Cleveland Clinic

Stay tuned…our webinar will begin shortly!
(Please note that your line has been muted.)

Market and Network Services Access Line

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Robotic Partial Nephrectomy

A NEW ERA FOR NEPHRON SPARING SURGERY

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Director, Center For Laparoscopic and Robotic Surgery
Glickman Urologic and Kidney Institute

Cleveland Clinic

ROBOTIC PARTIAL NEPHRECTOMY

More intense compared to radical prostatectomy

More time sensitive

More demanding hemostatic techniques

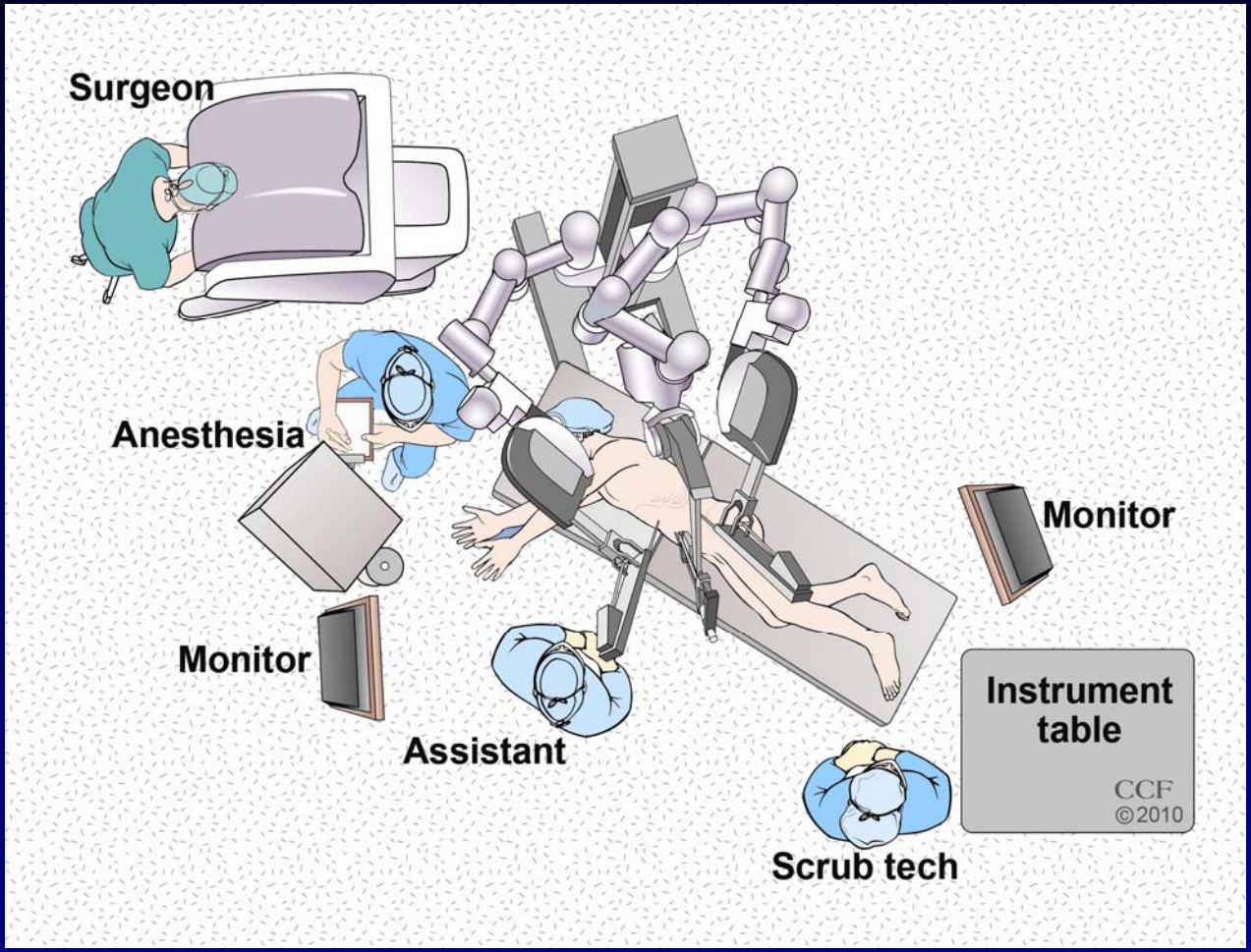
Dependent on assistant

Need background in laparoscopy

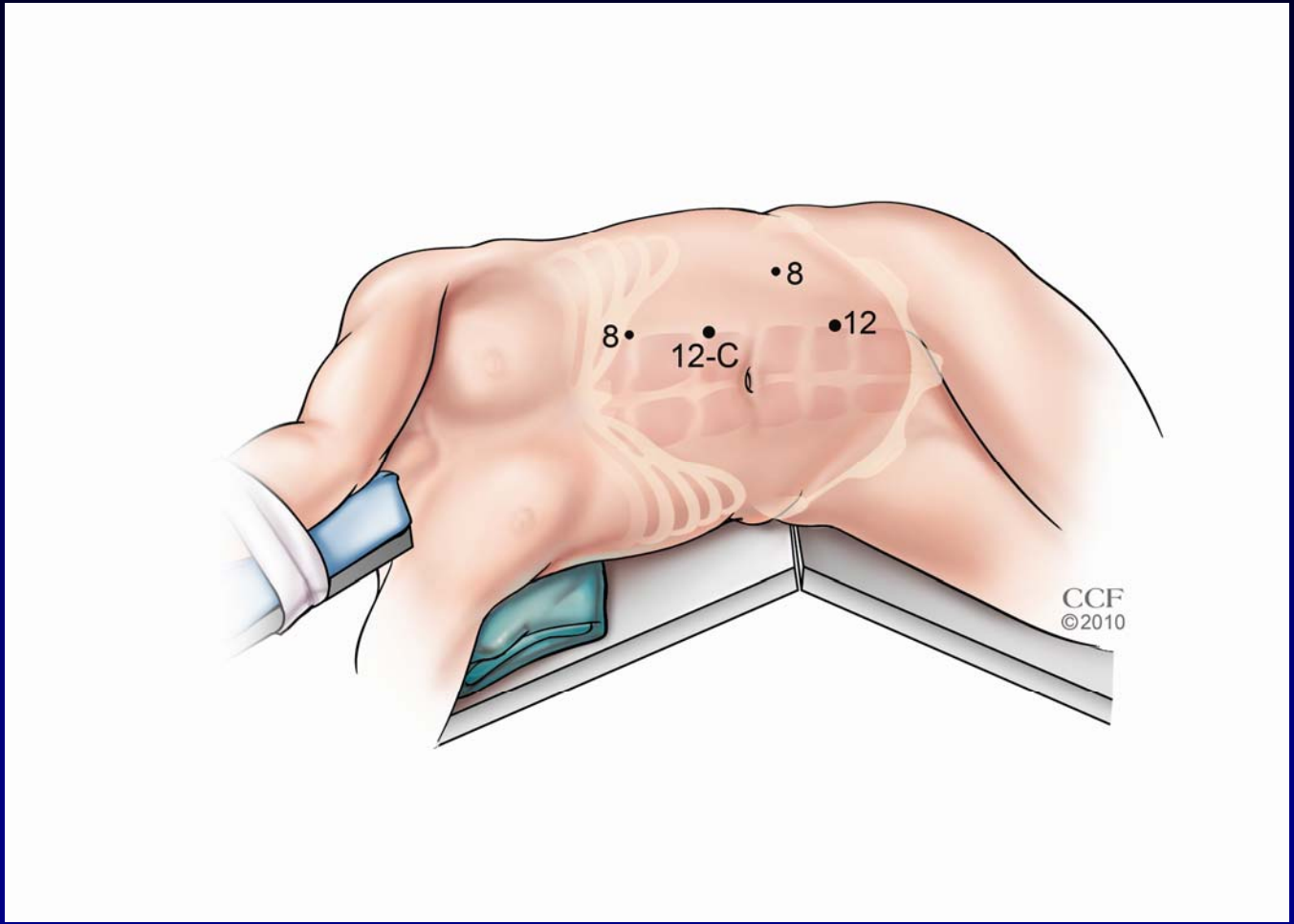
ROBOTIC PARTIAL NEPHRECTOMY

Surgical Steps

1. Colon mobilization
2. Renal hilar preparation
3. Tumor Exposure / Ultrasound
4. Control of renal hilum
5. Tumor Excision
6. Suture repair of collecting system/ hemostasis
7. Tumor extraction / Exit


Surgeon
Anesthesia
Monitor
Monitor
Assistant
Instrument table
CCF
©2010
Scrub tech

Port Placement



Port Placement

Port Placement

- Port in Port
- Quick conversion
- Interchange port for assistant or robot instrument

Robotic Partial Nephrectomy

- **Renal Hilar Preparation**
  - **Bulldog clamp:** Individual dissection of all arteries and veins
  - **Satinsky clamp:** Creating windows above and below the hilum

Renal Hilum Clamping
Satinsky clamp

Advantage

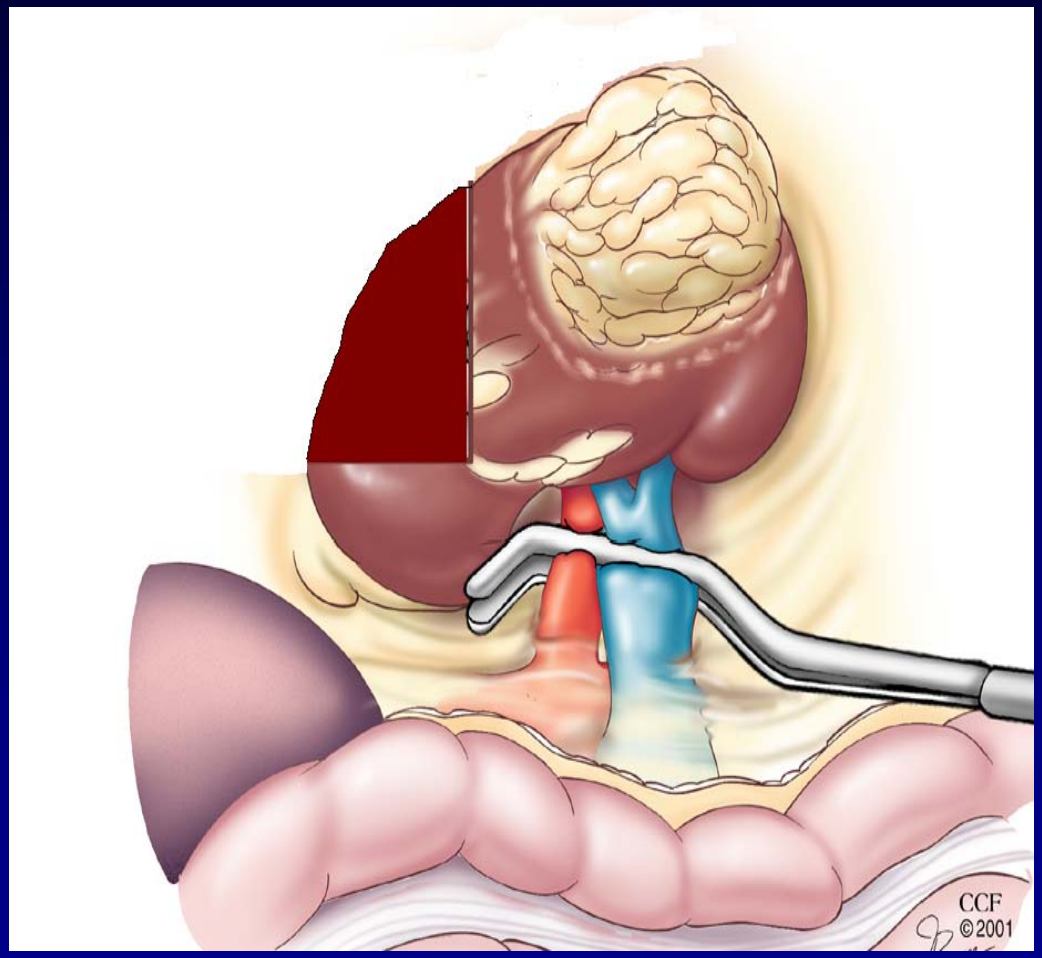
- Minimal dissection of renal hilum
- Robust Clamping
- Option of quick re clamping in case of emergency

