

New robotic surgery platforms, what to expect.

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Batric Centro quirúrgico de la obesidad
Mendoza Argentina

26 years of Robotic Surgery!!

In love with Robotic's from the very beginning!! (May 2000)

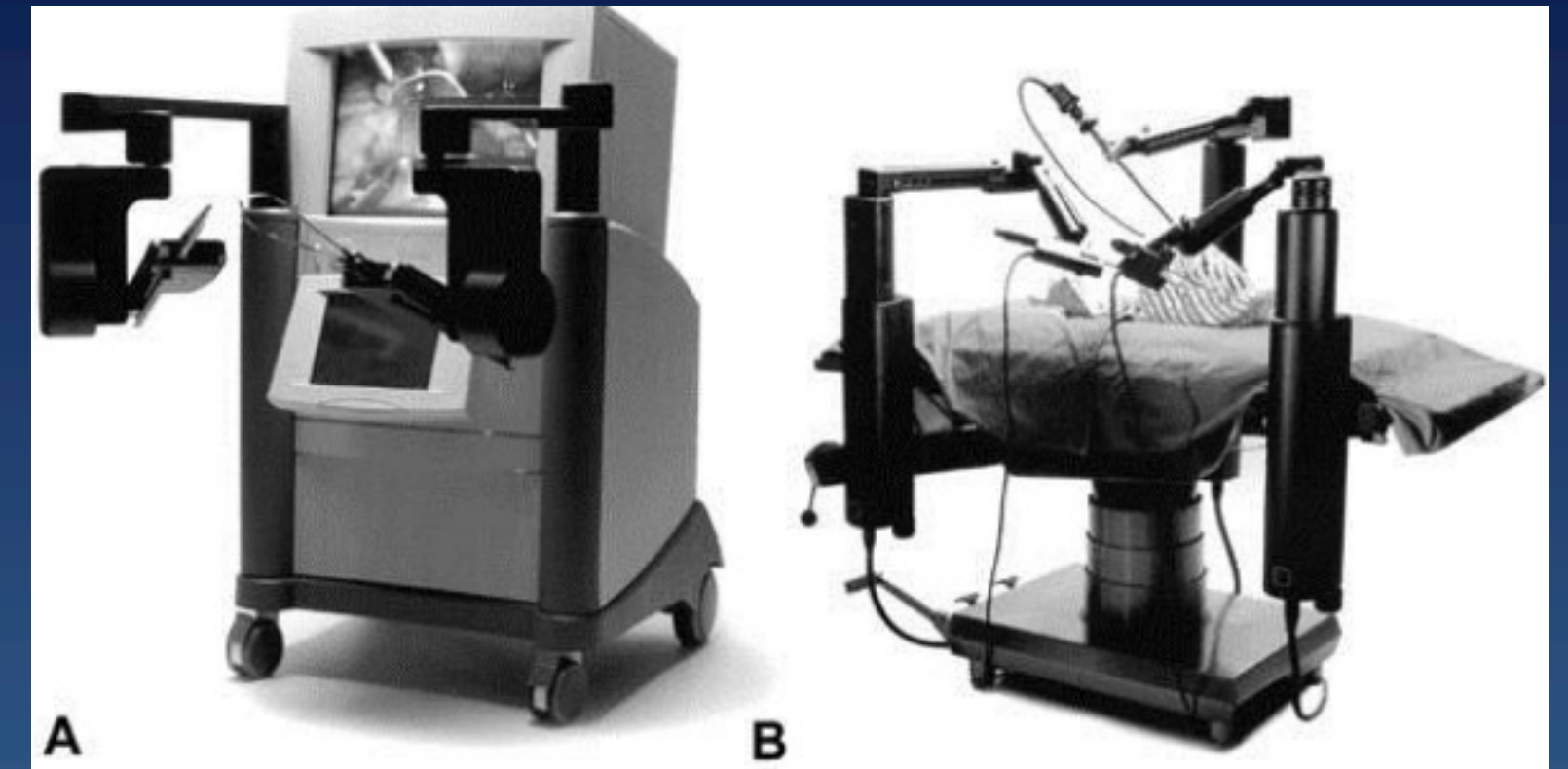
Robot # 4



Introduction

History of Robotic Surgery

- AESOP was first surgical robot (1994)
 - Function was to maneuver an endoscope inside the body during surgery, controlled by voice commands by the surgeon or computer
- ZEUS system (1998)
 - Could hold 28 different instruments
- Intuitive Surgical da Vinci System
 - FDA approved for general laparoscopic surgery in 2000
 - Approved for prostate surgery in 2001



BENEFITS

- Greater Accuracy;
- More versatility: Firefly, energy and sureform;
- High Definition 3D Visualization;
- Minor tissue trauma;
- Early Recovery and shorter LOS;
- Less blood loss;
- Lower incidence of complications....

**BENEFIT FOR THE
SURGEON**

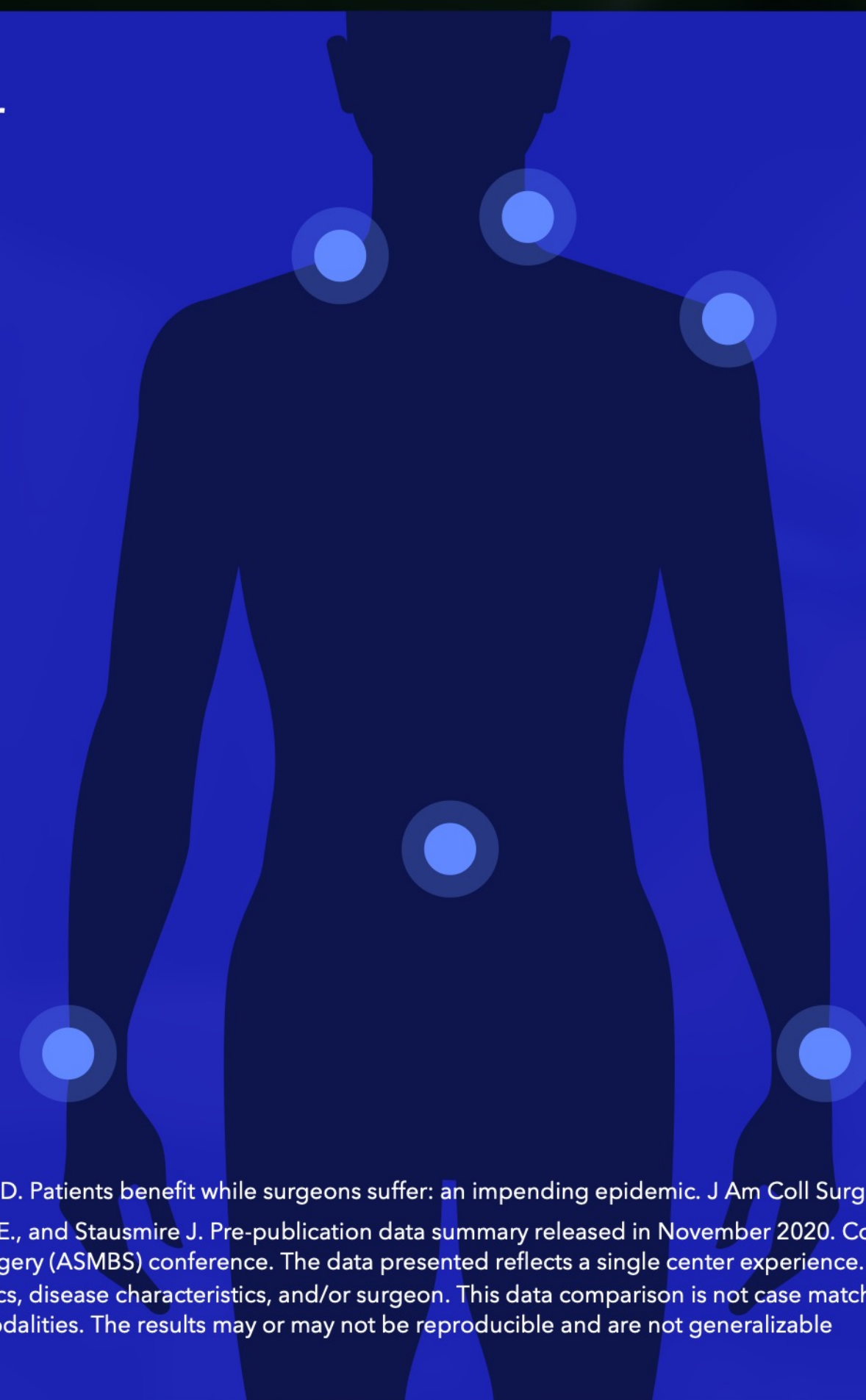


It's getting tougher
on the surgeon

87%

of laparoscopic surgeons
reported physical symptoms
or discomfort¹

But it's not just the
physical demands
that have an impact.²



¹ Park A, Lee G, Seagull FJ, Meenaghan N, Dexter D. Patients benefit while surgeons suffer: an impending epidemic. J Am Coll Surg. 2010;210(3):306-313. doi:10.1016/j.jamcollsurg.2009.10.017.

² Fourman M., Johnston G., Duckett K.J., Norte G.E., and Stausmire J. Pre-publication data summary released in November 2020. Complete findings to be published in 2022 at the American Society for Metabolic and Bariatric Surgery (ASMBS) conference. The data presented reflects a single center experience. Individual outcomes may depend on several factors, including but not limited to, patient characteristics, disease characteristics, and/or surgeon. This data comparison is not case matched for patient complexity and/or disease status, and may not be comparable across these surgical modalities. The results may or may not be reproducible and are not generalizable

Background information

Current Overview of Robotic Surgery

- ✓ The expiration of the DV patent in 2019 revolutionized the market;
 - ✓ New players increased competitiveness;
 - ✓ More than 30 new platforms worldwide in different markets;
 - ✓ robotic procedures increased around the world;
- ✓ Growing trend of robots dedicated to specific types of procedures;
- ✓ Expectations of great accessibility with increased competition...

Benefits of the New Generation...

- ✓ **Greater surgical precision with stable and controlled movements;**
- ✓ **Less invasive procedures with smaller incisions;**
- ✓ **Fast recovery and earlier return to activities;**
- ✓ **Lower risk of complications and adverse events;**
- ✓ **Reduction of LOS;**
- ✓ **Better long term functional results...**

In 2015 the main question I got was...

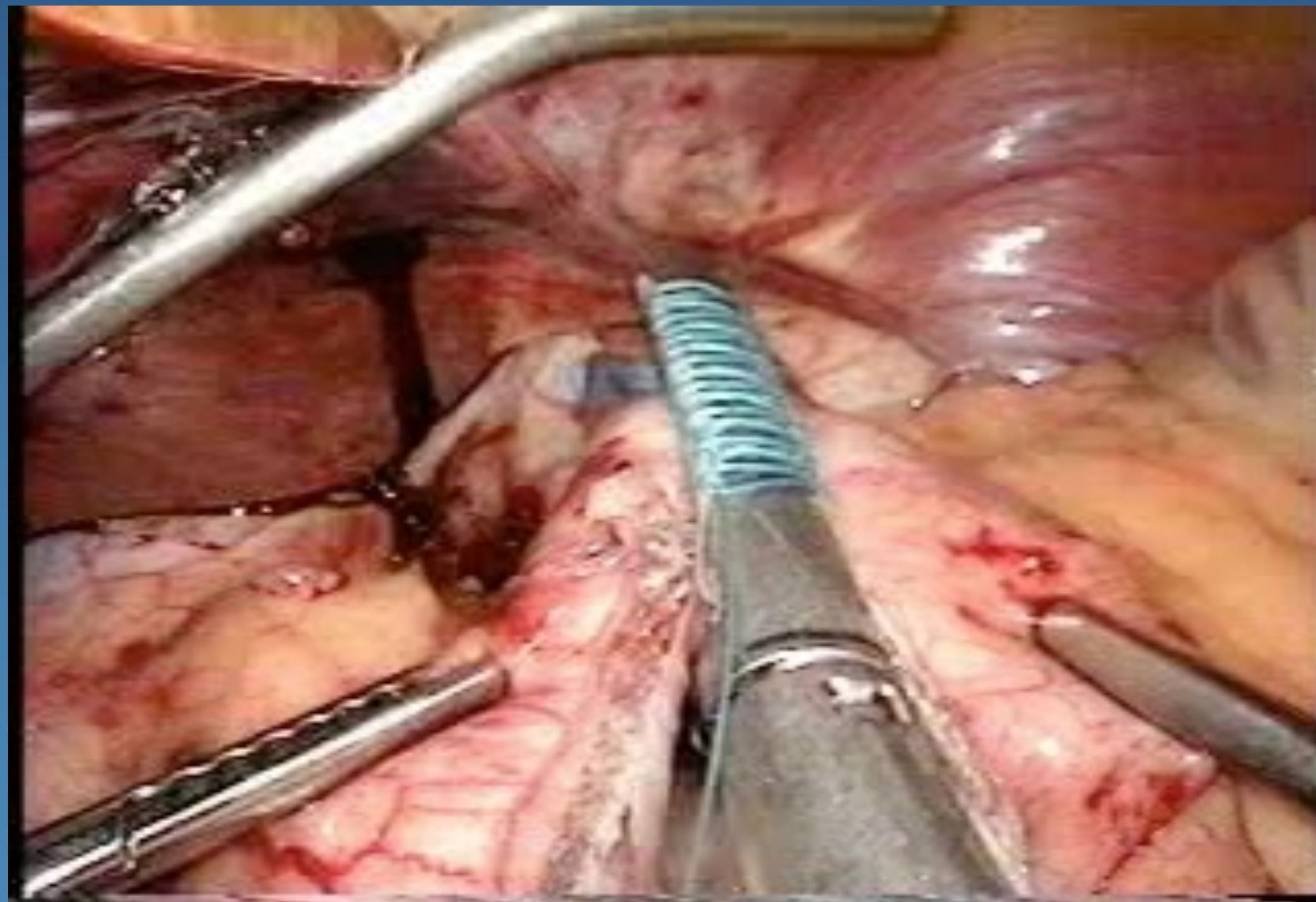
“Why should I buy a surgical robot?”

In 2024 the main question I get is...

“Which robot should I buy and how many?”

History

- FDA cleared Intuitive July 12, 2000
- First world wide robotic Gastric by -pass
 - University of Illinois Chicago: Horgan, September 5th, 2000



Robotic Gastric bypass

Jacobsen G, Berger R, Horgan S. The Role of Robotic Surgery in Morbid Obesity. Journal of Laparoendoscopic & Advanced Surgical Techniques. 2003; 13(4): 279-283.

- 106 patients: 0% leak rate
- University of Illinois: Horgan S, Berger R
- New York Medical College: Kaul A, Cerabona T
- University of CA Irvine: Nguyen N
- Mount Sinai School of Medicine: Gagner M
- Richmond, VA: Kelly W

Ceiling Mounted: The Boom is the Roof?

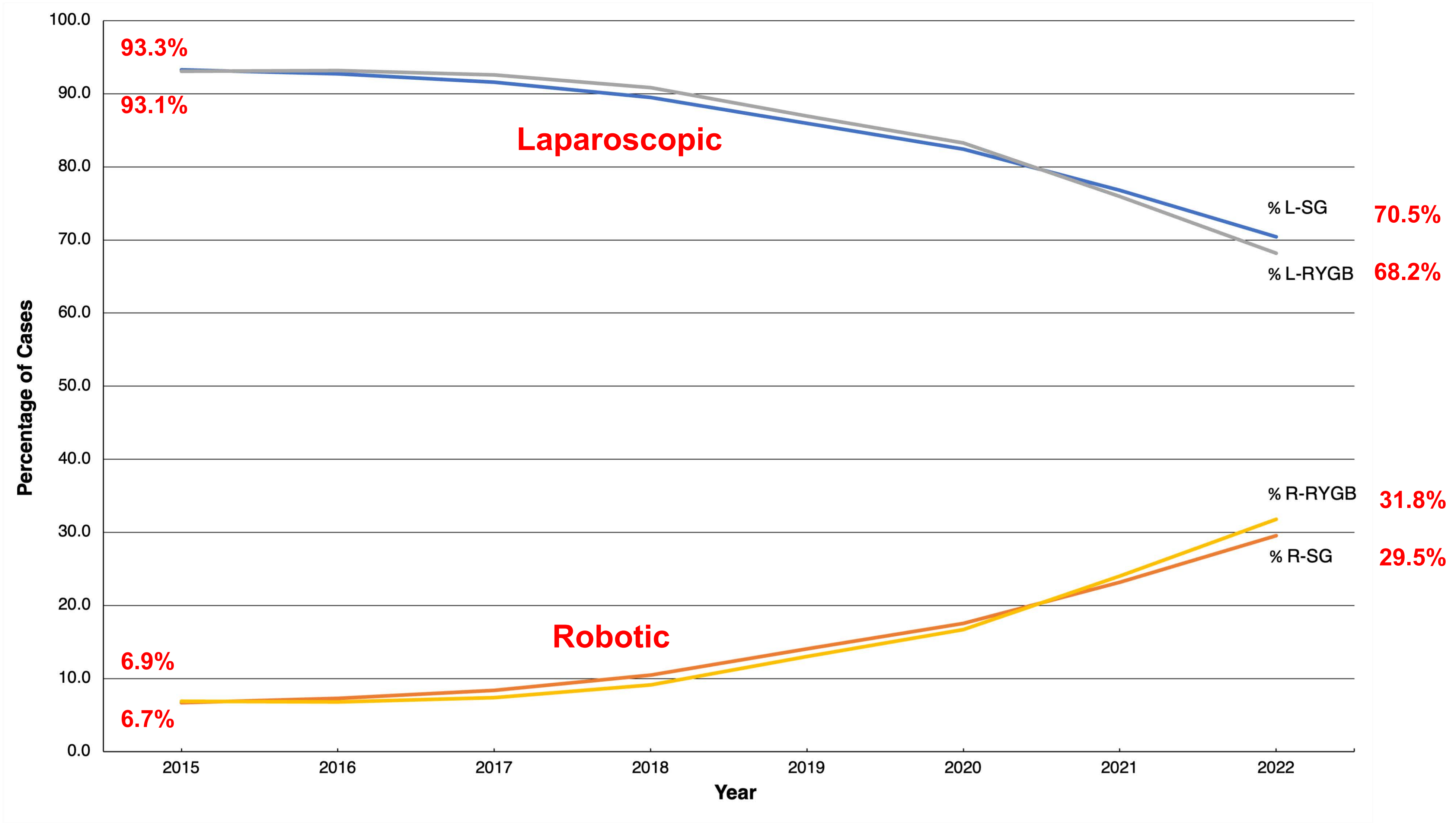


Pumping the Brakes on Robotic Sleeve Gastrectomy: Analysis of Nearly 600,000 Cases Shows Higher Complication Rates Compared to Laparoscopic (ACS Database)

- Compared to laparoscopic SG, **robotic SG** had **significantly higher** rates of:
 - **Overall morbidity** (2.10% vs 2.41%, AOR 1.16 [CI 1.10-1.21], $p < .001$)
 - **Reoperation for leak** (0.09% vs 0.12%, 1.30 [1.05-1.60], $p < .05$)
 - **Organ/space SSI** (0.16% vs 0.26%, 1.61 [1.39-1.86], $p < .001$)
 - **Bleeding** (0.28% vs 0.34%, 1.22 [1.08-1.38], $p < .01$)
 - **Blood transfusion** (0.48% vs 0.60%, 1.26 [1.15-1.38], $p < .001$)
 - **Sepsis** (0.07% vs 0.10%, 1.50 [1.19-1.88], $p < .001$) & **septic shock** (0.02% vs 0.04%, 1.67 [1.15-2.42], $p < .01$)
- Compared to laparoscopic RYGB, **robotic RYGB** had **significantly lower** rates of:
 - **Overall morbidity** (3.80% vs 2.44%, 0.64 [0.59-0.68], $p < .001$)
 - **Leak** (0.68% vs 0.48%, 0.74 [0.63-0.87], $p < .001$) & **bleeding** (0.91% vs 0.74%, 0.80 [0.70-0.91], $p < .01$)
 - **Blood transfusion** (1.04% vs 0.70%, 0.67 [0.58-0.76], $p < .001$)
 - **Superficial incisional SSI** (0.78% vs 0.32%, 0.40 [0.33-0.49], $p < .001$)
 - **Deep incisional SSI** (0.13% vs 0.04%, 0.30 [0.18-0.52], $p < .001$)

Robotic sleeve gastrectomy has higher complication rates compared to laparoscopic: 8-year analysis of robotic versus laparoscopic primary bariatric surgery

Graham J Spurzem, MD¹; Ryan C Broderick, MD¹; Emily K Kunkel, MD¹; Hannah M Hollandsworth, MD¹; Bryan J Sandler, MD¹; Garth R Jacobsen, MD¹; Santiago Horgan, MD¹



Surgical Robotics Competitive Landscape

Lap Assisted

Traditional Visualization
Stabilized Image (2D or 3D)
May Have Wristed Instrumentation



Hybrid Robots

Bedside or Cockpit
Quickly Switch Between Lap and Robotic
Utilize Lap Stapling/Adv. Energy



Hybrid Robots

Robot Assisted

Tele-Cockpit (may not scrub in)
Full Robotic Ecosystem
May Have Dedicated Stapling/Adv. Energy



Traditional
Laparoscopy



★ US Commercialized Product

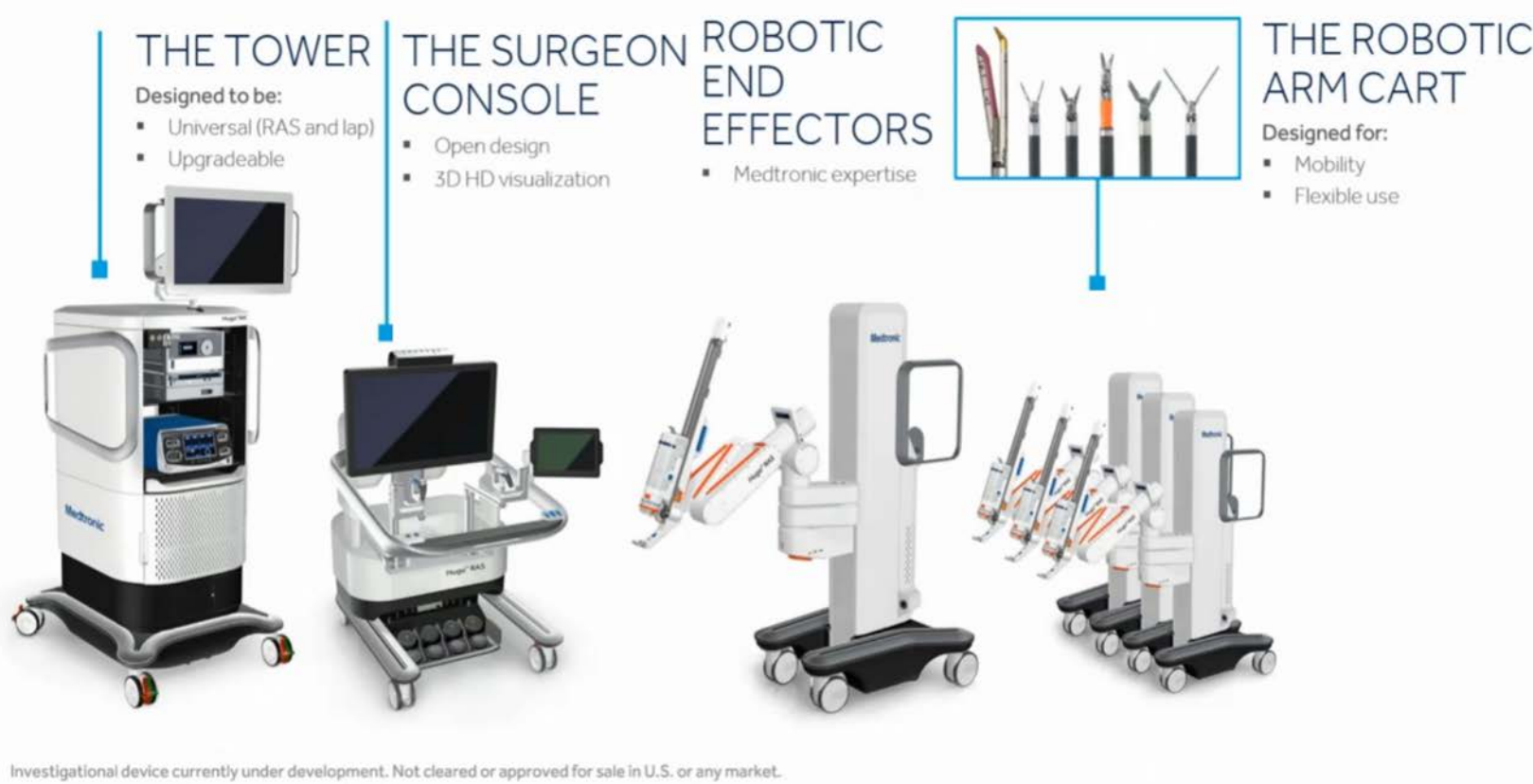
Robotics Spectrum

Full Robotic
Assisted



New Market Entrants, Europe

Hugo, Medtronic

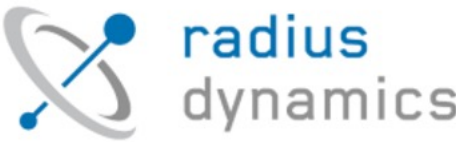


Background

- **Current as of:** Aug 2023
- **Location of Target:** Lausanne, Switzerland
- **Number of employees:** 150
- **Key contact at Target:** Michael Friedrich (CEO)
- **Maturity of target:** Commercial (Europe), Founded 2013
- **Footprint:** 2000+ cases (focused in Switzerland, Germany, France)
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Dexter Robotic System



