



Predictors of biochemical recurrence in patients treated with partial and whole prostate gland cryoablation

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BACKGROUND AND AIMS

- Partial and whole gland cryoablation is a valid alternative to radical treatment for a subgroup of patients at low to intermediate risk disease with less side effects. However, lacking long-term data, there is no consensus about the best strategies to follow up patients after the treatment.
- The aim of this study was to determine which are the predictive variables of biochemical recurrence after this treatment.

MATERIALS & METHODS

- From our institutional database, we identified 128 patients who underwent partial (56, 43%) and whole gland (72, 57%) cryoablation for biopsy proven unilateral or bilateral prostate cancer respectively.
- Partial and whole-gland cryoablation was performed by a free-hand technique under TRUS guidance using argon/helium gas based system (Endocare, HealthTonics Inc., Austin, TX, USA), with a double freeze-thaw cycle. All patients maintained an 18F Foley catheter for 1 week or 10 days respectively after partial and whole cryoablation that was discontinued after a voiding trial.
- Follow up was scheduled with a serum PSA every three months and a mpMRI 6 month after partial gland procedure. Of each patient, we recorded data about age, clinical stage, preoperative PSA, ISUP, prostate density, prostate volume, PSA nadir and cryoprobe number.
- We analyzed factors associated with biochemical recurrence defined according to Phoenix criteria as a PSA rising of more than 2 ng/ml after PSA nadir.
- Cox regression univariate and multivariate analysis was done to determine the clinical indicators that predict for PSA failure.
- Kaplan Meier analysis was run to estimates overall progression free survival after partial and whole gland treatment

RESULTS

- Patients's characteristics and predictive variables are reported in **table 1**. Using EAU risk stratification criteria, 49 had low risk disease (ISUP 1 with PSA <10 and cT1c-cT2a), 31 had Intermediate Risk disease (ISUP 2 or PSA 10-<20 or cT2b) and 48 patients had high Risk disease (ISUP ≥3 or PSA >20 or cT2c).

Variable	PARTIAL GLAND	WHOLE GLAND
	N. Patients= 56	N. Patients= 72
Age	78 (71, 80)	77 (73, 79)
Clinical Stage, n (%)		
1	38 (68%)	46 (64%)
2	8 (14%)	0 (0%)
3	8 (14%)	1 (1%)
4	2 (4%)	24 (33%)
5	0 (0%)	1 (1%)
PSA	6.11 (4.70, 8.19)	5.82 (4.84, 9.20)
ISUP, n (%)		
1	33 (59%)	16 (22%)
2	13 (23%)	18 (25%)
3	4 (7%)	14 (19%)
4	6 (11%)	20 (28%)
5	0 (0%)	4 (6%)
PSA density	0.13 (0.10, 0.20)	0.15 (0.10, 0.25)
Prostate volume	48.00 (37.50, 62.75)	42.00 (30.00, 56.00)
PSA nadir	1.12 (0.50, 2.72)	0.20 (0.09, 0.65)
N°aghi	4.00 (3.00, 4.00)	6.00 (6.00, 6.00)
Recurrence, n (%)		
0	51 (91%)	62 (87%)
1	5 (9%)	9 (13%)

Table 1: Demographics characteristics

	UNIVARIATE				MULTIVARIATE			
	Haz.	95% C.I.		P> z	HAZ.	95% C.I.		P> z
ISUP								
1	ref.				ref.			
2	3.023	0.273	33.362	0.366	5.975	0.457	78.110	0.173
3	14.807	1.726	127.013	0.014	26.943	2.178	333.294	0.01
4	7.346	0.856	63.019	0.069	15.922	1.240	204.396	0.034
5	12.201	0.755	197.028	0.078	27.506	1.262	599.151	0.035
Pre op PSA	1.027	1.001	1.053	0.04	0.929	0.870	0.992	0.029
PSA nadir	1.145	1.026	1.278	0.016	1.521	1.152	2.009	0.003
Partial Gland	ref.				ref.			
Whole Gland	1.199	0.401	3.584	0.744	2.035	0.397	10.433	0.394

Table 2: Univariate and multivariable analysis

- Biochemical recurrence rate for partial and whole gland treatment was 9 (5/56) and 13 % (9/72) of patients respectively until to 55 months of follow-up Local recurrence was defined as prostate cancer in treated lobe or both lobes respectively in partial and whole gland cryoablation. In the last three years follow-up is completed with mpMRI in partial treatment. All of them underwent MRI/Target biopsy with diagnosis of cancer progression or local recurrence and then underwent to a radical cryoablation of prostate in previous treated partial ablations while to androgen deprivation therapy and re-cryoablation respectively in 7 and 6 patients previously treated whole gland ablation with, actually undosable PSA. At 55 months of follow-up no patients showed distant metastases. Univariate and multivariate Cox regression analysis showed that pre-operative PSA, PSA nadir, ISUP 3-4-5 are associated with an higher risk of biochemical recurrence (table 2).

DISCUSSION

This study is limited by its retrospective nature. Patients were selected by TRUS biopsy rather than with MRI and consequent MRI/TRUS Fusion biopsy, which could add accuracy to staging and potentially provide better outcomes. However, in the last three years, MRI is part of follow-up protocol. So, this new imaging technique may have identified recurrences earlier. Cryoablation is a safe, minimally-invasive procedure that uses cold temperature delivered via probes through the skiin to kill prostate cancer cells. Partial and whole-gland cryoablation may offer an alternative treatment option to surgery and radiotherapy. We found that patients had good cancer outcomes to 55 months after partial and whole-gland cryoablation.

CONCLUSIONS

- In patients suitable for Partial and whole gland, on the basis of parameters suggested by EAU guidelines, around 91 and 87 % respectively are biochemical recurrence free to 55 months. We identified higher PSA nadir, pre-operative PSA and ISUP particularly grade 3,4 and 5 as predictive factors of biochemical recurrence after cryoablation therapy for clinically localized prostate cancer.