BLADDER DYSFUNCTION AND FECAL INCONTINENCE AFTER COLORECTAL SURGERY

The Problem.

The goal of treatment of patients with rectal carcinoma is first and foremost oncologic cure. In order to accomplish this goal patients are usually treated by both surgical and radiological means.

Currently with combined therapy, cure rates of 46-62% for primary locally advanced lesions and 19-21% for recurrent lesions are achieved.

However, treatment is not with out significant morbidity. In order to obtain these cure rates wide resection is necessary. Often at the expense of the autonomic nerves which innervate the pelvic viscera or at the expense of the anal sphincters

The result can be significant urogenital morbidly and fecal incontinence

The neuro anatomy.

There are 4 major nerve complexes that are involved in normal genitourinary function which can be damaged during dissection

1) The pelvic splanchnic nerves. These provide the parasympathetic (S2-S4) inervation to the pelvic organs. They control the detrusor and thus micturition, and are also involved in erectile function. These nerves run from the sacrum, ventrally and laterally to join the sympathetic forming the inferior hypogastric complex and anteriorly to Denovilliers fascia. It is here that the nerves are most easily damaged. Damage to these nerves can result in erectile dysfunction or neurgenic bladder.

2) The superior hypogastric plexus. This provides sympathetic inervation (L3-S1). These run parallel with the ureters and join the inferior hypogastric complex. Damage of this plexus can occur at the origin of the inferior mesenteric artery, laterally to the rectum or near the posterior wall of the prostate. Damage will result in an incompetent bladder neck and difficulty with ejaculation.

3) The inferior hypogastric plexus is the joining of the superior hypogastric plexus and parasympathetic plexus.

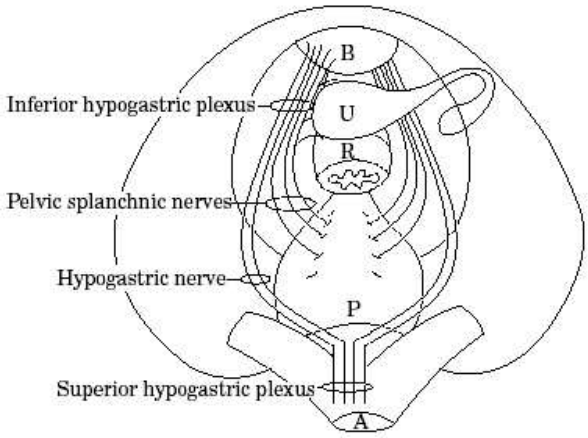
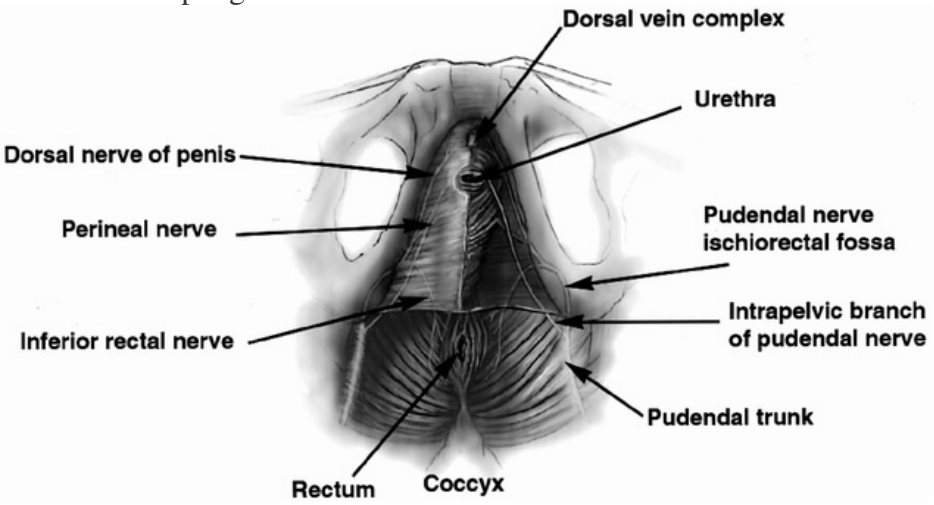


Fig. 1. Schematic representation of the main autonomic nerves in the female pelvis. A: abdominal aorta, B: bladder, P: sacral promontory, R: rectum, U: uterus.

Eur J Surg Oncol. 2000 Dec;26(8):751-7.

4) The pudendal nerves S2-S4. This is the somatic component it runs through the pudendal canal and innervates the external anal and urinary sphincter, ischiocavernosus and bulbospongiosus.



Dis Colon Rectum. 2000 Oct;43(10):1390-7.

The Results:

GU disturbances are due mostly to damage of the pelvic autonomic nerves.

