Robotic Gastric Bypass

Robot v Hugo Platform

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Disclosures

- Industry payments. Intuitive, Device Technologies, JNJ, Medtronic, Gore….probably others
- None relevant to this talk.

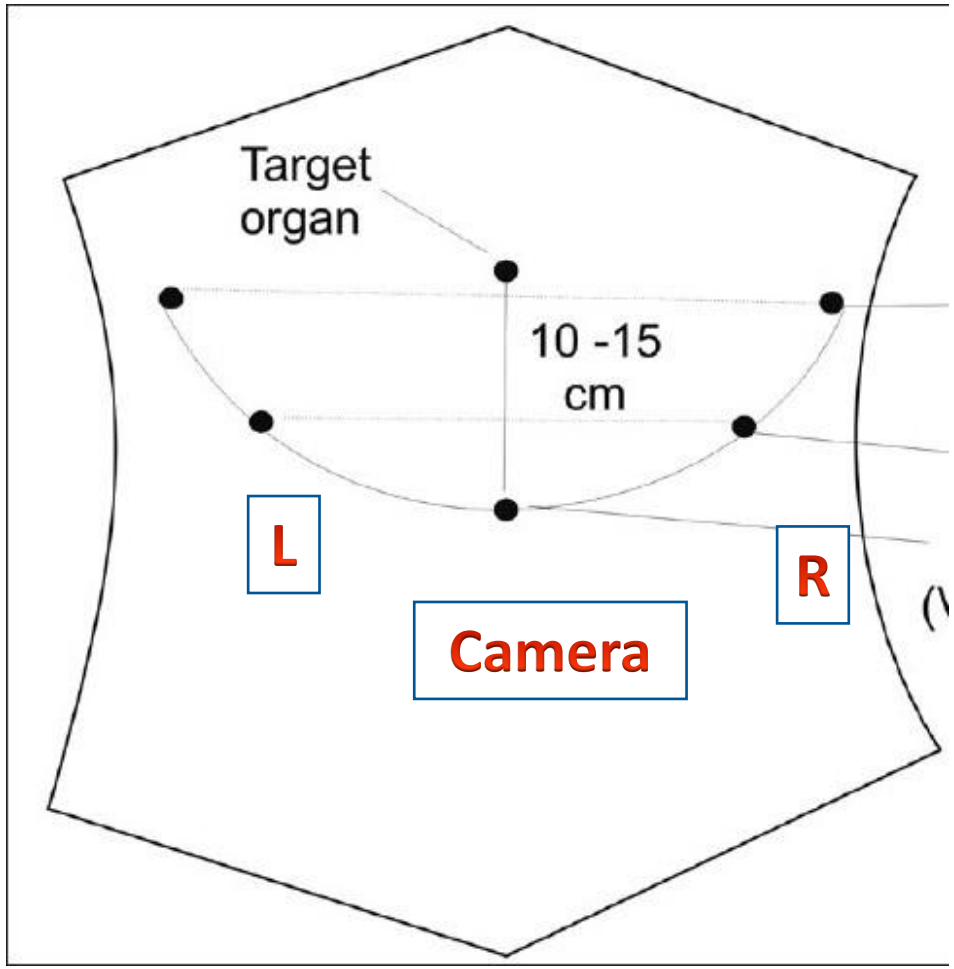
Background

- Foregut/Bariatric surgeon and therapeutic endoscopist since 2003. LSG and Lap Roux since 2004, MIS gastrectomy/oesophagectomy 2003-2008.
- First to do robotic foregut and bariatrics in ANZ circa 2014.
- April 2023 access to Medtronic Hugo for first cases incl gastric bypass.
- Acknowledgement to Francesco Bianco (coach), Rajkumar Palanippan and Marco Raffaelli who have done the first cases.

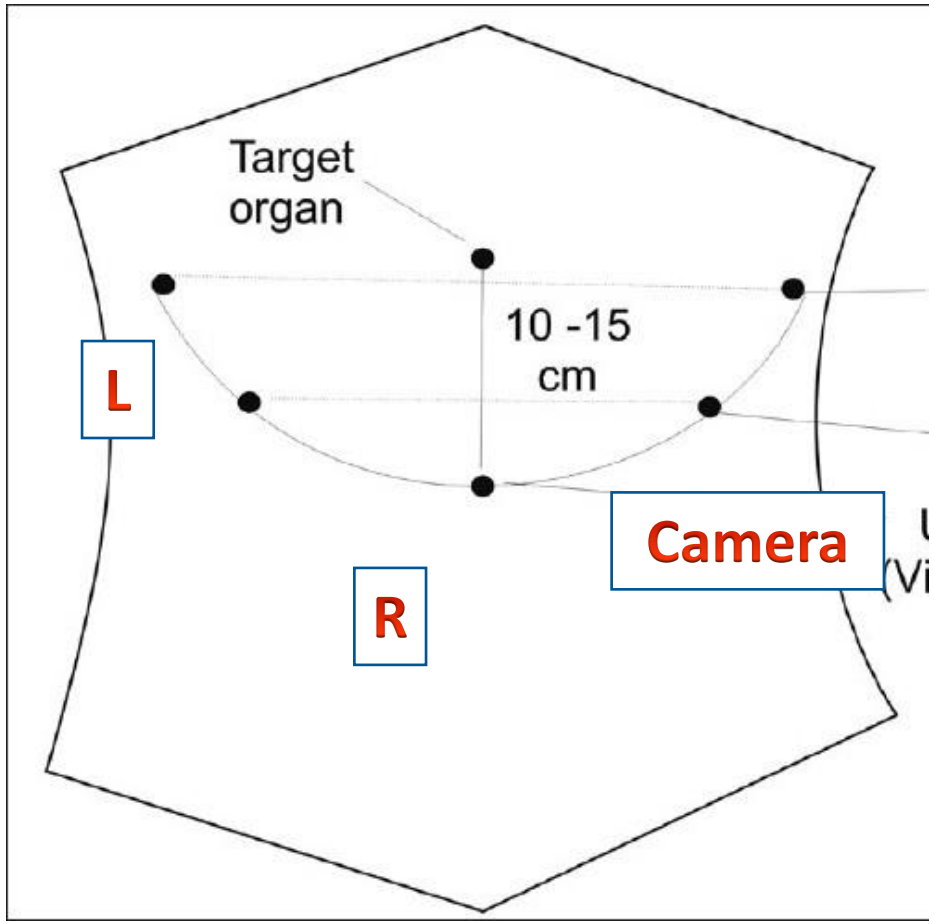
Perspective

- Supine vs “French position”
- I don’t use assistant port (Esophagectomy/Gastrectomy/Bypass/Heller etc).
  - Aim for “complete robotics”
- Generally, I prefer the same setup for all foregut procedures.
  - Aim to achieve this for Hugo

