



Robotic Radical Cystectomy and intracorporeal diversion: Where do we stand?



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- I have done open surgery for more than ... years
- I am doing robotic surgery for 17 years
- I try to do my best...

A Little bit of history...

En **1.874**, el Dr. Billroth, in Germany
Graduated in Berlin 1950
First excision of bladder cancer by suprapubic approach
First Cystectomy in **1887** (patient died in 14 days).



In **1923** : common diversion **ureterosigmoidostomy**
59 % Mortality rate

THE BOSTON Medical and Surgical JOURNAL

VOLUME 196

JUNE 23, 1927

NUMBER 25

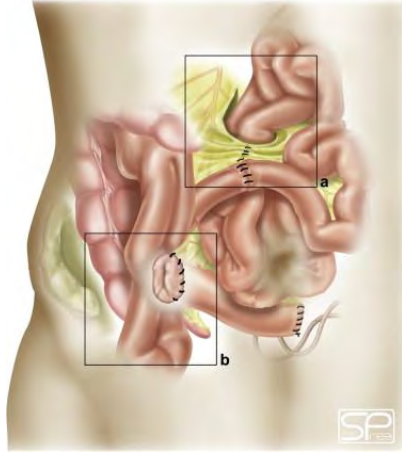
THE NEW ENGLAND BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION

A CASE OF TOTAL CYSTECTOMY FOR
CANCER*

BY GEORGE GILBERT SMITH, M.D., F.A.C.S.

tube. A catheter was passed into the rectum and the rectum opened at the reflection of the peritoneum. The ureteral tubes were fastened to the catheter and drawn out through the anus, leaving about 1 inch of free ureter projecting into the rectum. The

A Little bit of history...



In **1950**, Brickers´s loop (ileal conduit)



In **1958** Camey Neobladder

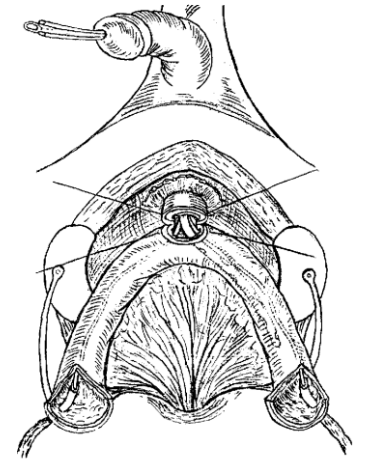
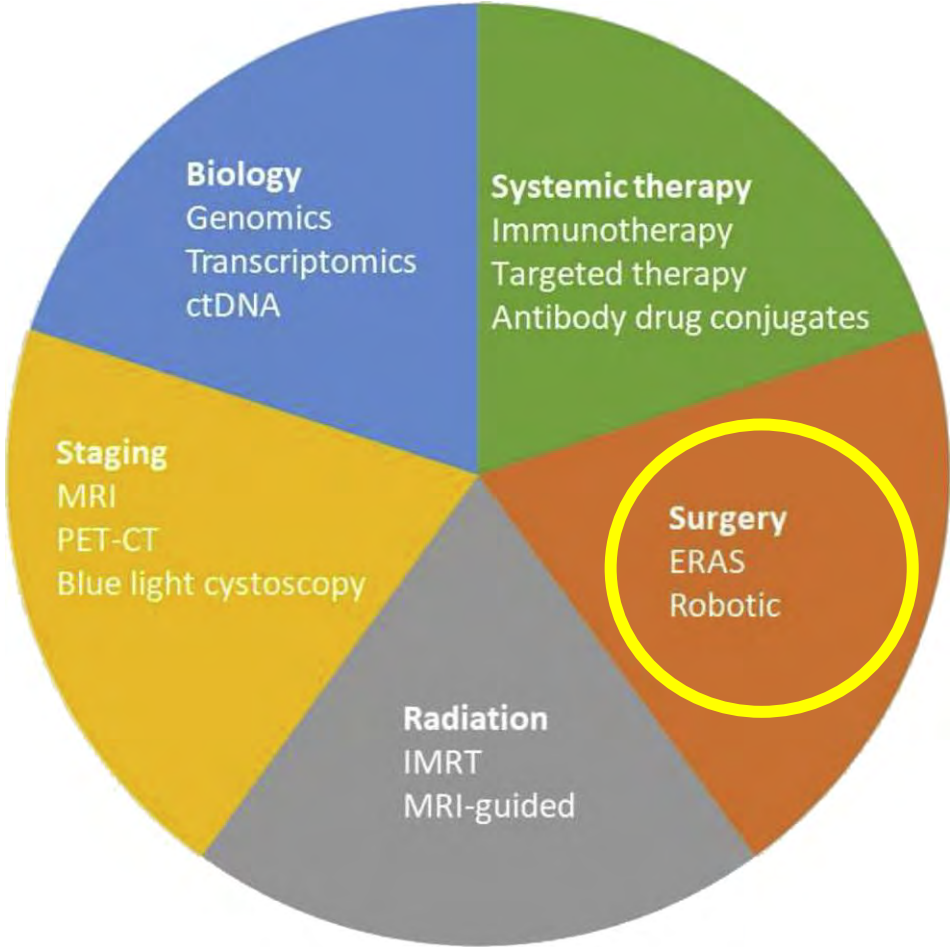


Fig. 2 The ileal loop, the antireflux implantation of the ureters, and

In **1985** Studer neobladder



Changes in the last 30 years in MIBC ?



Open vs robot-assisted radical cystectomy (BORARC): a double-blinded, randomised feasibility study



Patient and care doctor did not know the type of surgery during the early postop.

Response of the patient	Assigned intervention	
	ORC	iRARC
- ORC, n (%)	11 (44)	7 (28)
- iRARC, n (%)	7 (28)	12 (48)
- Do not know, n (%)	7 (28)	6 (24)

	ORC (n=25)	iRARC (n=25)	
Intraoperative			
Operation time, minutes, median (IQR)	136 (124–154)	263 (244–291)	Estimated median difference 123 min (95% CI 107;142), p<0.001
Estimated blood loss, ml, median (IQR)	850 (580–1100)	200 (75–300)	Estimated median difference 610 ml (95% CI 435;800), p<0.001



All cystectomies in Sweden january 2011 to December 2018

N= 889 RARC and 2280 open surgery
Propensity score matching

	ORC	RARC	P value
Derivation type (%)			
IC	89.2	79.2	< 0.001
OBS	7.5	20.3	
Estimated blood loss (ml)	700	150	< 0.001
Intraop. Blood transfusión (%)	38.7	7.7	< 0.001
Removed lymph nodes	14	20	< 0.001

Mortezavi et al, JAMA network open 2022



All cystectomies in Sweden january 2011 to December 2018
N= 889 RARC and 2280 open surgery
Propensity score matching

	ORC	RARC	P value
Clavien-Dindo Classification (%)			
I-II	27	33	
III	19	14.2	0.001
IV	3.1	2.2	
Reoperation (%)	12	9.4	0.05
Length of stay (days)	13	9	< 0.001
Rehospitalization in 90 days	26.1	34.3	< 0.001

