Bladder Adjuvant RadioTherapy (BART)

Acute and Late Toxicity from a Phase III Multicentre Randomized Controlled Trial

PI: Vedang Murthy, Tata Memorial Centre

Presenter: Priyamvada Maitre, Tata Memorial Centre

CT 01 - Clinical Trials Session

LBA04 - Bladder Adjuvant RadioTherapy (BART): Acute and Late Toxicity from a Phase III Multicenter Randomized Controlled Trial

Late Breaking Abstracts Session at ASTRO 2024

Sunday, September 29, 2024 1:50 PM – 2:00 PM ET Location: Ballroom A/B/C

Presenter(s)

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CLINICAL INVESTIGATION

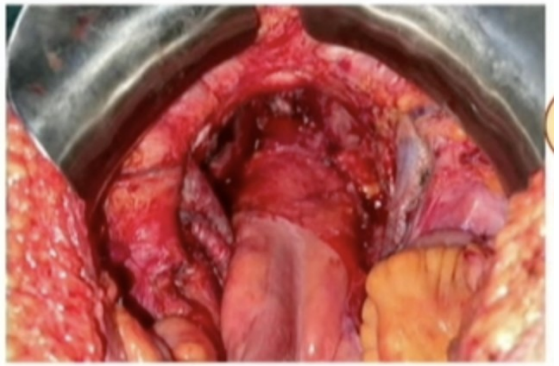
Bladder Adjuvant Radiation Therapy (BART): Acute and Late Toxicity From a Phase III Multicenter Randomized Controlled Trial

Vedang Murthy, MD,* Priyamvada Maitre, MD,* Ganesh Bakshi, MCh,† Mahendra Pal, DNB,† Maneesh Singh, MD,* Rakesh Sharma, MCh,‡ Duleep Gudipudi, MD,‡,§ Lincoln Pujari, MD,‖ Himanshu Pandey, MCh,‖,¶ Bhavesh Bandekar, MSc,‖,# Deepa Joseph, MD,** Rahul Krishnatry, MD,* Reena Phurailatpam, MSc,†† Sadhana Kannan, MSc,‡‡ Amandeep Arora, MCh,† Ankit Misra, MCh,† Amit Joshi, DM,§§ Vanita Noronha, DM,§§ Kumar Prabhash, DM,§§ Santosh Menon, MD,‖‖ and Gagan Prakash, DNB†

...even a podcast!

Red Journal Podcast November 1, 2024 **It's ASTRO! The BART and PARTIQoL Trials**

Muscle-invasive Bladder Cancer After Radical Cystectomy



Adjuvant RT???

RT to pristine surgical bed?!!

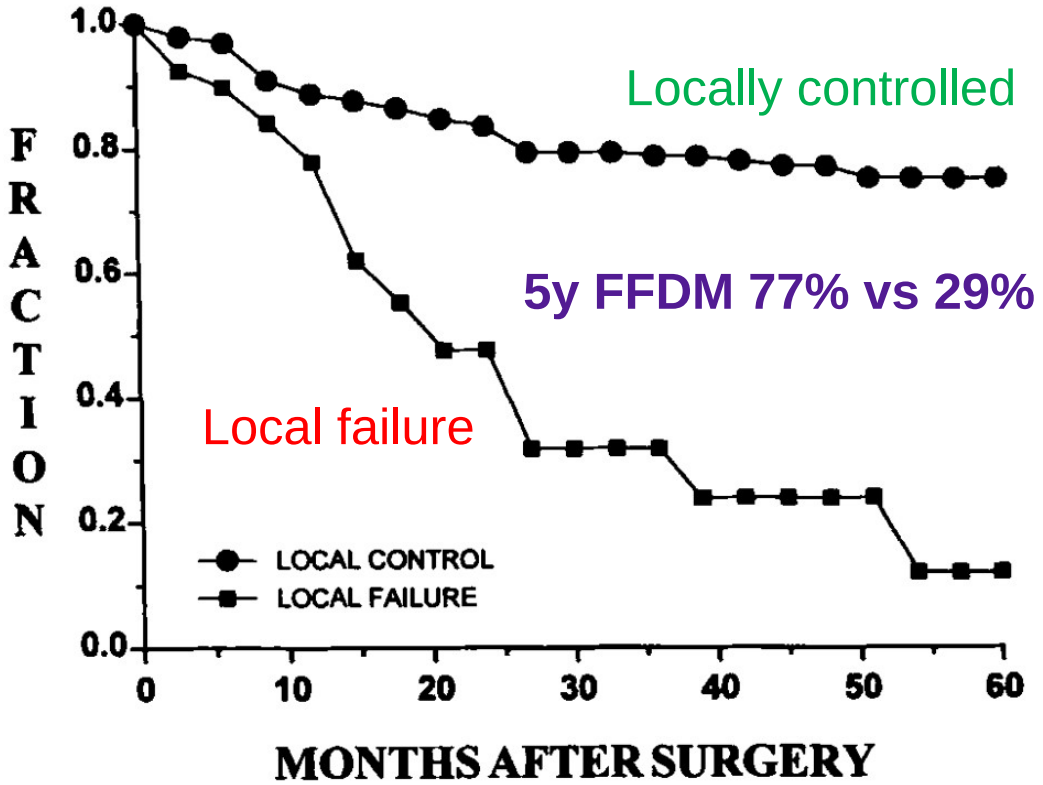
Lot of Bowel!!

