Delay of Systemic Treatment following Salvage Lymph Node and Pelvic Mass Dissection Identified by 68Ga-PSMA PET/CT With Reference to Lymph Node Removal at Time of Radical Prostatectomy

Whitney Zhang, Karren Liang, Erica Huang, Linda My Huynh, Joshua Tran, Thomas Ahlering MD
UC Irvine Health; University of California – Irvine, Orange, CA USA

1. Introduction

Previous publications suggest a lymph node dissection at the time of RP has an NNT of 200 that may decrease adverse oncologic events by 10%. 68 Ga-PSMA PET/CT scan can identify BCR patients who may benefit from local therapy post-RP, specifically lymph nodes or pelvic masses. This study assesses relative efficacy of robot-assisted salvage pelvic lymph node dissection (sPLND) and salvage pelvic mass resection (sPMR) for patients with locally recurrent disease identified by PSMA PET/CT.

2. Materials and Methods

From September 2016 to June 2021, 80 patients underwent PSMA PET/CT imaging following post-RP BCR (PSA values >0.2 ng/mL, x2). Of the positive findings (n=61), patients underwent sPLND (n=18) or sPMR (n=10) based on recurrence location. Primary outcomes were efficacy of salvage surgery, assessed as failure (ADT and/or RT <6 mos), treatment delay, and success.

3. Results

Age and PSA was 65.9 yrs±12.4 and 2.5±2.11 ng/mL at salvage. Follow-up is 15.1 yrs±10.2 post-RP and 1.26 yrs±0.85 post-salvage. Following surgery, PSA was 1.37±2.17 ng/mL with 47%±54.9 percent decrease in PSA (Table 1).

Of the 28 salvage procedures:
- 33% (6/18) sPLND versus 20% (2/10) sPMR patients failed (p=0.47).
- 39% (7/28) sPLND versus 20% (2/10) sPMR patients delayed intervention by 18.2 mos (p=0.31).
- 28% (5/18) sPLND versus 60% (6/10) sPMR patients did not require treatment (p=0.10) at mean follow-up of 11.5 (0.92-34.1) mos post-salvage.

Figure 1. Tree Diagram

Figure 1: Stratification of patients who underwent salvage surgery for local recurrence in the lymph node vs prostate bed.
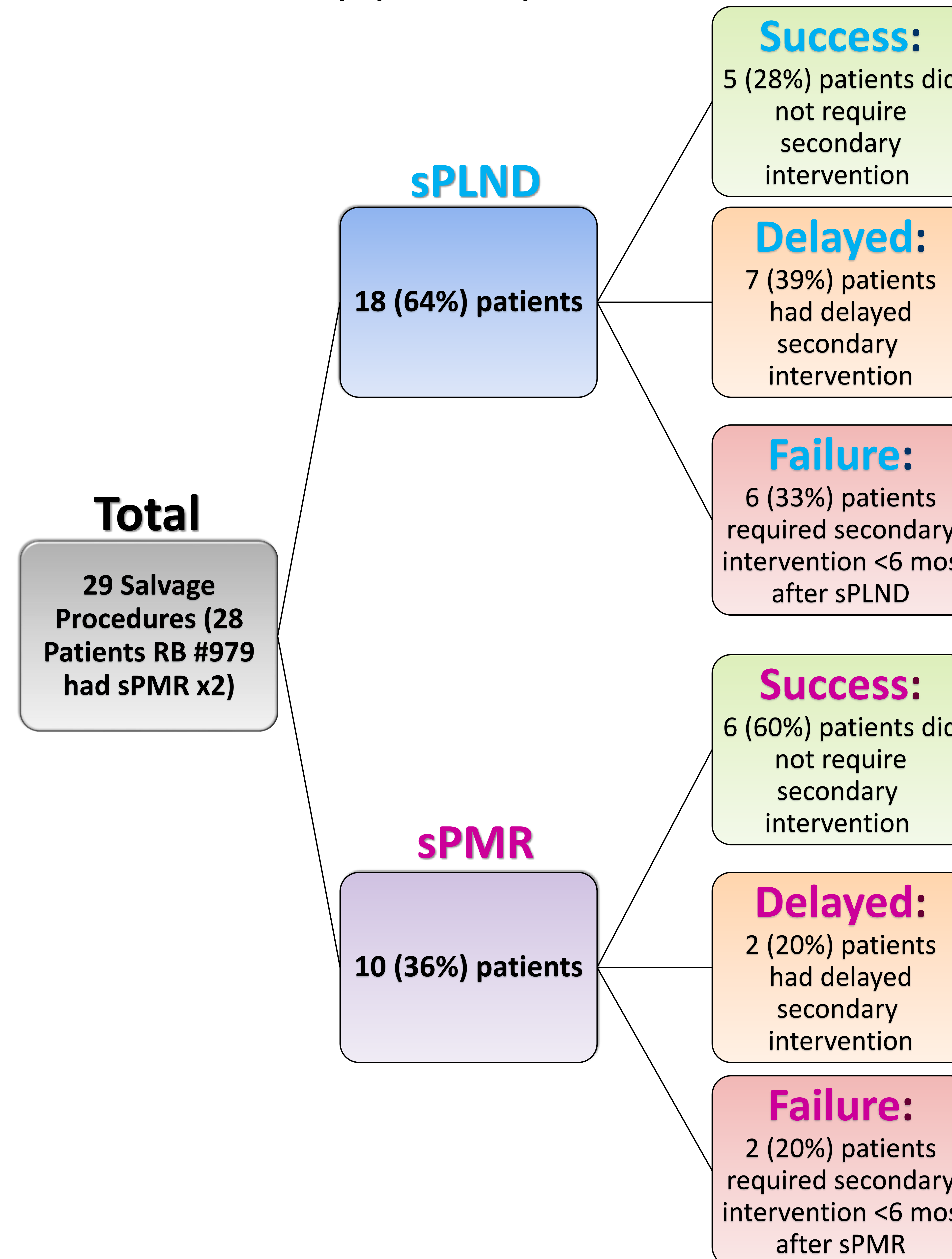