Table 3 Questionnaire urogenital dysfunction in locally advanced primary and locally recurrent rectal cancer

	Locally advanced primary rectal cancer					Locally recurrent rectal cancer				
	Preoperative		Postoperative		*P* value	Preoperative		Postoperative		*P* value
	n	%	*n*	%		*n*	%	*n*	%	
Voiding dysfunction	1/34	3	15/34	44	0.000	7/32	22	18/32	56	0.001
Hypotone bladder requiring catheterization	0/32	0	6/32	19	0.03	0/33	0	3/33	9	0.3
Hypotone bladder not requiring catheterization	1/32	3	13/32	41	0.000	3/32	9	11/32	34	0.008
LUTS	2/34	6	17/34	50	0.000	12/32	38	25/32	78	0.001
Urgency	2/31	6	18/31	58	0.000	9/32	28	21/32	66	0.002
Incontinence	2/32	6	13/32	41	0.001	8/31	26	16/31	52	0.02
Sexual activity	27/34	79	11/34	32	0.000	23/34	68	11/34	32	0.000
Ability to have orgasm	29/30	97	16/30	53	0.000	23/32	72	10/32	31	0.000
Experience of pain/discomfort during intercourse	2/15	13	6/15	40	0.1	1/12	8	5/12	42	0.1
Ability to achieve normal erection	18/18	100	8/18	44	0.002	15/19	79	7/19	37	0.008
Ability to ejaculate	20/21	95	5/21	24	0.000	14/20	70	2/20	10	0.000
Quality of orgasm (mean on 5 cm VAS)	3.0	60	1.4	28	0.000	2.5	50	1.1	22	0.000
Quality of erection (mean on 5 cm VAS)	3.3	66	0.7	14	0.000	2.7	54	0.5	10	0.000

Eur J Surg Oncol. 2001 Apr;27(3):265-72.

Bauer JJ, et al. Ann Surg. 1983 Mar;197(3):363-7. Found out of 135 males with TPC for benign disease, only 3% had long lasting sexual dysfunction. 1.5% had retrograde retrograde ejaculation, 1.5% were temporally impotent. 1.3% of female patients had temporary dyspareunia.

Nerve spearing procedures can avoid GU dysfunction. Identification of the autonomic nerves during surgery has a positive effect

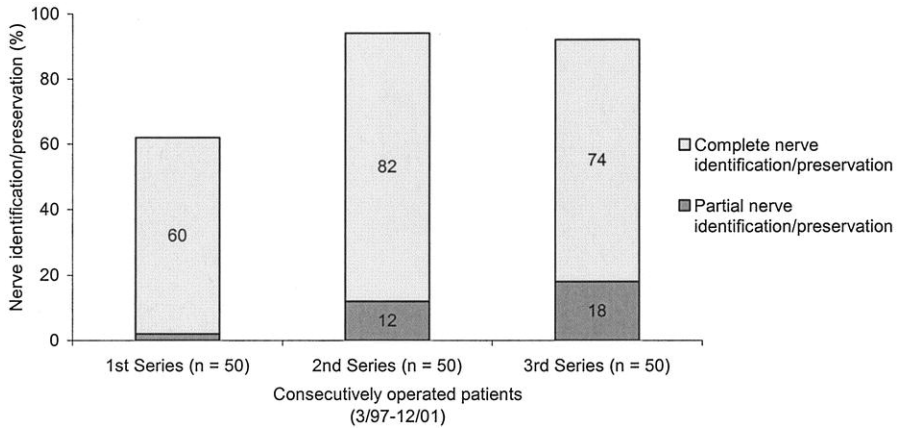


Figure 1. Frequency of identification and preservation of pelvic autonomic nerves after mesorectal excision for rectal carcinoma.
From: Junginger: Dis Colon Rectum, Volume 46(5).May 2003.621-628

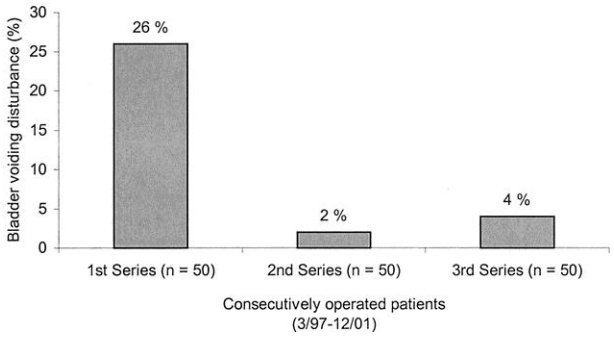


Figure 2. Frequency of bladder voiding disturbance after mesorectal resection for rectal carcinoma requiring catheterization.
From: Junginger: Dis Colon Rectum, Volume 46(5).May 2003.621-628

Fecal incontinence can have many causes

(1) sphincter damage

(2) pudendal neuropathy and other neurological disease

(3) diminished rectal compliance

(4) faecal impaction causing paradoxal diarrhea

(5) diarrhea.

Fecal Incontinence is not an unheard of complication of colorectal surgery

Permanent incontinence	Number of patients
Solid stool	2 out of 31 (6.5%)
Liquid stool	5 out of 31 (16.1%)
Flatus	9 out of 31 (29.0%)
Life style alteration	13 out of 31 (41.9%)

Colorectal Disease 5 (3), 214-217.

Ramussen et al, Colorectal Dis. 2003 May;5(3):258-61. Rectal function following rectal resection was studied in 43 patients using clinical data and rectal manometry

"The results of this study show that only half the patients were completely continent following low anterior resection…Patients with a very low anastomosis have an increased risk of fecal incontinence."

This was comparable to other studies, which show a 15-31% incontinence rate

Conclusion:

There is significant morbidity associated with colorectal surgery. Damage to the autonomic nerves can result in sexual and urinary problems. An effort to avoid these nerves, critical to the quality of life, is helpful but by no means a perfect way of preserving GU function.

Fecal incontinence is also morbidity associated with LAR, the lower the resection the higher the chance of incontinence. This time the cause is likely damage to the anal sphincters and not the pudendal nerves whose path runs out side of the surgical field.

The good news is that both incontinence and GU morbidity get better with time.

However when discussing with patients surgical options for cancer treatment. These morbidities should also be discussed so that they are not unexpected should they occur post-operatively.

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