Triangulation

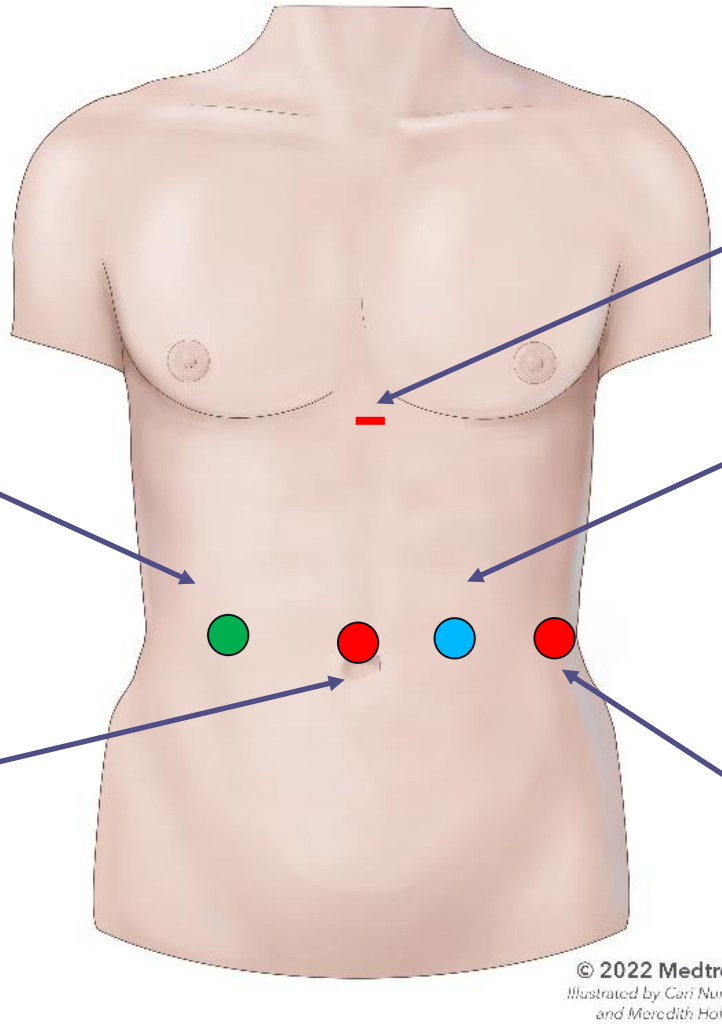


Sectorisation



Da Vinci Robot from patients' right side

Optical 12 mm entry site
Left hand, Stapler and assistant



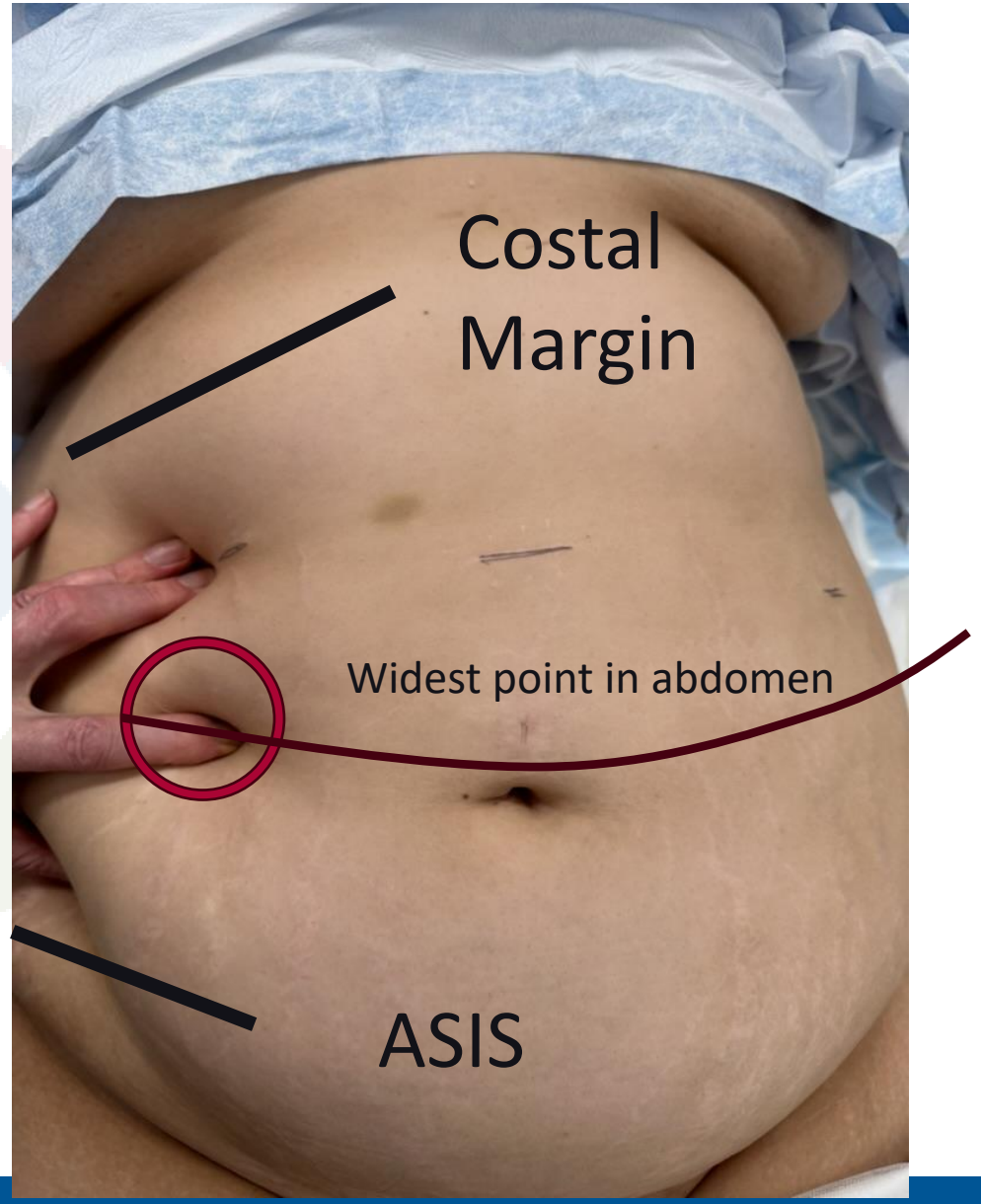
Nathanson

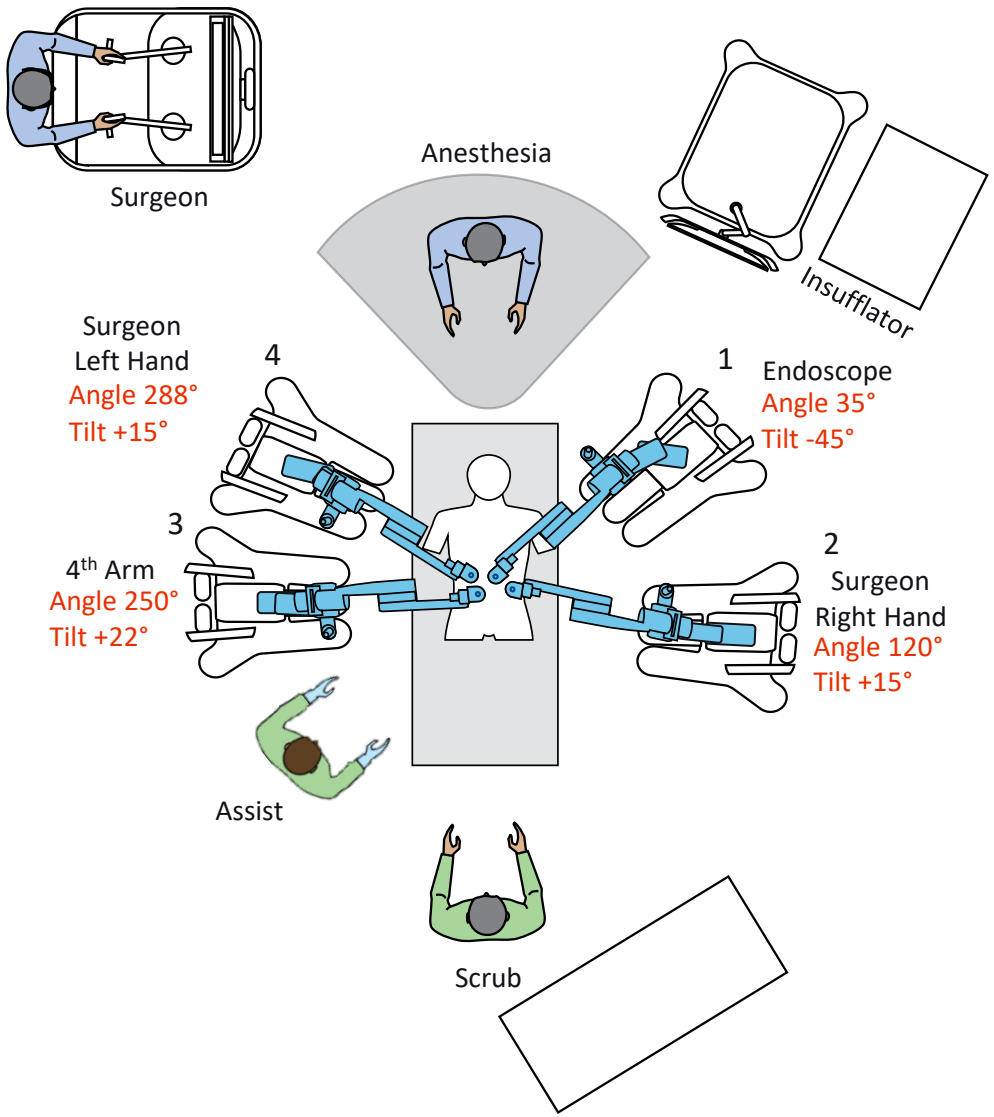
Camera 8 mm

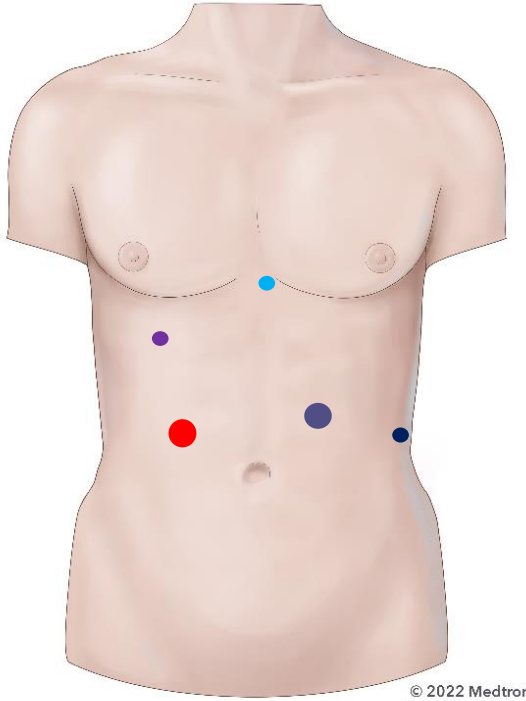
Accessory right hand 8mm

Primary right hand 8mm

Optical entry 12mm.
