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coloproctology
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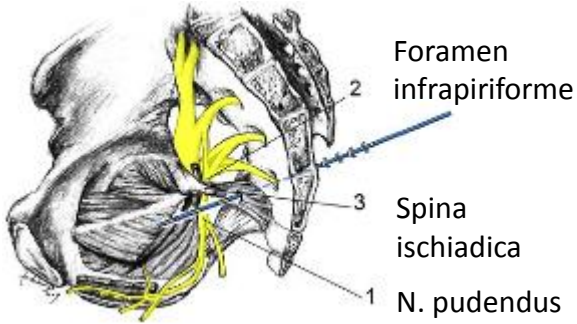


Chirurgische Behandlung des hypersensitiven Rektums

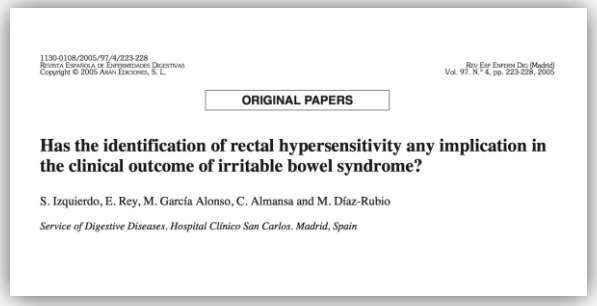
Lukas Marti, Leitender Arzt Proktologie
Chirurgie, Kantonsspital St. Gallen

DGVC CACP

Referenzzentrum für chirurgische Koloproktologie

Introduction

LARS ⟷ Hypersensitive Rectum



1130-0108/2005/97/4/223-228
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Rev Esp Enferm Dig (Madrid)
Vol. 97, N.º 4, pp. 223-228, 2005

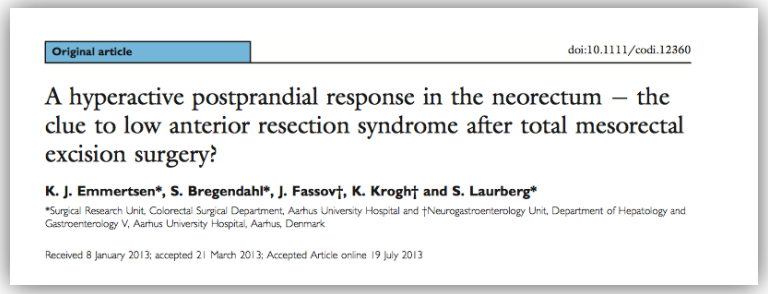
ORIGINAL PAPERS

Has the identification of rectal hypersensitivity any implication in the clinical outcome of irritable bowel syndrome?

S. Izquierdo, E. Rey, M. García Alonso, C. Almansa and M. Díaz-Rubio

Service of Digestive Diseases. Hospital Clínico San Carlos. Madrid, Spain

- Rectum removed...
- That means: *not correct!!*
- All the same: **hypersensitivity**



Original article

doi:10.1111/codi.12360

A hyperactive postprandial response in the neorectum – the clue to low anterior resection syndrome after total mesorectal excision surgery?

K. J. Emmertsen*, S. Bregendahl*, J. Fassov†, K. Krogh† and S. Laurberg*

*Surgical Research Unit, Colorectal Surgical Department, Aarhus University Hospital and †Neurogastroenterology Unit, Department of Hepatology and Gastroenterology V, Aarhus University Hospital, Aarhus, Denmark

Received 8 January 2013; accepted 21 March 2013; Accepted Article online 19 July 2013

Introduction

- 32 Hits,
- 2 before 2008

NCBI Resources How To Sign in to

PubMed Home More Resources Help

PubMed Advanced Search Builder

YouTube Tutorial

Use the builder below to create your search

Edit Clear

Builder

All Fields Show index list

AND All Fields Show index list

Search or Add to history

History Download history Clear history

Search	Add to builder	Query	Items found	Time
#1	Add	Search **((anterior resection syndrome[Title]) OR anterior resection syndrome[MeSH Major Topic]) OR low anterior resection syndrome[MeSH Major Topic]**	32	03:23:30

- The probability of patients suffering from LARS was underestimated .... Deficient awareness regarding risk factors for LARS was documented. Knowledge of therapeutic options was also limited.[1]

1. Jimenez-Gomez L Low anterior resection syndrome: a survey of the members of the American Society of Colon and Rectal Surgeons (ASCRS), the Spanish Association of Surgeons (AEC), and the Spanish Society of Coloproctology (AECP). International journal of colorectal disease 2016.

Actual Situation

Abdominoperineal resection (APR) 1913

"The operation is a severe one. I do not think that it should be performed on those over 60 years of age; of 10 such cases all died. With regard to the remainder, of whom there were 36, 8 died from the effects of the operation, 4 have had recurrence, 2 died of intercurrent disease, while 22 are alive and well after periods varying from six months to six years."1

Fig. 1 – William Ernest Miles ((1869-1947). The English surgeon who developed the abdominoperineal excision of the rectum.

