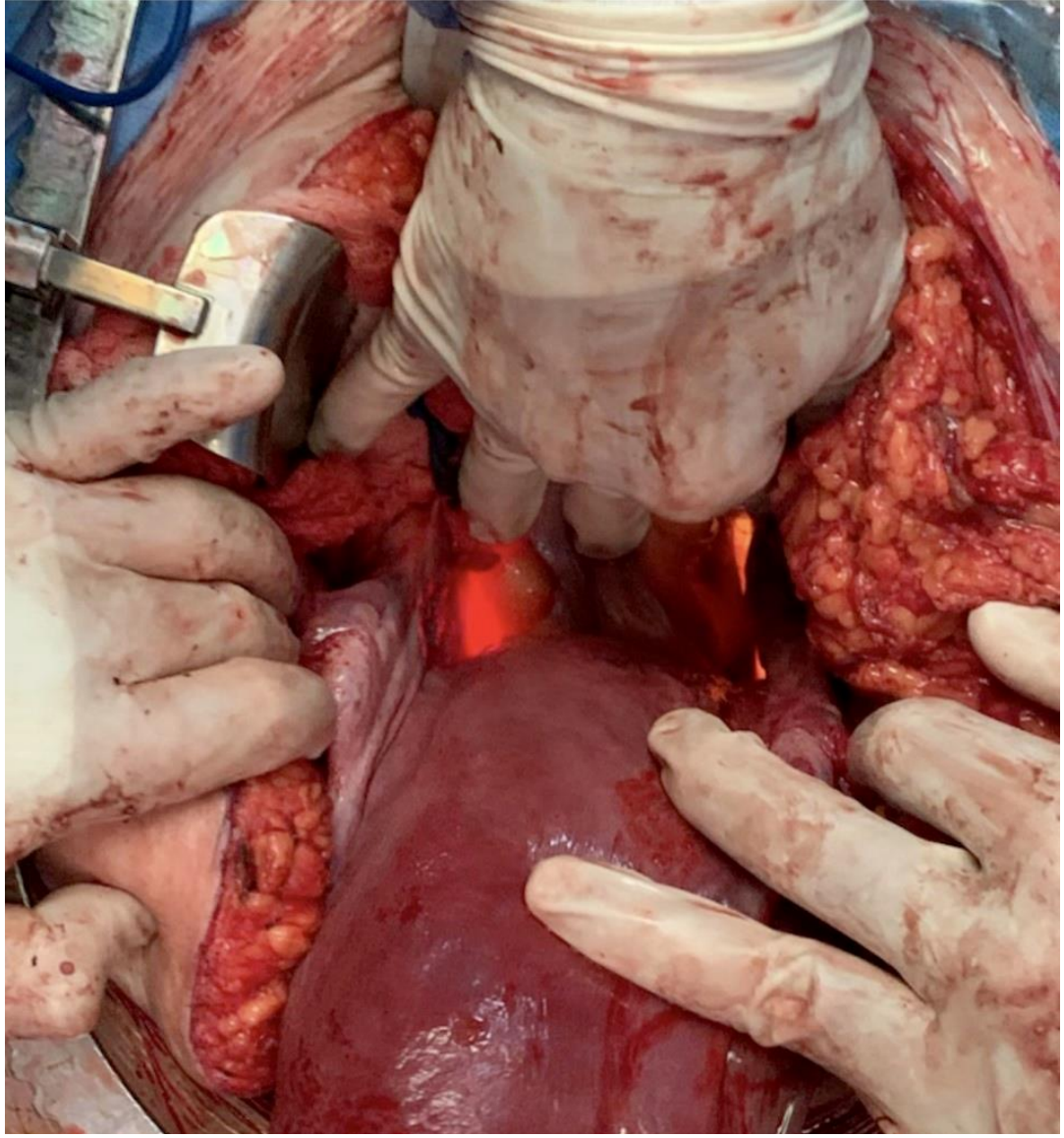
Fig. 6 Forest plot of studies for postoperative hospitalization duration (days)

Aortic Occlusion Protocol at TCH/BCM

- 4F common femoral arterial line (COBRA)®
  - Ultrasound and Seldinger technique prior to surgery and after stents are placed
  - If 3a or 3b suspected COBRA is placed before CS
  - If unsure of severity arterial sheath only is placed
  - Minimal use of fluoroscopy
- Once abdomen is open PAS severity assessed:
  - If severe percreta, a COBRA catheter is placed prophylactically and positioned by IR
    - Prior to expected heavy blood loss COBRA is inflated
  - If not severe proceed with only arterial line in place
    - If blood loss is then persistent and heavy/or massive a COBRA is placed emergently and palpated


Stents are awesome


Stents are awesome



Stents are awesome

Especially lighted ones!

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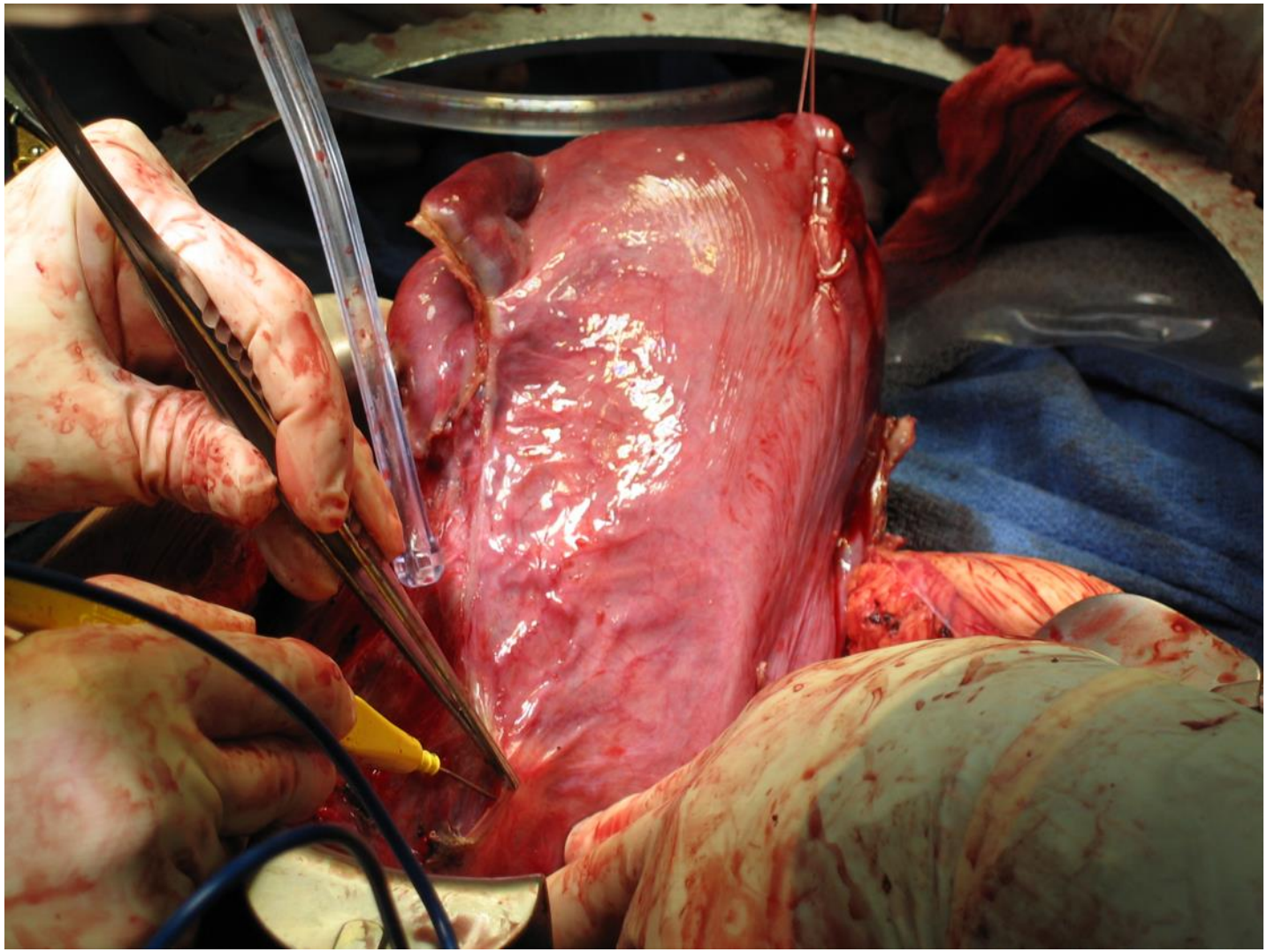
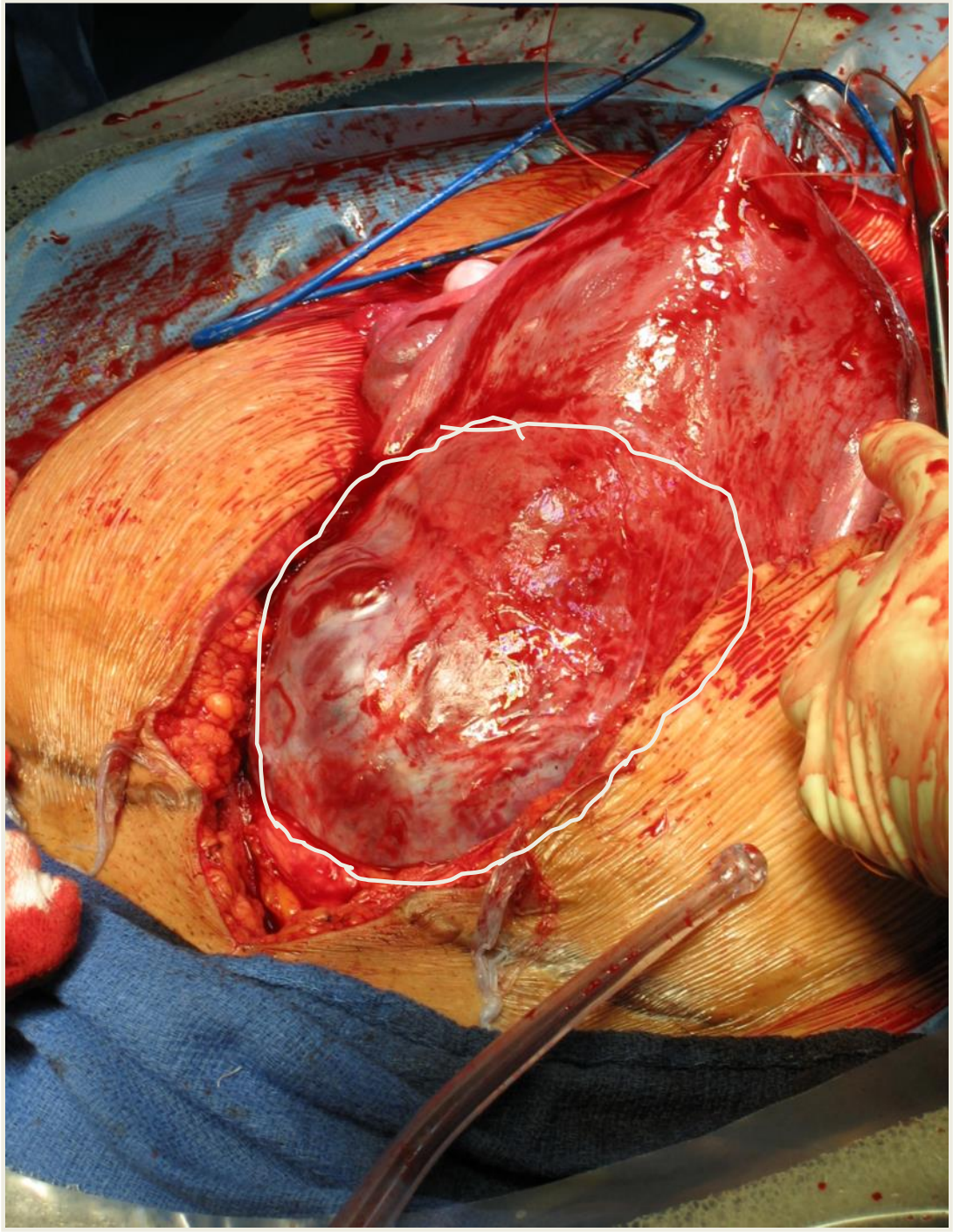
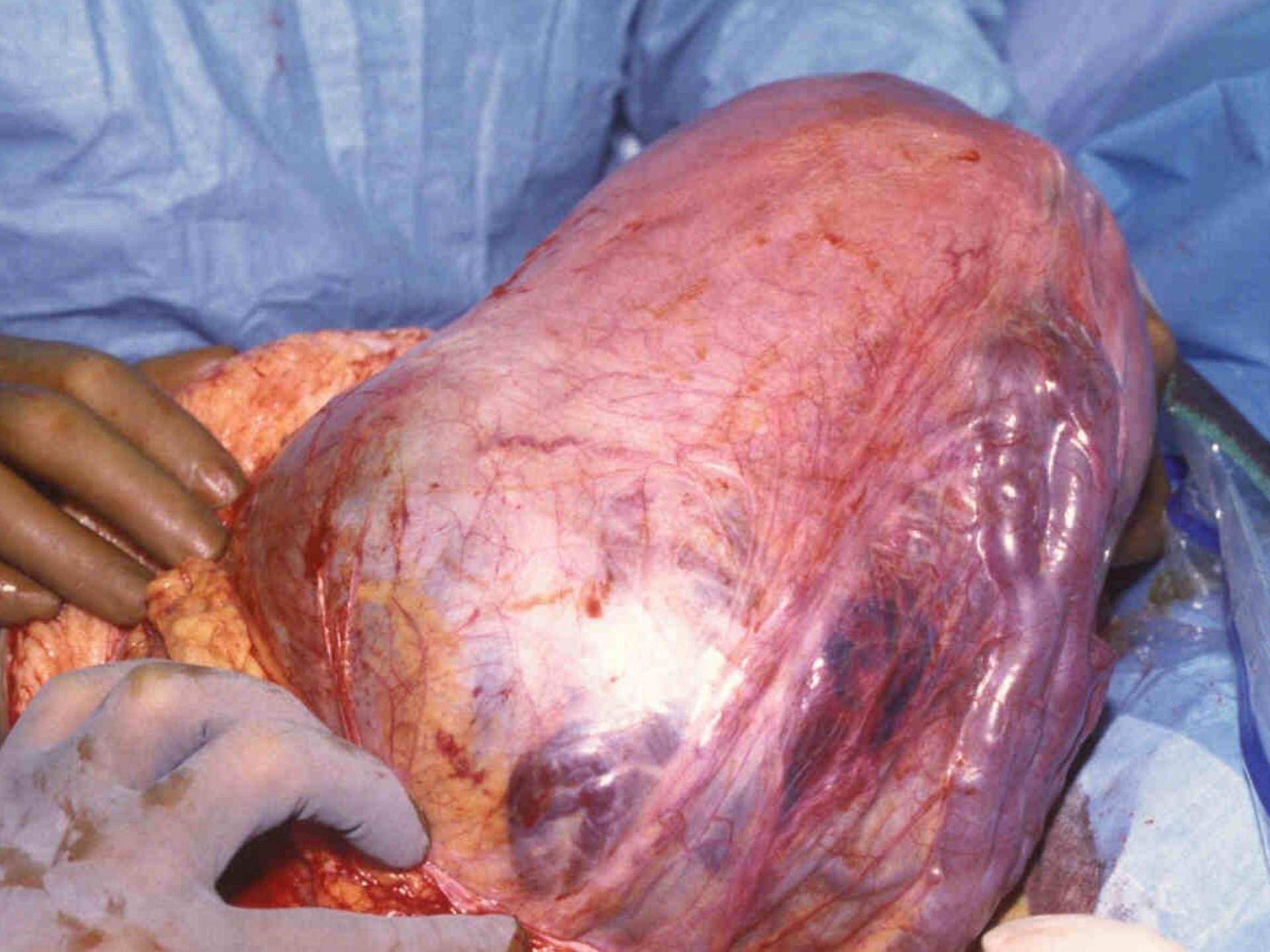
Coagulation, sealing and cutting technology