Versius England



Background

- **Current as of:** Aug 2023
- **Location of Target:** Tübingen, Germany
- **Number of employees:** 150
- **Key contact at Target:** Marc Schurr (CEO)
- **Maturity of target:** Pre-Revenue (for robotics), Founded 2001
- **Footprint:** NA
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Radius Robotic System

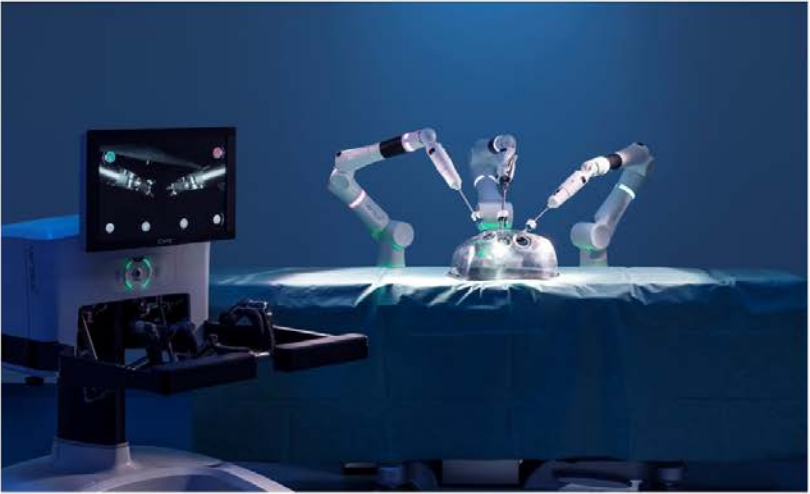


Developed by CMR, just announced in Sept 2018

CE mark obtained March 2019
Not FDA approved

3D vision

Portable/transportable arms with small footprint, allowing for enhanced access to patient



RobSurgical

Background

- **Current as of:** Aug 2023
- **Location of Target:** Barcelona, Spain
- **Number of employees:** ~30
- **Key contact at Target:** Jaume Amat (CEO)
- **Maturity of target:** Pre-Revenue, Founded 2012
- **Footprint:** ~30 procedures
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** BiTrack Robotic System



Next Market Entrants Asia



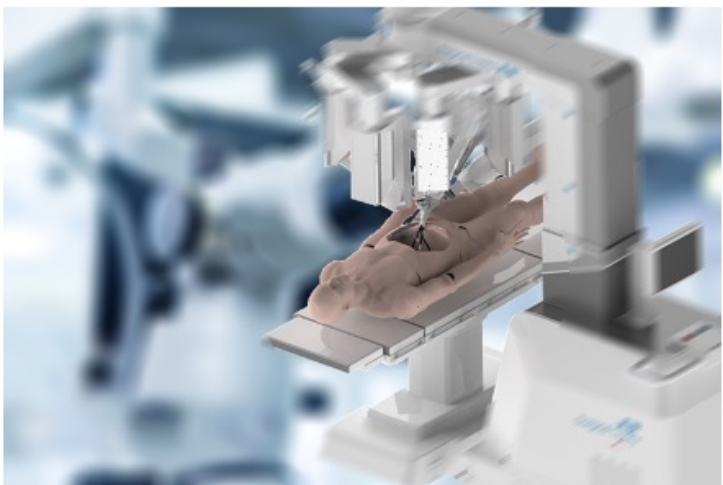
Background

- **Current as of:** Aug 2023
- **Location of Target:** Shanghai, China
- **Number of employees:** ~170
- **Key contact at Target:** John Ma (CEO), Ying Mao (CTO)
- **Maturity of target:** Pre-Revenue, Founded 2020
- **Footprint:** ~90 preclinical labs
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Carina Robotic System



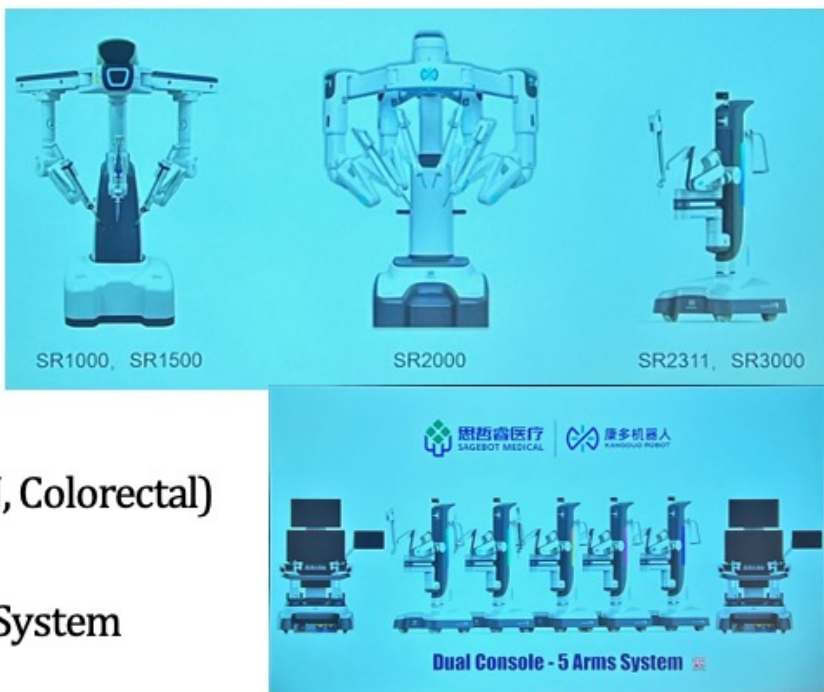
Background

- **Current as of:** Aug 2023
- **Location of Target:** Shanghai, China
- **Number of employees:** ~170
- **Key contact at Target:** Hongbin Sun (CFO), Johnathan Chen (Chief of International Business)
- **Maturity of target:** Pre-Revenue, Founded 2014
- **Footprint:** ~In clinical studies for URO and GYN
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Toumai Robotic System



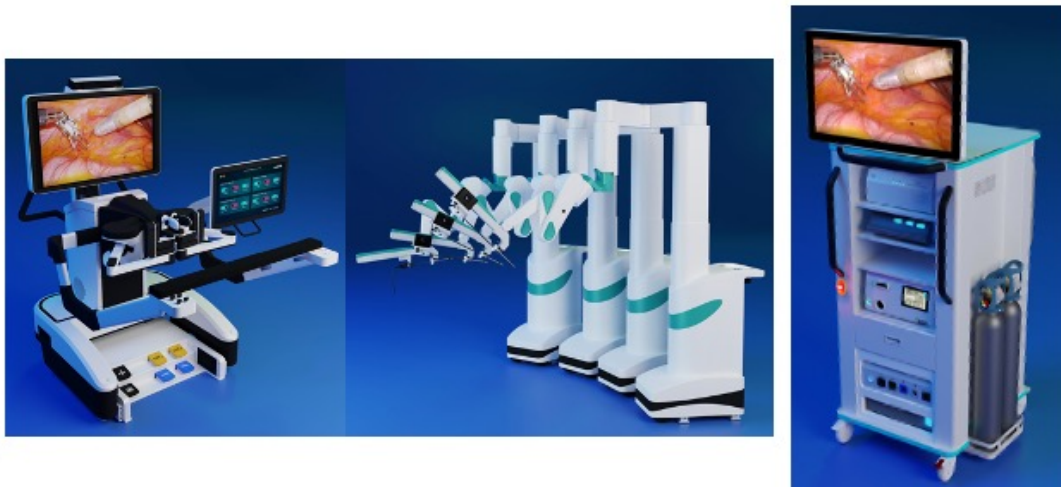
Background

- **Current as of:** Aug 2023
- **Location of Target:** Shanghai, China
- **Number of employees:** ~170
- **Key contact at Target:** Hongbin Sun (CFO), Johnathan Chen (Chief of International Business)
- **Maturity of target:** Pre-Revenue, Founded 2016
- **Footprint:** ~250 procedures complete (URO, GYN, Colorectal)
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Toumai Robotic System



Background

- **Current as of:** Aug 2023
- **Location of Target:** Harbin, China
- **Number of employees:** ~170
- **Key contact at Target:** Dr. Liang Cui (CMO)
- **Maturity of target:** Pre-Revenue, Founded 2013
- **Footprint:** ~250 procedures complete (URO, GYN, Colorectal)
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Kangduo Robotic System

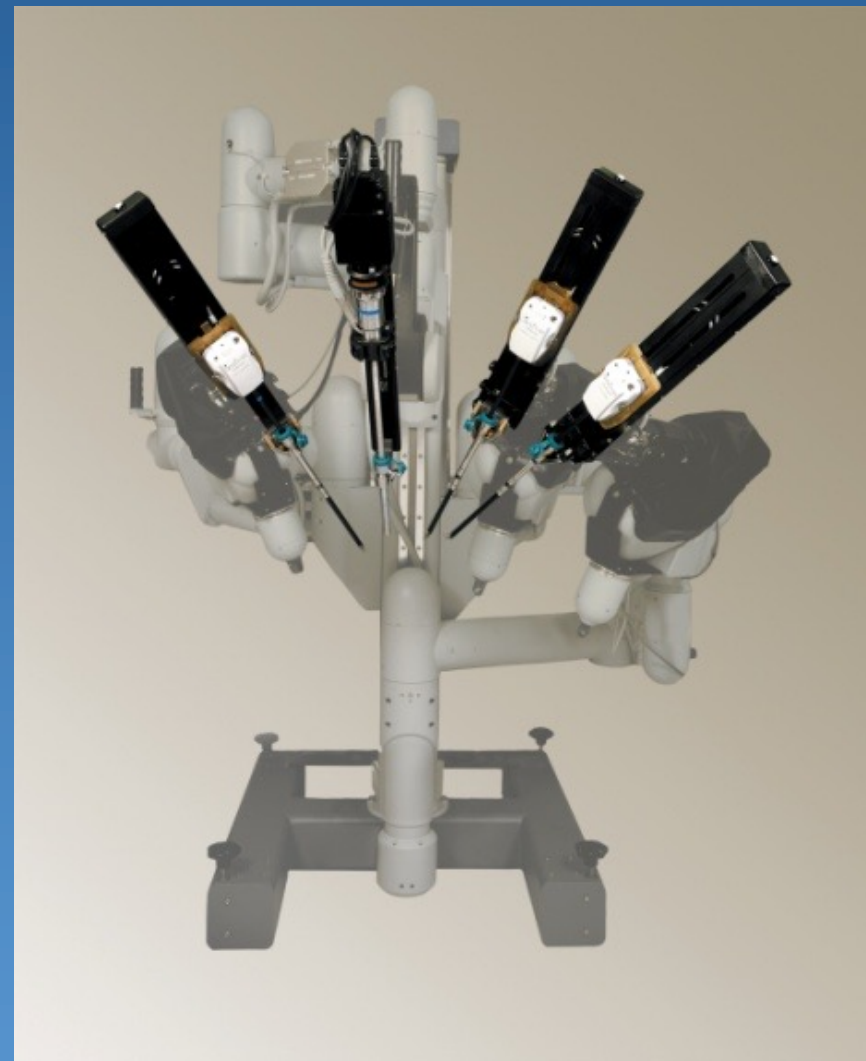


Background

- **Current as of:** Aug 2023
- **Location of Target:** Guragon, India
- **Number of employees:** ~60
- **Key contact at Target:** Dr. Sudhir Srivastava (CEO)
- **Maturity of target:** Commercial in India, Founded 2017
- **Footprint:** ~260 procedures complete (mostly Urology)
- **Target Segment category:** Soft Tissue Robotics
- **Description of Key Products:** Mantra Robotic System

Muti Arm-Single Cart systems

Intuitive Surgical Since 1990...



Evolution of Da Vinci Robotic Platform

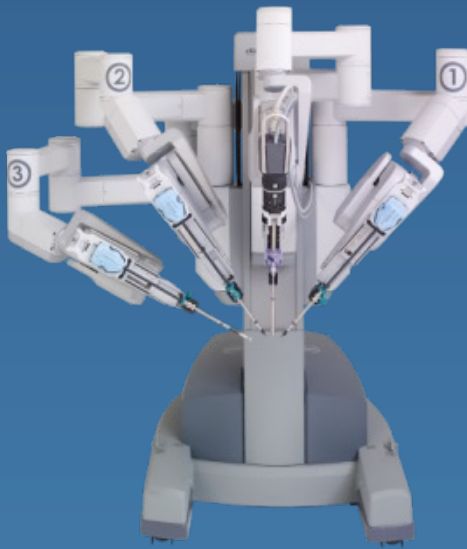
1999



da Vinci®

- Eliminates lap compromises
- Introduction of 4th arm (2003)
- Simple instruments

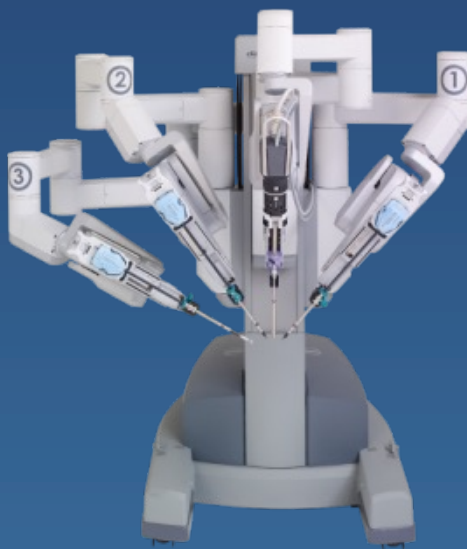
2006



da Vinci® S™

- 3D HD Vision (720p)
- Cross-quadrant access
- Streamlined set-up

2009



da Vinci® Si™

- Dual Console option
- Enhanced HD Vision (1080i)
- Upgradable architecture

2014

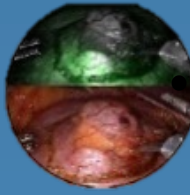


da Vinci® Xi™

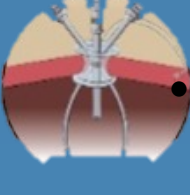
- Multi-quadrant access
- Crystal clear 3D HD vision
- Platform for future technologies



FIREFLY™



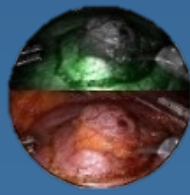
SINGLE-SITE™



SKILLS® SIMULATOR™



ADVANCED INSTRUMENTATION



FIREFLY™
(EXPECTED MID 2014)



- XI SKILLS SIMULATOR™
(AVAILABLE NOW)



- INTEGRATED ENERGY
(AVAILABLE NOW)



VESSEL SEALER
(EXPECTED MID 2014)



- STAPLER
(EXPECTED MID 2014)



- FUTURE INNOVATION
SINGLE PORT SURGERY

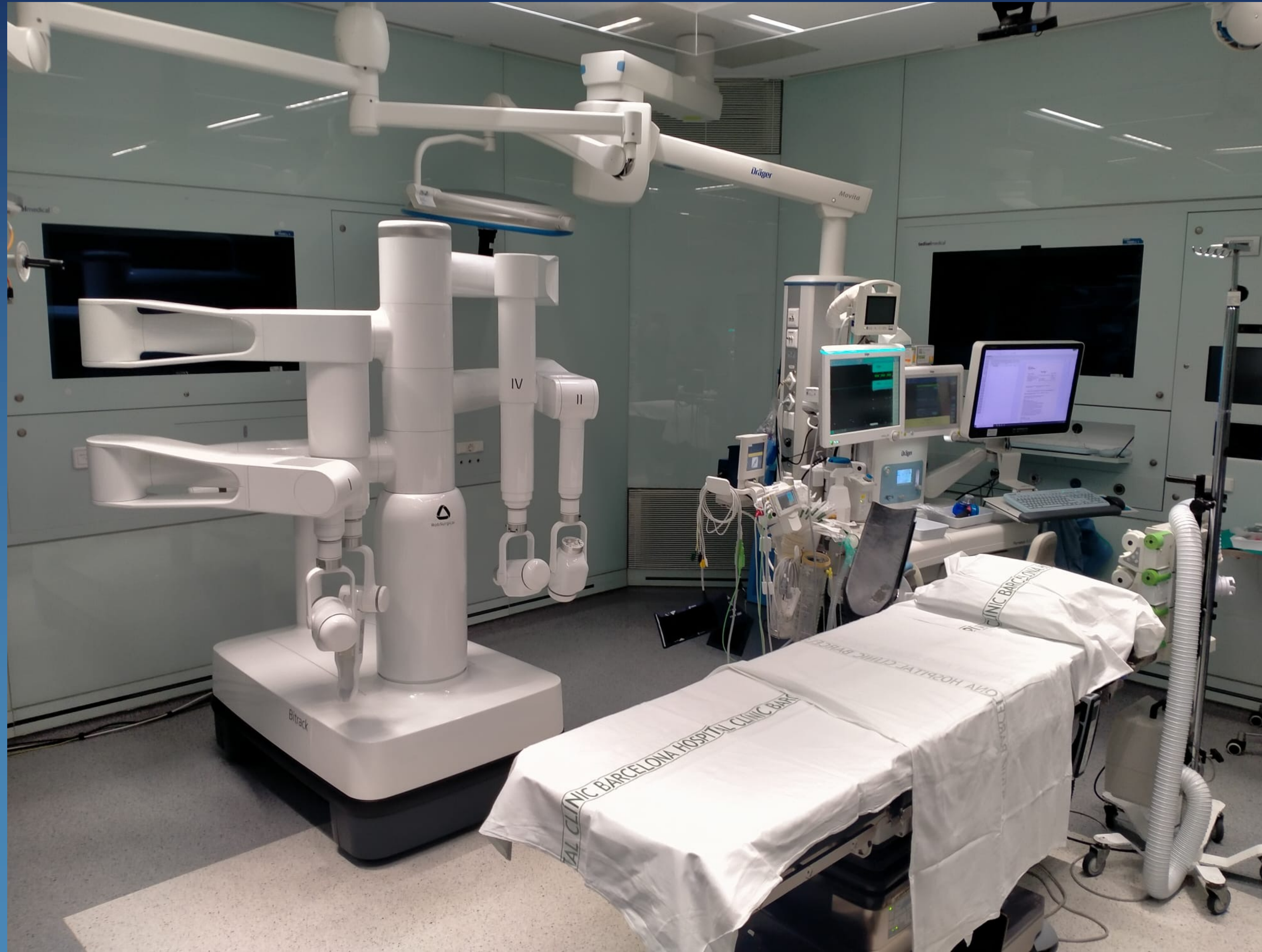
Intuitive DV 5

Da Vinci 5

**Our most advanced and integrated
robotic surgery system—ever**



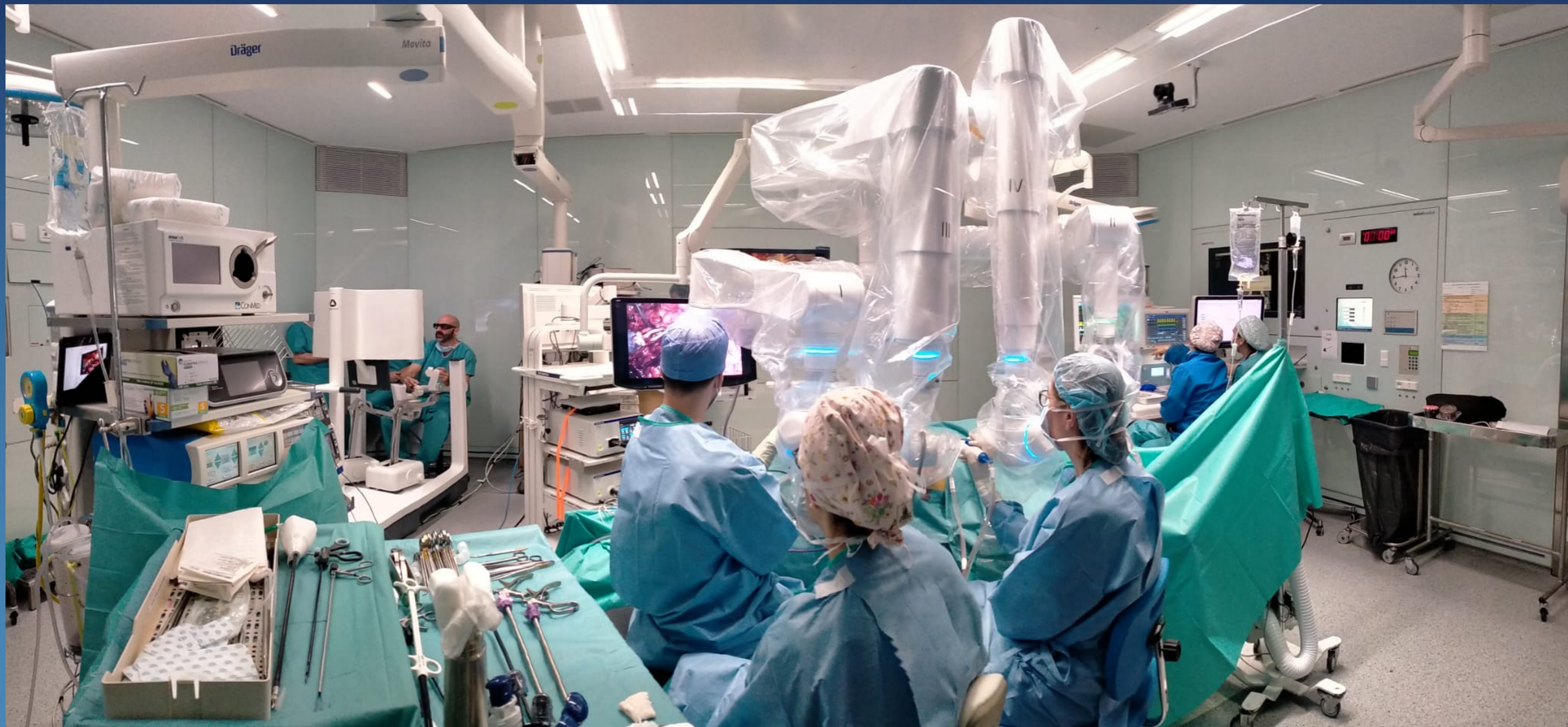
Rob Surgical: CE mark pending



Rob Surgical



Rob Surgical



Rob Surgical



J&J MedTech

OTTAVA

- ✓ Submitted to FDA in January 7th, 2026;
- ✓ Stands out for its unique architecture that integrates robotic arms directly into the O.T.;
- ✓ Not yet commercially available;
- ✓ FDA authorization between October and November;
- ✓ First Clinical Trial - RYGB completed in 2025;
- ✓ Unified Movement - Twin Motion: Table and arms move in sync - allows patient repositioning during surgery;
- ✓ Digital Integration: Connects to J&J Polyphonic Ecosystem and uses Google's AI.