Stapler lateral to umbilicus, ½ way between ASIS and costal margin allows stapling for gastric bypass pouch and anastomosis, entero-enterostomy LSG, SADI, oesophagectomy, total and sub-total gastrectomy, and distal pancreatectomy.





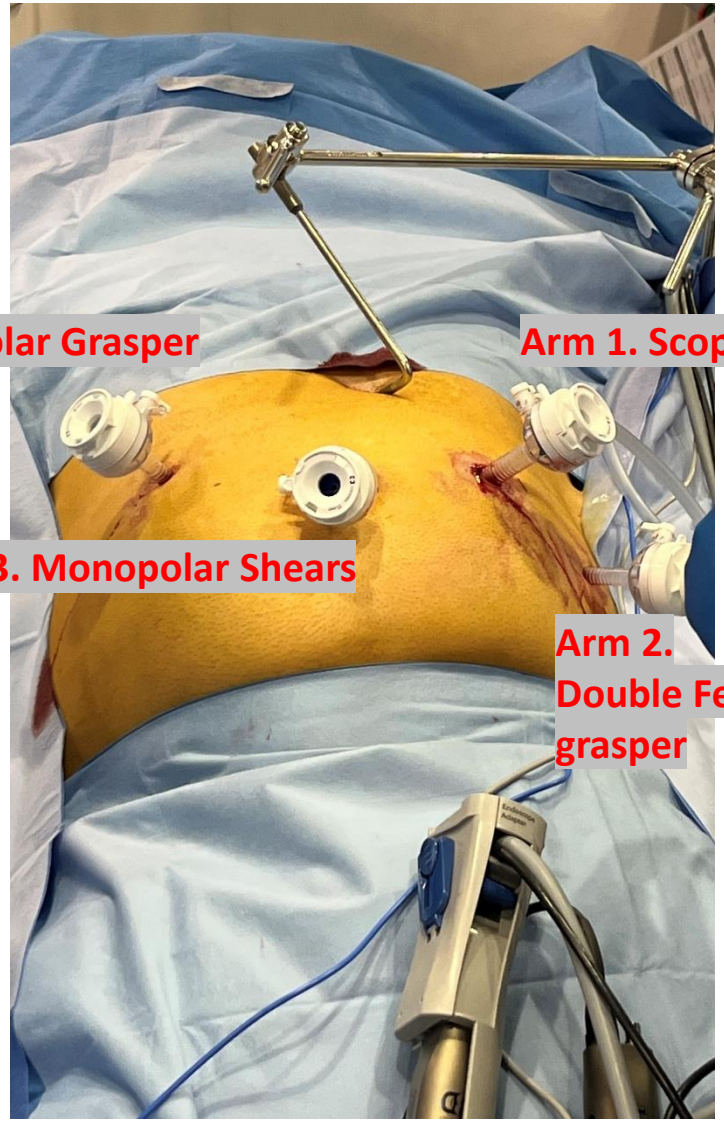


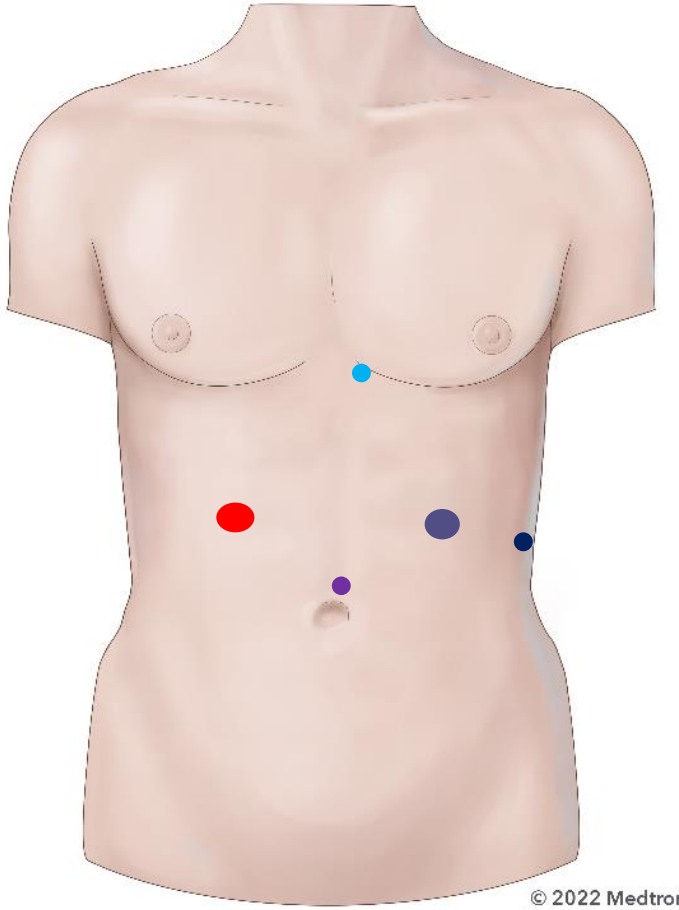
Nathanson clamp at left shoulder

- Endoscope
- 8mm sRH
- 8mm LH
- 11mm 4th /reserve arm
  - Converted to **15mm** assistant port for stapling
- Nathanson

