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Patient Positioning and Access for Robotic Surgery

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@pgargollo

Associate Professor

The Mayo Clinic

 |

In addition to open surgery in my practice I perform

a) Laparoscopic surgery
b) Robotic surgery
c) Both laparoscopic and robotic surgery

Overview

- Surgery Specific Positioning
  - Special Considerations
- Access and complications
- Instrument and trocar choice
- Surgery specific trocar placement

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Room Set-up

- Ideal OR room
  - Dedicated OR room for the robot
  - Large room to comfortably accommodate all the equipment

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My institution has access to a robotic system

a) No
b) Yes

If you perform robotic surgery do you have a dedicated robotic team?

a) No
b) Yes

Positioning Basics

- Positioning depends on the organ of interest
- Patient safety
  - Complications of positioning
    - Nerve Injury
    - Compartment Syndrome
    - Injury to limbs
    - IV injuries
- Maximize effective docking / ergonomic
  - Minimize clashing

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Positioning Basics

- Pad all pressure points
  - Bovie cords
  - IV tubing
  - Consider pressure points after docked
  - Protect the face and feet
- Check and recheck
  - Check again
- Position table to maximize docking

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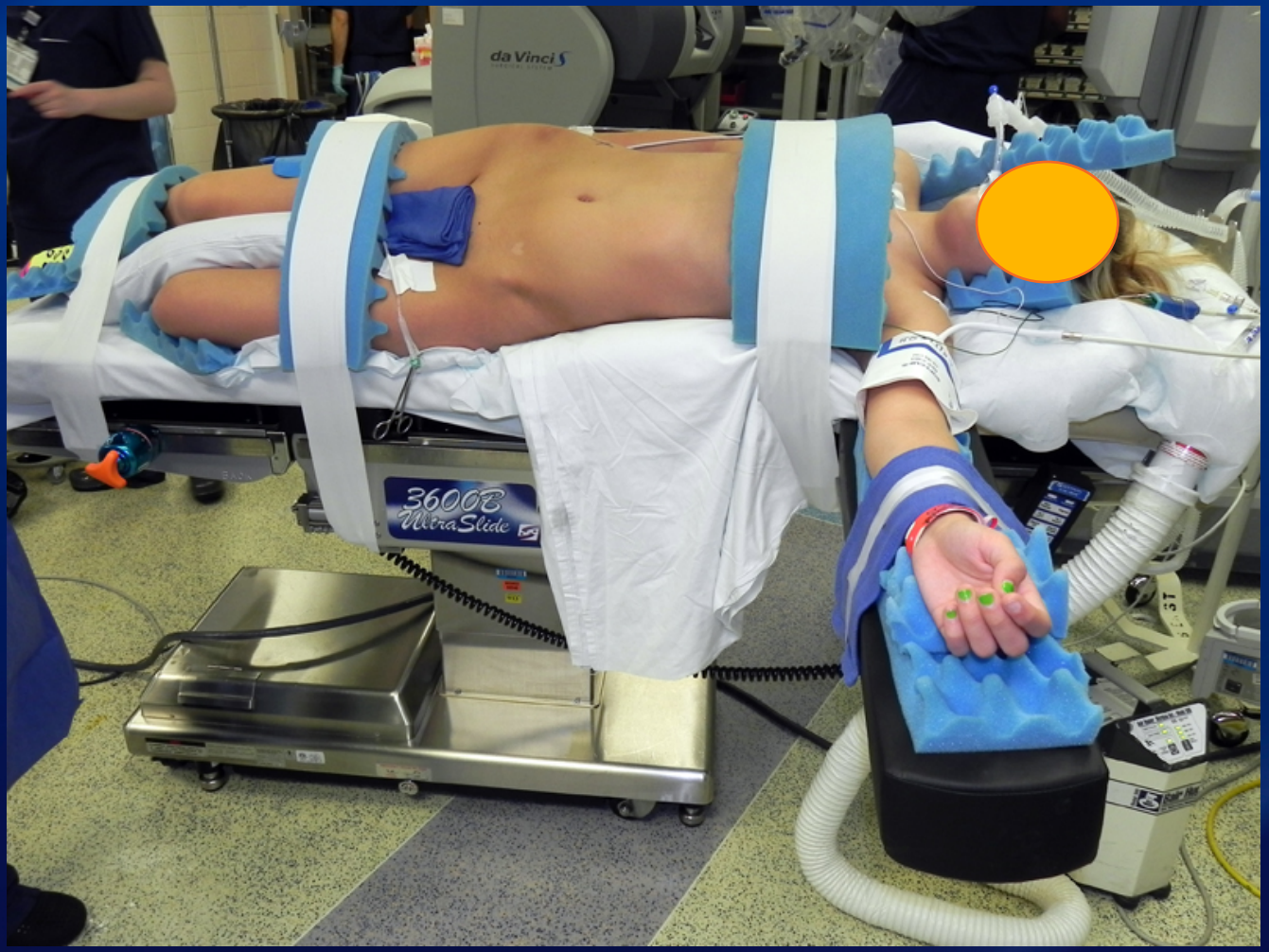
Renal Surgery / UPJ



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Bladder and ureteral surgery

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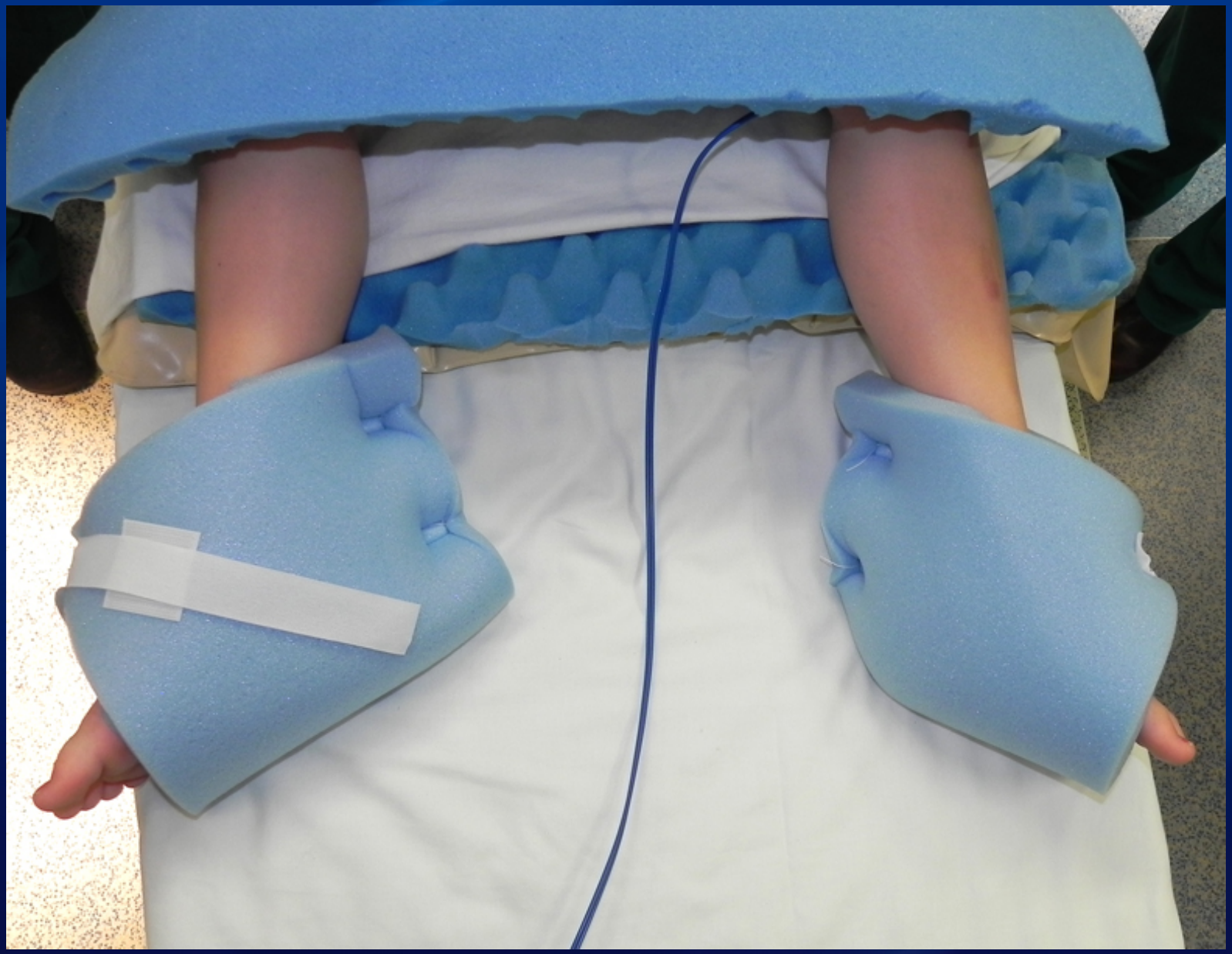

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Avoiding Positioning Complications

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Complications of Positioning

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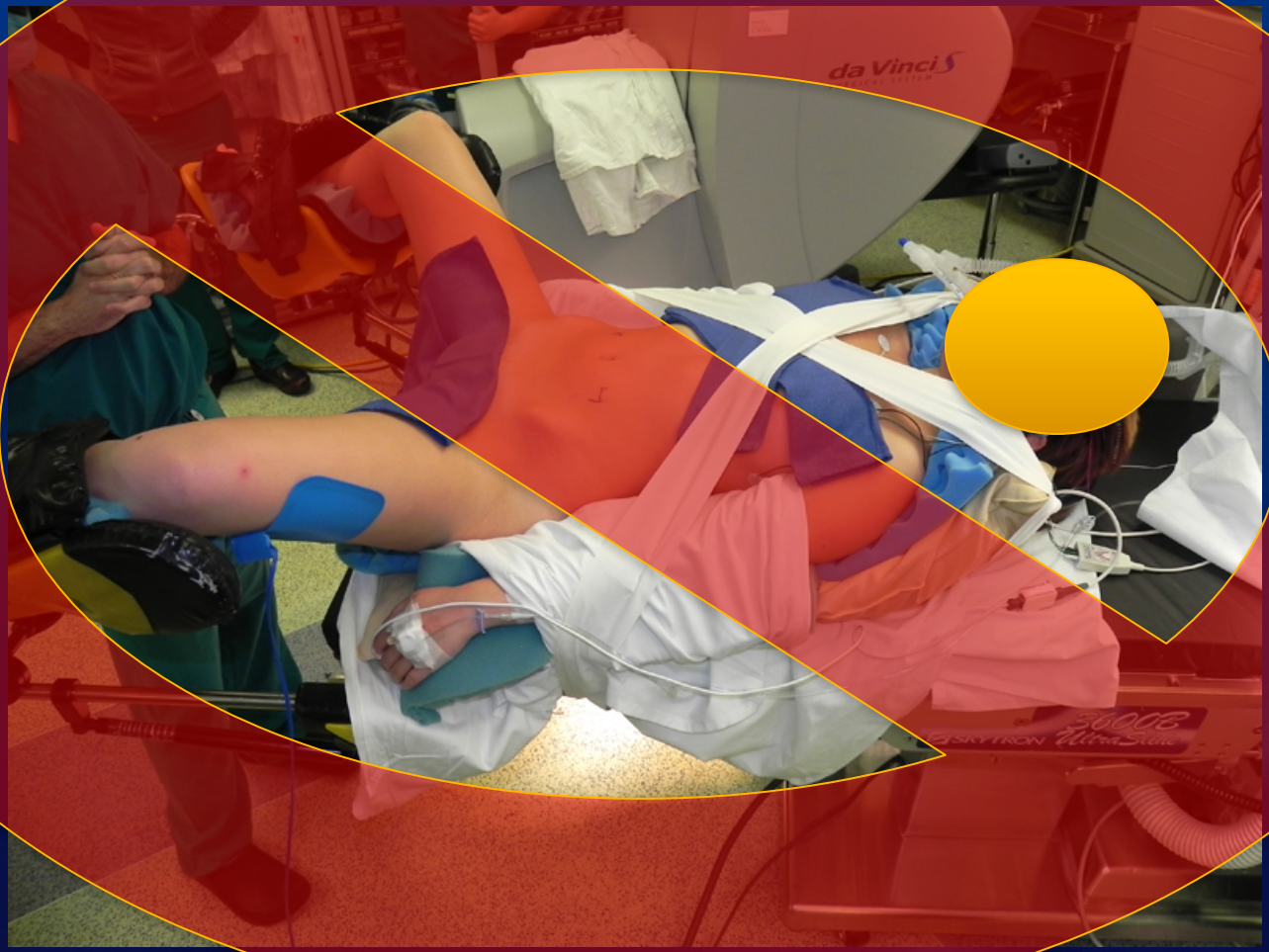
I use lithotomy for minimally invasive cases

a) Always
b) Sometimes (depending on the case)
c) Never



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Beware of the Sandbag

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Complications of Positioning

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Whats wrong with this picture?