Renal Hilum Clamping
Satinsky clamp

Disadvantage

- Addition of extra port
- Clashing with robot instruments
- Challenge of multiple vessels

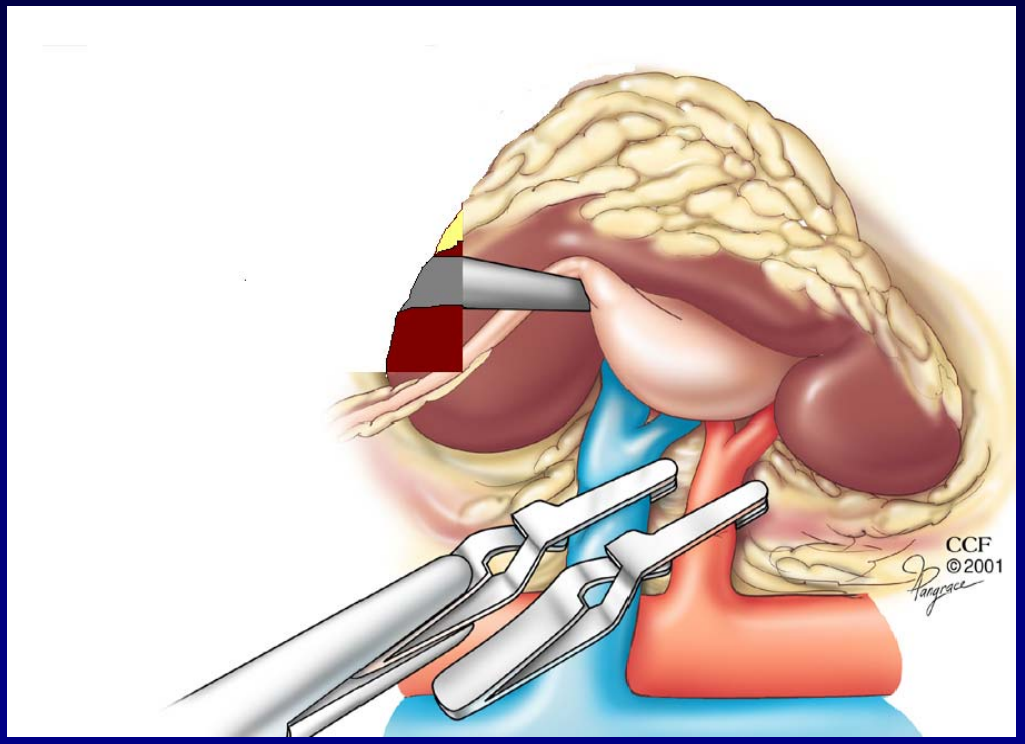
Robotic Partial Nephrectomy



- Not too much tissue
- Avoid ureter
- No clips
- Include all vessels
- No movement

Robotic Partial Nephrectomy

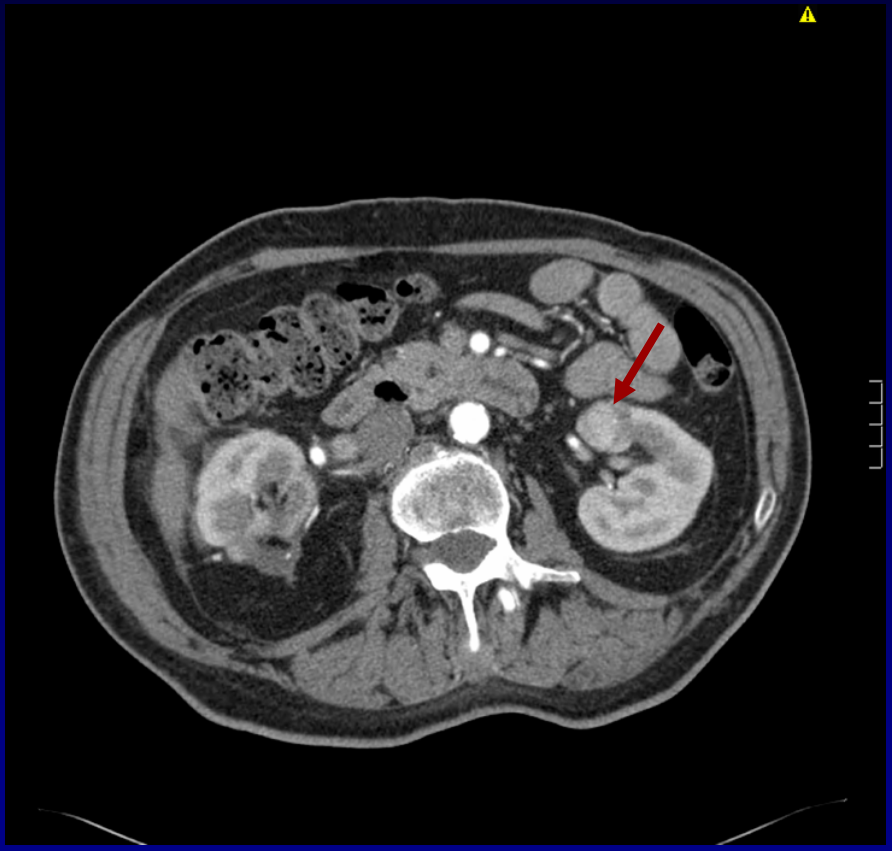
Bulldog clamping

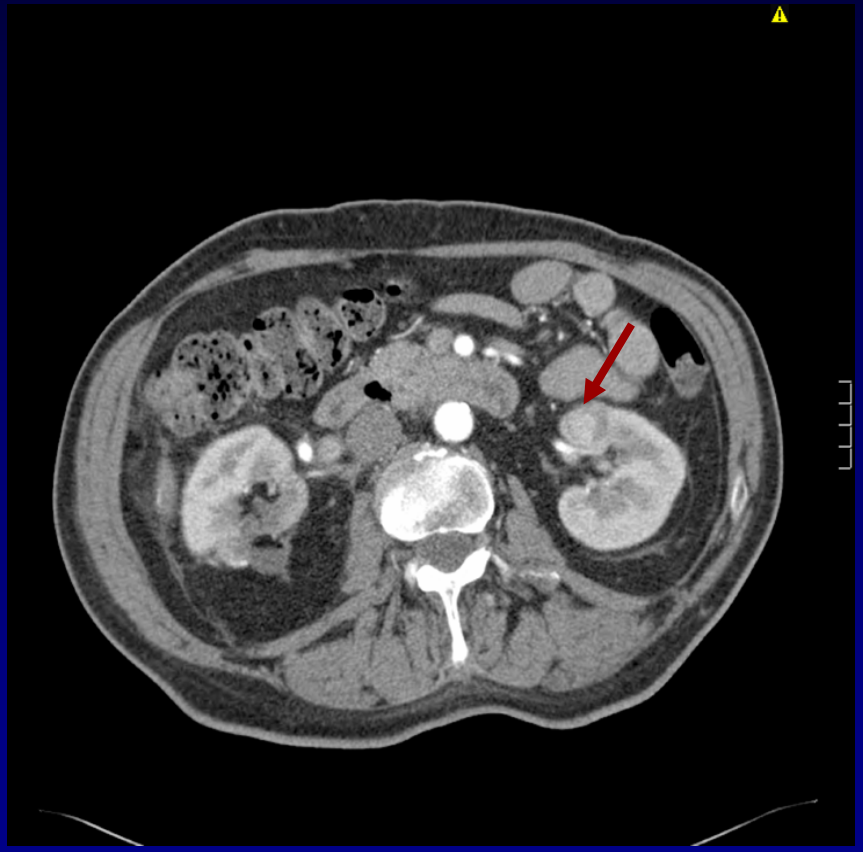


Left sided 2.3 cm anterior, interpolar, hilar renal mass

60 yo male
Prior right sided partial nephrectomy had been performed for a 4cm renal mass
Path: Clear Cell RCC

