



Γιατί Ρομποτική?

Στην Ουρολογία

Α.Γρηγοράκης

Ουρολογικό Τμήμα

ΓΕΝ Ευαγγελισμός



Σύγκρουση Συμφερόντων

- Καμία

Ιστορία της Λαπαροσκοπικής Χειρουργικής



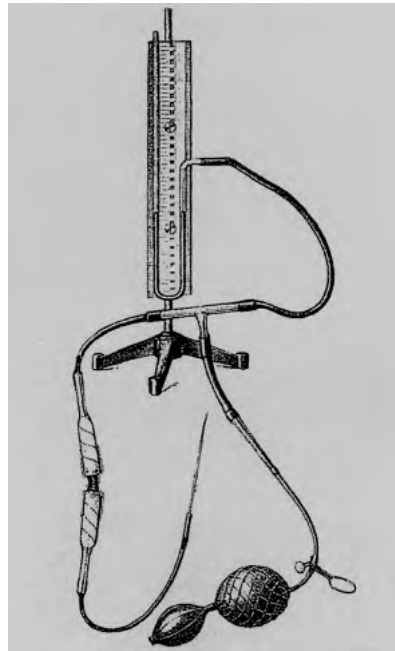
Dmitry Ott
1901



Ιστορία της Λαπαροσκοπικής Χειρουργικής

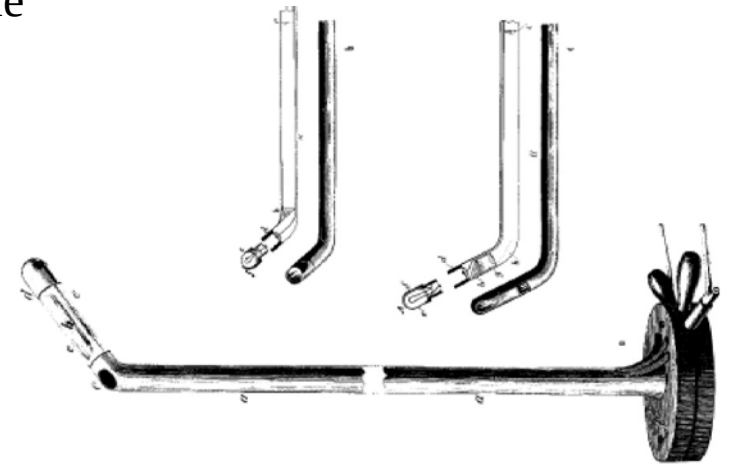


Kelling G (1923) Zur Colioskopie. Arch Clin Chir 126:226



Fiedler puncture needle

Nitze's Cystoscope



1901



Hans Christian Jacobaeus
1911
“laparothorakoskopie”



Heinz Kalk
1929
45 ° lens
“father of laparoscopy”

Karl Fervers
1933
The 1st
laparoscopic
lysis of
adhesions
using
electrocautery

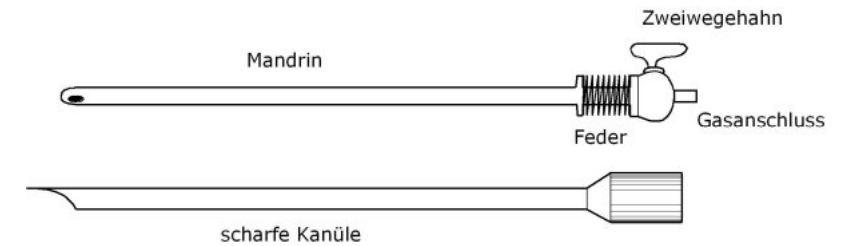
HISTORIA

(1920)

Richard Zollikofer



co2 pneumo.



Veress Needle

János Veres: 1932

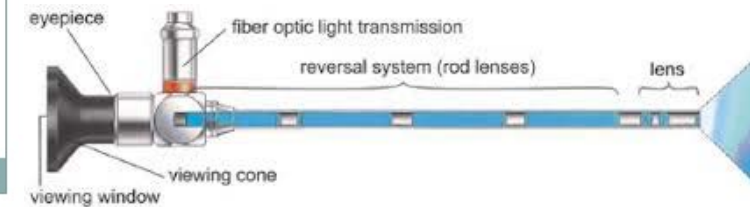
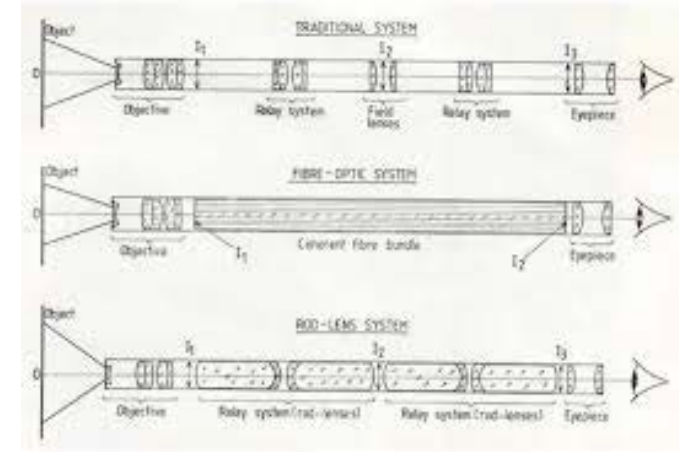
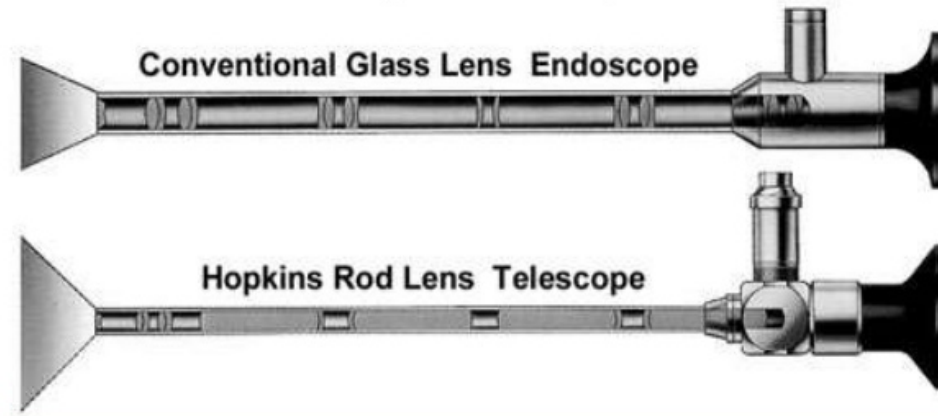
Raoul Palmer: 1943