OTTAVA™ Robotic System

Ottava Robotic System

Designed to provide greater access with a smaller footprint and flexible architecture, enabling a broad range of procedures and approaches

Designed to provide increase autonomy and control of a procedure with a full portfolio of Ethicon instrumentation and visualization solutions

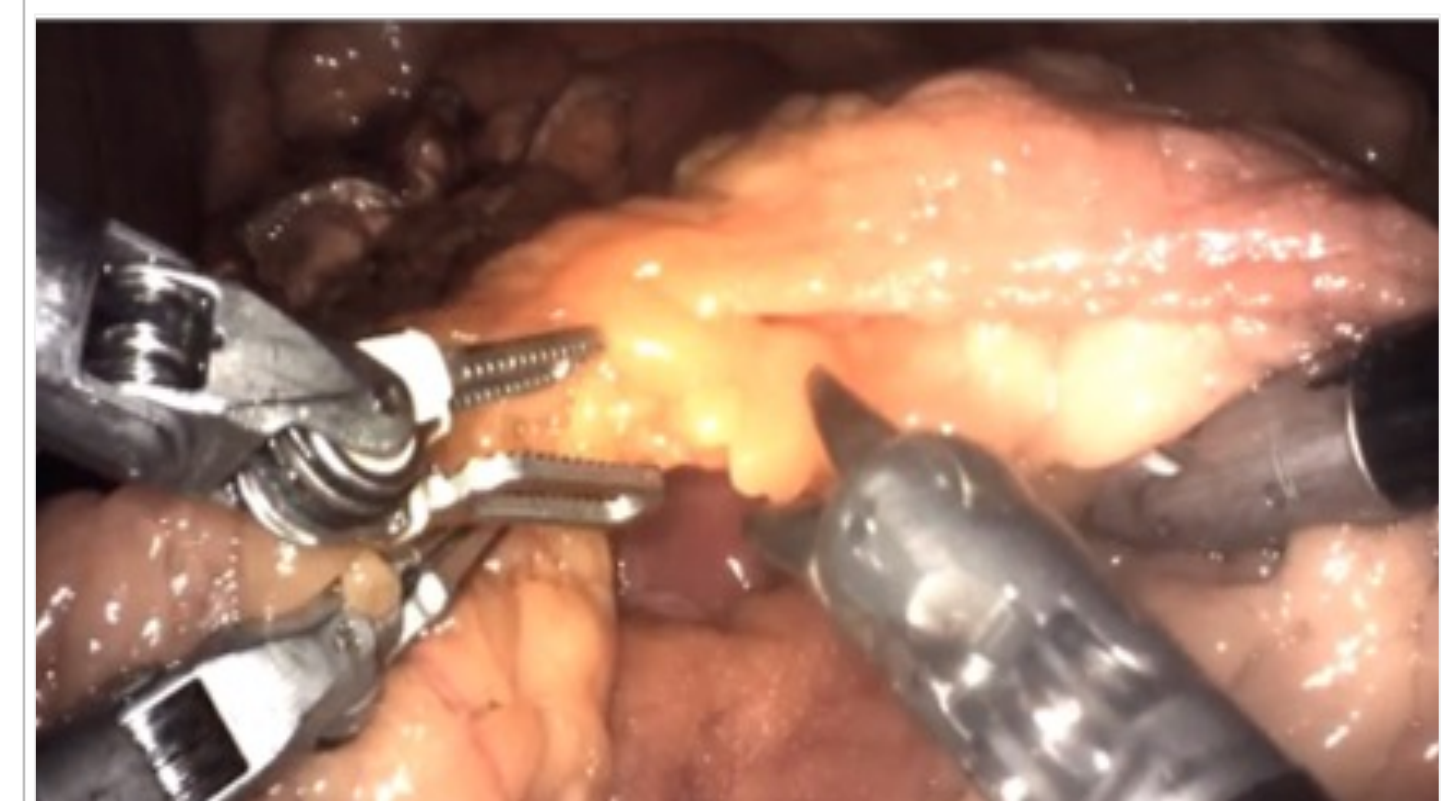
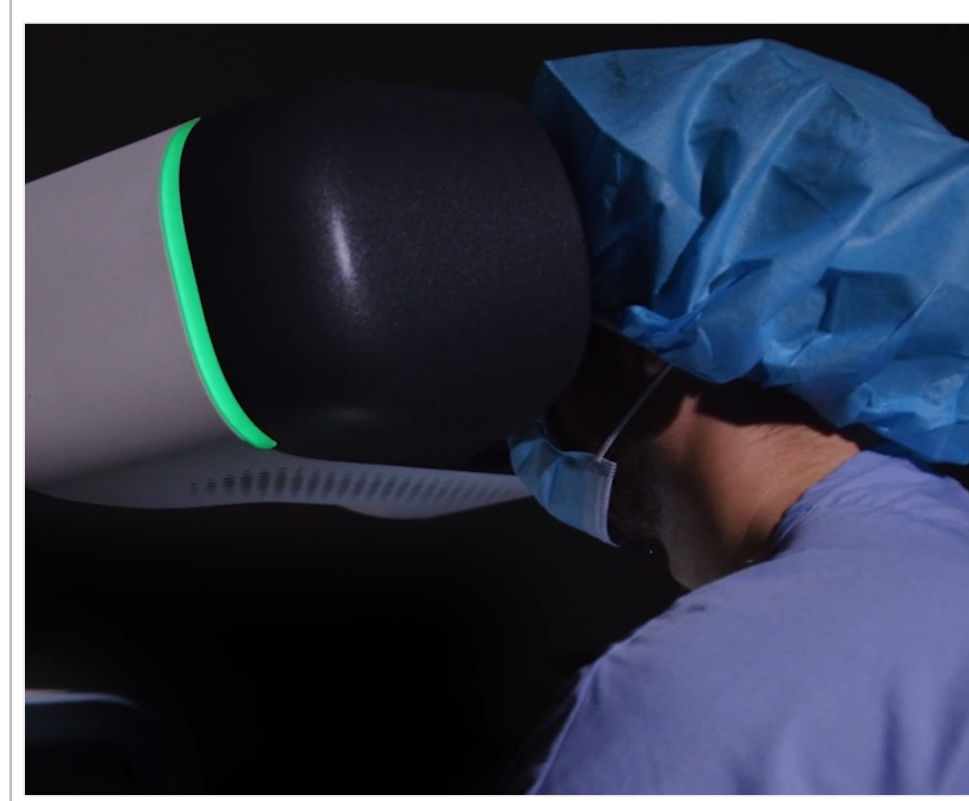
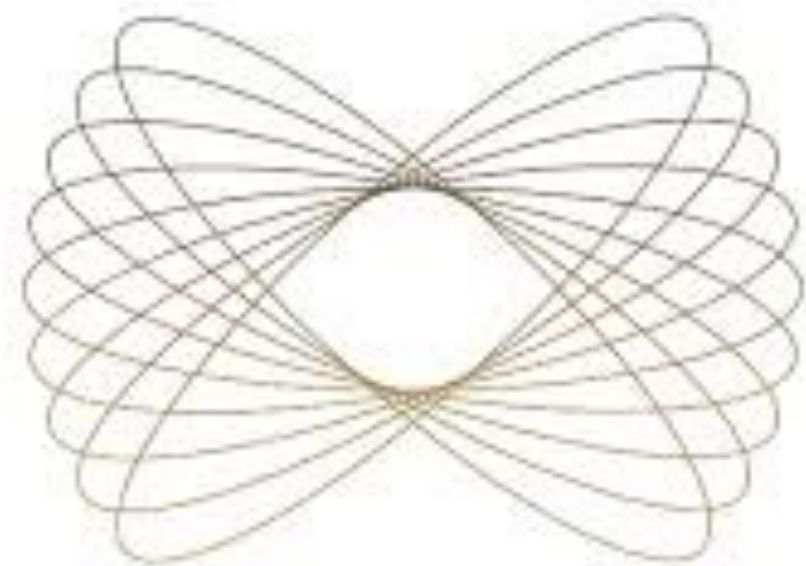
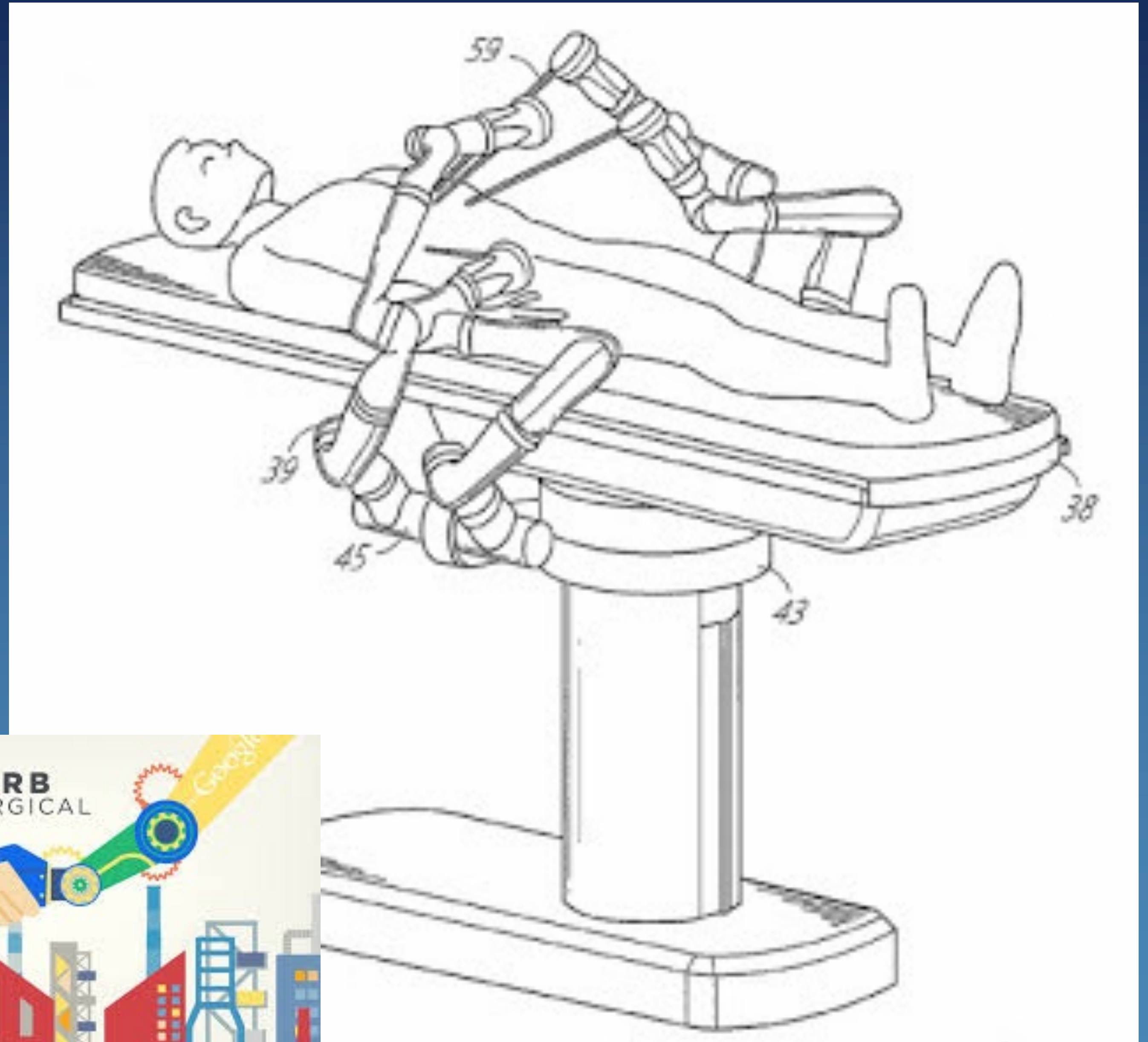


Table Mounted Arms

- Open surgical cart
- Table based designs
- Endolumenal designs too
- Full complement of robotic driven lap wristed instruments
- Focused on procedure analysis
- Possible integrated robotic CELS



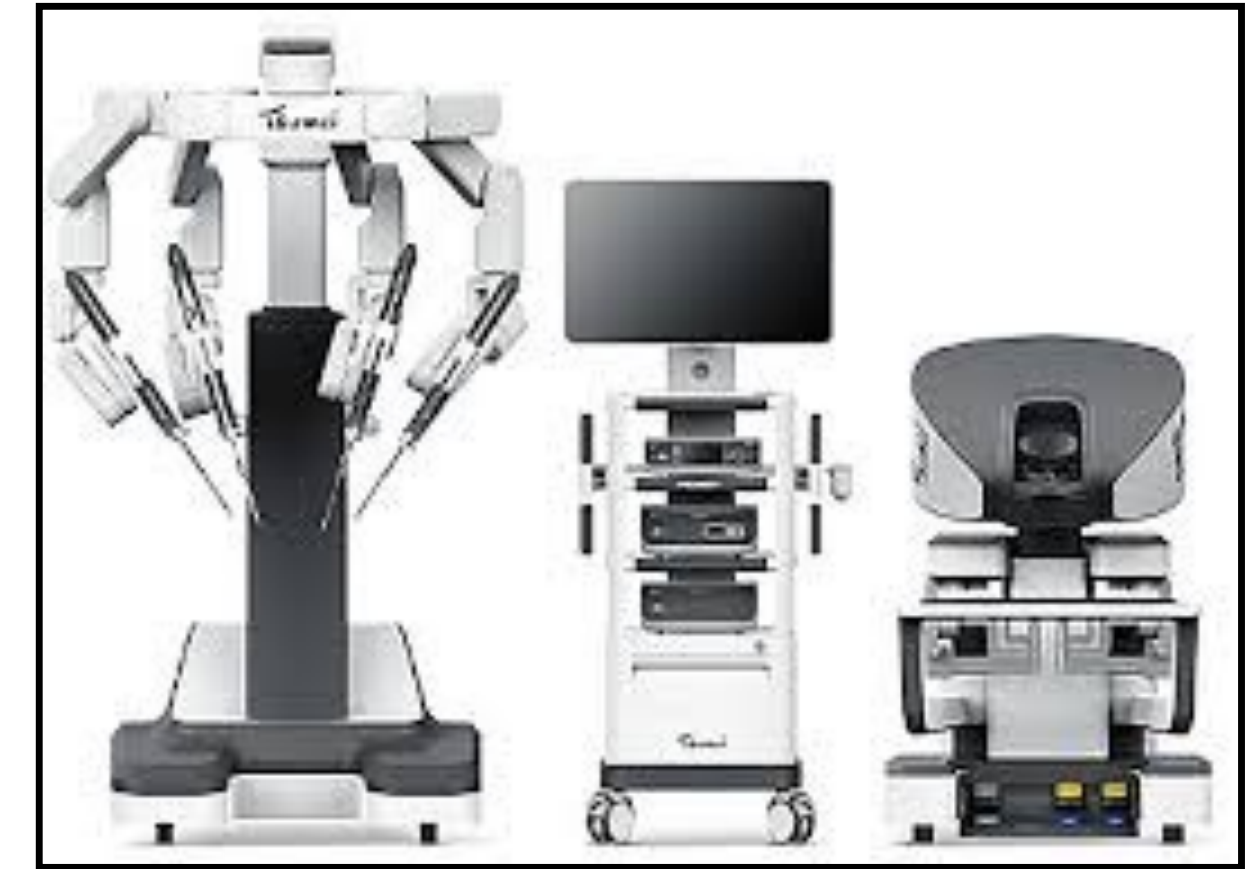
AURIS



Robot & Instruments



- ✓ Arms with 7 degrees of freedom / Tremor filtering;
- ✓ Technologies for surgical smoke removal, vascular enhancement, clarity of surgical field in real time;
 - ✓ Telesurgery - 5G connectivity;
 - ✓ HapticSense (Tactile Feedback);
 - ✓ Real-Time Security;
- ✓ Master-Slave system - stable and no delay movs.;
 - ✓ Cost-Effectiveness...



- ✓ Japan - Joint Venture: Kawasaki & Sysmex Corp.;
- ✓ Semi-Open Console with 3D HD View;
 - ✓ Telesurgery - 5G connectivity;
 - ✓ Single-Boom Design;
- ✓ Loop Like Handles - Allow surgeons to control the 4 wristed robotic arms...



Single Port Robotic Platforms

SINGLE PORT ROBOTIC PLATFORMS

INTUITIVE
SURGICAL®

 **Medrobotics**

EDGE™

 **TITAN MEDICAL™**


VICARIOUS
SURGICAL

Intuitive SP system



UC San Diego
MEDICAL CENTER

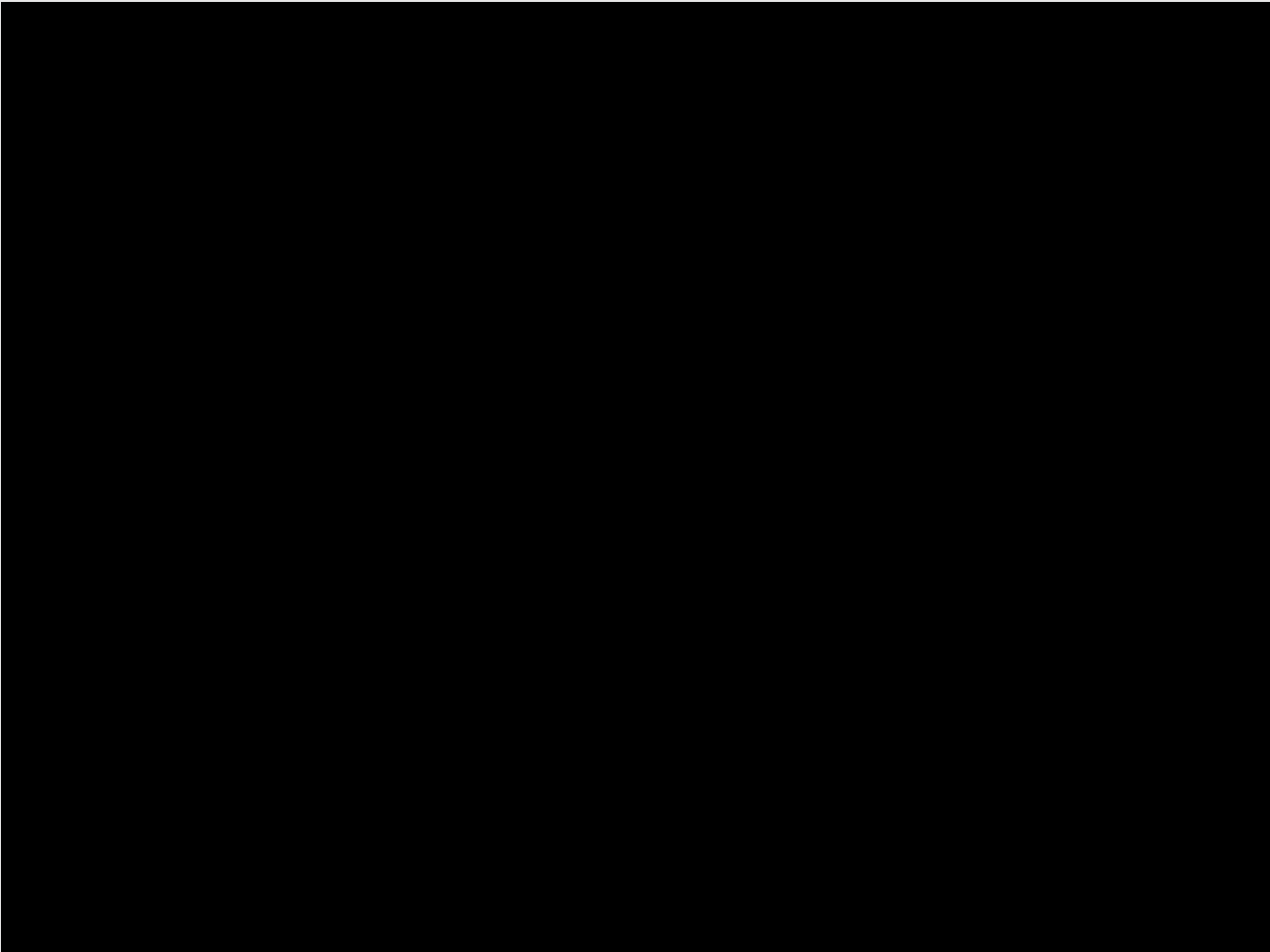
SINGLE PORT ROBOTIC PLATFORMS

INTUITIVE
SURGICAL®



- ✓ 25mm Single Incision;
- ✓ 3 wristed instruments and 3DHD wristed camera;
 - ✓ Wristed and Elbow double articulation;
 - ✓ Aesthetic benefits;
 - ✓ Less pain and early recovery??
 - ✓ Incisional Hernia??





Vicarious Surgical

- Boston-USA
- Single-Site Robotic Platform



VICARIOUS SURGICAL



SINGLE PORT ROBOTIC PLATFORMS

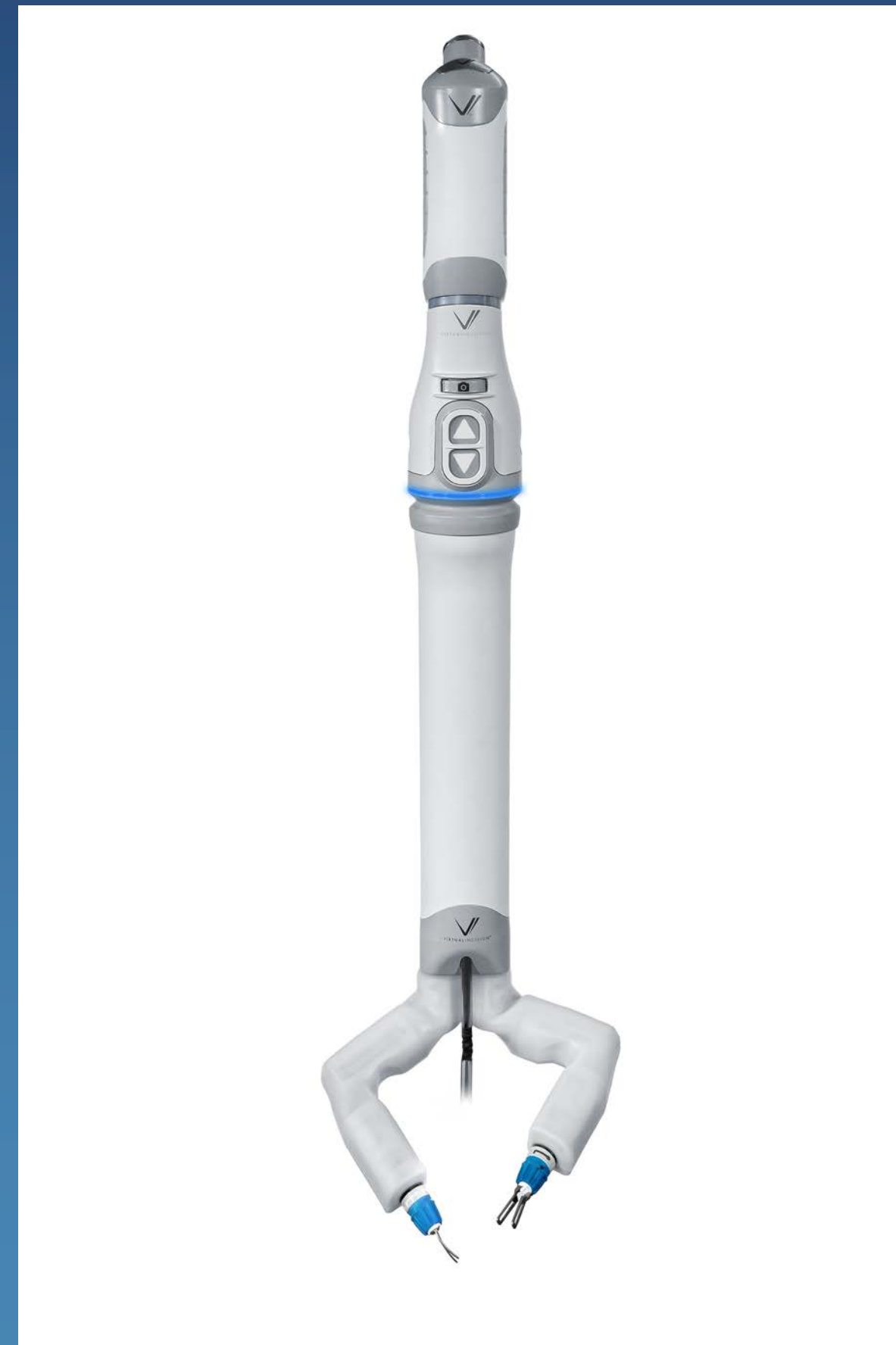


- ✓ Abdominal Surgeries;
- ✓ 1.5cm incision;
- ✓ High dexterity and motion: 360 degree visualization and high degree of freedom;
- ✓ Human like mobility - 28 sensors per arm;
- ✓ Initial focus on ventral hernia repair;
- ✓ Back by investors like Bill Gates;
- ✓ Human trials for 2026...



