Robotic Cystectomy and Intra-corporeal Urinary Diversion

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Open Radical Cystectomy (ORC)

- ORC is the gold standard for treatment of muscle-invasive bladder cancer
- Role in high risk non-muscle invasive bladder cancer

Components of ORC

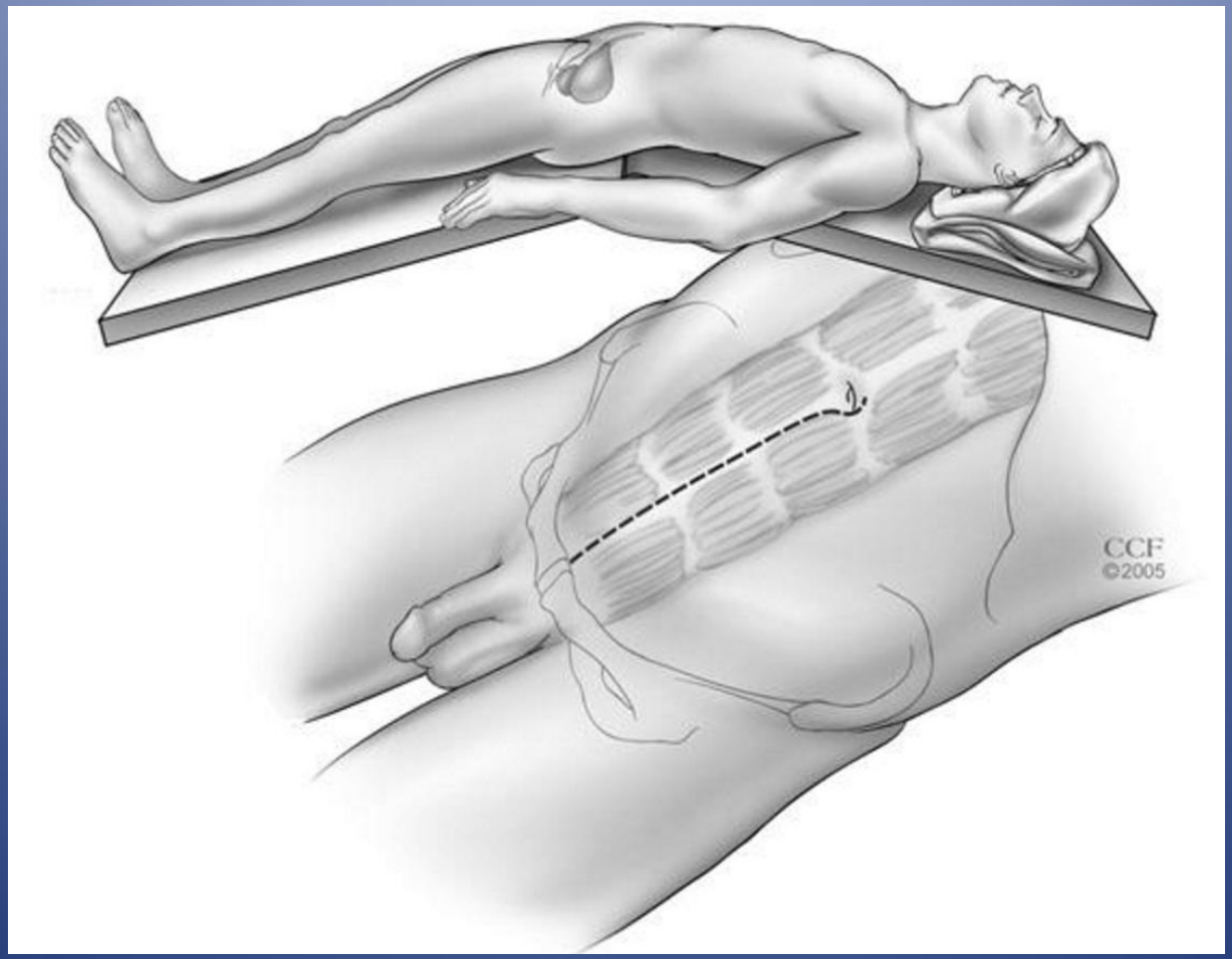
Extirpative components:

1) Removal of bladder along with:
   - prostate and seminal vesicles in men
   - uterus, fallopian tubes, ovaries and anterior vagina in women
2) Extended pelvic lymph node dissection