The Bladder in Percreta

Think of the bladder as a large collateral vessel between the internal iliac artery, the aorta and the placenta – superior vesical art.

Even when the ***internal iliac is ligated*** the collaterals from the aorta: via inferior mesenteric, last lumbar and median sacral arteries

The bladder feeds the placenta!

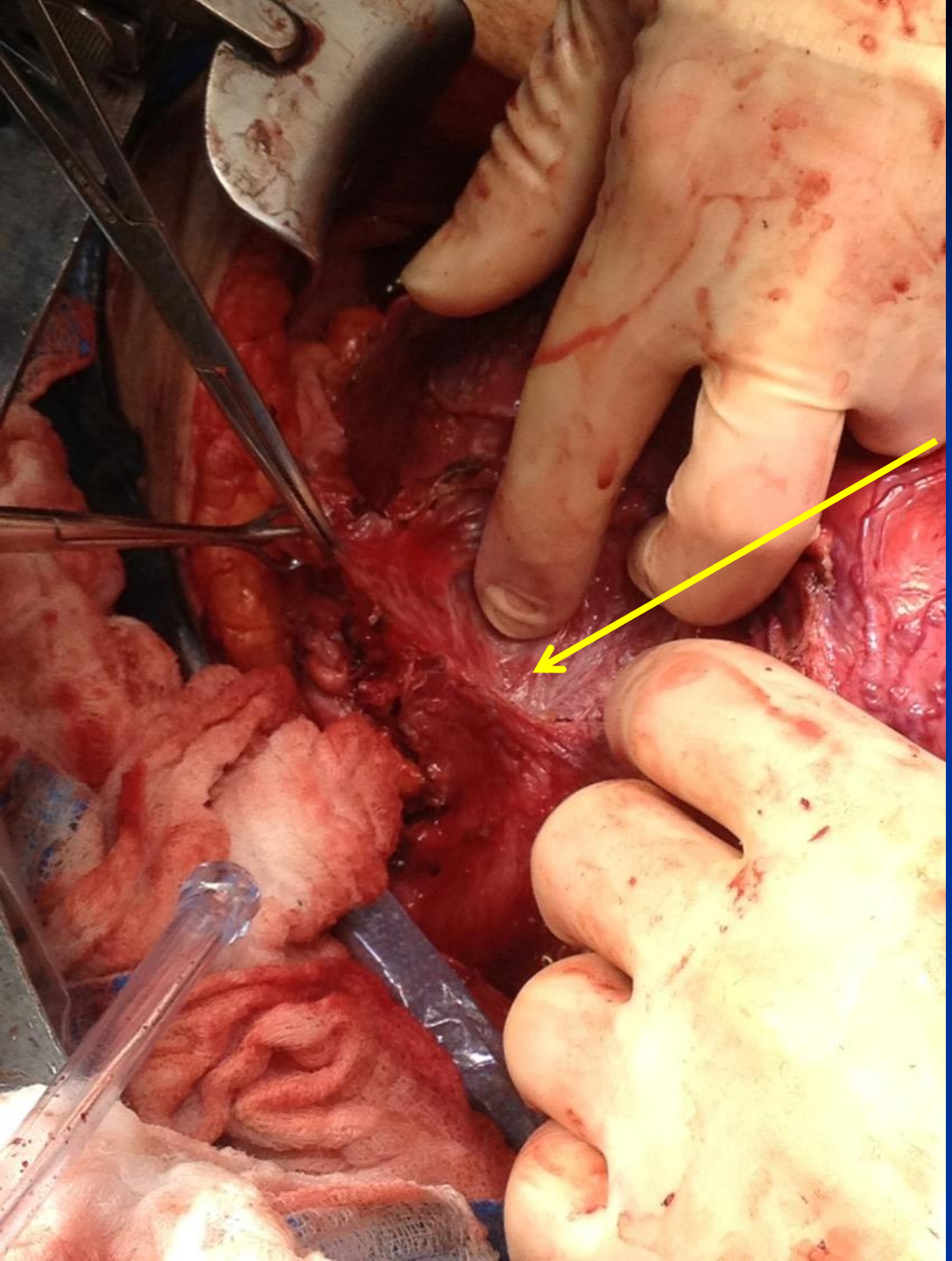
Suggested Approach- Bladder

- Resect bladder invasion rather than extensive dissection – fill the bladder with 150ml saline

