Endometriose in Balans

Nerve-sparing radical pelvic surgery: the reasons why, the anatomy and the surgical approach

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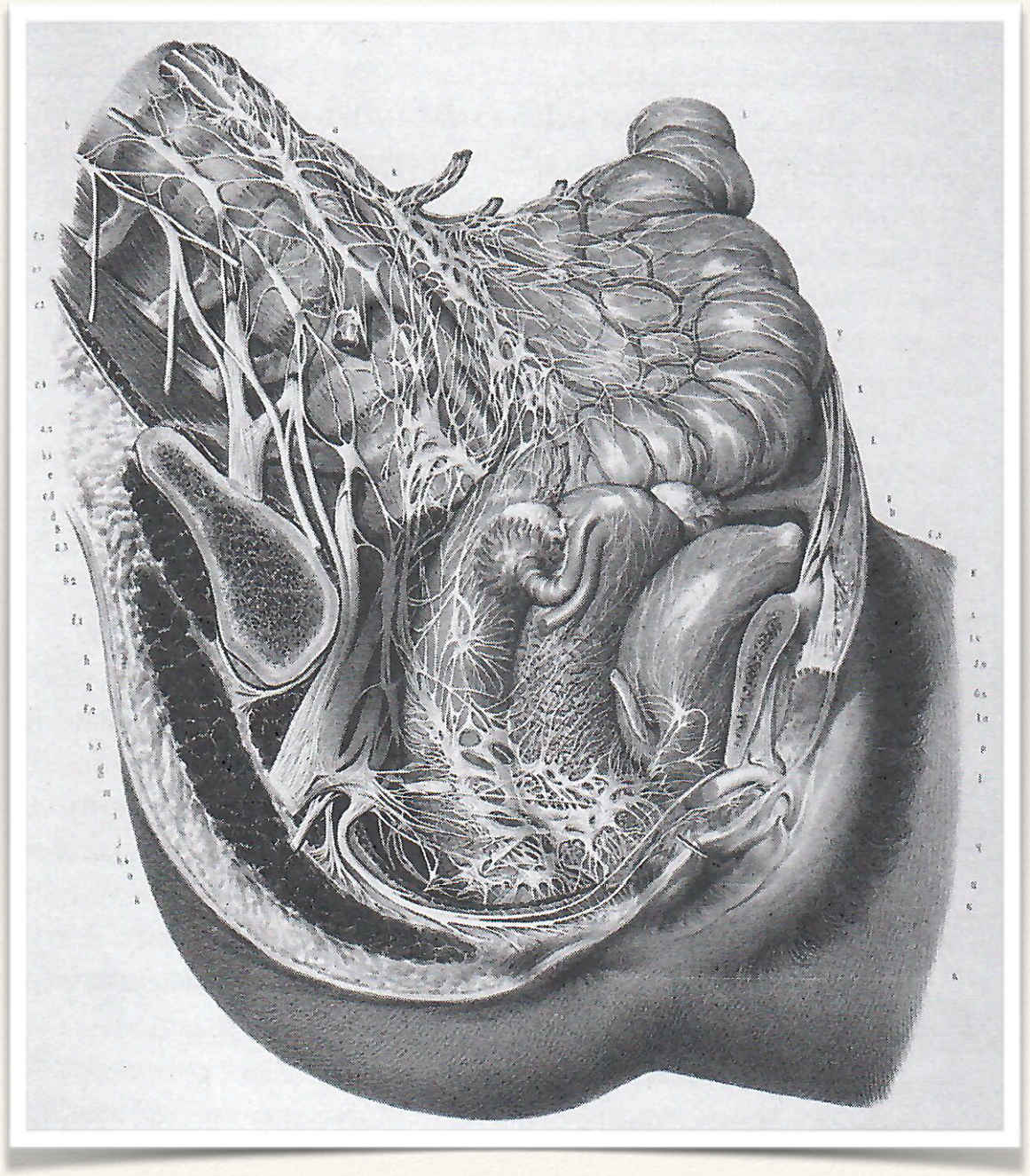
We only see what we look for, but we only look for what we know

Bougery, JM, Jacob, NH:
L'Anatomie de l'homme;
anatomie descriptive et
physiologique.
Tome cinquième. Paris,
Delaunay, 1839



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Cornelis Peter Maas: Nerve Sparing Radical Surgery; PhD thesis, 2003

Endometriose in Balans, Den Haag

Founded 2018

c.2,000 new referrals p.a.

c. 150 major bowel resections p.a.

c. 30 major urological surgeries p.a.

All surgery nerve-sparing

Endometriose in Balans

Why nerve-sparing?

- Potential reduction in risk of Low Anterior Resection Syndrome
- Preservation of bladder and sexual function
- Aim: to improve the quality of surgery and not perform inadequate surgery

Low Anterior Resection Syndrome - TME

Up to 80% of patients with rectal cancer undergo sphincter-preserving surgery. It is widely accepted that up to 90% of such patients will subsequently have a change in bowel habit, ranging from increased bowel frequency to faecal incontinence or evacuatory dysfunction. This wide spectrum of symptoms after resection and reconstruction of the rectum has been termed anterior resection syndrome. Currently, no precise definition or causal mechanisms have been established. This disordered bowel function has a substantial negative effect on quality of life.

Catherine L C Bryant 1 , Peter J Lunniss, Charles H Knowles, Mohamed A Thaha, Christopher L H Chan

Lancet Oncol

2012 Sep;13(9):e403-8. doi: 10.1016/S1470-2045(12)70236-X.

Low Anterior Resection Syndrome

"The development of low anterior resection syndrome likely involves an interplay between mechanical and neural pathways."

Nguyen TH, Chokshi RV

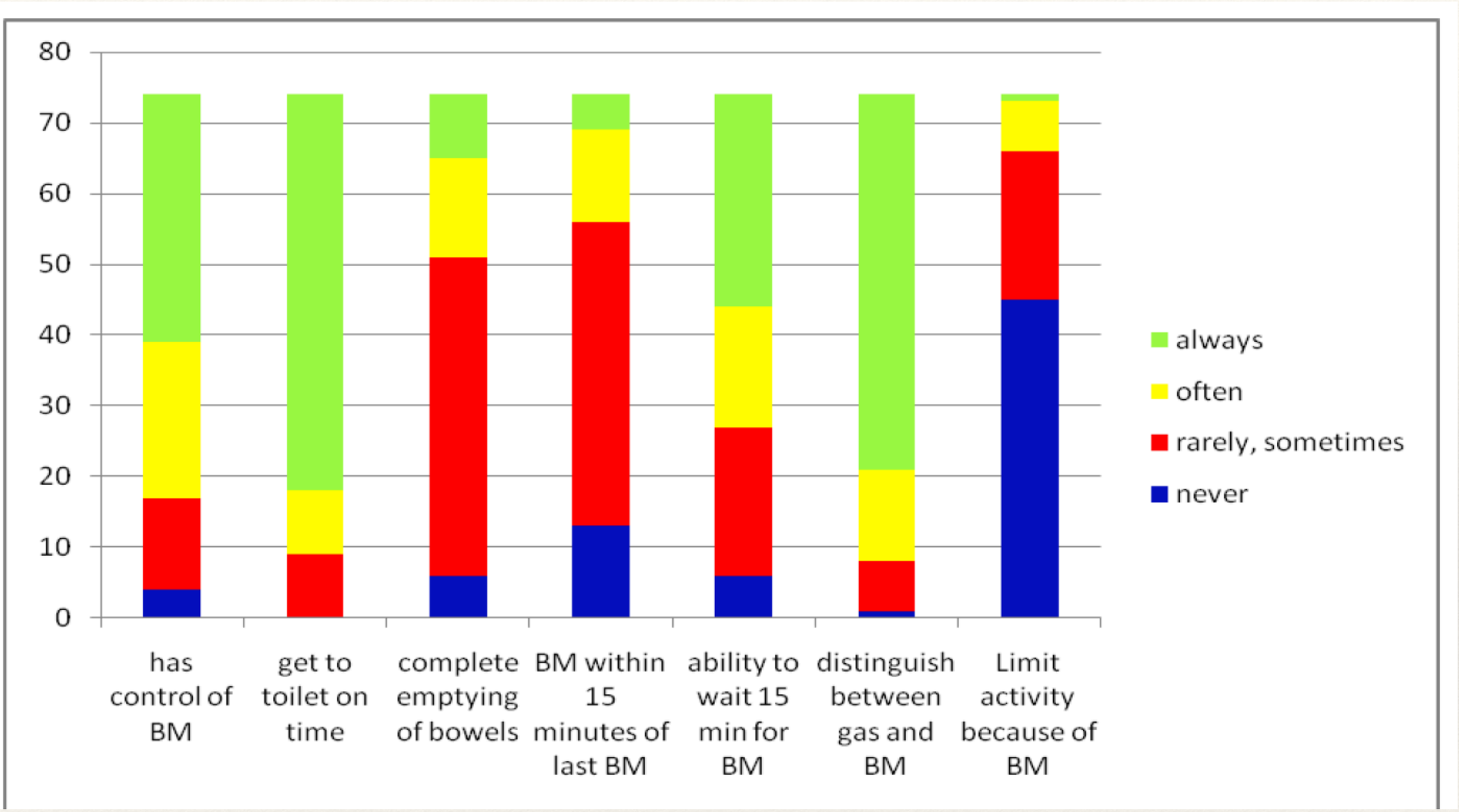
Curr Gastroenterol Rep. 2020 Aug 4;22(10):48. doi: 10.1007/s11894-020-00785-z.