Why is LRC important?

THE RELATIONSHIP OF LOCAL CONTROL TO DISTANT METASTASIS IN MUSCLE INVASIVE BLADDER CANCER

ALAN POLLACK, GUNAR K. ZAGARS, CHRISTOPHER J. COLE, COLIN P. N. DINNEY, DAVID A. SWANSON AND H. BARTON GROSSMAN

From the Departments of Radiotherapy and Urology, University of Texas, M. D. Anderson Cancer Center, Houston, Texas

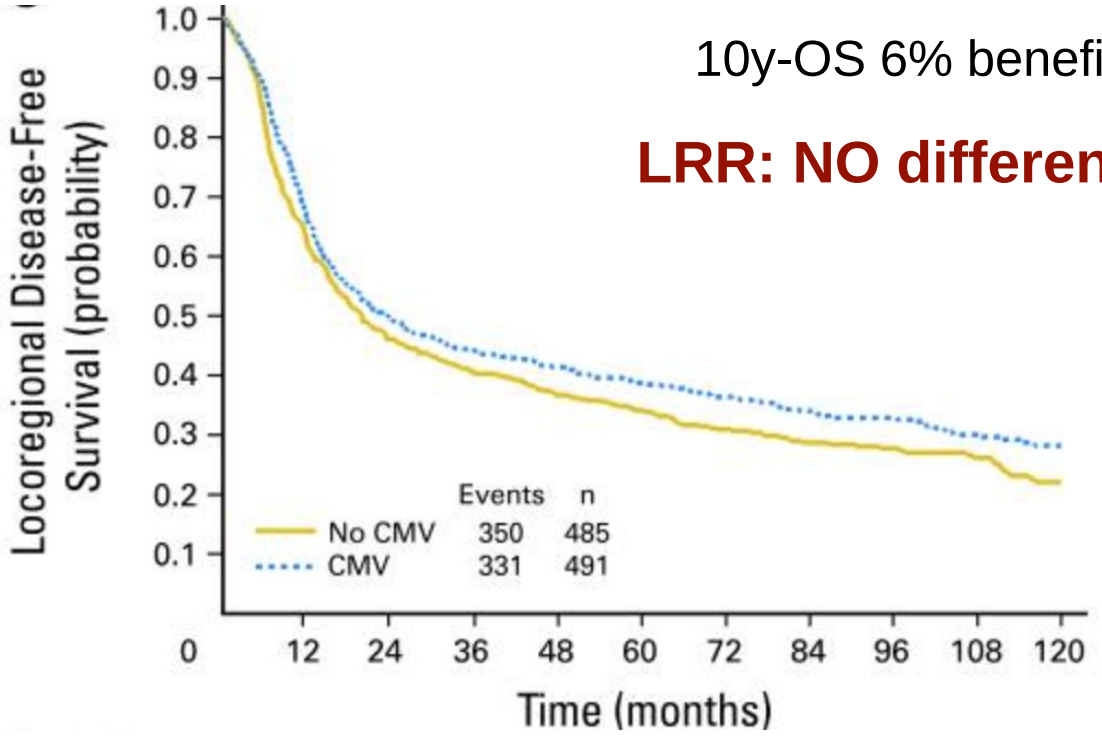


Pollack, J Urol 1995

Local control reduces risk of distant mets

Effect of NACT on LRC

BA-06 RCT: RC vs NACT + RC



10y-OS 6% benefit

LRR: NO difference

Peri-op chemo does NOT improve LRC

MRC Bladder Group JCO 2011

LRF post RC is Not Insignificant

Optimizing Bladder Cancer Locoregional Failure Risk Stratification After Radical Cystectomy Using SWOG 8710

John P. Christodouleas, MD, MPH[1]; Brian C. Baumann, MD[1]; Jiwei He, MS[2]; Wei-Ting Hwang, PhD[2]; Kai N. Tucker, BA[1]; Justin E. Bekelman, MD[1]; Catherine M. Tangen, MS, PhD[3]; Seth P. Lerner, MD[4]; Thomas J. Guzzo, MD, MPH[5]; and S. Bruce Malkowicz, MD[5]

A Novel Risk Stratification to Predict Local-Regional Failures in Urothelial Carcinoma of the Bladder After Radical Cystectomy

This work was presented in part at the American Society of Clinical Oncology Genitourinary Cancers Symposium, San Francisco, CA, February 2-4, 2012.