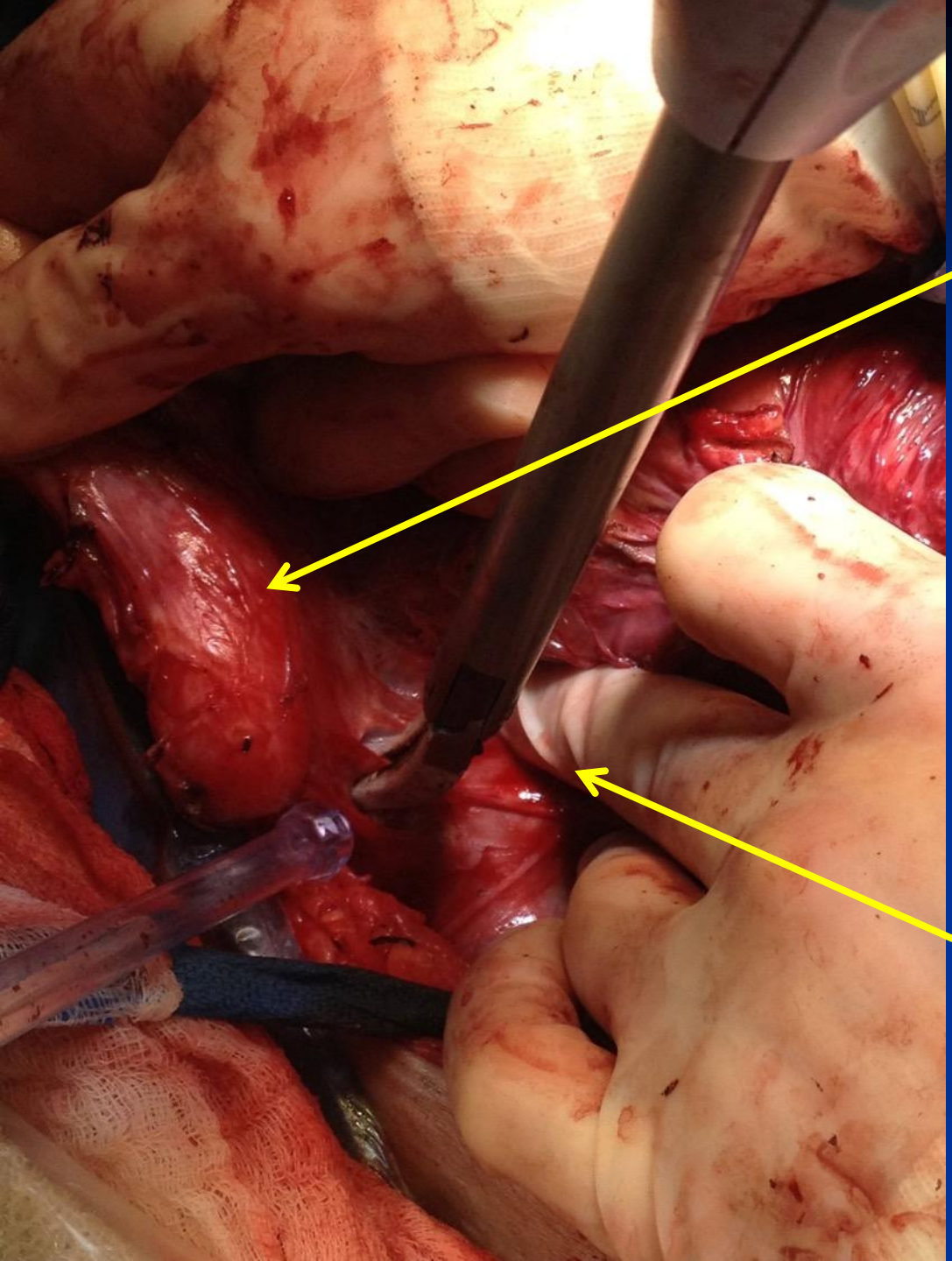
- Control blood supply before dissection from uterus
  - Uterine/iliac/superior vesical & collaterals
    +/- retroperitoneal dissection

- If cannot control uterine arteries before dissection try posterior approach - be careful of ureters (stents!!)

- Cystotomy & dissect/resect under direct visualization
  - Limits danger of damaging the ureters/trigone
  - Leave Foley in for 7 – 10 days



Bladder stuck to placenta



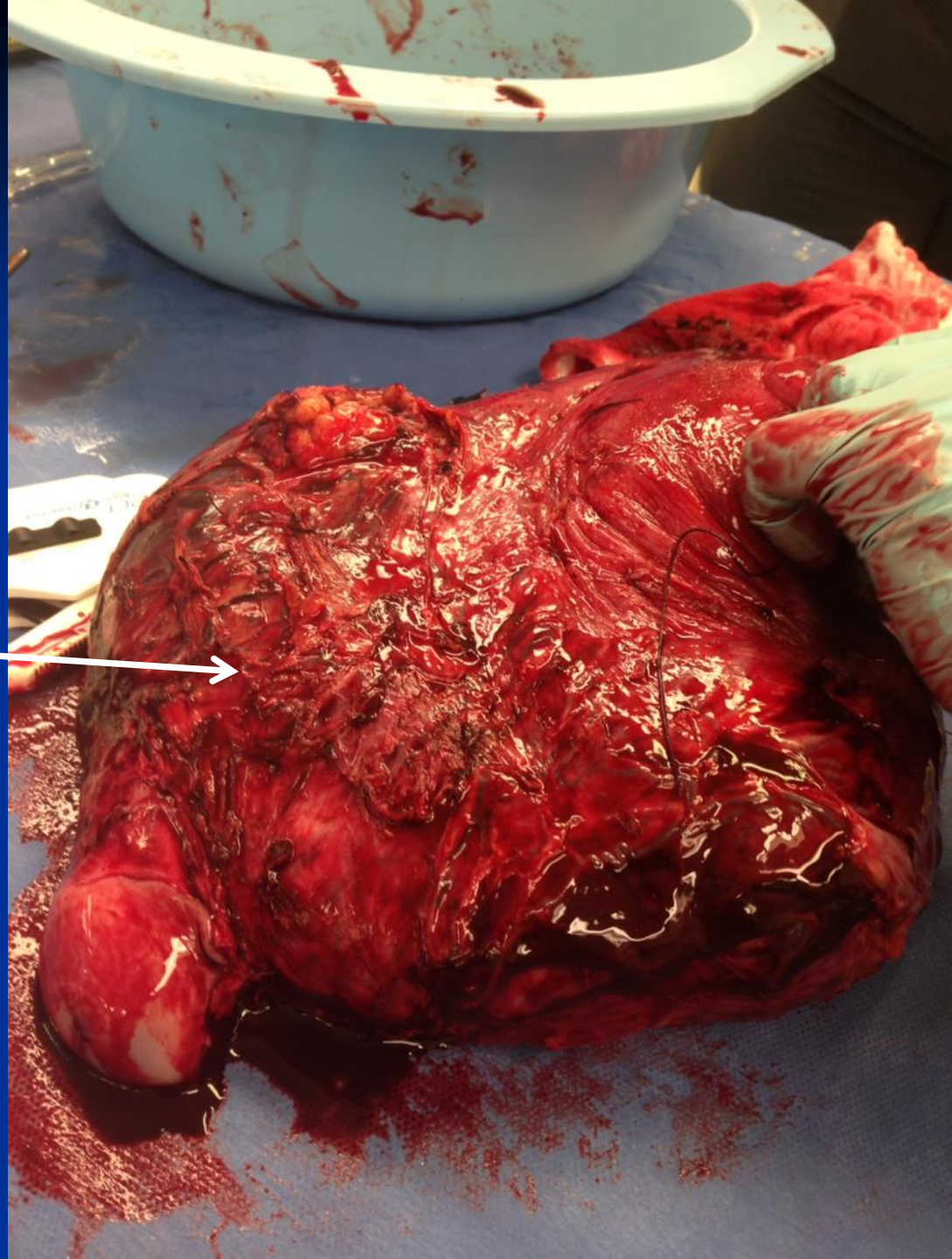
Filled bladder

Coagulation and sealing device used to separate bladder very carefully!

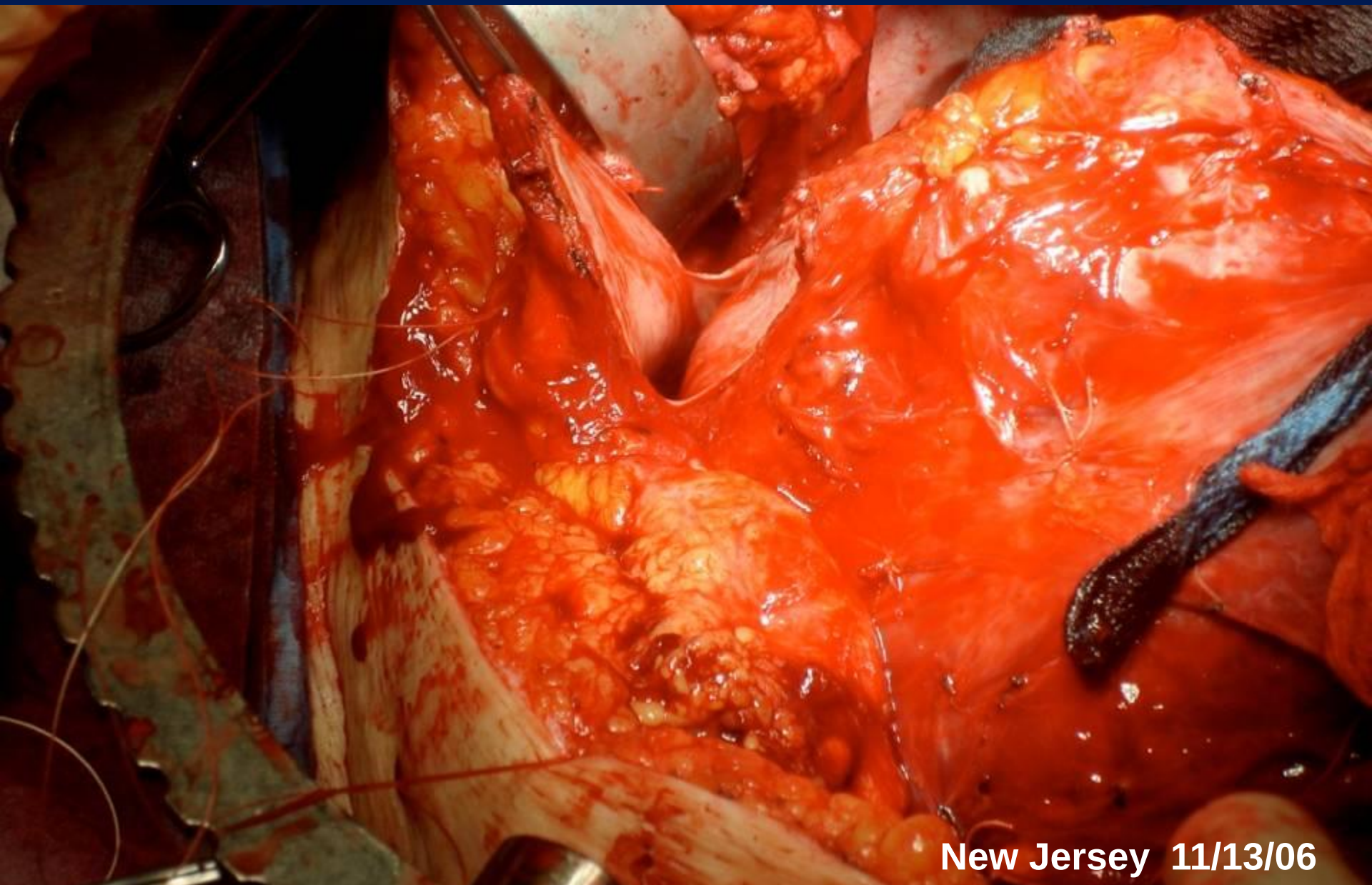
May need to reimplant ureters

What do you gain from this?