Mortezavi et al, JAMA network open 2022



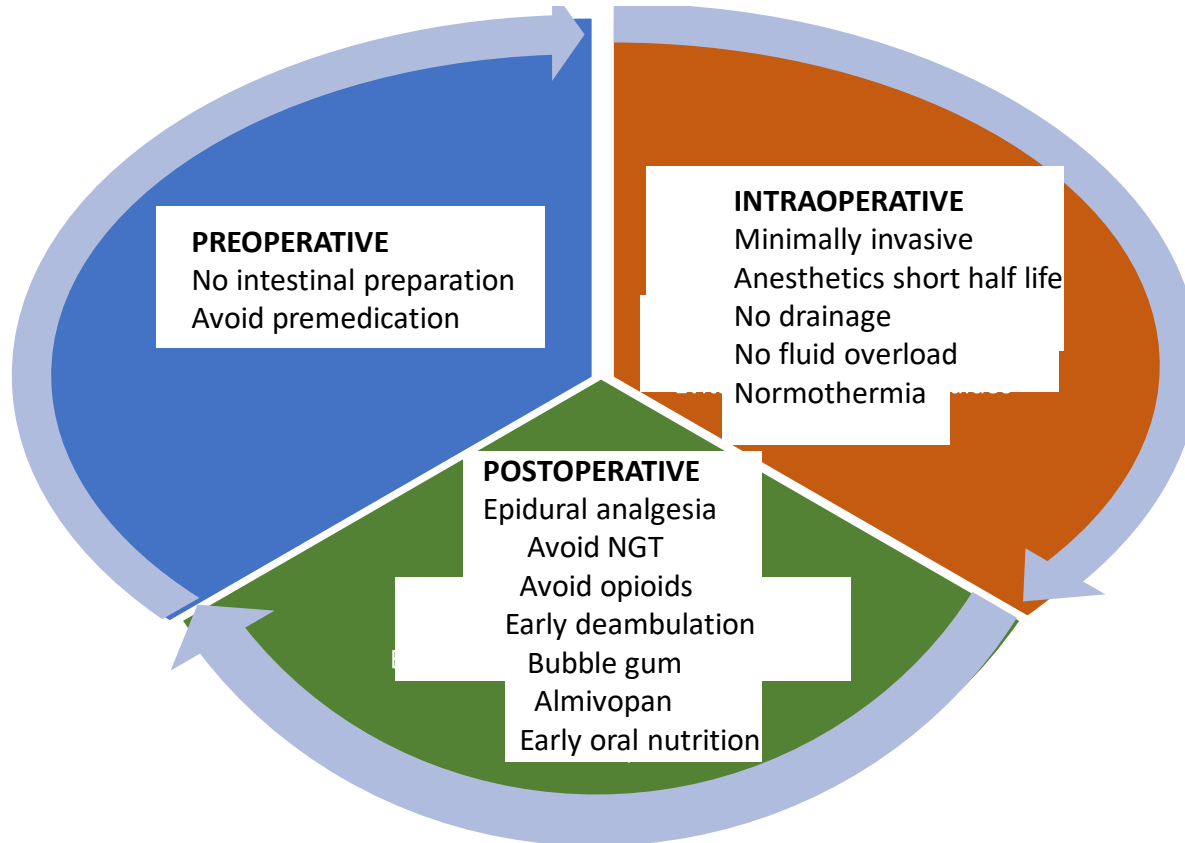
Complications	No. (%)		Difference, % (95% CI)
	Robotic cystectomy (n = 161)	Open cystectomy (n = 156)	
Type			
Gastrointestinal	46 (28.6)	44 (28.2)	0.37 (-9.54 to 10.25)
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Genitourinary ^b	19 (11.8)	17 (10.9)	0.9 (-6.19 to 7.94)
Wound	9 (5.6)	27 (17.3)	-11.72 (-18.59 to -4.58)
Neurological	7 (4.3)	10 (6.4)	-2.06 (-7.23 to 3.12)
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Pulmonary	7 (4.3)	4 (2.6)	1.78 (-2.55 to 6.04)
Surgical	6 (3.7)	3 (1.9)	1.8 (-2.2 to 5.72)
Miscellaneous ^c	4 (2.5)	9 (5.8)	-3.28 (-7.89 to 1.37)
Thromboembolic ^d	3 (1.9)	13 (8.3)	-6.47 (-11.43 to -1.38)

RARC:

- Less infection
- Less wound problems
- Less thromboembolic events

	RARC	ORC
Length of stay	7 days	8 days
Readmission	21.8 %	32.2 %
Cancer Recurrence	18 %	16 %
Overall mortality	14.3 %	14.7 %

Catto J et al, JAMA 2022





PREOPERATIVE VARIABLES: Patient

- Age
- Gender
- BMI
- Charlson-Romano score
- ASA score
- Renal function
- Organ confined disease
- Albumin
- Previous pelvis RT
- Prior abdominal surgery
- Prior chemotherapy
- Bowel preparation



PREOPERATIVE VARIABLES: Surgeon

Surgical volume (cystectomies per year per center; per surgeon)

Experience with open/lap/robotic surgery



- Create clear “anatomical spaces”: ANATOMY
- No traction in the dissection of the ureter (ICG)
- Dissection with or without preservation of neurovascular bundles
- Correct control of the bleeders
- Adequate selection and suture of the bowel
- Correct stoma placement (if ileal conduit)
- Closure of the abdominal wall



- A review of 44 papers
 - Males 76 %
 - OT 305-720 min
 - ICUD OT 124-553 min
 - EBL 200-900 ml
 - Clavien <3 29.4 %
 - Clavien >3 17.7 %

 - Potency 53.2 %
(10 papers)
 - Continence Day 84.2 %
(22 papers) Night 53.2 %



Ideal bladder substitution that maintains low pressure during the filling phase and has high compliance with good continence.

The reservoir should empty on voiding and protect the upper urinary tract:

Low pressure reservoir

No post void residual urine

Continence

No bacteriuria



Bowel configuration of the neobladder

Prostate apex and “external sphincter” preservation

Nerve sparing cystectomy

Management of bacteriuria

Control of Base excess

Neobladder: Karolinska Studer modified technique

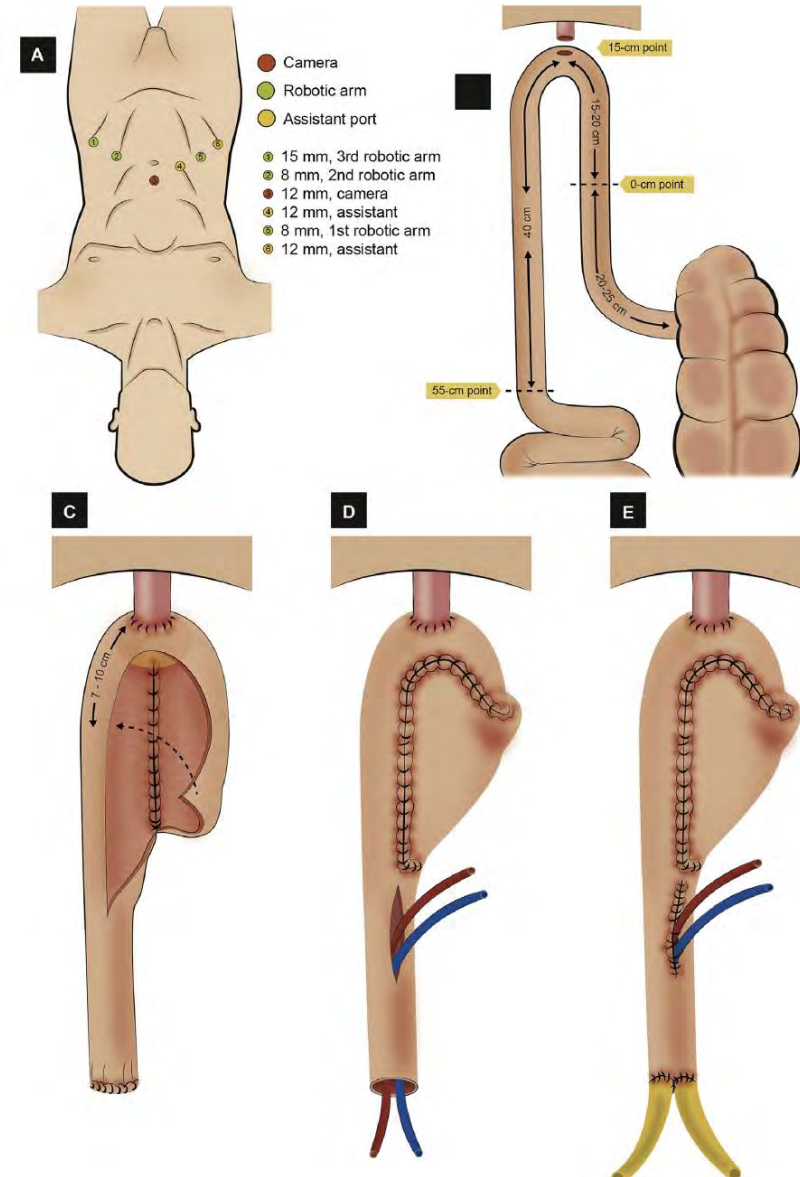


J-configuration and a urethro-ileal anastomosis is performed.

The ileum is **detubularized** and the posterior plate is closed.

The anterior wall of the neobladder is folded to close the neobladder anteriorly with absorbable sutures.

Uretero-ileal anastomosis is performed at the afferent limb in a **Wallace** fashion.

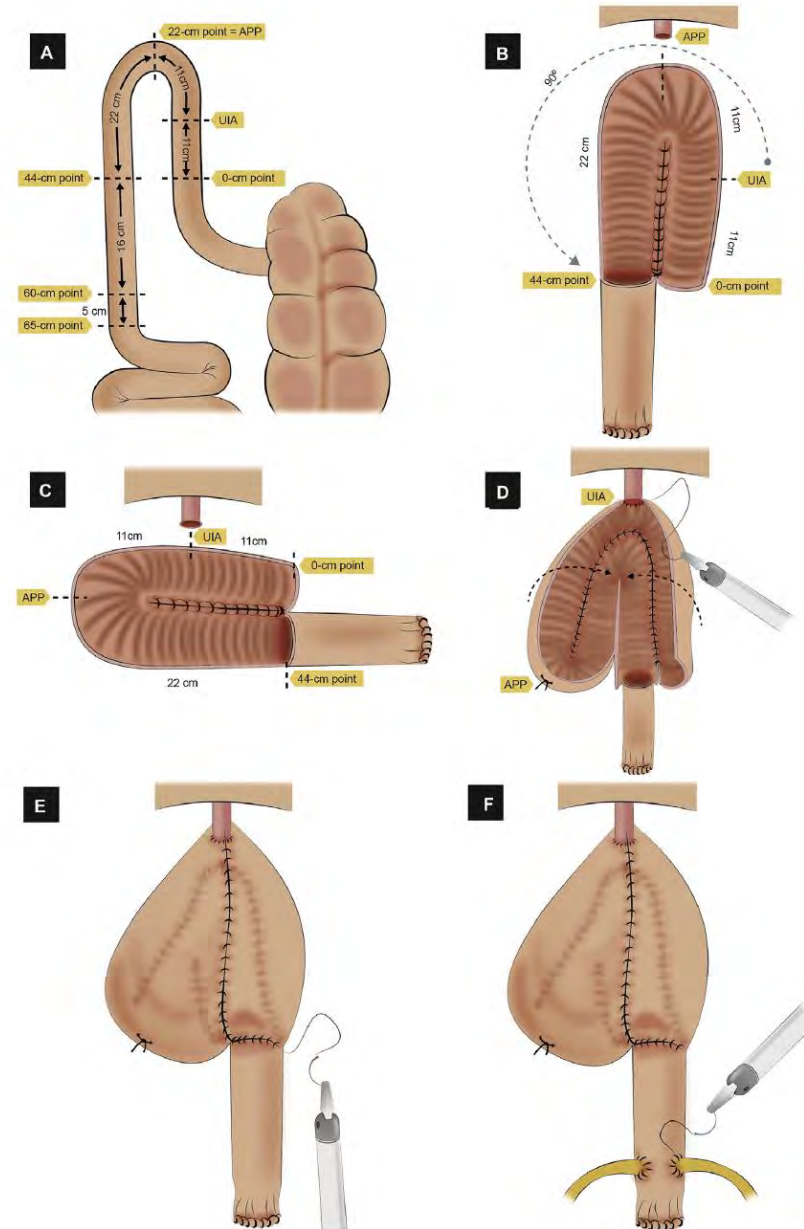




An isolated 44-cm segment of ileum is **detubularized**, 15 cm being preserved for the afferent limb.

The posterior plate is closed with absorbable sutures and **rotated 90° counterclockwise**.

A **urethro-ileal anastomosis** is performed and the anterior suture line is closed, followed by a **uretero-ileal anastomosis** with the **Bricker technique**