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Special Positioning Considerations

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XR FLUORO VOIDING URETHROC

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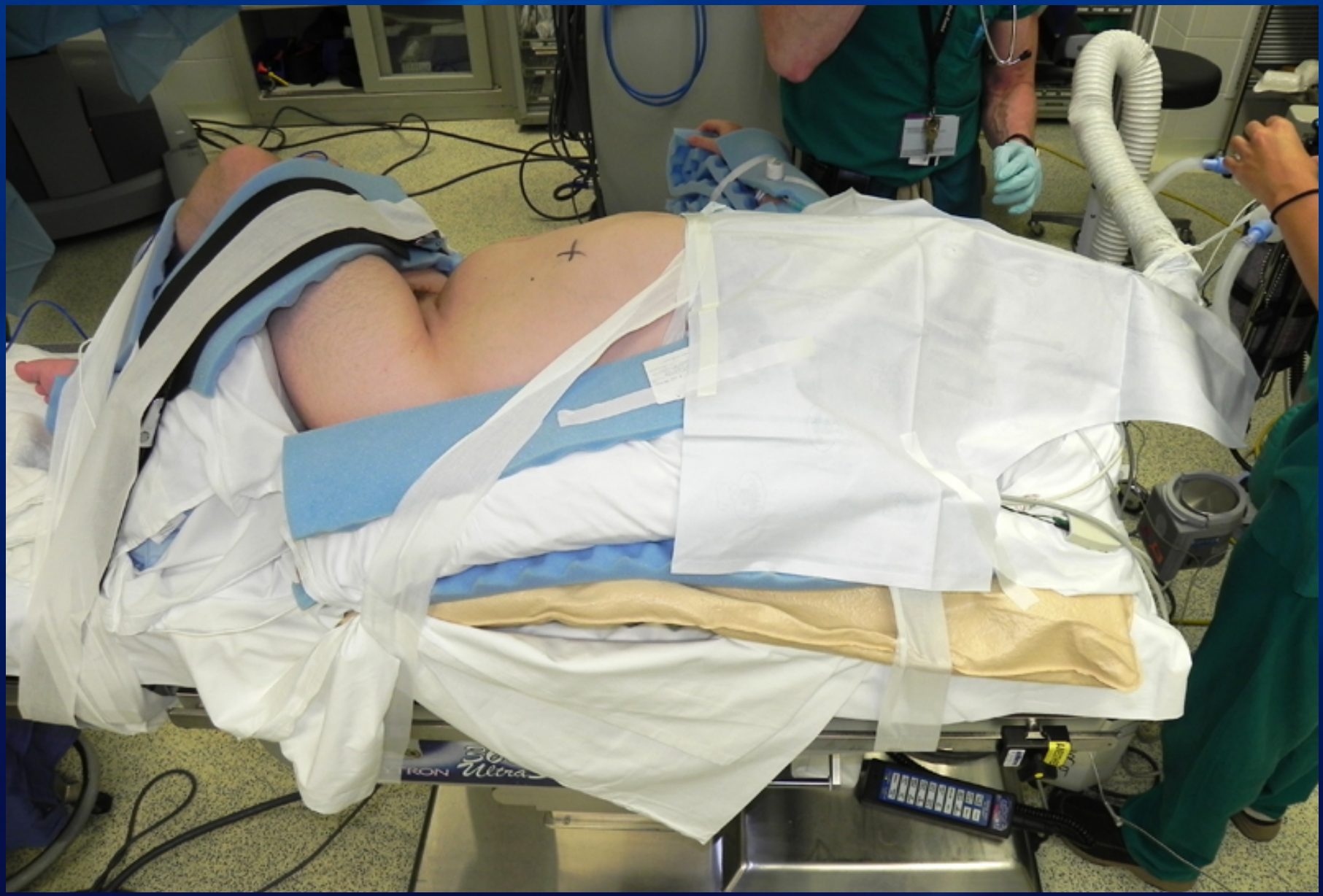

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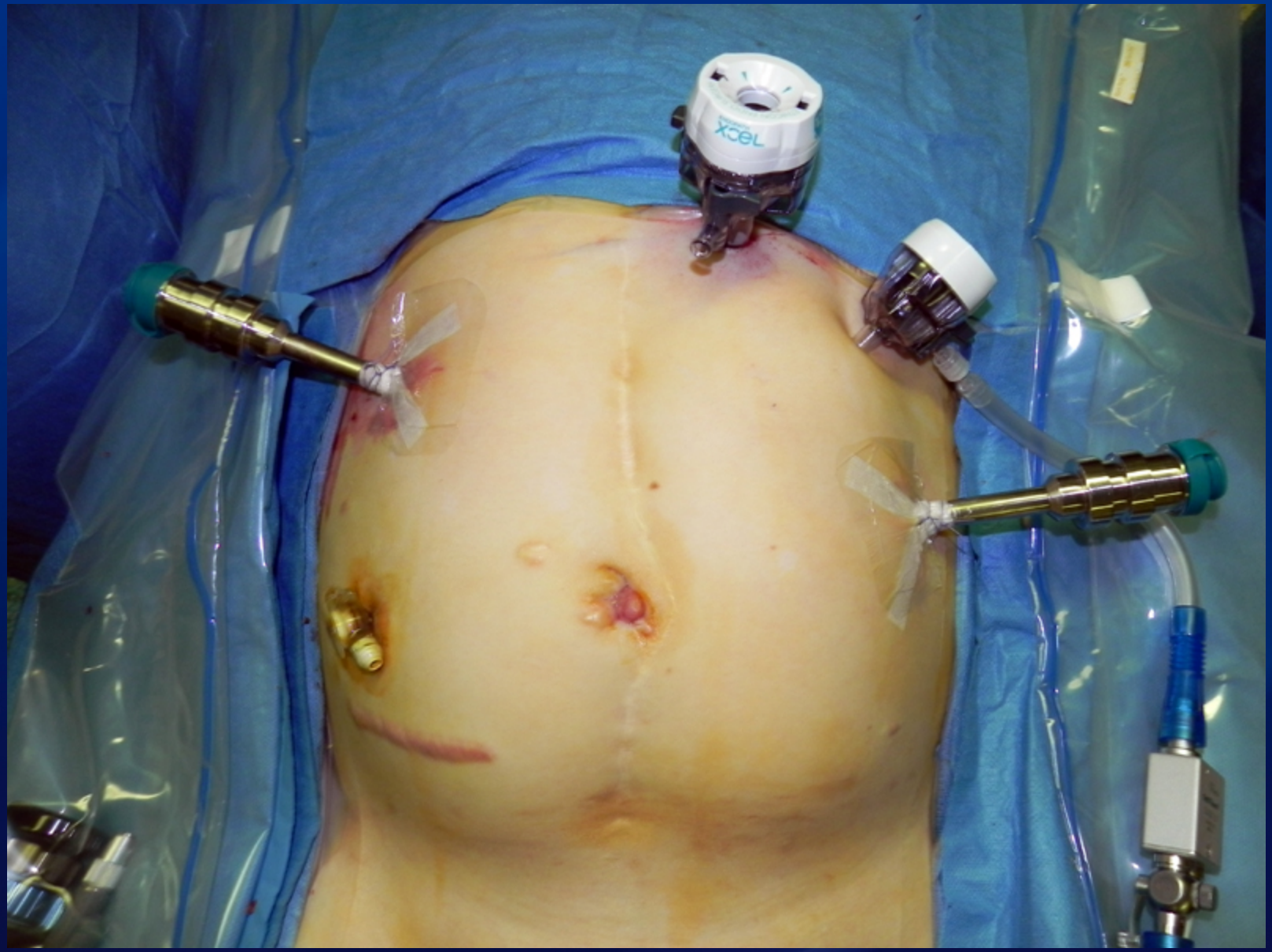

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Modify your positioning for the problem

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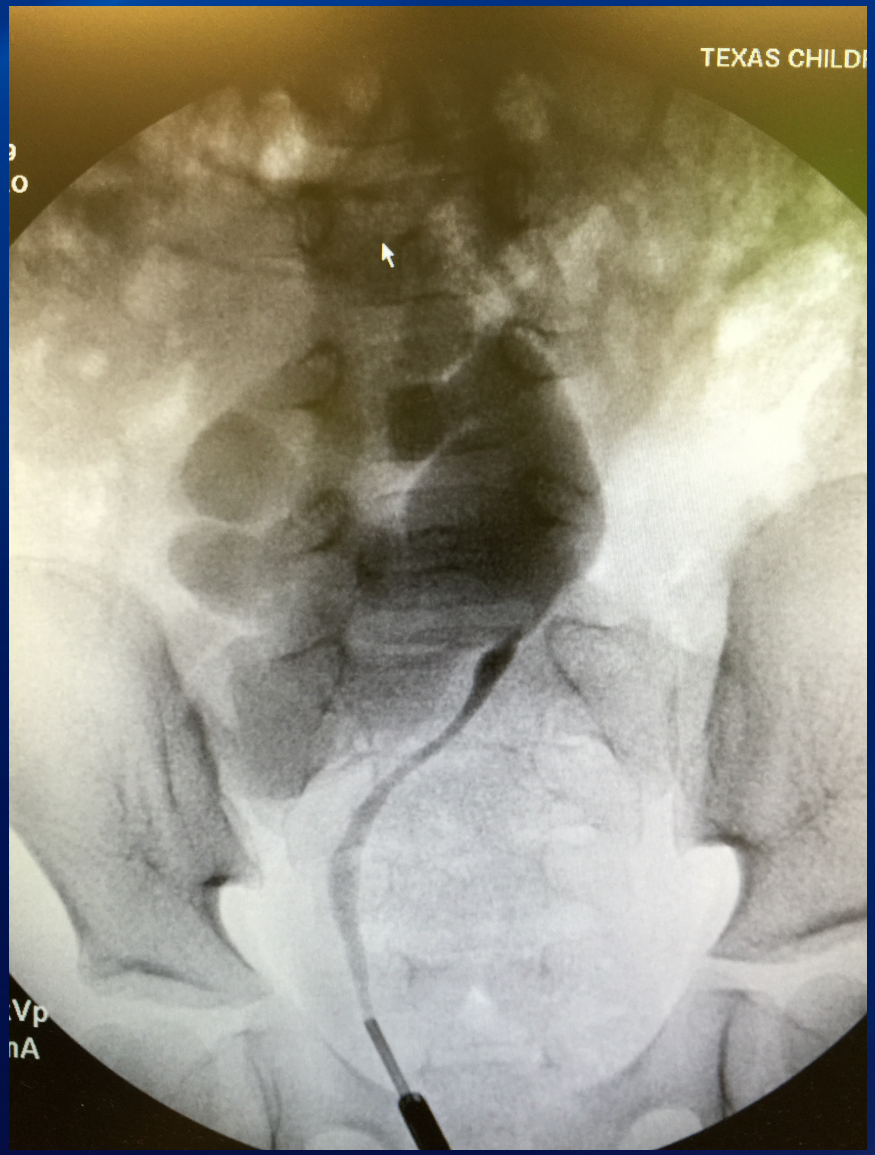

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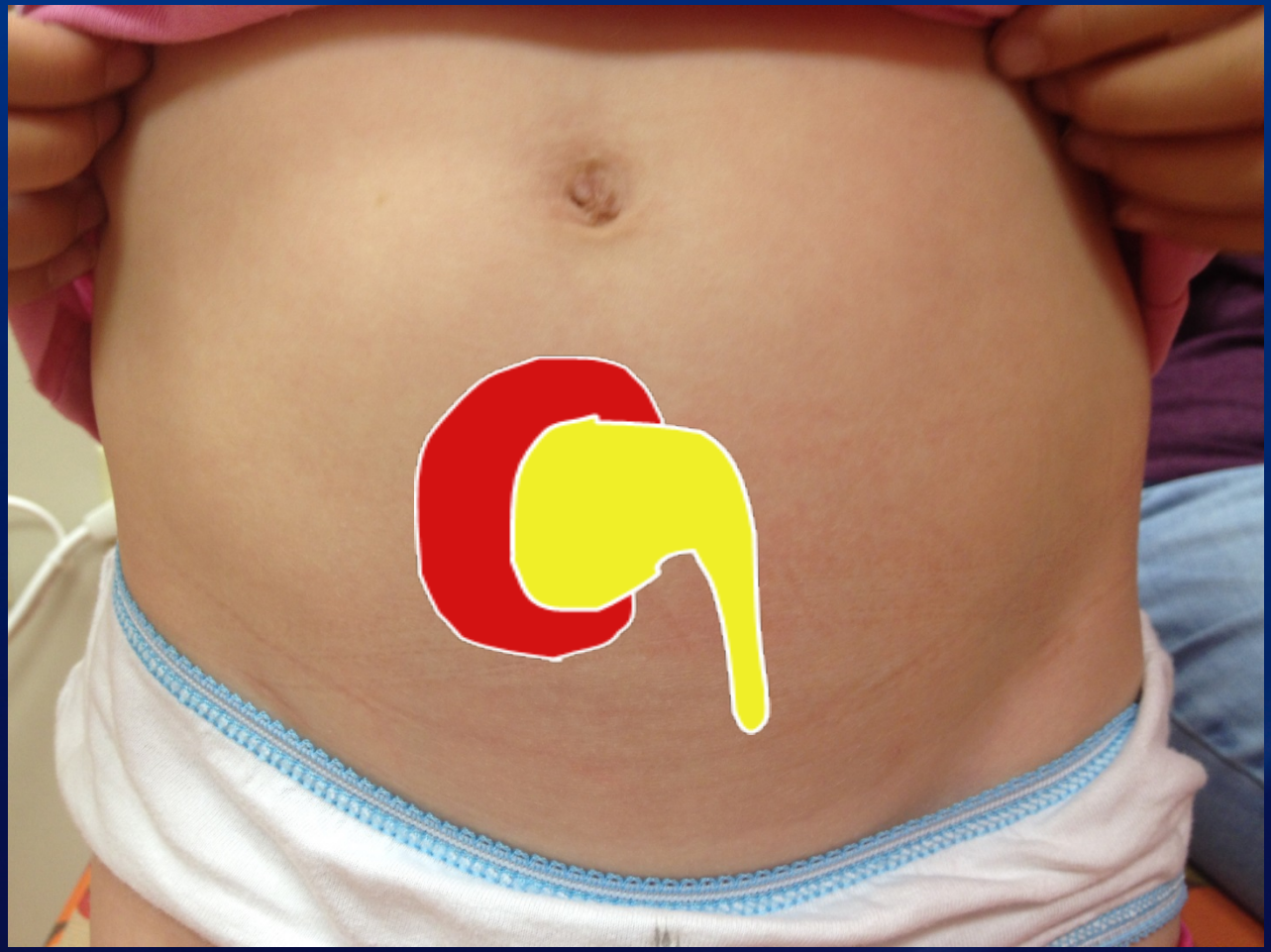
I would perform this pyeloplasty

a) Open
b) Laparoscopic
c) Robotically



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If doing this case laparoscopically I would position my ports

a) Horizontal (right to left) below the kidney
b) Horizontal (right to left) above the kidney
c) Vertical (head to toe)
d) Other