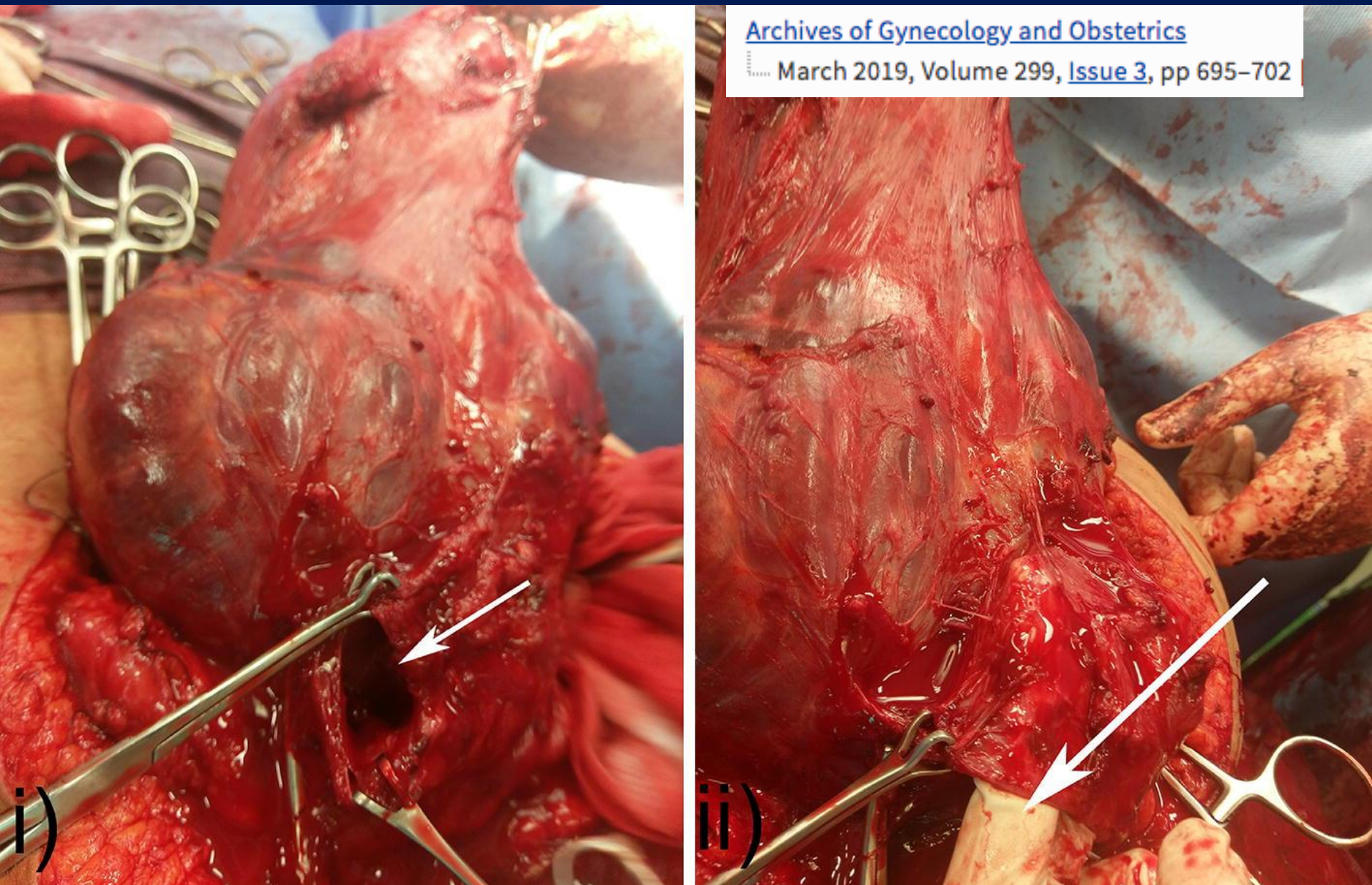
Bladder muscle left on uterus after dissection

