



CHANGING PATTERNS AND PREDICTORS OF SALVAGE RADIATION THERAPY USE OVER TIME IN PATIENTS TREATED FOR POST-PROSTATECTOMY BIOCHEMICAL RECURRENCE: A TREND ANALYSIS OVER A 20-YEAR PERIOD FROM A MULTI-INSTITUTIONAL SERIES

Elio Mazzone¹, Nicola Fossati¹, R. Jeffrey Karnes², Stephen A. Boorjian², Giovanni Motterle², Alberto Bossi³, Tamizhanban Kumar³, Nadia Di Muzio⁴, Cesare Cozzarini⁴, Barbara Noris Chiorda⁴, Giorgio Gandaglia¹, Giuseppe Rosiello¹, Marco Bandini¹, Detlef Bartkowiak⁵, Shahrokh Shariat⁶, Gregor Goldner⁷, Gaetan Devos⁸, Steven Joniau⁸, Charlien Berghen⁹, Gert De Meerleer⁹, Hein Van Poppel⁸, Francesco Montorsi¹, Thomas Wiegel⁵, Alberto Briganti¹

1 Division of Oncology/Unit of Urology; URI; IRCCS Ospedale San Raffaele, Milan, Italy; 2 Department of Urology, Mayo Clinic, Rochester, MN, USA; 3 Department of Radiation Oncology, Gustave Roussy Institute, Villejuif, France; 4 Department of Radiotherapy; IRCCS Ospedale San Raffaele, Milan, Italy; 5 Department of Radiation Oncology, University Hospital Ulm, Ulm, Germany; 6 Department of Urology, Medical University of Vienna, Vienna, Austria; 7 Department of Radiation Oncology, Medical University of Vienna, Vienna, Austria; 8 University Hospitals Leuven, Department of Urology, Leuven, Belgium; 9 University Hospitals Leuven, Department of Radiotherapy, Leuven, Belgium;

Background

- A rapidly changing scenario in the management of patients with PSA rising after radical prostatectomy (RP) may have determined different patterns of salvage radiation therapy (SRT) use over the last two decades.
- We aimed to define patterns and predictors of SRT administration relative to timing of treatment, PSA level, and biochemical outcome after SRT.

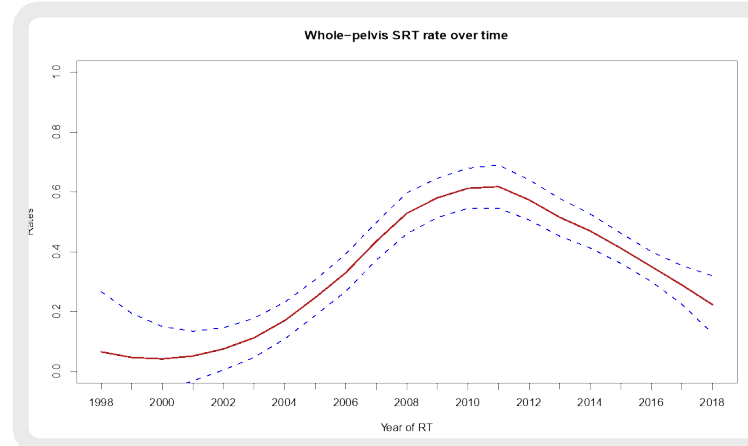
Methods

- We included **1455 patients** who received post-RP local radiation to the prostatic and seminal vesicle bed at **seven tertiary referral centres** for PSA rise over the last two decades (1998- 2018).
- Timing of SRT was categorized as **early** (PSA level 0.5 ng/ ml; ESRT) or **late** (PSA level >0.5 ng/ml; LSRT).
- **Cumulative incidence methods were used to assess 5-year biochemical recurrence (BCR) rates** in patients with at least 5 years of follow-up (n=891).
- **Lowess analysis** graphically represented the year-by-year trends in **SRT type, median PSA level at SRT, and 5-year BCR after SRT.**
- **Logistic regression models (LoRM) were used to identify predictors of ESRT use.** Covariates consisted of age at SRT, year of SRT, concomitant hormonal therapy (HT), pT stage, Gleason grade, and lymph nodal status.

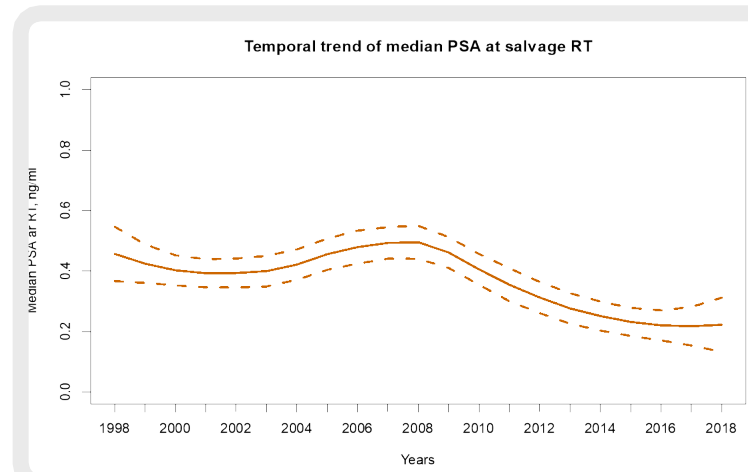
Baseline patients characteristics

Variable	Overall, n=1455
Age at surgery, years	66 (62, 71)
Year of RT	2010 (2005, 2015)
Time from RP to RT, months	24 (11, 50)
Timing of SRT, n (%)	
ESRT	981 (67)
LSRT	474 (33)
Radiation therapy total dose, n (%)	
≤66 gy	1,010 (73)
>66 gy	445 (27)
RT type, n (%)	
3D	1,052 (72)
IMRT	403 (28)
Concomitant hormonal therapy use, n (%)	
No	729 (50)
Yes	726 (50)
Biochemical recurrence post-RT, n (%)	
No	1,056 (72)
Yes	399 (28)