1. Miles WE. A Lecture ON THE DIAGNOSIS AND TREATMENT OF CANCER OF THE RECTUM: Delivered at the Cancer Hospital, Brompton, on January 22nd, 1913. British medical journal 1913

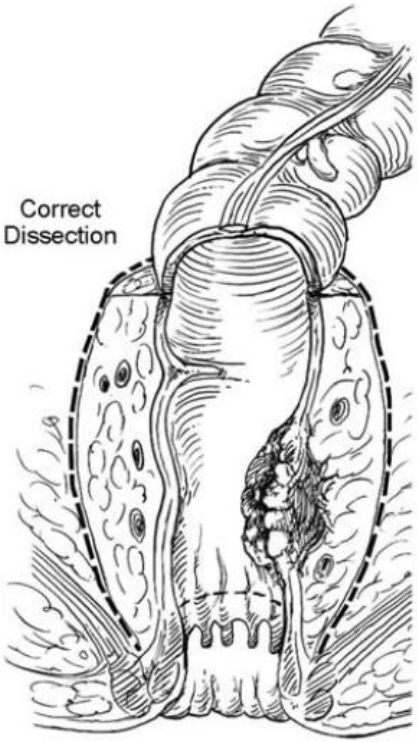
Actual Situation

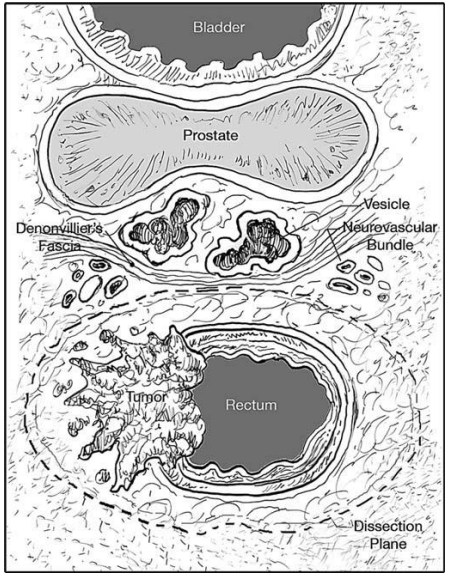
Low anterior resection

- The concept of TME (≈ 1982)
- In Basingstoke you can only talk about rectal cancer... There is nothing else [1]

Neoadj. radiochemotherapy

- Better local control
- Up to 80% sphincter perservation [2]





1. Personal communication Heald W („Bill"); in Basingstoke 2009
2. Sauer R, Becker H, Hohenberger W, et al. Preoperative versus postoperative chemoradiotherapy for rectal cancer. N Engl J Med. 2004;351:1731-1740.

Actual Situation

LARS

- LARS Score: Dänisch 2012 [1]
- LARS Score: Deutsch/Spanisch/Schwedisch 2014[2]
- LARS Score: English 2015[3]

⇨ rather **new, important** concept

⇨ **Very small, recent evidence for therapy**

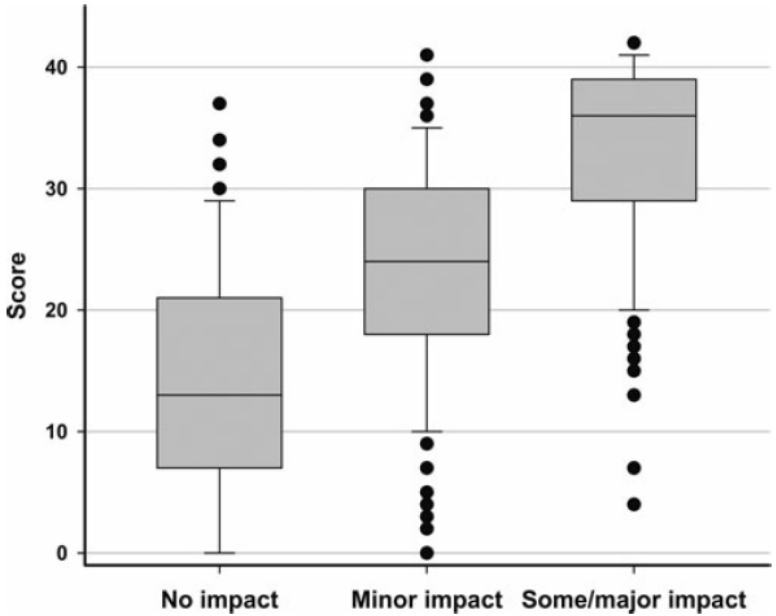


FIGURE 3. Score versus impact on QoL. There was a significant difference between all groups ($P < 0.001$, Kruskal-Wallis test).

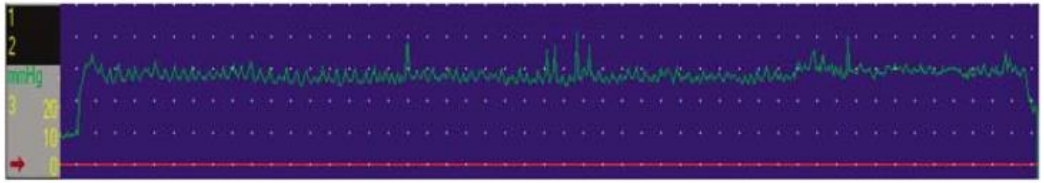
1. Emmertsen KJ, Laurberg S. Low anterior resection syndrome score: development and validation of a symptom-based scoring.....after low anterior resection for rectal cancer. Ann Surg. 2012
2. Juul T, Ahlberg M, Biondo S, et al. International validation of the low anterior resection syndrome score. Ann Surg. 2014
3. Juul T, Battersby NJ, Christensen P, et al. Validation of the English translation of the low anterior resection syndrome score. Colorectal Dis. 2015;17:908-916.

Pathophysiology

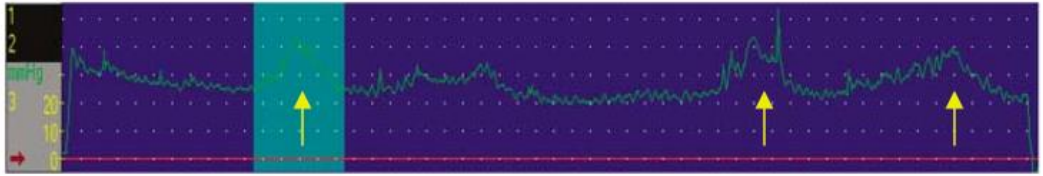
Up to 18% internal sphincter damage after LAR, but