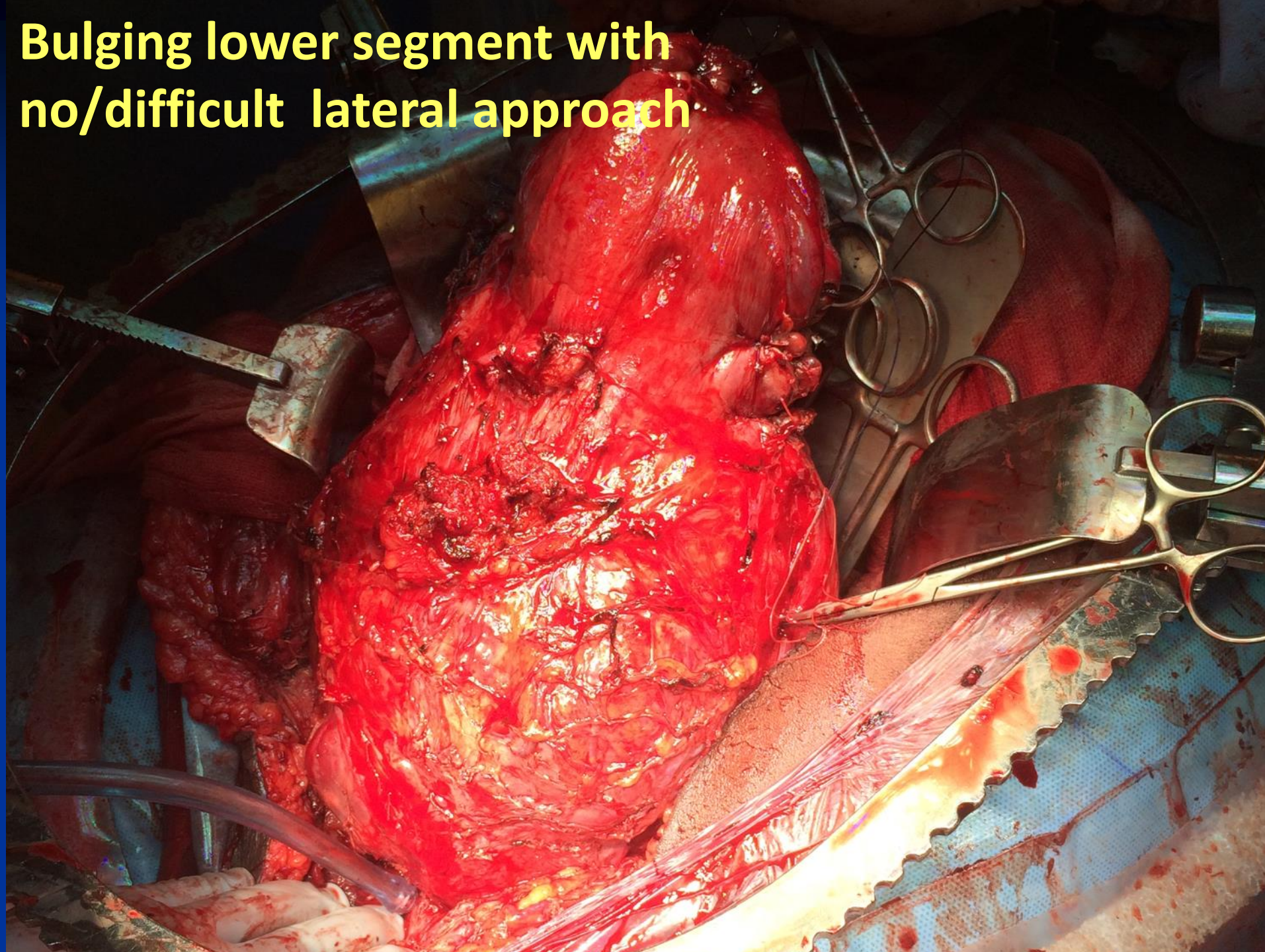


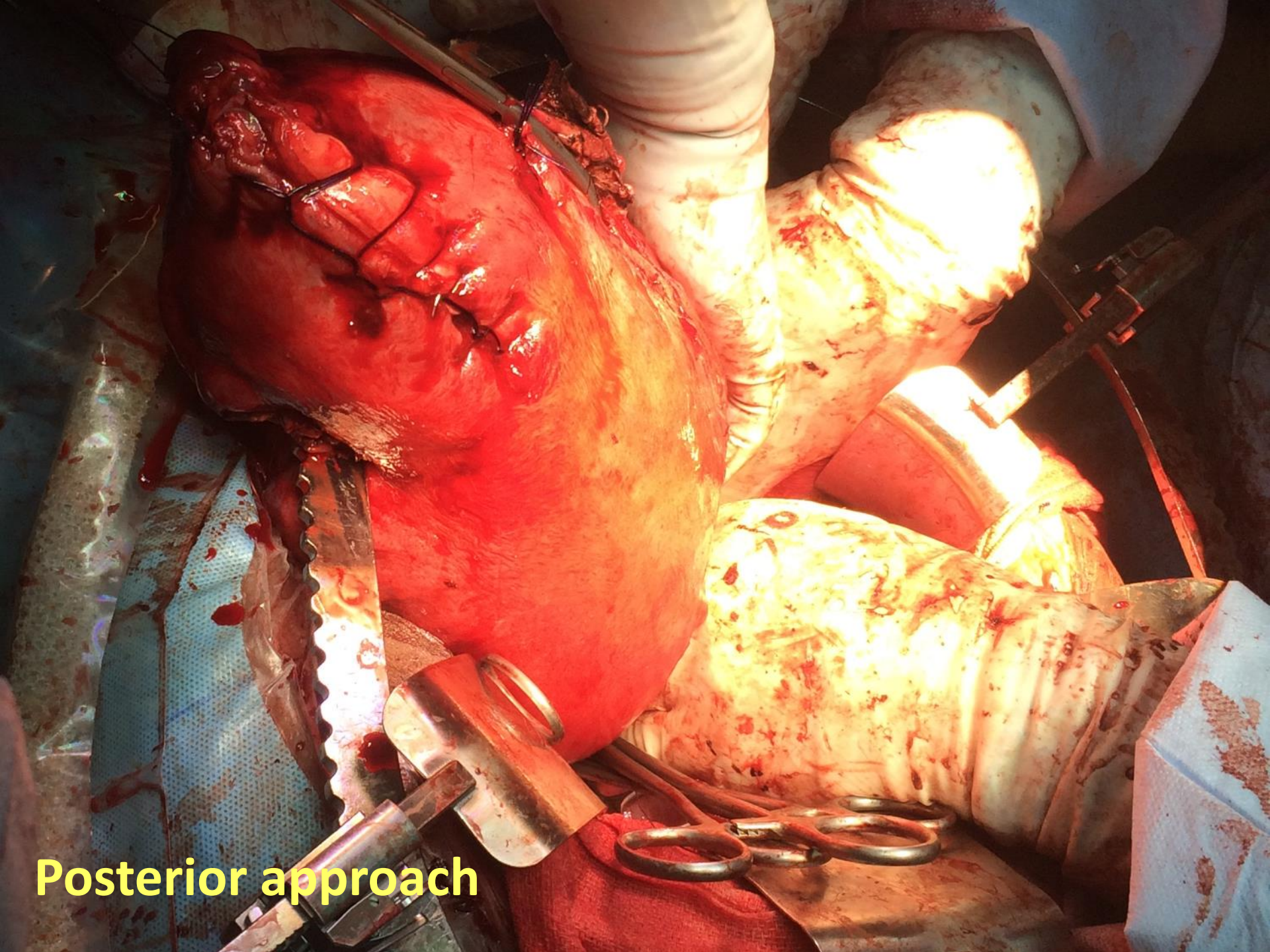
Deliberate Cystotomy



Deliberate Cystotomy

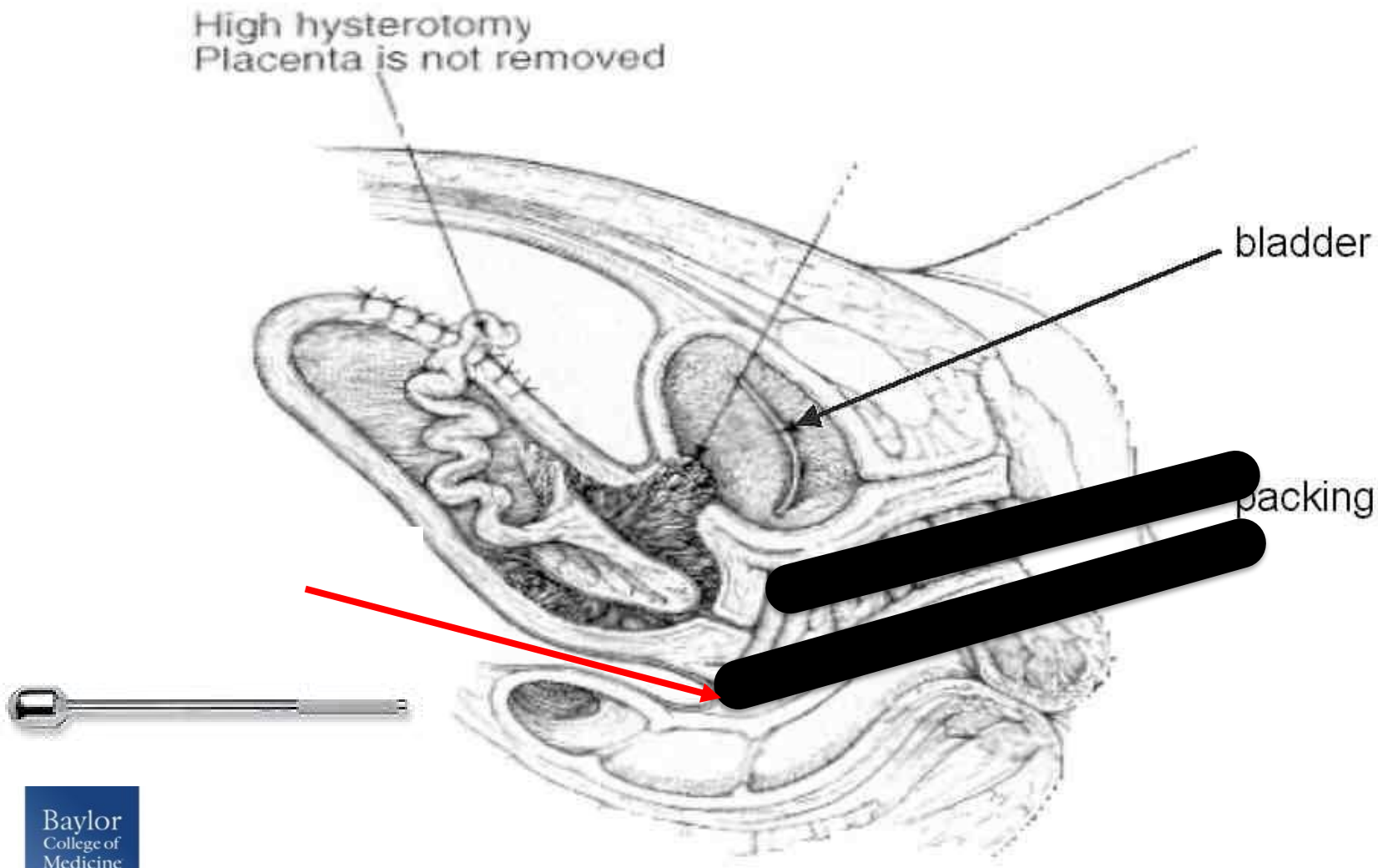



Bulging lower segment with
no/difficult lateral approach


Posterior approach

Suggested Approach- Packing vs. EEA

- Pack vagina (Pelosi 1999) or "EEA" device (unpublished)



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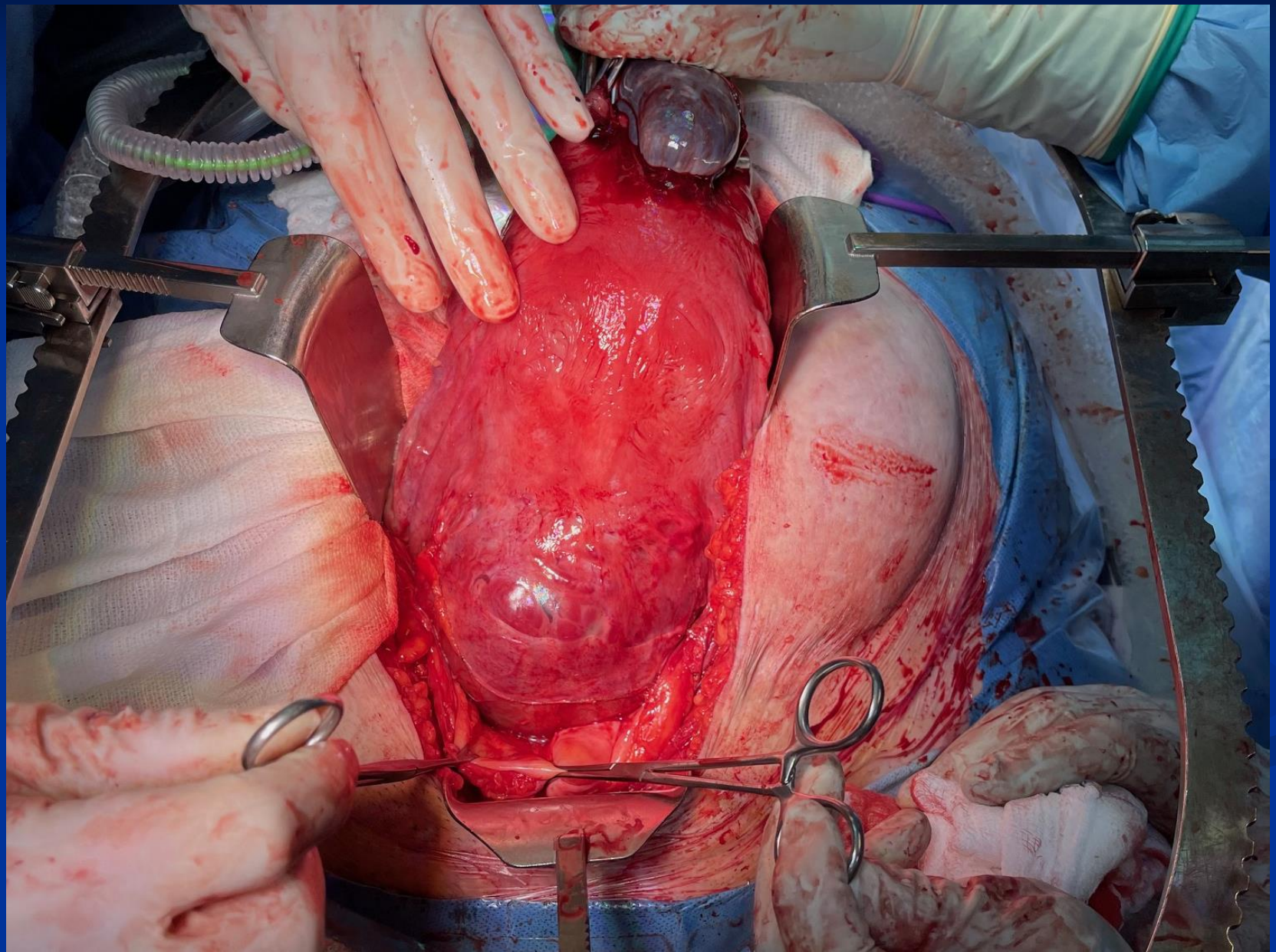
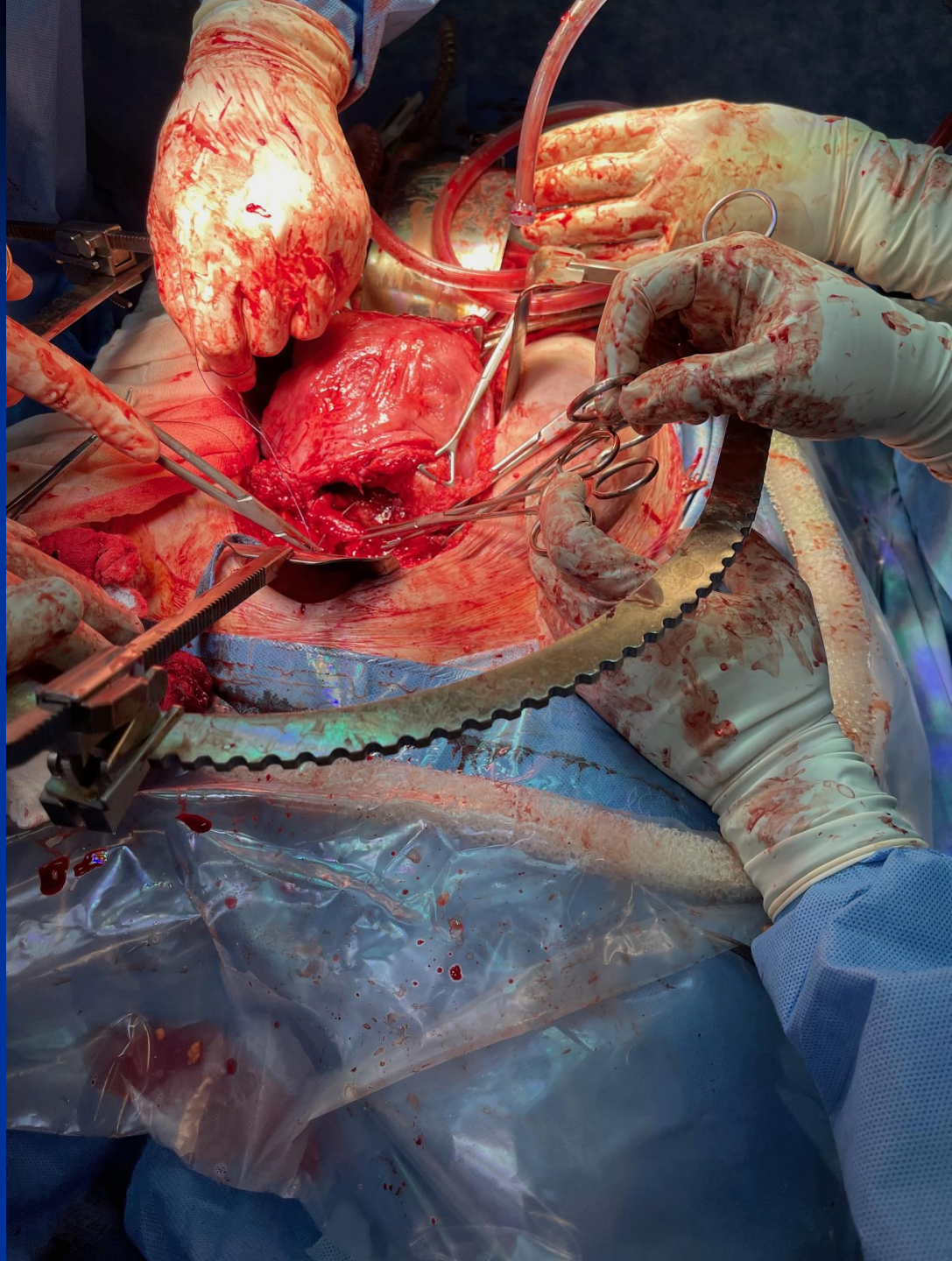
Conservative Mx