Ιστορία της Λαπαροσκοπικής Χειρουργικής



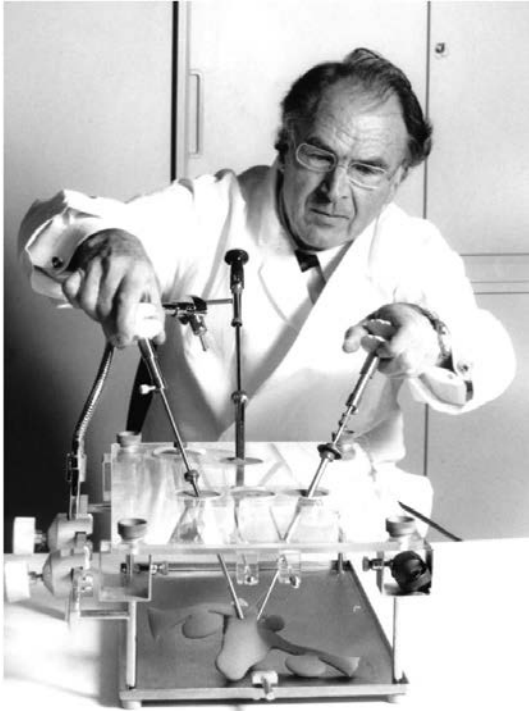
Harold Hopkins (physicist)
1918-1994

- 1945 – Karl Storz est his company
- 1951-1965 Harold Hopkins, fundamental improvements made
- Solid glass rods with lenses in between, providing excellent resolution with good contrast, a large visual field and perfect fidelity of colour



1952

Ιστορία της Λαπαροσκοπικής Χειρουργικής



Kurt Semm
12/9/1980
1st lap. Append/my

[Khirurgiiia \(Mosk\).](#) 1983 Aug;(8):125-7.
**[A method of laparoscopic
cholecystostomy].**
[Article in Russian]
[Lukichev OD](#), [Filimonov MI](#), [Zybin IM](#)



Erich Muhe
12/9/1985
1st Lap Chol/my

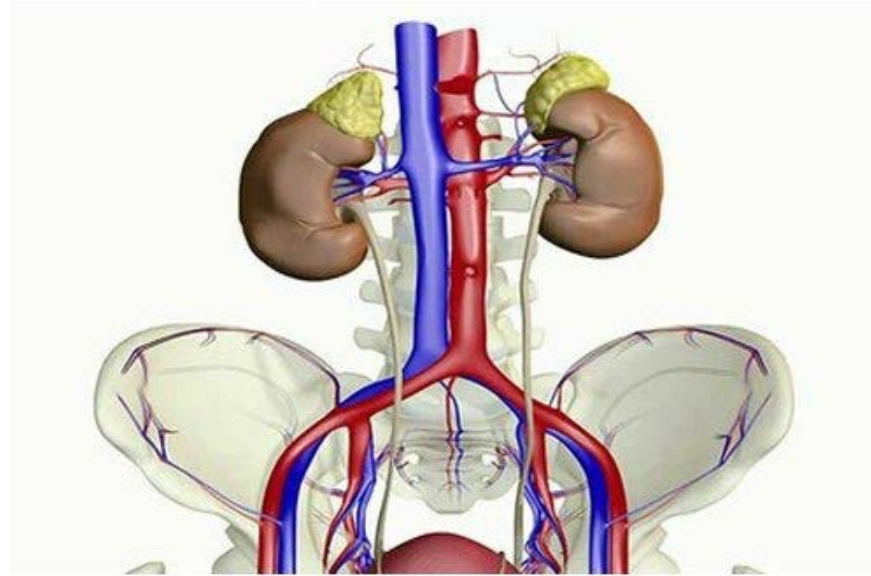
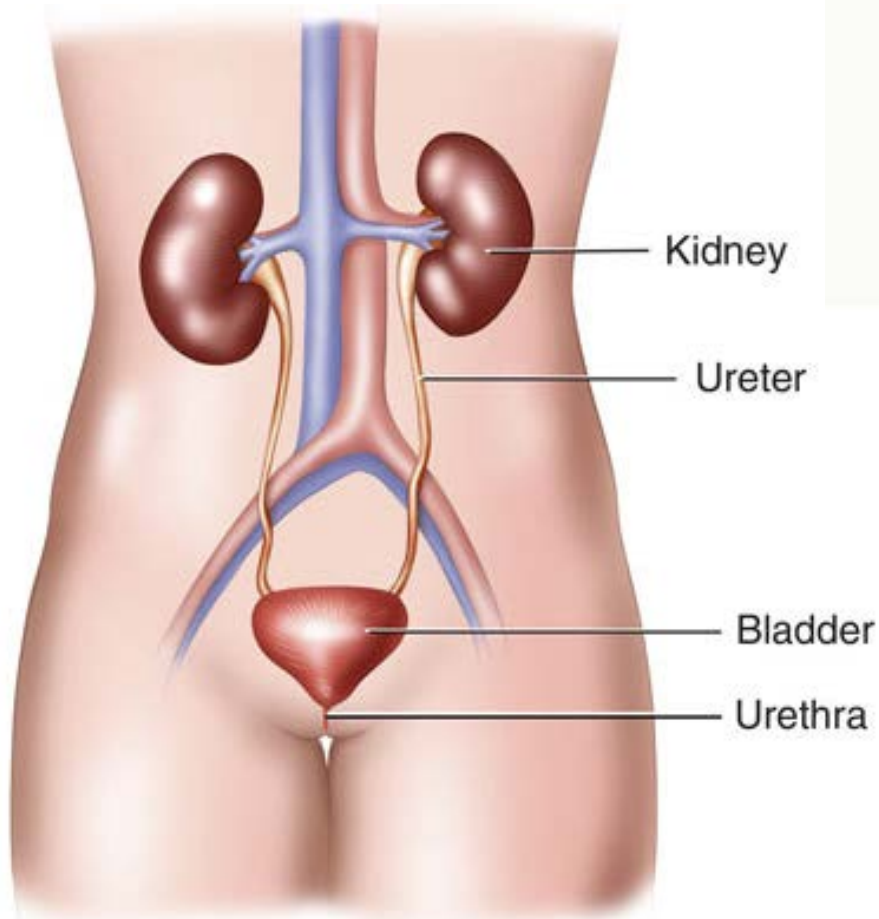