Nerve-sparing laparoscopic eradication of deep endometriosis with segmental rectal and parametrial resection: the Negrar method. A single-center, prospective, clinical trial

Marcello Ceccaroni 1, Roberto Clarizia, Francesco Bruni, Elisabetta D'Urso, Maria Lucia Gagliardi, Giovanni Roviglione, Luca Minelli, Giacomo Ruffo

Overall detection of severe bladder/rectal/sexual dysfunctions was significantly different between the two groups, and 56 patients of group A (86.2%) reported a significantly higher rate of severe neurologic pelvic dysfunctions vs. 1 patient (1.6%) of group B ($p < 0.001$).

LAR Syndrome after close dissection of rectal tube



English J, Sajid, M, Lo, J, Hudelist, G, Baig, M, Miles WM (2014).
Segmental rectal resection in the treatment of deeply infiltrating rectal endometriosis: 10 years' experience from a tertiary referral unit.
Gastroenterol Rep (Oxf). 2014 Nov; 2(4): 288–294.

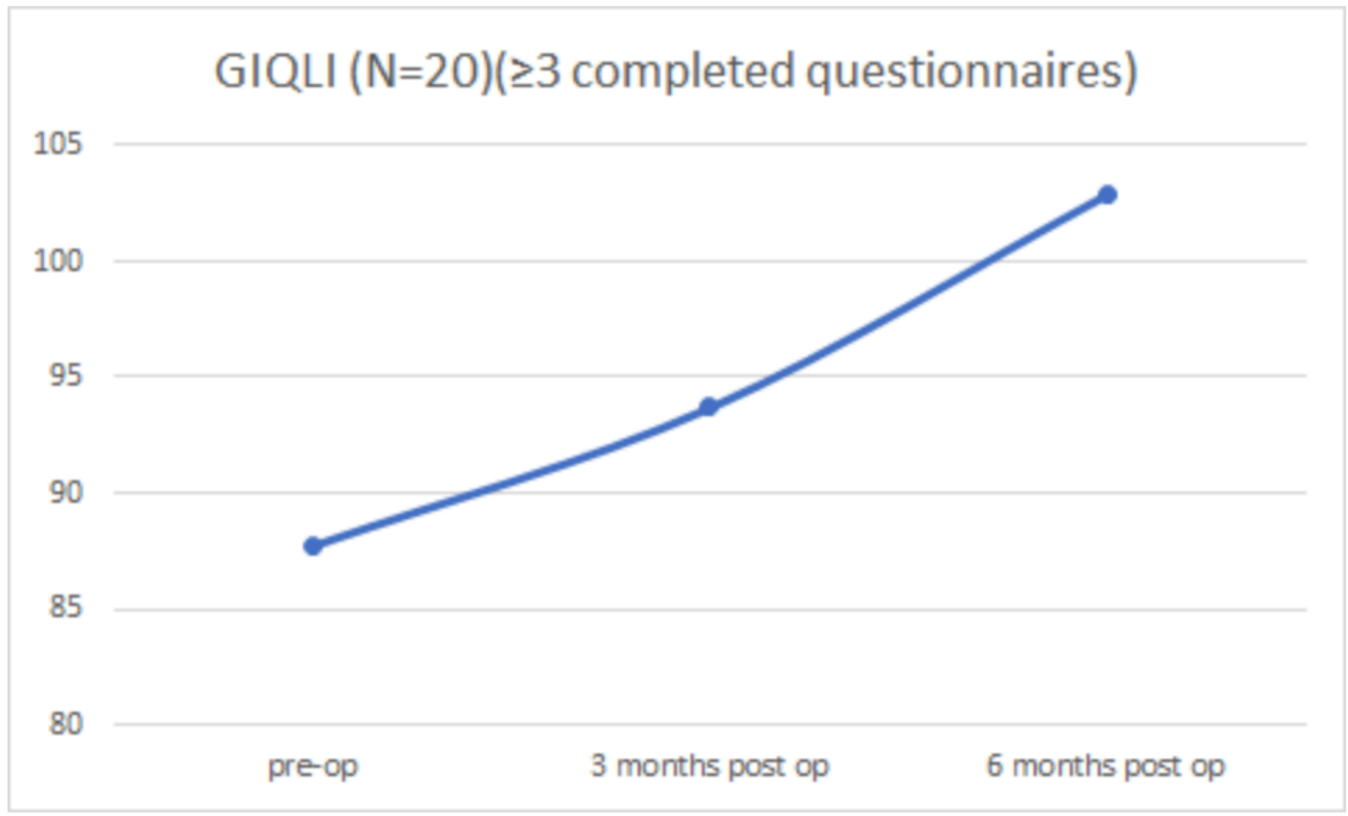
Endometriose in Balans

Causes of LARS

- Damage to rectal innervation
- Excision of ampulla and replacement with smaller calibre sigmoid or upper rectum
- Duration of active disease? Is it DIE which predisposes to LARS? Do women with severe rectal endometriosis have abnormal rectal function before surgery?

Pre-LAR rectal function

GIQLI (N=20)	average	SD
pre-op	87,74	19,4
3 months post op	93,71	21,71
6 months post op	102,9	23,07



What is nerve sparing?

- We standardise endometriosis with #ENZIAN but there is lack of any standardisation for nerve-sparing surgery

What is not nerve-sparing surgery?

- Total mesorectal excision (TME)
- Close rectal dissection?
- No agreement re. nerve-sparing and research very poor as a result

What is nerve-sparing surgery?

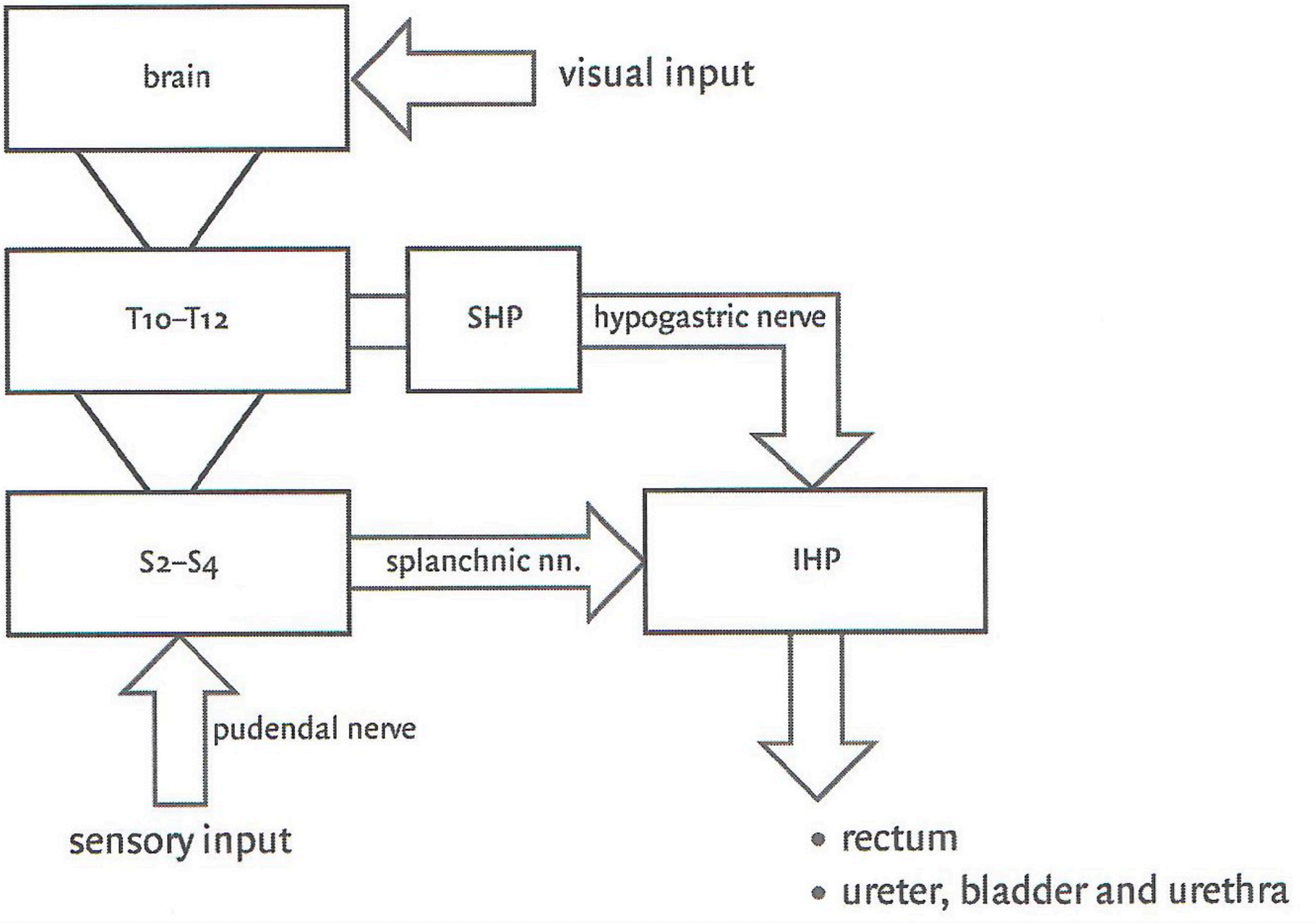
- Hypogastric Nerve identification & lateralisation
- Dissection of Inferior Hypogastric Plexus: how lateral?
- Dissection and identification of S 2-4 parasympathetics
- Dissection of rectal plexus and nerves in lateral ligament
- Sympathetic chain

Saving parasympathetics?