Foregut placement - now

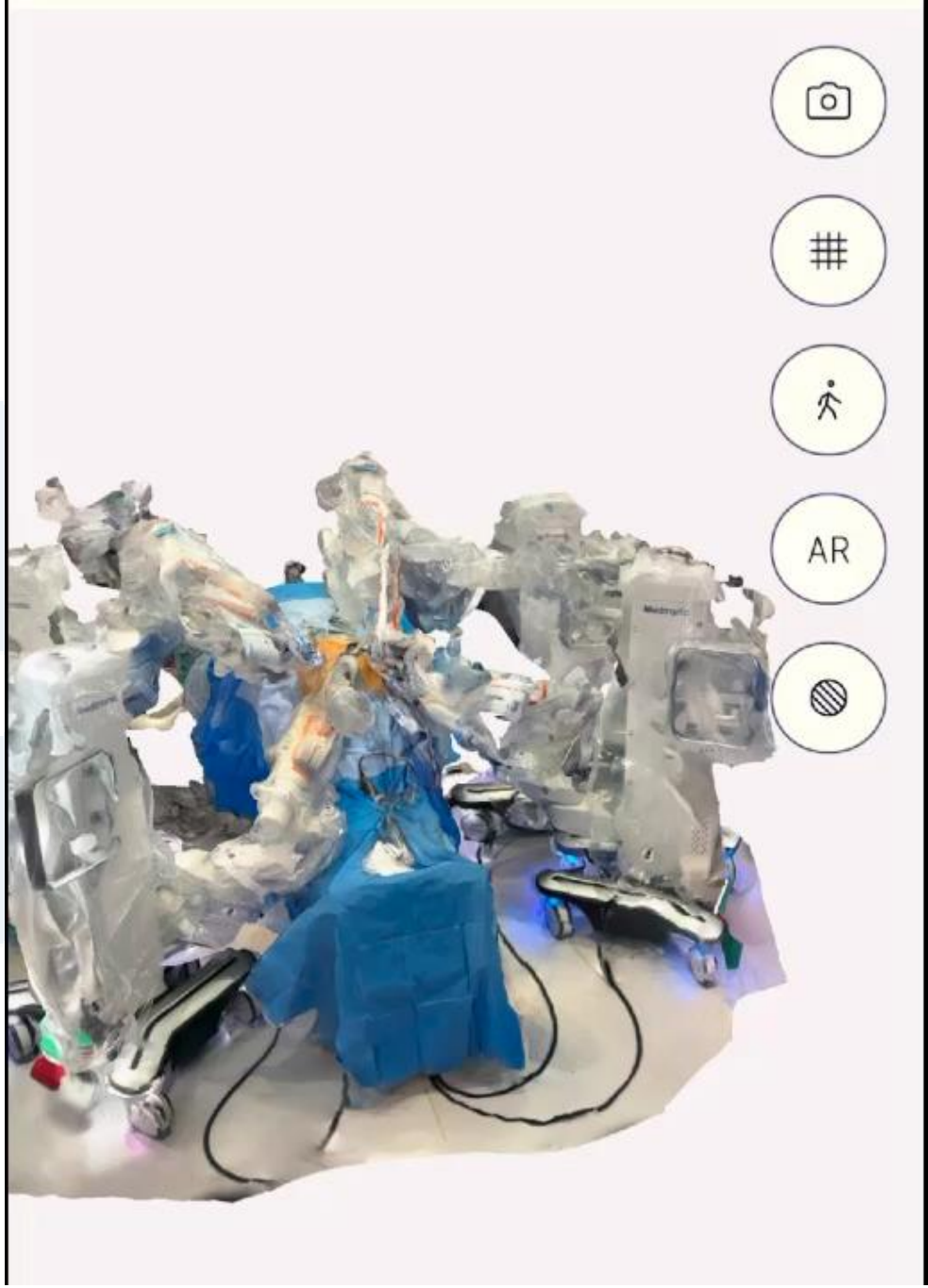
- ENDOSCOPE – 11mm Port, 0 & 30 degree
- Surgeon second RIGHT Hand - 8mm Port
- Surgeon LEFT Hand - 8mm Port
- Dominant Right Arm - 11mm Port