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Access

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Access Basics

- Patient safety
  - Avoid complications
- Access
  - No technique is free from complications
- Trocar placement
  - Use a 5 mm camera
  - Point away from vital structures
- Maximize effective docking / ergonomics
  - Minimize clashing

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Access Complications

- Inadvertent laceration or perforation of intraabdominal structure or vascular structure.
- Usually initial access.
- Occurs with all access methods
- Most common injury - epigastric laceration

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Tips to minimize complications

- Avoid scared areas
- Use disposable initial trocar
  - Less entry force
- Lift abdominal wall by fascia
  - Increases distance to retroperitoneum
- Angle entry (45-60 degrees) during umbilical access

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Initial Access

No “perfect” technique

Attending: “Verees needles kill people”

Resident: “Verees needles don’t kill people, people kill people”

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Hasson	Veress	Direct
?slow/fast	Fast	Faster
Bigger incision	Minimal incision	Minimal incision
Direct vision	Blind	Direct vision
Novice	Experience required	Experience required

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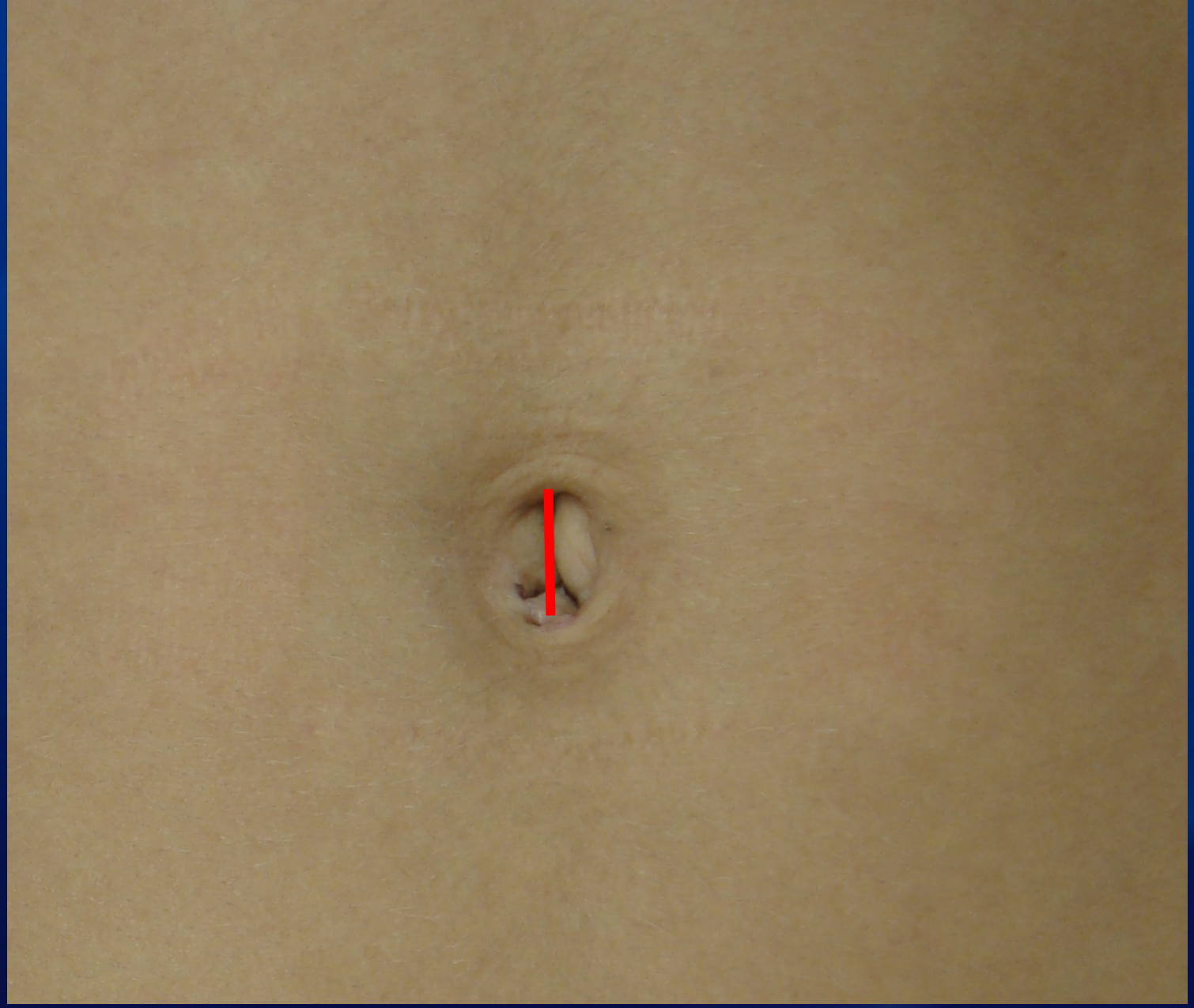
My preferred method of obtaining initial access is

a) Hasson
b) Veress
c) Optical trocar
d) Other



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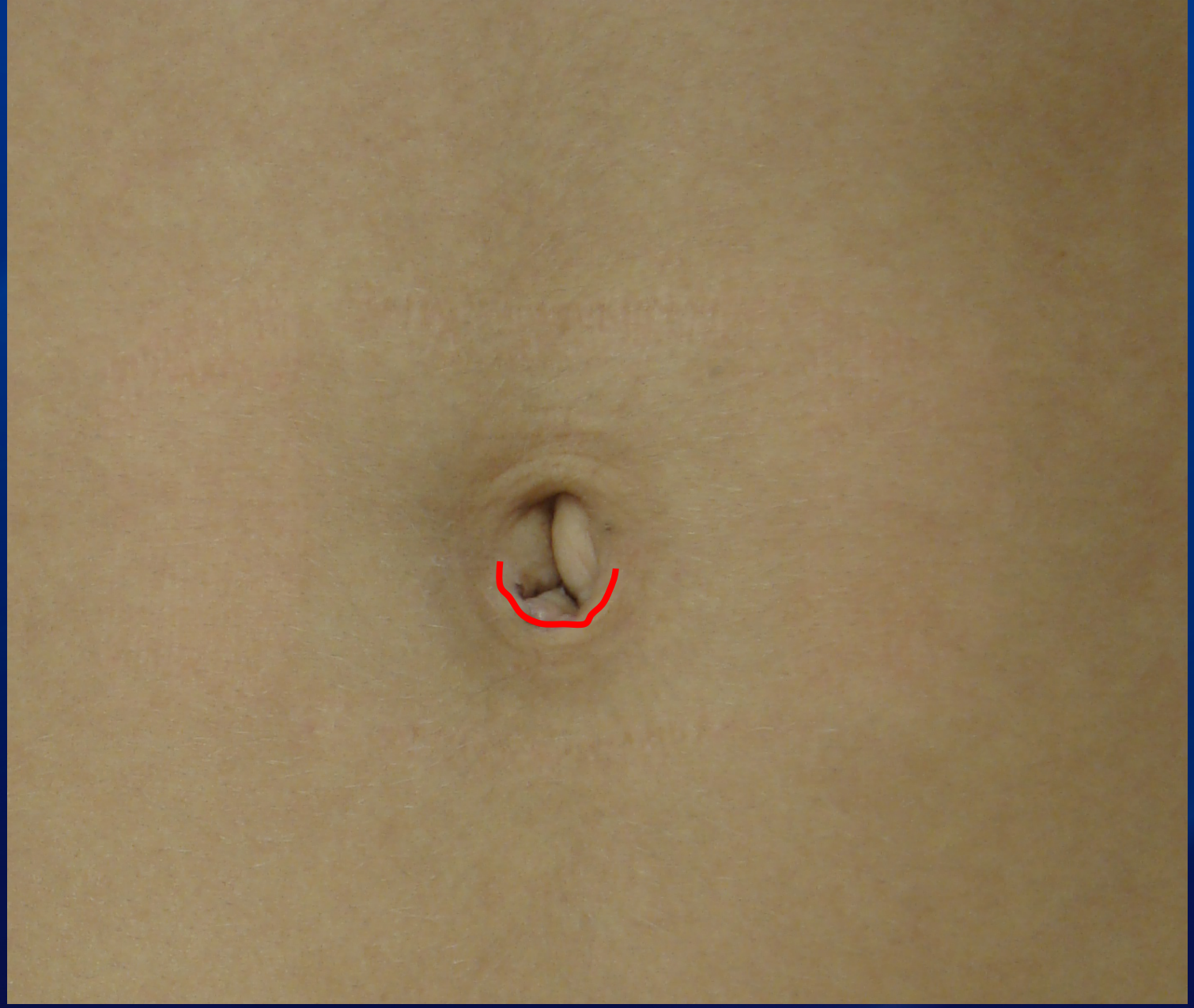

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Robotic Trocars
Camera Port

- Wide variety of ports available
- Suitability to access technique
  - Hassan technique
    - BTT™ (Autosuture)
  - Veress technique
    - Step™ (Autosuture) Dilating System
  - Optical technique
    - Endopath™ (Ethicon)
    - Kii Optical™ (Applied)

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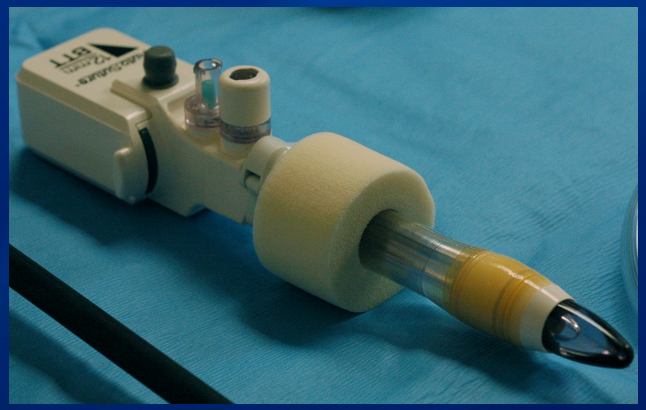
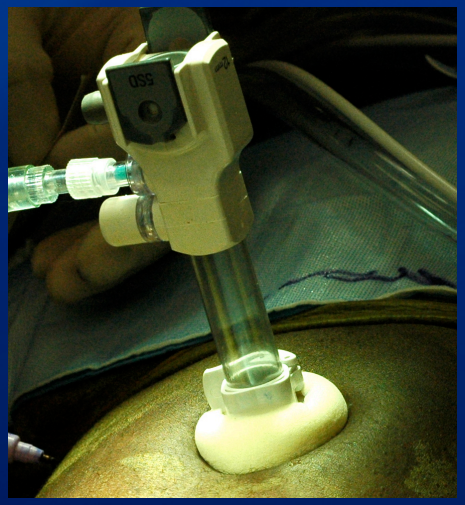
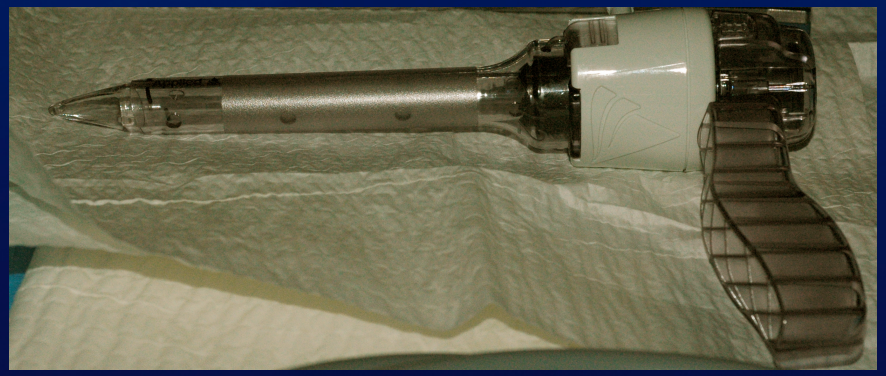
Camera Ports





12 mm BTT
(Autosuture)

Step™
(Autosuture)



Kii™ Optical Trocar (Applied)

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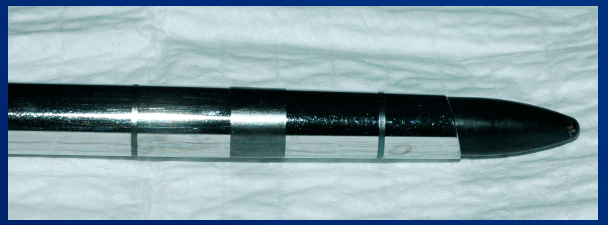
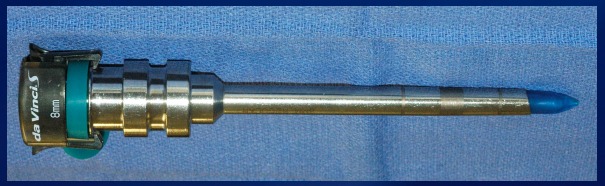
Robotic Trocars
Working Ports

- Available in 8 mm and 5 mm
- Introducers available in:



Blunt

Sharp



Bladeless
Disposable

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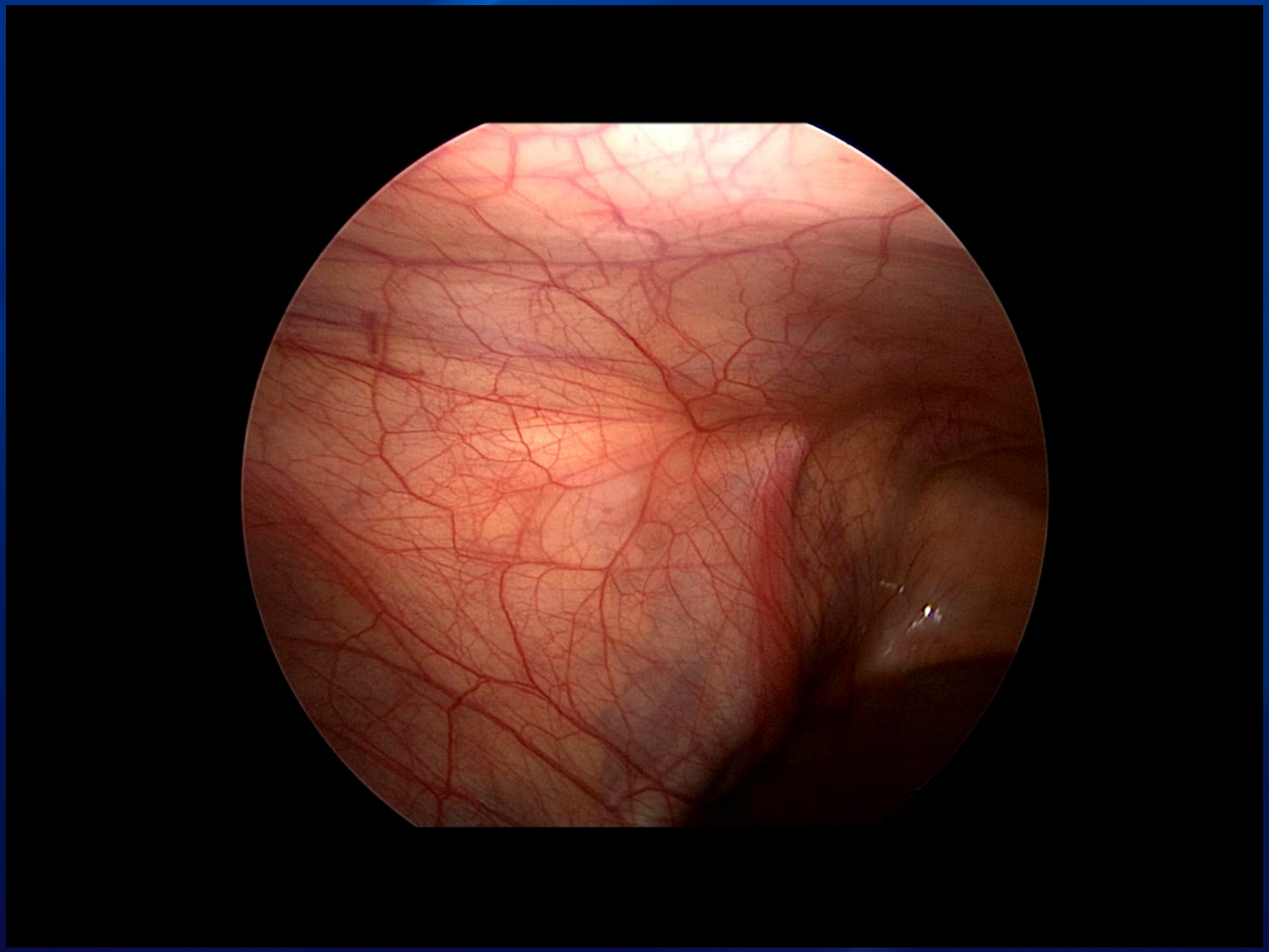

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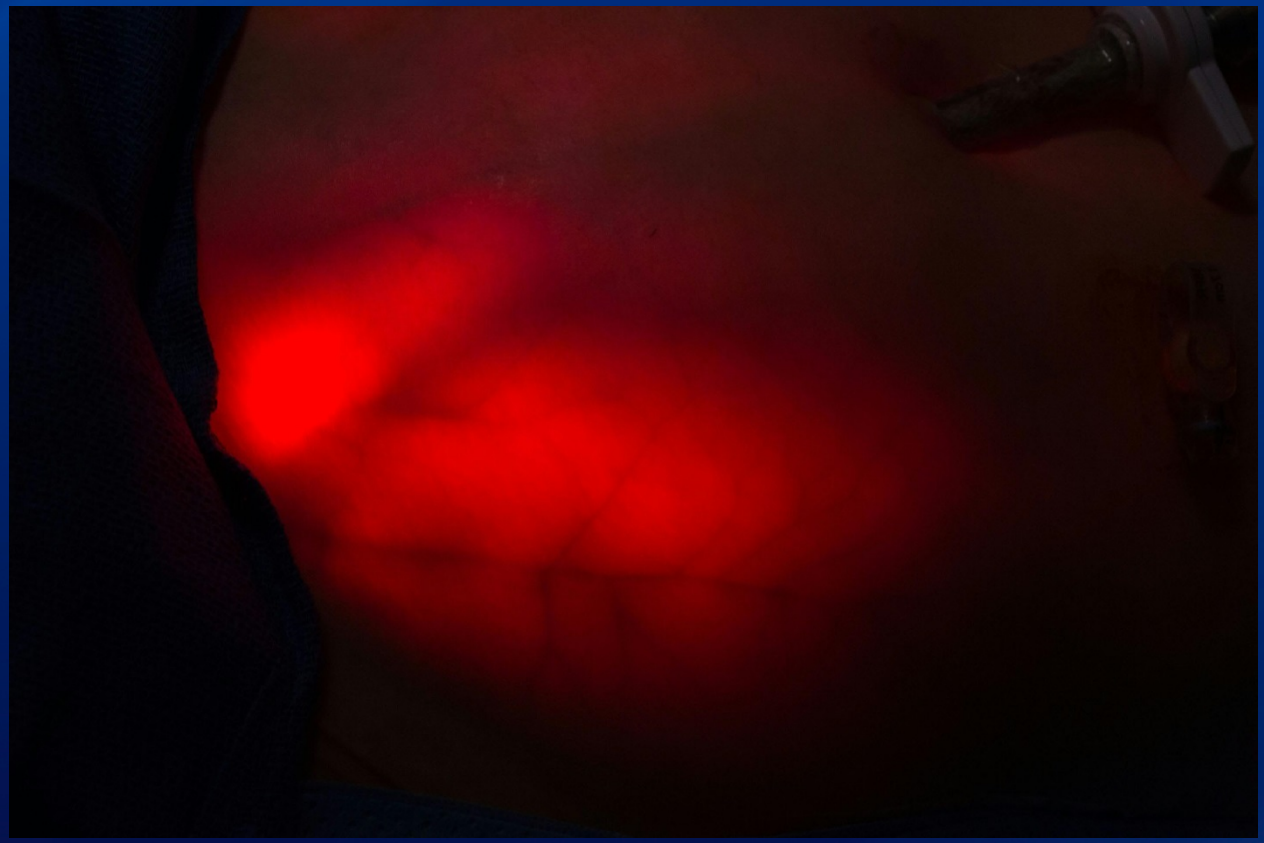

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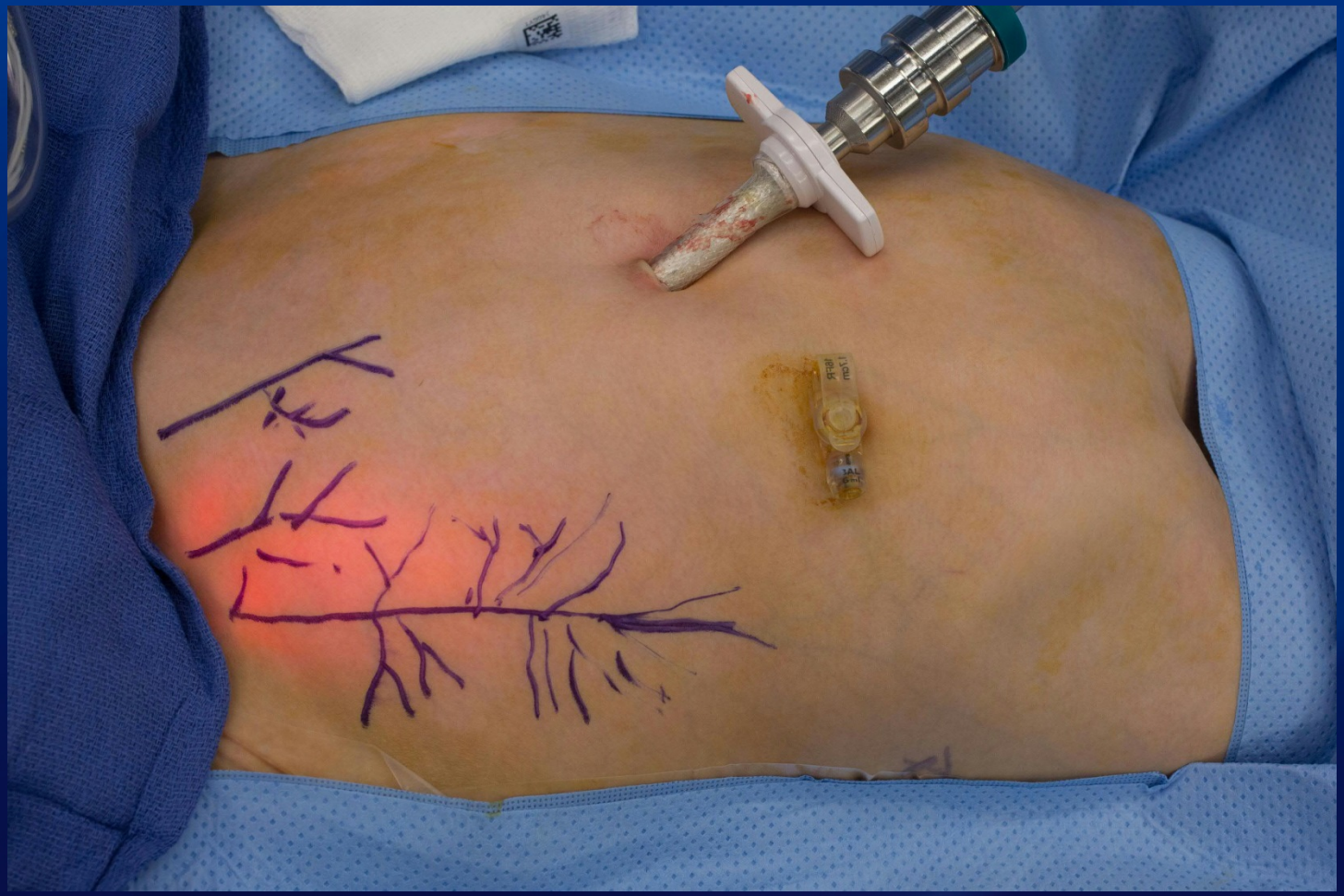

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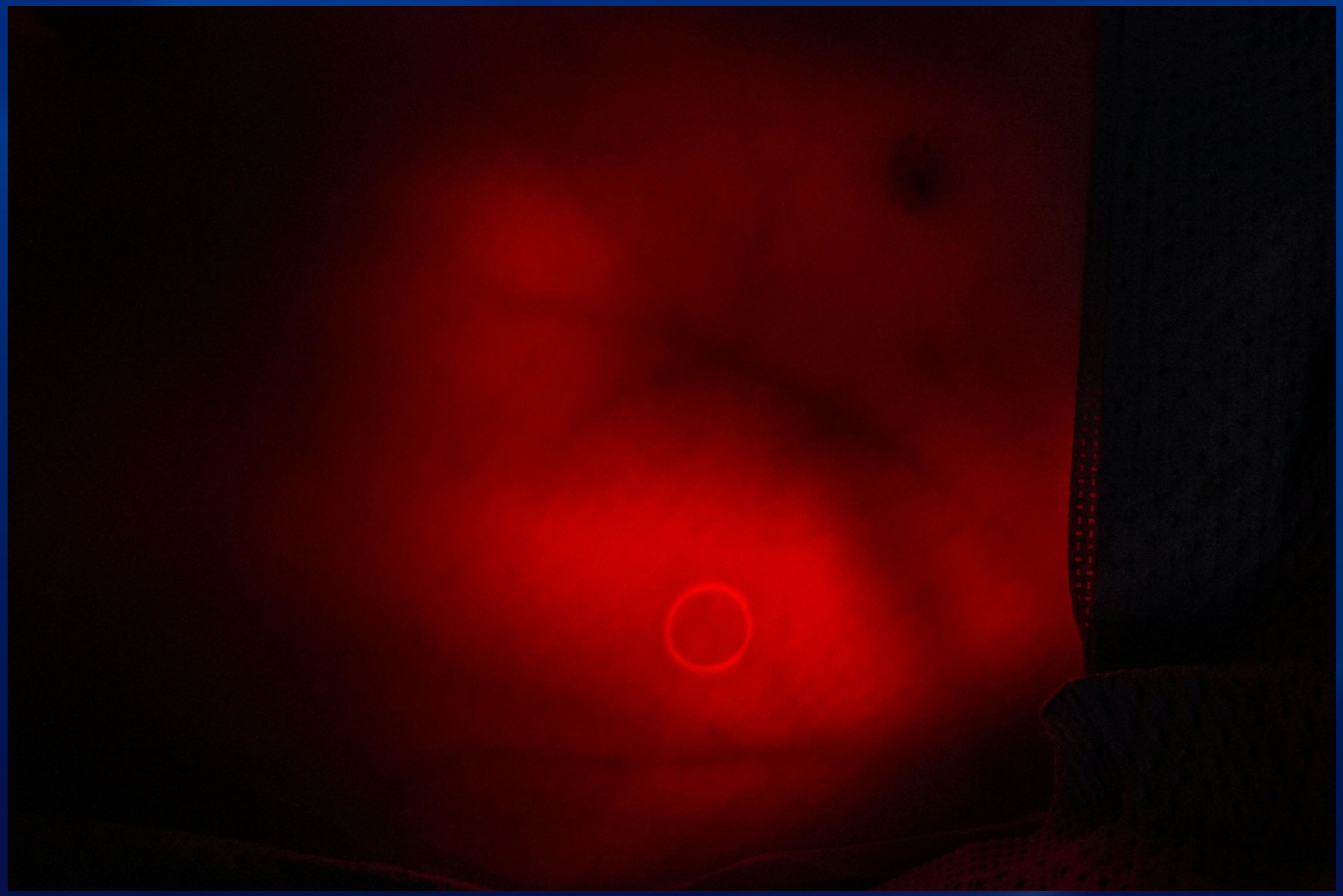