Virtual Incision system: MIRA

FDA approved





VIRTUALINCISION

FDA approved



VIRTUALINCISION

VIRTUAL INCISION

0:00

Single Arm-Multi Cart systems

Transenterix/Asensus
Senhance: FDA approved
Acquired by Storz 2024



FDA approved Oct. 2017
CE mark for more than 10 years
Non-wristed instruments in US
Wristed instruments in Europe

Key features: haptic feedback and
Eye-sensing camera

Medtronic Hugo

Approved FDA 2025

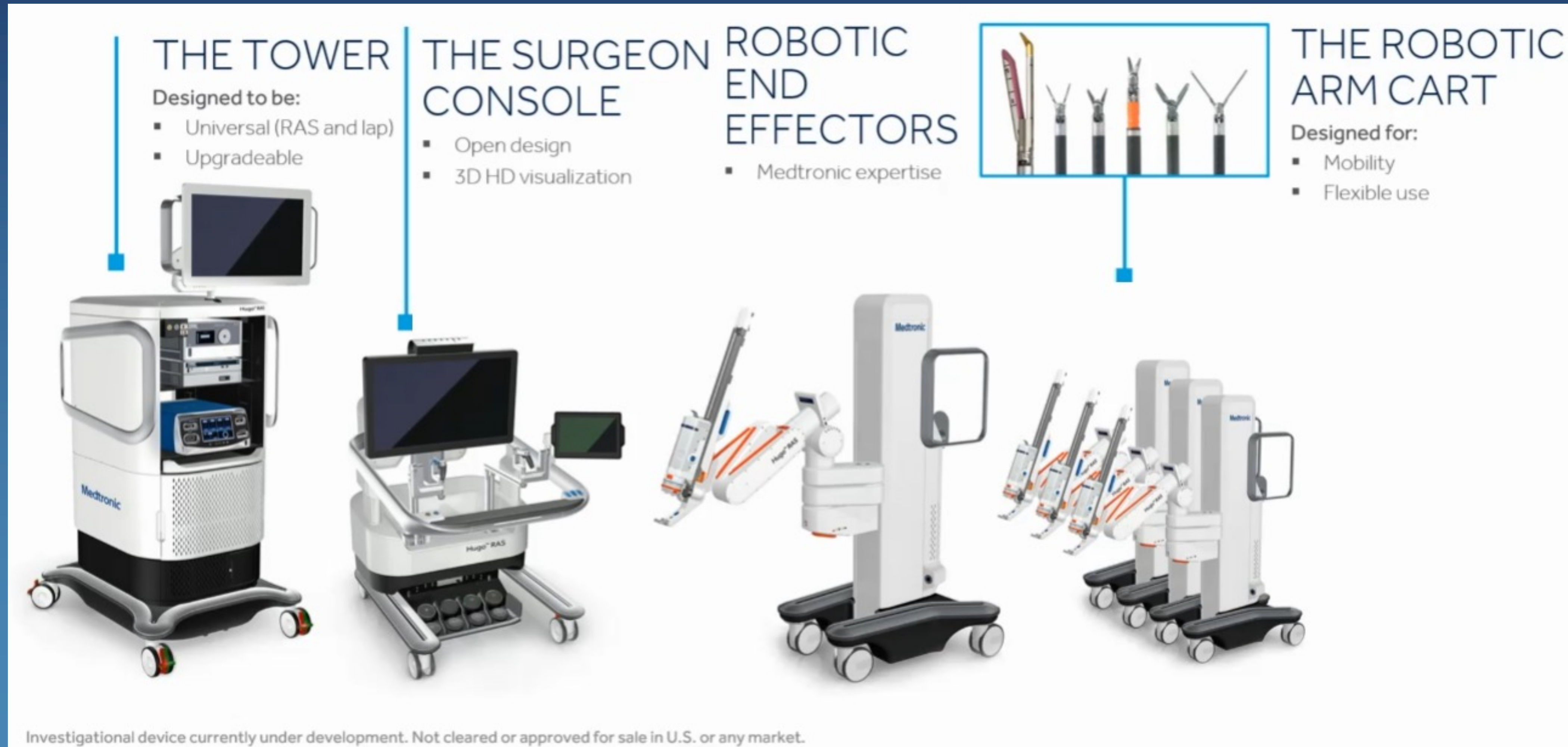
-Open surgical cart

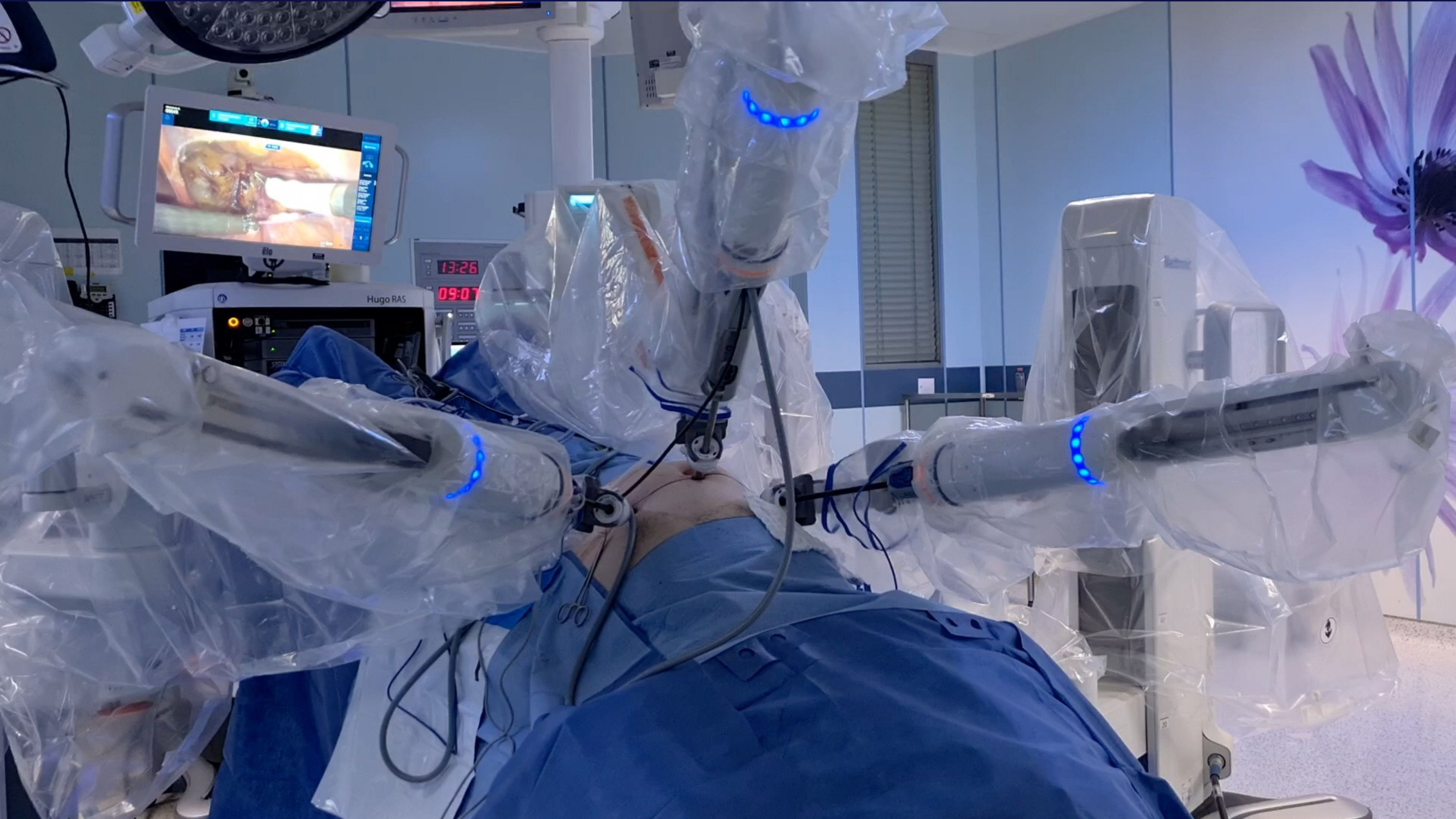
-Modular design 3-4 arms

-Full complement of robotic driven lap wristed instruments

-Cost focused

Storz video system





PROSTATE ID:
00048

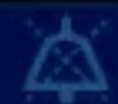
Bipolar Maryland Forceps



3D

BYZ

PROCEDURE ID:
0006A



PAUSE
AUDIO

4 Cadiere Forceps



1 Cadiere Forceps

2 Large Needle Driver

END SURGERY

SETUP VIEW



MESSAGES

Surgeon head
tracking: clutched.
Look at 3D display to
regain control.
2h, 36m, 35s

Surgeon head
tracking: clutched.
Look at 3D display to
regain control.
2h, 36m, 20s

Arm 3: Instrument
straight.
2h, 36m, 11s

Surgeon head
tracking: clutched.
Look at 3D display to
regain control.
2h, 35m, 40s

S-Technologies Filters

3D

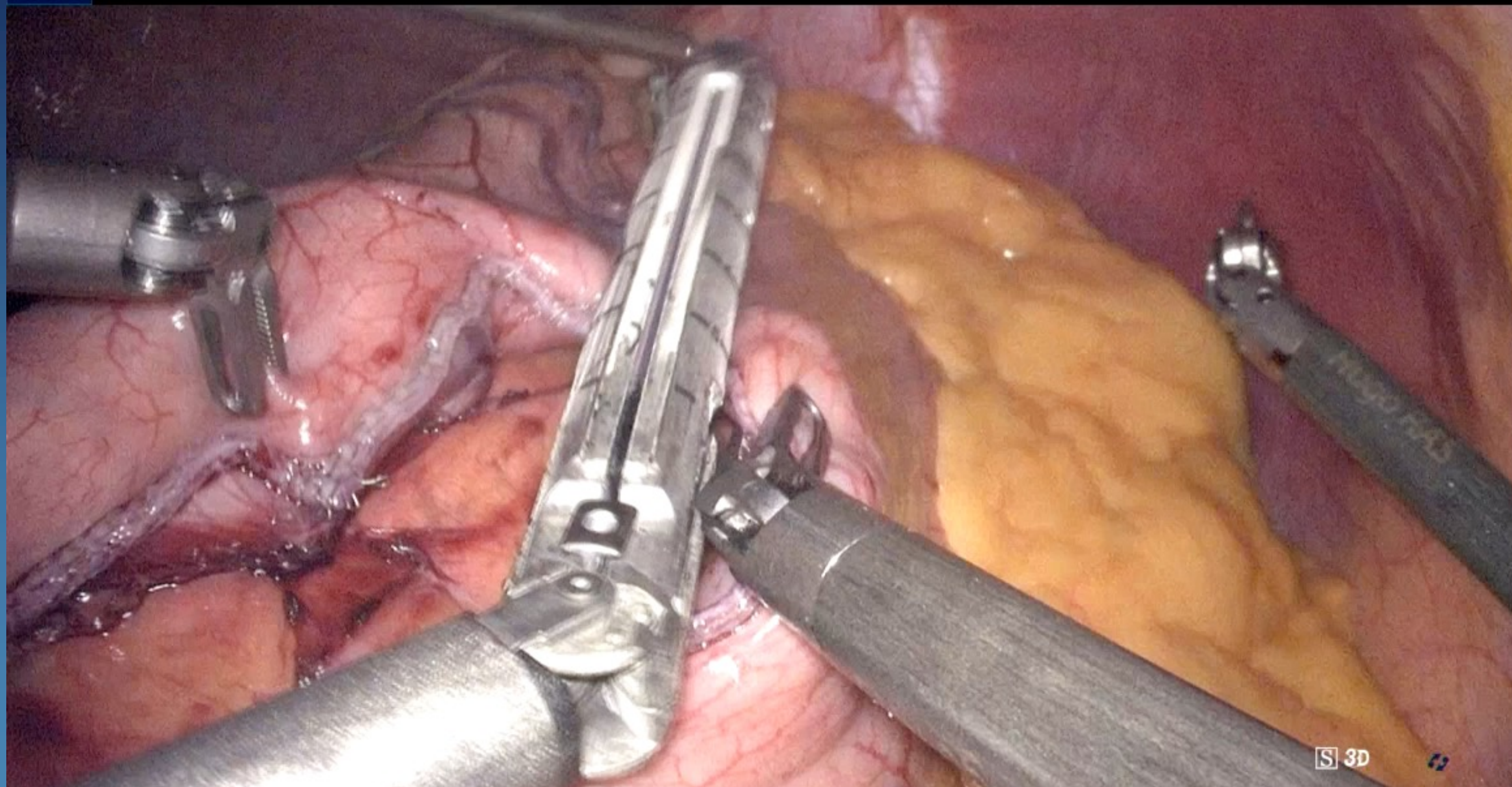
A



1



CAPTURE



S 3D



PROCEDURE ID:
000A2



1 Bipolar Maryland
Forceps



2 30°

3 Monopolar Curved
Shears



END SURGERY

SETUP VIEW



MESSAGES

Arm 3: Monopolar
energy enabled.
2h, 22m, 55s

Energy pedals
disabled.
2h, 22m, 01s

Arm 3: Monopolar
energy enabled.
2h, 21m, 18s

Energy pedals
disabled.
2h, 21m, 06s

Surgeon head
tracking: clutched.
Look at 3D display to
regain control.
2h, 21m, 03s

S-Technologies Filters

3D

A

-

1

+

CAPTURE

3D





The Hugo RAS™

Initial Experience from Israel

Yoav Mintz MD

Associate Professor of Surgery

Director Division of Foregut Surgery

Hadassah Hebrew University Medical Center

Jerusalem, Israel





Total Hugo Operations - 44

May 2023

General Surgery 32

- Inguinal Hernia - 12
- Heller Myotomy - 6
- Esophagectomy - 3
- Mini Gastric Bypass - 4
- Ventral Hernia – 2
- Colorectal – 3
- Hiatal Hernia – 1
- Partial Gastrectomy - 1

Urology 12

- Radical Prostatectomy – 9
- Pyeloplasty - 3

- ✓ AI powered system for workflow optimization;
- ✓ Open Console facilitating communication;
- ✓ 4 free standing arms for greater flexibility;
- ✓ Telemedicine capabilities for remote supervision;
 - ✓ Available in Latam since 2022;
 - ✓ Expansion to general surgery;



Versius: FDA approved 10/2024



Versius

England

Developed by CMR

CE mark obtained March 2019
FDA approved

3D vision

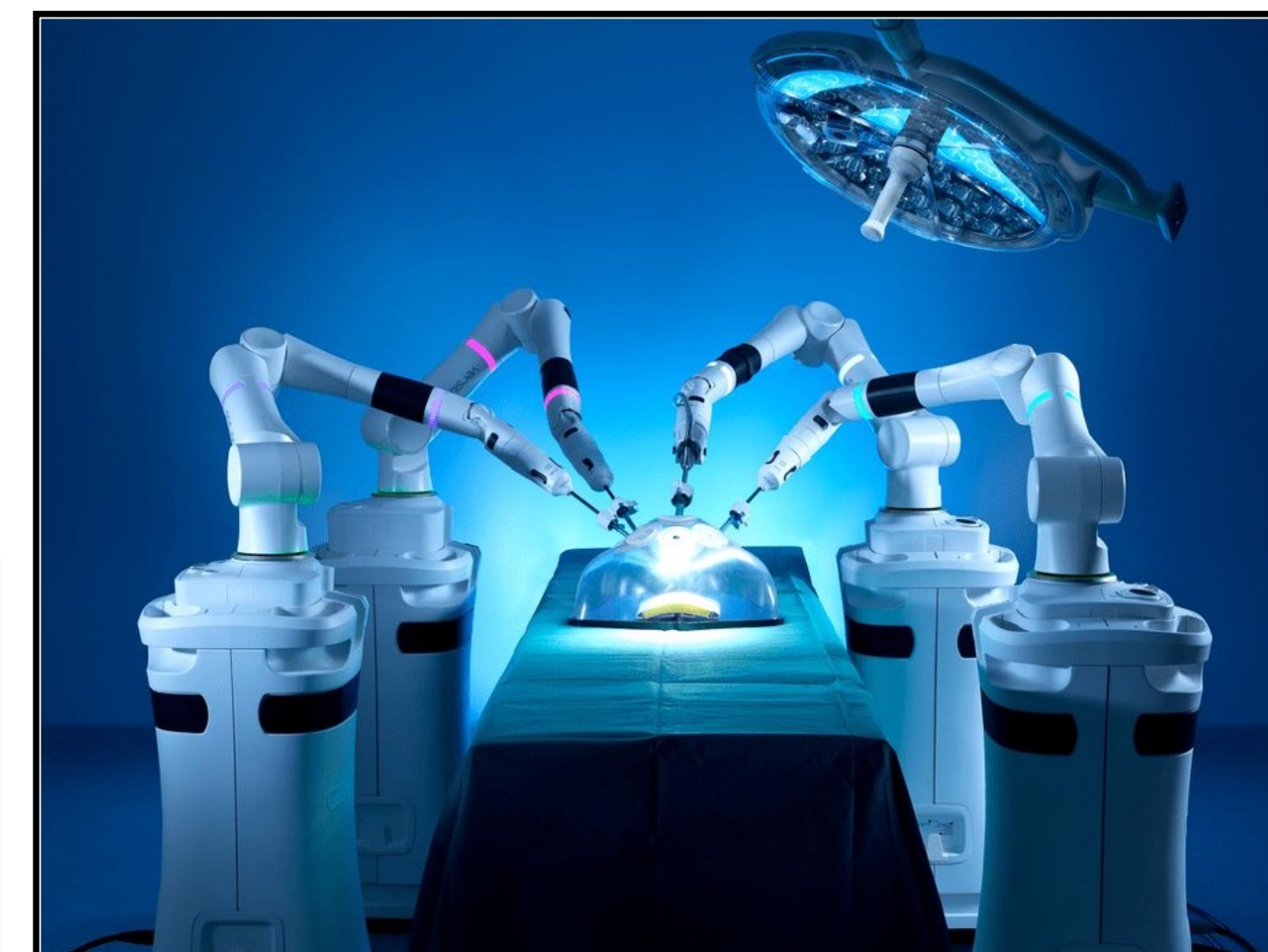
Portable/transportable arms with small footprint, allowing for enhanced access to patient





VERSIUS

- ✓ Modularity & Flexibility;
- ✓ Modular system with independent and portable arms;
- ✓ Present in more than 30 countries;
- ✓ Over 27.000 surgical procedures;
- ✓ Available in Latam since 2022;
- ✓ Open Console with magnified 3D visualization...



Lap Chole and Lap Nissen

Dr. Simon Higgs

Gloucester Royal Hospital



Versius Economic model

- India:
 - Dr Pradeep Chowbey: Chairman Max Healthcare, New Delhi India
- 500 cases: Robotic general surgery
- Average cost of surgery all Included is 1,000 dollars over regular laparoscopy (\$3,000)

Distal Motion: Dexter

FDA approved: 1st case done at UCSD

December 2024



Single-Use Instruments



Needle Holder



Bipolar Johann
Grasper



Bipolar Maryland
Dissector



Monopolar
Scissors



Monopolar
Hook



Robotics where there
is a real advantage



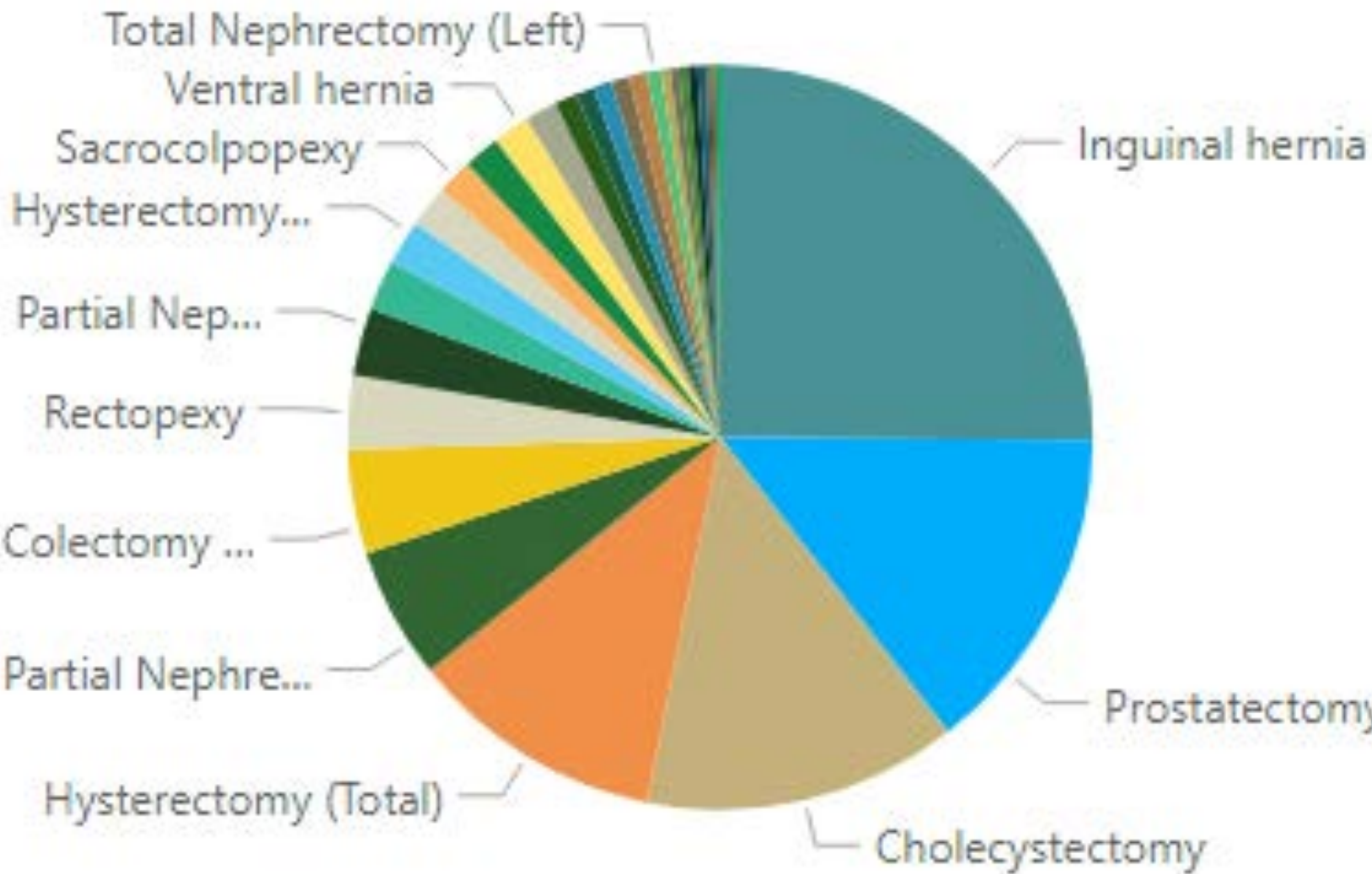
Standard Laparoscopy
where it is at its best