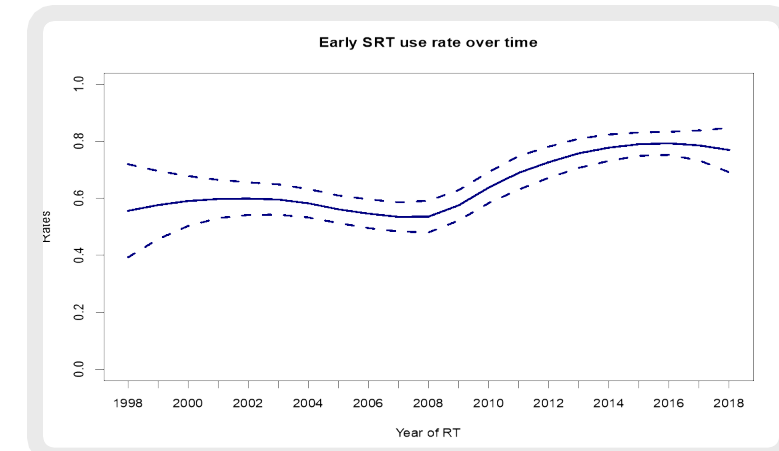
Whole pelvis radiotherapy use rate



Median PSA at radiotherapy over time

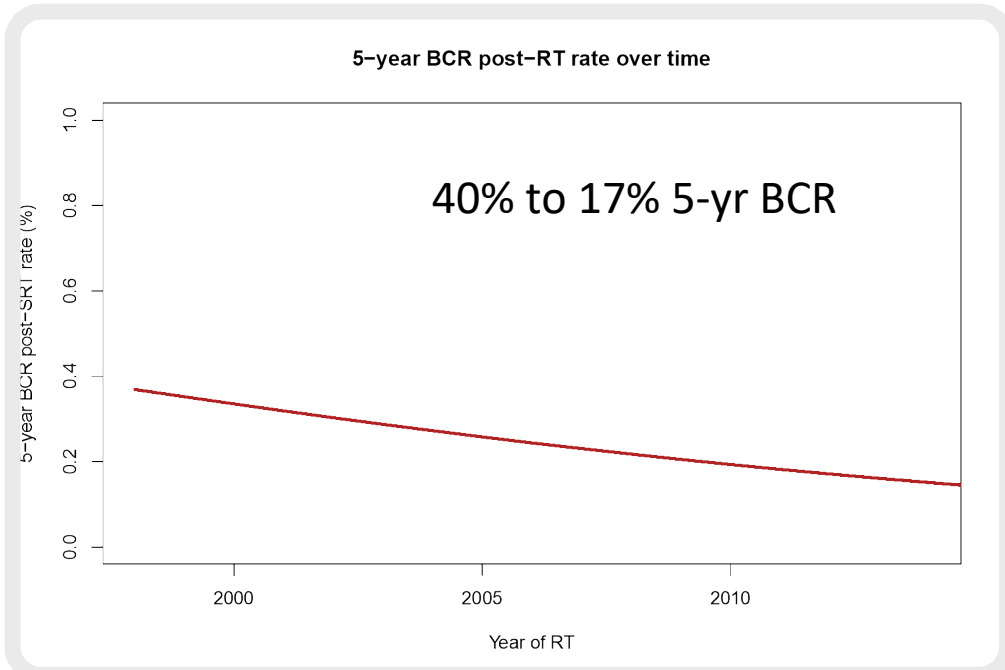


Early salvage RT use over time



MVA predicting early SRT use

	Multivariable Model		
	HR	95% CI	p value
Age at RT	0.92	0.90-0.95	<0.001
Year of SRT	1.04	1.02-1.06	<0.001
HT use			
No	Ref		
Yes	1.79	1.37-2.34	<0.001
pN status			
pN0	Ref		
pN1	0.99	0.61-1.58	0.9
Pathological stage,			
pT2	Ref	--	
≤ T3a	0.86	0.63-1.17	0.3
≥ pT3b	1.12	0.78-1.59	0.5
Pathological GS,			
≤ 7	Ref		
8-10	0.96	0.70-1.30	0.8



Conclusions

- The rate of patients treated with **ESRT** and **WPRT** steadily increased during the last two decades.
- This trend seems to be associated with an **encouraging decreasing rate of post- SRT 5-yr BCR**.
- This trend highlights current practice of SRT, and **reinforces the evidence on the association between ESRT and patient outcomes**.