  - Converted to 15mm assistant port for stapling
- Nathanson

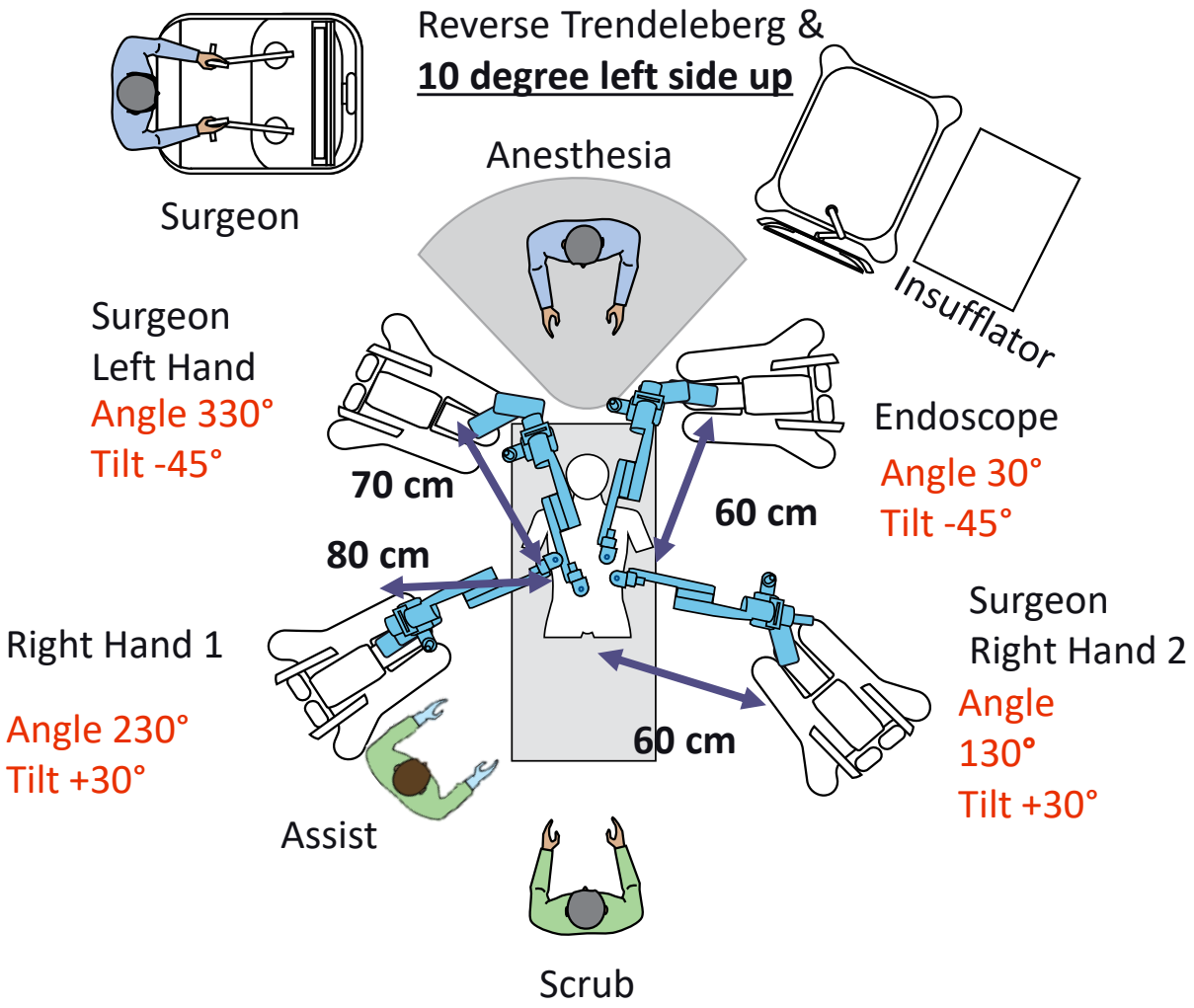




Setup

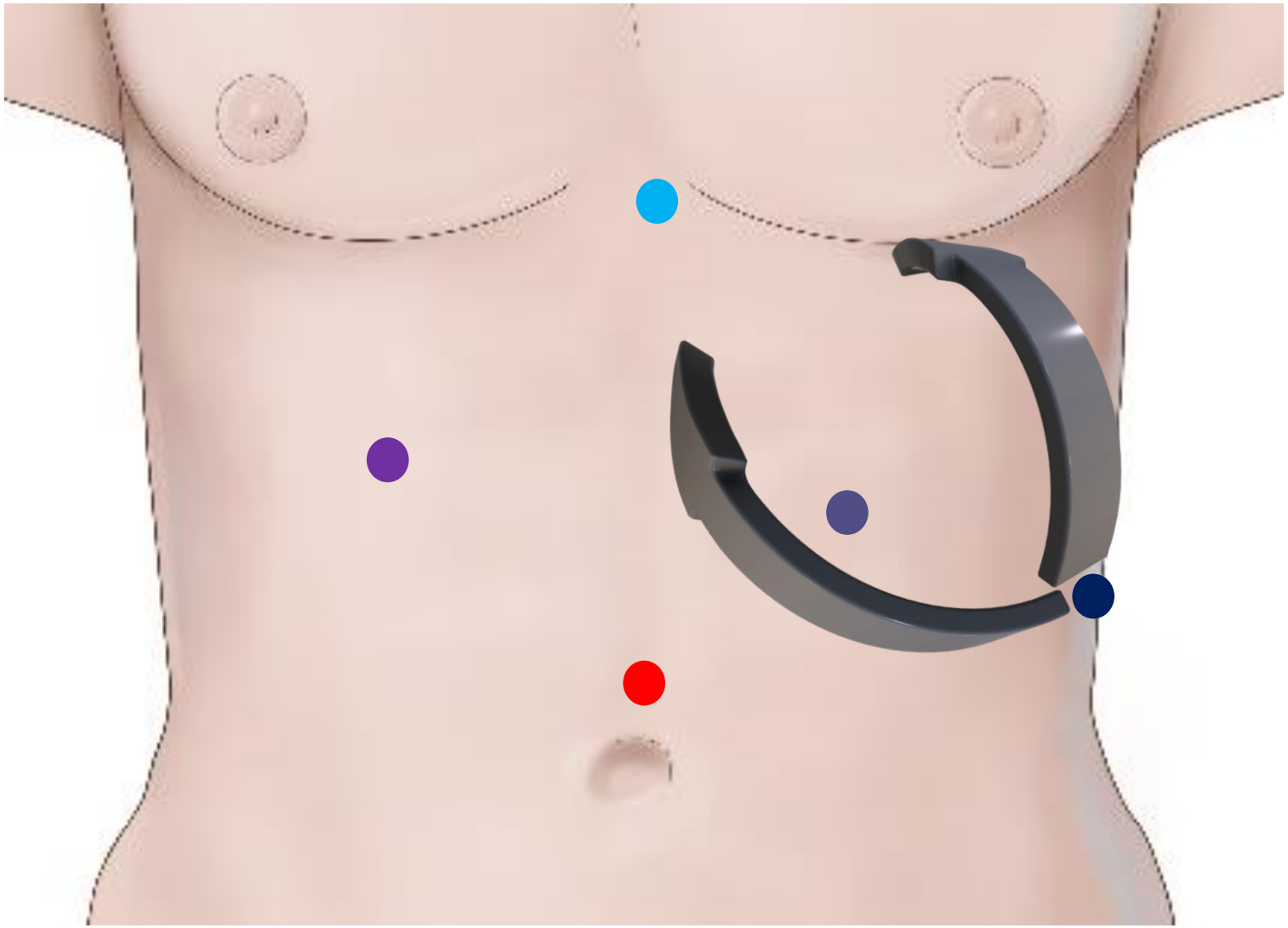
- Many variables.
- Bed height, external arm clash
- Access to infra and supra colic compartments.

