

**Prostate Cryoablation for Local Recurrence of Prostate Cancer After  
Radiation Therapy: The Initial Singaporean experience**  
**Rene Gatsinga, Alvin WX Low, Kae Jack Tay**  
Department of Urology, Singapore General Hospital

**Background:** Recurrence of prostate cancer after radiotherapy is common and difficult to treat<sup>1</sup>. Traditionally, radical prostatectomy has been the recommended treatment, but newer modalities may be able to achieve similar oncological control with better functional outcome. There is growing evidence of favorable results using whole-gland cryoablation to treat prostate cancer recurrence after radiotherapy<sup>2</sup>. We report the preliminary functional, safety, and oncological outcomes of the first Singaporean experience with this modality.

**Methods:** Carefully selected patients underwent salvage cryoablation of prostate between August 2017 and February 2021 at the Singapore General Hospital. They had biochemical recurrence after radiation therapy, fulfilling the Phoenix definition. Additionally, participants were assessed with Magnetic Resonance Imaging (MRI) of the prostate and robot assisted MRI guided biopsy of the prostate. Metastatic disease was assessed using prostate specific membrane antigen positron emission tomography (PSMA) computed tomography. Whole-gland cryoablation was administered using the Galil Medical system and standard measures to preserve urethral and periprostatic structures integrity. Post-procedure, patients were monitored for peri-operative complications, short term functional and oncological outcome.

Age	65-69	3(43%)
	70-74	3(43%)
	≥75	1(14%)
PSA	<3	1(14%)
	3-3.9	2(29%)
	4-4.9	1(14%)
	≥5	3(43%)
Gleason sum	6	3(43%)
	7	3(43%)
	8	1(14%)
ADT	Y	1(14%)
	N	6(86%)

Table 1. Patient characteristics

**Results:** Seven patients aged between 66 and 79 years were included in the study. Pre-treatment organ confined recurrence was confirmed with biopsy and PSMA scan. Median follow up was 18 months, ranging from 2 to 32. All post-operative complications were of Clavien-Dindo Grade I or lower. Noted complications included short-term perineal pain (28%); hematuria (42%); dysuria (29%); and scrotal ecchymosis (14%). Functional outcomes: One patient (14%) reported new onset erectile dysfunction within 6 months of procedure. The continence rate, defined as ≤1pad or less per day was 57% immediately post-procedure, and 71% 3 months after procedure. No patient experienced treatment related urinary retention. No patient had rectal fistulation. Oncological outcome: Median pre-salvage PSA was 5. Median post-salvage PSA at 3 months was 0.14. At the latest follow-up, 2 patients (29%) had biochemical recurrence fulfilling the Phoenix criteria.

Urinary retention	0
New onset ED	1(14%)
Incontinence (3m post salvage)	2(28%)
Rectal fistula	0

Table 2. Functional outcomes

Mean pre-salvage PSA	5
Mean PSA 3 months post-salvage	0.14
Biochemical Recurrence rate	29%

Table 3. Oncological outcome

**Discussion:** The European Association of Urology recommends consideration of salvage treatment for locally recurrent prostate cancer in selected patients with low comorbidity and low risk disease<sup>2</sup>. The recommendations did not comment on specific treatment modalities due to insufficient of supporting data. This study endeavors to contribute to the growing literature assessing whole-gland cryoablation as salvage treatment. This report is of particular importance because it describes the first prostate cryoablation experience in Singapore. Our findings, though preliminary, suggest that salvage whole-gland cyroablation of prostate is an effective treatment for radiorecurrent prostate cancer with acceptable functional outcomes. As with all salvage treatments, functional outcomes are less ideal than those after primary treatment for prostate cancer.

**References**  
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