rather **not** the cause of LARS

Healthy volunteer



TME patient



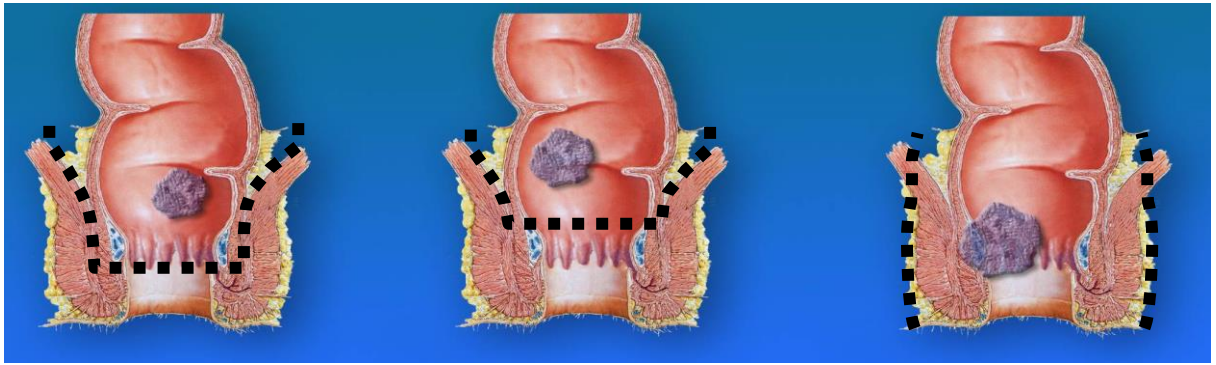
- Increased motoric propulsions
- Missing „rectal“ brake
- Hyperirritability on stimuli
- Defect of sacral and pudendal nerves

1. Tomita R. Sacral nerve function in patients with soiling more than 10 years after low anterior resection for lower rectal cancer. Hepatogastroenterology. 2009
2. Bassotti G, de Roberto G, Chistolini F, Morelli A, Pucciani F. CR: colonic manometry reveals abnormal propulsive behaviour after anterior resection of the rectum. Dig Liver Dis. 2005
3. Bakx R et al. Neorectal irritability after short-term preoperative radiotherapy and surgical resection for rectal cancer. Am J Gastroenterol. 2009;104:133-141.

Prevalence/risk factors

- LARS in about 70% of LAR[1,2]
- In about 50% severe[2]

worser/more common:

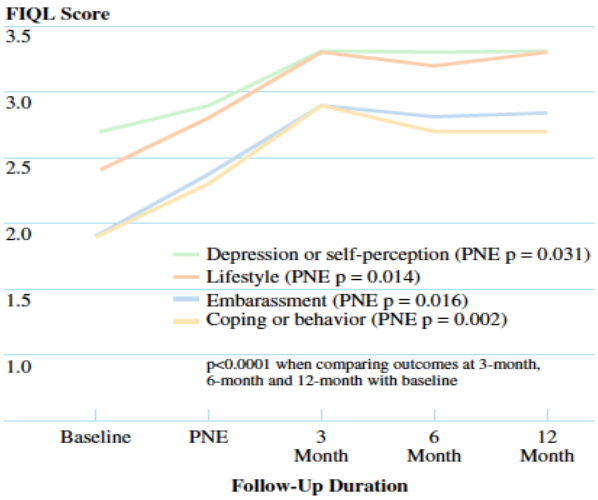


- Height of anastomosis[3]
- Straight vs. „reservoir“ (effect lost after 18mths)[4]
- (neo)adjuvant R(C)Tx[3]
- Anastomotic leakage[5]

1. Juul T, Battersby NJ, Christensen P, et al. Validation of the English translation of the low anterior resection syndrome score. Colorectal Dis. 2015;17:908-916.
2. Juul T, Ahlberg M, Biondo S, et al. Low anterior resection syndrome and quality of life: an international multicenter study. Dis Colon Rectum. 2014;57:585-591.
3. Emmertsen KJ, Laurberg S. Low anterior resection syndrome score: symptom-based scoring system for bowel dysfunction after low anterior resection for rectal cancer. Ann Surg. 2012
4. Carrillo A et al. Incidence and characterization of the anterior resection syndrome through the use of the LARS scale (low anterior resection score). Cir Esp. 2016
5. Pucciani F. A review on functional results of sphincter-saving surgery for rectal cancer: the anterior resection syndrome. Updates Surg. 2013;65:257-263.

Sakrale Neuromodulation (SNM)

- Good efficacity in fecal incontinent patients (Improvement in 77-90%[1,2])
- First „**Test**“; only in successful test-patients: **definitive implantation**
- Mechanism of action still not completely clear[3]
- Works in fecal incontinent patients up to 7 years[4]



[1] **Hollingshead JR et al**, Colorectal Dis. 2011; [2] **Wexner SD et a**l., Ann Surg. 2010;
[3] **Thaha MA et al.** Sacral nerve stimulation for faecal incontinence.... Cochrane Database Syst Rev. 2015
[4] **Uludağ O et** al., Colorectal Dis. 2011;