Intra-operative identification of parasympathetic nerves has been reported to be possible in 50 to 90% of patients

Volpi 2004, Vironen, 2006

Basic Anatomy



Cornelis Peter Maas, PhD, 2003

Rectal Neurophysiology

- NN run along the conjoint muscle layer having originated in the Inferior Hypogastric Plexus

- Sympathetic NN
  - Motility
  - Internal anal sphincter

    (major)

- Parasympathetic NN
  - Lattice-like plexus in circular muscle layer of distal rectum
  - Motility
  - Sensation
  - Internal anal sphincter (minor)

Bladder Neurophysiology

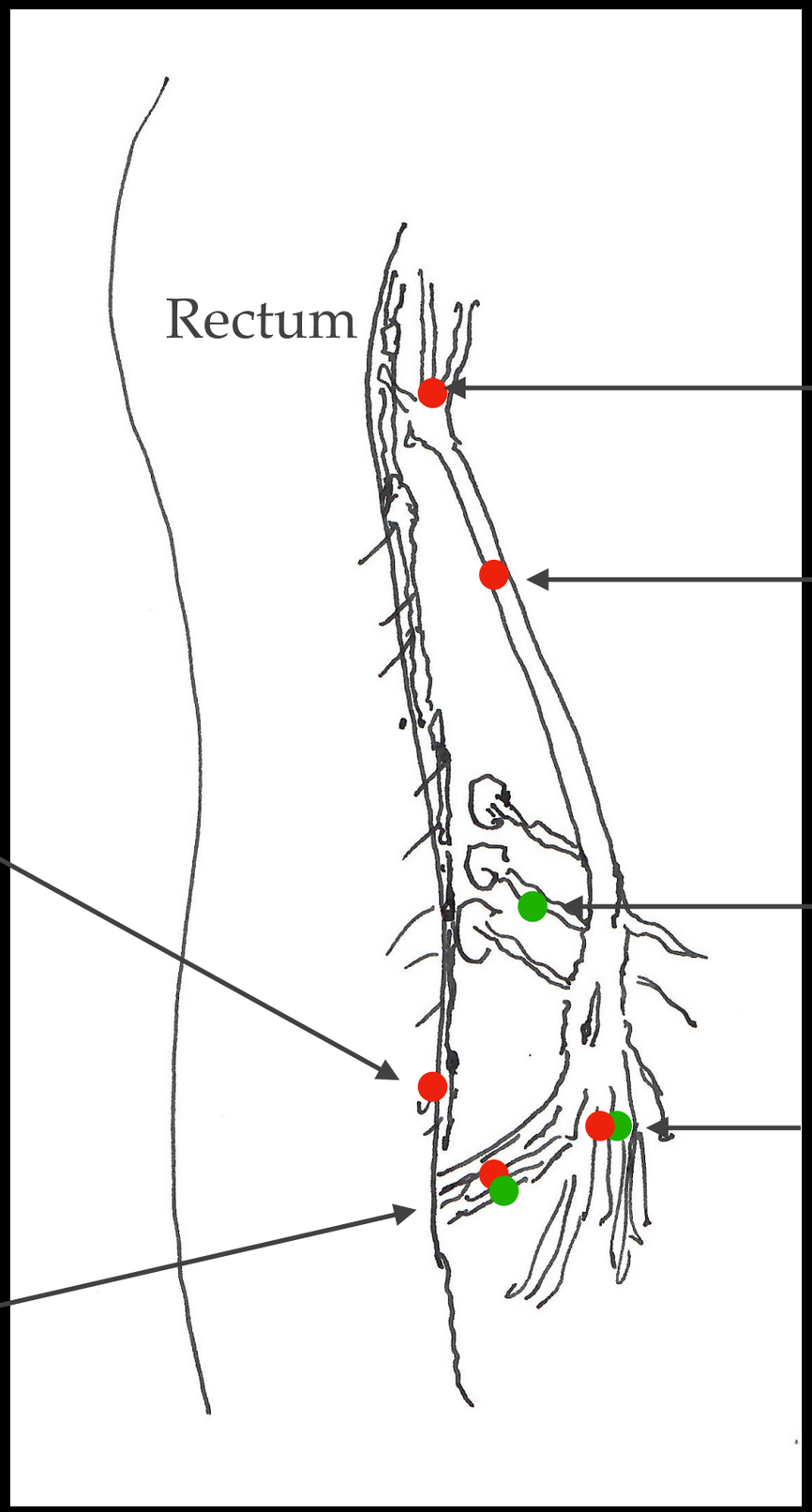
- Sympathetic nerves
  - Compliance
  - Low storage pressure
  - Bladder neck competence
  - Continence
- Parasympathetic nerves
  - Contractility
  - Sensation

Sexual function

- Sympathetics responsible for arousal
- Interruption of hypogastric sympathetics may lead to disordered orgasm
- Pudendal nerve supplies external genitalia

Anatomy of the pelvic autonomic nerves

Potential sites for damage to the rectal nerve supply



Pelvic brim where the Hypogastric nerve lies close to the rectum

Hypogastric nerve Pararectally during TME

Sympathetic contribution from sympathetic chain by undermining of Rectosigmoid

Splanchnic nerves during sacral plexus or side wall endometriosis resection

Division of lateral rectal ligament with S2-4 parasympathetic, sympathetics and middle rectal artery