Brian C. Baumann AB *, Thomas J. Guzzo MD, MPH †, Jiwei He MS ‡, Stephen M. Keefe MD §,

LRR rate ~ 30%-40%

pT3-4 / N+ / LN removed <10 / LVI+ / Margin +

Risk stratification for locoregional recurrence after radical cystectomy for urothelial carcinoma of the bladder

Vladimir Novotny · Michael Froehner · Matthias May · Chris Protzel · Katrin Hergenröther · Michael Rink

Locoregional recurrence after cystectomy in muscle invasive bladder cancer: Implications for adjuvant radiotherapy

Vedang Murthy, M.D., D.N.B.[a,b,*], Ganesh Bakshi, M.S., M.Ch., D.N.B.[c,b], Jifmi Jose Manjali, M.D.[a,b], Gagan Prakash, M.S.[c,b], Mahendra Pal, M.S.[c,b],

Bladder Adjuvant RadioTherapy (BART) trial

Multicentric phase III RCT

clinical ONCOLOGY
The Royal College of Radiologists

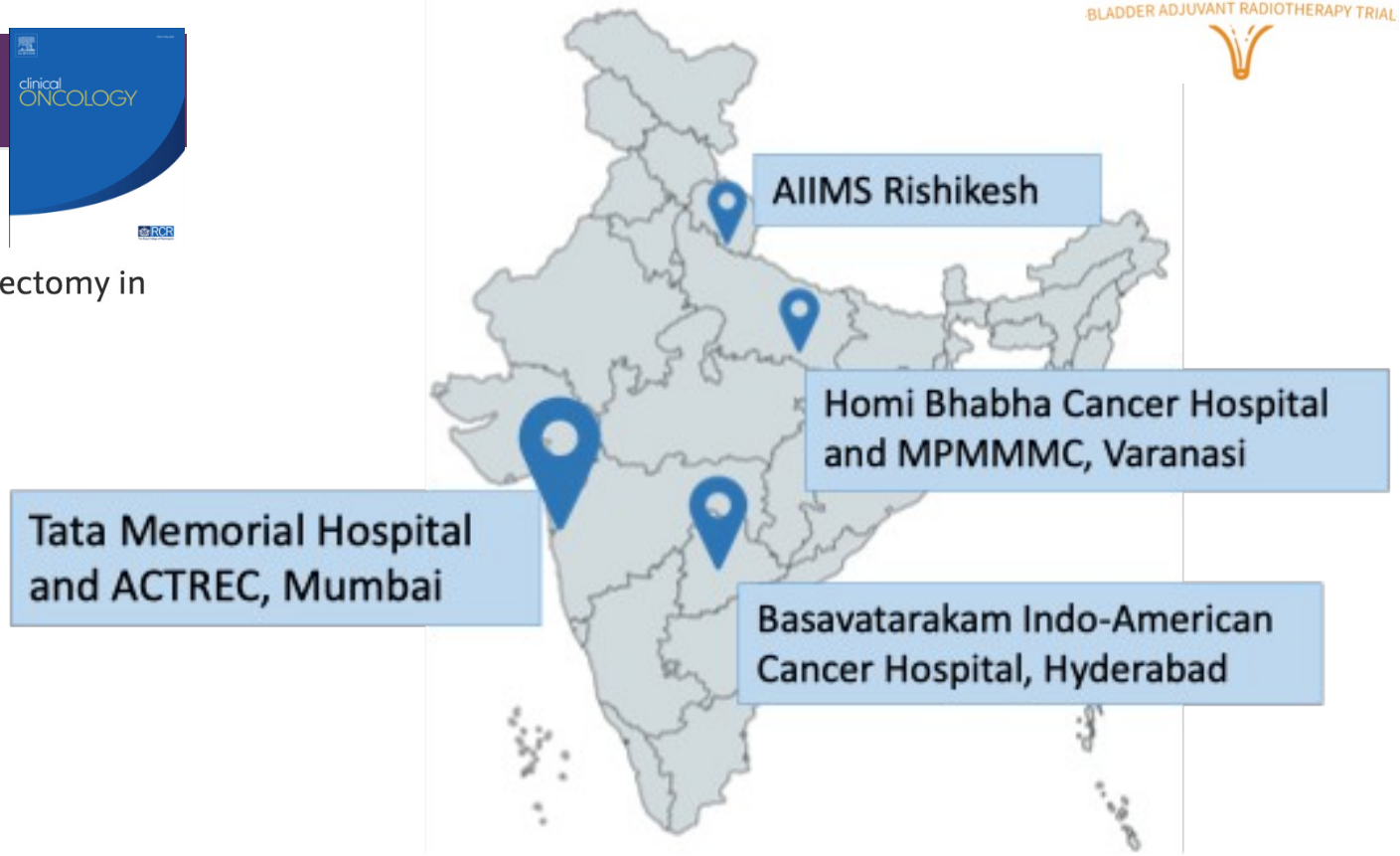
ORIGINAL ARTICLE · Volume 35, Issue 9, E506-E515, September 2023 Download Full Issue