SNM Test I

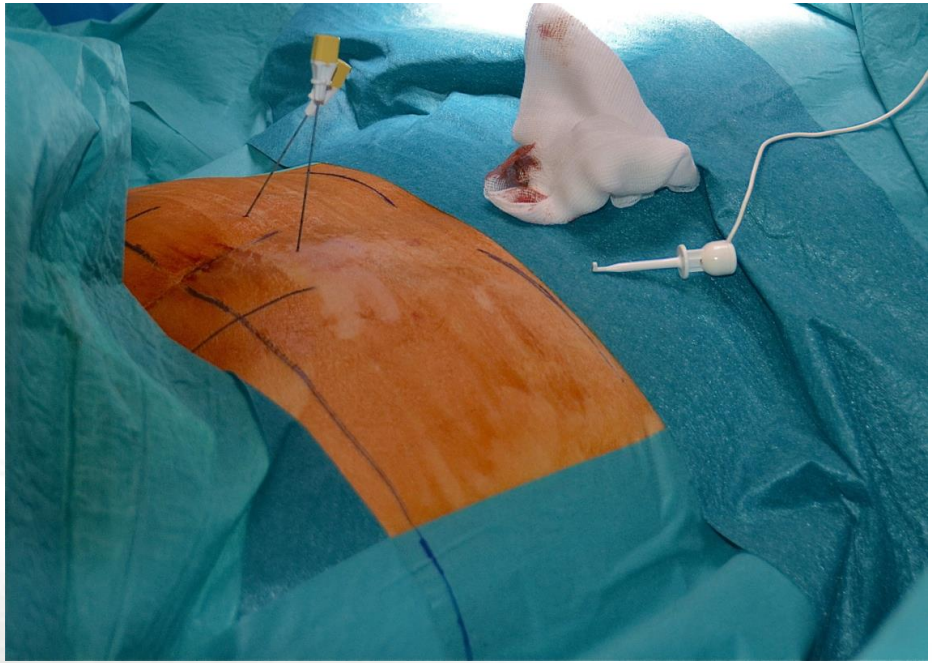
- C-arm radiograph
- Video“tower“ to see anus
- Foots visible...
- In local/spinal/general anaesth.
- Single shoot antibiotics

SNM Test II

Nerve-evaluation:

- „seaching“ for nerves at 5-10 Volt
- Using a foramen-needle S3/4 left/right
- Reduction and positioning
- Lowest possible voltage:
  for „Anal-Twitch“ or „sensation“
- No movement of the feet/toes

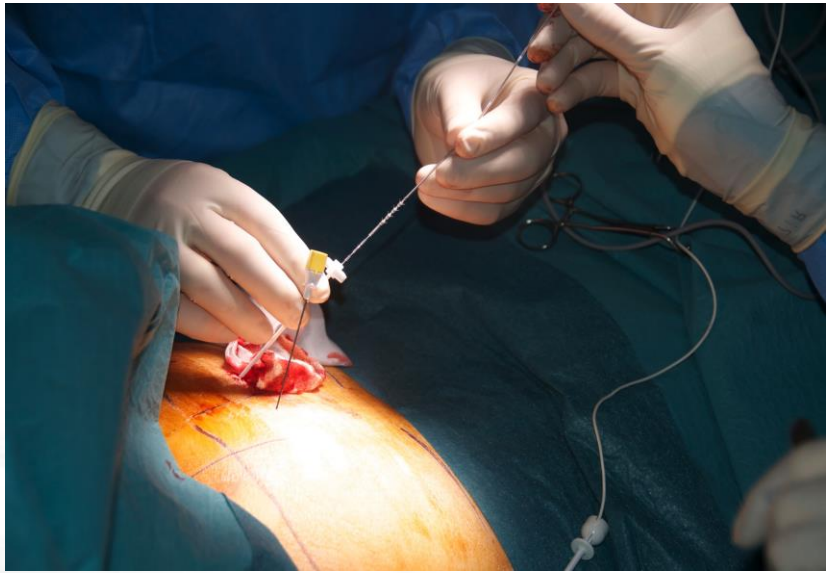
➢ Ideal position for SNM



Durchführung Test III

Implantation of tined lead (def. elektrode)

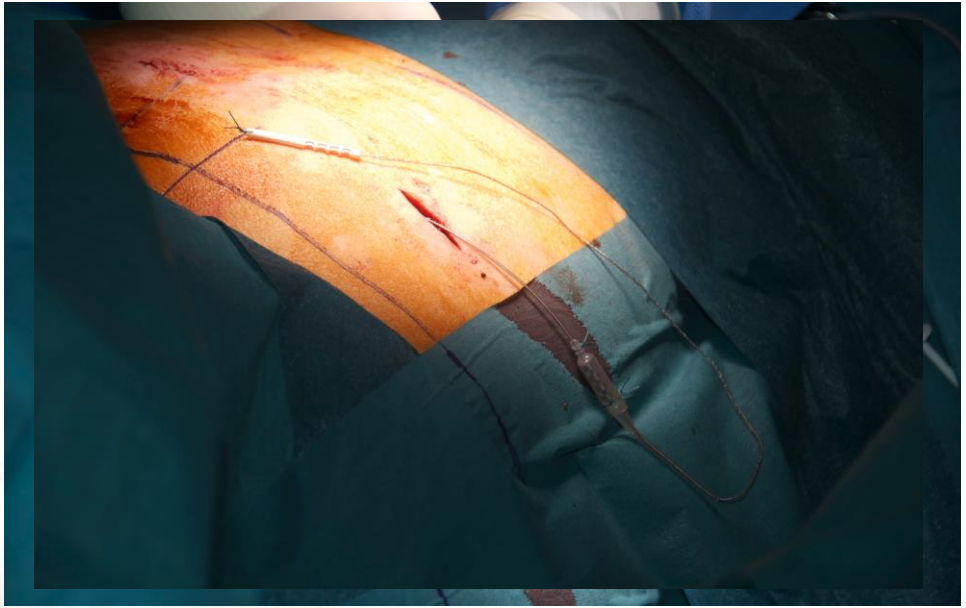
- Bring in a trocar via a guide-wire
- Positioning of trocar
- Bring in tined lead
- Positioning using:
  - Radiological and
  - Electronical control



Durchführung Test IV

- Dissect a „pocket“
- Tunneling, bring in transparent protection
- Push/guide tinead lead in the „pocket“

SNM Test V



- Connection to extension

Test VI

- Bring the extension to the left side of the buttocks
- Closure of the wounds

Influence of SNM on sensitivity/capacity

- There is good evidence, that
- SNM:
  - Lowers sensitivity of rectum
  - Elevates rectal volumes
  - Increases retrograde „movements“of colon
  - Decreases antegrade propulsions
  - Influences continence on a afferent/central neurological level