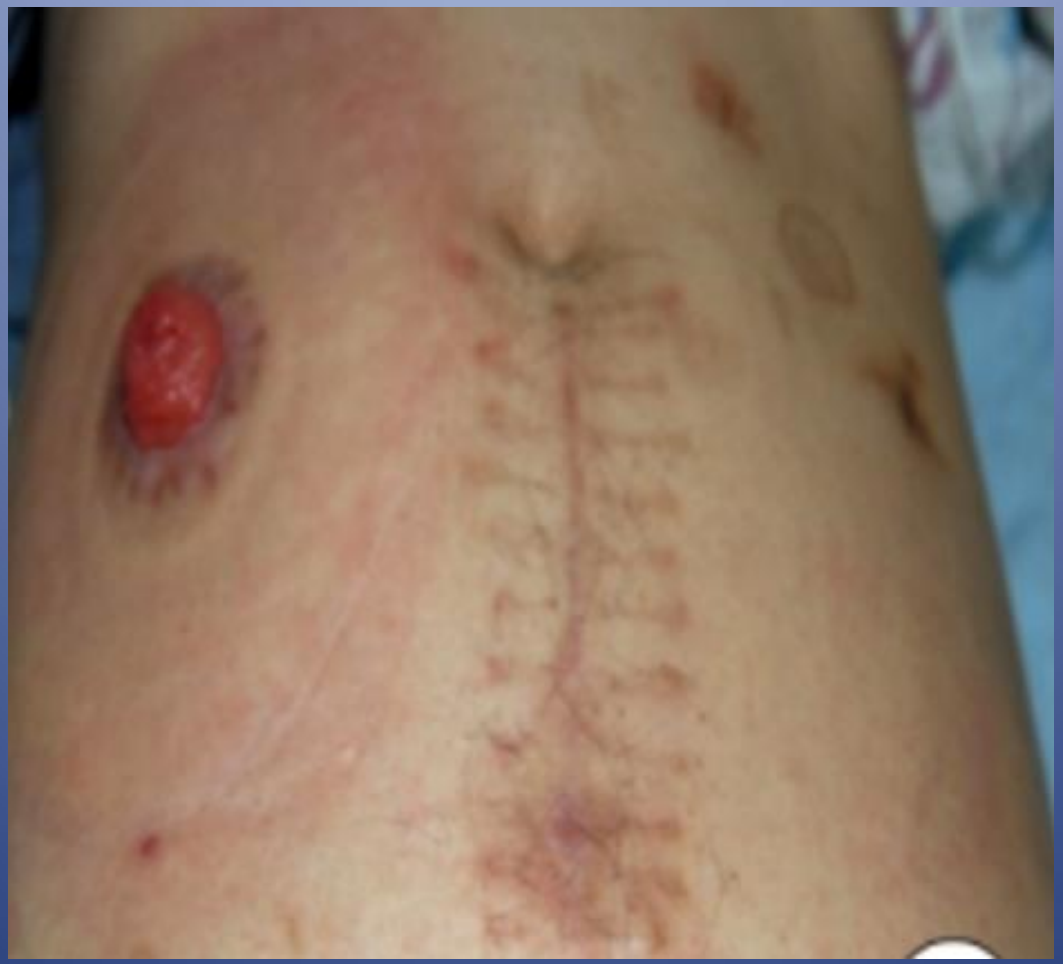
Reconstructive component:

3) Construction of urinary diversion eg. Ileal conduit or Neobladder

Open Radical Cystectomy (ORC)