Dexter : Clinical Use

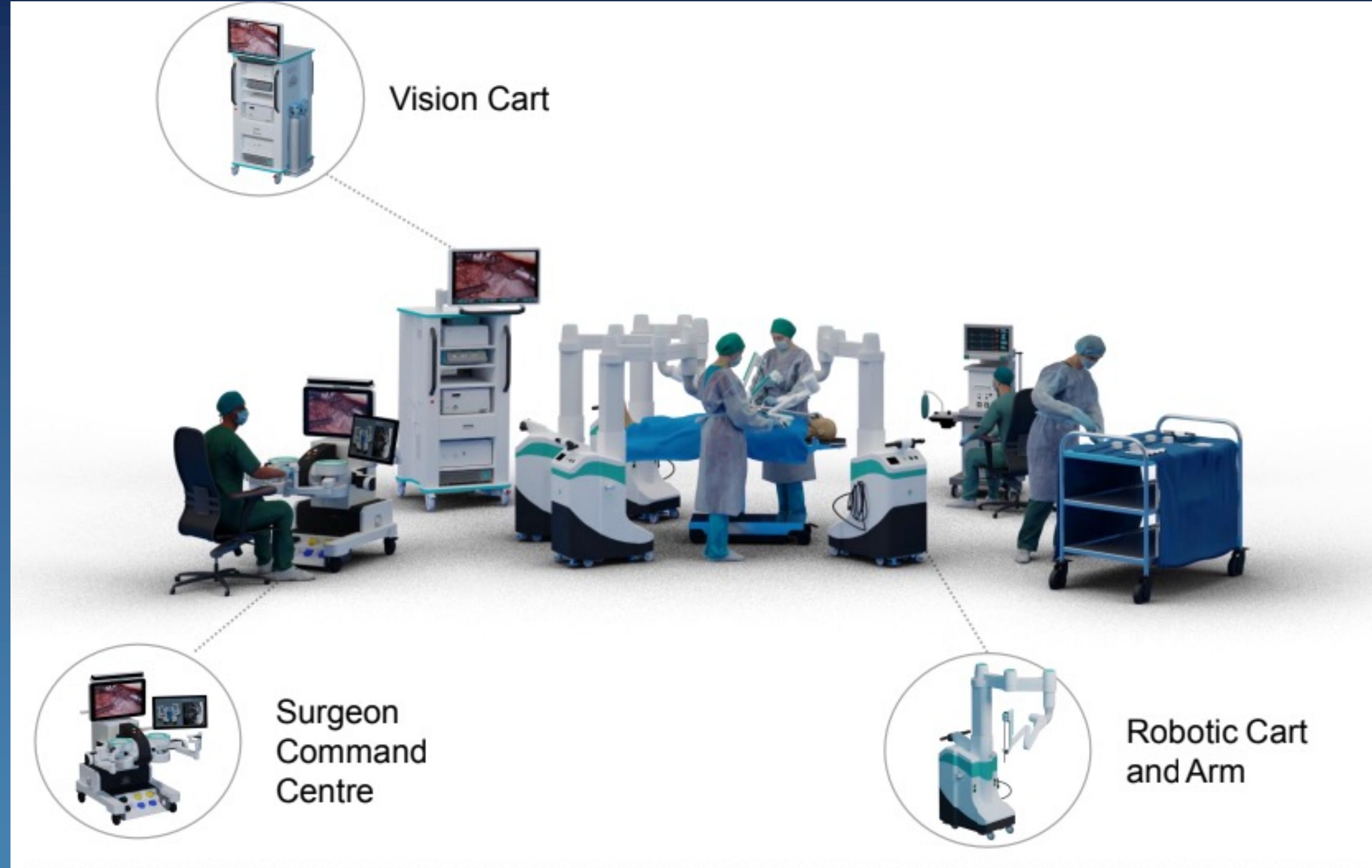
Dexter is being used across General Surgery, Gynecology, and Urology

Procedure Type



General Surgery	Gynecology	Urology
Inguinal hernia	Hysterectomy (Total)	Prostatectomy (Radical)
Ventral hernia	Hysterectomy (Radical)	Partial Nephrectomy (Left)
Cholecystectomy	Hysterectomy (Partial)	Partial Nephrectomy (Right)
Colectomy (Right)	Sacrocolpopexy	Nephroureterectomy
Colectomy (Transverse)	Endometriosis Surgery	Pyeloplasty
Rectopexy	Cyst Extirpation	Simple Prostatectomy
Pancreas Resection	Adnexectomy	Cystectomy
Sigmoidectomy	Myomectomy	Cystoprostatectomy
Carcinomatosis Removal		Total Nephrectomy (Left)
		Total Nephrectomy (Right)
		Varicocelectomy

SSI: Mantra (India Founded 2019)



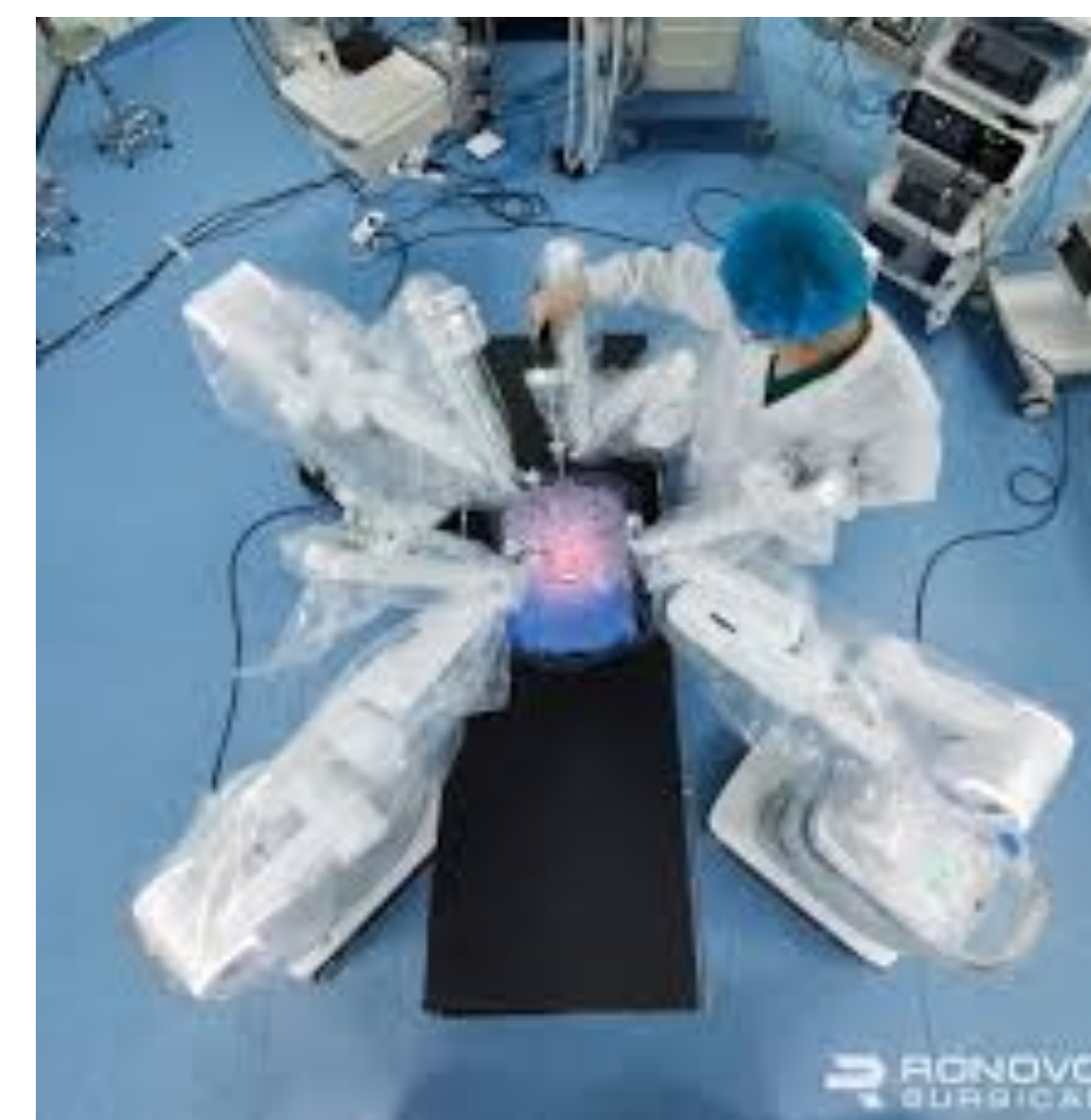
Clinical Applications

General Surgery	Urology	Thoracic Surgery
Cardiac Surgery	Gynecology	Head & Neck Surgery

SSI Innovations



- ✓ Chinese / partnership with J&J (Europe / S.A.);
- ✓ Modular multi-arm system, up to 4 independent arms;
- ✓ Both wristed 8mm and lap 5mm instruments;
 - ✓ Closed consoled;
- ✓ Enhanced Vision: 3D HD view with advanced security...



Renovo: Carina China



Renovo: 1st market





Flexible systems

Endoscopic sleeve gastroplasty

Rev Esp Enferm Dig. 2016 Apr;108(4):201-6. doi: 10.17235/reed.2016.3988/2015.

Endoscopic sleeve gastroplasty (the Apollo method): a new approach to obesity management.

López-Nava Breviere G¹, Bautista-Castaño I², Fernández-Corbelle JP¹, Trel M³.

Author information

Abstract

BACKGROUND: Many obese patients cannot lose weight or reject conventional obesity management. Endoscopic sleeve gastroplasty (the Apollo method) is a pioneering coadjuvant, interventionist technique for the integral management of obesity.

OBJECTIVES: The goals of this study were to report safety and efficacy results obtained at 6 months in patients undergoing endoscopic sleeve gastroplasty.

MATERIAL AND METHODS: A prospective study was performed in 55 patients (13 males, 42 females) who were subjected to the Apollo technique; mean age was 43.5 years (range 25-60) and mean BMI was 37.7 kg/m² (range 30-48). All received multidisciplinary follow-up for weight loss. Weight changes and presence of complications were assessed. Through the endoscope a triangular pattern suture is performed consisting of approximately 3-6 transmural (mucosa to serosa) stitches, using a cinch device to bring them nearer and form a plication.

RESULTS: A total of 6-8 plications are used to provide a tubular or sleeve-shaped restriction to the gastric cavity. No major complications developed and patients were discharged at 24 hours following the procedure. Endoscopic and radiographic follow-up at 6 months post-procedure showed a well preserved tubular form to the stomach. After 6 months patients had lost 18.9 kg and 55.3% of excess weight.

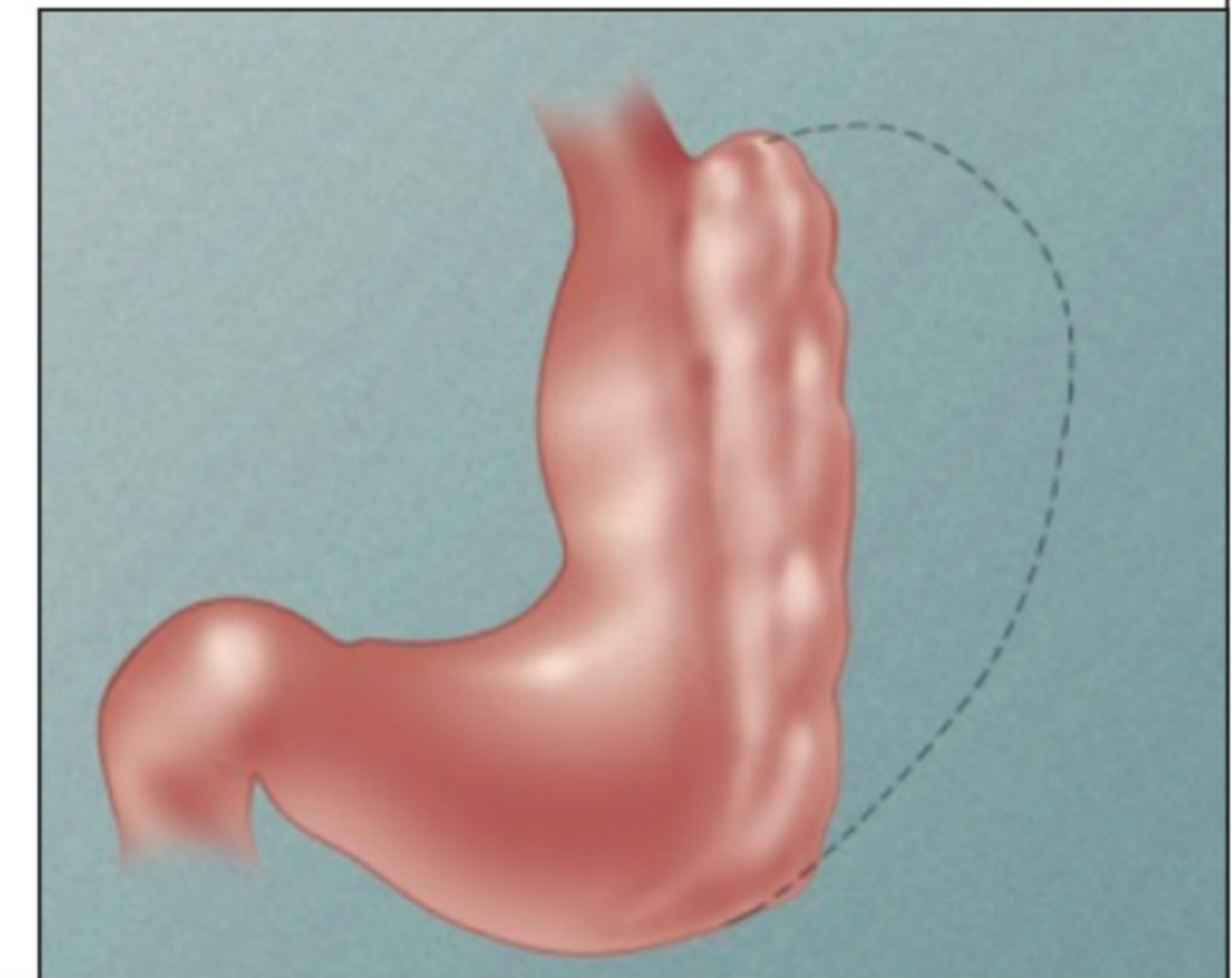
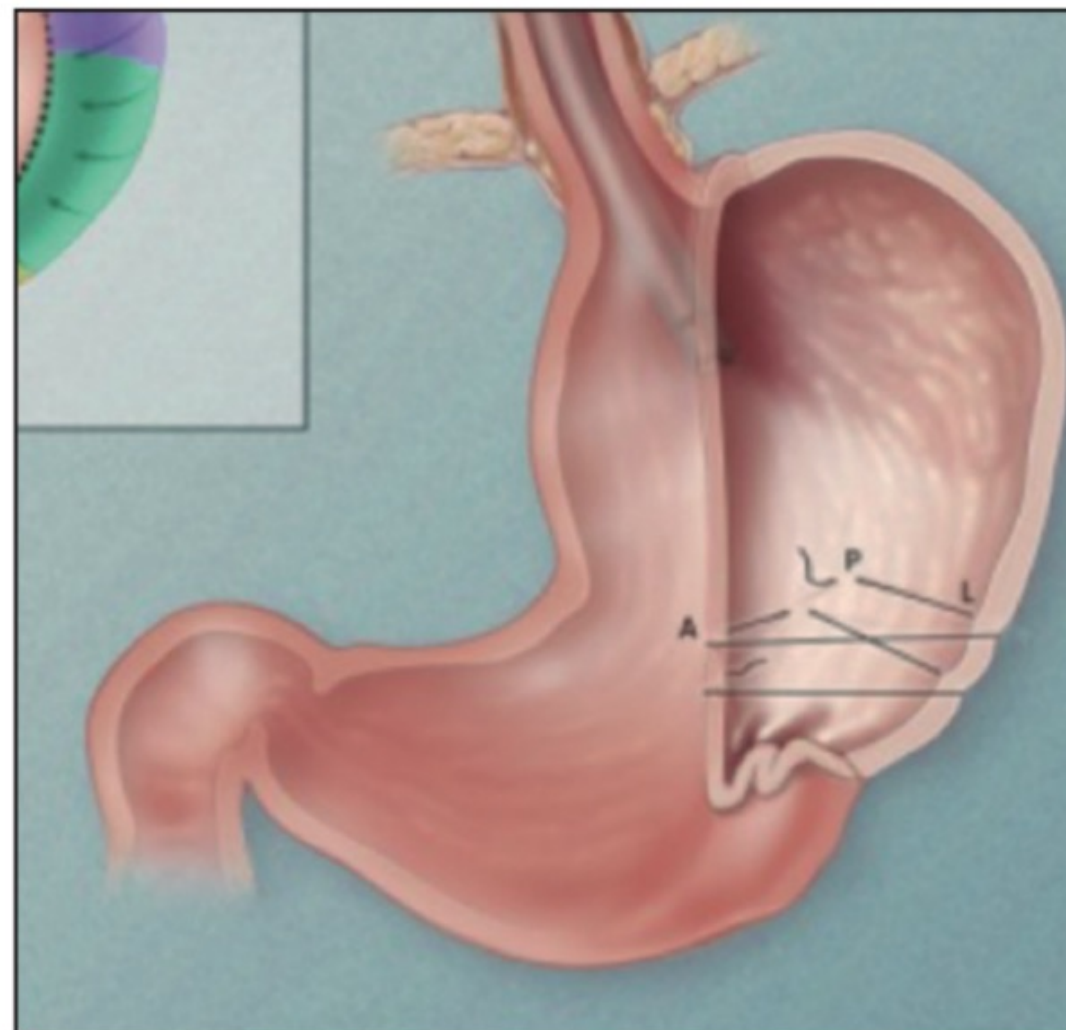
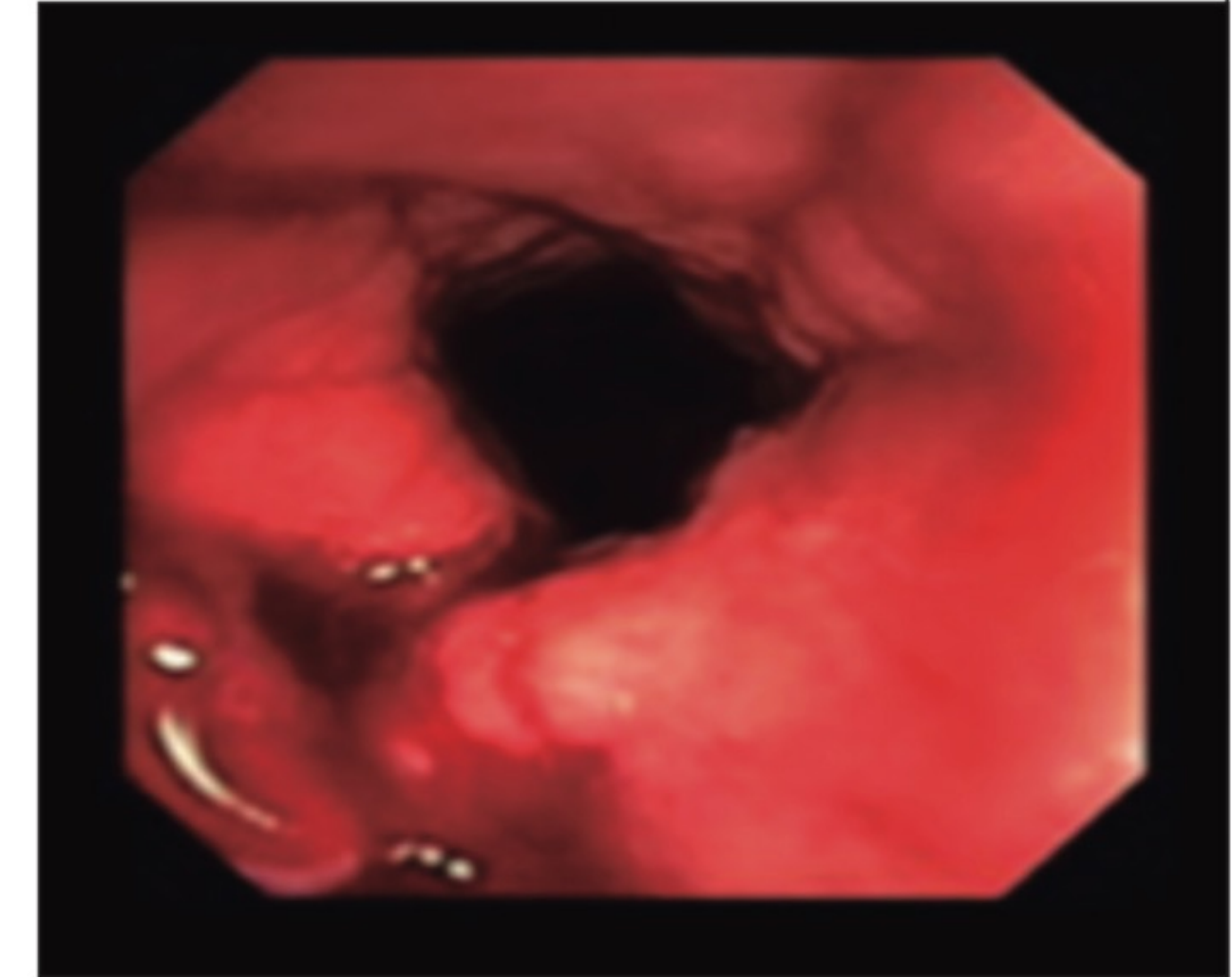
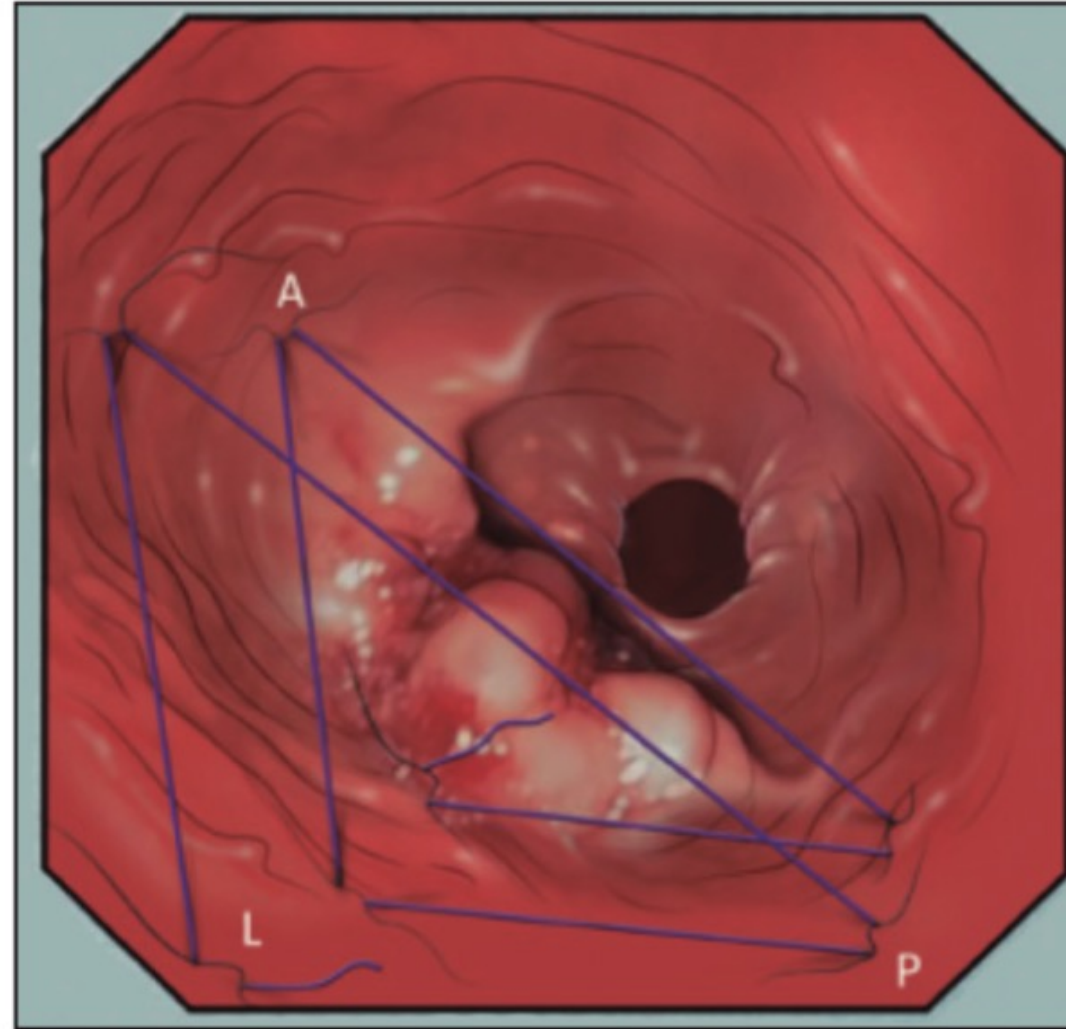
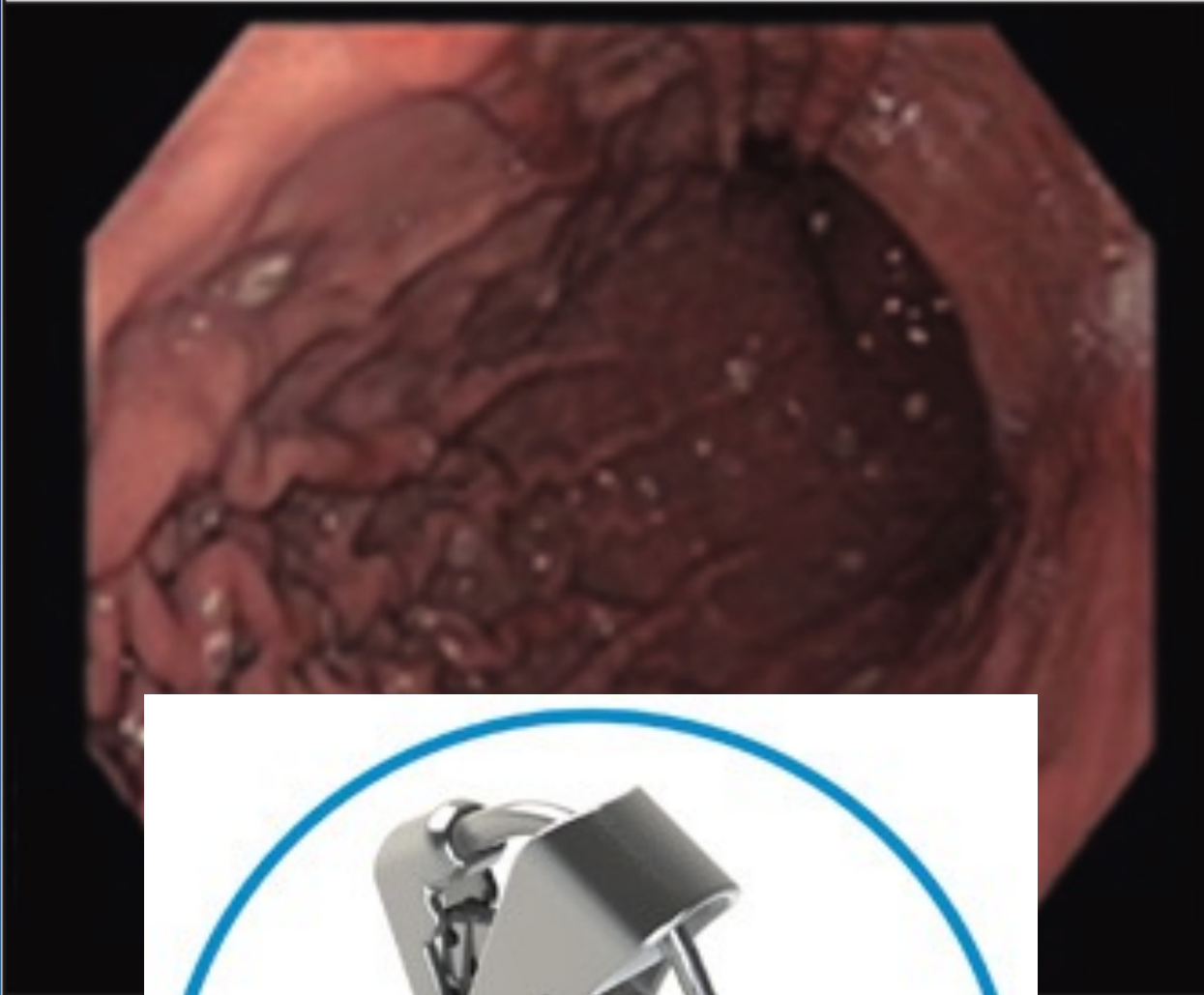
CONCLUSIONS: Endoscopic sleeve gastroplasty, together with dietary and psycho-behavioral changes, is a safe, effective technique in the coadjuvant management of obese patients.