Philippe Mouret
17/3/1987
Video Lap. Chol/my

The Urinary System

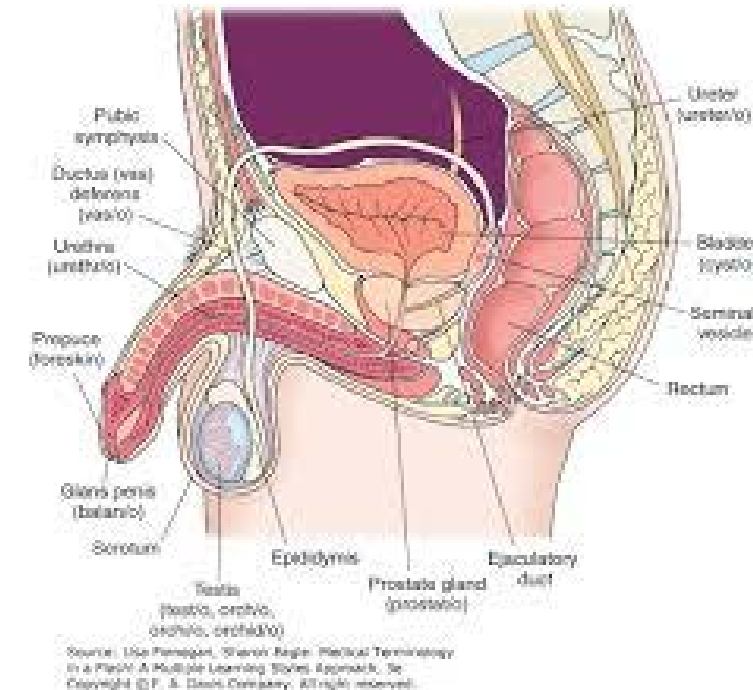


Organs of the Urinary System



Upper

Lower



Ιστορία της Λαπαροσκοπικής –Ρομποτικής Χειρουργικής στην Ουρολογία

- early 1970s: essential diagnostic procedure
(undescended cryptorchid testes)

- 1991: RV Clayman; Laparoscopic nephrectomy

Clayman RV, Kavoussi LR, Sopper NJ et al (1991) Laparoscopic nephrectomy: initial case report. J Urol 146:278

- 1995: HN Winfield; Partial nephrectomy

Winfield HN, Donovan JF, Lund GO, Kreder KJ, Stanley KE, Brown BP, et al. Laparoscopic partial nephrectomy: initial experience and comparison to the open surgical approach. J Urol. 1995;153:1409–1414

- 1997: Hand Assisted Laparoscopic Nephrectomy

Nakada SY, Moon TD, Gist M et al (1997) Use of a Pneumo Sleeve as an adjunct in laparoscopic nephrectomy. Urology 49:612

- 1999: CC Abbou; Retroperitoneal Laparoscopic Nephrectomy

Abbou CC, Cicco A, Gasman D, Hoznek A, Antiphon P, Chopin DK, and Salomon L (1999). Retroperitoneal laparoscopic versus open radical nephrectomy. J Urol 161, 1776–178

Ιστορία της Λαπαροσκοπικής –Ρομποτικής Χειρουργικής στην Ουρολογία

- 1991: WW Schuessler; PLND in Prostate Cancer

Schuessler WW, Vancaillie TG, Reich H et al (1991) Transperitoneal endosurgical lymphadenectomy in patients with localized prostate cancer. J Urol 145:988

- 1992: Laparoscopic Radical Prostatectomy (1st case)

Kavoussi LR, Schuessler WW, Vancaillie TG, Clayman RV (1993) Laparoscopic approach to the seminal vesicles. J Urol 150:417–419

Schuessler WW, Schulam PG, Clayman RV et al (1997) Laparoscopic radical prostatectomy: initial short term experience. Urology 50:854

“...laparoscopy is not an efficacious surgical alternative to open prostatectomy for malignancy....” (9 hours duration)

- 1997: Extraperitoneal Lap. R.Pros/my

Raboy A, Ferzli G, Albert P (1997) Initial experience with extraperitoneal endoscope radical retropubic prostatectomy. Urology 50:849–853

- Dec. 1997-1998: Guilloneau et al. Transperitoneal L.R.Pr/my (<6 hours duration)

Guilloneau B, Vallancien G (2000) Laparoscopic radical prostatectomy: the Montsouris technique. J Urol 163:1643

Minimally invasive surgery (MIS)

(1999)

Drawbacks of classic laparoscopy

- the loss of wrist articulation
- touch feedback
- 2-dimensional (2D) vision (with 2D cameras)
- eye–hand coordination
- mirror vision
- typically poor ergonomics of the tools