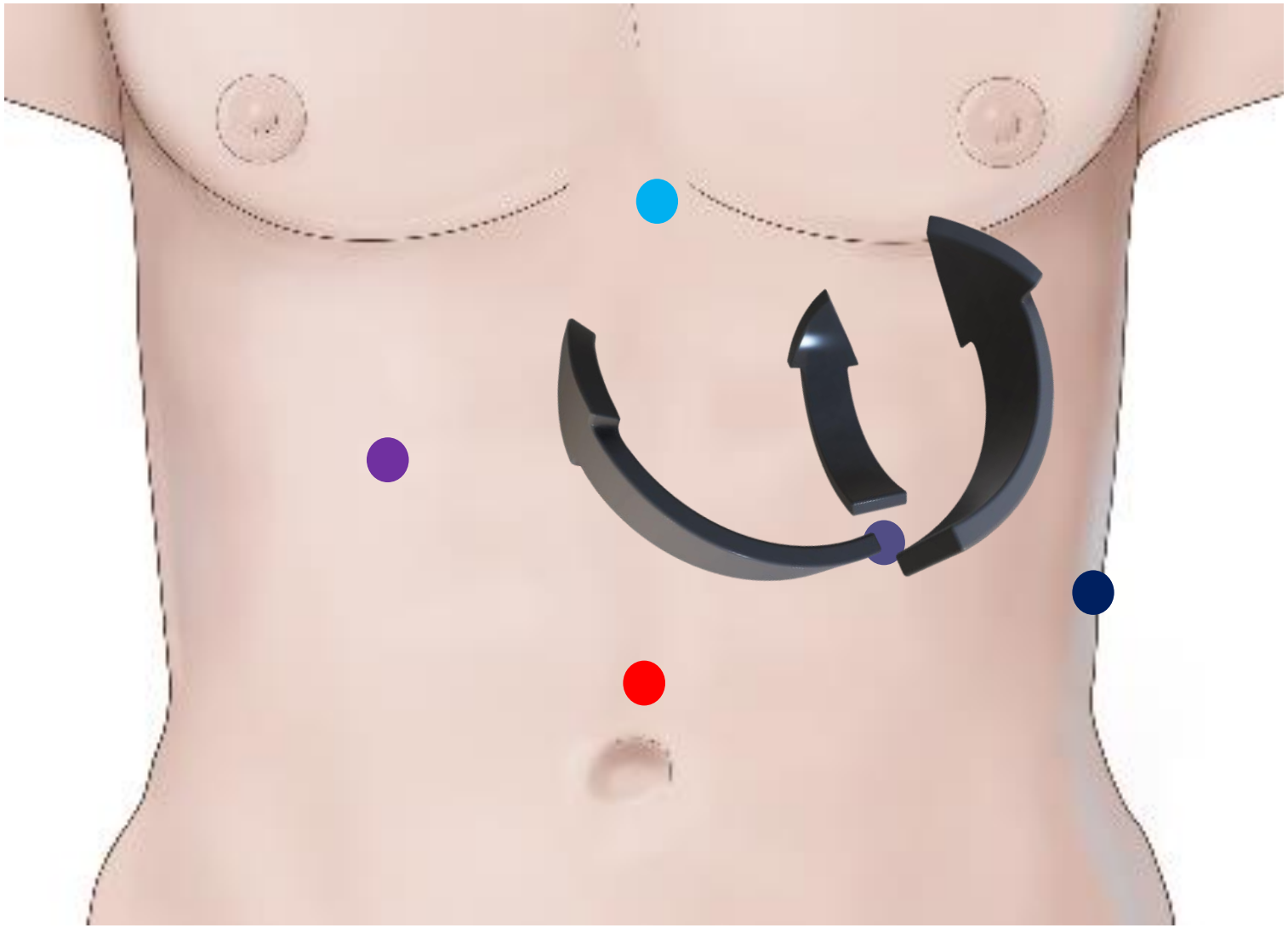


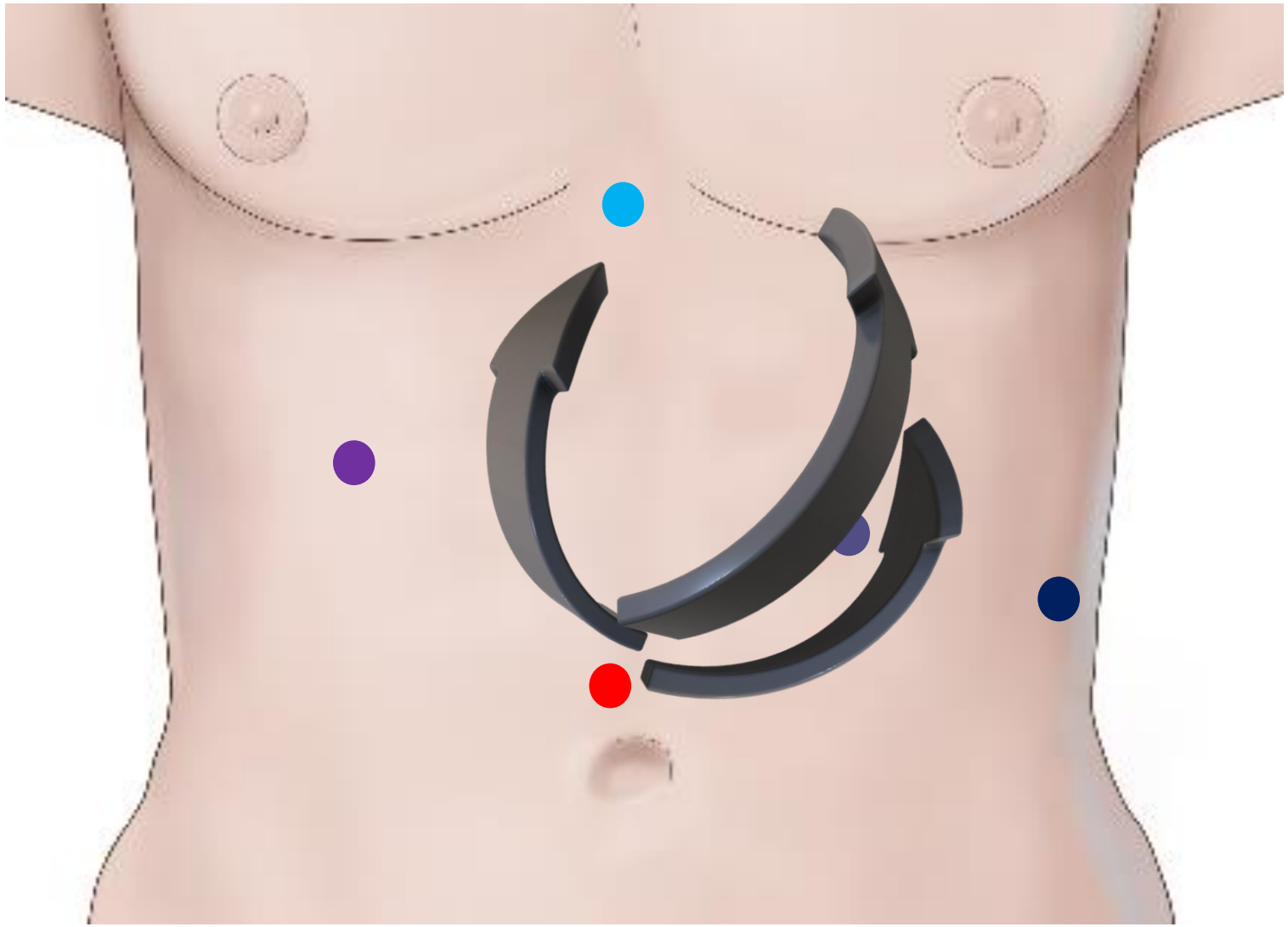


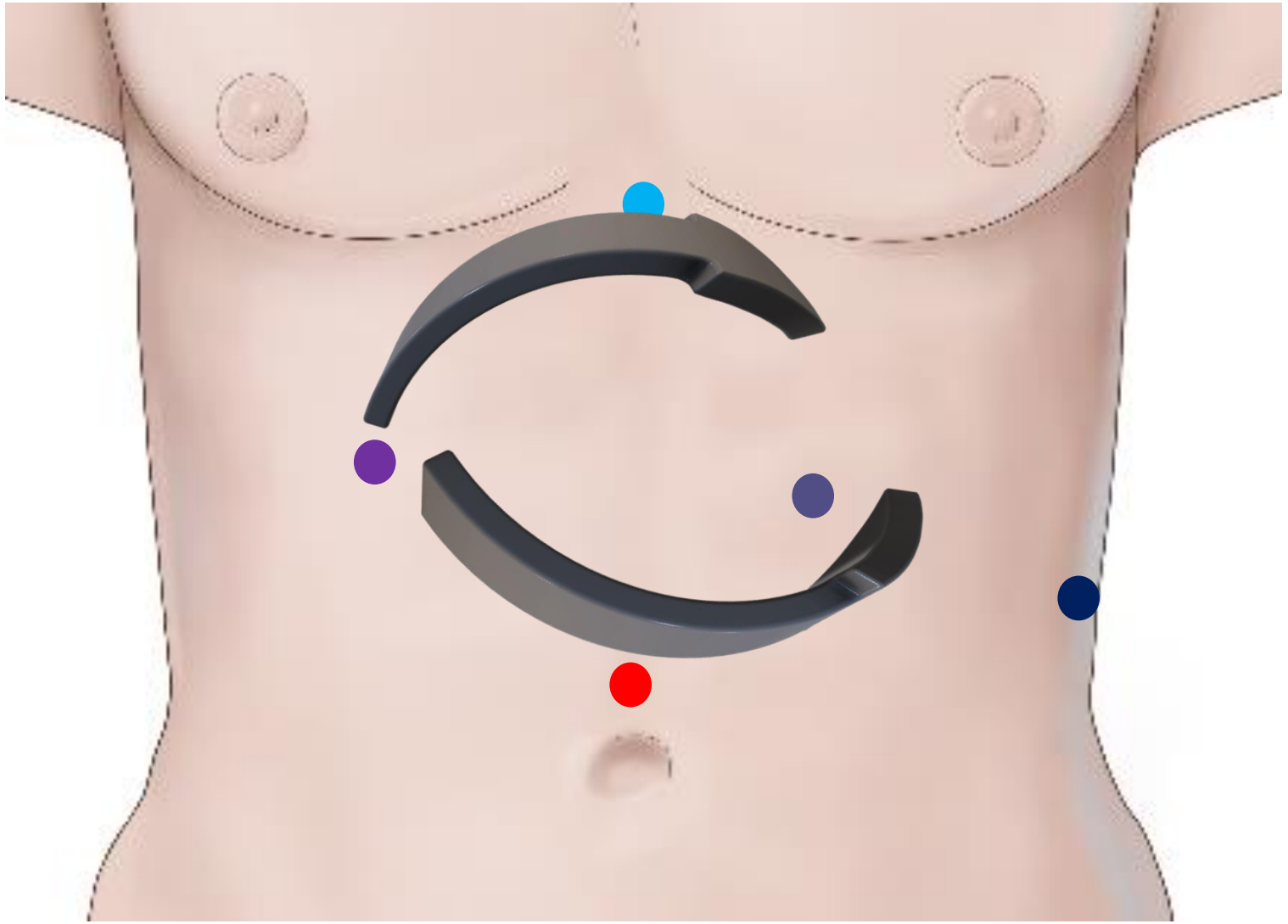
Foregut - Current

- Bed height >70 cm at hip on cart
- Distance between skin incisions and fulcrum of arm standardised and measured
- Arms 1 and 4 with –ve tilt, extend over patient, then back in opposite direction towards target anatomy
- Arms 2 and 3 with +ve tilt point directly upward to port
- Left side up helps with left-lateral port clash