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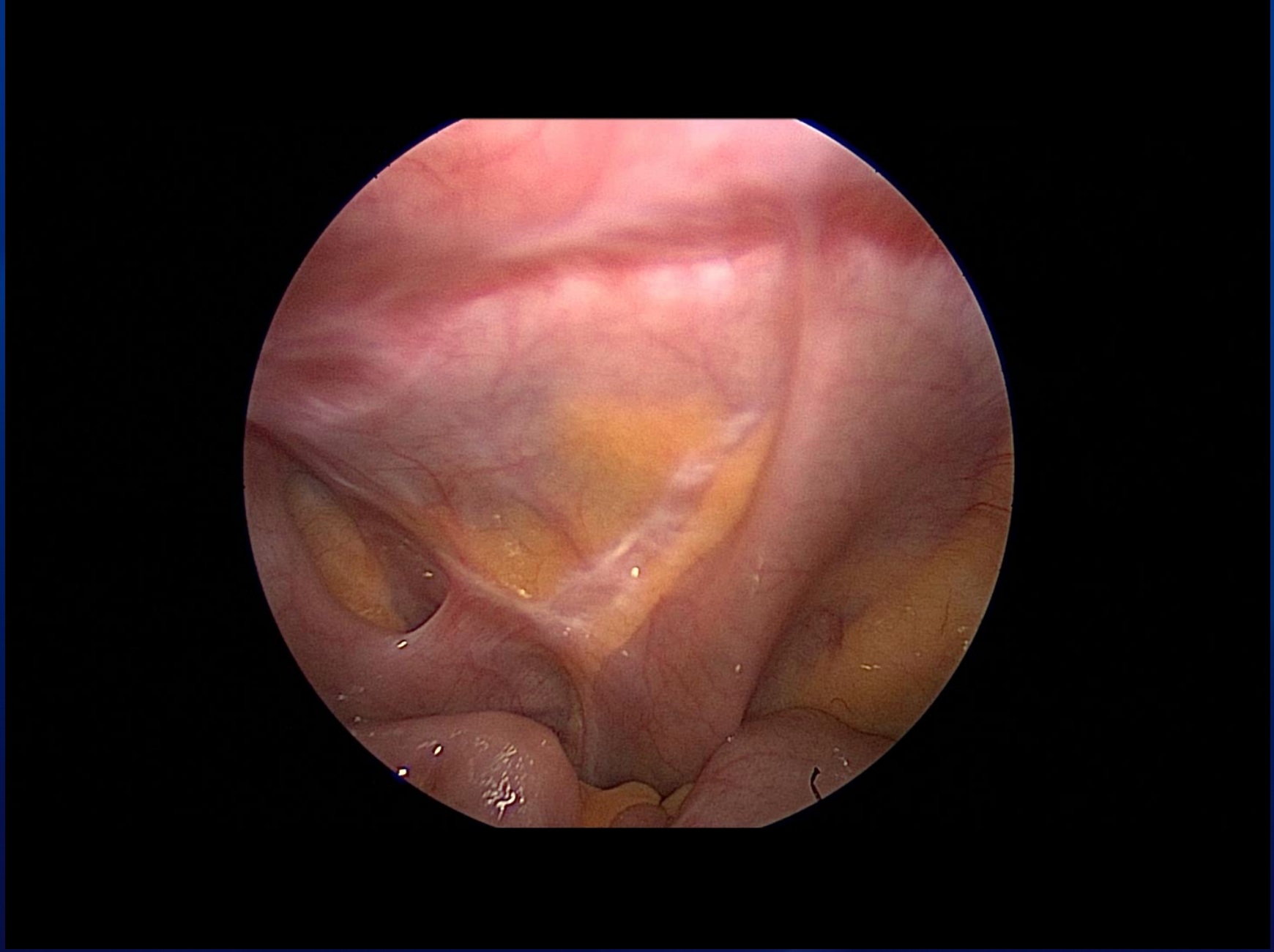

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Procedure Specific Port Configuration

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Renal Surgery / UPJ

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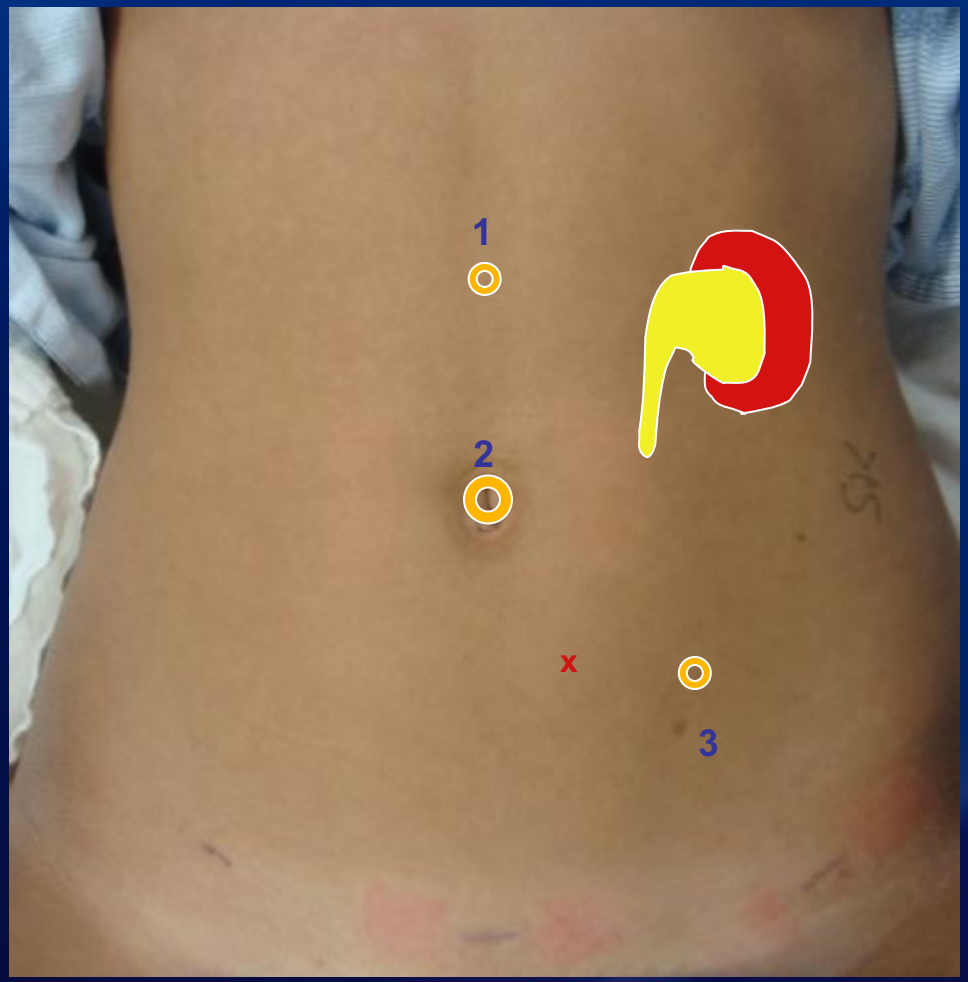
Left Pyeloplasty / Pyelo-ureterostomy