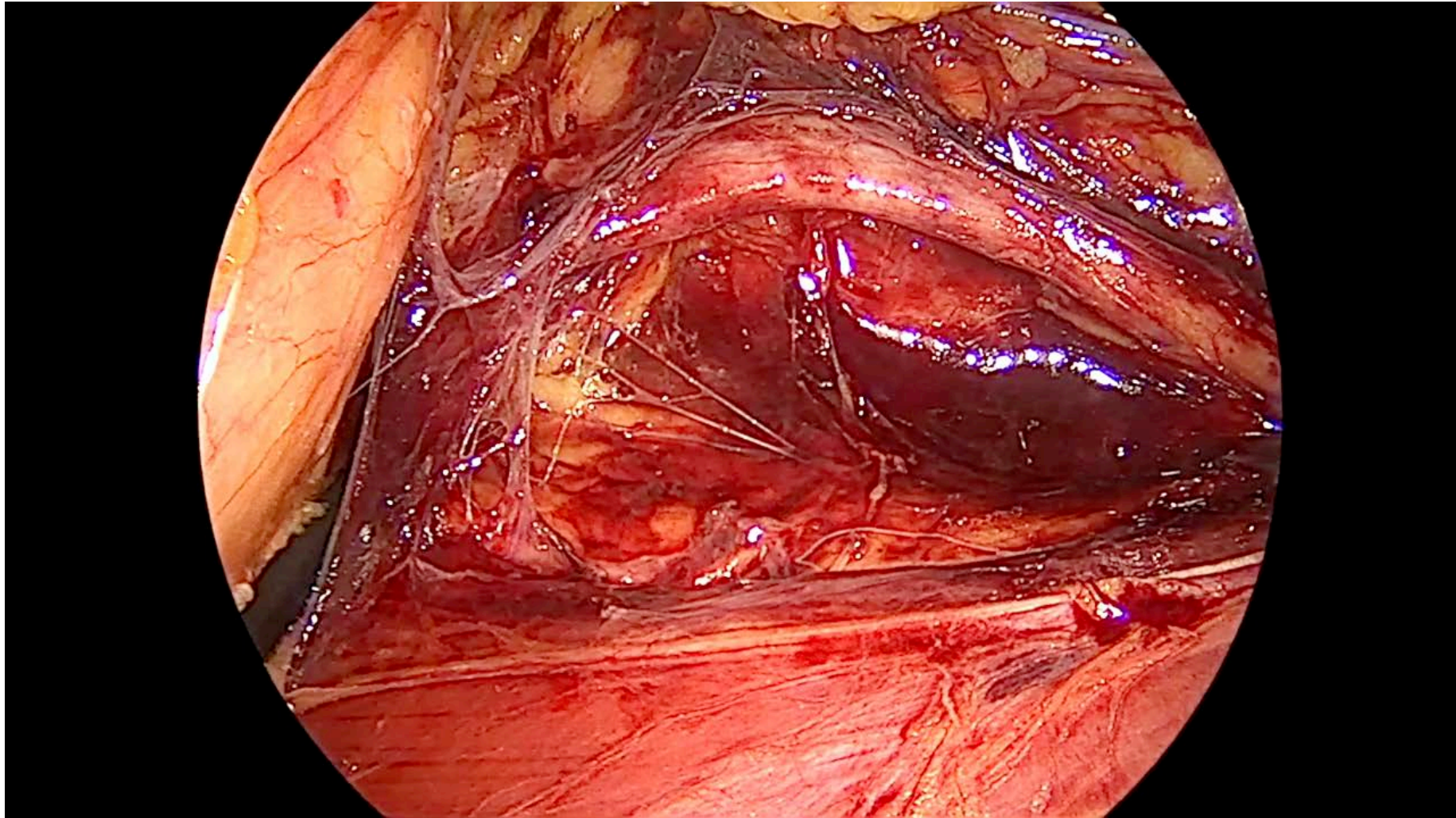
“laparoscopic surgery is a “transitional” technology leading to robotic Surgery”



Satava RM. Arch Surg. November, 1999;134(11):1197–1202.
Ballantyne GH, Moll F. Surg Clin North Am. December, 2003;83(6):1293–1304.

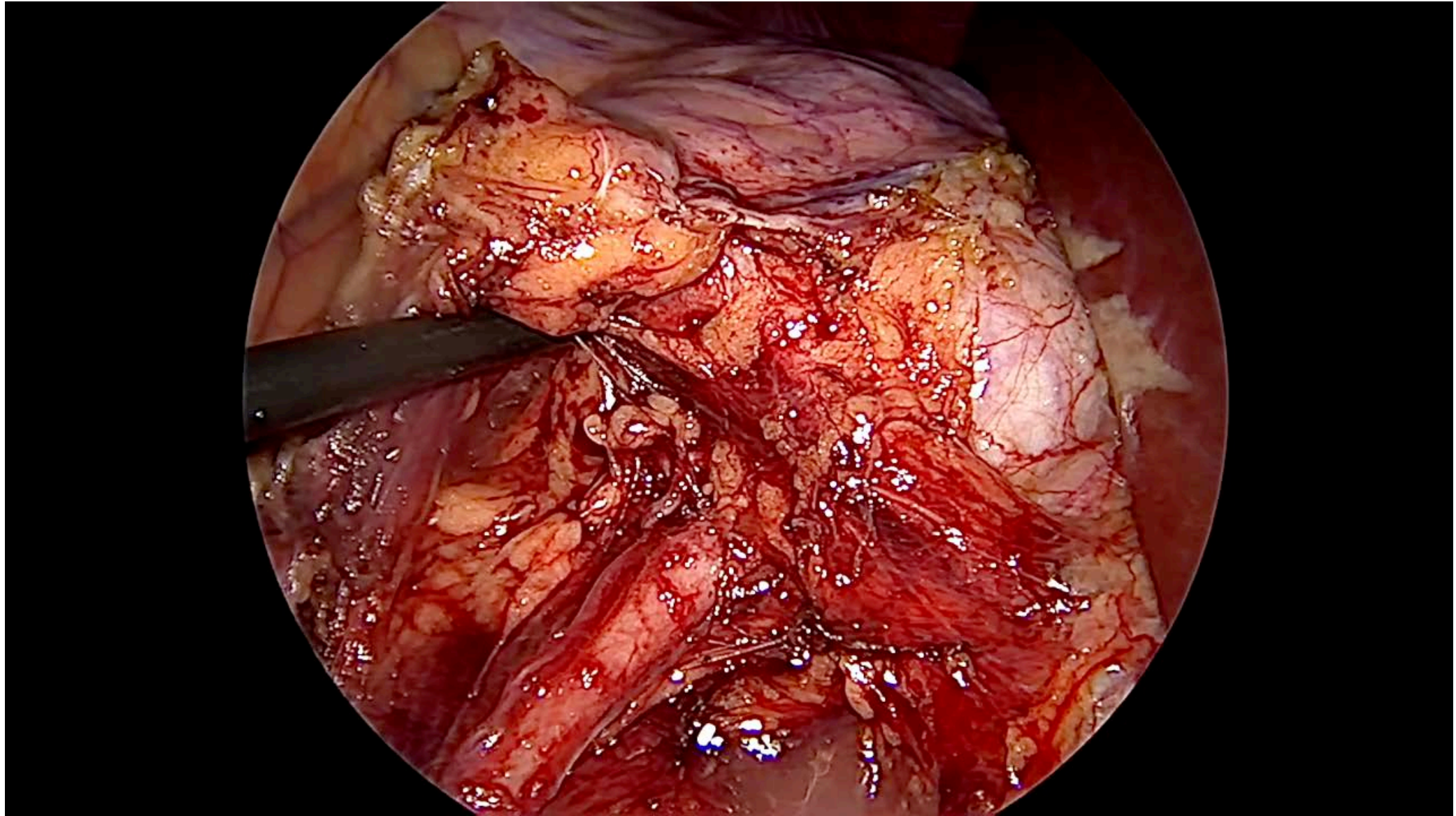
Γιατί Ρομποτική? Στην Ουρολογία

ΔΕ Οπισθοπεριτοναϊκή νεφρουρητηρεκτομή- Ουροθηλιακό Ca νεφρικής πυέλου (2019)