⇨ Might be the ideal treatment of LARS

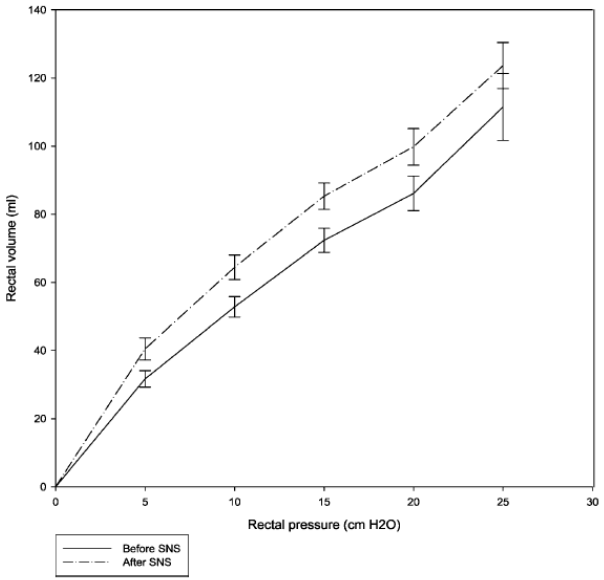


Figure 1. Rectal pressure-volume curves before and after sacral nerve stimulation. Values are shown as means and standard error of the means. SNS = sacral nerve stimulation.

1. Michelsen HB, Buntzen S, Krogh K, Laurberg S. Rectal volume tolerability and anal pressures in patients with fecal incontinence treated with SNM. Dis Colon Rectum. 2006
2. Vaizey CJ, Kamm MA, Turner IC, Nicholls RJ, Woloszko J. Effects of short term sacral nerve stimulation on anal and rectal function in patients with anal incontinence. Gut. 1999
3. Michelsen HB, Christensen P, Krogh K, et al. Sacral nerve stimulation for faecal incontinence alters colorectal transport. Br J Surg. 2008;95:779-784.
4. Carrington EV, Evers J, Grossi U, et al. A systematic review of sacral nerve stimulation mechanisms in the treatment of fecal incontinence..... Neurogastroenterol Motil. 2014

SNM for LARS

- It helps for incontinence in LARS patients in a systematic review[1] (success: 74,4%)
- It helps against the other LARS symptoms[2] in 2/3 (urgency, fragmentation, soiling)
- So far:
  - Only 7 studies
  - Very low numbers (total: 43 patients)
- But it is the **only evidence** for surgical therapies of LARS[3]

Table 2 The treatment details of PNE and permanent device implantation.

Study	Number of patients	Number undergoing PNE	Number of stages	Anaesthesia type	PNE lead	Duration PNE	Indication for permanent implant	Follow-up duration
Matzel *et al.* [6]	1	1	3	GA	Unipolar electrode	16 days	> 50% improvement in continence	18 months
Jarrett *et al.* [7]	3	3	2	ND	Unipolar electrode	Minimum 10 days	> 50% improvement in continence	12 months
Ratto *et al.* [8]	4	4	2	ND	Unipolar electrode	14 days	> 70% reduction of incontinence symptoms	19.5 months
Holzer *et al.* [9]	7	7	2	GA	Unipolar electrode	14 days (12–21)	Improvement of continence	32 months (17–46)
de Miguel *et al.* [10]	15	14	3	LA	Unipolar electrode (2) Quadripolar electrode (12)	18 days (13–28)	50% reduction in number of days per week incontinence experienced	12 months (1–44)
Moya *et al.* [11]	4	4	3	ND	ND	4 weeks	> 50% improvement in continence	ND
Schwandner [12]	9	9	2	GA	Quadripolar electrode	28 days	Subjective symptom improvement	12 months

GA, general anaesthesia; LA, local anaesthesia, ND, not documented.

1. Ramage L, Qiu S, Kontovounisios C, Tekkis P, Rasheed S, Tan E. A systematic review of sacral nerve stimulation for low anterior resection syndrome. Colorectal Dis. 2015
2. Schwandner O. Sacral neuromodulation for fecal incontinence and "low anterior resection syndrome" following neoadjuvant therapy for rectal cancer. Int J Colorectal Dis. 2013
3. Martellucci J. Low Anterior Resection Syndrome: A Treatment Algorithm. Dis Colon Rectum. 2016;59:79-82.

Re-Do „LAR“/Stoma-Formation?

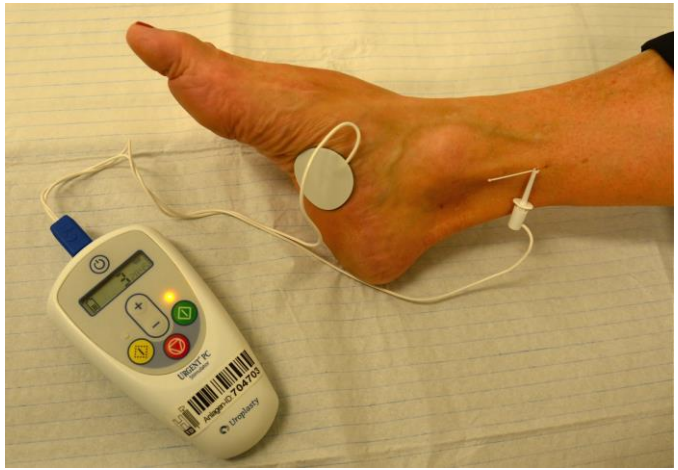
Re-Do „LAR“

- Jochen Lange: Du musst alles resezieren und neu anlegen!
- Why not?
  - Damage has already been done!
  - Impairement of nerves will not ameliorate
  - „stronger propulsions etc.“ of neorectum will persist
  - Risk of new damage and complications
- In the literature there is not one single case of LARS treated like that!