Variable	Baseline (n = 55)	1 month (n = 55)	3 months (n = 55)	6 months (n = 55)
Weight (kg)	106.6 ± 18.3	98.9 ± 16.4	92.2 ± 15.6	87.6 ± 14.7
BMI (kg/m ²)	37.7 ± 4.5	35.0 ± 4.2	32.7 ± 4.3	31.1 ± 4.5
TWL (kg)		7.7 ± 2.9	13.3 ± 4.0	18.9 ± 9.5
%TWL		7.1 ± 2.2	13.3 ± 4.0	17.3 ± 7.0
%EWL		23.1 ± 10.2	43.0 ± 16.2	55.3 ± 23.8

TWL: Total weight loss; %TWL: % of total weight loss; %EWL: % of excess weight loss.

Before

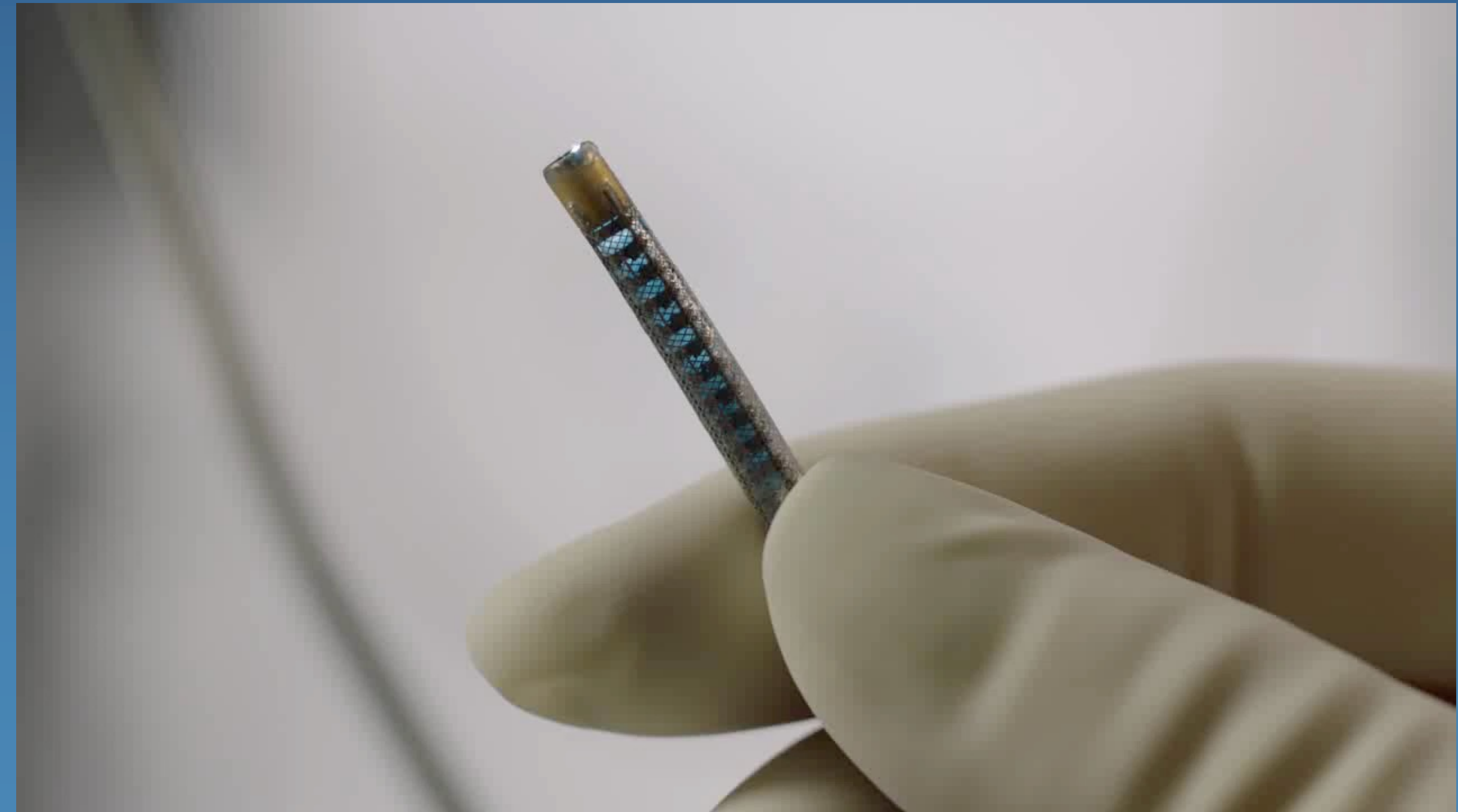
After



UC San Diego
SCHOOL OF MEDICINE

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ION Thoracic Flexible Robotic System



Auris Monarch

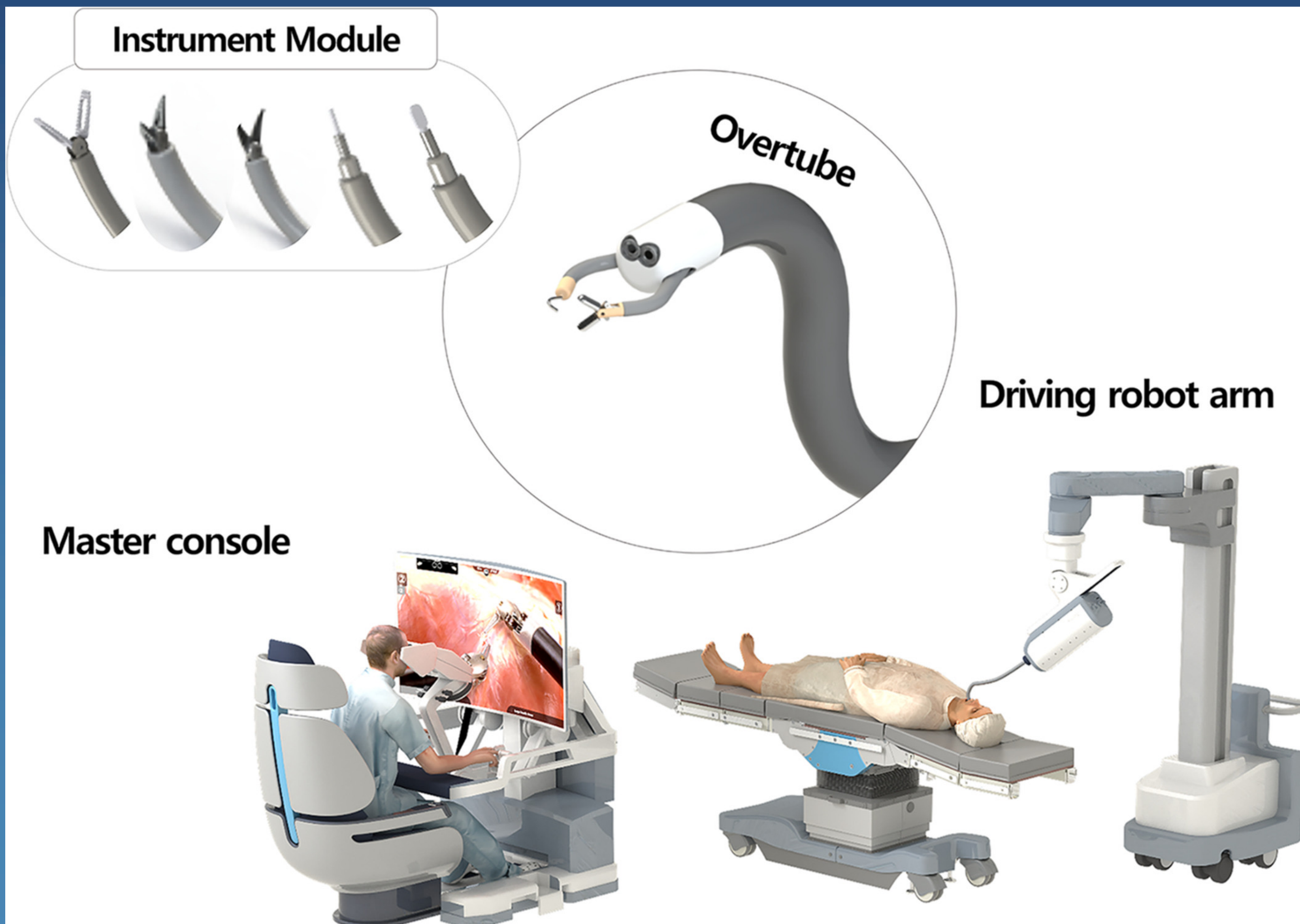
(aquired by Ethicon, 5 B \$)

FDA approved March 2018

Drive-able endoscopic biopsy platform. Controlled with joystick. Combines computer-assisted navigation to small lung tumors based on 3-D models of patient's lungs.



K-flex Robot



> [Int J Med Robot.](#) 2020 Apr;16(2):e2078. doi: 10.1002/rcs.2078. Epub 2020 Feb 11.

K-FLEX: A flexible robotic platform for scar-free endoscopic surgery

[Minho Hwang](#)¹, [Dong-Soo Kwon](#)¹

Affiliations + expand

PMID: 31945797 DOI: [10.1002/rcs.2078](#)

Abstract

Background: Despite its high lesion accessibility and versatility, endoscopic platforms have suffered from designing flexible manipulators with high payload capability sufficient to perform advanced endoscopic procedures.

Methods: A flexible robotic platform, K-FLEX, has been developed with a design of 17 mm in overall diameter. To overcome the shape distortion and deflection in payload handling, a strong continuum manipulator has been designed to have maximum resistance to the distortion. The kinematic analysis and mapping strategy have been established for the master-slave teleoperation.

Results: The proposed manipulator has shown 7.5 mm in trajectory variation to lift the weight of 300 g. Finally, the feasibility of the integrated K-FLEX system has been verified through three kinds of simulated surgical tasks.

Conclusions: The initial prototype of the proposed robot showed the possibility of advanced endoscopic surgery with improved payload capability.

Keywords: computer-assisted surgery; continuum robots; flexible manipulator; kinematics mapping; master device; minimally invasive surgery (MIS); surgical robots.



hominis

small system, big reach



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**Memic**
Innovative surgery

Next-generation advancements to current Hominis™ technology will enhance multiple capabilities



Near-Term Product Enhancements

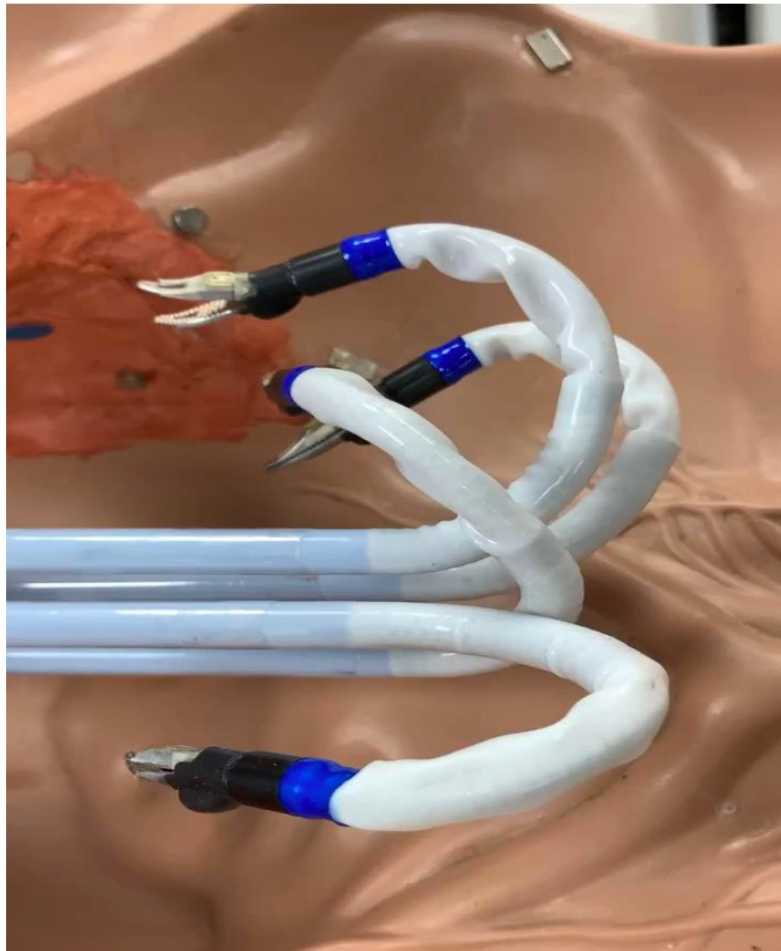
**Memic**
Innovative surgery

Multiple enhancements to broaden Hominis'™ capabilities to address additional future indications while maintaining single port access

Block 2 Enhancements

4 Arms

Facilitates Complex Procedures



Camera

Integrated Visualization



Customized Instrumentation

Preferred Physician Tools



> [J Minim Invasive Gynecol](#). 2021 May;28(5):1101-1106. doi: 10.1016/j.jmig.2020.10.021.

Epub 2020 Nov 2.

Robotic Vaginal Natural Orifice Transluminal Endoscopic Hysterectomy for Benign Indications

Lior Lowenstein¹, Omer Mor², Emad Matanes², Roy Lauterbach², Sari Boulus², Zeev Weiner², Jan Baekelandt³

Affiliations + expand

PMID: 33144242 DOI: [10.1016/j.jmig.2020.10.021](#)

Study objective: The Hominis surgical system is a novel robot-assisted system, designed specifically for robotic vaginal natural orifice transluminal endoscopic surgery (RvNOTES). We presented our experience of the first 30 RvNOTES hysterectomies assessing the feasibility and safety of this technology.

Design: A two-center prospective study.

Setting: Academic tertiary referral centers. The ethics committees approved the study in both centers.

Patients: Thirty women with benign indication for hysterectomy.

Intervention: RvNOTES hysterectomy performed by the Hominis surgical system.

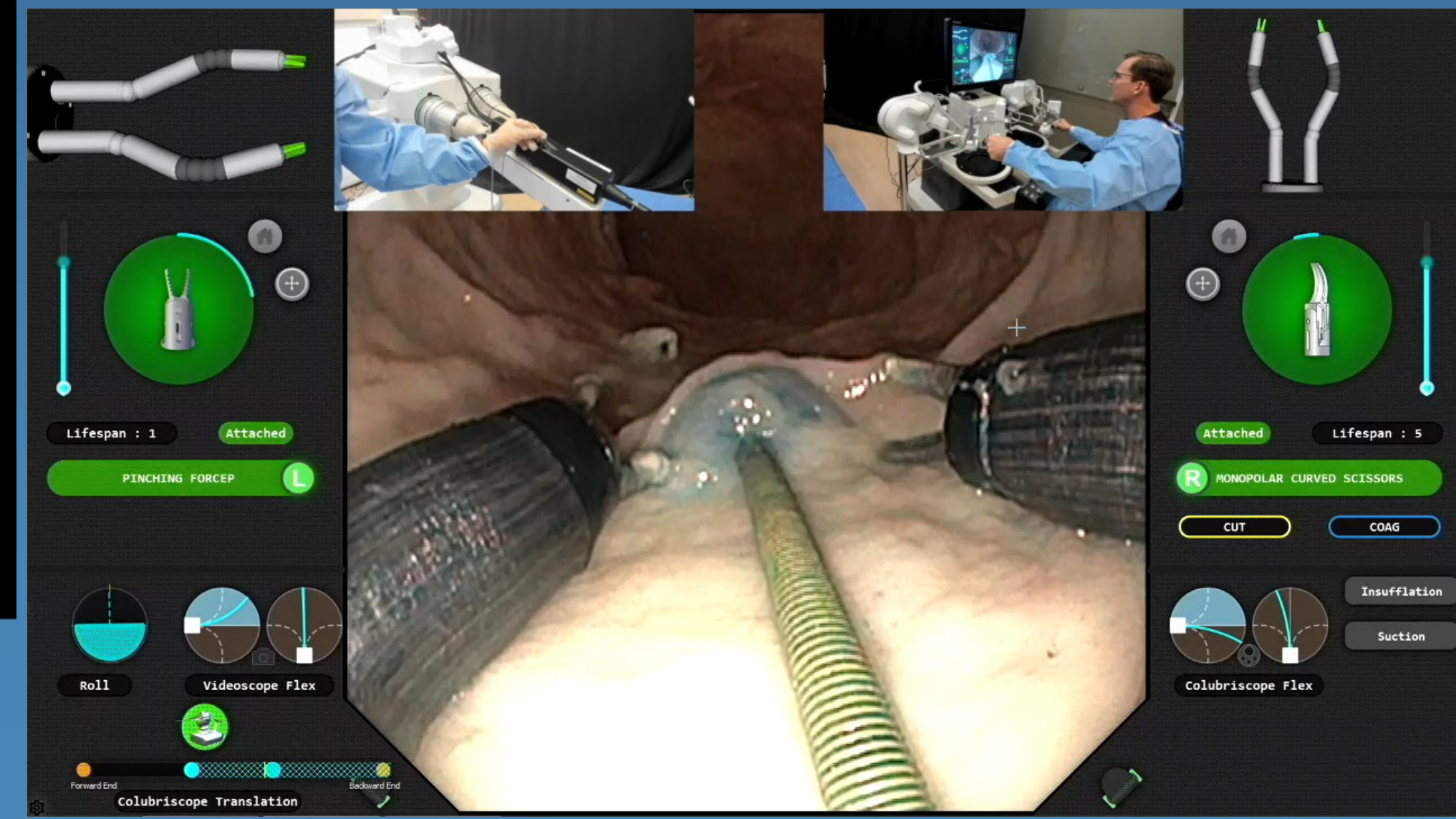
EndoQuest Robotics™ – ELS System



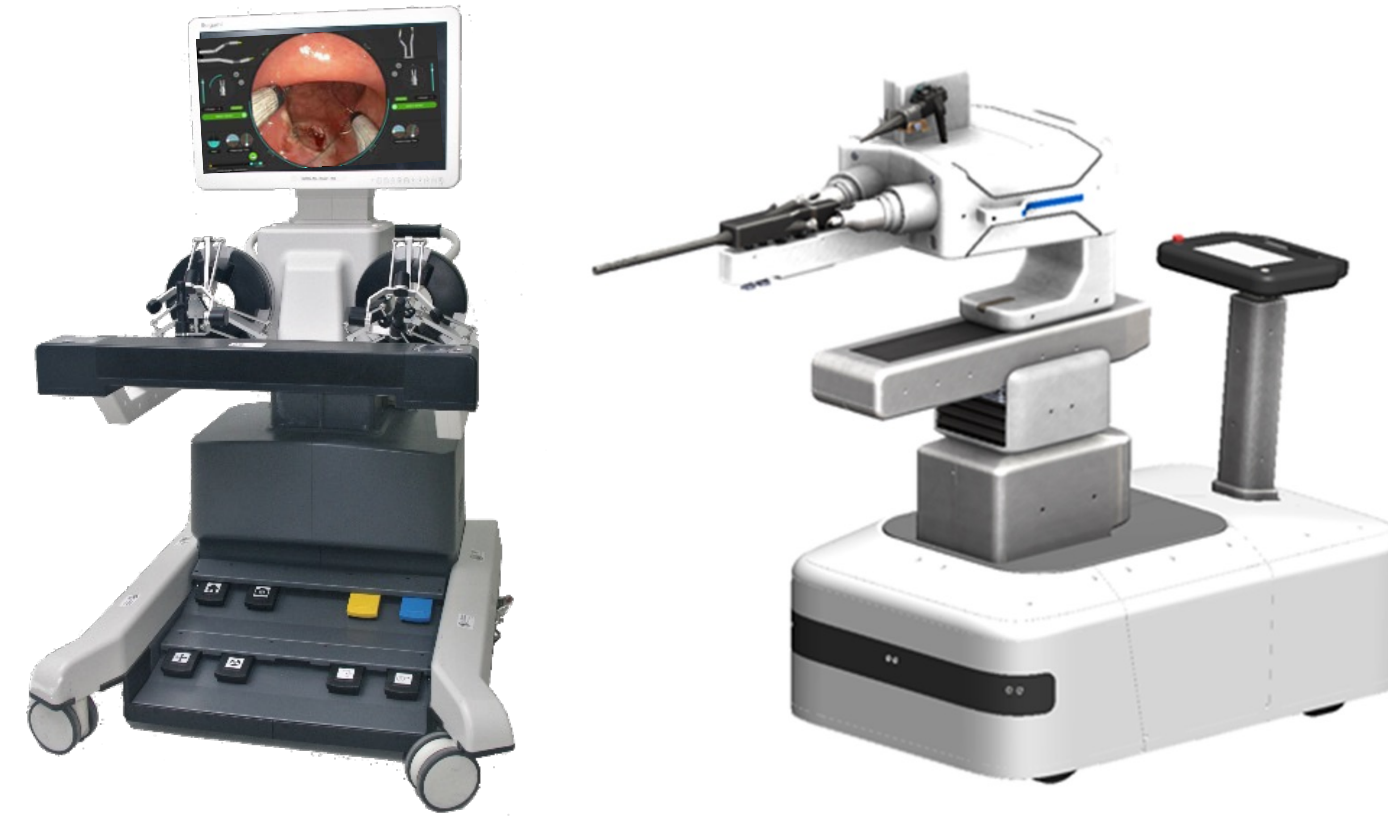
Physician
Console



Patient Cart



ELS System – Clinical Applications



TransOral (Upper GI)

- Natural Orifice Transluminal Endoscopic Surgery (NOTES)
- Endoscopic Mucosal Resection (EMR)
- Endoscopic Submucosal Dissection (ESD)
- Endoscopic Sleeve Gastropasty (ESG)
- Primary Obesity Surgery Endoluminal (POSE)
- Transoral Incisionless Fundoplication (TIF)
- Peroral Endoscopic Myotomy (POEM)
- Endoscopic Full Thickness Resection (EFTR)
- Endoscopic Retrograde Cholangiopancreatography (ERCP)