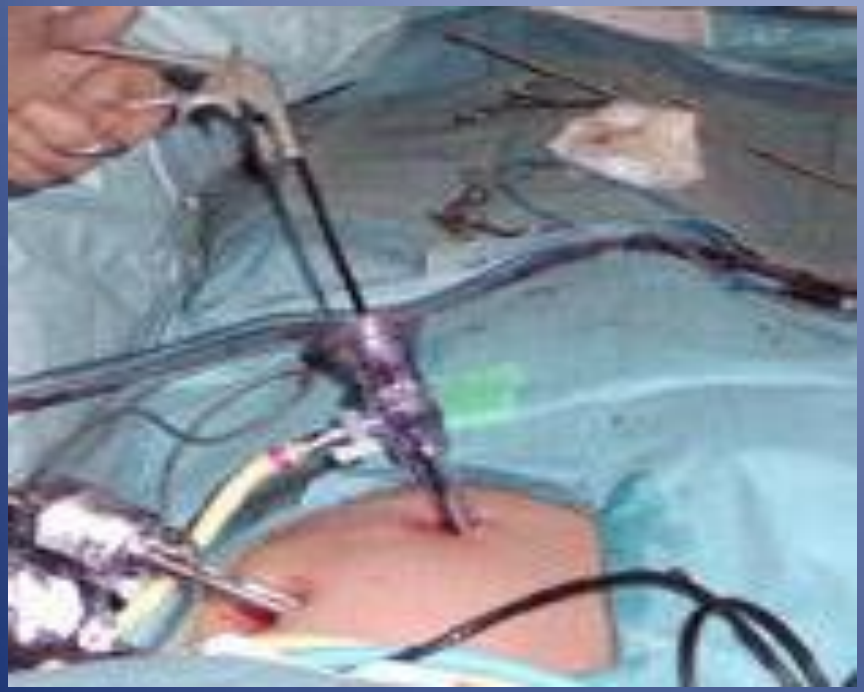


ORC with Ileal conduit



Minimally Invasive Radical Cystectomy

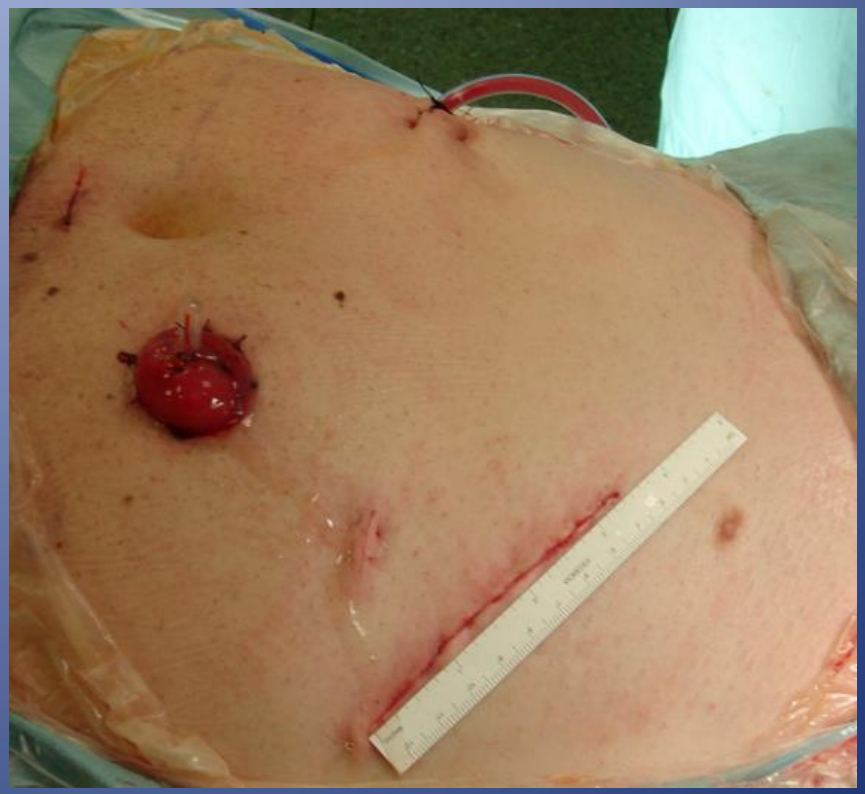
Laparoscopic Cystectomy - 1992



Robotic Cystectomy - 2003

RARC with ECUD

- Robotic cystectomy with **extra-corporeal** urinary diversion (ECUD) – involves large open incision



Bochner BH et al. Eur Urol. 2015

	Robotic	Open	P-value
By randomization arm/intention-to-treat	n = 60	n = 58	
Grade 3–5 complication, n (%)	13 (22)	12 (21)	0.9
Operative room time, min, mean	456	329	<0.001
Estimated blood loss, ml, mean	516	676	0.027
Hospital length of stay, d, mean	8 (3)	8 (5)	0.5
Positive surgical margin, n (%)	2 (3.3)	3 (5.2)	0.6
Lymph node–positive patients, n (%)	10 (17)	9 (16)	0.9
Lymph node yield, mean (SD) Standard dissection Extended dissection	 19.5 (10) 31.9 (12)	 18.9 (10) 30.0 (12)	 0.5 0.5

All 3 RCT published so far had extracorporeal diversions

RARC with ICUD

- Robotic cystectomy with intra-corporeal urinary diversion – **no open incision except for specimen retrieval in men**
- **Benefits:**