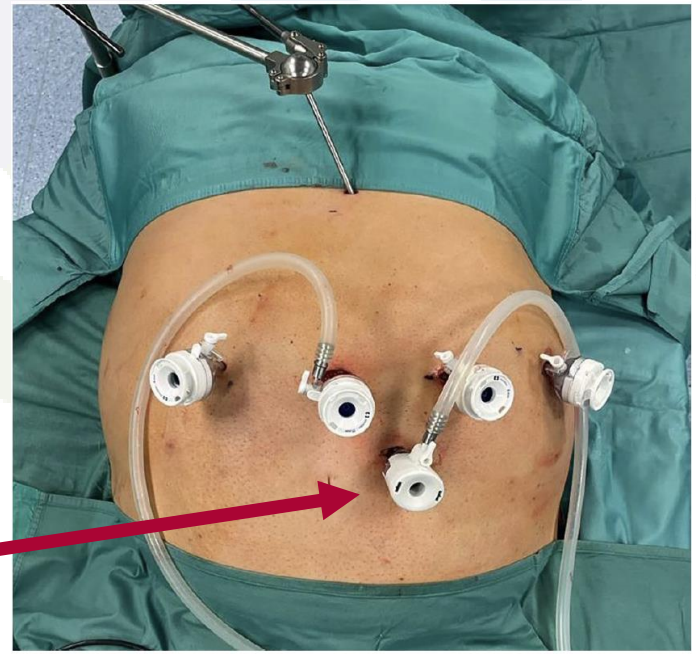


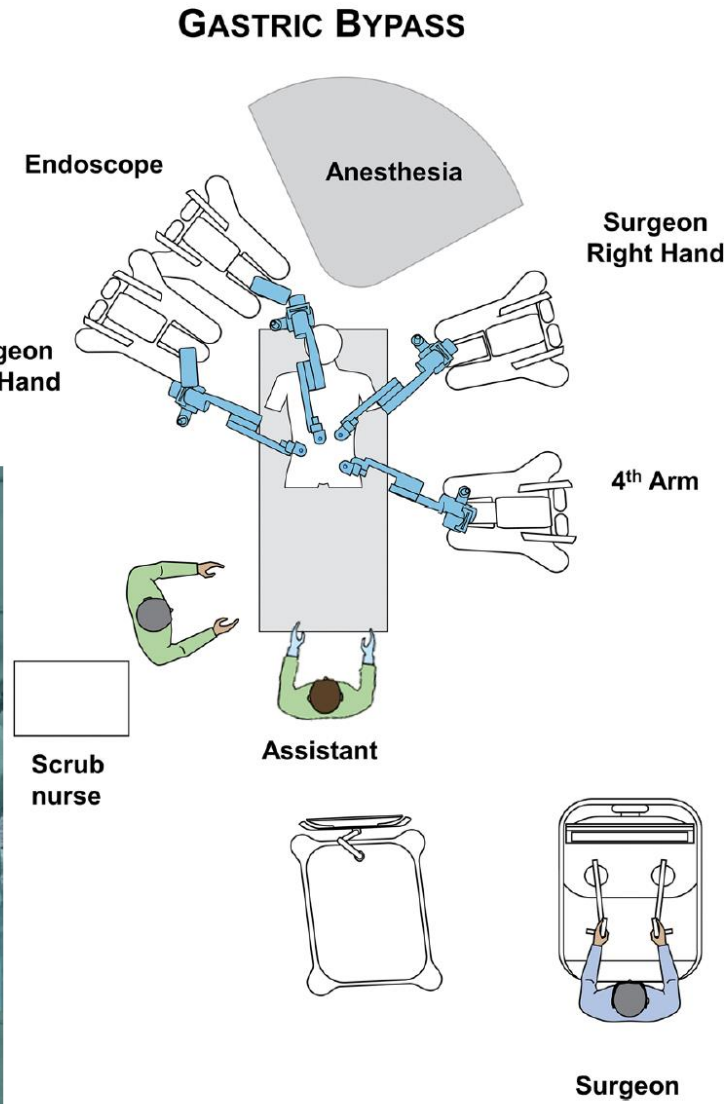




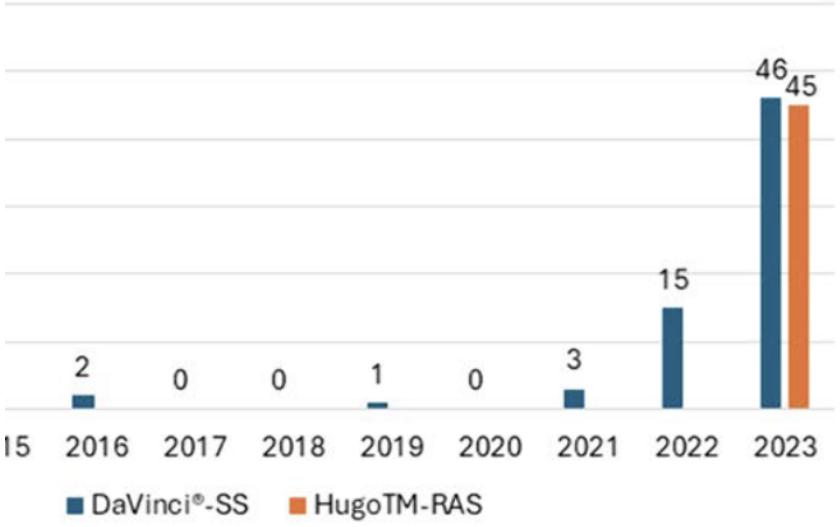
Marco Raffaelli- - RGBP

- Uses separate assistant port, so needs a little more dedicated assistant space.
- A bit more crowding of anaesthesia
- Camera midline, otherwise similar.
- I think this may be similar to laparoscopic setup





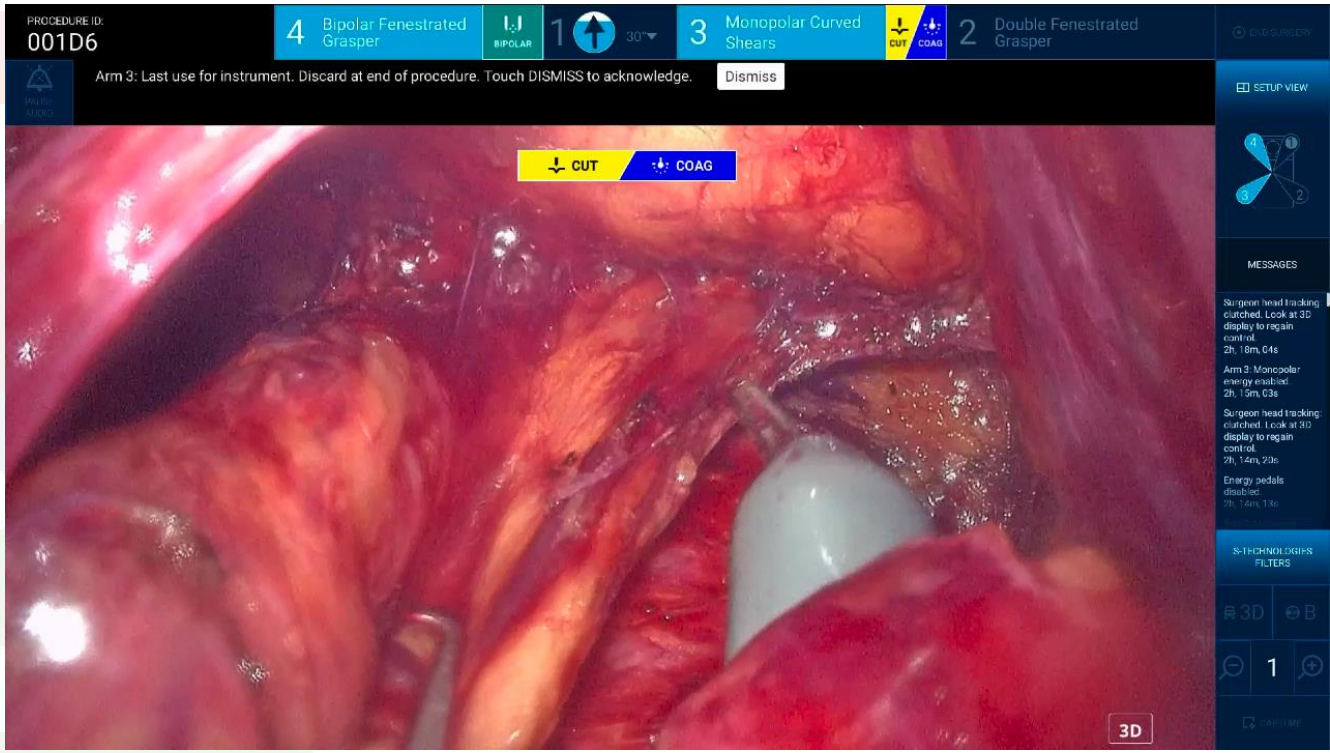
Results, Hugo v Da Vinci.



Variable	Hugo™-RAS $N=45$	DaVinci®-SS $N=45$	p-value
Age, years (mean ± SD)	48.1 ± 10.8	46.3 ± 10.1	0.416
Gender, (M:F)	20:25	18:27	0.671
BMI, kg/m^2 (mean ± SD)	42.1 ± 4.2	43.5 ± 5.2	0.163
Weight, Kg (mean ± SD)	121.9 ± 21.1	126.7 ± 23.2	0.307
Comorbidity, (*n*, %)	36 (80%)	30 (66.7%)	0.155
OSAS, (*n*, %)	8 (17.8%)	6 (13.3%)	0.563
Hypertension, (*n*, %)	18 (40%)	22 (48.9%)	0.398
Type 2 Diabetes Mellitus, (*n*, %)	10 (22.2%)	13 (28.9%)	0.509
NAFLD, (*n*, %)	25 (55.6%)	24 (53.3%)	0.833
Previous abdominal surgery			
Laparoscopic, (*n*, %)	6 (3.3%)	13 (28.9%)	0.075
Open, (*n*, %)	13 (28.9%)	6 (3.3%)	
Intra-operative complications (*n*, %)	1 (2.2%)	2 (4.4%)	1
Mean docking time (mean ± SD), min	5.6 ± 1.2	5.4 ± 0.5	0.176
Mean console time (mean ± SD), min	131.6 ± 34.8	144.4 ± 46.9	0.678
Mean total operative time (mean ± SD), min	166.9 ± 39.9	179.8 ± 47.1	0.229
Post-operative ICU, (*n*, %)	1 (2.2%)	2 (4.4%)	1
Post-operative hospital stay, days (Median, IQR)	2 (1–2)	2 (2–2)	0.052
Post-operative NRS (mean ± SD)	3.6 ± 1.8	3.6 ± 1.6	1
Patients with early complications, (*n*, %)	3 (6.7%)	3 (6.7%)	1
Readmission, (*n*, %)	2 (4.4%)	1 (2.2%)	1