Inferior Hypogastric Plexus

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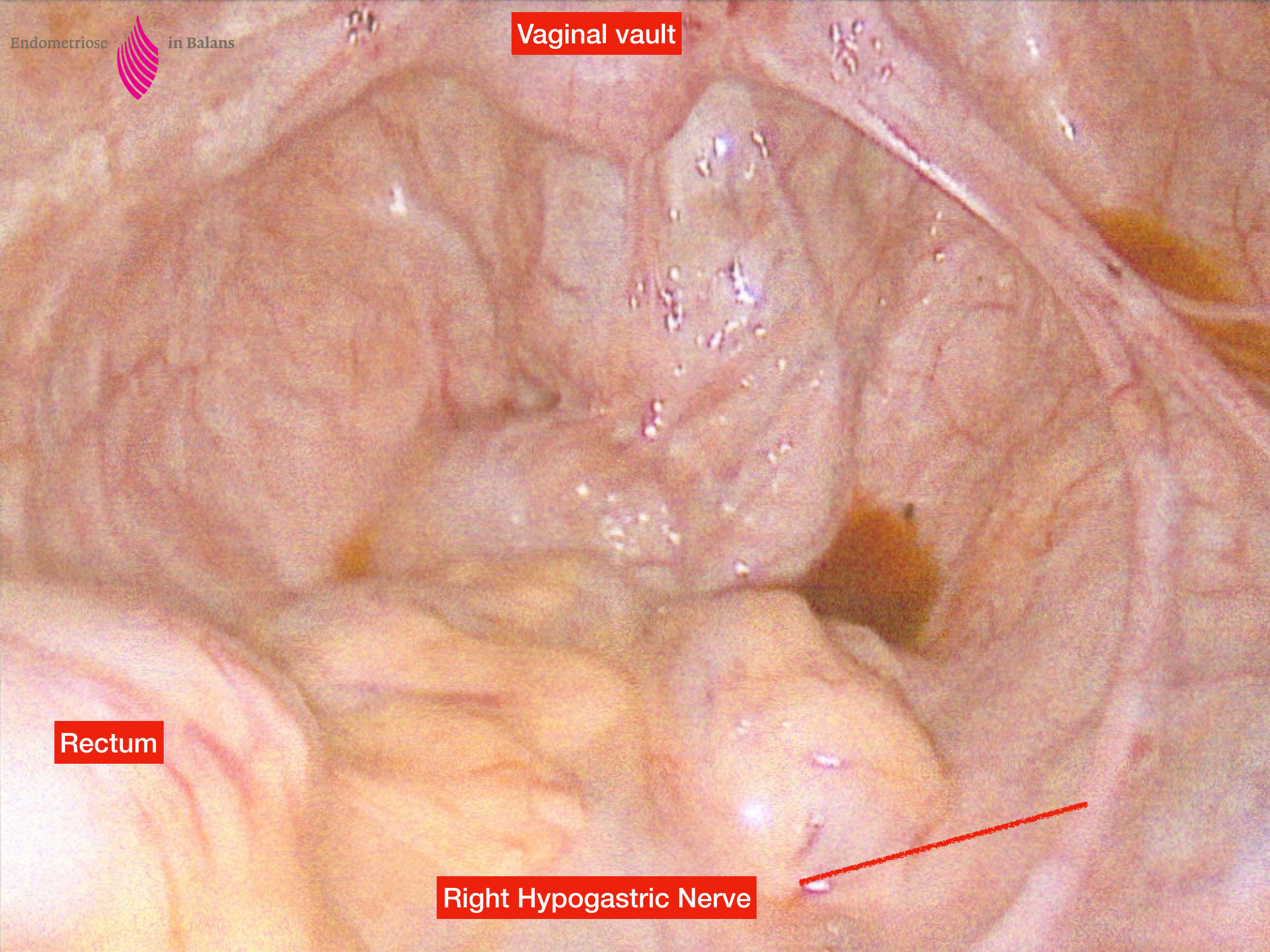
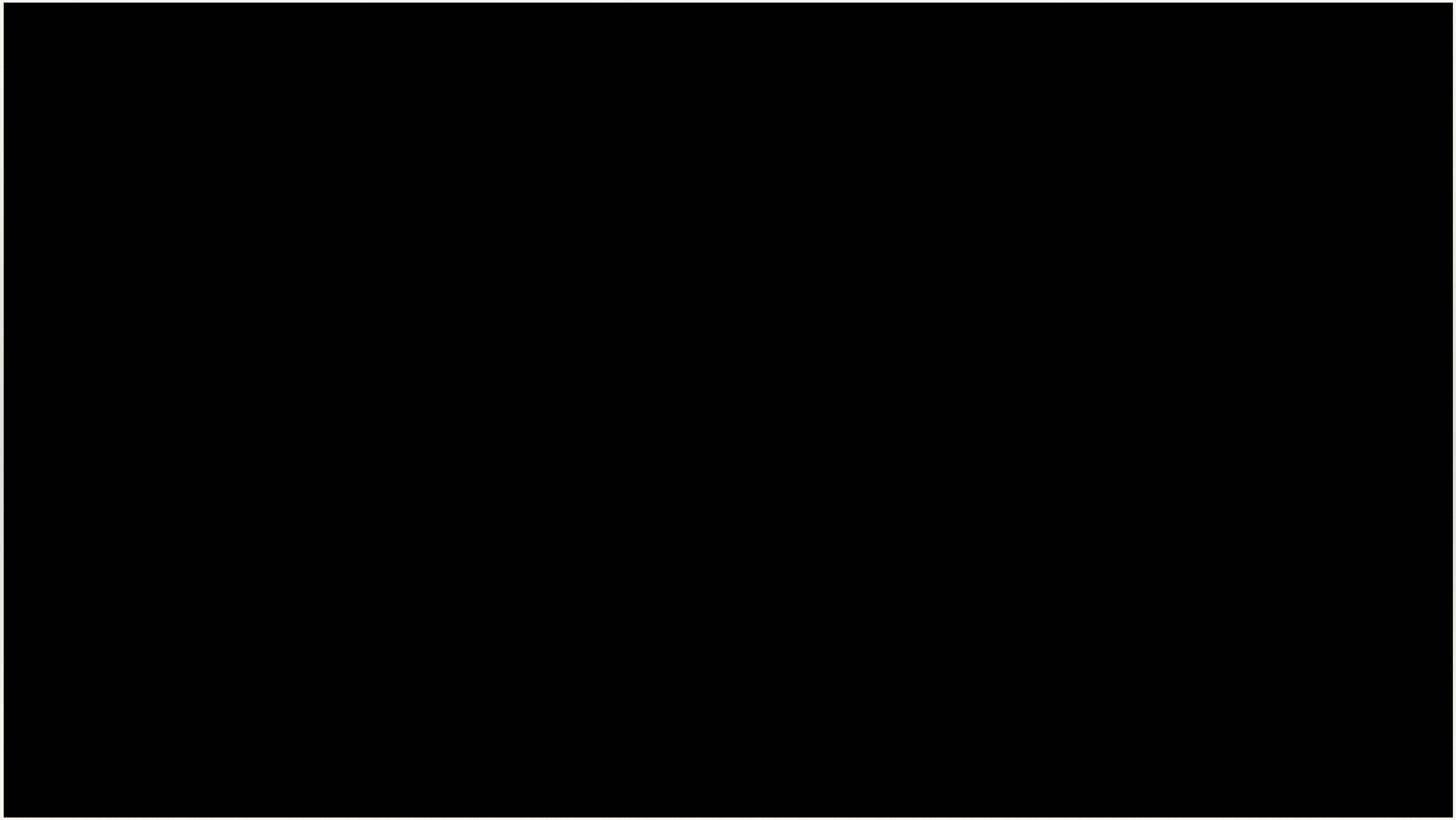
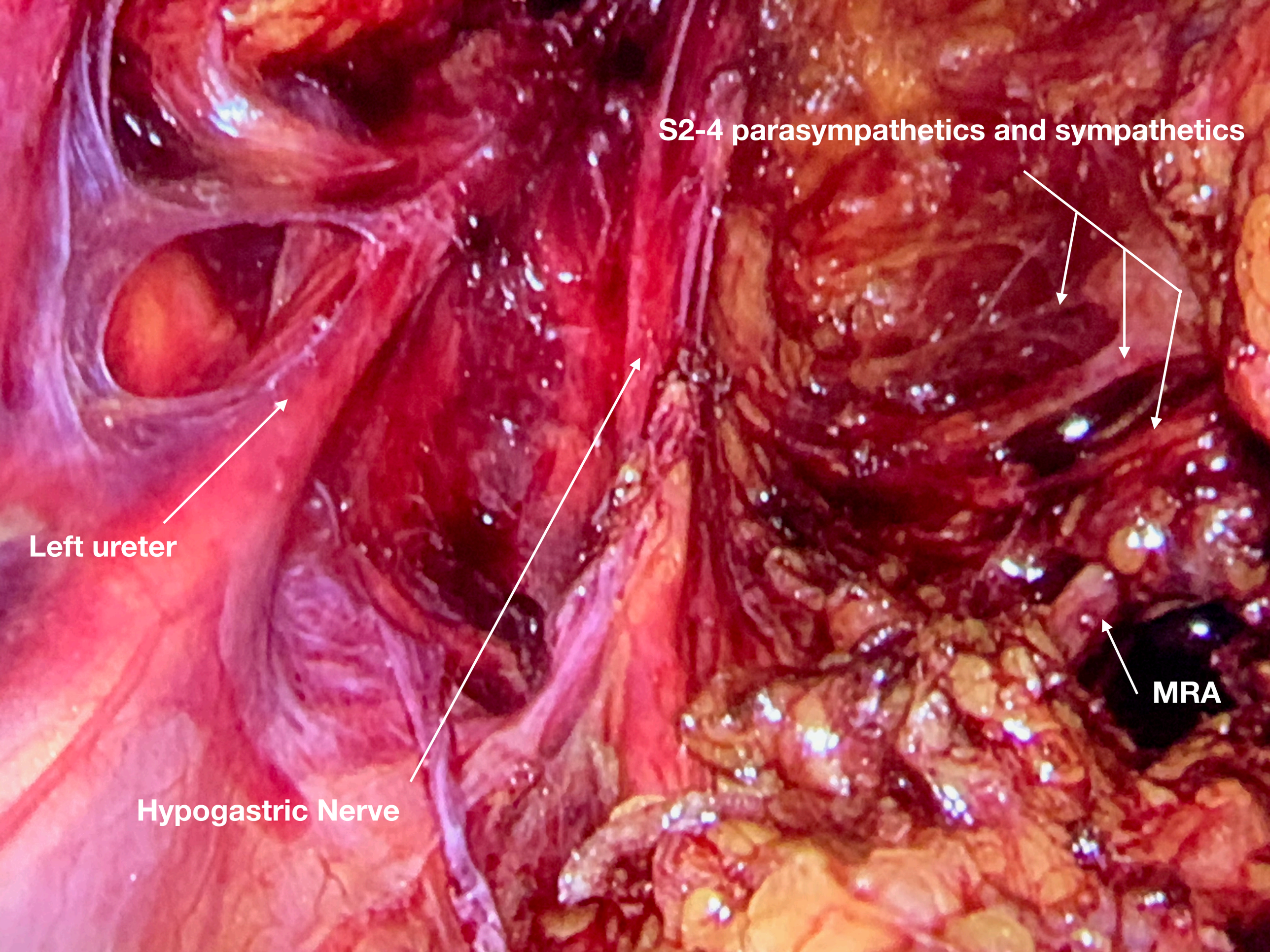
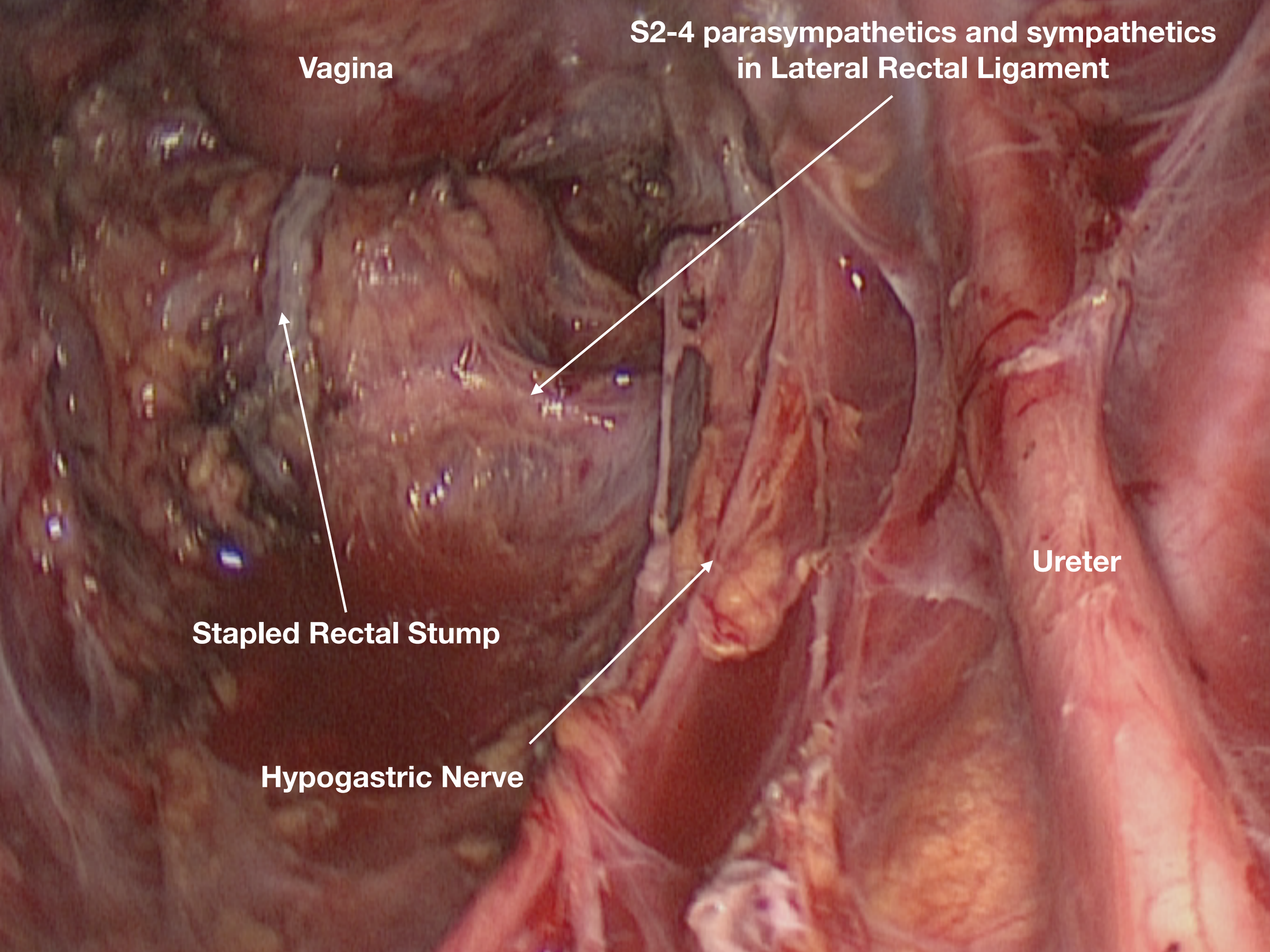