Study Protocol of the Bladder Adjuvant RadioTherapy (BART) Trial: A Randomised Phase III Trial of Adjuvant Radiotherapy Following Cystectomy in Bladder Cancer

V. Murthy * · P. Maitre * · M. Singh * · ... · P. Mehta * · G. Bakshi † · G. Prakash †... Show more

NCT02951325

BART
BLADDER ADJUVANT RADIOTHERAPY TRIAL



Trial Schema

'High-risk' MIBC

Post radical cystectomy

+/- NACT or ACT

- ≥pT3
- pN+
- R+
- LN<10
- Downstaged with NACT

RANDOMISE

Standard Arm

Observation

Stratification

- N+ vs N0
- Chemotherapy (Neoadjuvant vs adjuvant vs none)

Test Arm

Adjuvant RT

50.4Gy/28# to pelvic nodes and cystectomy bed

Primary EP

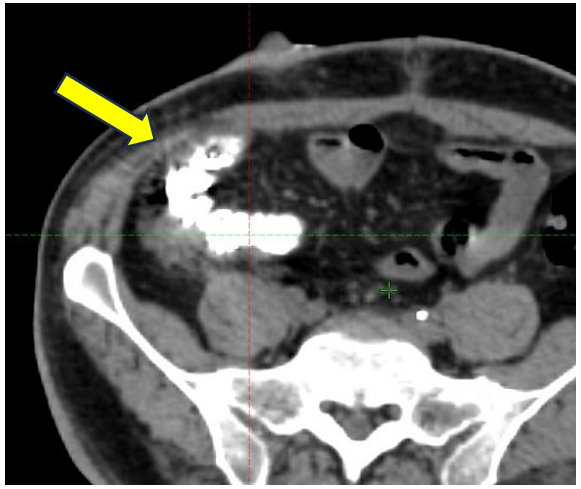
2-yr LRFS

N = 153

NCT02951325

Radiotherapy Procedures: Contouring

- **Global consensus guidelines** ***[Baumann IJROBP 2016, IBIS PRO 2019]***
- **Cystectomy Bed CTV:** 2cm above PS to penile bulb
- **Nodal CTV:** common iliac, internal & external iliac, presacral, obturator



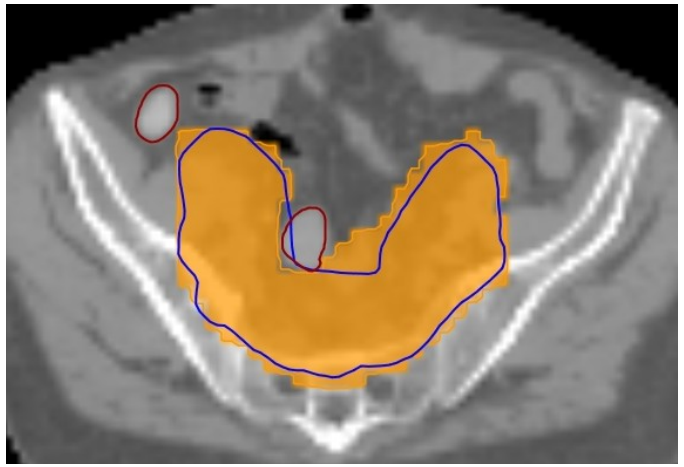
OARs:

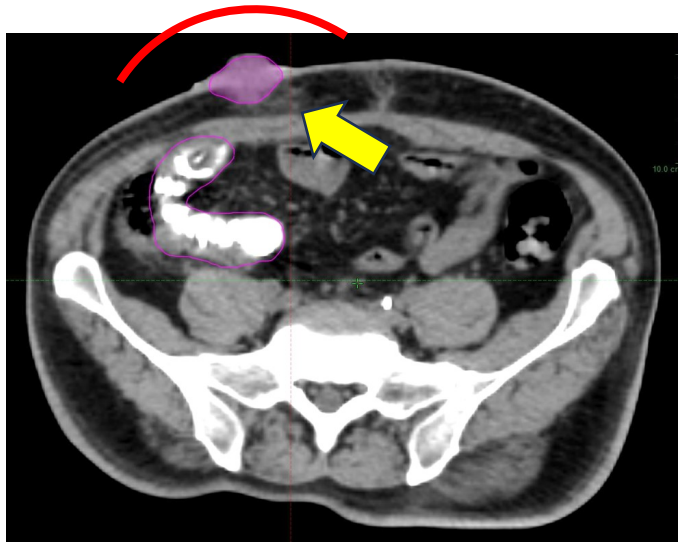
- ☒ Stoma
- ☒ Ileal conduit
- ☒ Bowel bag
- ☒ Anorectum
- ☒ Femurs
- ☒ Neobladder