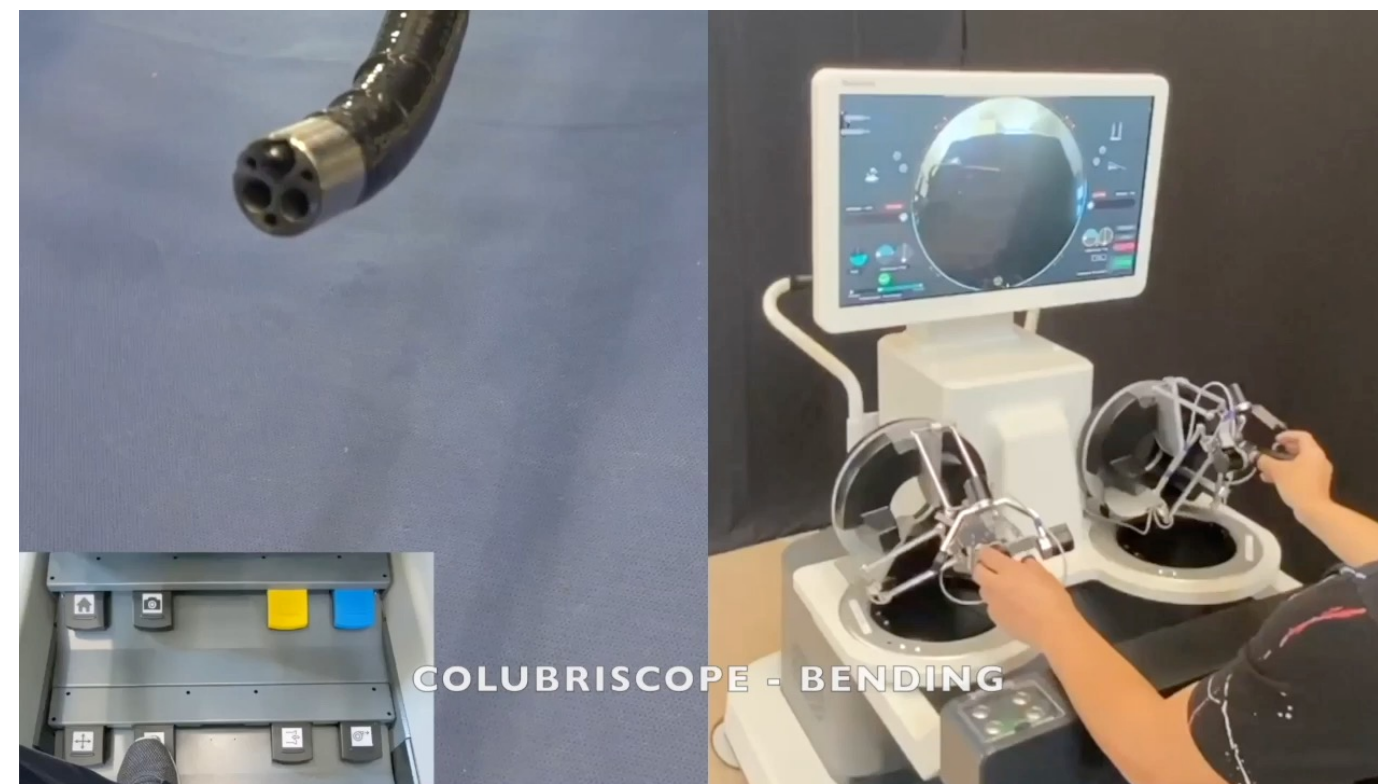
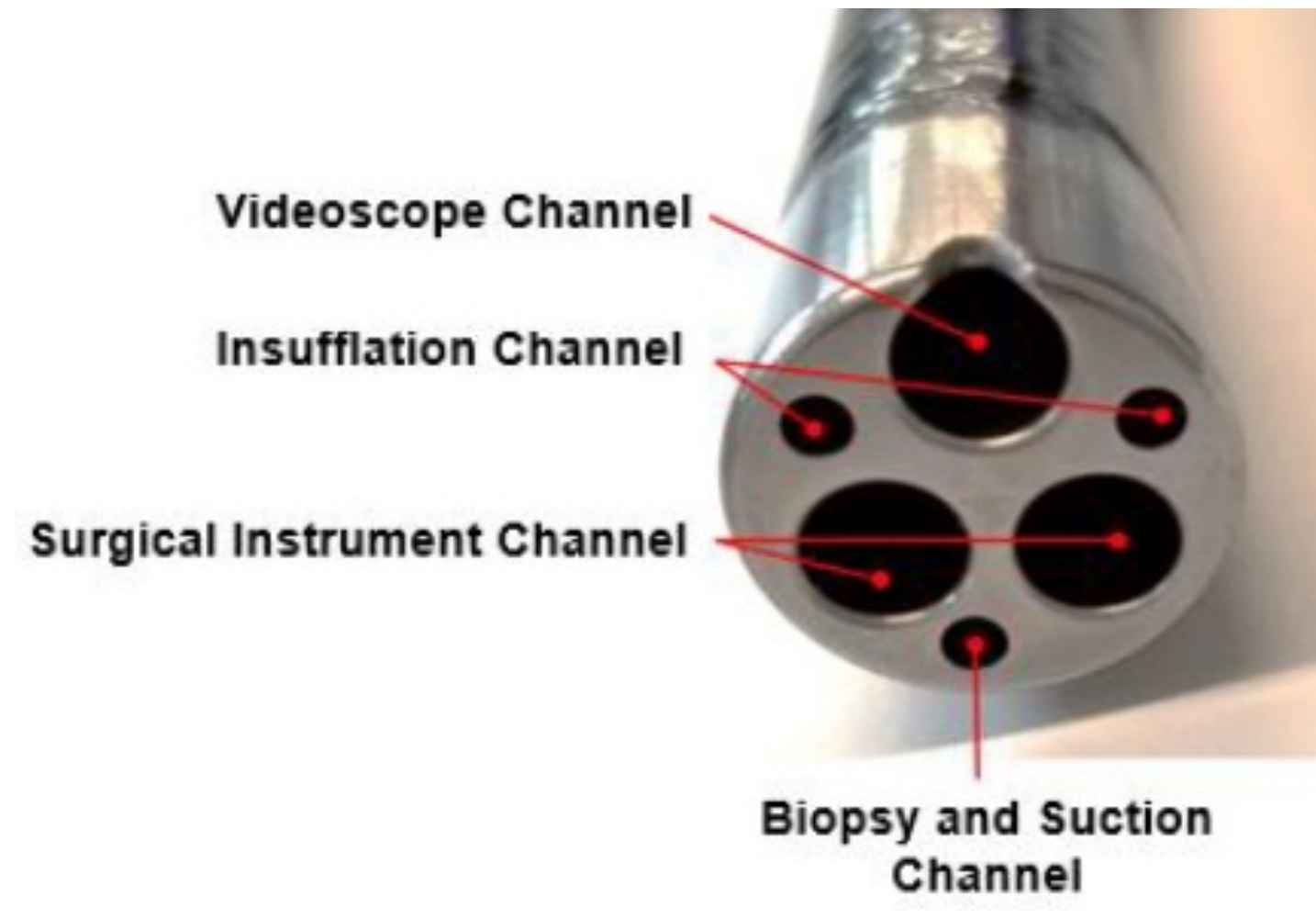
TransAnal (Lower GI)

- Natural Orifice Transluminal Endoscopic Surgery (NOTES)
- Endoscopic Mucosal Resection (EMR)
- Endoscopic Submucosal Dissection (ESD)
- Transanal Minimally Invasive Surgery (TAMIS)
- Transanal Endoscopic Microsurgery (TEM)
- Endoscopic Full Thickness Resection (EFTR)

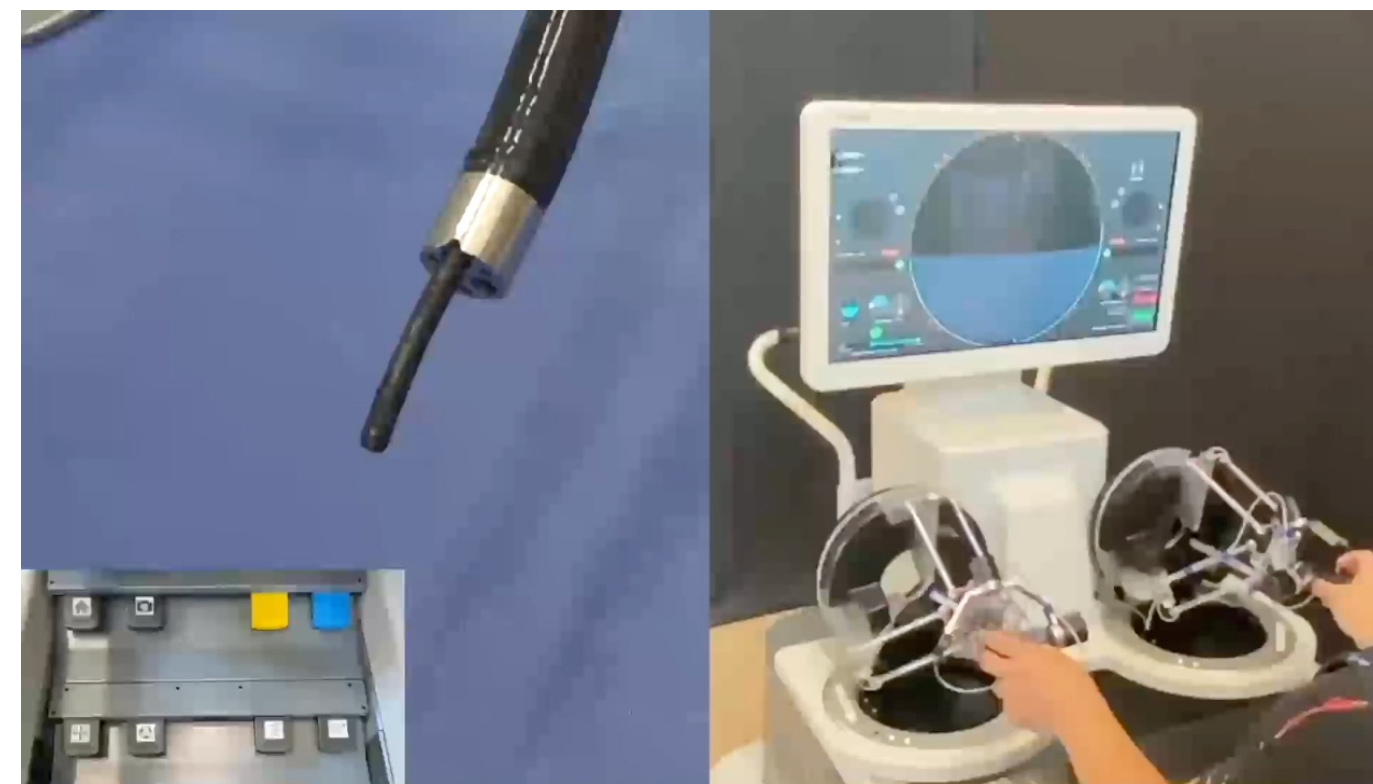
ELS System – Colubriscopes

COLUBRISCOPE (Flexible Overtube)

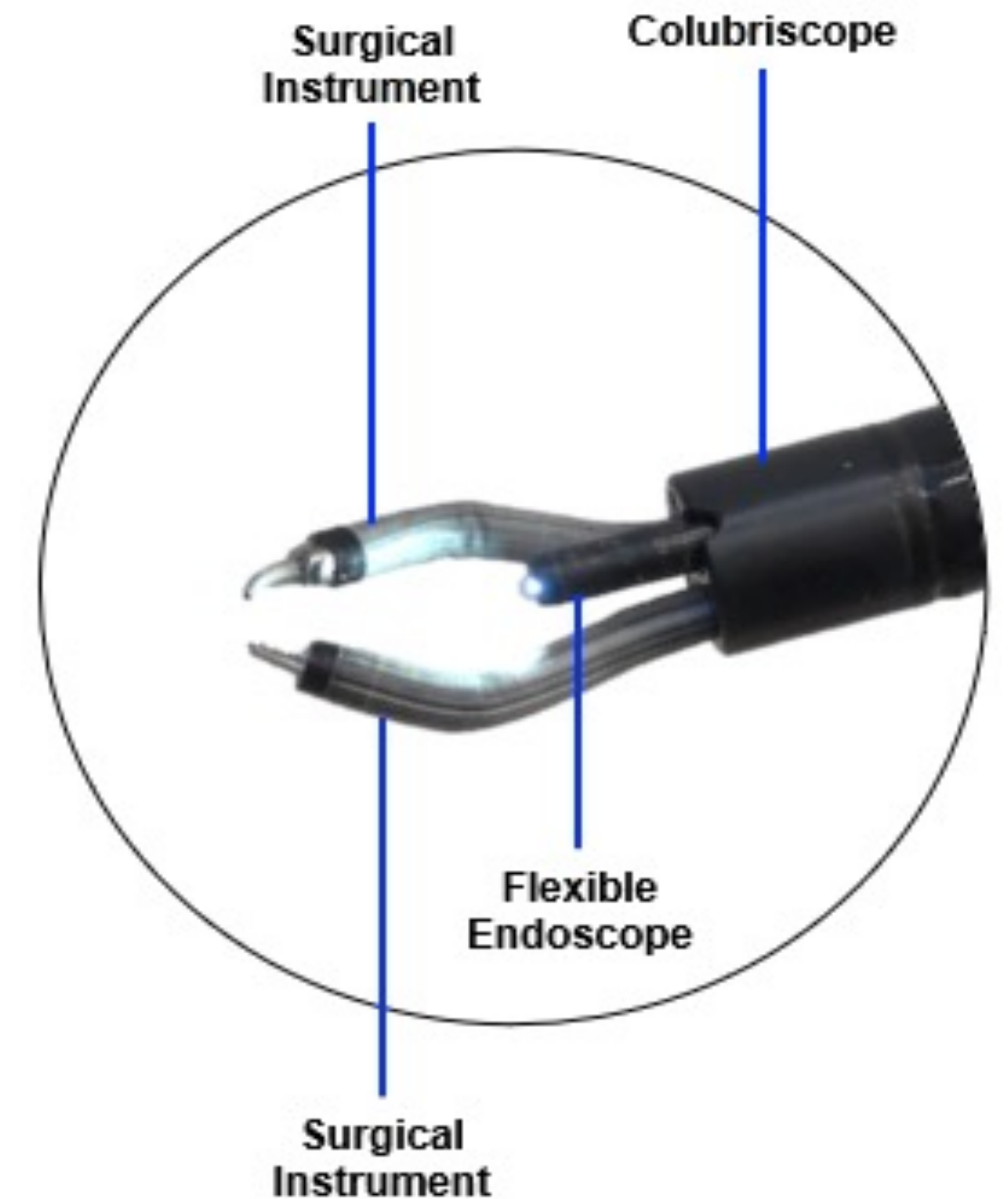
- **TransOral Colubriscopes – 75 cm**
- **TransAnal Colubriscopes – 55 cm**



Colubriscopes Control



Videoscope Control



ELS System – Surgical Instruments

SURGICAL INSTRUMENTS



ELS TransAnal Instrument – 81 cm



ELS TransOral Instrument – 120 cm

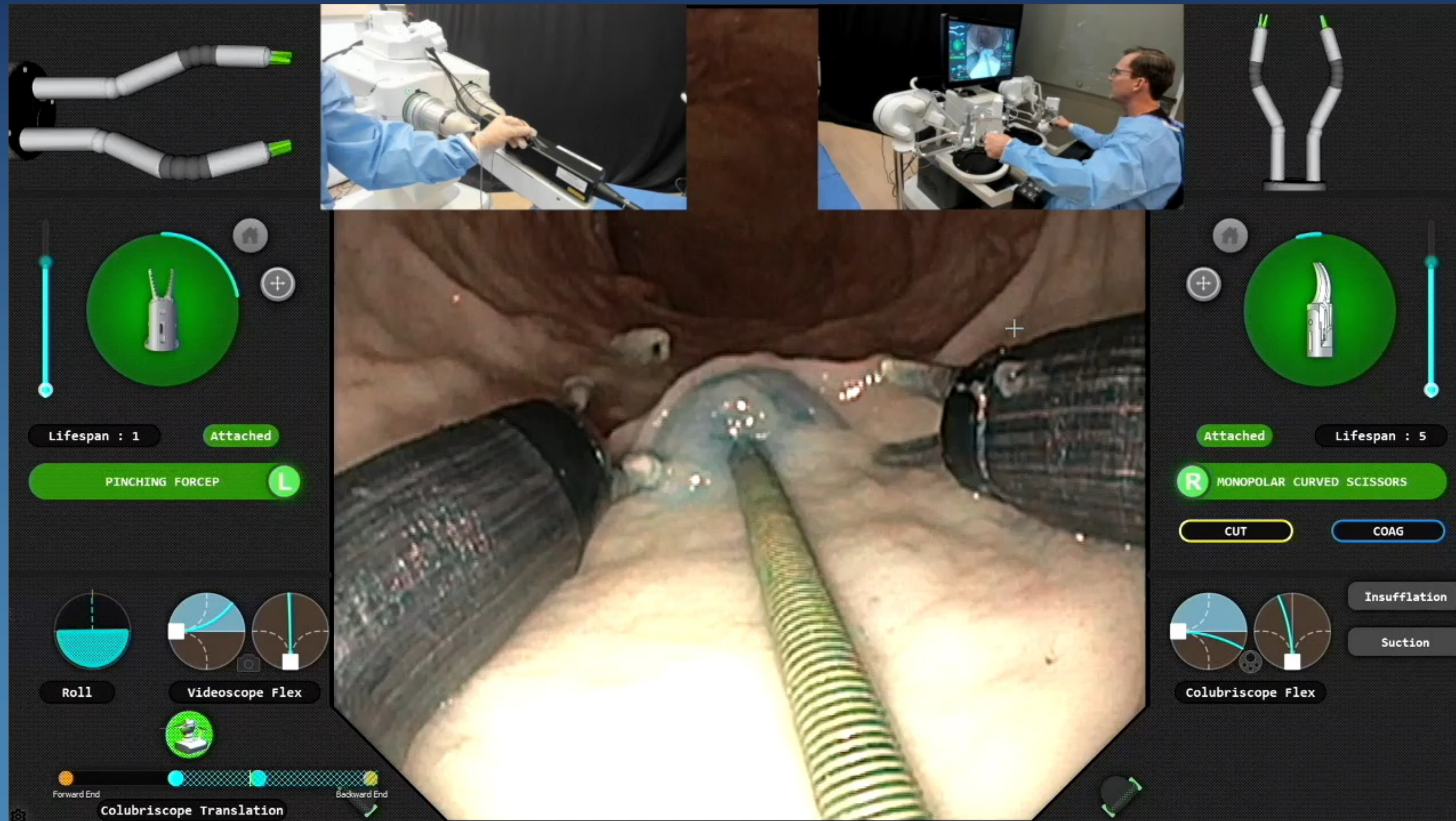


1. Pinching Forceps
2. Monopolar Knife
3. Needle Driver
4. Monopolar Curved Scissors
5. Rat Tooth Forceps
6. Cadiere Forceps

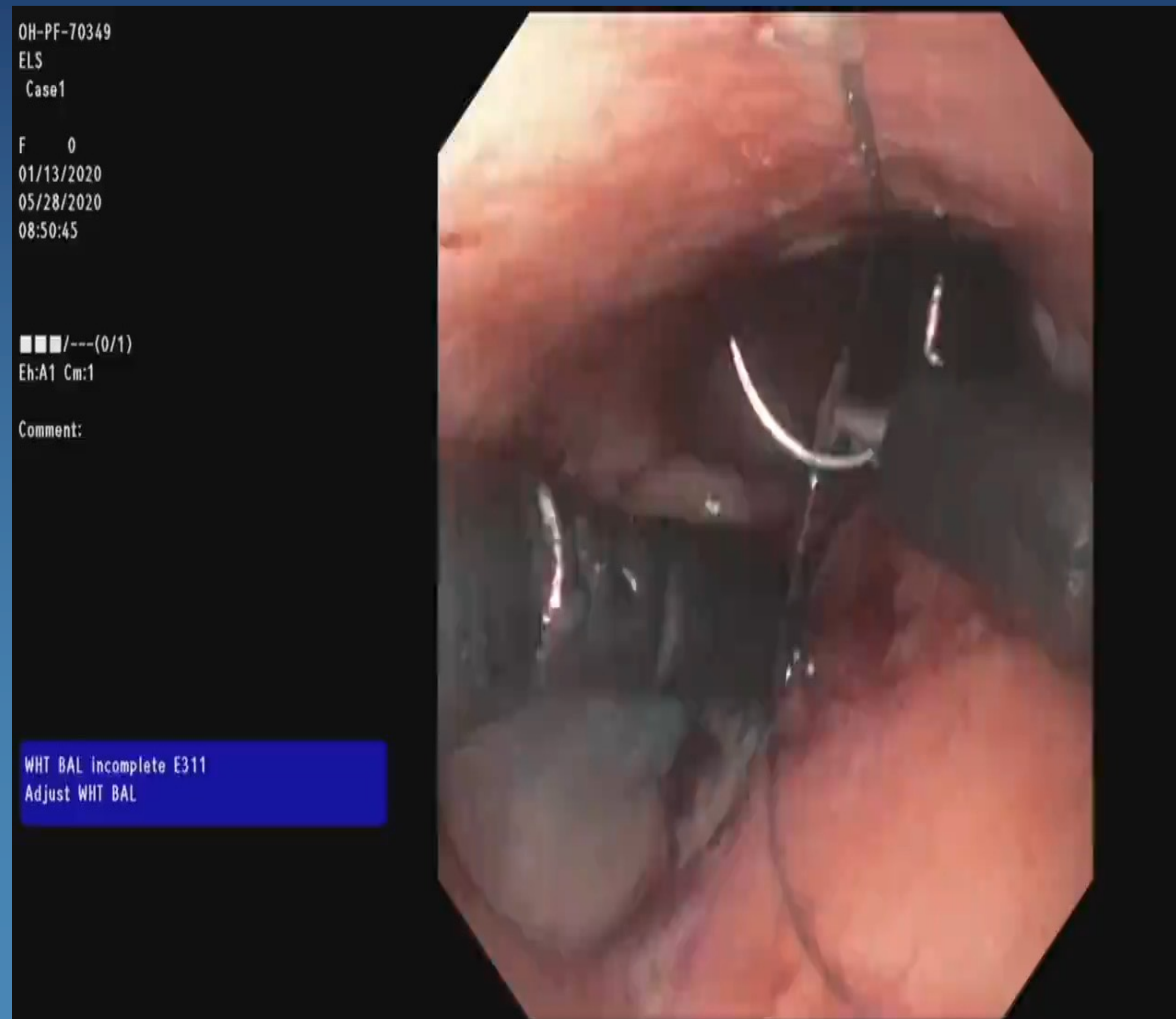


- 6-mm
- 7 Degrees of Freedom
- Elbow and Wrist Joint

ESD Procedure



Suturing with the Endoquest System



Robotic Assistant Platforms

FDA approved

- Moon Surgical (France -USA)
- Levita, MARS (Chile-USA)



MOON
SURGICAL

Inspired Surgery.



HELLO, MAESTRO.

A **new category** of surgery.

20 issued US patents



✓ Available in the US & EU
The Maestro System is intended to hold and manipulate laparoscopic instruments in laparoscopic procedures.