Computed Tomography

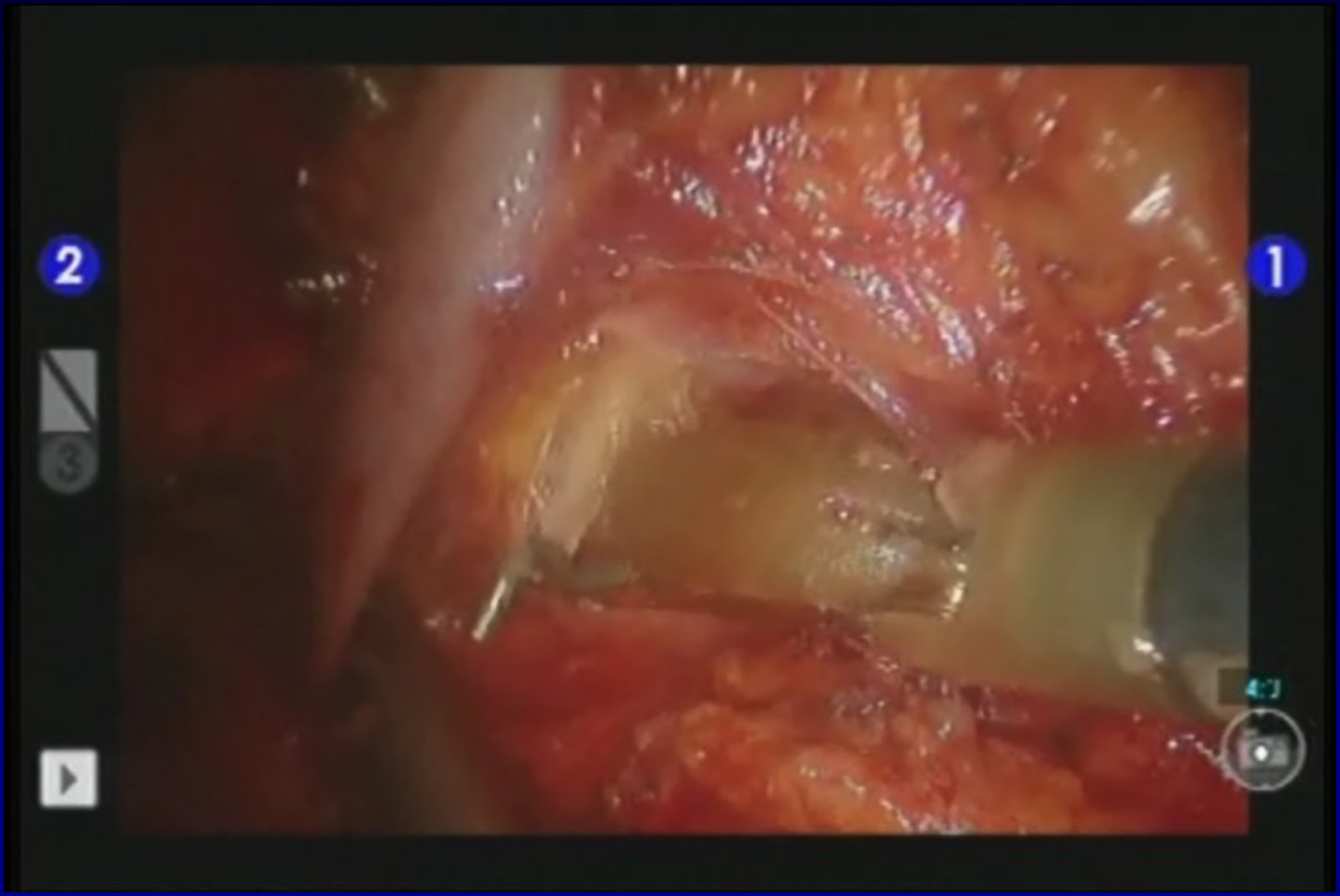




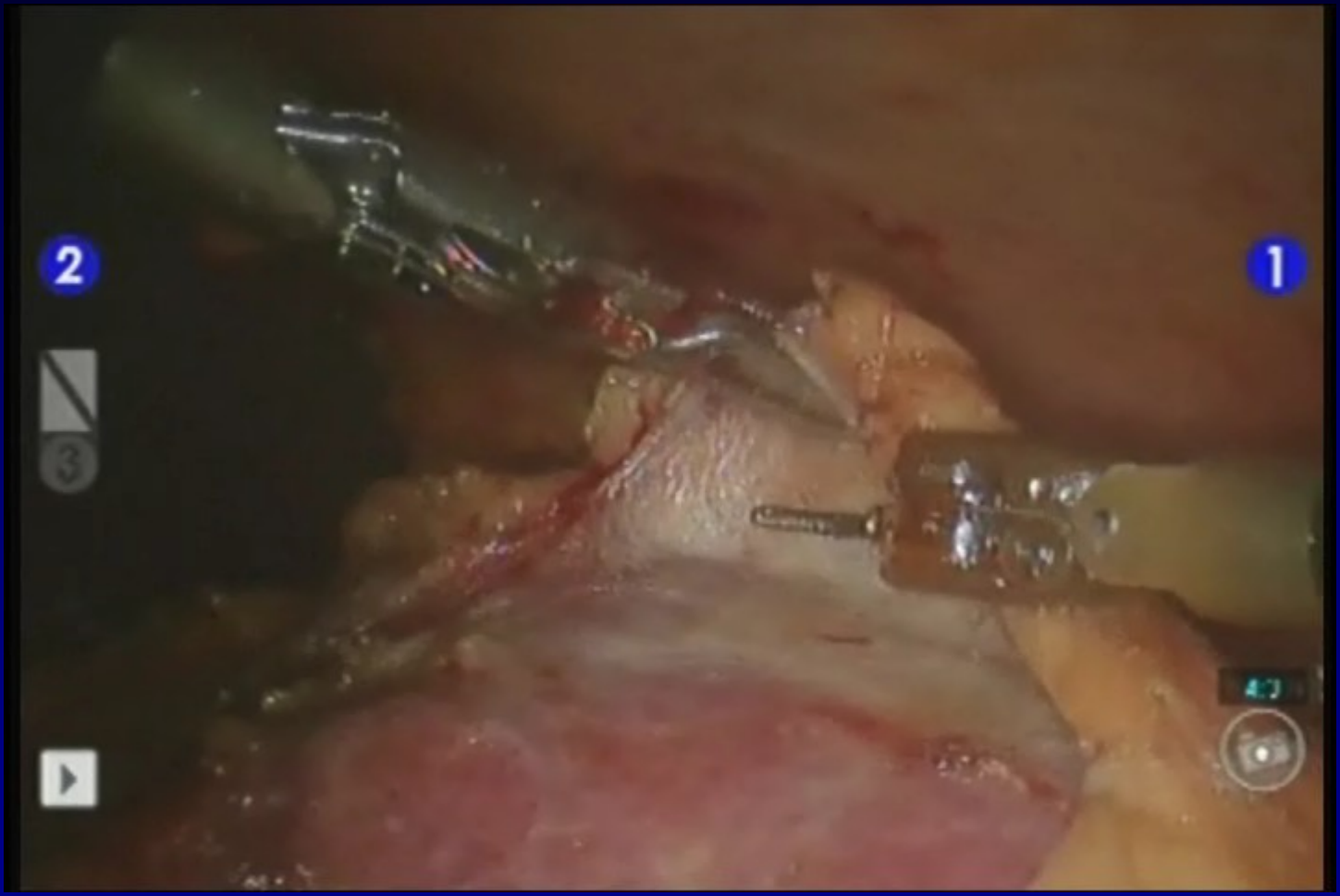
Colon Mobilization

Mobilization of the Ureter

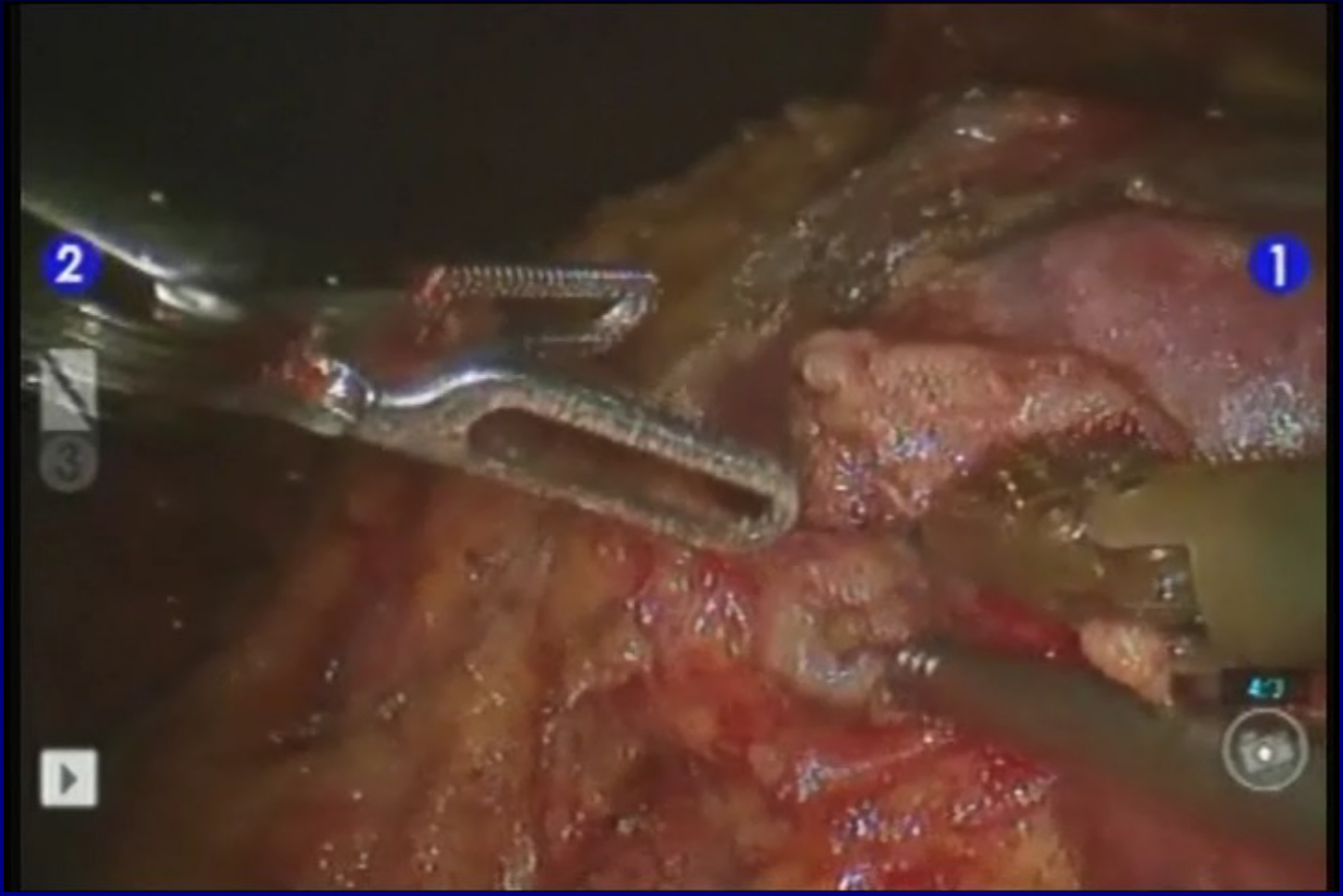
Hilar Dissection



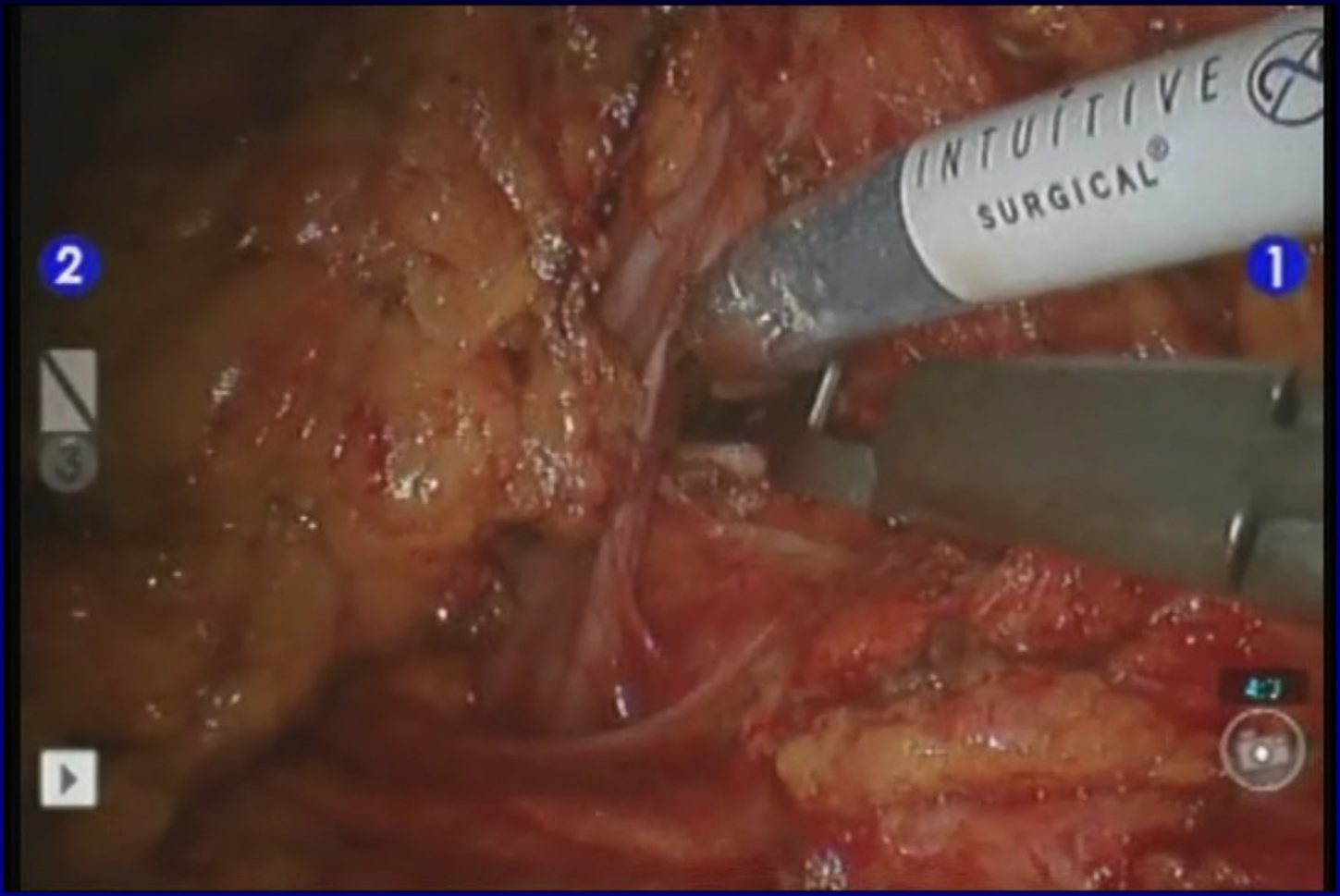
Defatting the Kidney



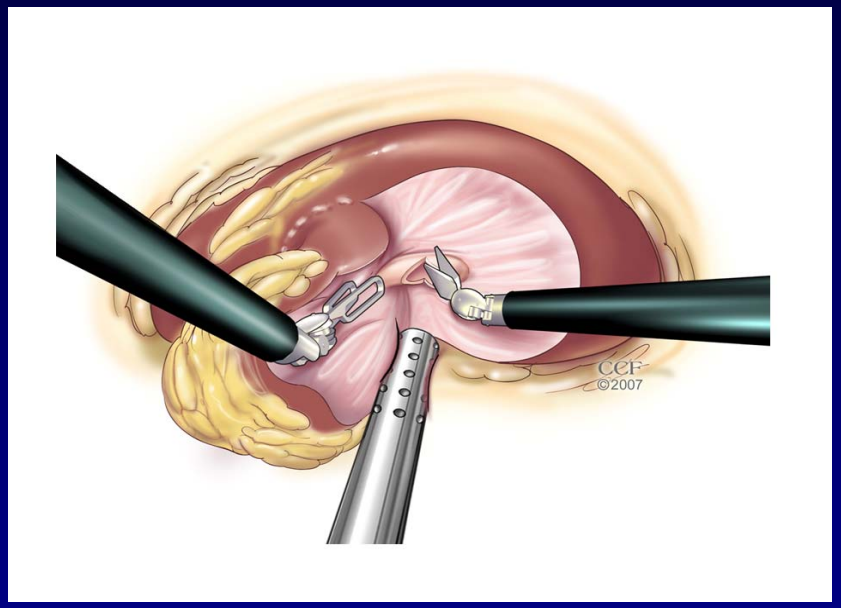