1: 8mm working port

2: 10 mm camera port

3: 8mm working port

X: 5mm assist



Robotic System


INCHES
CM

HIdES Pyeloplasty /Renal Surgery

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Robotic System

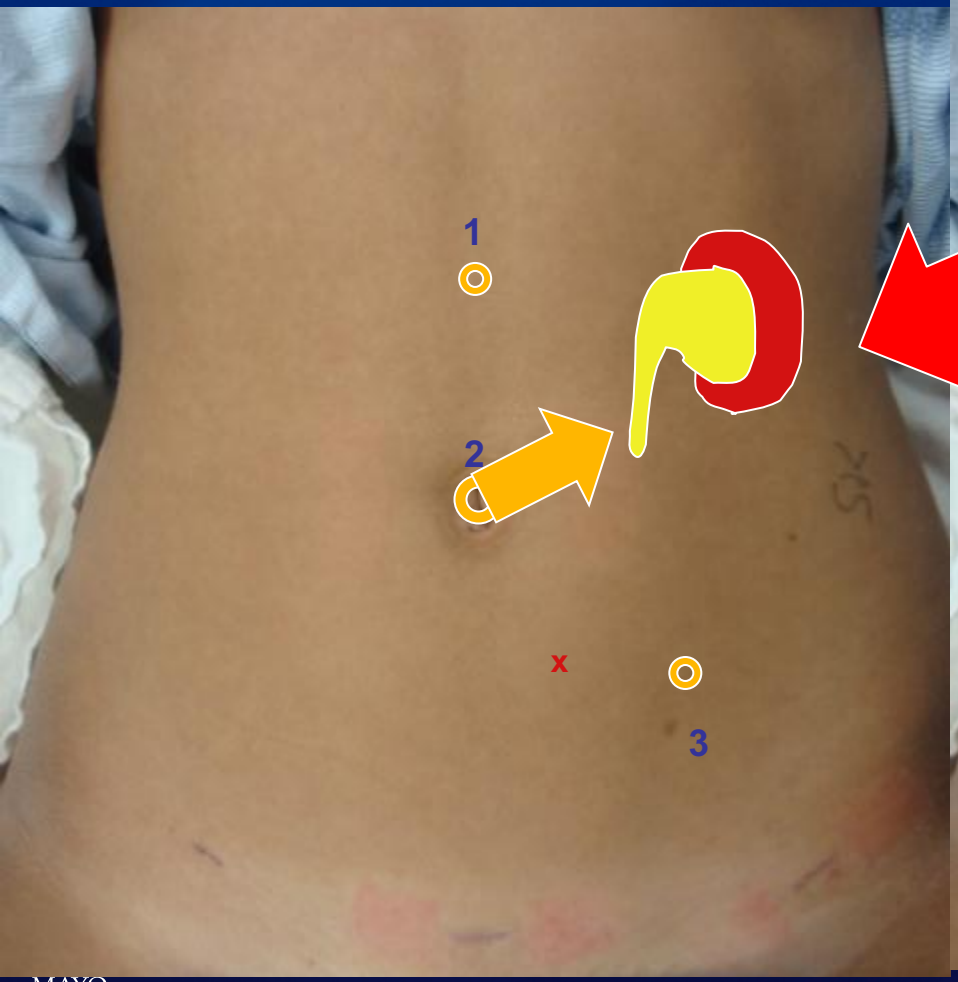
1: 8mm working port

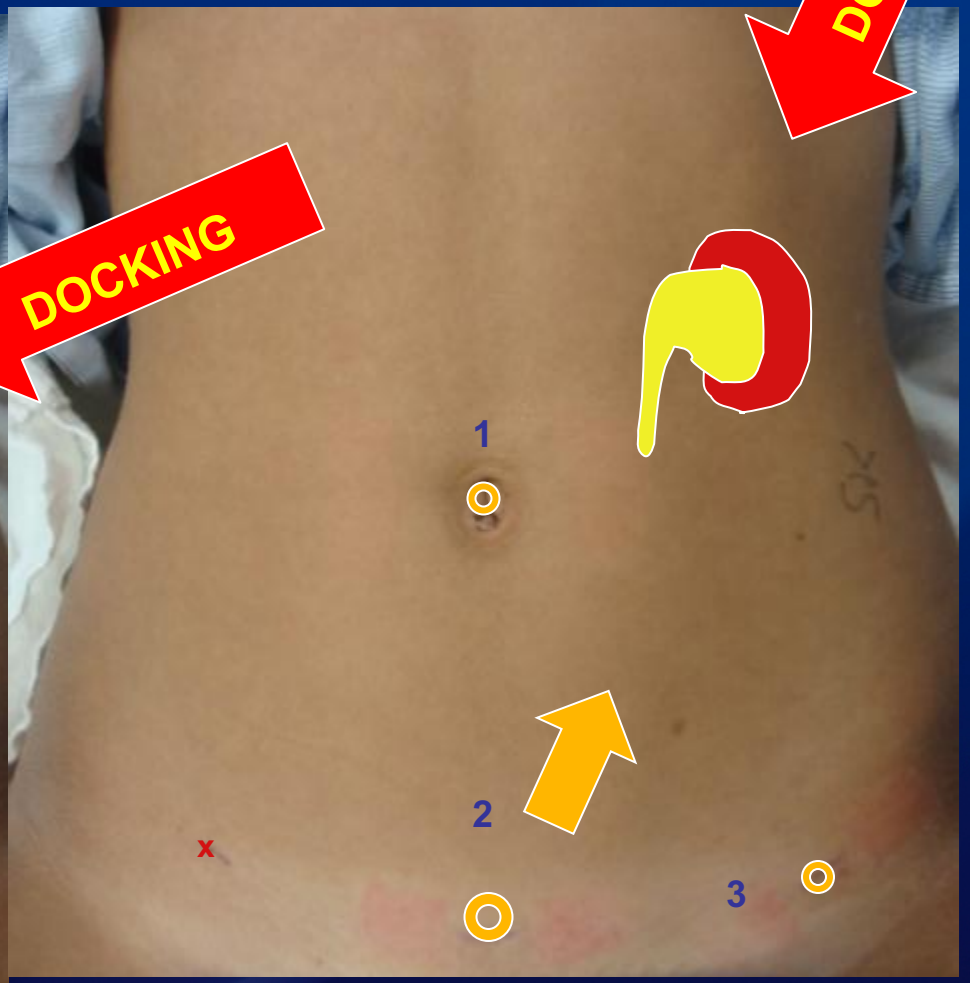
2: 10 mm camera port

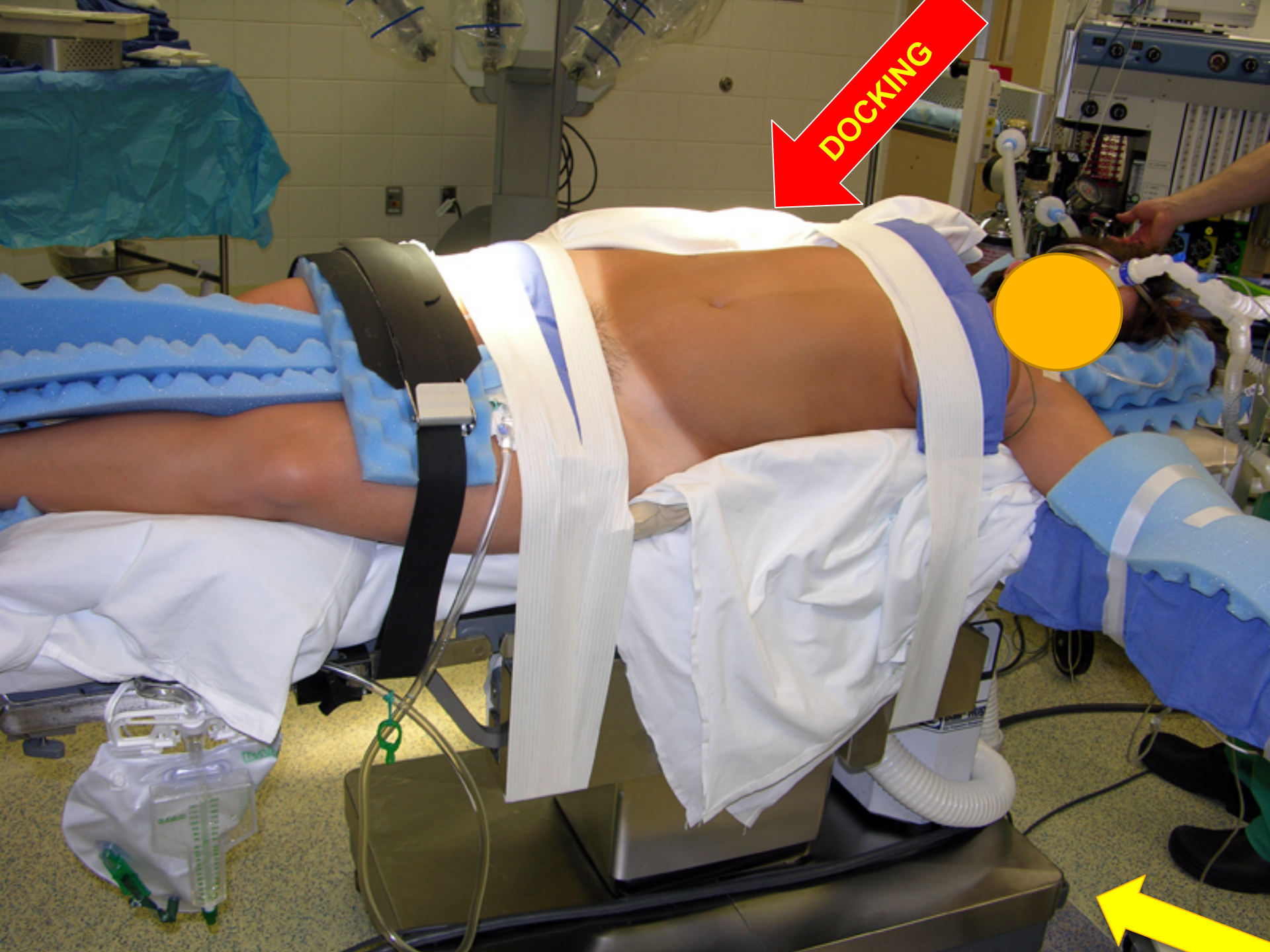
3: 8mm working port

X: 5mm assist

Traditional RALP vs HIdES P






DOCKING

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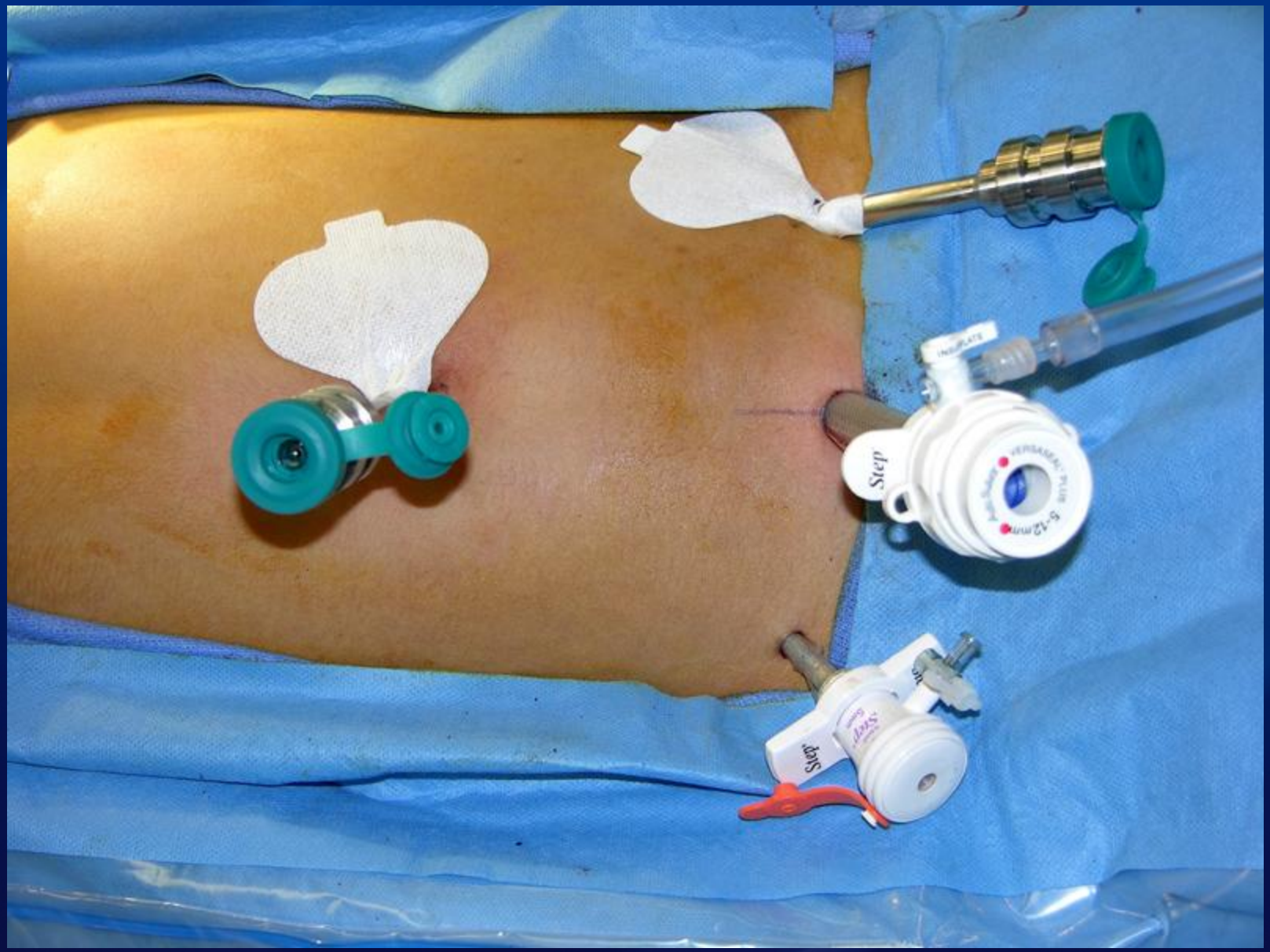

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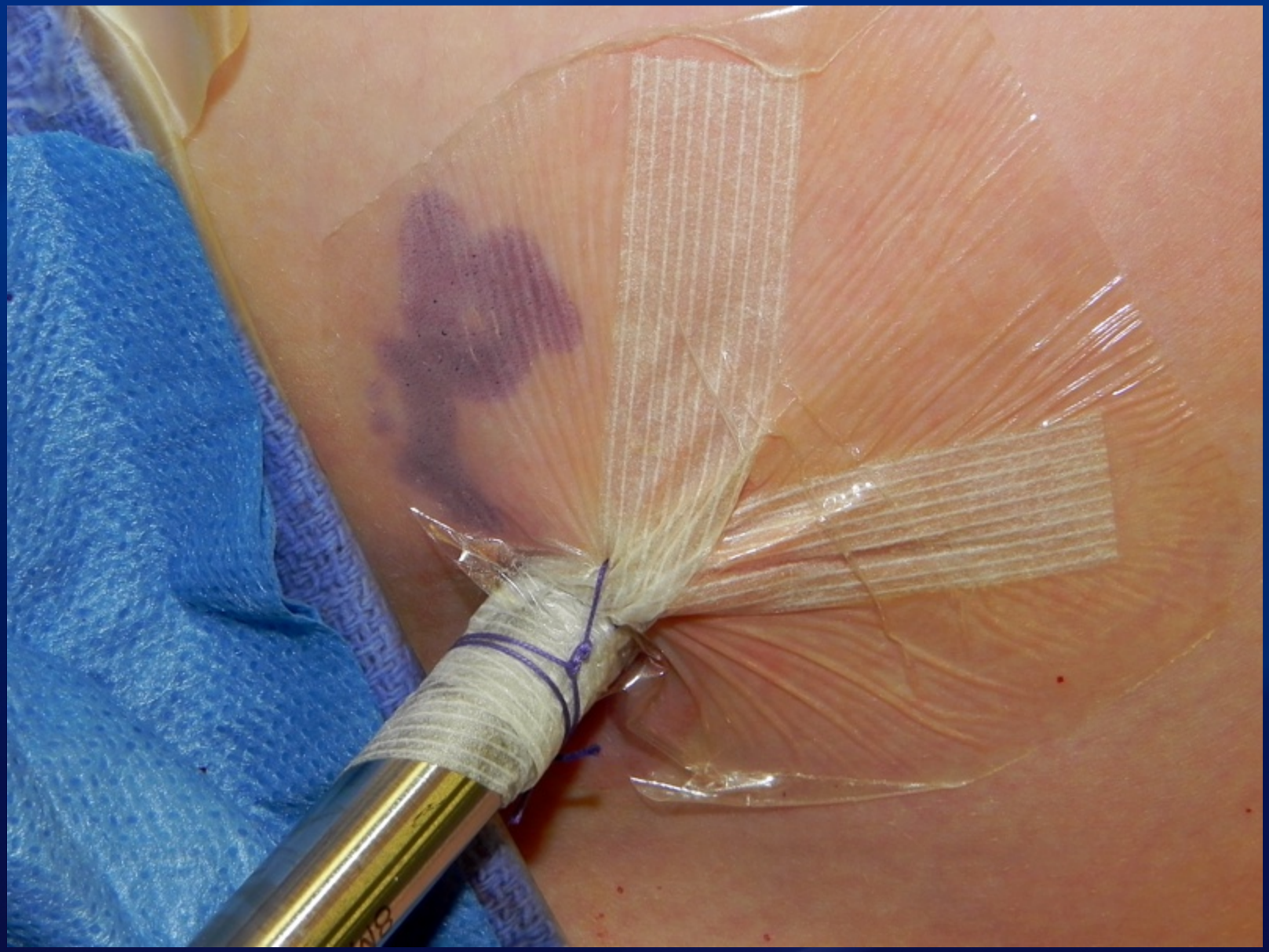