Radiotherapy Procedures: Planning

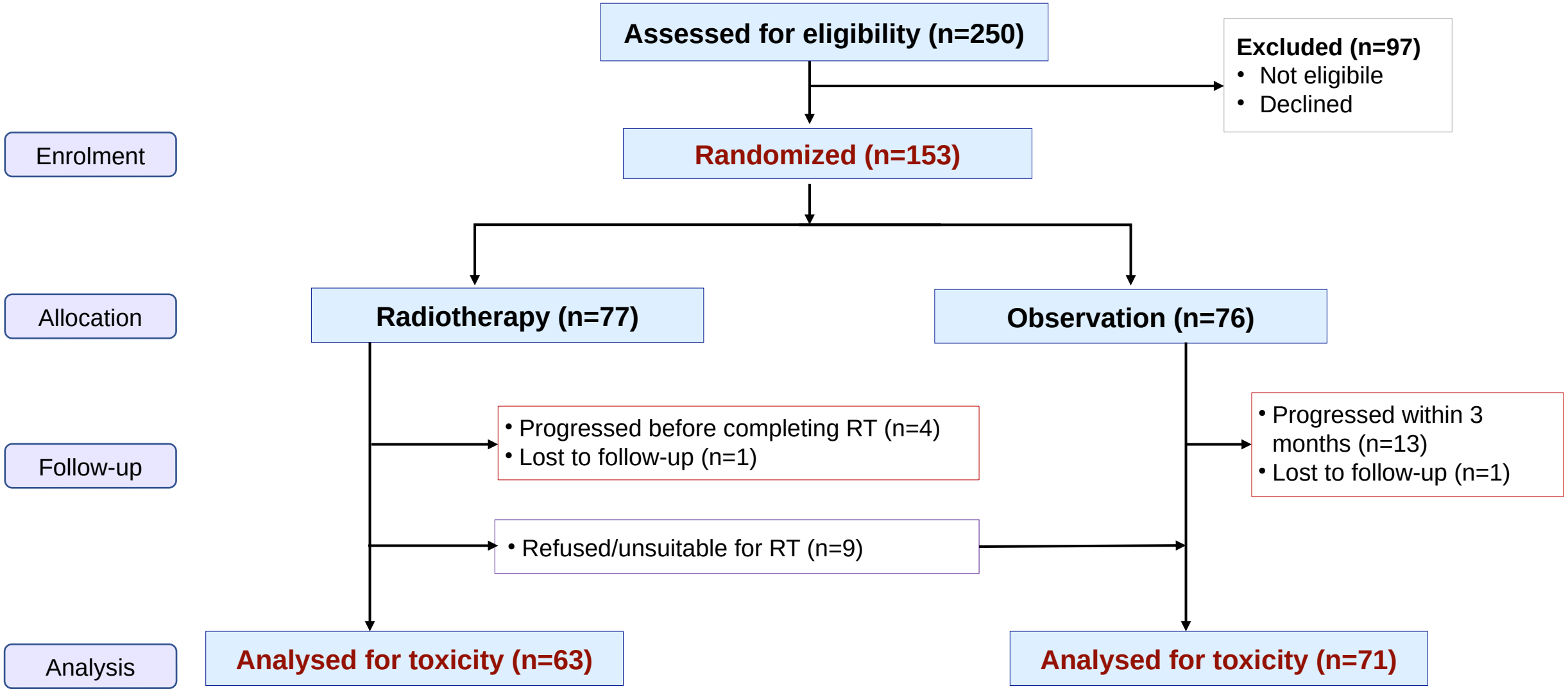
- **IMRT** (helical/VMAT)
- **Daily MVCT/CBCT**
- Sector avoidance for stoma
- Maximal bowel sparing

Stoma	Dmean <5Gy
Ileal conduit	Dmax ≤ 95%
Bowel bag	V40Gy < 30%
Rectum	V30Gy < 56%
Femoral heads	V30Gy < 15%