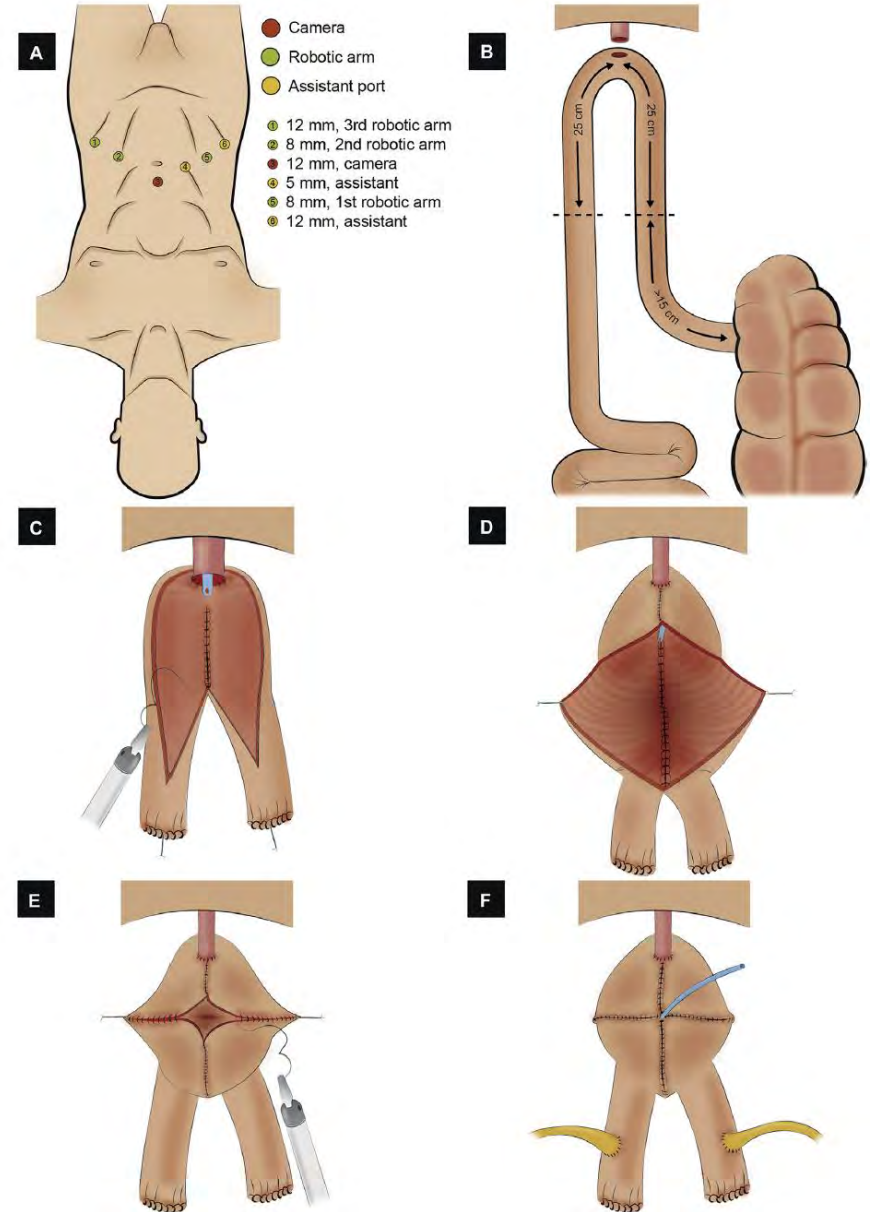
Neobladder: Pyramid pouch technique



Urethro-ileal anastomosis is performed, followed by **detubularization** of the ileum at its antimesenteric border.

The posterior and anterior plates are then closed with absorbable sutures, and the folded edge of the neobladder is closed from lateral to medial.

A uretero-ileal anastomosis is performed according to **Bricker**.





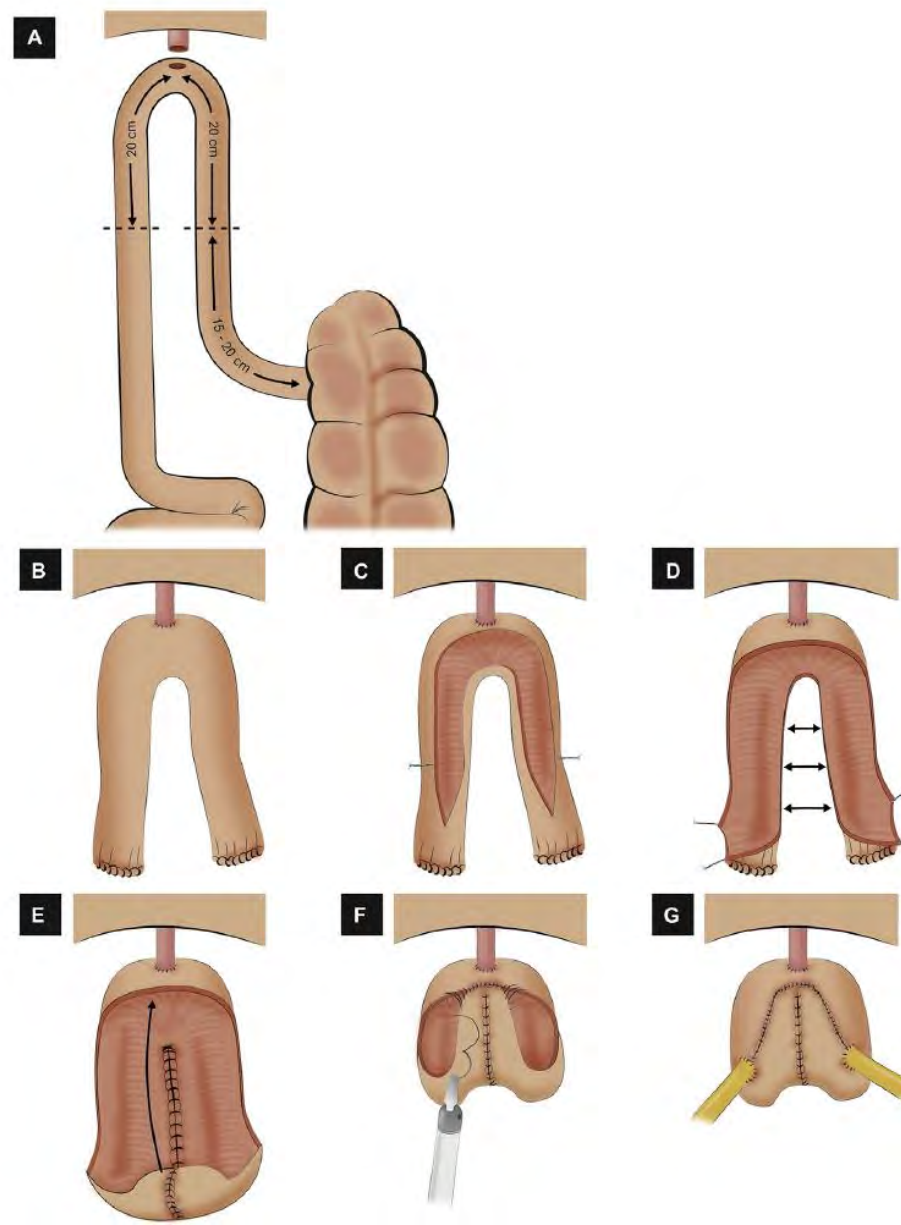
Neobladder: Y pouch technique

A 40-cm ileal segment is isolated and it is arranged in a **Y-shape**, with two central 14-cm segments and two 6-cm limbs.

The two central segments are brought together and **detubularized** and inserted through an opening made at the lowest point of the neobladder on its anti-mesenteric border.

Then the Y-neobladder is **anastomosed to the urethra**.

The ureters with a ipsilateral **Bricker technique**.