❖ Less paralytic ileus and associated GI complications

❖ Less blood loss

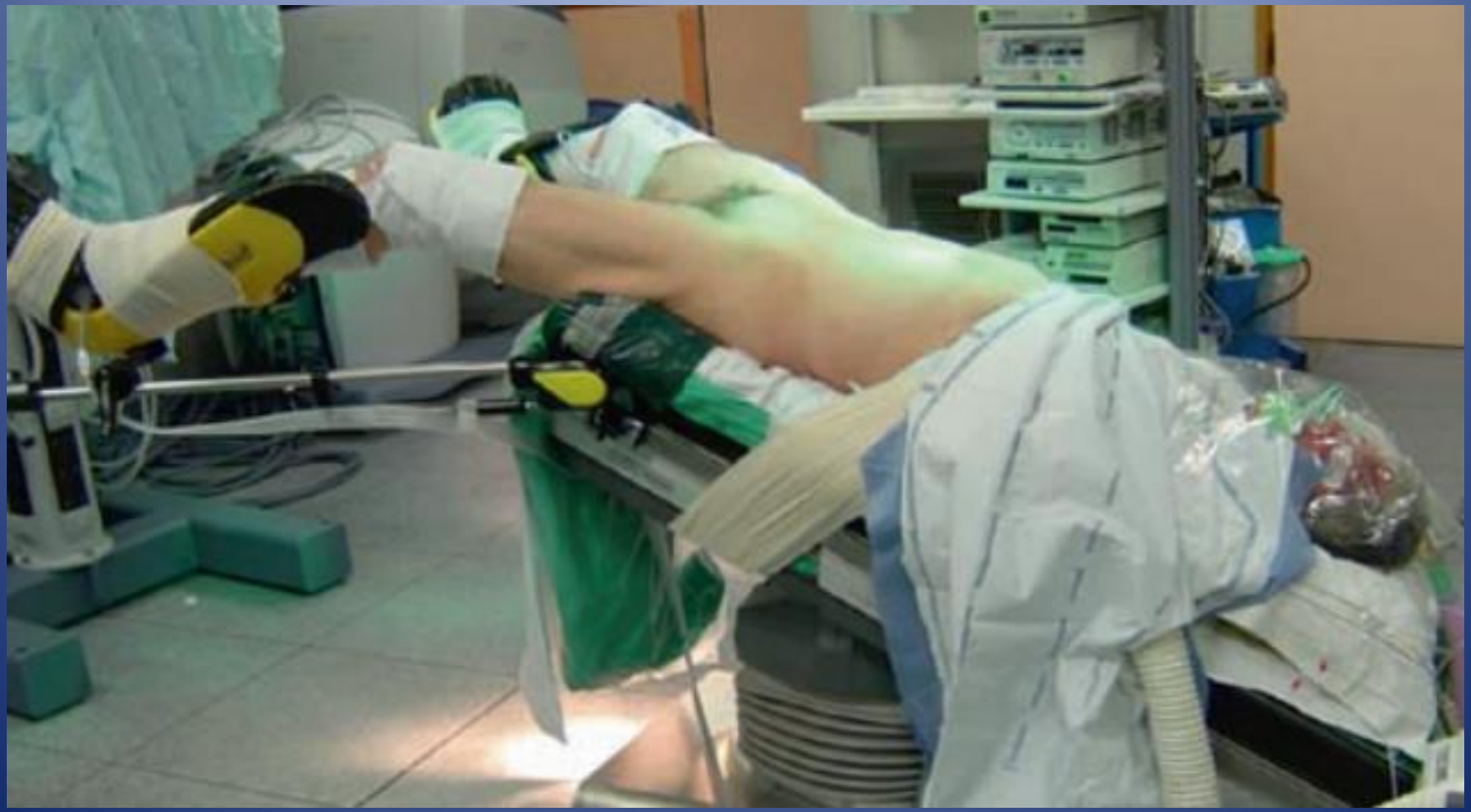
❖ Less need for analgesia