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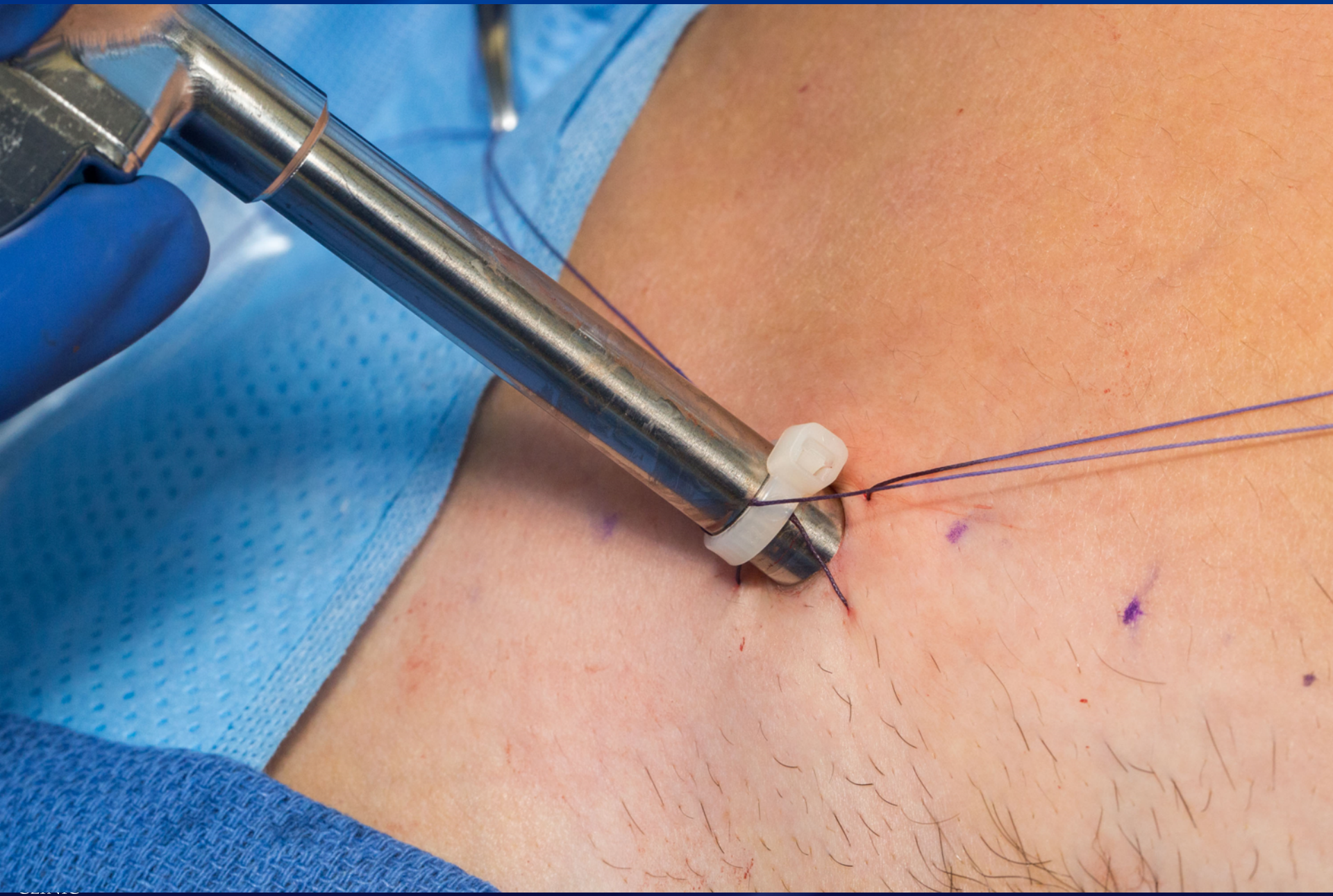

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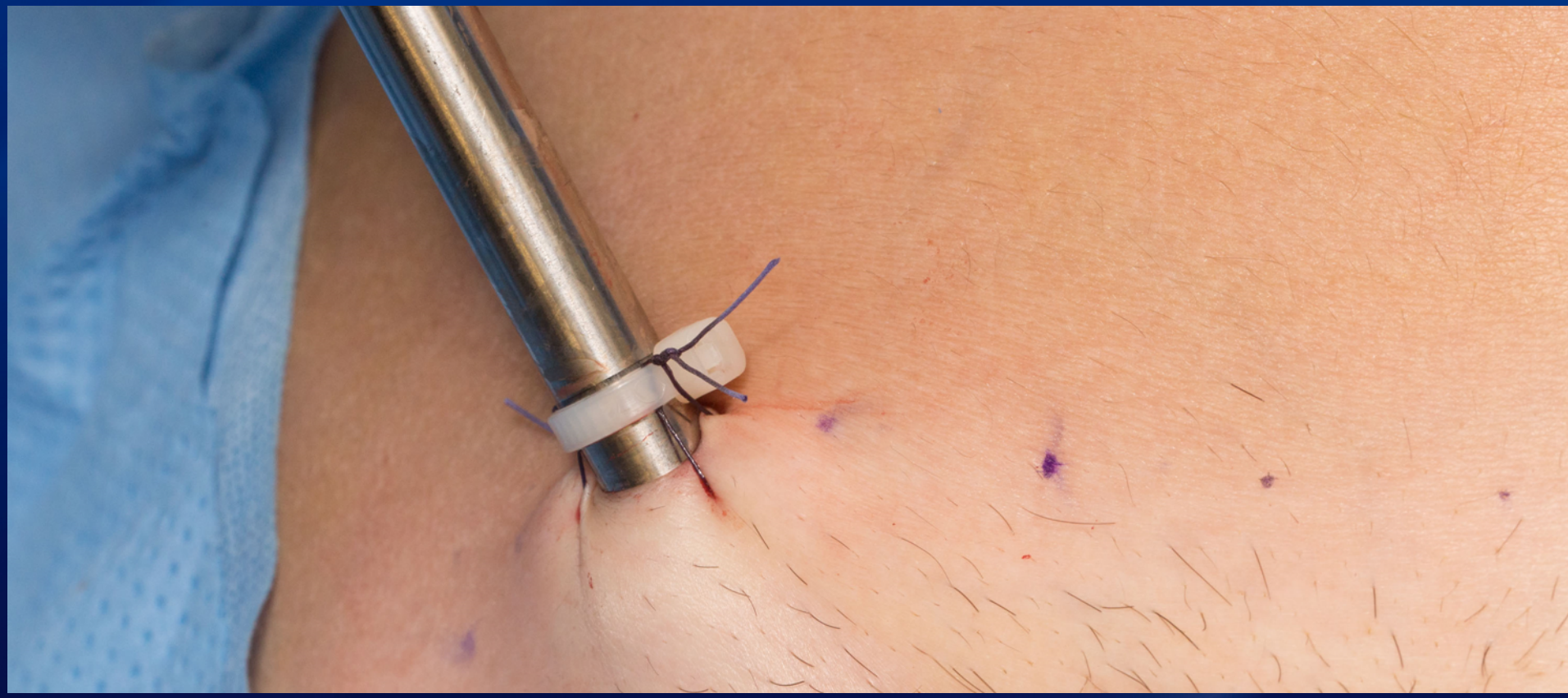

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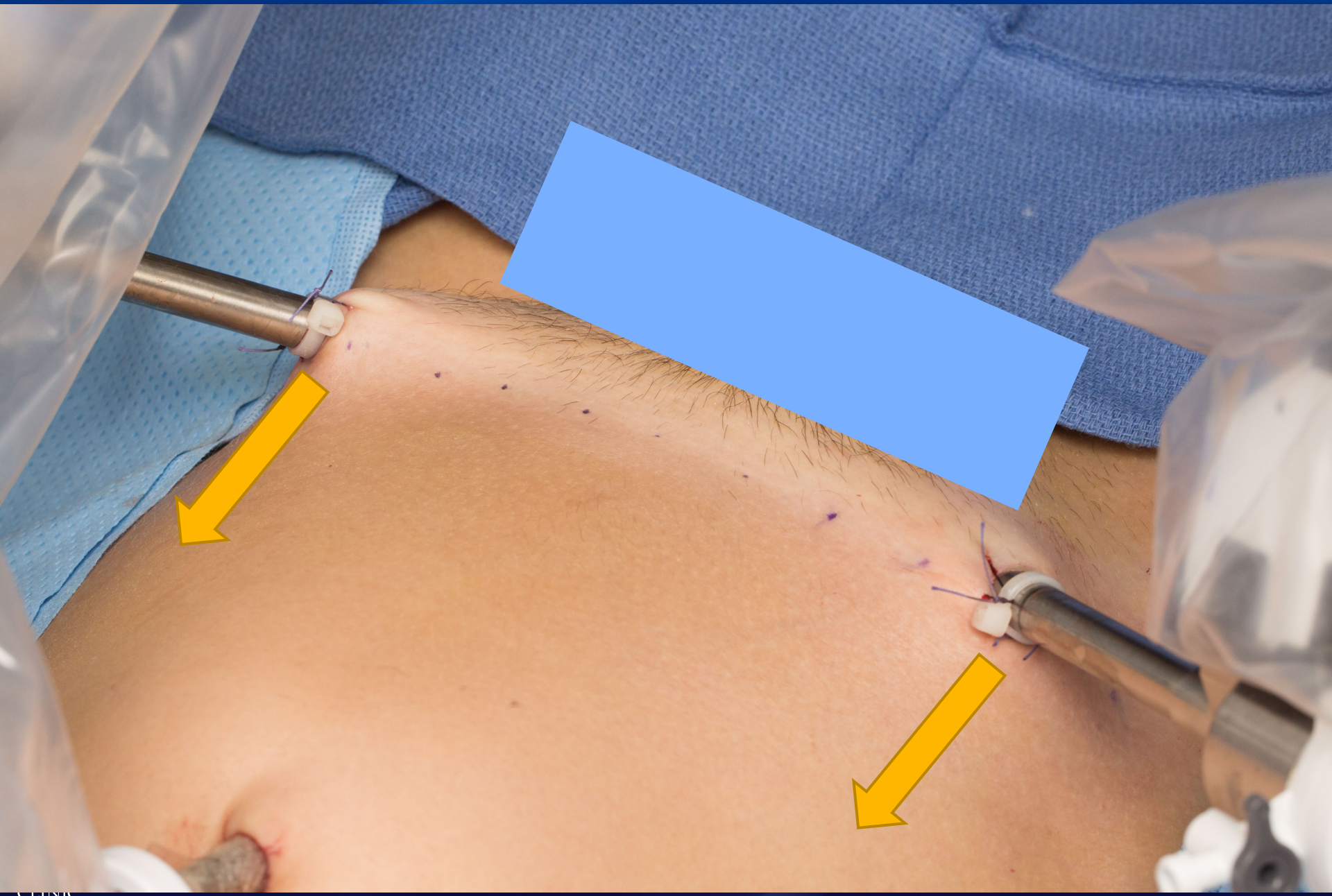


Step
Step

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Redo Pyeloplasty / Ureterocalycostomy

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Port Placement for Pelvic Surgery

- Low UU
- Ureteral Reimplant
- Retrovesical Surgery
- Bladder Outlet Surgery

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Trocar Placement

- "If you are creating visible scars…this procedure is useless" Anonymous
  - Place trocars low (medial to ASIS)
- Camera: umbilical
- Working ports
  - 5 mm vs 8.5 mm

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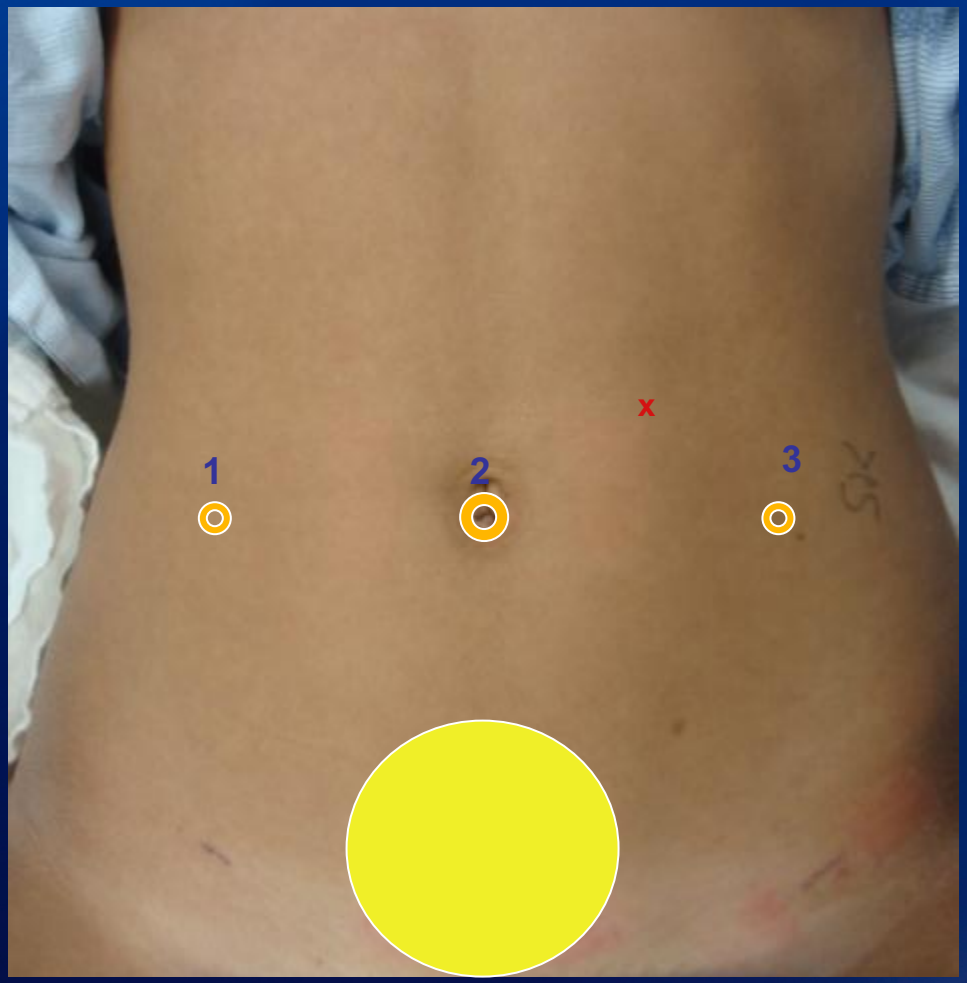
Ureteral Reimplant Traditional Port Placement