Results: CONSORT



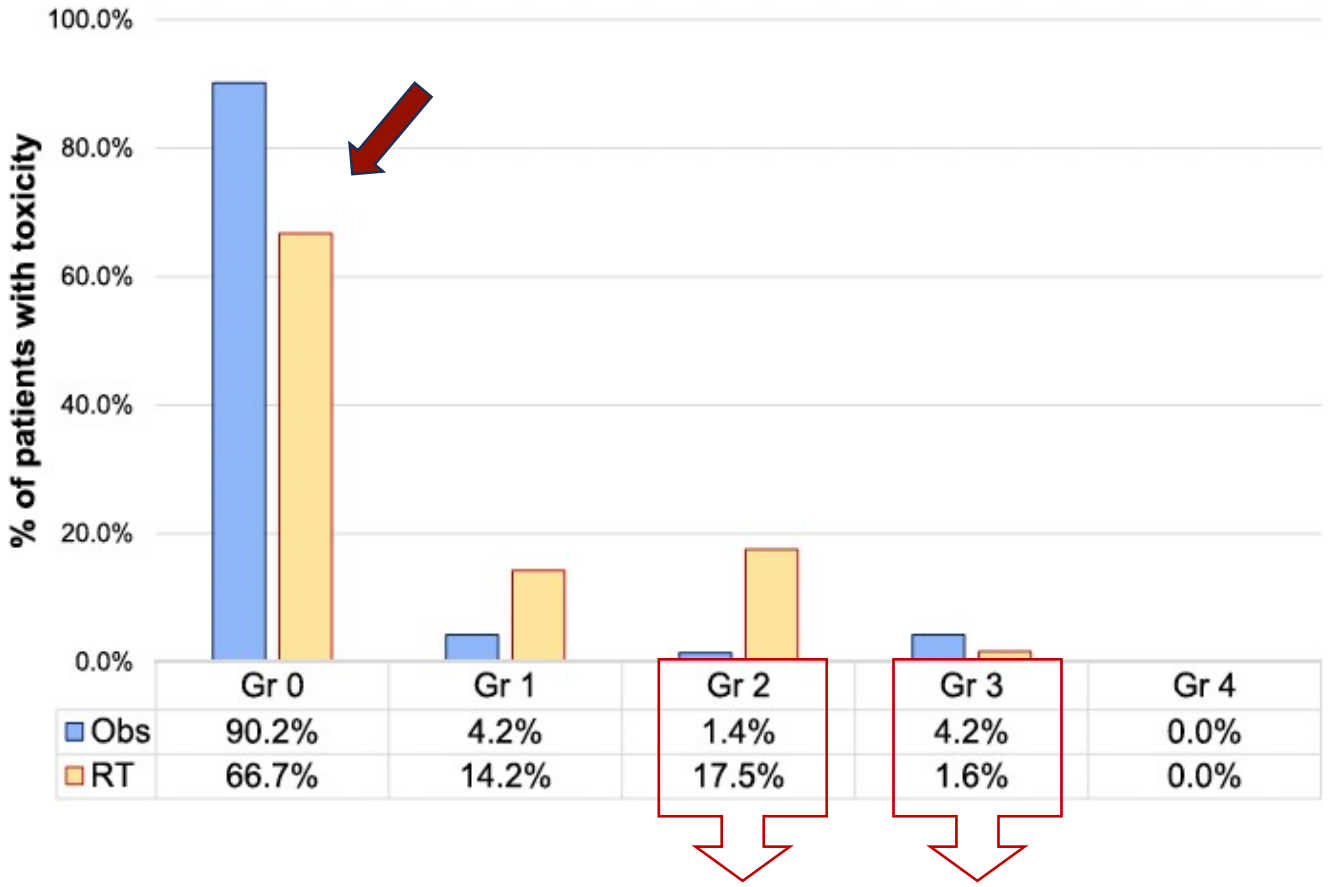
Results: Cohort Characteristics

- Median age 57 years
- Median nodes = 20
- Margin positive **4.6%**

		Total (n=153) (%)	Obs (n=76)	RT (n=77)
Clinical Tumour stage	T1-T2	22.9	23.7	22.1
	T3-4	**77.1**	76.3	77.9
cN+		**33.3**	36.8	29.9
Chemotherapy	Neoadjuvant	**70.6**	72.4	68.8
	Adjuvant	**20.3**	19.7	20.8
	None	9.2	7.9	10.4
Pathological T stage	0 (yp)	10.5	9.2	11.7
	1-2 (yp)	28.2	26.2	31.2
	3-4	61.3	64.4	58.5
pN+		**41.2**	40.8	41.5
Variant histology	Pure urothelial	72.5	73.7	71.4
	Urothelial + variant	**27.5**	26.3	28.6

Results: Acute Toxicity

- **No toxicity-related RT stoppage**
- **Grade III**
  - **Obs 4.1%**
  - **RT 1.6%**
- **Grade II**
  - **Obs 1.4%**
  - **RT 17.5% (p = 0.03)**