❖ Shorter hospital stay

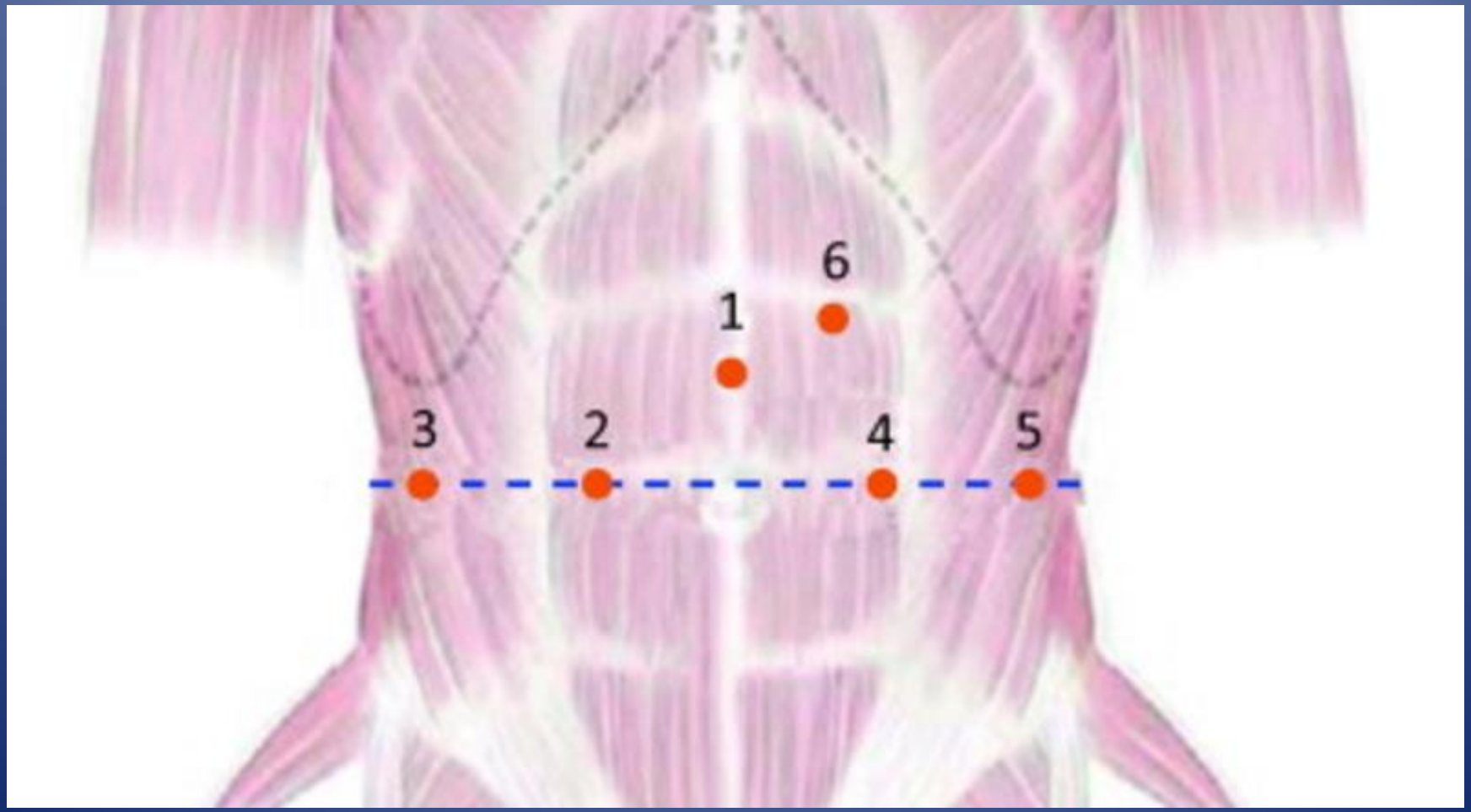
❖ ? Quicker overall recovery

da Vinci® surgical robot

Patient positioning