1: 8mm working port

2: 10 mm camera port

3: 8mm working port

X: 5mm assist



Robotic System

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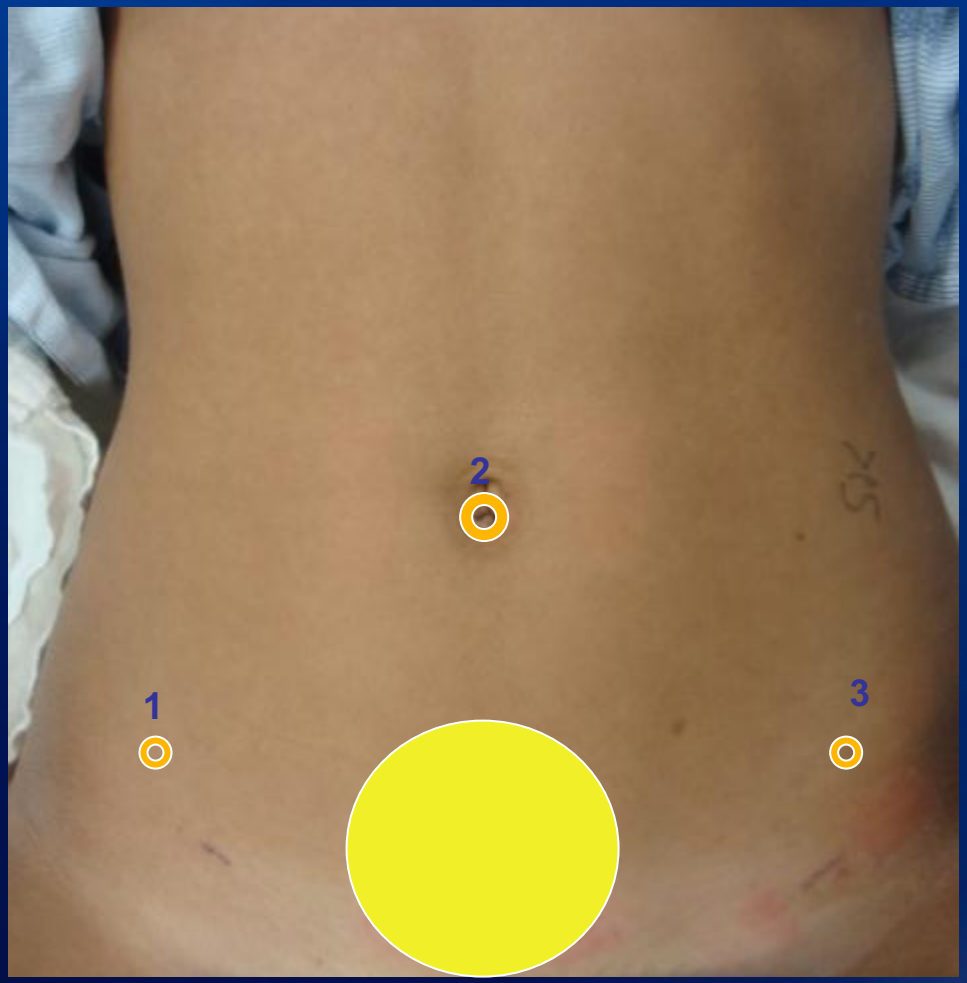
Hidden Incision Port Placement

1: 8mm working port

2: 10 mm camera port

3: 8mm working port

X: 5mm assist



Robotic System

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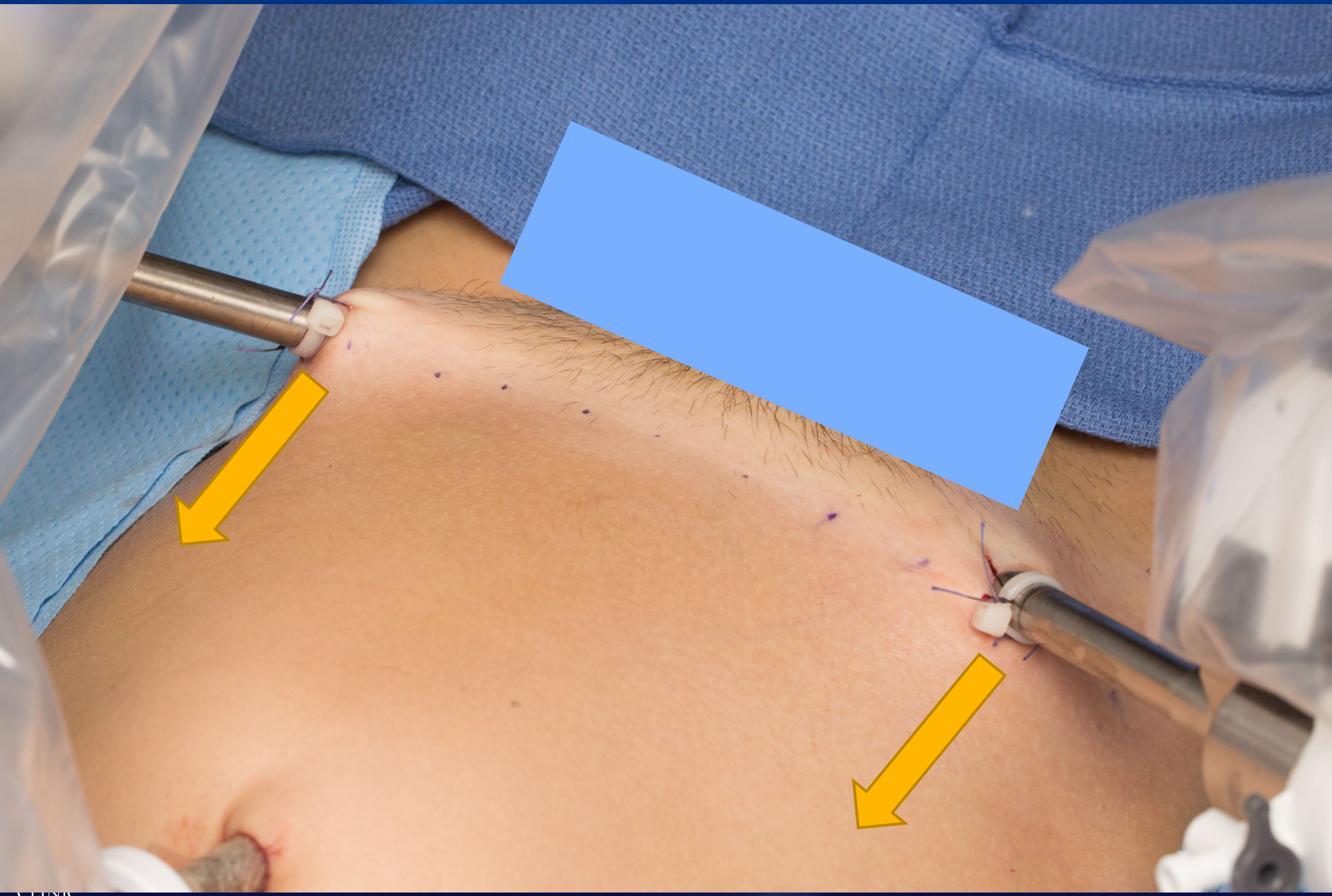

Extravesical Port Placement Right Side

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Intravesical Ureteral Reimplant

- Ports
  - Camera near dome
  - Working ports lateral
  - Port placement is CRITICAL step
  - Placed under pneumovesicum
- Replicates open technique
- Pitfalls:
  - Urine leak from Trocar sites
  - “Blind” Trocar Placement

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Intravesical Trocar Placement

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Port Placement in Neonates

- 3-4 months of age
- Common robotic procedures in neonates
  - Pyeloplasty
  - Hemi-nephrectomy
  - Nephrectomy

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Special Considerations: Neonates

- Confined space
  - Outside
  - Intra-peritoneal
- Place camera port first
- Insufflate the abdomen prior to placing the robotic working ports
- “Burp” the ports

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Instrument Selection

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Robotic Trocars
Working Ports

- 8 mm instruments
  - Shorter distance between tip to articulation
  - Wide variety of instruments
    - Harmonic ACE®
    - Monopolar scissors
    - Bipolar instruments
    - Clip appliers
- 5 mm instruments
  - Smaller incision
  - Limited variety of instruments
    - Harmonic ACE®
    - No monopolar scissors
    - No bipolar instruments
    - No clip appliers

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Instrument Selection

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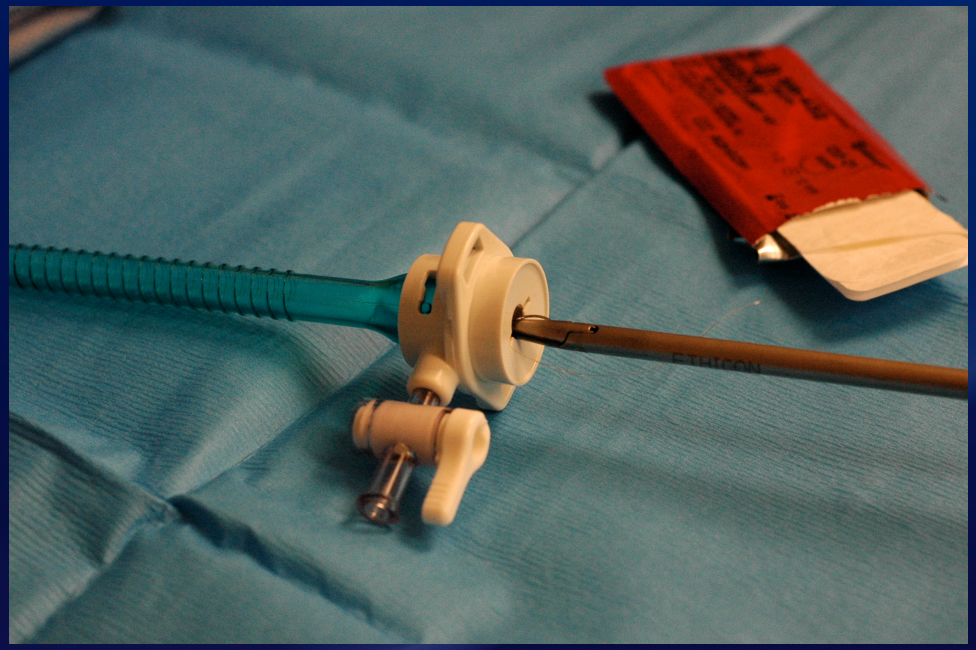
8 mm versus 5 mm Tip to Articulation

If you perform robotic assisted surgery your preferred instrument size is

a) 8mm
b) 5mm
c) Depends on the case

Robotic Instruments
Accessories

- Assistant ports: 5 mm or 10 mm
  - Useful for retraction, suction, and passing sutures
  - Care needed in passing needles with 5 mm port



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Conclusion

- Injuries occur with positioning and access
- Ultimate responsibility lies with you
- Pick a technique and stick to it
- Become very comfortable with these techniques and THEN teach
- Try different intruments / port configurations

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Registration Link : http://www.aua2018.org/register/instructional-courses

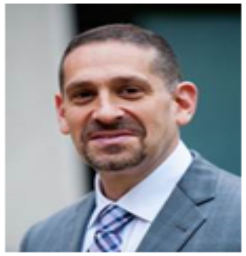
080IC - Practical & Evidence Based Minimally Invasive and Robotic-Assisted Surgery in Pediatric Urology

Monday, May 21
4:00 PM - 6:00 PM
Location: MCC WEST, 2009

Instructional Course Director

Patricio Gargollo, MD
Associate Professor
The Mayo Clinic, Mayo Medical School

Instructional Course Faculty(s)



Michael Ost, MD
West Virginia University - WVU Medicine

Aseem Shukla, MD
Perelman School of Medicine, University of Pennsylvania

http://lab.research.sickkids.ca/purc/

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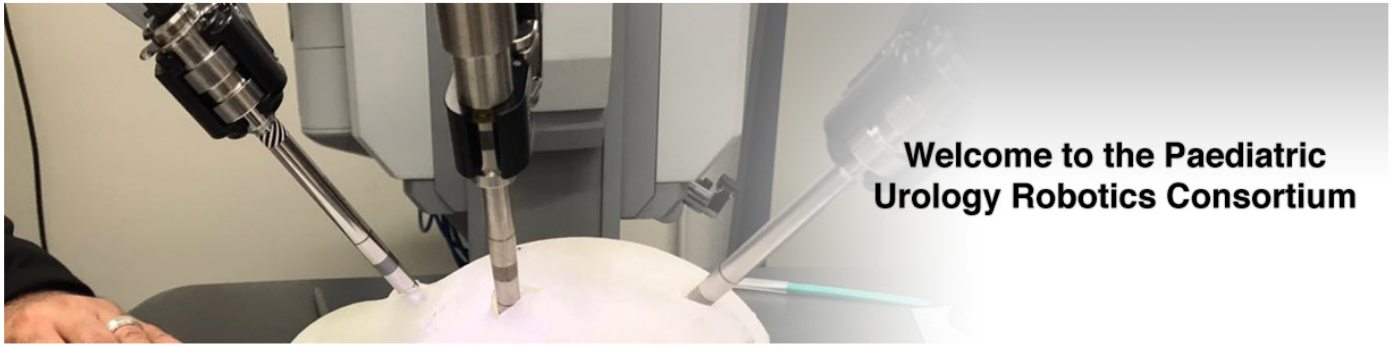

SickKids recently acquired a da Vinci SI from Intuitive Surgical for research purposes. With this recent acquisition, we have organized this Paediatric Urology Robotic Consortium to share ideas and collaborate on ongoing research efforts with a particular focus on robotics in paediatric urology (instruments design, approaches, and outcomes).

This will be a password protected forum open to anyone who wants to follow and/or contribute. Access to the site will provide you the opportunity to blog, post, share anything in relation to robotics in paediatric urology over a period of approximately six months. The hope is that this initiative will culminate into a working group that meets either annually or bi-annually for a round table discussion with focused dialogue, data analysis and a report production. The mission of the consortium is to take robotic research and training to the next level, and potentially develop a broader understanding on the progress of robotic surgery in paediatric urology and methods to enhance its utility.

For those interested, please email lisa.abreu@sickkids.ca and she will provide you with an access username and password to the forum.

Thank you!

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Thank you

- Please email me if you have any questions
  Gargollo.patricio@mayo.edu

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