Tumor Demarcation

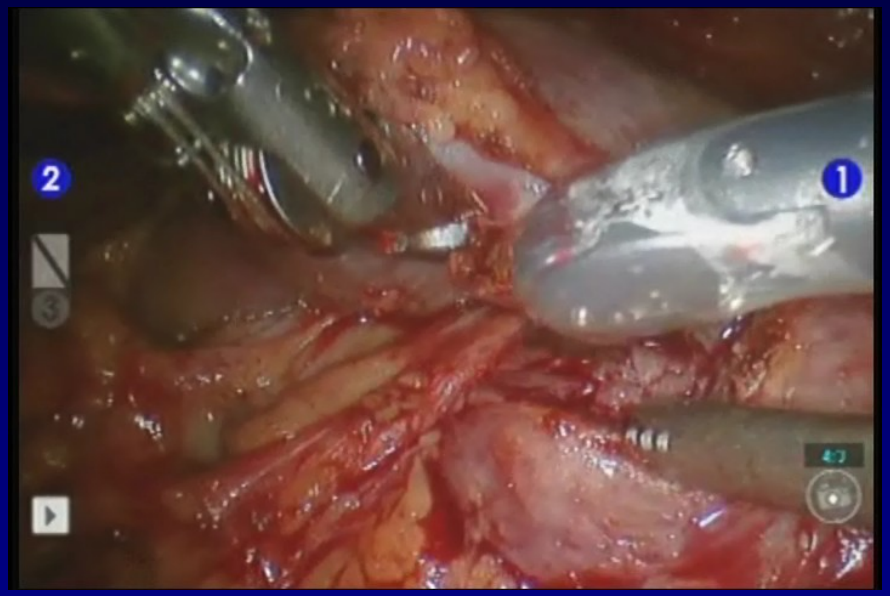


Hilar Occlusion

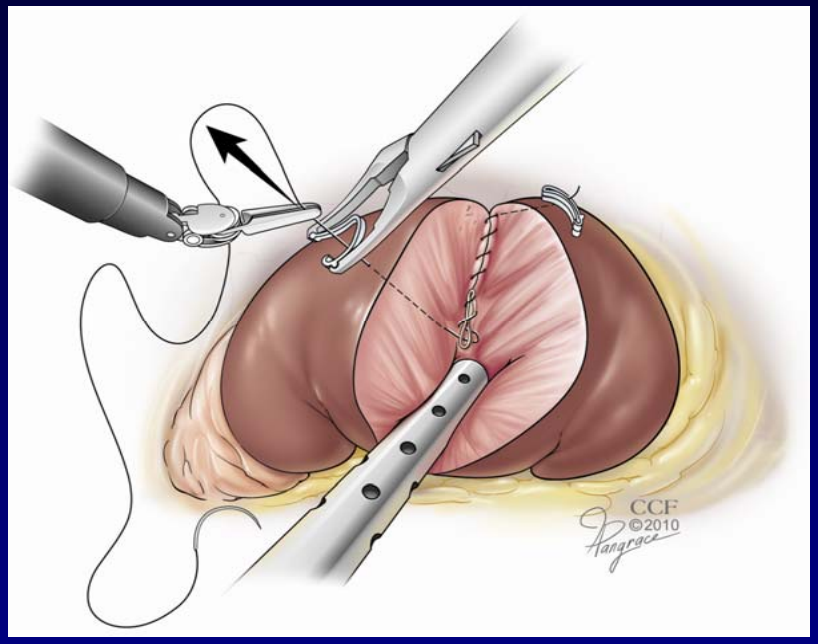


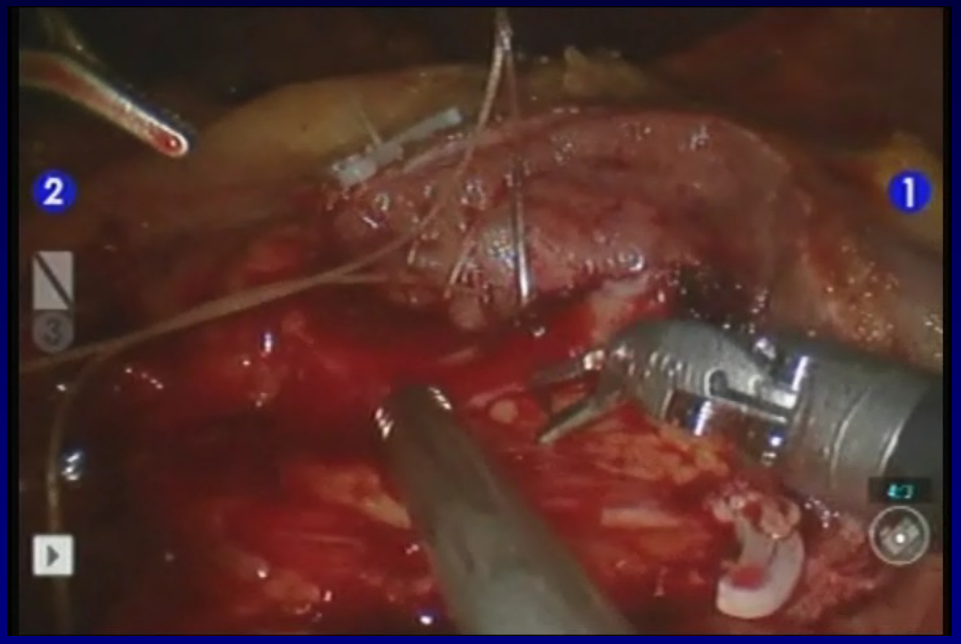
Tumor Excision





Reconstruction





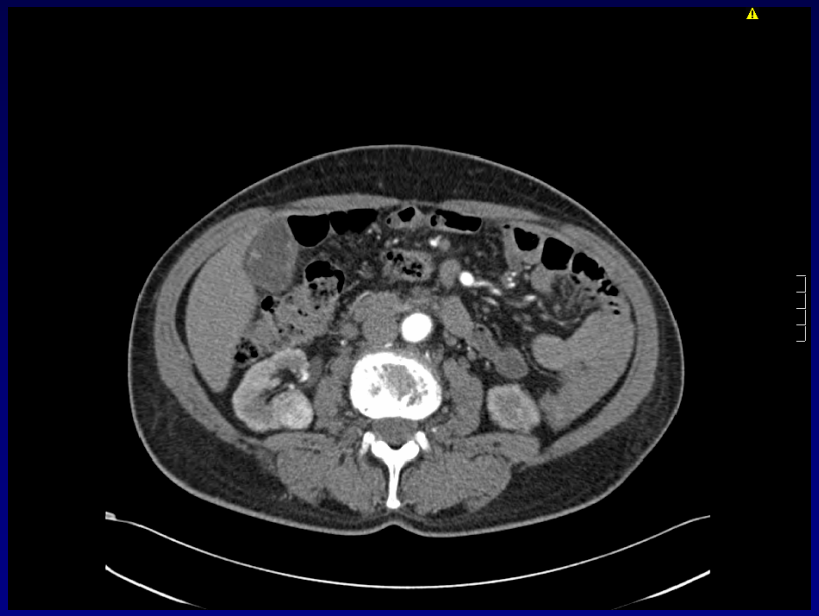
Application of Hemostatic Agents Specimen Extraction