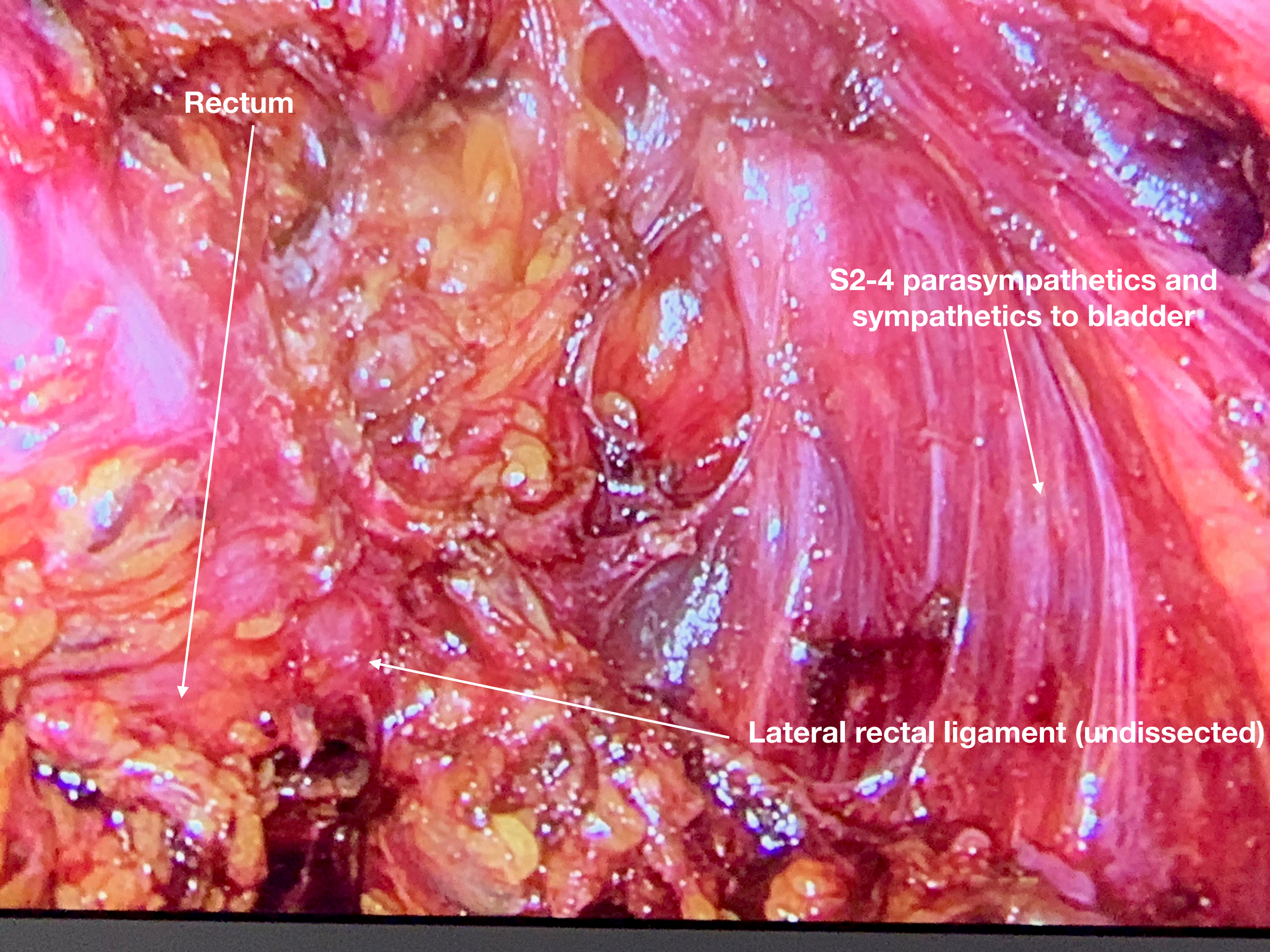
Inferior hypogastric plexus dissection

Nerve-sparing LAR




S2-4 parasympathetics and sympathetics
Left ureter
Hypogastric Nerve
MRA


Vagina
S2-4 parasympathetics and sympathetics
in Lateral Rectal Ligament
Stapled Rectal Stump
Hypogastric Nerve
Ureter


Rectum
S2-4 parasympathetics and sympathetics to bladder
Lateral rectal ligament (undissected)