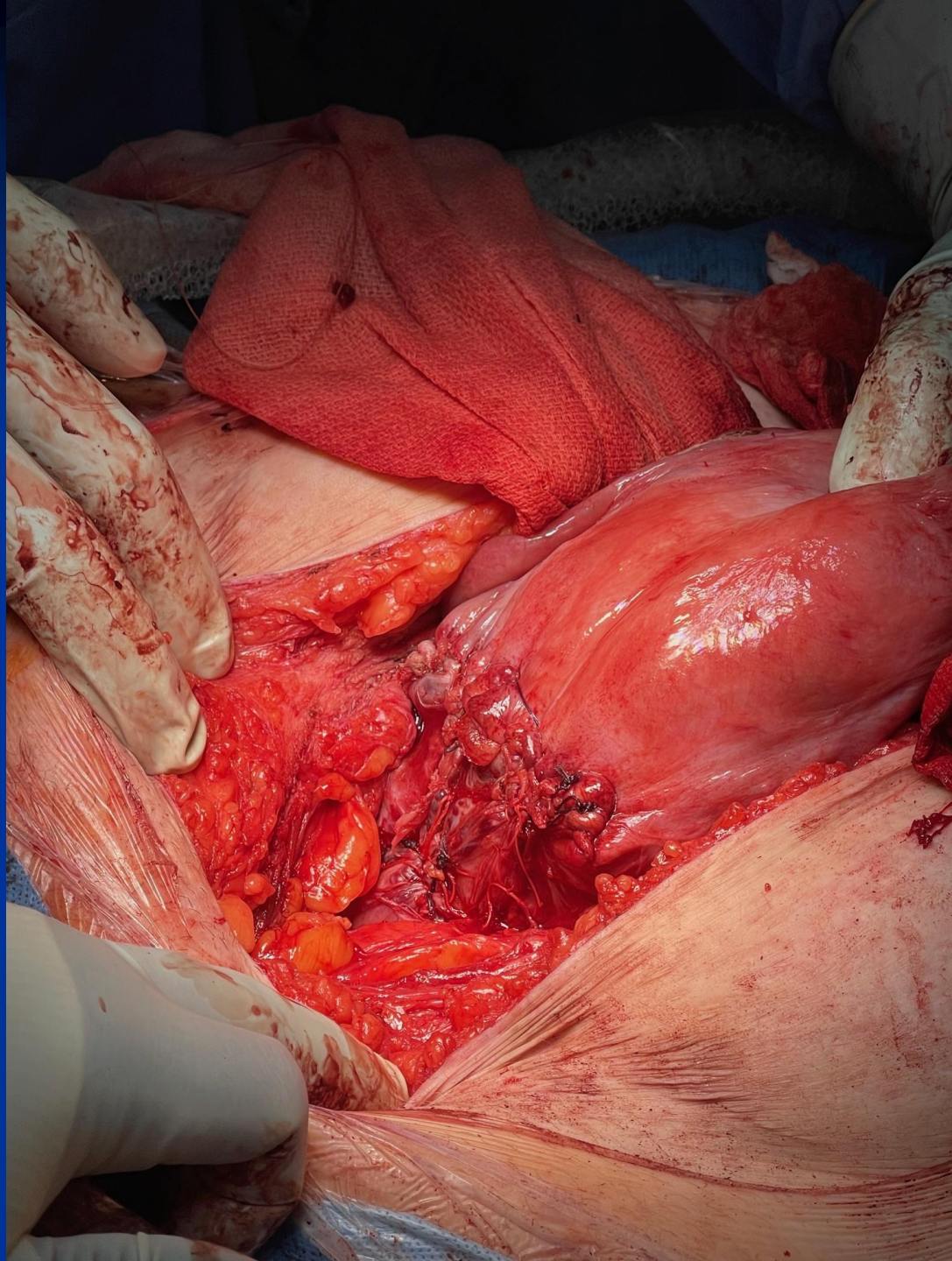


Conservative Mx

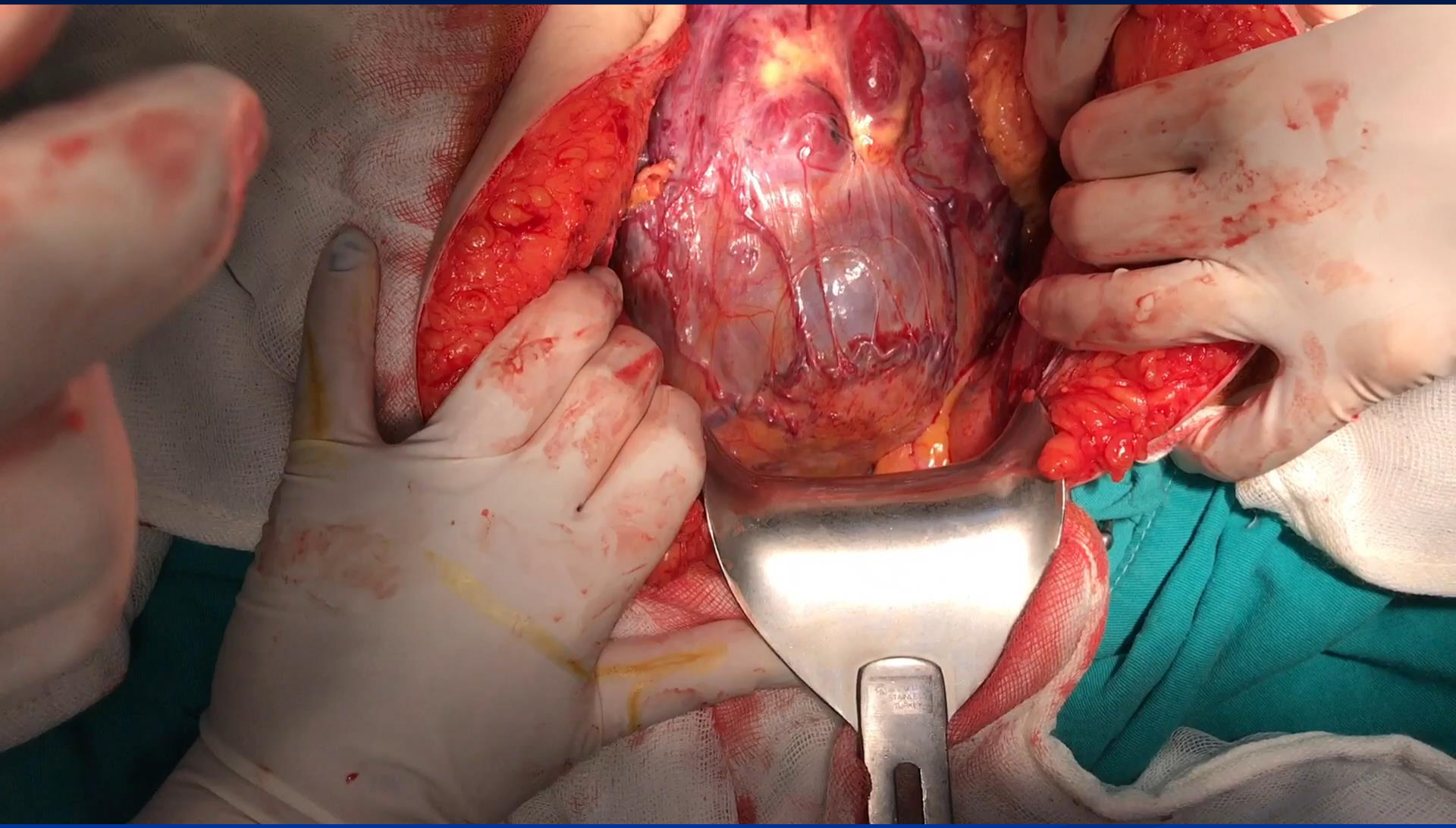
Definitely has a place when the uterine arteries and cervix can be easily accessed