Definitive stoma-formation

- QoL after LAR and APR are the same![1]
- So that might be the ultimate solution[2]

1. Fischer A, Tarantino I, Warschkow R, Lange J, Zerz A, Hetzer FH. Is sphincter preservation reasonable in all patients with rectal cancer? Int J Colorectal Dis. 2010;25:425-432.
2. Martellucci J. Low Anterior Resection Syndrome: A Treatment Algorithm. Dis Colon Rectum. 2016;59:79-82.



pTNS: percutaneous tibial nerve stimulation

- Percutaneous stimulation of the tibial nerve with a needle
- **Modificated Stoller scheme:**

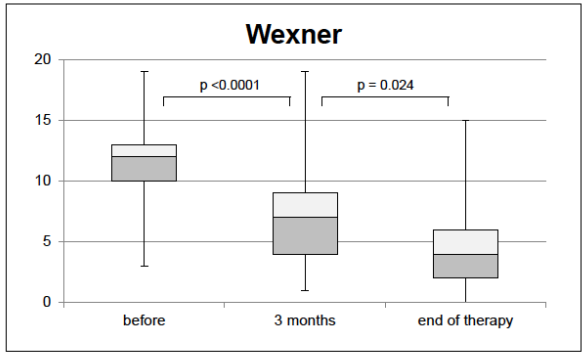
Time of stimulation:	30 min
Therapy:	1x/week for 3 months
Maintenance therapy:	2x/months for 6 months
Total time of therapy:	9 months

- **Successful** in prospective case series for fecal incontinence[1]
- **No difference** of efficacity against sham in multicenter RCT[2]
- More successful in **urge** than passive faecal incontinece[3]

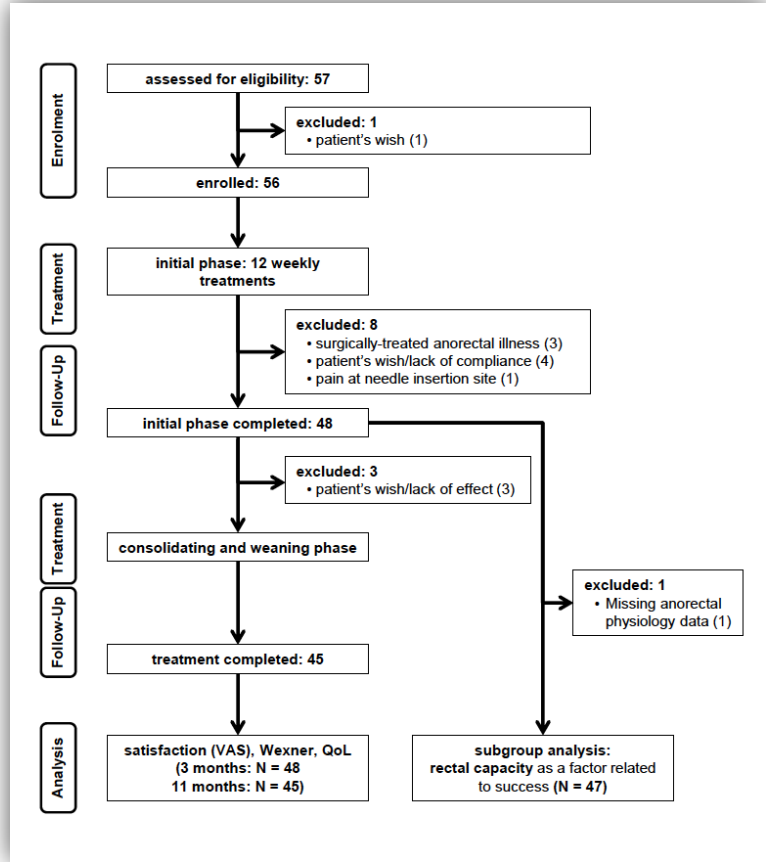
1. Horrocks EJ, Thin N, Thaha MA, Taylor SJ, Norton C, Knowles CH. Systematic review of tibial nerve stimulation to treat faecal incontinence. Br J Surg. 2014
2. Knowles CH et al. Percutaneous tibial nerve stimulation versus sham electrical stimulation for the treatment of faecal incontinence multicentre RCT (CONFIDeNT) Lancet. 2015
3. Hotouras A, Thaha MA, et al. Short-term outcome following percutaneous tibial nerve stimulation for faecal incontinence: a single-centre prospective study. Colorectal Dis. 2012

pTNS, own results....

- Only urge faecal incontinent patients, very successful
- **No influence** rectal sensitivity/capacity



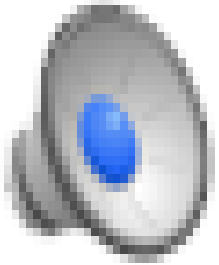
⇨ Value in LARS **unclear**



Lukas Marti MD[1,2], Christian Galata MD[2], Ulrich Beutner PhD[1], Franc Hetzer MD[3], Nicoletta Pipitone MD[1], Katja Wolff MD[1], Walter Brunner MD[1], Michael Christian Sulz MD[4], Jan Borovicka MD[4], Christine Maurus MD[1]: **Percutaneous tibial nerve stimulation (pTNS): Is it worthwhile and does rectal capacity or a change thereof impact its success?** ***Under review***

Magnetic sphincter

- In faecal incontinence[1] (worldwide n=300):
  - Improvement in 70%
  - Explantation in 10-20% due to infection
- Implantation after R(C)Tx not allowed....
- Newly FDA approved
- We implanted 3 so far, next to come 10th march
- LARS:????