Port positions



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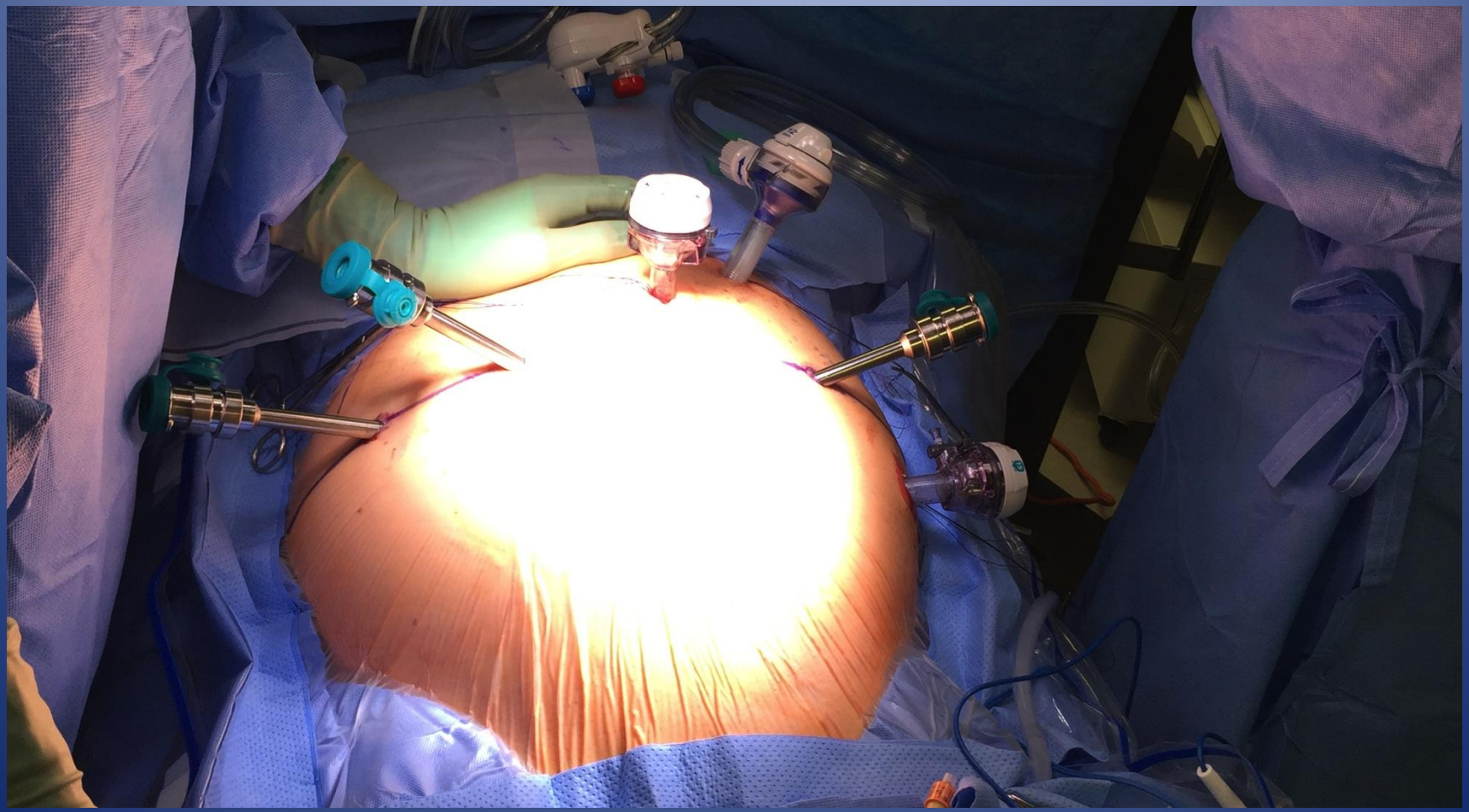
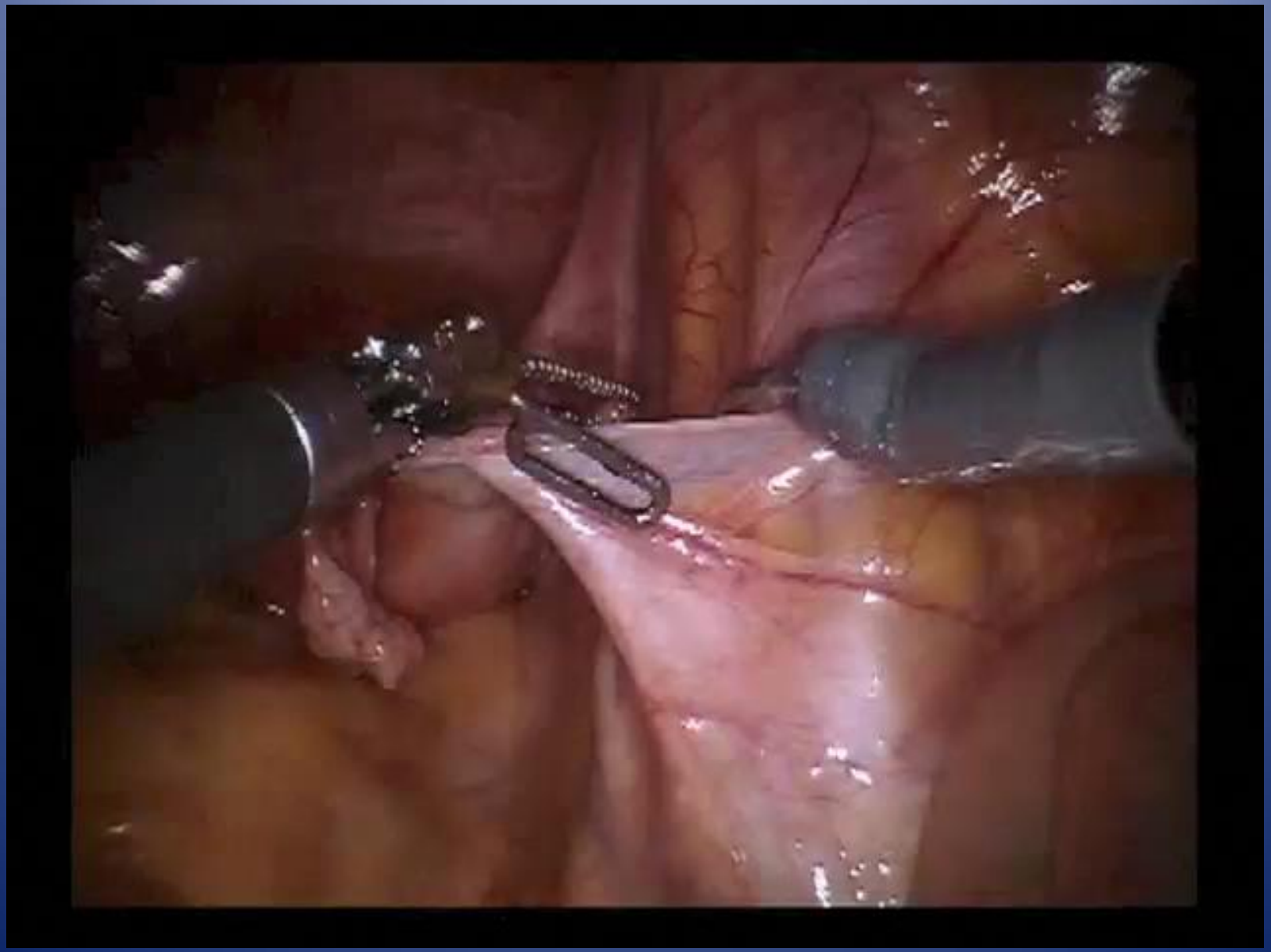