ADAPTABLE TO ANY LAPAROSCOPY



Hernia & Bypass Revision
Multi-Quadrant



Cholecystectomy
High Volume Procedures

ADAPTABLE TO ANY LAPAROSCOPY



Right hemicolectomy
Complex Procedures



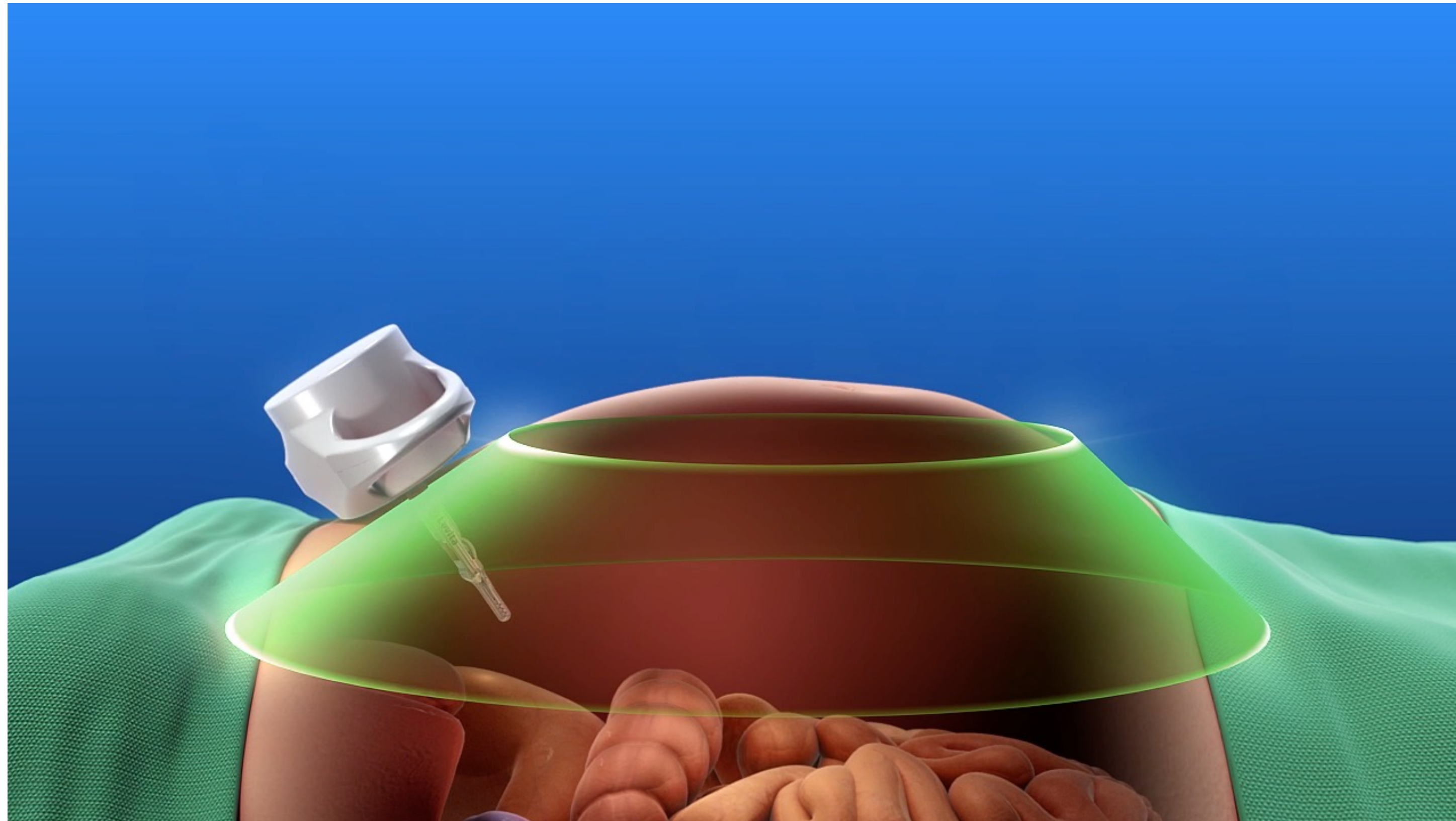
Surgical Training



Levita[®]
M A G N E T I C S



Dynamic Magnetic Positioning™

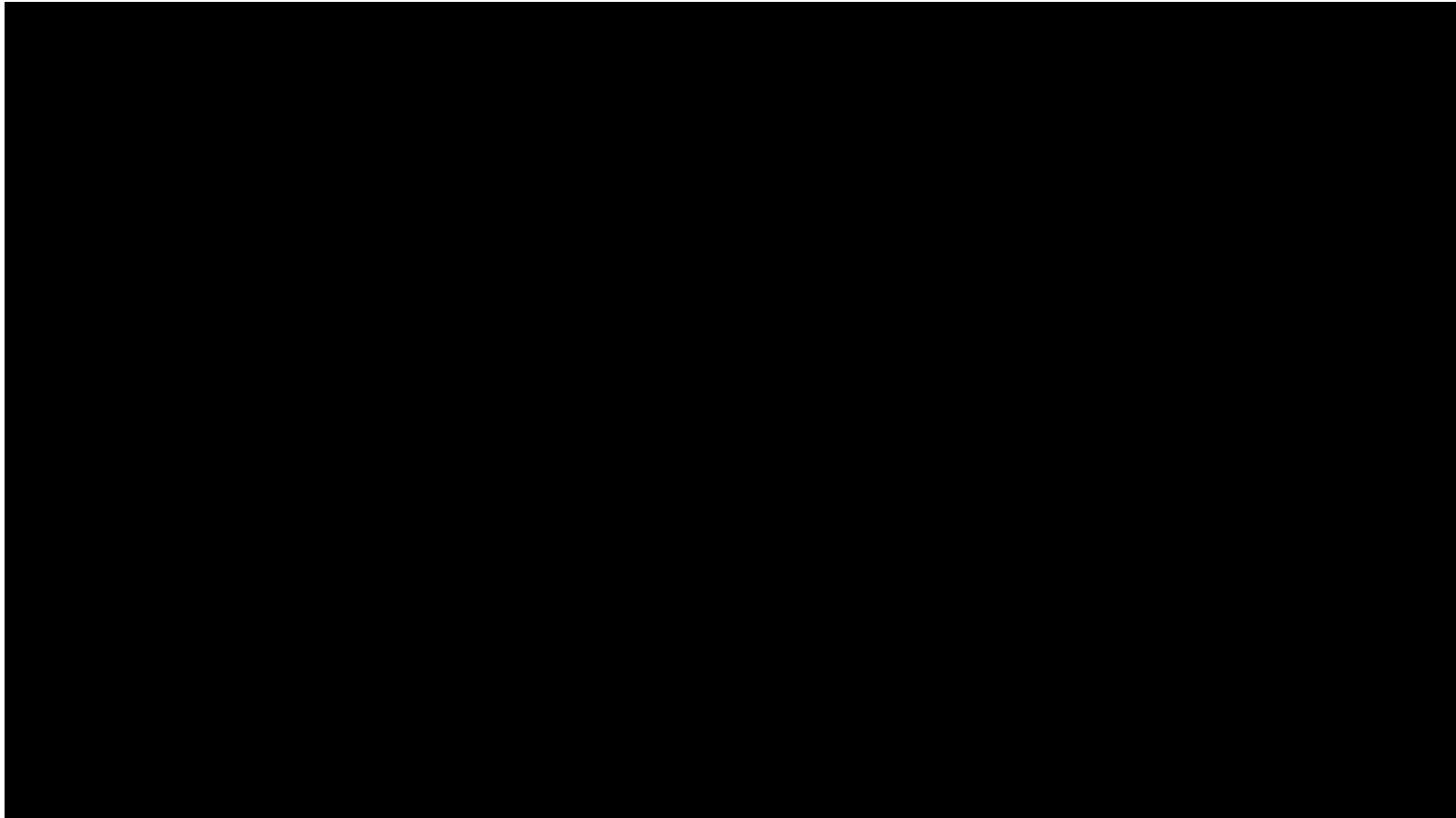


Unique Technology

Unconstrained
Effective Force
Creation from
Any Point

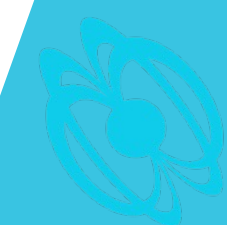


MARS System





Dr. Ignacio Robles



First Surgery in the World with Two Robots Collaborating



UTSW Dallas, Nov 8th 2024



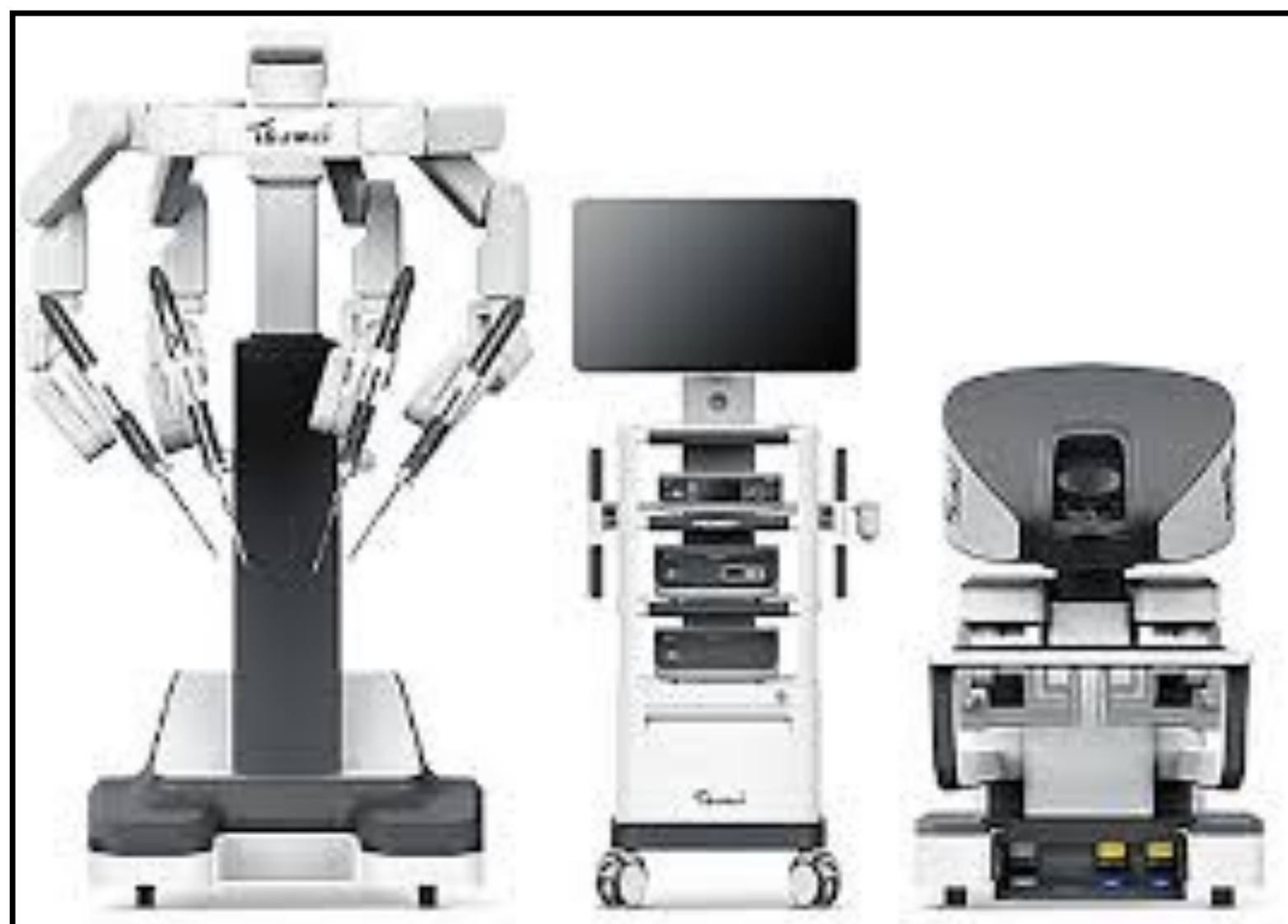


Advancing Telesurgery Connectivity Between North and South America: the first Remote Surgery Conducted Between Orlando and São Paulo in Animal Models

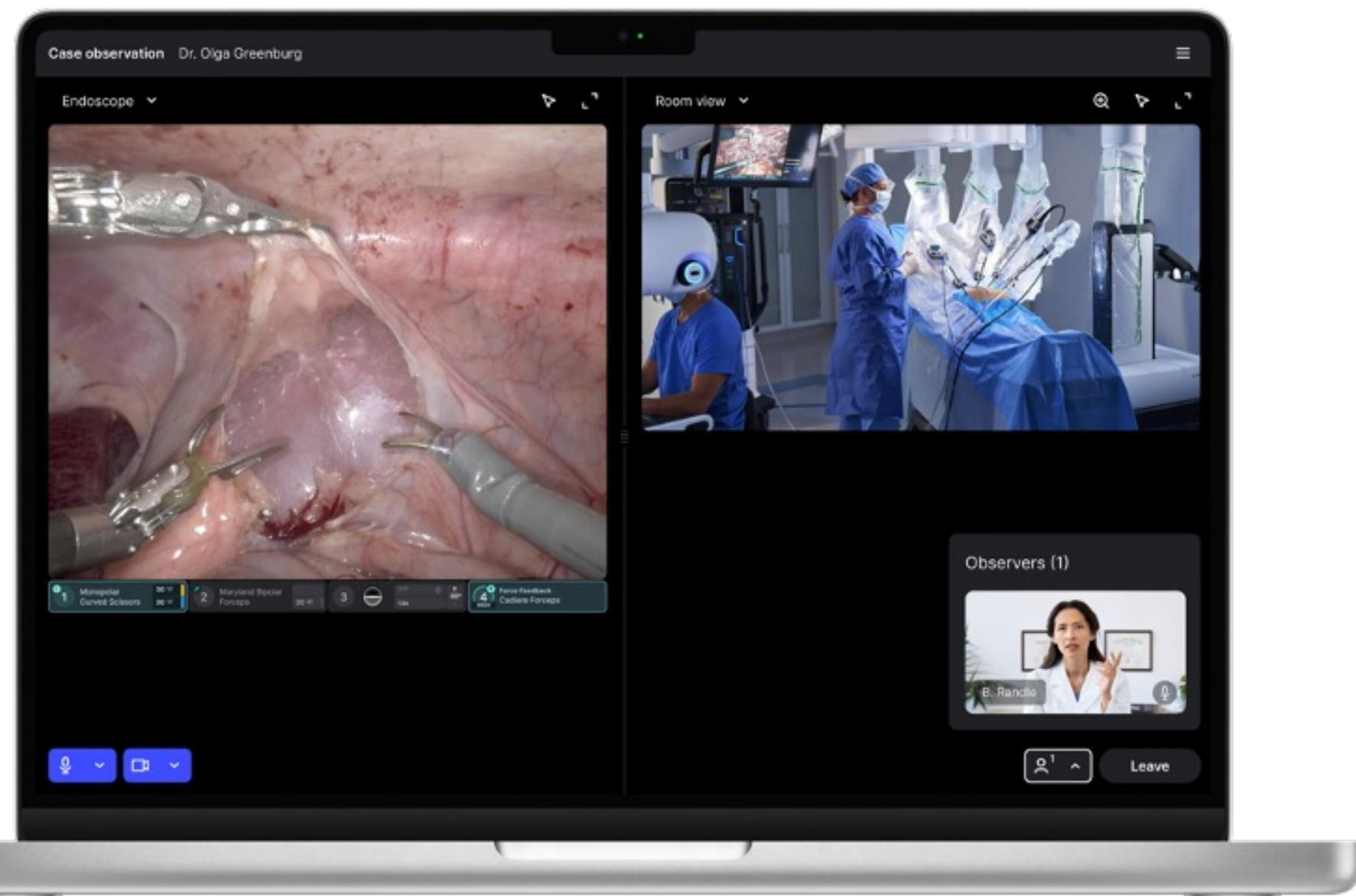
Marcio Covas Moschovas ^{1,2}, Shady Saikali ¹, Mischa Dohler ³, Ela Patel ¹, Travis Rogers ¹, Ahmed Gamal ¹, Jeffrey Marquinez ¹, Vipul Patel ^{1,2}

¹ AdventHealth Global Robotics Institute, FL, United States; ² University of Central Florida – UCF, FL, United States;

³ Advanced Technology Group, Ericsson Inc., Santa Clara, United States

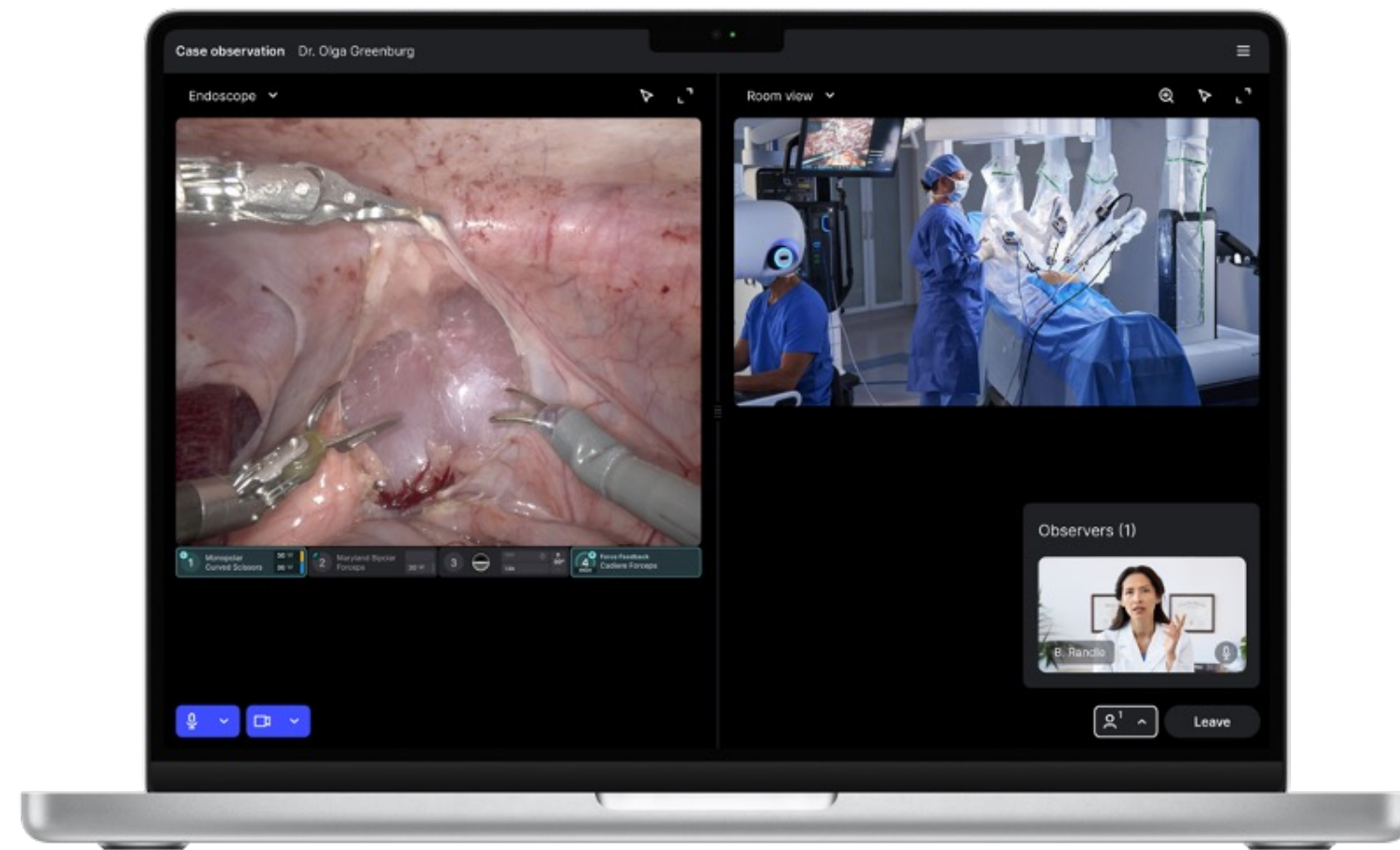


INTUITIVE HUB - TELEPRESENCE



Allows surgeons and teams to leverage telepresence to break down geographical barriers, building strong and meaningful connections that help deliver the best possible care...

INTUITIVE HUB - TELEPRESENCE



- ✓ Avoid Displacement of the proctor;
- ✓ Reduce learning curve;
- ✓ Certificate and educate more surgeons;
- ✓ Reduce costs;

- ✓ Surgeon become more confident and reduce operative time;
- ✓ Benefit more patients at a long distance...



ARTIFICIAL INTELLIGENCE

AI Suggestion:

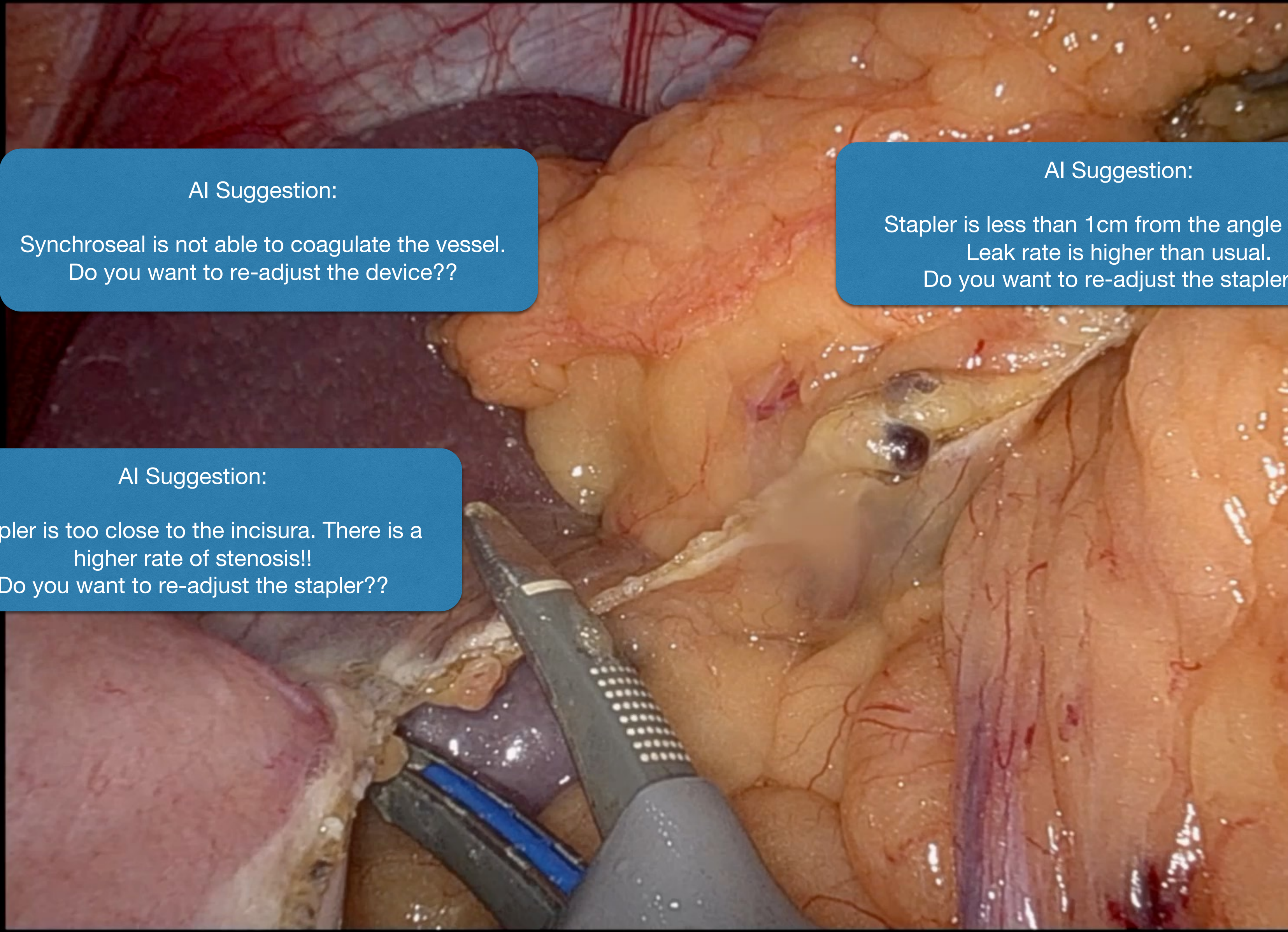
Synchroseal is not able to coagulate the vessel.
Do you want to re-adjust the device??

AI Suggestion:

Stapler is less than 1cm from the angle of His.
Leak rate is higher than usual.
Do you want to re-adjust the stapler??

AI Suggestion:

Stapler is too close to the incisura. There is a
higher rate of stenosis!!
Do you want to re-adjust the stapler??



Conclusion I

- Plenty of new robotics platforms for the next years
- Non modular, multimodular or single port systems
- Closed or Open Consoles
- Telesurgery capability
- Telepresence
- More certified surgeons
- Reducing costs and making the access easier
- Benefits for the surgeons, teams and hospitals
- MORE PATIENTS WILL HAVE ACCESS
- Artificial Intelligence and Digital Surgery.....
- Flexible robotic platforms are going to be the next revolution in robotic surgery

Conclusion II

- Cost will decrease significantly making it worldwide accessible as laparoscopy is today
- Capital cost will be low
- Robotics systems will be largely available worldwide

Conclusion II

- Strategy of new robotic system models to be cost efficient
- Cost will decrease significantly making it worldwide accessible as laparoscopy is today
- Lower cost of surgery packages
- Robotics systems will be largely available worldwide
- Create a cost per procedure model to match laparoscopy



Argentina World Champion 2022