1. Barussaud ML, Mantoo S, Wyart V, Meurette G, Lehur PA. The magnetic anal sphincter in faecal incontinence: is initial success sustained over time? Colorectal Dis. 2013

Possible algorithm LARS

- Multimodal conservative therapy
- Consider preventive therapy
- Not successful enough:

⇨ **Try SNM**

- If not ready for it: *pTNS*
- Soiling: *Bulking agents inj.*
- No RTx, incontinence: *Magnetic spincter*
- Ultima ratio: *stoma…*

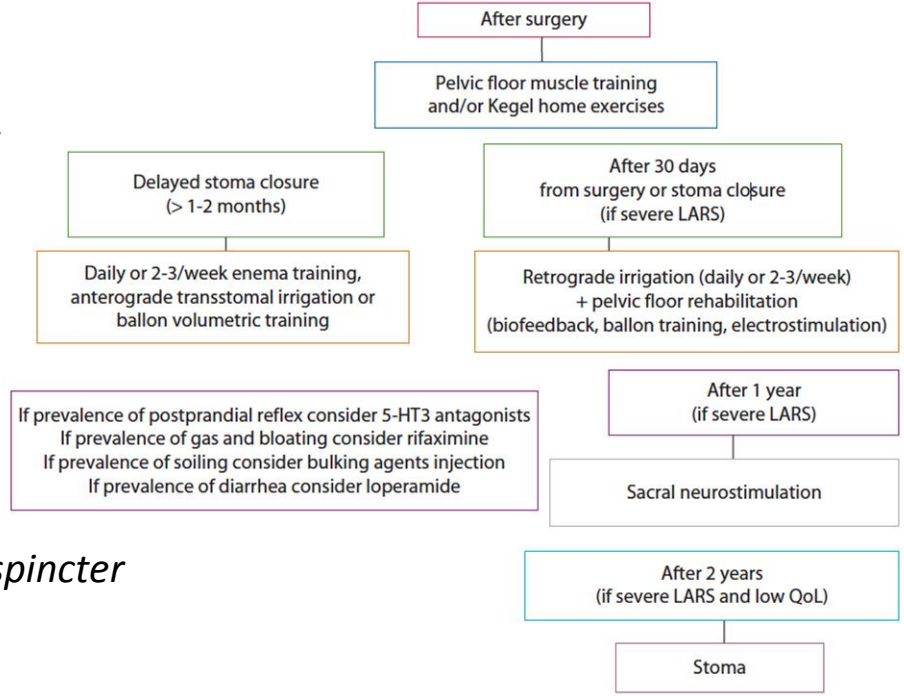
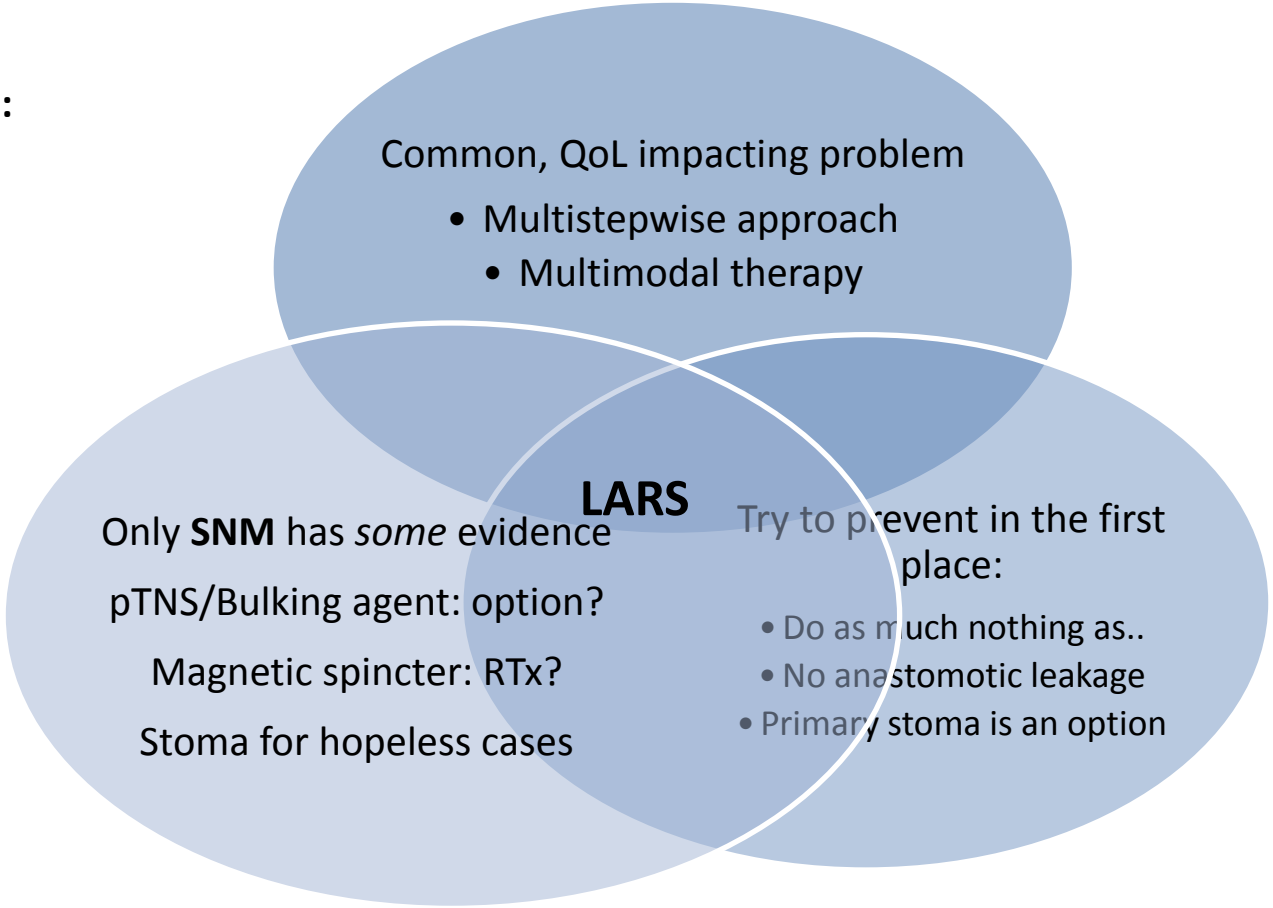


Figure 1. Treatment algorithm. LARS = low anterior resection syndrome; QoL = quality of life.