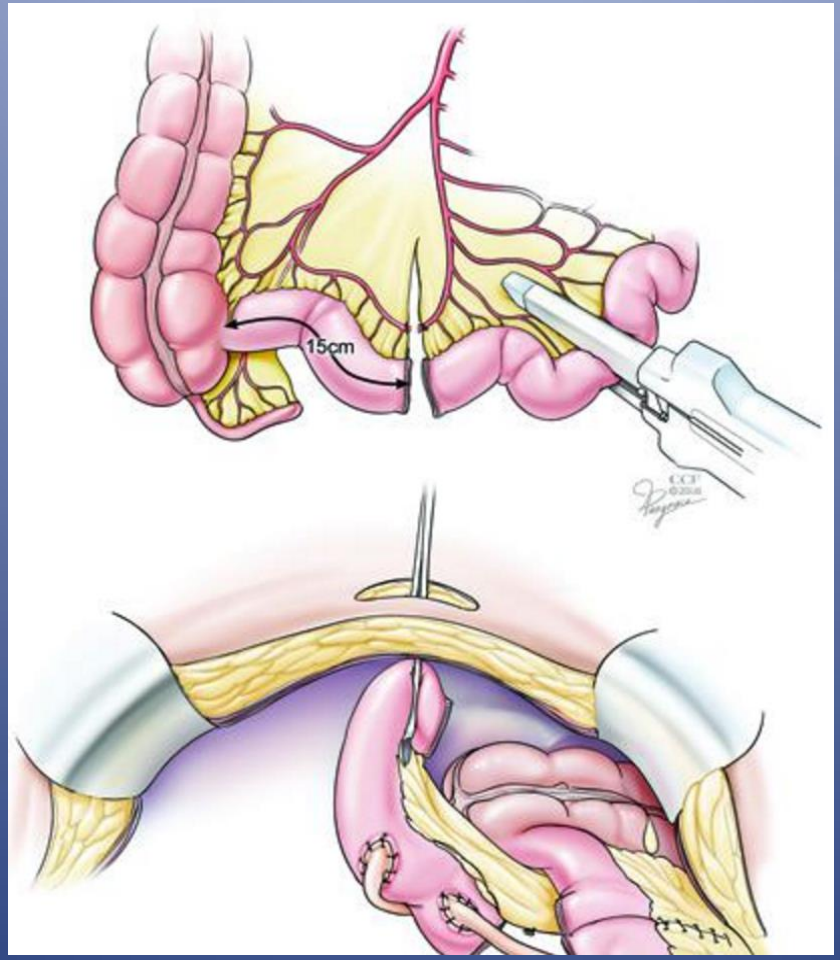
RARC video



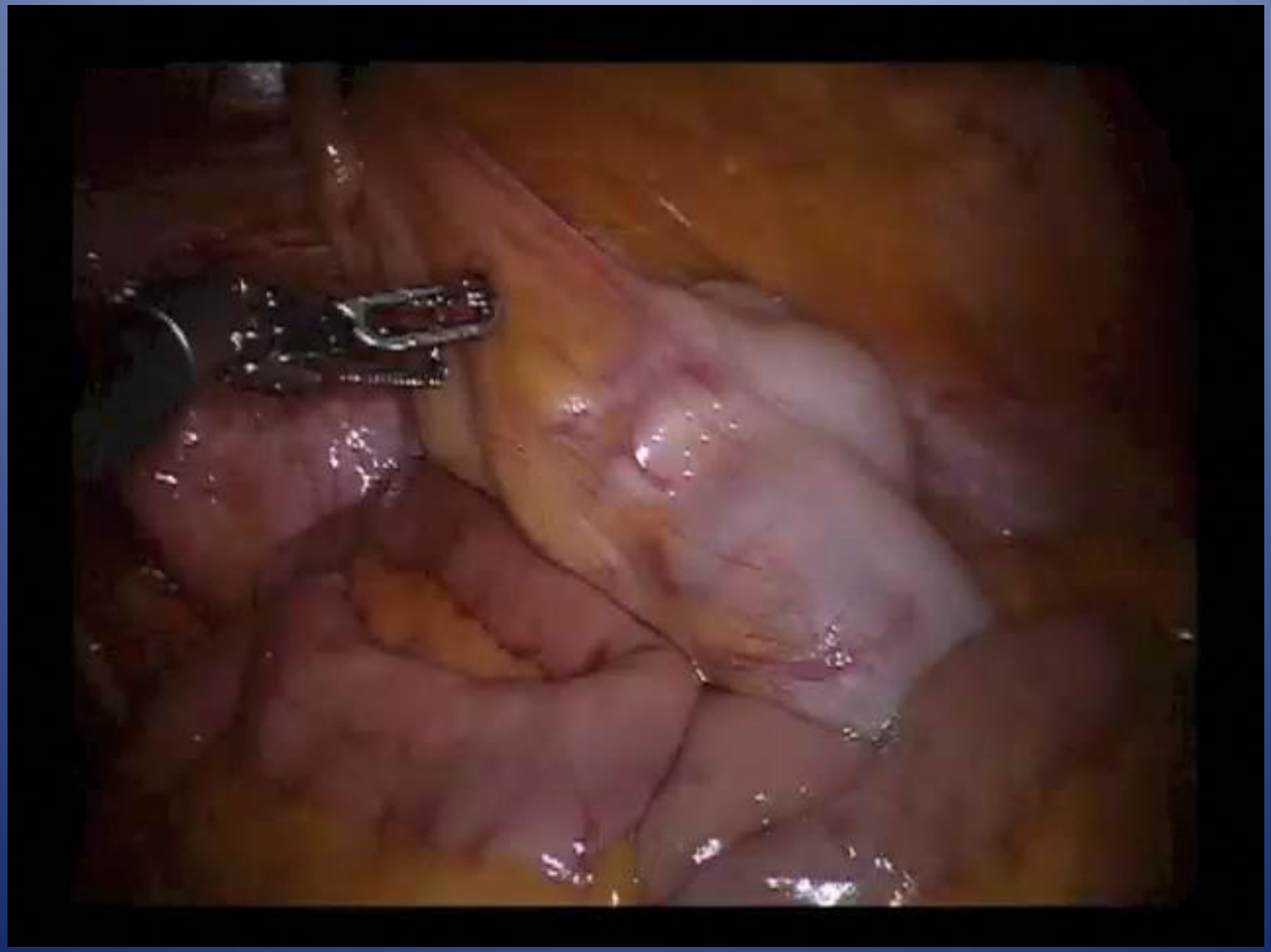
Operative steps – female cystectomy

- Mobilise ureters up to the bladder
- Infundibulopelvic ligaments and uterine arteries are transected en bloc using EndoGIA staplers
- Lateral dissection of the bladder and control of vascular pedicles
- The uterus is retracted proximally
- Retrovesical dissection - With a sponge-stick inserted through the vulva into the vagina, the posterior vaginal fornix is then identified and opened
- Bladder is then dissected from the anterior abdominal wall
- Dissection of urethra and anterior vaginal wall
- Specimen removed through the vagina

Construction of Ileal conduit



Intra-corporeal Ileal conduit



Our initial experience - RARC with intra-corporeal ileal conduit

- Lots of ground work – almost 6 months
- Business plan approval
- LTHT robotic development committee approval
- Approval from New Intervention Procedure (NIP) group
- Training for the robotic team – at USC and UCL