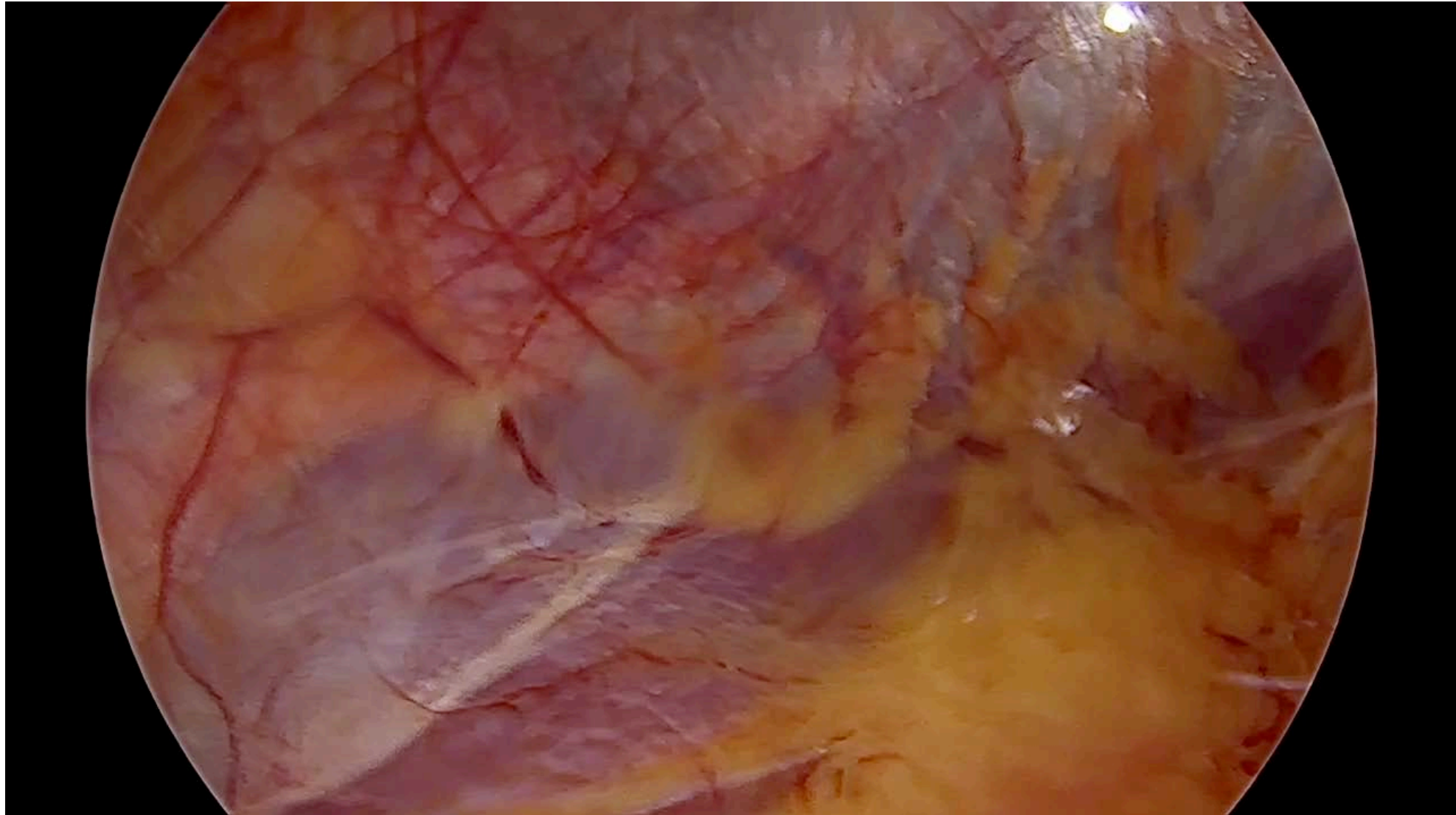
Γιατί Ρομποτική? Στην Ουρολογία

Πυελοπλαστική-Συγγενής στένωση πυελοουρητηρικής συμβολής (2019)



Γιατί Ρομποτική? Στην Ουρολογία

Οπισθοπεριτοναϊκή Μερική Νεφρεκτομή- Νεφροκυτταρικό Ca (2019)



Ιστορία της Λαπαροσκοπικής –Ρομποτικής Χειρουργικής στην Ουρολογία

da Vinci Surgical System 1999



A National Aeronautics and Space Administration (NASA) project on telepresence battlefield surgery led to the development of the da Vinci System (Intuitive Surgical, Sunnyvale, CA, USA)

The unique features of this system were its Endowrist technology



The da Vinci system has had a CE mark since 1999 and full FDA approval since 2001

Ιστορία της Λαπαροσκοπικής –Ρομποτικής Χειρουργικής στην Ουρολογία



- Da Vinci 2000
- Da Vinci S (2007)
- Da Vinci Si (2009)
- Da Vinci Xi (2014)

da Vinci Surgical System

- It was designed for robot-assisted coronary artery surgery
- the first cases were performed at the Heart Centre of Leipzig