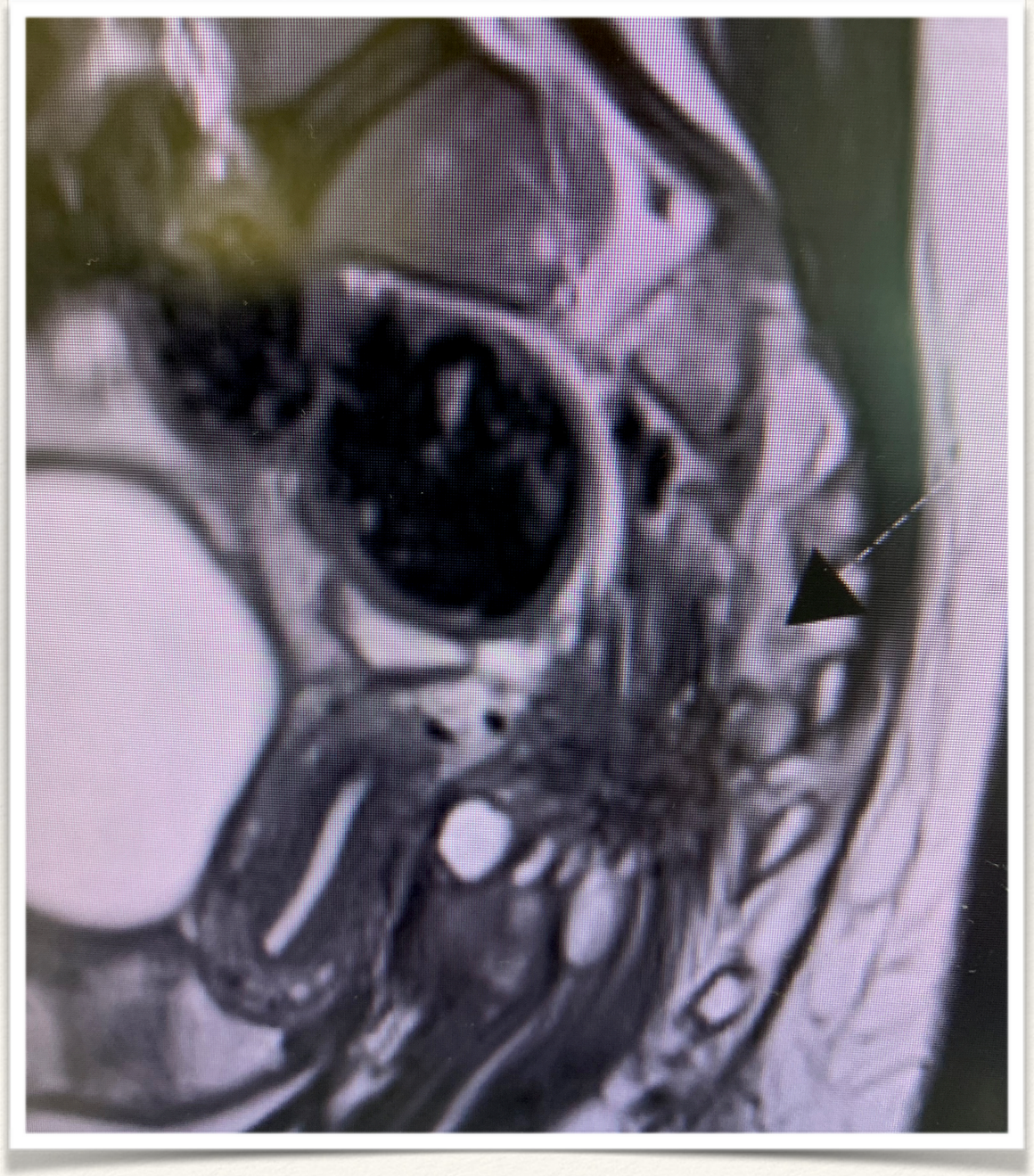
Benefits of nerve-sparing

- The ability to preserve innervation on one side if possible - perhaps with longer oblique staple line but avoiding 3+ cartridge use
- Avoidance of inadvertent damage in resection and dissection for LAR/disk/shave

Concomitants of nerve sparing

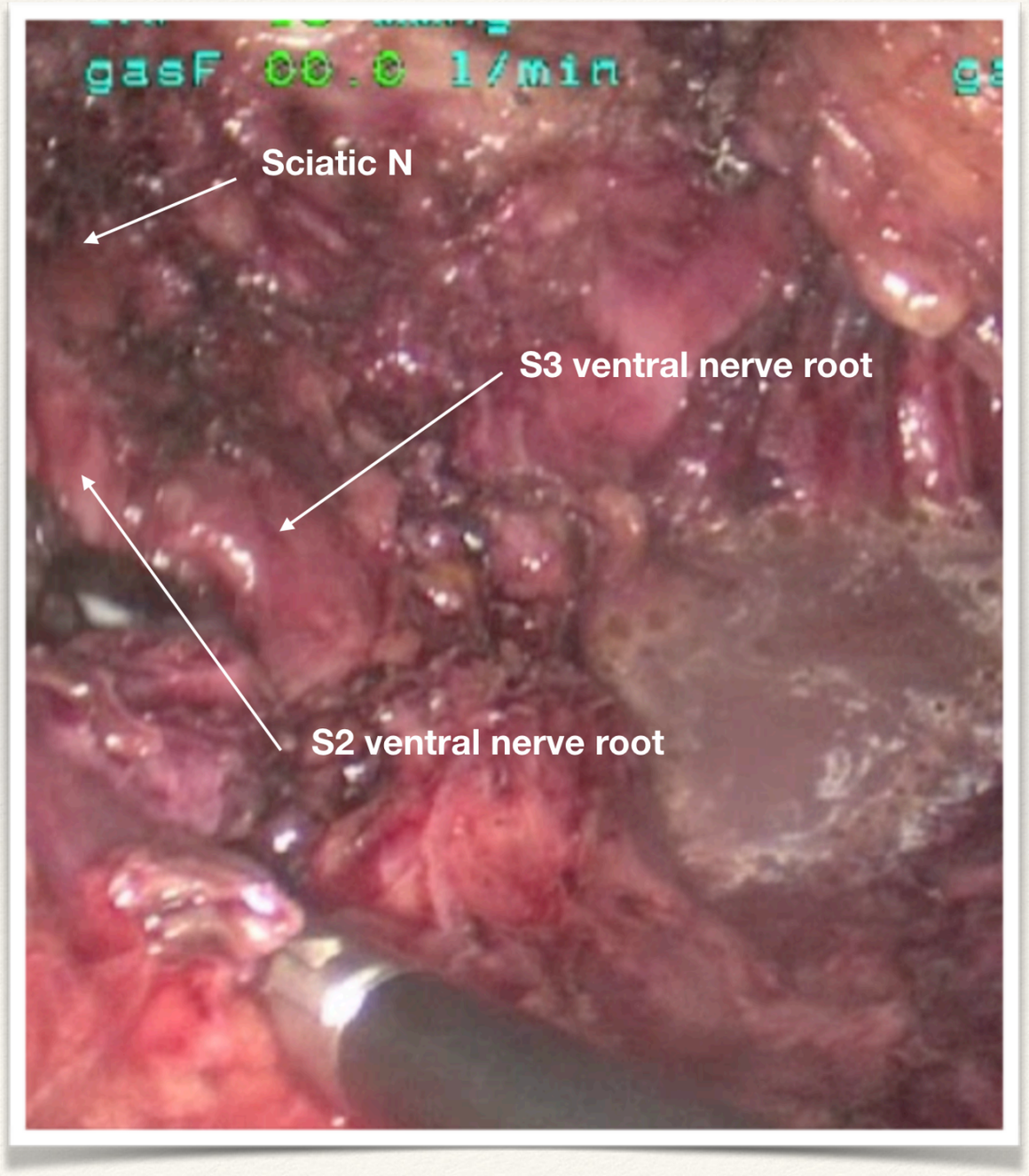
- Excise minimum length of bowel necessary for complete excision of disease or at least do not leave denervated bowel in situ
- Only dissect nerves in the intended surgical field
- End to end anastomosis without J-pouch to avoid undermining proximal rectum or sigmoid?

What can we not do?



- Avoid damage to nerves if involved in disease

What can we not do?

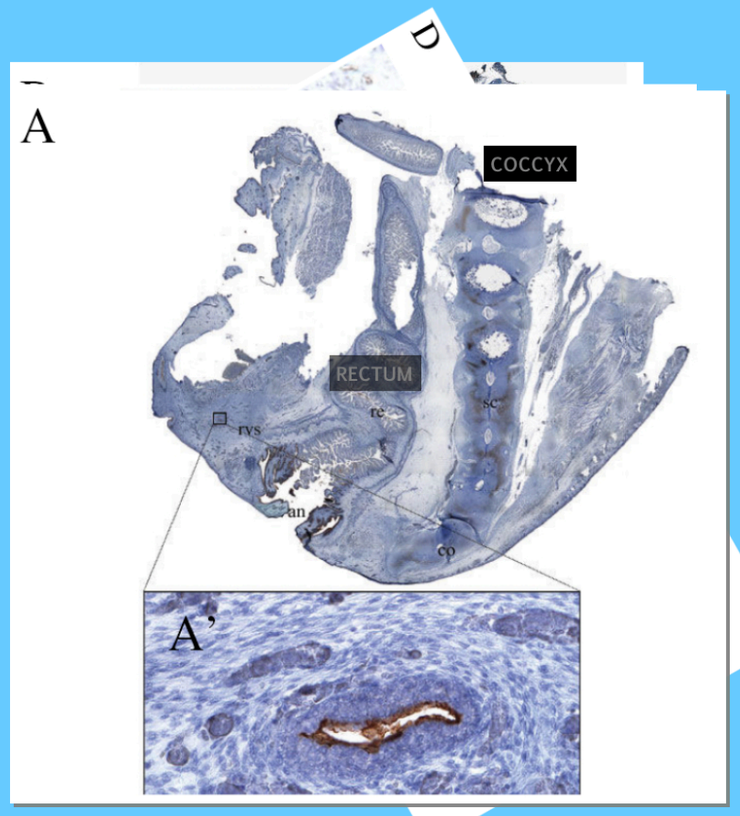


- If there is sacral nerve DIE we cannot protect the S 2-4 parasympathetics on that side

When to treat?