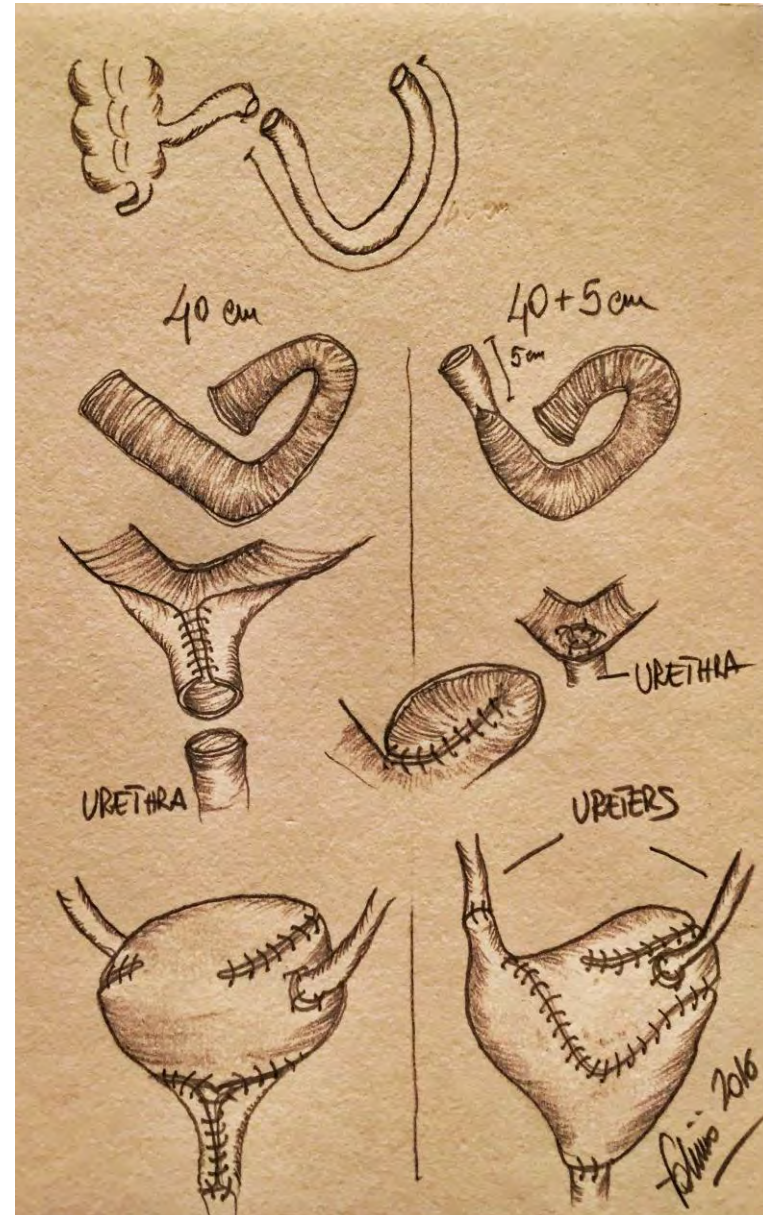




The ileal segment is incised and **urethro-intestinal anastomosis** is done.

The proximal loop is folded in a **reverse "S"** configuration and is created an ileal cup. The anterior aspect is then folded downward.

The ureters anastomosed with the **ipsilateral Bricker Technique**.





Common features: Detubularized ileum

Type of NB	U-NB anastomosis	Afferent limb	Ureteral anastomosis	Side of the ureteric anastomosis	Morphology
Karolinska	Initially	Yes	Wallace	Unilateral	J
USC	Intermediate	Yes	Bricker	Unilateral	90° Rotation
Pyramid	Initially	Yes	Bricker	Ipsilateral	Pyramid
Y Pouch	Initially	No	Bricker	Ipsilateral	Y
Padovana	Initially	No	Bricker	Ipsilateral	S



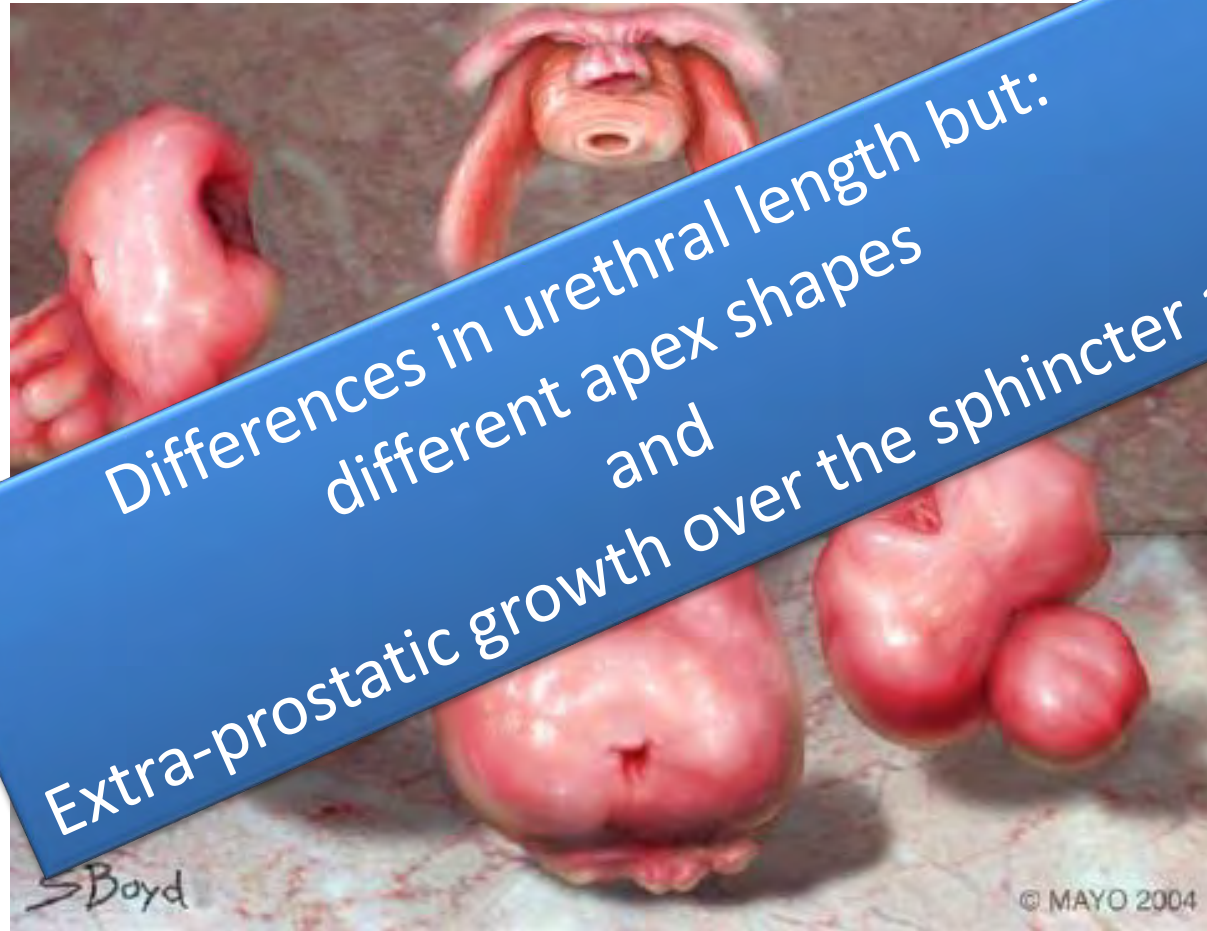
High mortality rates after radical cystectomy: we must have acceptable protocols and consider the rationale of cutaneous ureterostomy for high-risk patients