Conservative Mx



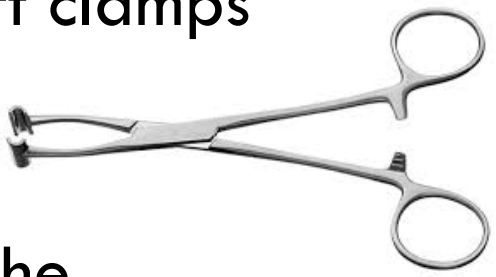
Excision of Placental Bed – aortic occlusion



Courtesy: Prof. Ismail Celik - Turkey

Practical Points for Focal Accreta

- Open uterus with diathermy (a la fetal surgery technique) and clamp edges with Smith-Pratt clamps
  - deliver baby and place tourniquet



- Make sure you can feel the entire edge of the placenta all the way round

- Inject hemabate intramyometrially (Prostaglandin F2a)
  - 250 micrograms/20cc saline – 22G spinal needle

- Separate placenta to point of focal invasion and then resect invaded myometrium

- Close in 2-3 layers

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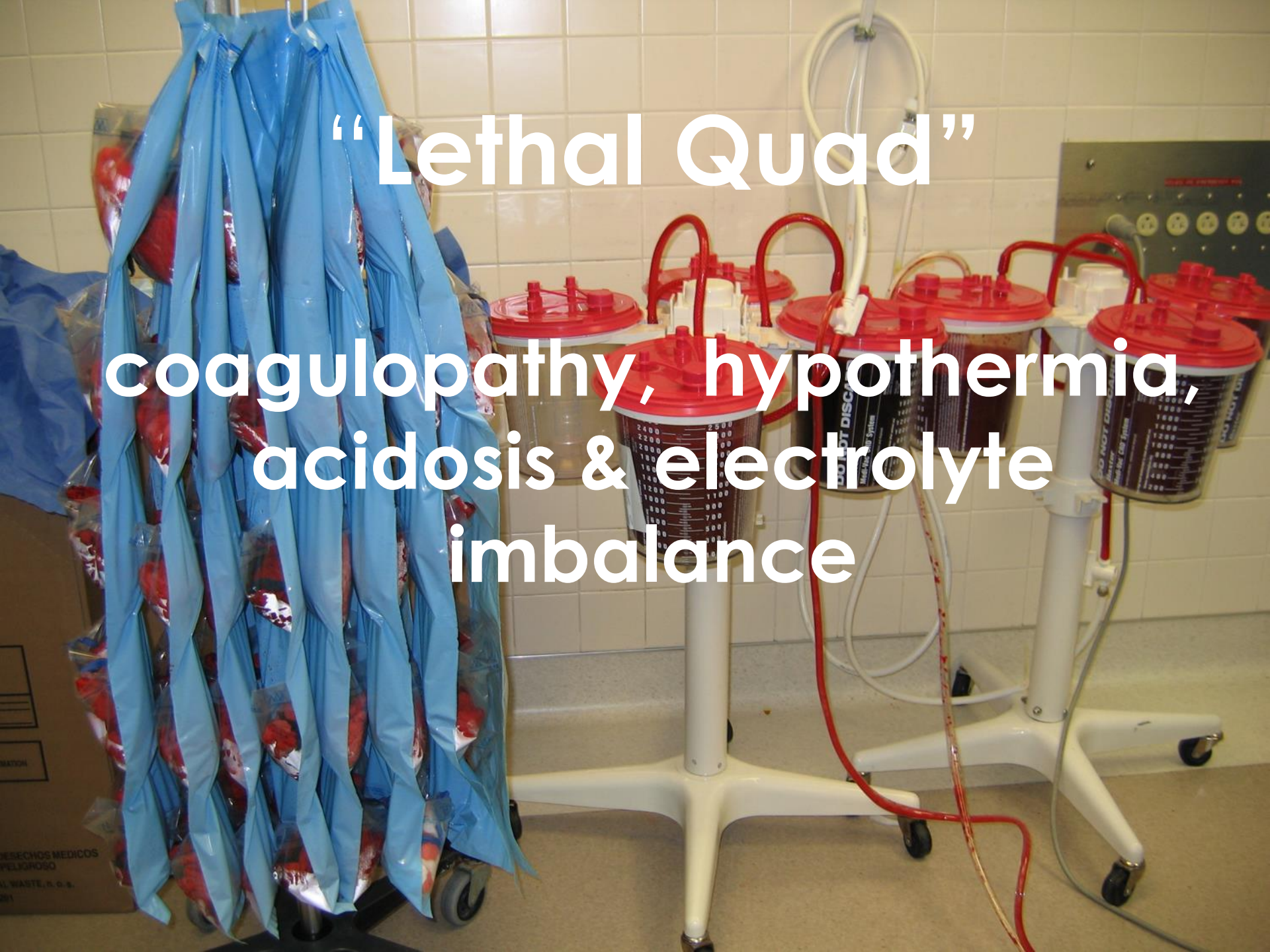

"Lethal Quad"
coagulopathy, hypothermia, acidosis & electrolyte imbalance

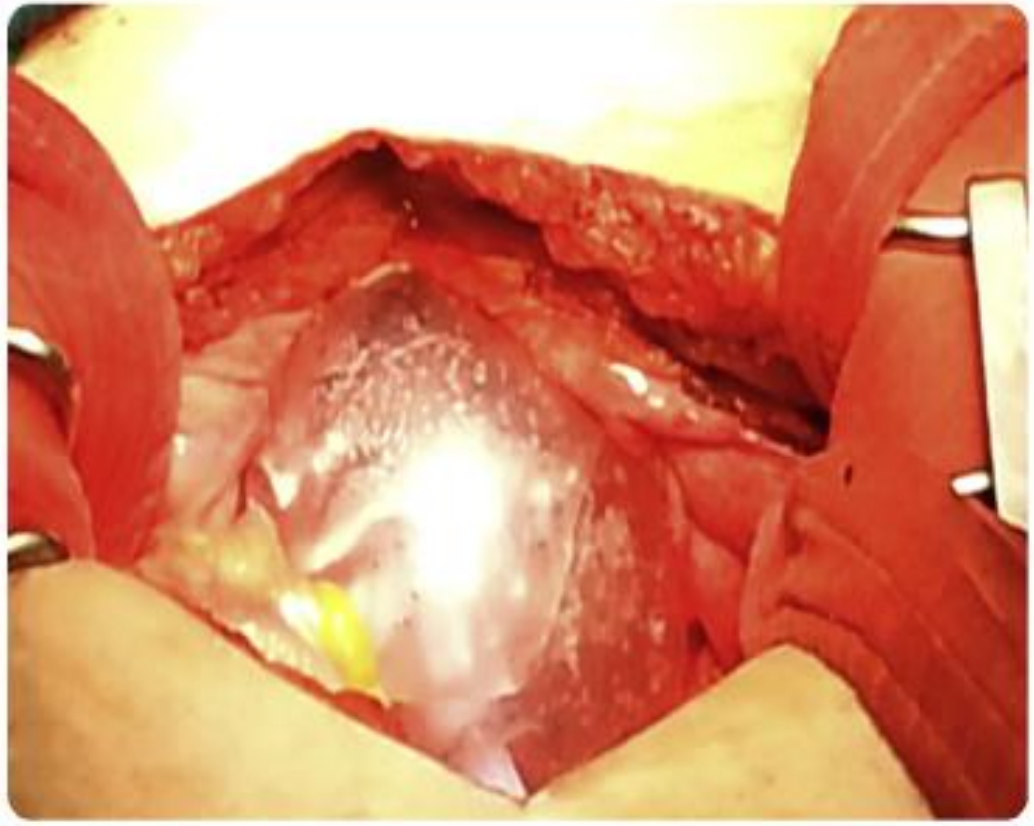
Intra Operative Blood Loss Mx

- **Avoid coagulopathy !!!!!!**
  - Check Hct/platelets/PT/PTT/fib/Rotem/ABG q 15 min
  - Use cryoppt/Fibrinogen concentrate (RiaSTAP) or 4 Factor Prothrombin Complex Concentrate (PCC) (Kcentra) if coagulopathic - ? Factor VIIa (potentially thrombogenic)
  - Fibrinogen < 300 mg/dl is a **warning** - < 200mg/dl give cryoppt or fibrinogen concentrate (Riastap or Fibryga)
  - FFP alone will NOT normalize very low fibrinogen!
- **Avoid acidosis (bicarb)**
- **Avoid hypothermia**
- **Check K+ and Ca++ frequently, Mx with Ca++ and insulin/glucose aggressively**

Effective use of the Bakri postpartum balloon for posthysterectomy pelvic floor hemorrhage

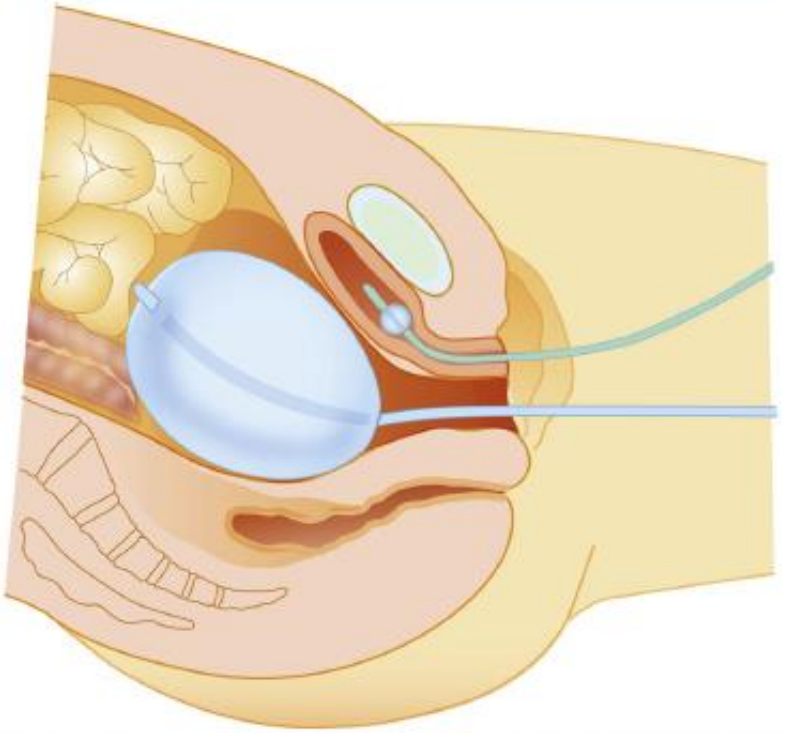
Kittipat Charoenkwan, MD

FIGURE 4
The balloon in place



Charoenkwan. Posthysterectomy pelvic packing balloon. Am J Obstet Gynecol 2014.