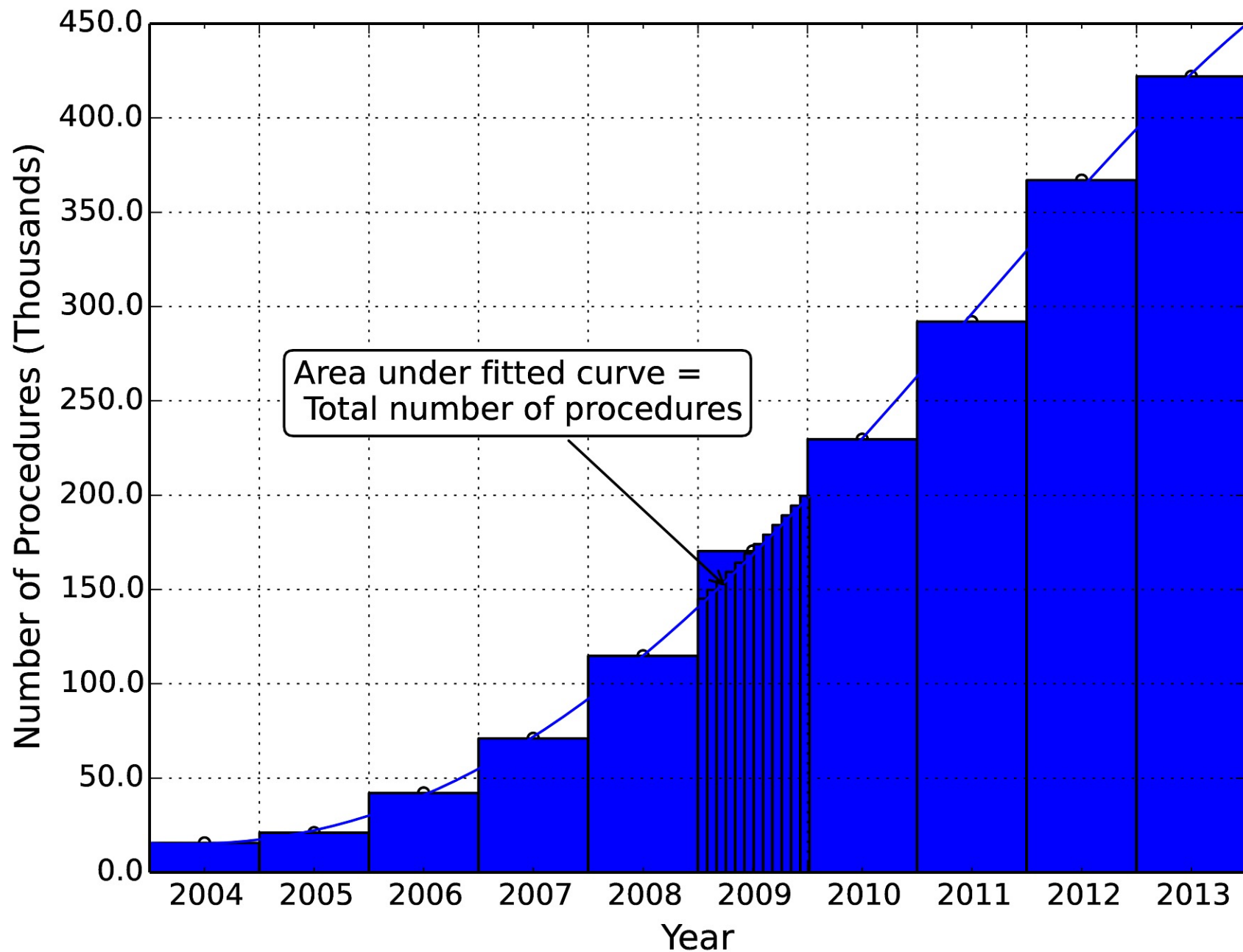
Mohr FW, Falk V, Diegeler A, Autschbach R. Computer-enhanced coronary artery surgery. J Thorac Cardiovasc Surg 1999

The first RALP was reported in 2000

Abbou CC, Hoznek A, Salomon L, et al. Prog Urol. September, 2000

The da Vinci system has been approved by the FDA for use in both adult and pediatric robotic surgery procedures in the following areas:

- Urological surgeries
- General laparoscopic surgeries
- General non-cardiovascular thoracoscopic surgeries
- Thoracoscopically-assisted cardiectomy procedures