Conclusion:


Common, QoL impacting problem
• Multistepwise approach
• Multimodal therapy
LARS
Only **SNM** has *some* evidence
pTNS/Bulking agent: option?
Magnetic spincter: RTx?
Stoma for hopeless cases
Try to prevent in the first place:
• Do as much nothing as..
• No anastomotic leakage
• Primary stoma is an option

Thank you for your attention

coloproctology
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Results: Satisfaction, QoL, functional outcome

- Median Satisfaction (Likert scales)
  no relapse 8.5 (7 - 10)
  relapse 7 (6 - 8.8) *p 0.038 A)*

- Median Re-election of operation (Likert Scales)
  no relapse 9 (8 - 10)
  relapse 6 (5 - 8) *p 0.001 A)*

- Qualitiy of life (FIQL Score)
  no relapse 3.5/3.2/3.6/3.6
  relapse 3.2/2.9/3.5/3.3 *p<0.001 A)*

- Relief of ODS in 15 of 21 patients (71.4%)

- Mean Wexner score decreased (p<0.001)
  preoperative 9.7 ± 6.7
  postoperative 4.4 ± 4.7

A) Mann – Whitney U-Test

Results: functional outcome

Table 4 Outcomes at follow-up

		Total (N=42)	No relapse (N=24)	Relapse (N=18)	P
Medication	No	16 (38.1 %)	9 (37.5 %)	7 (38.9 %)	0.672 A)
	Congesting	16 (38.1 %)	8 (33.3 %)	8 (44.4 %)	
	Laxatives	10 (23.8 %)	7 (29.2 %)	3 (16.7 %)	
Abdominal Problems	No	38 (90.5 %)	21 (87.5 %)	17 (94.4 %)	0.515 B)
	Yes	4 (9.5 %)	3 (12.5 %)	1 (5.6 %)	
Incontinence	No	18 (42.9 %)	13 (54.2 %)	5 (27.8 %)	0.101 B)
	Yes	24 (57.1 %)	11 (45.8 %)	13 (72.2 %)	
Wexner score	Median (IQR)	6.5 (2.0-9.0)	5.0 (1.5-9.0)	7.5 (3.8-9.0)	0.315 C)
at follow-up	Mean (SD)	6.1 (4.4)	5.8 (5.1)	6.6 (3.3)	
Likert scales (0 to 10):					
Satisfaction with	Median (IQR)	8.0 (6.2-9.0)	8.5 (7.0-10.0)	7.0 (6.0-8.8)	0.038 C)
Operation	Mean (SD)	7.7 (1.9)	8.3 (1.7)	7.0 (2.1)	
Re-election of	Median (IQR)	8.0 (6.0-10.0)	9.0 (8.0-10.0)	6.0 (5.0-8.0)	0.001 C)
Operation	Mean (SD)	7.7 (2.1)	8.7 (1.5)	6.4 (2.0)	
General	Median (IQR)	8.0 (7.2-9.0)	8.0 (7.0-9.0)	8.0 (8.0-9.0)	0.886 C)
Quality of life	Mean (SD)	8.1 (1.5)	8.1 (1.6)	8.1 (1.4)	
FIQL scores:					
Lifestyle	Median (IQR)	3.3 (3.2-3.5)	3.5 (3.3-3.6)	3.2 (3.1-3.3)	<0.001 C)
	Mean (SD)	3.3 (0.3)	3.5 (0.3)	3.2 (0.3)	
Coping	Median (IQR)	3.1 (2.9-3.2)	3.2 (3.1-3.3)	2.9 (2.8-3.0)	<0.001 C)
	Mean (SD)	3.1 (0.4)	3.2 (0.4)	2.9 (0.2)	
Depression	Median (IQR)	3.6 (3.5-3.7)	3.6 (3.6-3.7)	3.5 (3.5-3.6)	<0.001 C)
	Mean (SD)	3.6 (0.2)	3.6 (0.2)	3.5 (0.1)	
Embarrassment	Median (IQR)	3.4 (3.3-3.6)	3.6 (3.4-3.7)	3.3 (3.2-3.3)	<0.001 C)
	Mean (SD)	3.4 (0.3)	3.6 (0.3)	3.2 (0.3)	

A) Monte Carlo simulated Chi-Square Test B) Mid-p test C) Mann-Whitney U-test

Results: Postoperative incontinence, Wexner score & ODS

		Total (N=64)	No relapse (N=45)	Relapse (N=19)	P
Incontinence postoperatively	No	29 (45.3 %)	17 (37.8 %)	12 (63.2 %)	0.072 A)
	Yes	35 (54.7 %)	28 (62.2 %)	7 (36.8 %)	
	Temporary	9 (14.1 %)	9 (20.0 %)	0 (0.0 %)	0.036 B)
	Declining	6 (9.4 %)	6 (13.3 %)	0 (0.0 %)	
	Permanent	20 (31.2 %)	13 (28.9 %)	7 (36.8 %)	
ODS postoperatively	No	57 (89.1 %)	40 (88.9 %)	17 (89.5 %)	0.981 A)
	Yes	7 (10.9 %)	5 (11.1 %)	2 (10.5 %)	
Wexner Score postoperatively	Median (IQR)	3.0 (0.0-9.0)	5.0 (0.0-9.0)	0.0 (0.0-8.0)	0.218 C)
	Mean (SD)	4.4 (4.7)	4.8 (4.5)	3.4 (5.2)	

A) Mid-p test B) Monte Carlo simulated Chi-Square Test C) Mann-Whitney U-test