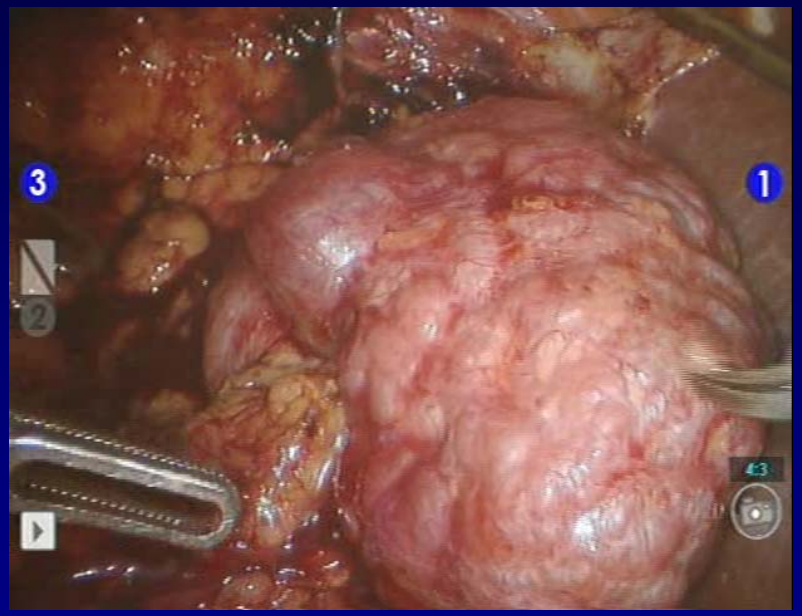
- Operative Time: 150 minutes
- Warm Ischemia: 24 minutes
- EBL: 50ml
- Path: Clear Cell 2.4 cm negative margins
- Stage: T1a
- Preop creatinine and GFR: 0.75 and 113
- Postop creatinine and GFR: 0.79 and 107

Right Sided Posterior Interpolar Mesophytic Hilar Mass

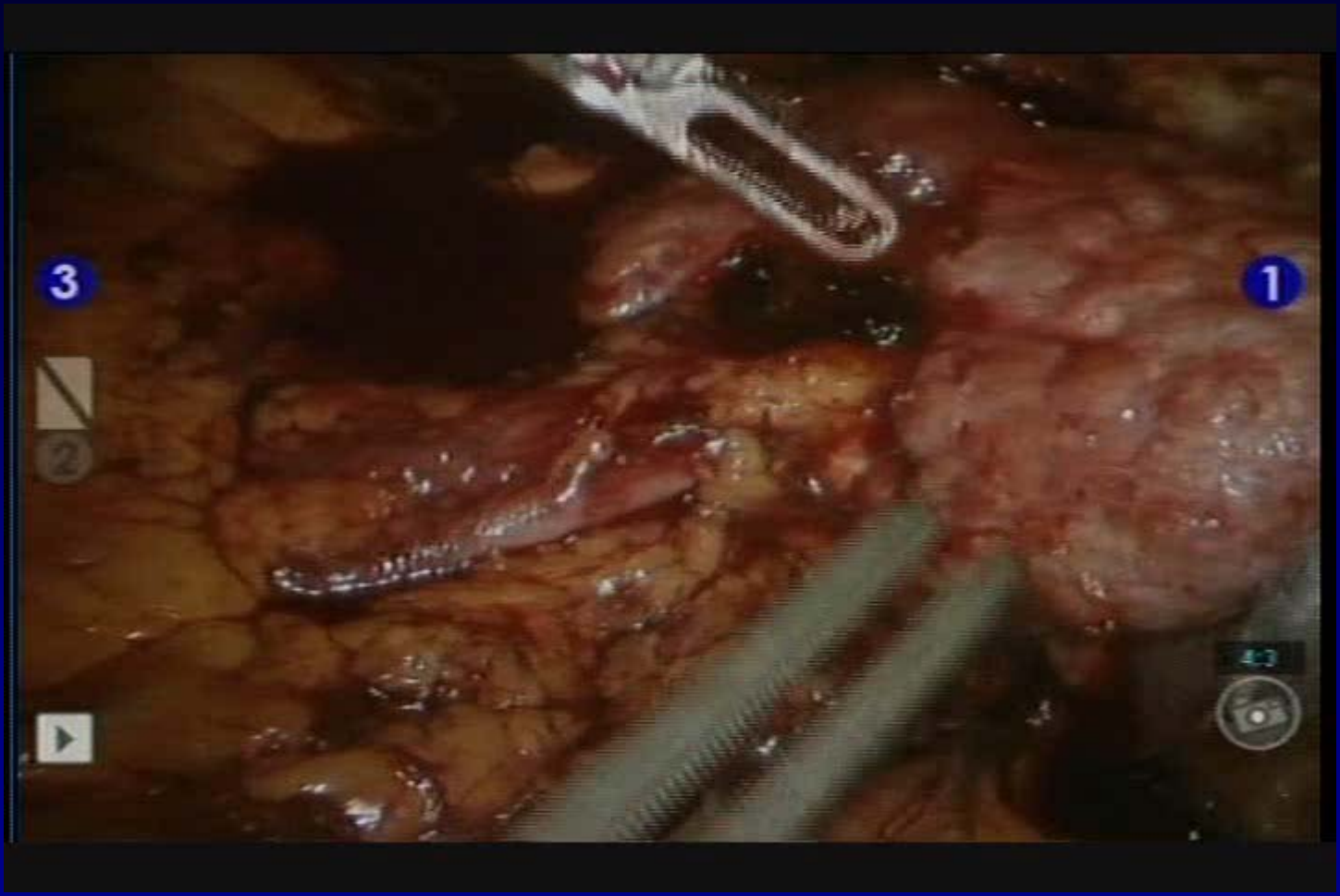
- 66 yo female with an incidentally discovered left sided renal mass
- PMH: HTN, GERD
- PSH: Bilateral Femoral Hernia Repair
- AVSS
- Physical Exam is WNL
- Creatinine: 1.80
- CT scan demonstrates a partially exophytic enhancing 2.5 x 2.2 x 1.9 cm in the posterior mid right kidney, which reaches the renal sinus.