Author	N	IHM	30-day	90-day	Setting
Barbieri, 2019, (14)	6,728	0.54%	-	-	Large volume academic centers
Udovicich, 2017, (15)	803	2.2%	-	-	Victoria state, Australia
Afshar, 2018, (12)	15,292		2.7%	7%	English database
Afshar, 2018, (19)			1.5%	4%	English database (after centralization program)
Waingankar, 2019, (1)	47,028		3.0%	8.2%	SEER, USA
Dell'Oglio, 2019, (16)	7,076	-	-	10.7%	SEER, USA
Timoteo, 2019, (18)	5,097	7.38%	-	-	DATASUS, Brasil
DATASUS, 2019	1,377	8.5%	-	-	DATASUS, state of SP
DATASUS, 2019	161	8.1%	-	-	DATASUS, institution 1, São Paulo
DATASUS, 2019	84	6.0%	-	-	DATASUS, institution 2, São Paulo
DATASUS, 2019	71	11.3%	-	-	DATASUS, institution 3, São Paulo
DATASUS, 2019	53	15.9%	-	-	DATASUS, institution 4, São Paulo
DATASUS, 2019	81	14.8%	-	-	DATASUS, suburban institutions of São Paulo

Country	Mortality (%)	At 90 months (%)
USA	0.54	
Australia	2.2	
UK	2.7	7
SEER data base	3	8.2 / 13.1
Spain	4.7	6.2



Apex shape/ intraprostatic sphincter



Differences in urethral length but:
different apex shapes
and
Extra-prostatic growth over the sphincter area



Patient selection:

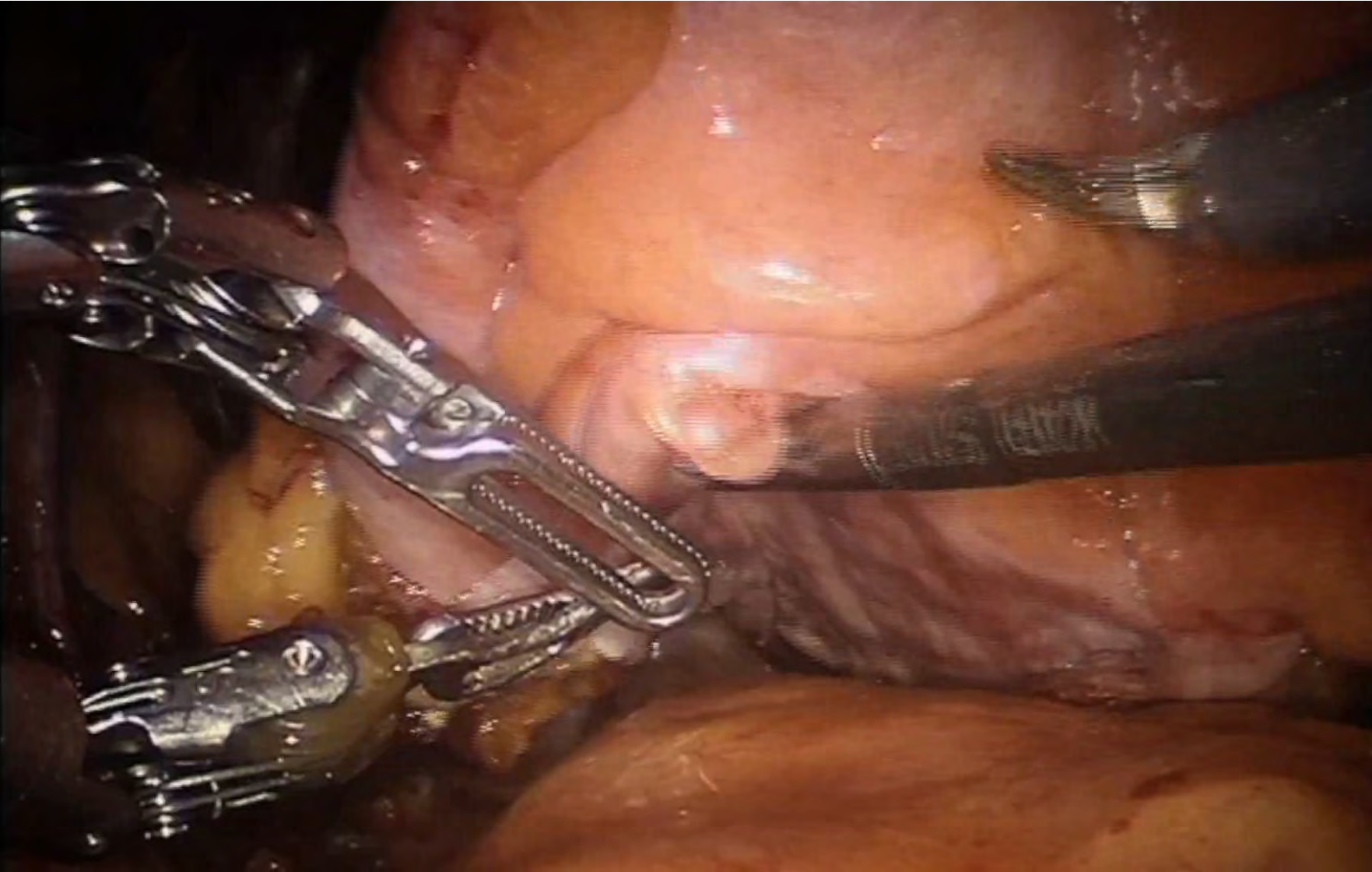
- Patients willing to preserve sexual function
- Preoperative sexual function
- Organ confined disease

Hernandez V et al, Urol Oncol 2017

- In patients candidates to neobladder
- Intraoperative Urethral margin negative for urothelial cell carcinoma

Do not offer sexual preserving cystectomy as a standard therapy for MIBC

EAU Guidelines Muscle Invasive and Metastatic BC 2019





- 180 patients who survived > 10 y
 - NNS 13%
 - Unilateral NS 56 %
 - Bilateral NS 31 %
- Most baselines characteristics did not differed between groups
- **The degree of nerve sparing progressively affected both daytime and night-time continence**

Variable	Univariate		Multivariable	
	OR (95% CI)	P	OR (95% CI)	P
Age	1.03 (1.00–1.06)	0.048	1.03 (1.003–1.061)	0.03
Female	1.15 (0.47–2.83)	0.8	1.28 (0.50–3.23)	0.6
Body mass index	1.04 (0.99–1.10)	0.2	1.05 (0.99–1.11)	0.1
Charlson-Age Comorbidity Index ≥ 2	1.11 (0.73–1.70)	0.6	0.98 (0.64–1.51)	>0.9
Pathological stage				
$\leq T1$	Reference	–	Reference	–
T2	0.92 (0.59–1.43)	0.7	0.93 (0.60–1.46)	0.8
T3a	0.91 (0.51–1.60)	0.7	1.07 (0.59–1.92)	0.8
NS status				
No NS	Reference	–	Reference	–
Any NS	2.08 (0.91–4.76)	0.05	2.51 (1.08–5.85)	0.03
Unilateral NS	1.84 (0.79–4.28)	0.15	2.25 (0.96–5.31)	0.06
Bilateral NS	2.63 (1.10–6.25)	0.03	3.49 (1.40–8.68)	0.007