- Mentoring – Prof Monish Aron from USC (GMC registration, Hospital contract, Occupational health clearance, Logistics)

Our initial experience - RARC with intra-corporeal ileal conduit

	Pt 1 (female)	Pt 2 (male)	Pt 3 (male)	Pt 4 (female)	Pt 5 (male)	Pt 6 (male)	Pt 7 (male)
Age	74	68	69	64	64	53	67
ASA grade	2	2	2	1	2	2	2
BMI	22	32	31.8	22.1	27	28.5	27
Preop T stage	Tis	T1	T2	T2 at least	Ta	T1 at least	Ta
pT stage	pT1 + Tis	pTa + Tis	pT3	pTis	pTa	pT0	pTa
Console time (min)	250	330	340	360	345	360	300
Blood loss (ml)	50	50	300	10	650	700	500
Blood transfusion	none	none	none	none	none	none	none
Clavien grade (30d)	none	none	Gr 1	none	Gr2	none	Gr 2
LN removed (n)	22	22	12	14	12	13	17
Hospital stay (days)	6	6	8	8	9	4	6

Future plans

- Gain further experience:
  - – cut down console time to about 4 hr
  - - introduce formal ERAS pathways for RARC
  - - decrease median in-hospital stay to 5 days

- Offer RARC with intra-corporeal urinary diversions to all radical cystectomy patients in next 6-12 months

Thank You