Enhancing 2.5 x 2.2 x 1.9 cm in the posterior mid right kidney

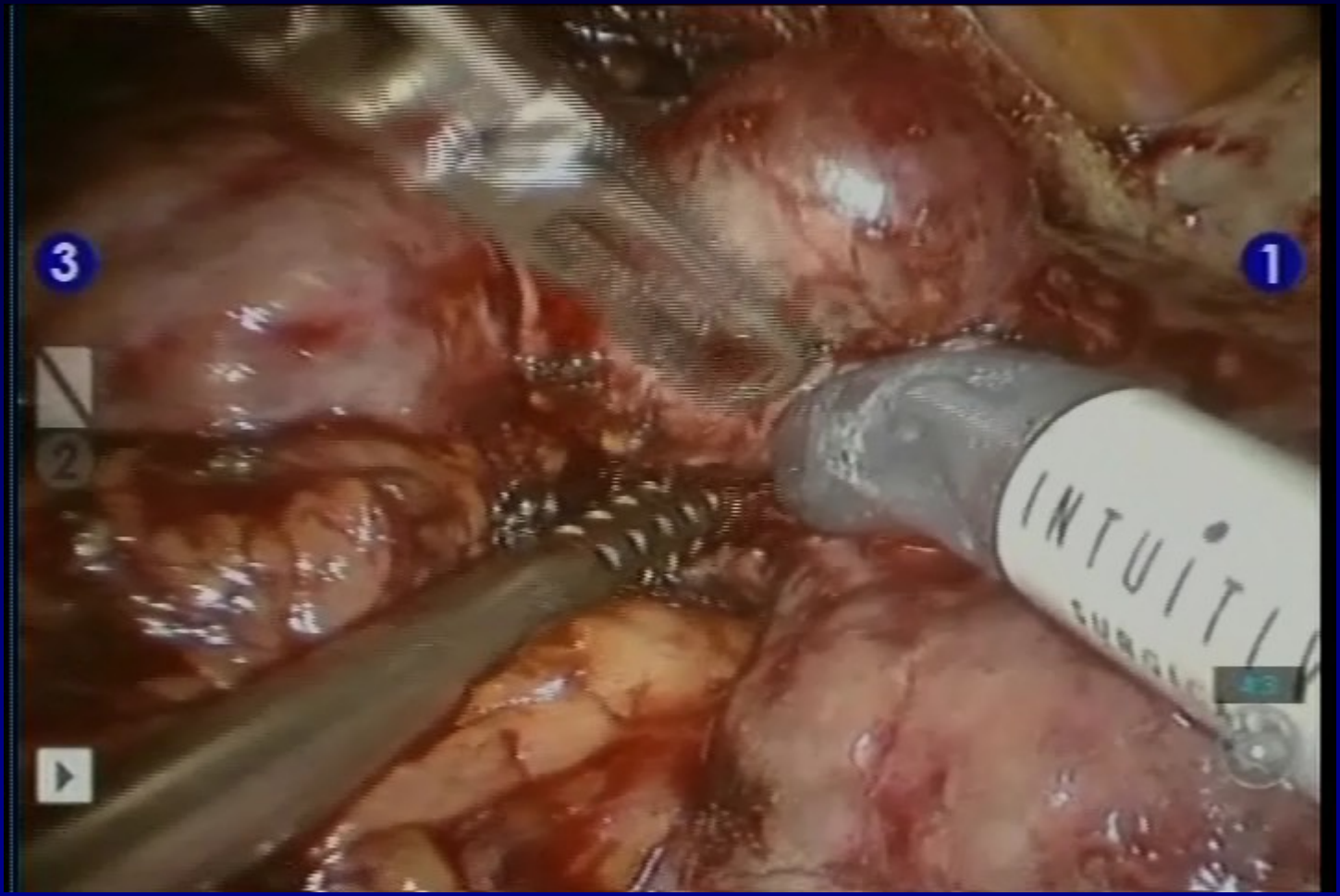




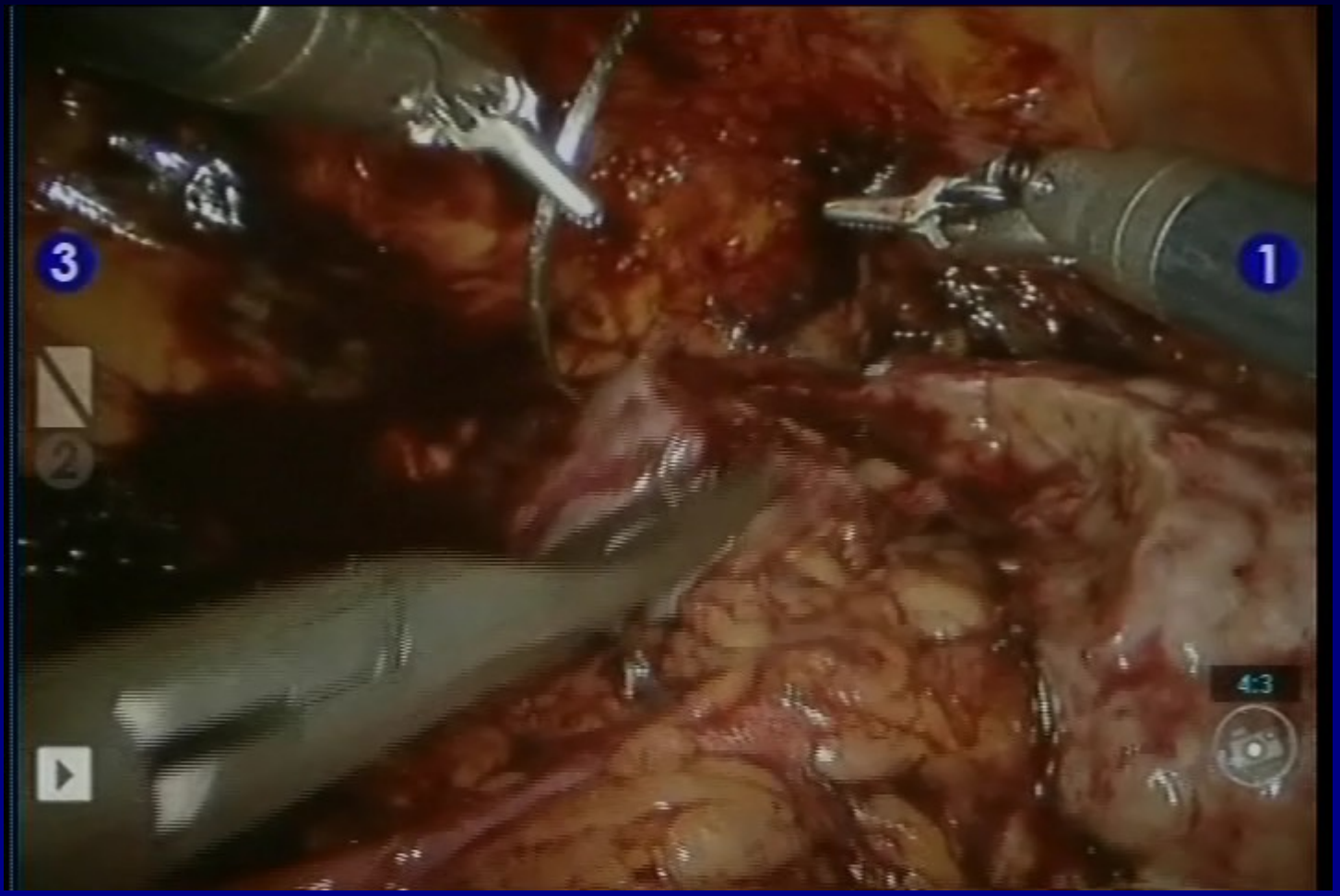
Satinsky Occlusion



Tumor Excision

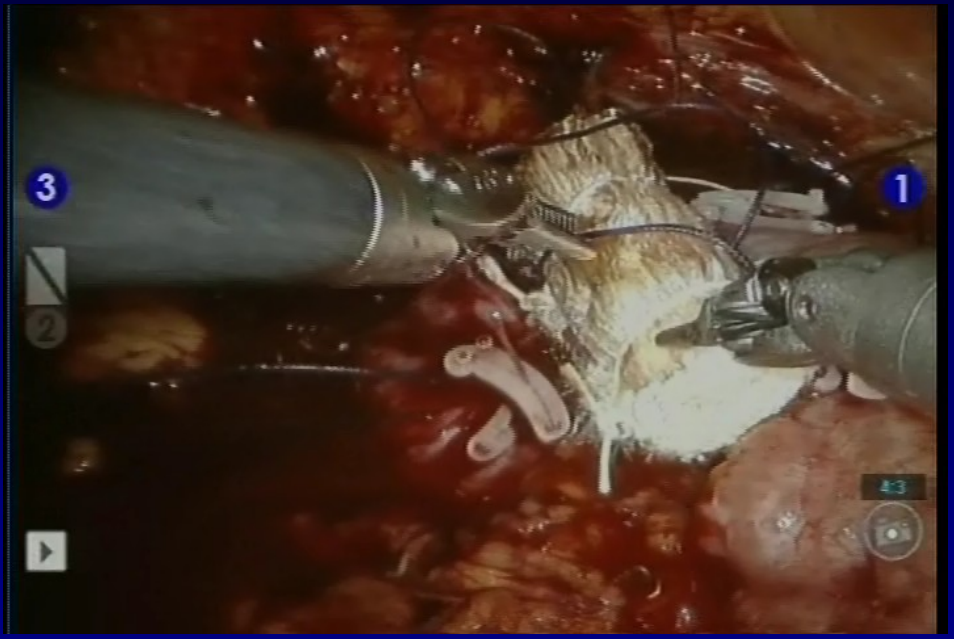


Deep Renorrhaphy



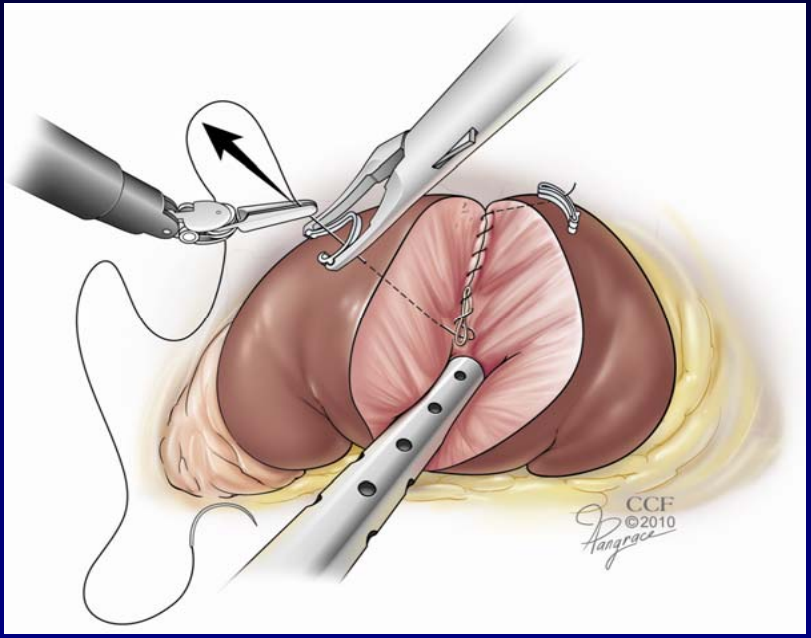
Placement of Bolster and Hemostatic Agents

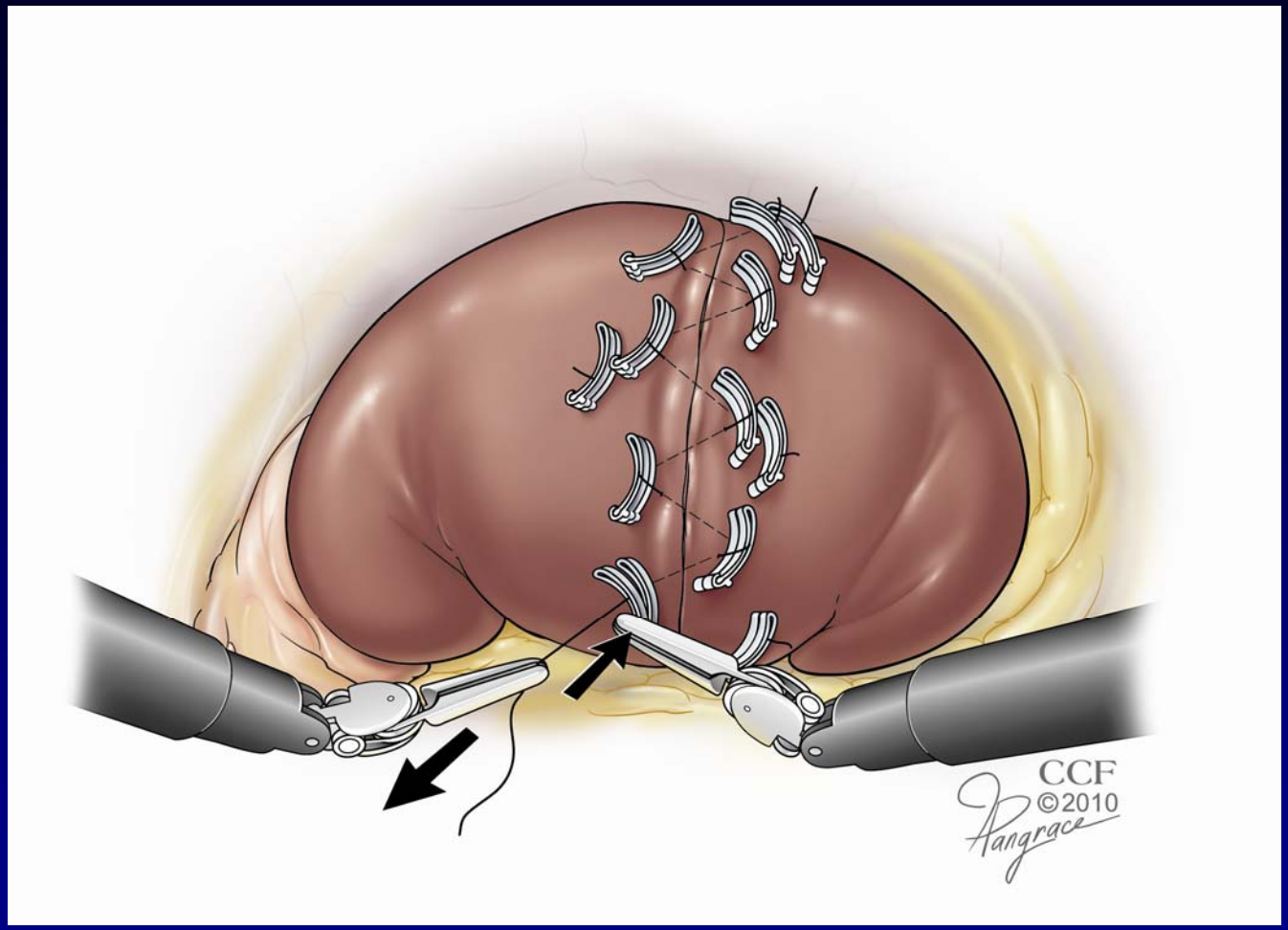
- Operative Time: 180 minutes
- Estimated Blood Loss: 50 ml
- Warm Ischemia time: 15 minutes
- Size of Mass: 2.0 cm
- Staging: T1a, Margins -ve
- Path: Clear Renal Cell Carcinoma
- Length of stay: 4 days