- Congenital disease

Signorile et al. J Exp Clin Cancer Res 2009, 28:49-53.
Fetal endometriosis/ER/CA-125



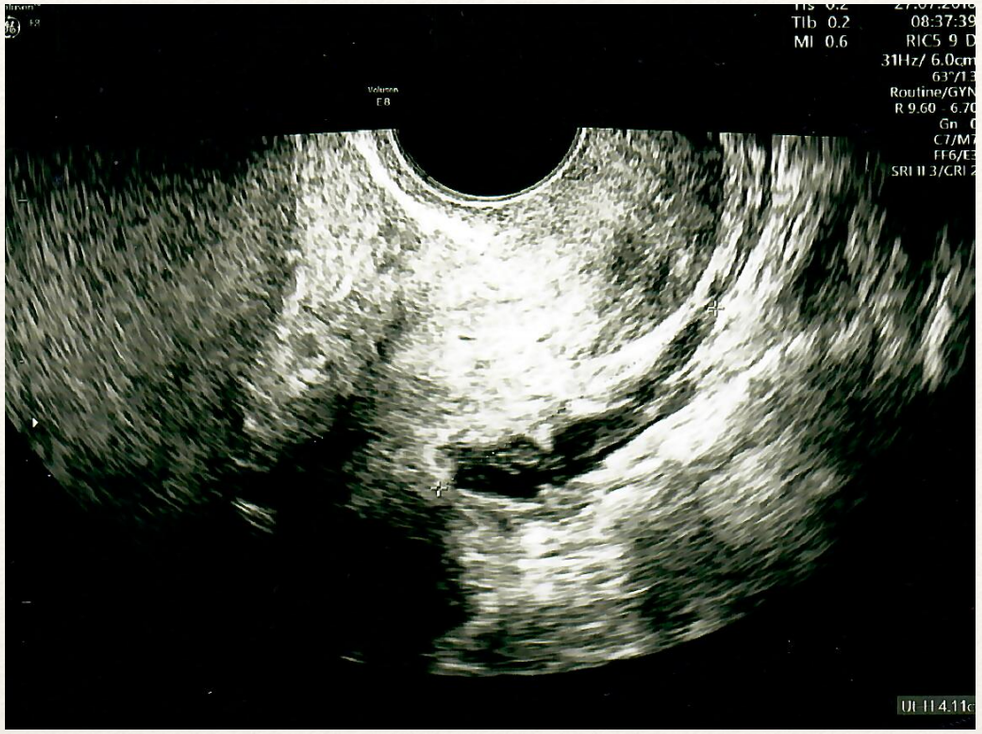
4/36 (11%) of fetal embryos had evidence of ectopic endometrial tissue

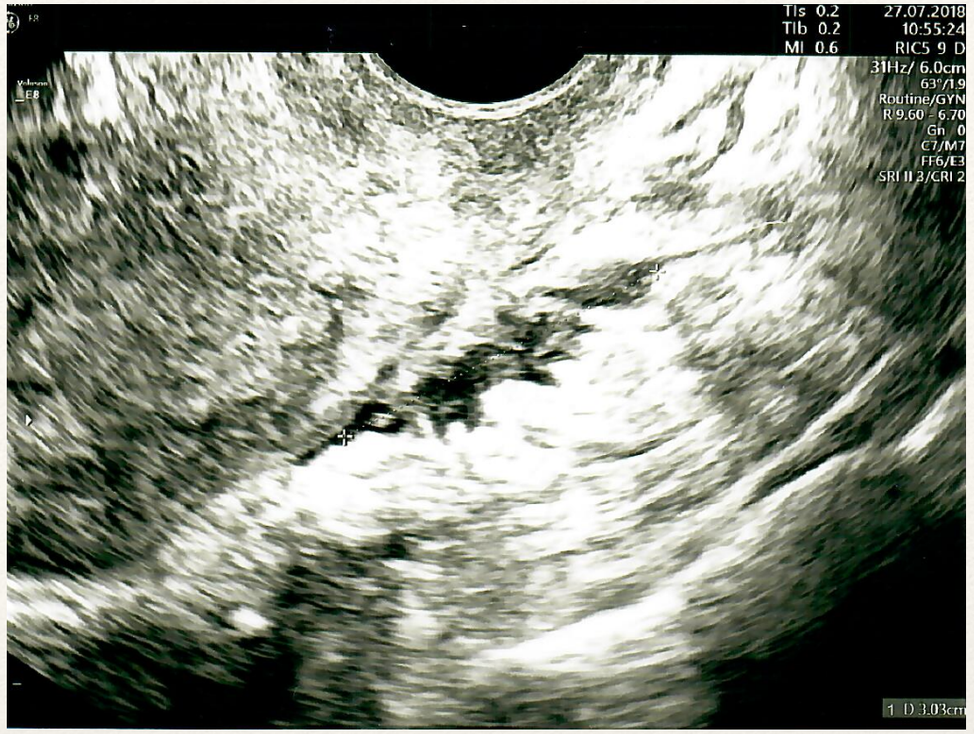
When to treat?

- Does conservative medical management in a young woman merely allow the disease to develop, the necessary ultimate surgery to become greater and the potential for complications more?

Can we predict LARS?

- Maybe on basis of #ENZIAN
  - A, B and C compartments
- Pre-operative abnormal rectal function: i.e. pre-operative neural damage due to long-standing DIE?


Tls 0.2
Tlb 0.2
MI 0.6
08:37:39
RIC5 9 D
31Hz/ 6.0cm
Routine/GYN
R 9.60 - 6.70
C7/M7
FF6/E3
SRI II 3/CRI 2


Tls 0.2
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27.07.2018
10:55:24
RIC5 9 D
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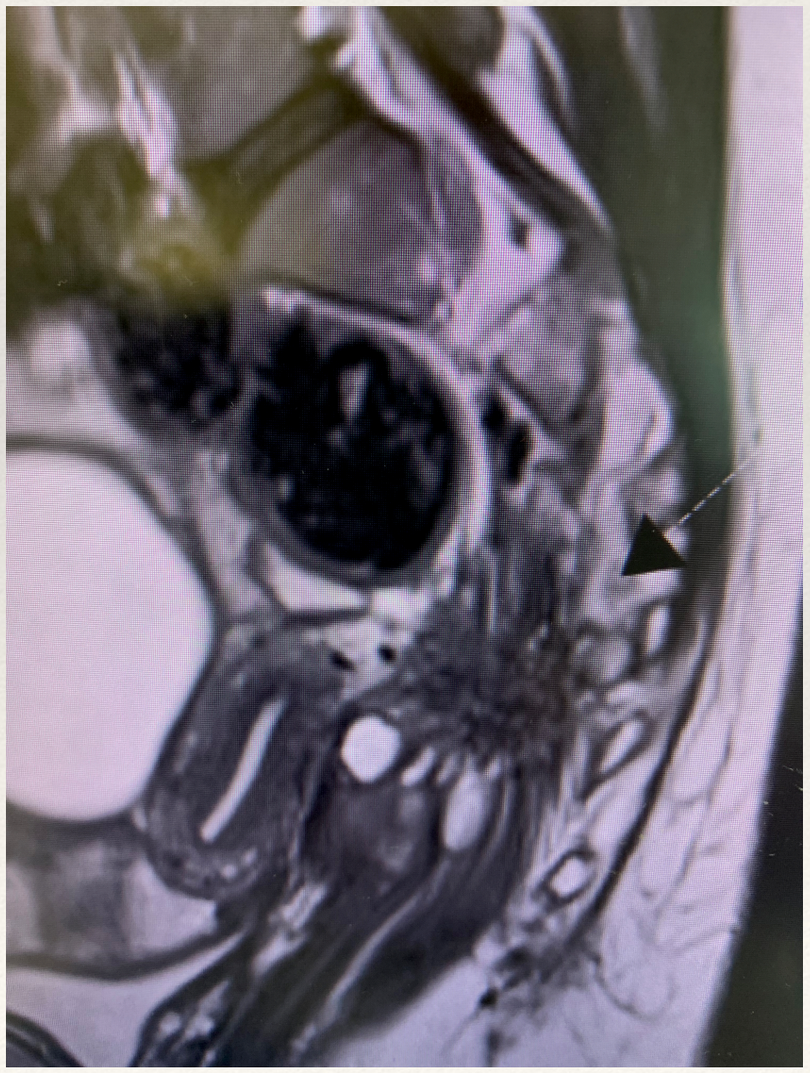
Routine/GYN
R 9.60 - 6.70
Gn 0
C7/M7
FF6/E3
SRI II 3/CRI 2