Oncological safety:

- No evidence that oncological results are compromised
- No evidence of unusual metastases

Potency results (nerve sparing only):

- Postoperative potency better with NS compared to controls (20-90% vs 0-4%)

Study ID	Postoperative sexual function assessment				Sexual outcomes-potency			
	Time frame (mo)	Questionnaire	Self-impression	n evaluated (intervention vs. control)	Intervention	Control	P	Treatment ED
<i>nerve sparing</i> Vilaseca et al. [20]	NR	Yes, EHS	No	30 (9–21)	77.8%	4.5%	<0.001	100% intervention, 23.0% control (PDE-5)
El-Bahnasawy et al. [21]/Hekal et al. [22]	12	Yes, IIEF-5	No	21	78.8%	0%	<0.05	21.0% PDE-5
Kessler et al. [7]	3–24	Yes, NR	Yes	331 (256–75)	77.0%	–	<0.001	8.0% PDE-5, 16.0% PG
Jacobs et al. [23] (NS group)	12	Yes, BCI	Yes	20	45.0%	–	–	–
Colombo et al. [24] (NS group)	24	Yes, IIEF-5	Yes	35	28.6%	–	–	–

Complications and RARC: INFECTION



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Infectious complication: 25 %

Parker et al Urol Oncol 2016

Preop Bacteriuria

ATB Prophylaxis

ATB treatment

Postop fever : **Hospital**

Intrabdominal, Wound, IV, Lung,...

After discharge

Urinary tract (with or without catheters)

Diversion (ileal conduit, neobladder)

REMOVE URETERAL CATHETERS AND BLADDER CATHETER ASAP!!



Preop:

urine culture; preop ATB treatment if positive (3-5 days)

Intraop:

ATB prophylaxis + treatment if urine culture positive

Minimally invasive surgery

Consider wound drainage (Penrose 4 days)

Postop:

Hospital:

Control urine culture at 5 days

No ATB treatment if urine culture negative

After discharge:

Control urine culture if catheters or neobladder

Treat bacteriuria in neobladder

ATB for catheter removal (the day before and for 3 days)



Practical aspects

Avoid postvoid residual urine

Bladder scan/ Ultrasonography

(7-10 days after catheter removal)

If PVRU > 50 ml: start self catheterization

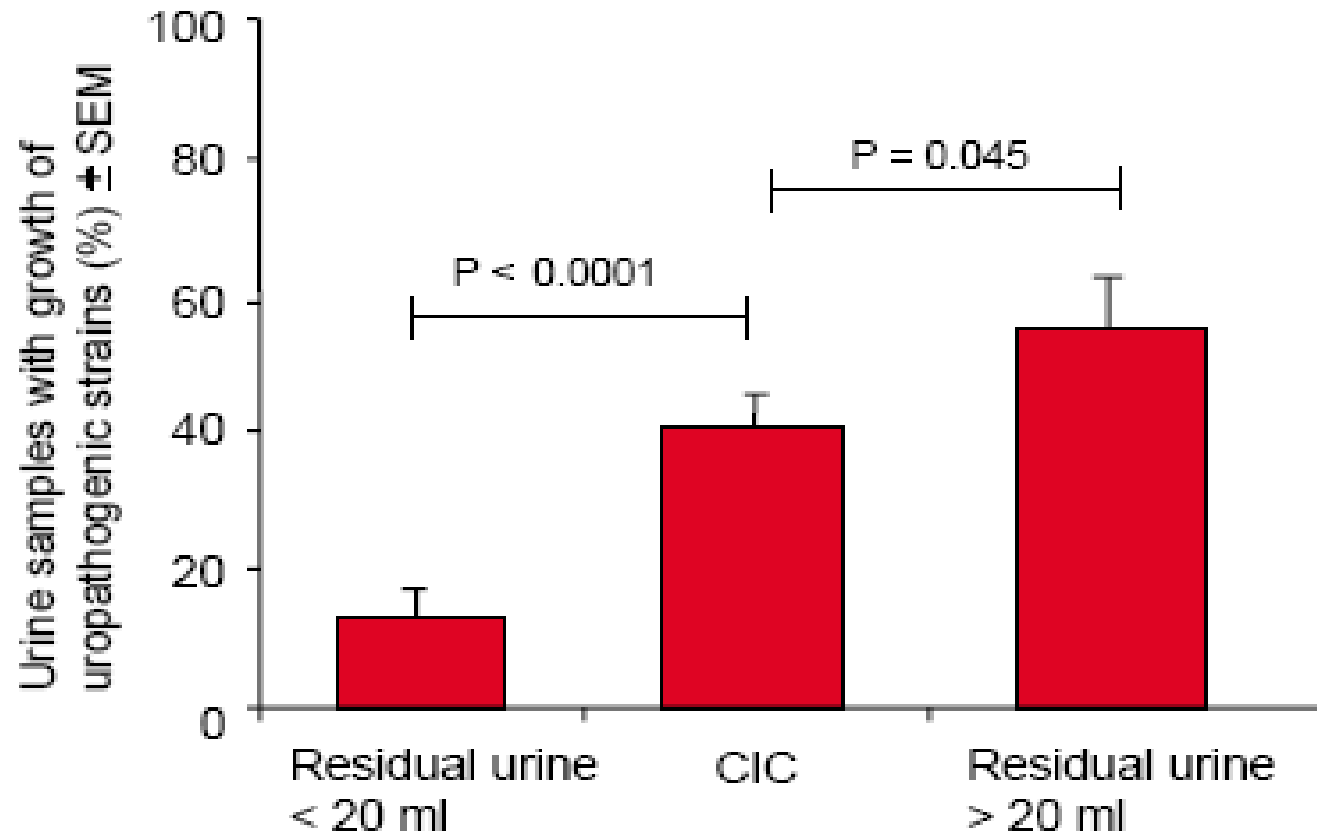
If bacteriuria in NB:

Treat bacteriuria for 7-10 days

Urine culture 10 days after treatment

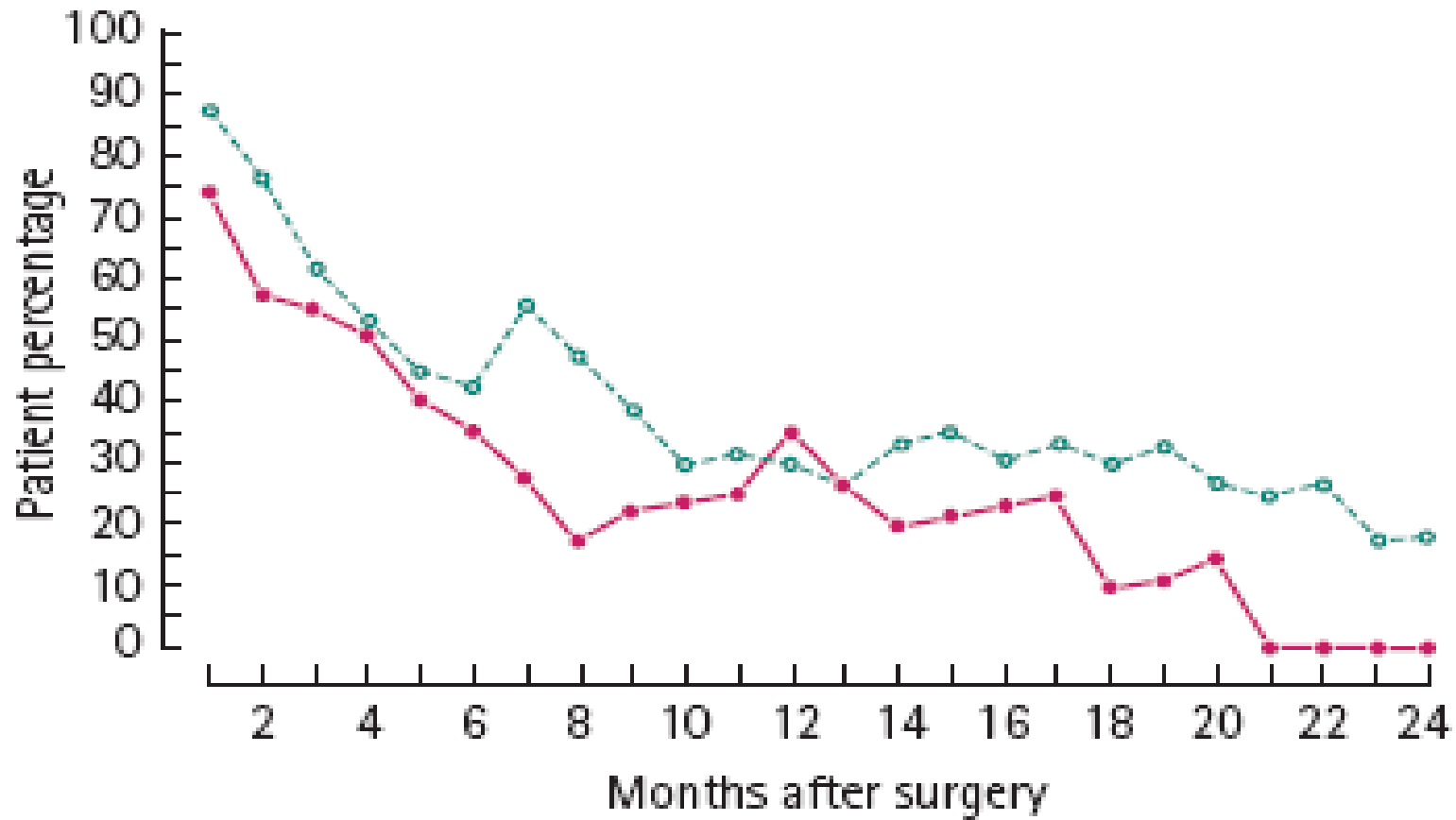


MICROBIAL FLORA IN ILEAL AND COLONIC NEOBLADDERS





BACTERIURIA AND NOCTURNAL ENURESIS





Neobladder “Function”: Tips and Tricks for Surgery and Postoperative Management

After surgery it is important that the emptying of the neobladder occurs every 2–3 h to ~~and then to increase to every 5–6 h~~ during the day and only once at night, thus reaching its final functional capacity, ~~to 400–500 ml~~

Causes for this lack of emptying:

- Excessive length of the ileum (>60 cm) with an oversized neobladder**
- Kinking of the bladder outlet**
- Stenosis of the urethra–bladder anastomosis**



Association between Development of Metabolic Acidosis and Improvement of Urinary Continence after Ileal Neobladder Creation

Metabolic acidosis should be suspected when:

nausea, vomiting, diarrhea, lack of appetite, fatigue, weakness and tachypnea.

To prevent exhaustion and the development of acidemia.

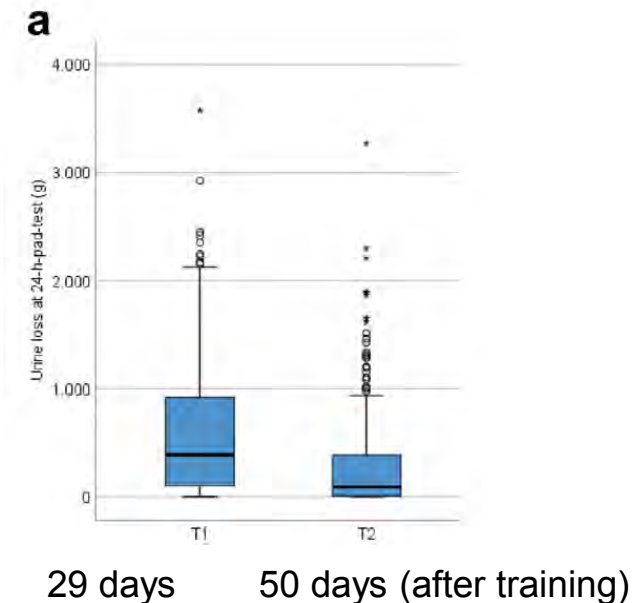
Bicarbonate should be given:

at BE of -2.5 mmol/l or less

The better the continence  acidemia

Average treatment: 3 grams Bicarbonate per day

Blood test at 10 days, 1 and 3 m after catheter removal



Müller G. et al, J Urol 2020



- **The best way to be successful:**
 - Good training and experience
 - To know the “100 details”
 - Preserve bundles
 - Choose one specific neobladder and “just do it”
- **Good final results and to decrease complications and readmissions if:**
 - Training for continence
 - Control and treatment of bacteriuria in ONB
 - Follow-up and correction of Base Excess

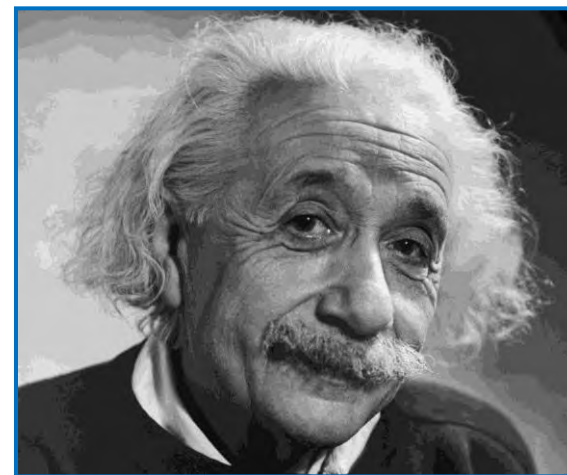
To be included in the ERAS PROTOCOL



“Let’s not pretend that things will change if we keep doing the same things”

Albert Einstein

THE FUTURE IS...
NO CYSTECTOMY





THANK YOU!



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