Total
29 Salvage Procedures (28 Patients RB #979 had sPMR x2)

sPLND — 18 (64%) patients
- **Success:** 5 (28%) patients did not require secondary intervention
- **Delayed:** 7 (39%) patients had delayed secondary intervention
- **Failure:** 6 (33%) patients required secondary intervention <6 mos after sPLND

sPMR — 10 (36%) patients
- **Success:** 6 (60%) patients did not require secondary intervention
- **Delayed:** 2 (20%) patients had delayed secondary intervention
- **Failure:** 2 (20%) patients required secondary intervention <6 mos after sPMR

Table 1. Patient Demographics

Table 1: Patient Demographics at time of RP and salvage procedure, stratified by outcome and procedure (N=28).

	sPLND			sPMR			
Treatment	Failure	Delayed	Success	Failure	Delayed	Success	
N, all Patients	6	7	5	2	2	6	
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	p-value
Age	63.7 (5.7)	67.3 (4.8)	62.1 (2.2)	62.8 (4.9)	53.7 (7.6)	61.1 (6.5)	0.87
BMI	27.7 (4.47)	29.0 (5.1)	26.9 (2.8)	24.3 (2.03)	25.2 (0.07)	27.7 (4.0)	0.33
Pre-RP PSA	12.6 (10.3)	8.4 (4.5)	6.16 (4.1)	7.6 (0.99)	17.8 (17.8)	5.65 (2.1)	0.8
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	
PSAdt Pattern							
Increasing	1 (14.2%)	3 (42.9%)	3 (42.9%)	0 (0.0%)	0 (0.0%)	4 (100.0%)	
Decreasing	5 (45.4%)	4 (36.4%)	2 (18.2%)	2 (33.3%)	2 (33.3%)	2 (33.3%)	
Gleason Grade Group							
1	0 (0%)	0 (0%)	0 (0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	
2	0 (0%)	0 (0%)	0 (0%)	1 (25.0%)	1 (25.0%)	2 (50.0%)	
3	2 (33.3%)	4 (57.1%)	2 (40%)	0 (0.0%)	1 (33.3%)	2 (66.7%)	
4-5	4 (40.0%)	3 (30.0%)	3 (30.0%)	1 (50.0%)	0 (0.0%)	1 (50.0%)	
SV							
0	3 (27.2%)	4 (36.4%)	4 (36.4%)	2 (100%)	2 (100%)	5 (83.3%)	
1	3 (50.0%)	2 (33.3%)	1 (16.7%)	0 (0.0%)	0 (0.0%)	1 (16.7%)	
SM							
0	5 (35.7%)	5 (35.7%)	4 (28.6%)	2 (22.2%)	2 (22.2%)	5 (55.6%)	
1	1 (25.0%)	2 (50.0%)	1 (25.0%)	0 (0%)	0 (0.0%)	1 (100.0%)	
Mean (SD)	Failure	Delayed	Success	Failure	Delayed	Success	p-value
Age	67.4 (5.32)	71.3 (2.2)	65.8 (5.0)	69.3 (9.06)	62.8 (10.9)	69.1 (4.6)	0.55
Pre-Salvage PSA	3.75 (3.06)	2.25 (2.15)	1.37 (0.46)	2.32 (1.84)	3.47 (1.05)	2.21 (2.07)	1
First PSA after Salvage	4.04 (3.74)	0.67 (0.65)	0.74 (0.64)	0.41 (0.42)	0.46 (0.03)	0.67 (0.86)	0.17
Decrease in PSA (%)	-17.0 (65.9)	52.9 (57.8)	51.5 (34.7)	84.8 (6.24)	86.0 (5.10)	74.7 (21.3)	0.02
Most Recent PSA	NA	0.57 (0.97)	0.72 (0.74)	NA	1.43 (0.32)	1.47 (2.19)	0.44
Follow-Up (mos)	21.2 (7.3)	21.0 (11.5)	8.21 (10.3)	9.40 (9.06)	12.7 (7.90)	14.1 (12.9)	0.4
PSAdt at Salvage (mos)	11.0 (8.0)	11.6 (10.5)	8.67 (8.6)	11.8 (4.0)	15.9 (9.8)	24.2 (18.9)	0.04
PSAdt Pattern after Salvage	Failure	Delayed	Success	Failure	Delayed	Success	
Increasing	-	4 (57.1%)	3 (60.0%)	NA	2 (100.0%)	5 (83.3%)	
Decreasing	-	3 (42.9%)	2 (40.0%)	NA	0 (0.0%)	1 (16.7%)	
NA	6 (100.0%)	0 (0.0%)	0 (0.0%)	2 (100.0%)	0 (0.0%)	0 (0.0%)	

BMI = Body Mass Index; PSA = Prostate Specific Antigen; c-stage = Clinical Stage; GGG = Gleason Grade Group; p-stage = Pathologic Stage; SV = Seminal Vesicle Invasion; SM = Surgical Margin; PSAdt = PSA Doubling Time

4. Conclusion

- PSMA PET/CT improved post-RP recurrence location identification and selection for salvage procedures.
- A therapeutic benefit from salvage LND/PMR resection was seen as it delayed treatment in 31% and has avoided treatment thus far in 38% patients (8.2 and 14.1 months)
- While less frequent, sPMR prompts higher success rates.
- Compared to LND at time of RP, we demonstrated a therapeutic benefit in 28% of 18 salvage PLNDs. There is a clear therapeutic benefit produced by sPLND.