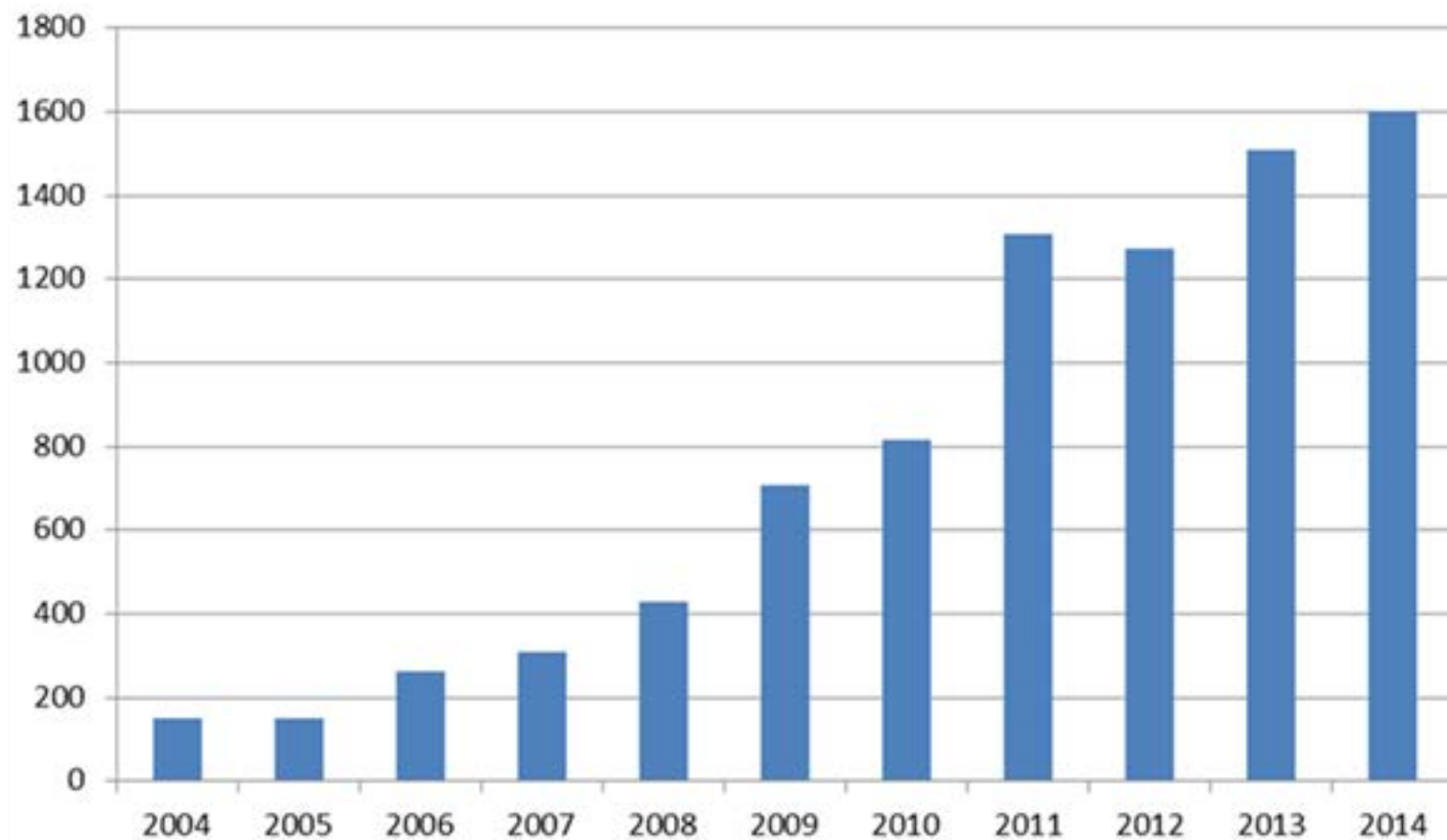


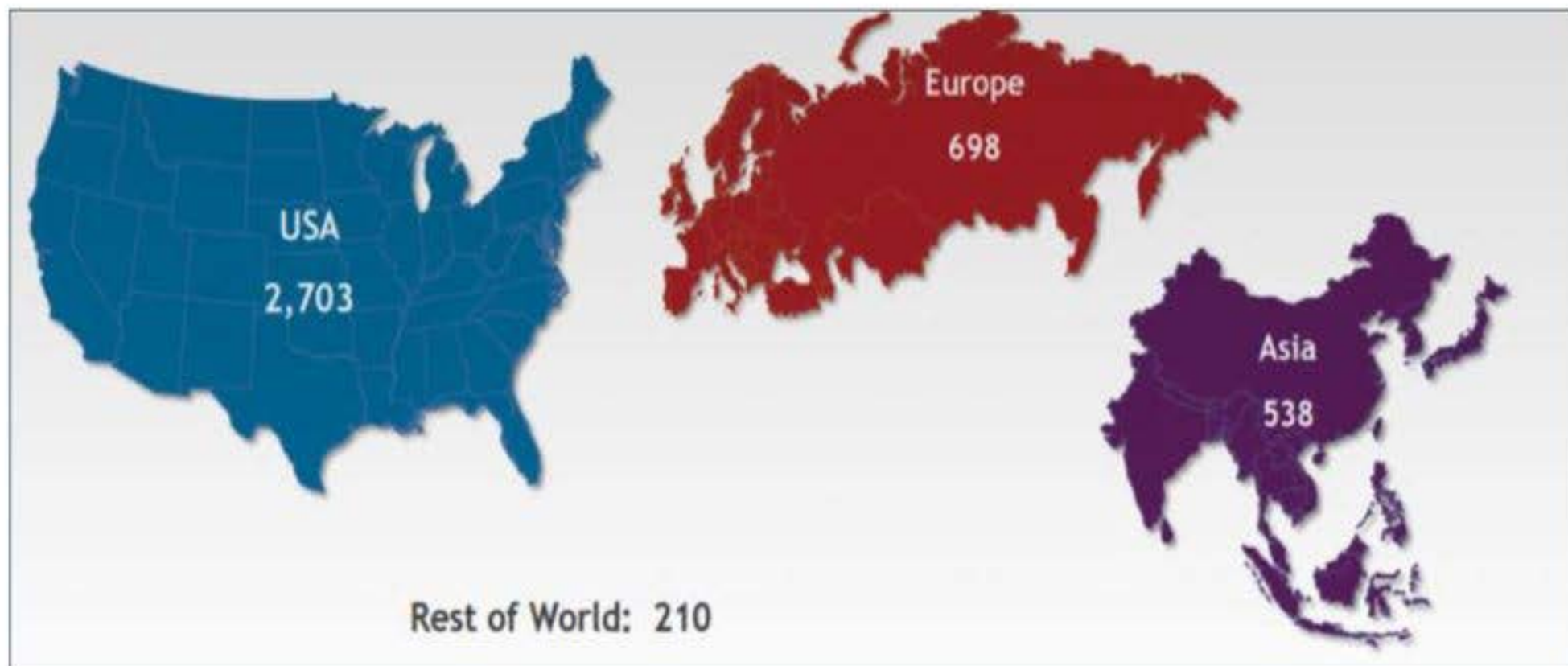
USA:

**82% of
prostatectomies**

**80% of malignant
hysterectomies.**

Number of Robotic Publications (2004-2014)