Renal Reconstruction

- Pre-prepare your sutures
- Faster suturing skills
- One hand needle positioning

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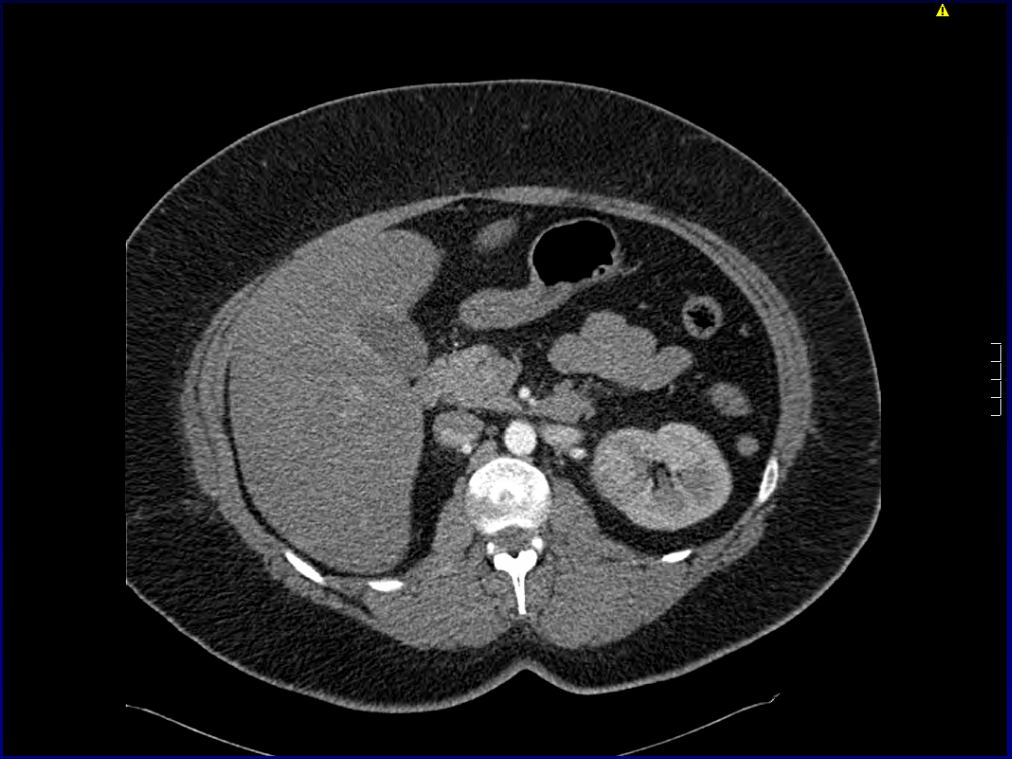
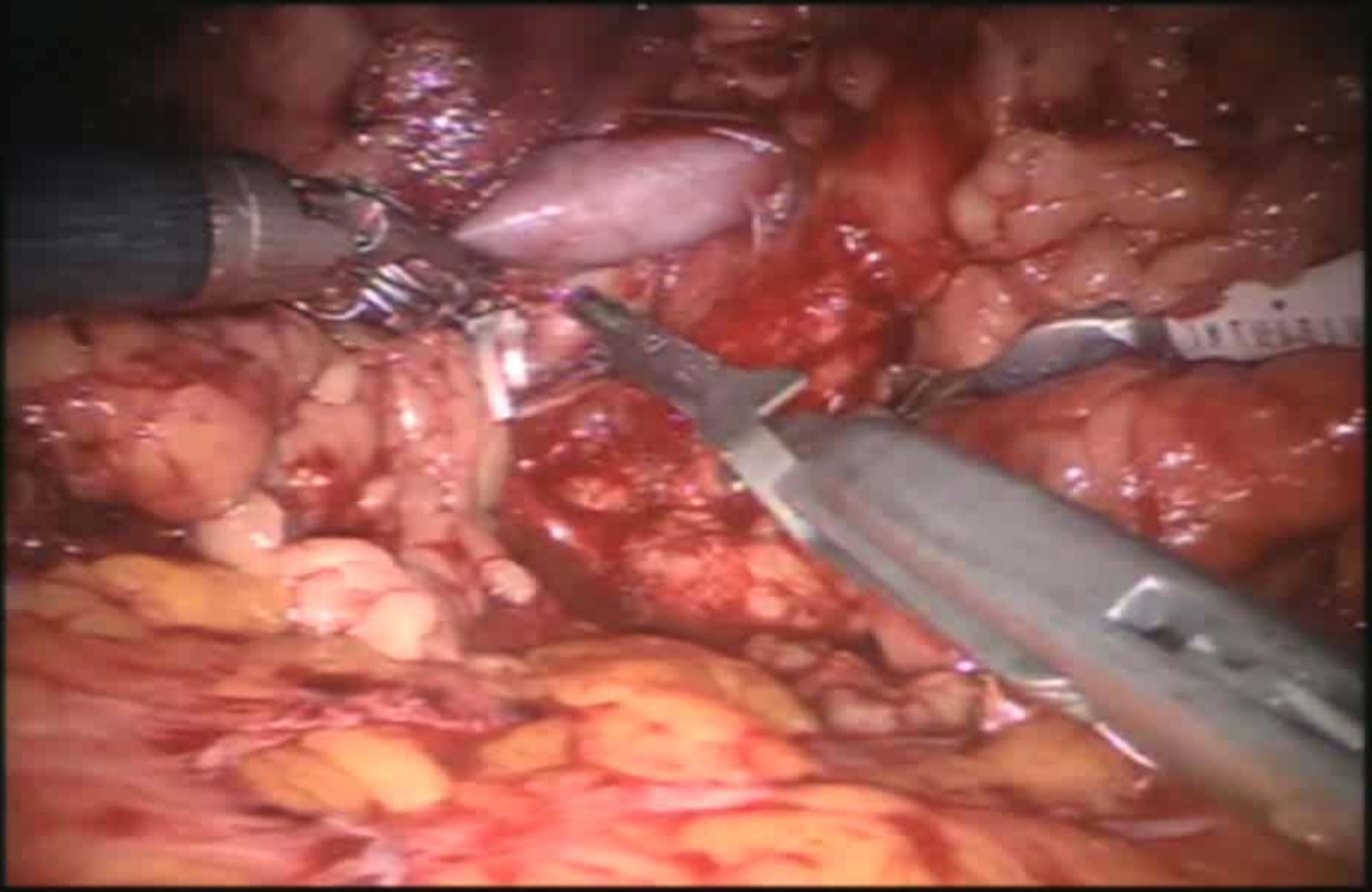
Incomplete Hilar Occlusion and Control

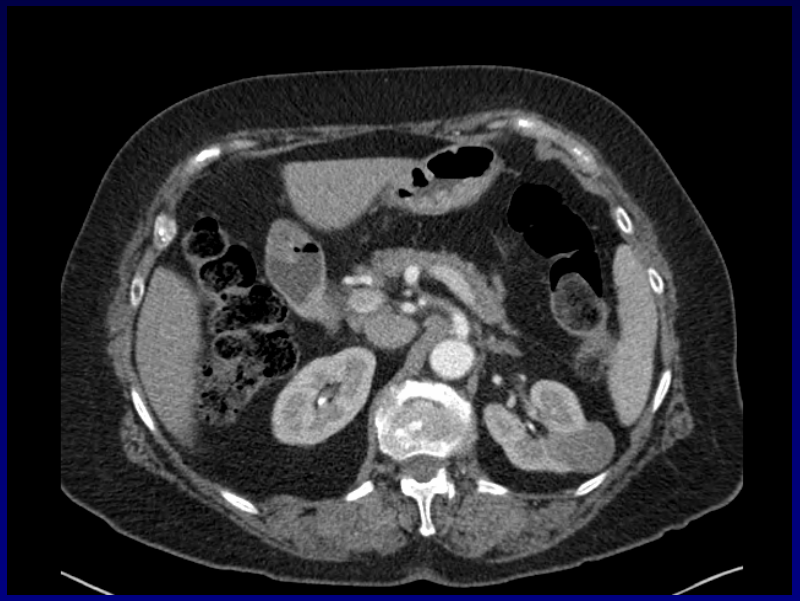
- 35 yo female presented with an incidentally discovered left sided interpolar 4.5 cm renal mass.





DO WE ALWAYS NEED TO CLAMP THE RENAL HILUM?