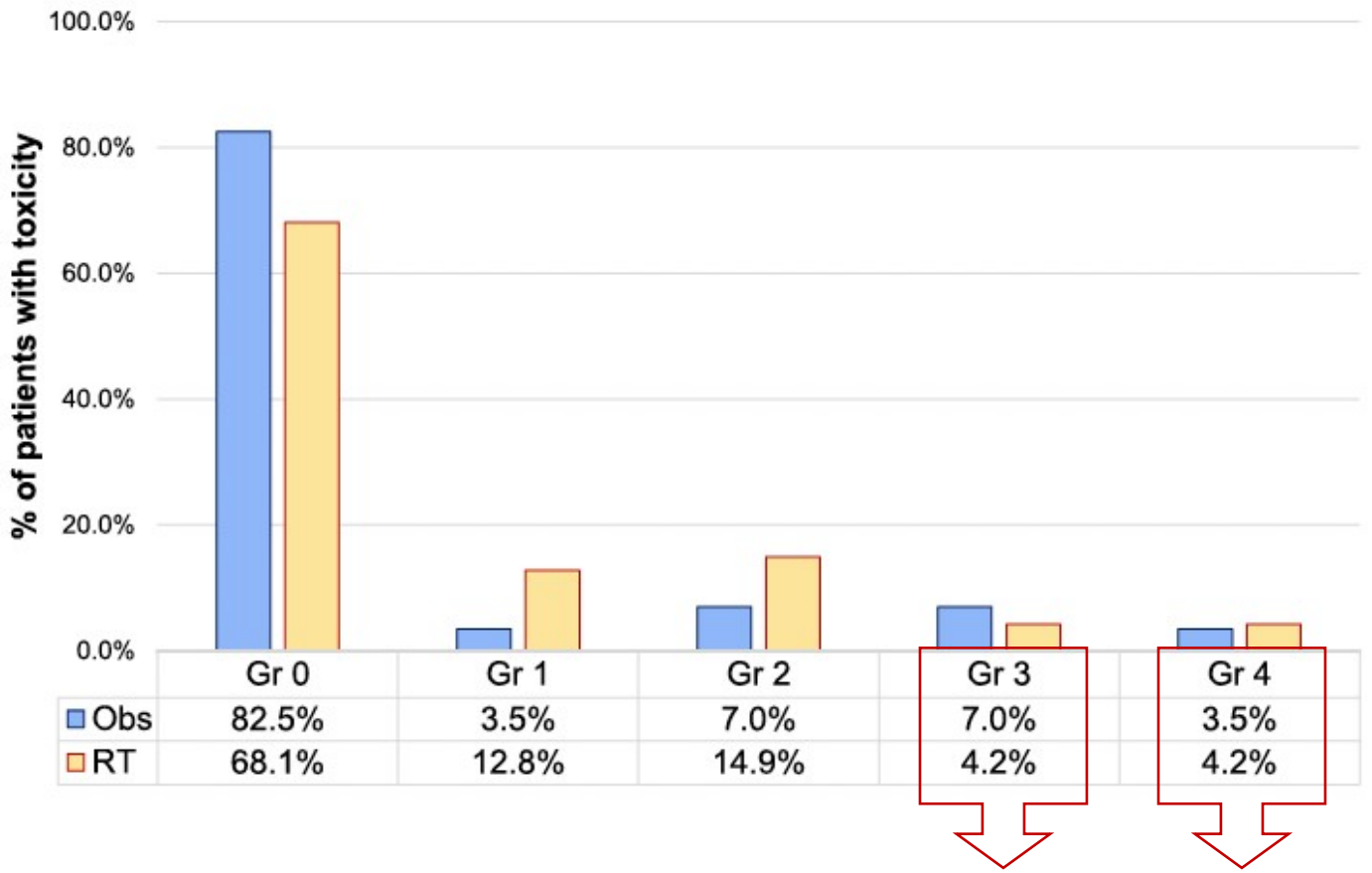
	Gr 0	Gr 1	Gr 2	Gr 3	Gr 4
Obs	90.2%	4.2%	1.4%	4.2%	0.0%
RT	66.7%	14.2%	17.5%	1.6%	0.0%