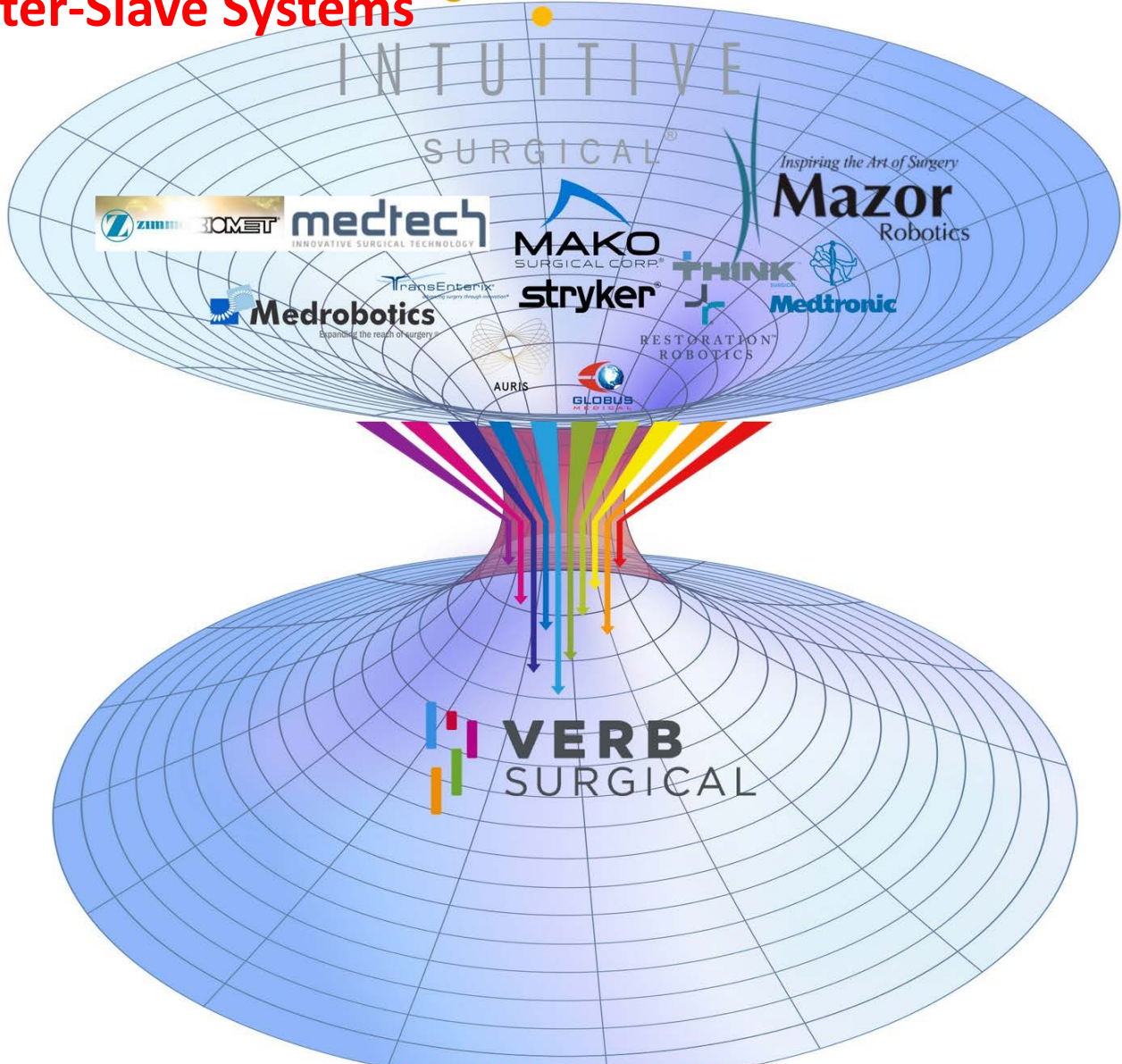


As June 30, 2017 **#4,149** DaVinci Robot worldwide installed

Proportion of RATS lobectomies for NSCLC has increased from 0.2% in 2008 to 3.4% in 2010

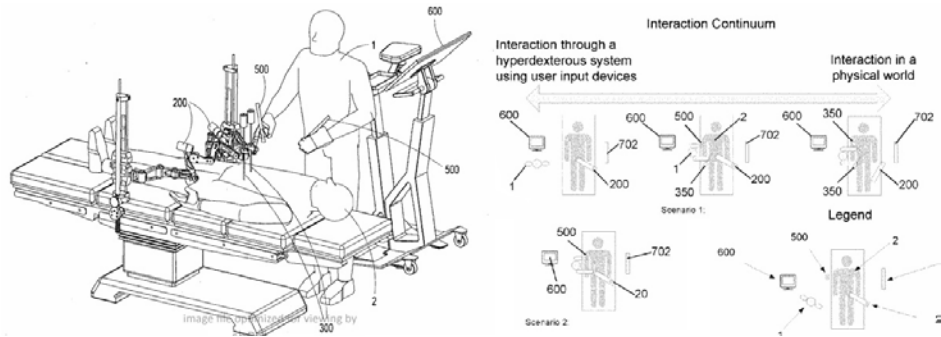
Master-Slave Systems

Surgical Robotics



NEW CATEGORY

VERB SURGICAL



Johnson & Johnson

MEDTRONIC RAS
MODULAR SOLUTION DESIGNED TO ADDRESS
COST AND UTILIZATION BARRIERS



Investigational device currently under development. Not cleared or approved for sale in U.S. or any market.

FUTURE INNOVATION

A LOOK AHEAD: FOUR RAS TECHNOLOGY VECTORS

HIGH VALUE
CAPITAL

HIGH VALUE
CONSUMABLES

HIGH TOUCH
CUSTOMER
SUPPORT



ROBOTIC
SYSTEMS



INSTRUMENTATION
+
IMPLANTS



DATA
+
ANALYTICS



VISUALIZATION
+
NAVIGATION



Επίλογος

- Η Χειρουργική ελάχιστης επεμβατικότητας (λαπαροσκοπική) ανέκαθεν ενθυλάκωνε όλες τις τεχνολογικές εξελίξεις.
- Η Γυναικολογία για περισσότερο από μισό αιώνα «μονοπωλούσε» τη λαπαροσκοπική χειρουργική μέχρι την πρώτη video -λαπαροσκοπική χολοκυστεκτομή που έγινε από γυναικολόγο.
- Η Ρομποτικά Υποβοηθούμενη Λαπαροσκοπική Χειρουργική (ΡΥΛΧ) είναι απλώς η εξέλιξη της λαπαροσκοπικής..... και συνέβη πριν 20 χρόνια
- Η Ουρολογία ήταν η ειδικότητα που αποτέλεσε το όχημα της ΡΥΛΧ
- Την επόμενη 5 ετία η λαπαροσκοπική χειρουργική δεν θα νοείται χωρίς τη ρομποτική υποβοήθηση.

Τεχνολογία Βιντεολαπαροσκόπησης (τέλος 10ετίας 80):

Η λαπαροσκοπική χειρουργική απογειώνεται

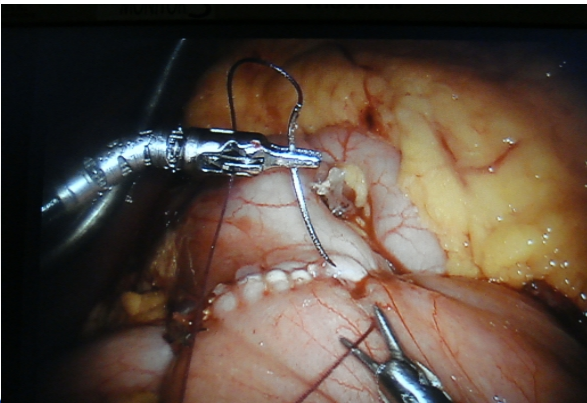


2 βαθμοί ελευθερίας



4 βαθμοί ελευθερίας

τέλος 10ετίας 90
2000



7 βαθμοί ελευθερίας.....

Quiz

1960s

First staplers introduced to the U.S.



1970s

Stainless steel and single-use EEA™ staplers



1980s

First bariatric stapler introduced to the market



1990s

The world's first endoscopic stapler makes minimally invasive surgery a reality



2000s

DST series™ technology allows for properly formed B-shaped staples



2010

Tri-Staple™ technology revolutionizes endostapling



2012

Specialty reloads designed to address variable types of tissue



2016

The world's first smart stapler puts real-time feedback in surgeons' hands



Πόσοι χειρουργοί ξέρουν σήμερα να αναστομώσουν με το χέρι ένα έντερο?