Current research to assess relationship of nerve sparing surgery to LARS

Pre-surgery, and 6/12/24 months post surgery: GIQLI Bowel function questionnaire

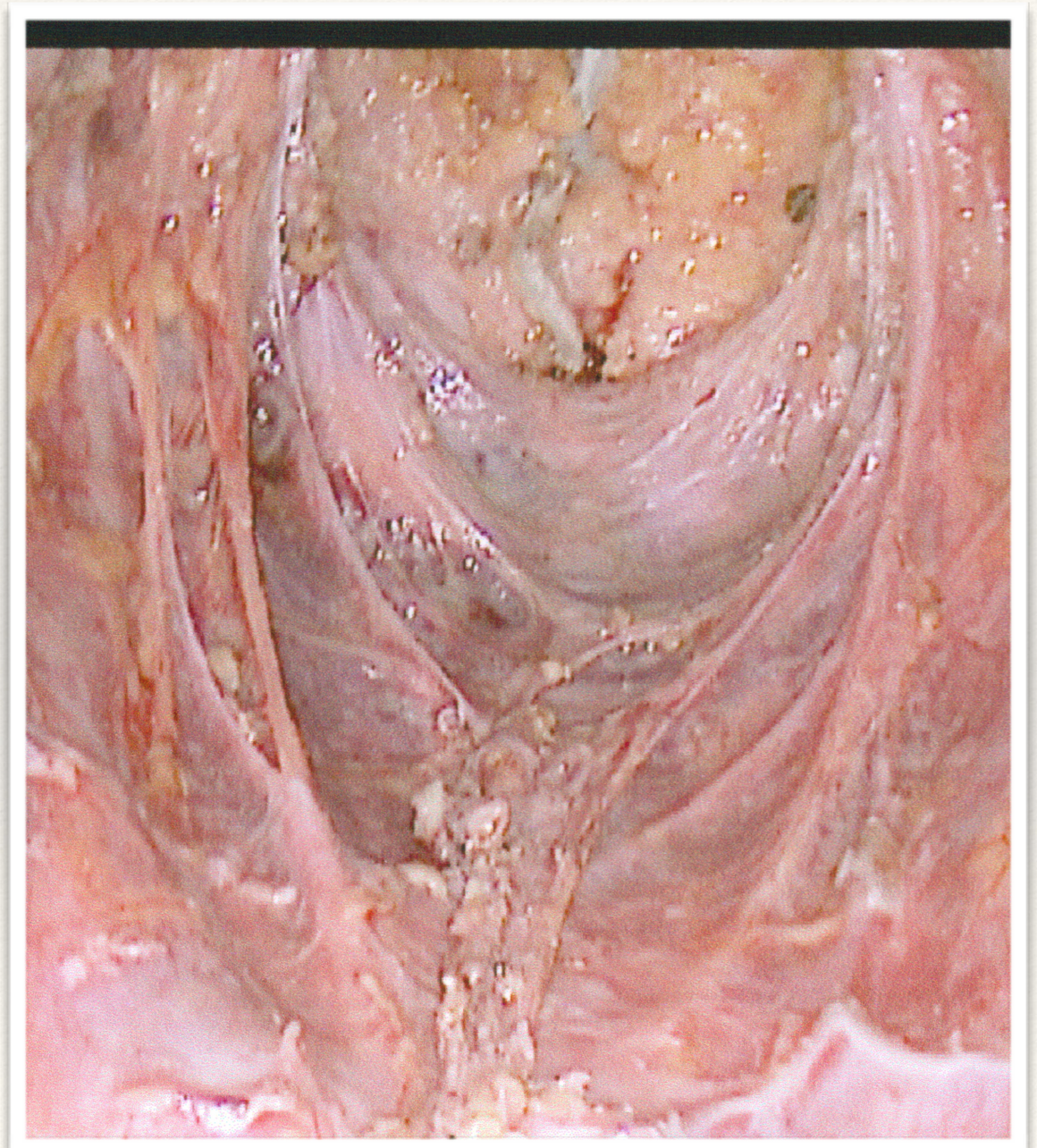
At surgery, record: Length of bowel resected,
length of denervated proximal rectum, E-E or E-S

	Left	Right
Hypogastric nerve(s)	Preserved	Preserved
	Not preserved	Not preserved
Long Splanchnic nerves	Preserved	Preserved
	Not preserved	Not preserved
Nerves in lat. rectal lig.	Preserved	Preserved
	Not preserved	Not preserved

Current research to assess relationship of nerve sparing surgery to LARS

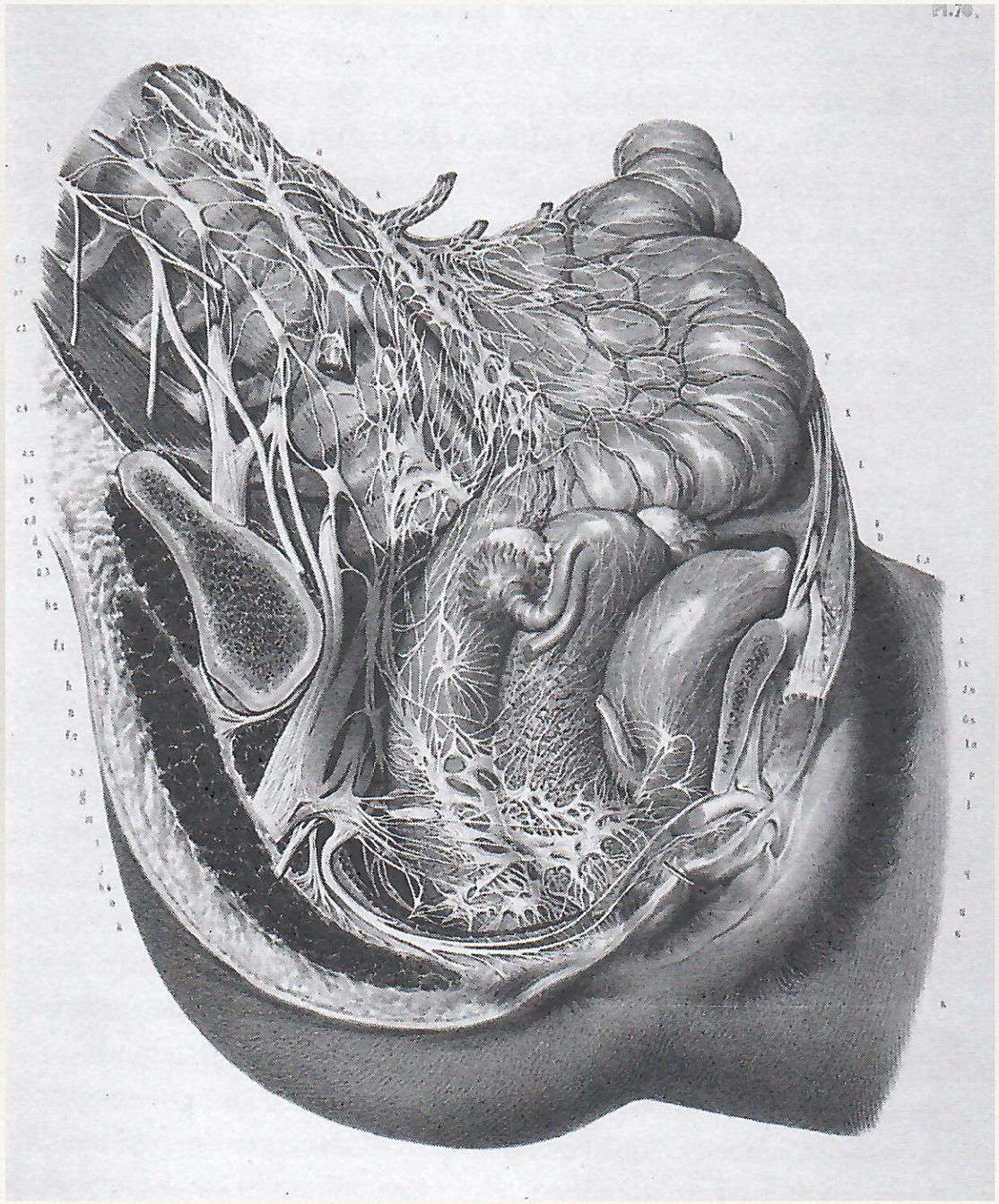
- Can #ENZIAN A/B/C compartments predict the development of LARS?
- Relationship of duration of symptoms to LARS
- Is LARS more likely to develop in women with abnormal bowel function pre surgery?

Conclusions



- It should be possible to reduce the risk of LAR Syndrome
- It is possible to identify and preserve the rectal innervation
- It is possible to perform more radical surgery more safely
- Good quality research required with standardisation of techniques

We only see what we look for, but we only look for what we know



Bougery, JM, Jacob, NH:
L'Anatomie de l'homme;
anatomie descriptive et physiologique.
Tome cinquième. Paris, Delaunay, 1839

Cornelis Peter Maas: Nerve Sparing Radical Surgery;
PhD thesis, 2003

Thank you

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