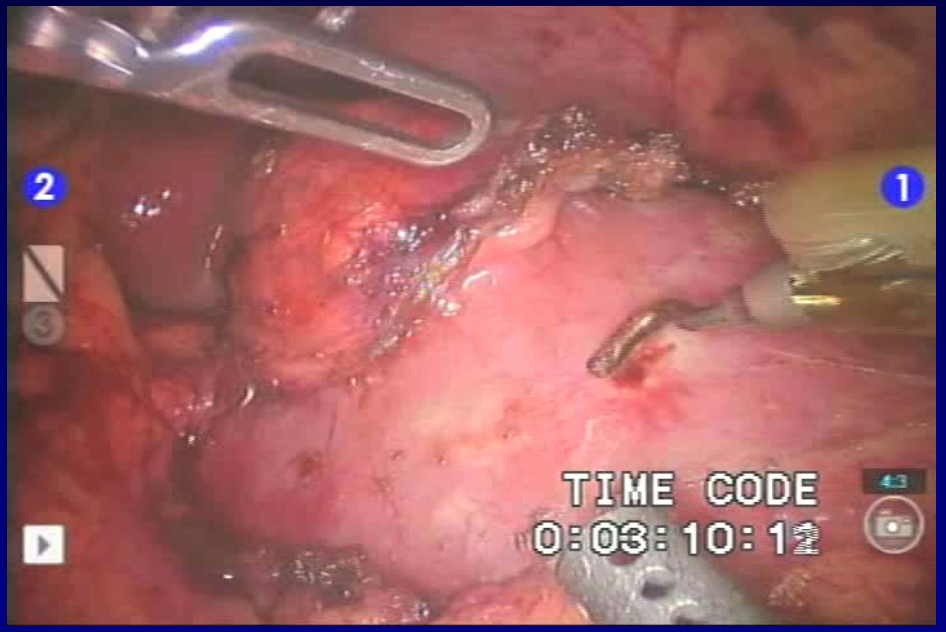
- Better Exposure
- Less bleeding
- Essential for deep or hilar tumors



- Warm ischemia time

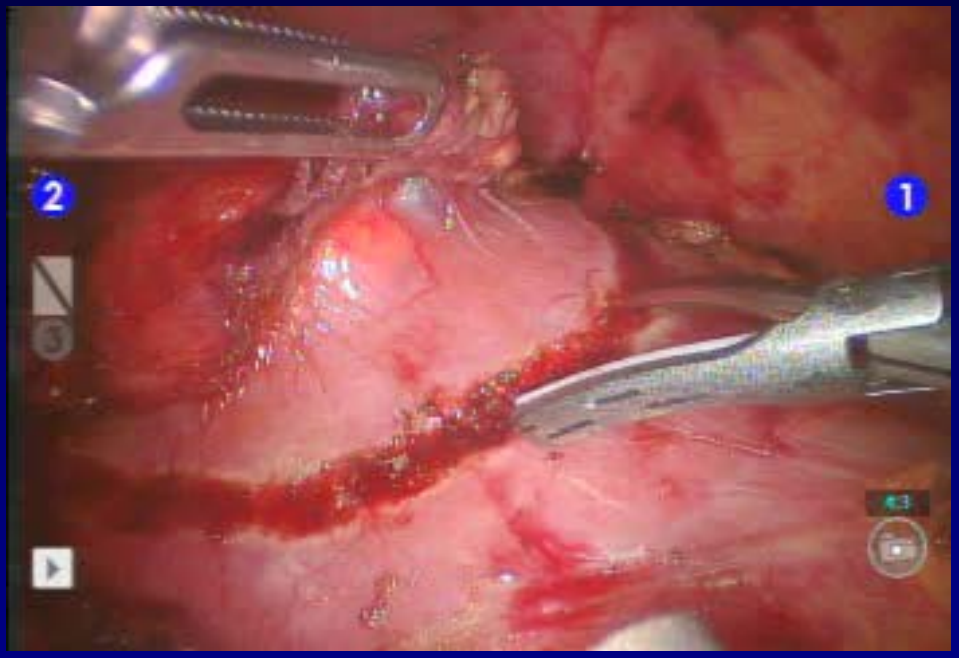
Robotic Partial Nephrectomy
No clamping

- For selected cortical masses only
- Small margin may risk positive margin
- Generous margin risk deep cut in kidney and more bleeding
- NO WARM ISCHEMIA TIME



Robotic Partial Nephrectomy
No clamping

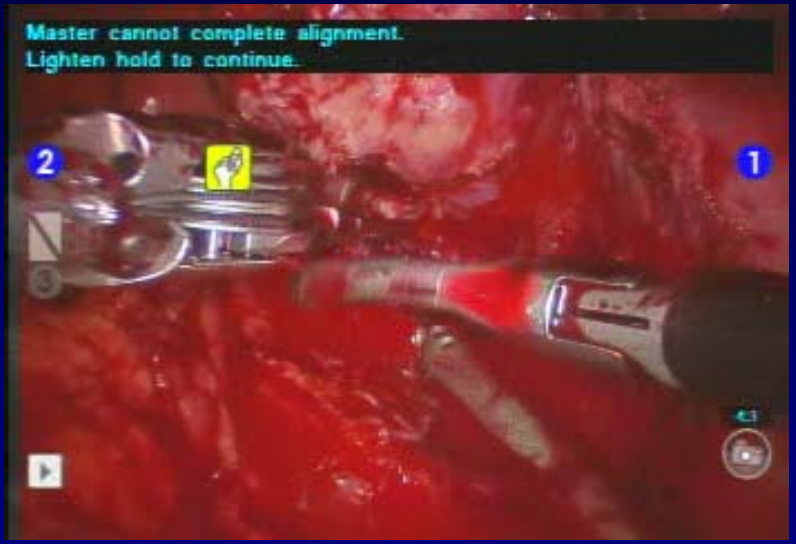
- Harmonic Scalpel effective for small cortical vessels
- Need Articulation for better surgical angles



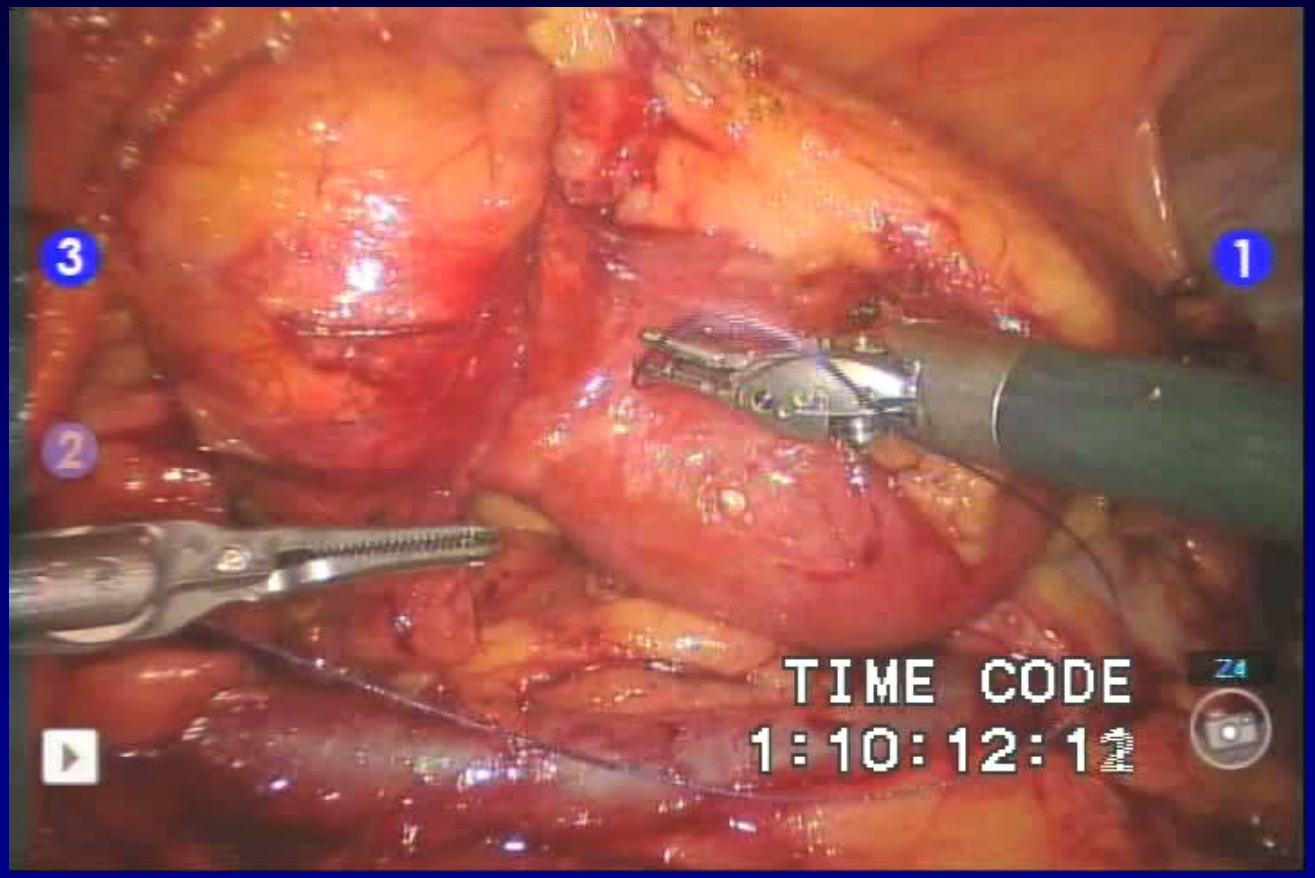
TAKE YOUR TIME

Robotic Partial Nephrectomy
No clamping

- Surgical field may not be dry
- Depend on experienced bed side assistant
- Suction very important
- Hilum should always be ready for quick clamping if needed



Early Suturing Technique



Robotic Partial Nephrectomy
Clamp vs Unclamp
N=21

	Clamped (n=12)	Unclamped (n=9)
Age (years)	58.5 ± 13.1	56.5 ± 14
BMI (kg/m2)	29.9 ± 7.0	28.5 ± 4.6
Tumor size (cm)	2.77 ± 0.9	2.37 ± 0.8
EBL (cc)	261 ± 152	375 ± 141
OR time (min)	197 ± 32	170 ± 25
Warm Ischemia Time (min)	26.7 ± 5.00	0
LOS	4.4 ± 2.1	4 ± 0.9
Complications	DVT (1), post op bleed (1), ileus (1)	Ileus (1), post op bleed (1)
Transfusion (units)	0.7 ± 1.9	0.33 ± 0.8

ROBOTIC PARTIAL NEPHRECTOMY

Cleveland Clinic Experience

RPN (n=175)	
Demographic	
Male/ Female	101/74
Age (yrs)	60.3
BMI(Kg/m2)	30.3
ASA	2.36
CCI	1.12
Tumor size (cm)	3
Solitary kidney (n)	2

ROBOTIC PARTIAL NEPHRECTOMY

Cleveland Clinic Experience

Intraoperative Data	
OR time (hrs)	182
WI time (mn)	17.5
EBL (cc)	293
Intraoperative Complications, n - Transfusion - Ileus - DVT	 4 6 5
Positive Margins	1 focally

ROBOTIC PARTIAL NEPHRECTOMY

Cleveland Clinic Experience

Postoperative Data	
Selective Angioembolization	1
Conversion to open	0
Conversion to radical nephrectomy	0
F/u period	11 months
Local recurrence	0
Distant metastasis	1
Mean decrease in e GFR	7.9%

Single Port Partial Nephrectomy

Cleveland Clinic

New: Robotic Single-Port Hands-On Labs

2nd Annual Single-Port Laparoscopy, Robotics, and NOTES® Surgery

"A Multidisciplinary Hands-On Course"

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