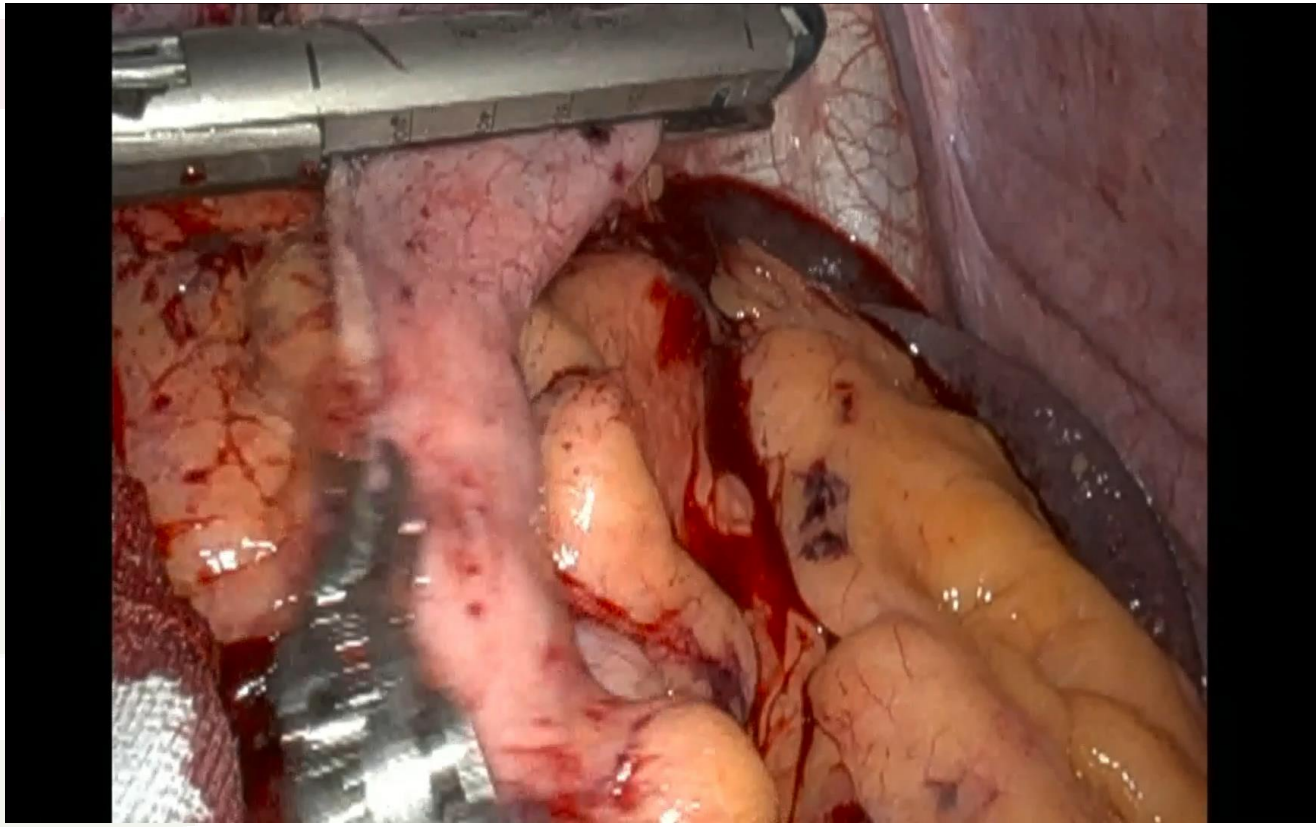
Problems?

- Stupid stupid annoying alarms
- Instrument clash can mean undocking everything.
- Set up guides don’t define distance from skin incisions to robot arms which means every case can be different...
- Laser guides not great.
- Why 11 mm ports?
- No 8mm camera
- No hook or vessel sealer
- Shorter instruments 26.5 cm vs 38 cm Da Vinci
  - Counting small bowel and closing internal hernia’s may be better done laparoscopically

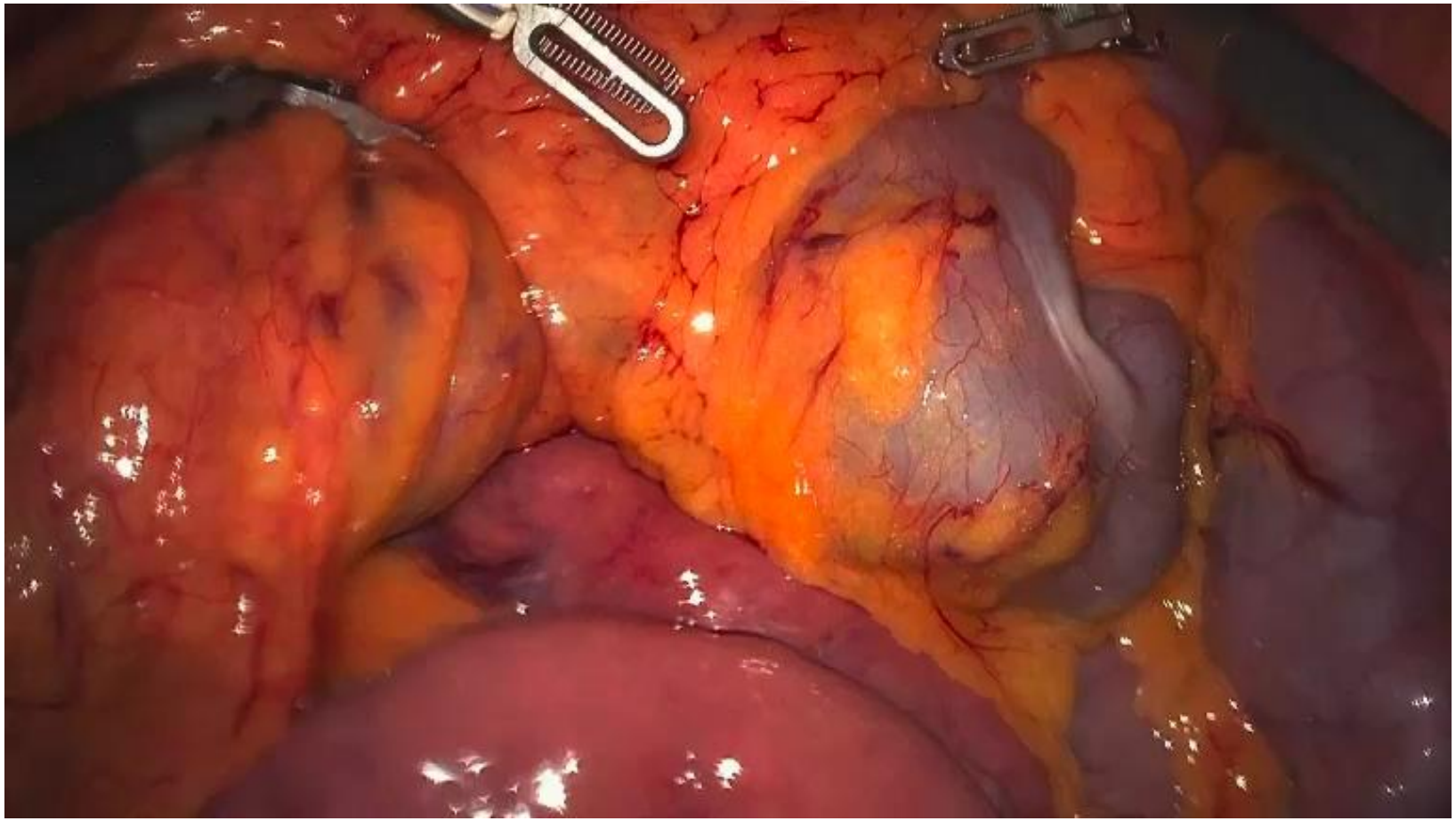


Advantages

- Bed-side stapling.
  - Advantage for some, disadvantage for others.
  - I suspect much is cultural and/or cost related.
  - Industry leaders in stapling are able to manage widest range of tissue types that cannot yet be met by Da Vinci stapler, 20+ years of experience counts for something…




Hugo RAS



Conclusions

- Its nice to have competition.
- System is first generation and somewhat incomplete, but its fine for many general surgical applications. I've done 18 hiatal hernias for example.
- The learning curve is different to Da Vinci with regards to procedure set-up.
- Longer instruments, complete instruments, and better trouble-shooting for arm clash are needed to be a complete package.