Obs: Subacute IO = 1
RT: Bowel symptoms = 10
Ureteric stricture = 1

Obs: Complicated UTI = 3
RT: Acute IO = 1

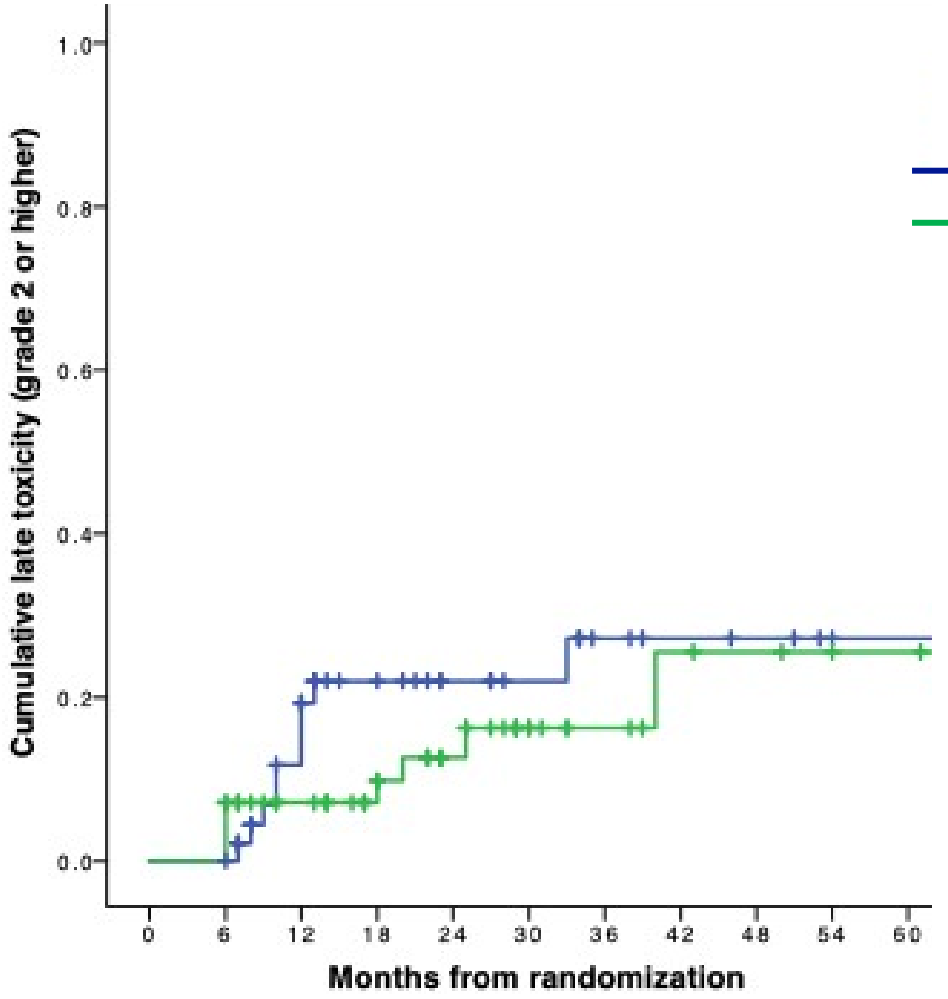
Results: Late Toxicity

- **Late toxicity similar**
- **Grade III-IV**
  - **Obs 10.5%**
  - **RT 8.4%**
- **Grade II**
  - **Obs 7%**
  - **RT 14.9%**



Obs: 1 each of UTO, IO, kidney injury, stomal bleed
RT: Intestinal Obstruction = 4

Cumulative Late Grade 2+ toxicity



Obs 17.5% vs RT 23.3%, p=0.27

Multivariable Analysis

Gr2+		Acute		Late	
		HR (95% CI)	p	HR (95% CI)	p
Age	<60 ≥60	Ref 2.3 (0.6-8.1)	0.2	Ref 0.9 (0.3-3.1)	0.8
BMI	<22.5 ≥22.5	Ref 1.3 (0.4-4.3)	0.7	Ref 1.0 (0.3-3.1)	1.0
Chemotherapy	NACT ACT	Ref 1.1 (0.3-4.6)	0.9	Ref 0.6 (0.1-2.7)	0.5
Operative complications	No Yes	Ref 1.3 (0.3-7.2)	0.8	Ref 2.2 (0.4-10.5)	0.3
Per protocol group	Obs RT	Ref 4.6 (1.2-17.9)	**0.03**	Ref 1.5 (0.5-4.7)	0.5
Acute gr2+ toxicity	No Yes	-	-	Ref 3.6 (0.6-20.6)	0.1

Strengths & Limitations

- ☑ **Largest RCT of adjuvant RT in bladder cancer**
- ☑ Multicentric
- ☑ 90% received systemic chemotherapy (70% NACT)
- ☑ Consensus contouring guidelines followed

Radiation Safety

- IMRT + daily IGRT
- Strict stoma sparing
- Controlling bowel spill
- 1.8Gy per fraction

- Results awaited for primary LRFS endpoint
- PROM correlation with toxicity (analysis ongoing)
- No adjuvant immunotherapy (~80% accrual before IO approval)

SEP
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PLENARY

PL 01 - PLENARY

San Francisco Ballroom

01:30pm - 03:00pm PT

Special Session

01:40pm - 01:50pm PT

Bladder Adjuvant RadioTherapy (BART): Clinical Outcomes from a Phase III Multicenter Randomized Controlled Trial

Speaker: Vedang Murthy, MD - Tata Memorial Centre, New Mumbai

Survival outcomes at ASTRO 2025 Plenary…

Thank You