FIGURE 2
Positioning the balloon

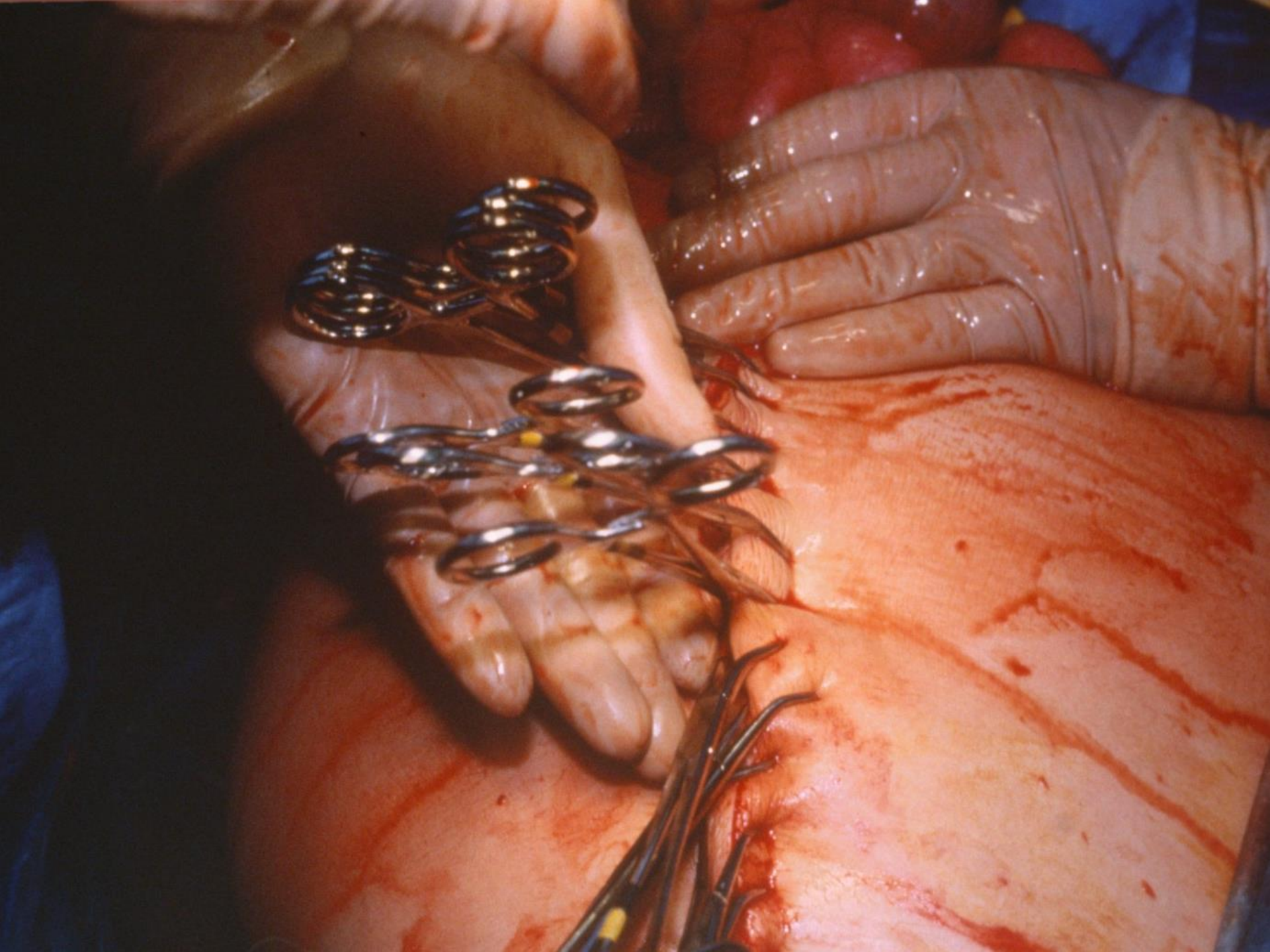


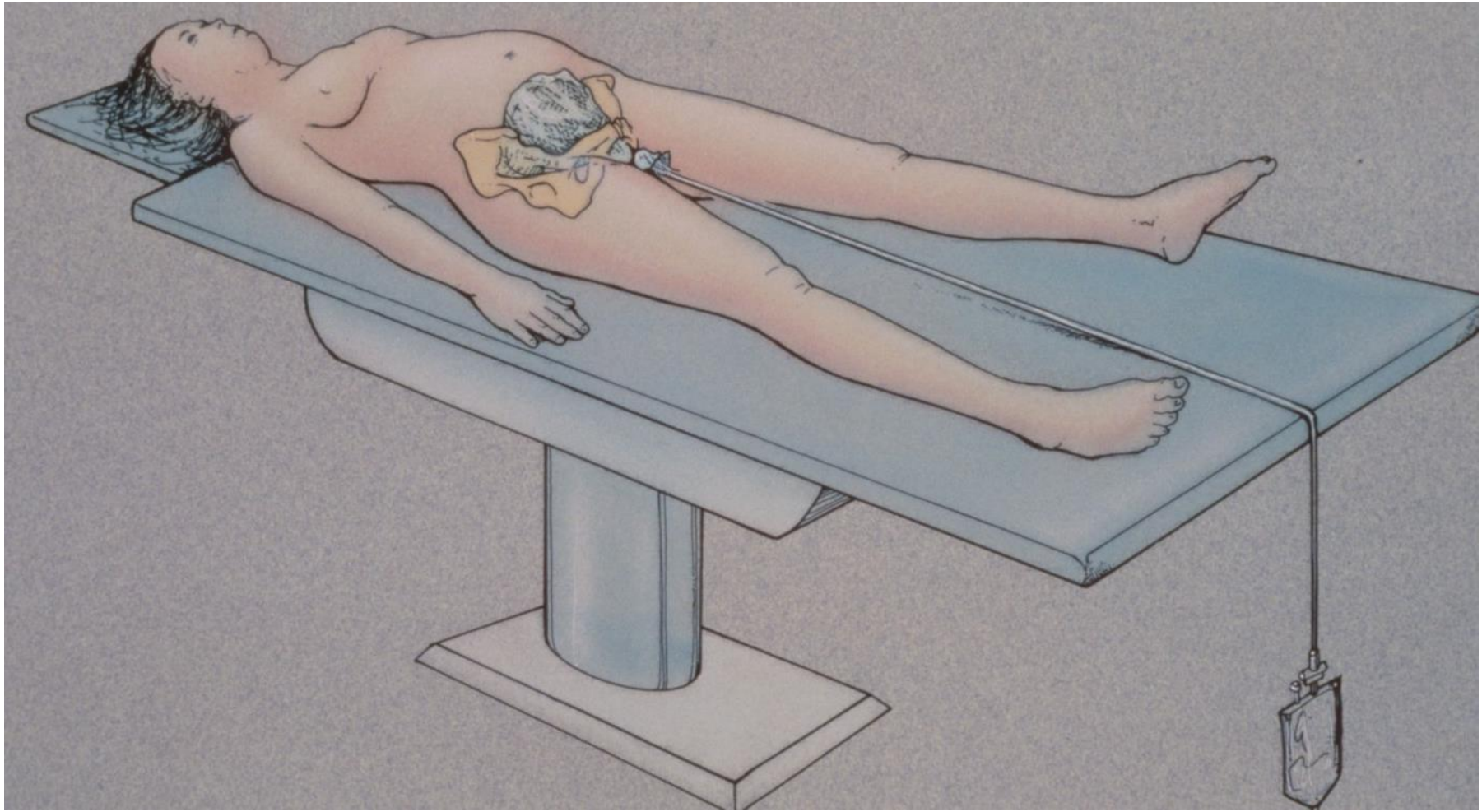
When proper tamponade position is achieved, the balloon is inflated gradually with sterile normal saline solution through the reattached stopcock. The balloon is filled up to the minimal volume that effectively compresses against the pelvic floor and successfully controls the hemorrhage.

Charoenkwan. Posthysterectomy pelvic packing balloon. Am J Obstet Gynecol 2014.

OFF LABEL use – Not approved by FDA for this use.

COI: I designed a similar device and have stock in the company that makes it





Open Abdomen vs Towel Clamp plus Drain

- Very rare (actually never in our experience)
- Open abdomen may be an option in ongoing severe bleeding
- Do not remove an actively bleeding patient to an IR suite!!!!
- If you do towel clip leave a drain in-situ to alert as to bleeding – the recently pregnant abdomen will accommodate 5L of blood before it becomes distended and will NOT tamponade

Methotrexate

Just Don't do it!

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Log-linear human chorionic gonadotropin elimination in cases of retained placenta percreta

Arch Gynecol Obstet (2014) 289:259–262

Michael L. Stitely · M. Gerard Jackson · William H. Holls

was one maternal death related to myelosuppression and nephrotoxicity from the intraumbilical instillation of methotrexate [9].

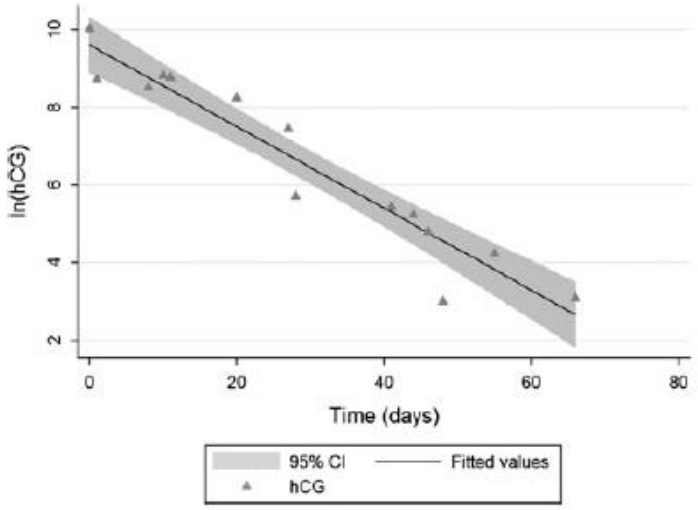

Table 1 Half-life of hCG elimination from study subjects and other selected authors

	Mean $T_{1/2}$ (h)
Study patients with retained placenta percreta	146.3
Retained placenta accreta prior to delayed placental removal (5)	125.0
Retained placenta percreta with methotrexate therapy (6)	139.2
Normal delivery (4)	32.2

No difference

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THANK YOU

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HARRIS HEALTH SYSTEM