MP30-18

Hemi-gland Cryoablation of Prostate Cancer: MRI-guided Biopsy for Evaluation and Follow-up

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Introduction

- Cryotherapy was the first of the prostate focal therapies, but follow-up via MRI-guided biopsy has not been reported[1-3].
- Hemi-gland treatment, readily achievable with cryotherapy, offers the potential for effective margins of ablation.

Objective

- To study the safety and cancer-control of hemi-gland cryoablation, using MRI-guided biopsies before and after treatment.

Materials & Methods

- 25 men with clinically significant prostate cancer (csCaP) were subjects of this open-label IRB-approved study (Table 1).
- MRI-guided targeted and systematic biopsy (fusion, Artemis) confirmed the lesion to be only unilateral and prostate volume <60 cc.
- Hemi-gland freezing was achieved via 14ga needles (2-3) inserted trans-perineally under US guidance, using two cycles of argon gas cooling (Galil/BTG) and a urethral warming catheter (Fig. 1).
- All patients were treated under general anesthesia in the UCLA surgi-center and discharged the same day with an indwelling Foley catheter.
- All patients underwent follow-up MR fusion biopsy at 6 months (Fig. 2).

Table 1: Patient characteristics

Mean Age, years (SD)	68.6 (5.9)
Ethnicity	
Caucasian	88%
Hispanic	12%
PSA (ng/ml), median (IQR)	6.4 (5.2, 10.3)
Prostate Volume (cc), median (IQR)	31.7 (25.1, 42.0)
PSA density (ng/ml/cc), median (IQR)	0.21 (0.14, 0.29)
PI-RADS ROI (pre-treatment), n (%)	
Grade 5	14 (56%)
Grade 4	6 (24%)
Grade 3	3 (12%)
MRI negative	2 (8%)
Gleason Score (pre-treatment), n (%)	
3+3 (high volume)	2 (8%)
3+4	16 (64%)
4+3	5 (20%)
4+4	2 (8%)

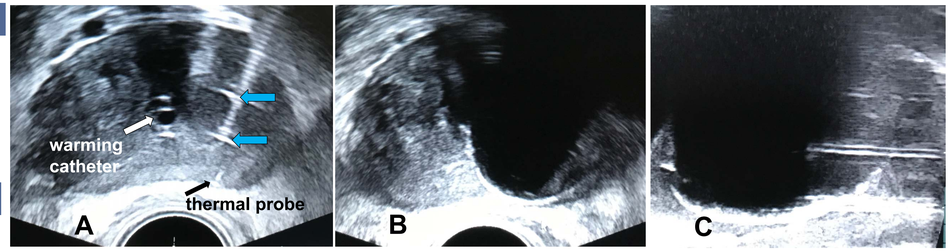

Fig. 1: Hemi-gland cryoablation. A. Pre-freezing. Blue arrows indicate cryo needle placement. B and C. Treatment in progress. Ice ball shown in transverse (B) and sagittal (C) views.

Results

- Cryotherapy was completed satisfactorily in all 25 cases in ≤ 90 minutes (room time) with no intra-operative complications.
- Ipsilateral biopsy (avg 10 cores) revealed no cancer in 20/25 (80%) and microfocal residual in 2 (Fig. 3). 3 were failures.
- Repeat MRI showed disappearance of the MRI target in 17/22 (77%) men.
- PSA and PSAD decreased 6 months post–operatively (Fig. 4).
- Treatment complications included one case of transient urinary retention; no incontinence was noted.
- At 6 months, IPSS and EPIC-26 scores were unchanged; median IIEF-5 scores decreased from 17.0 to 13.5, respectively. Of 12 men with erections adequate for intercourse initially, 10 maintained function and 2 were not sexually active.

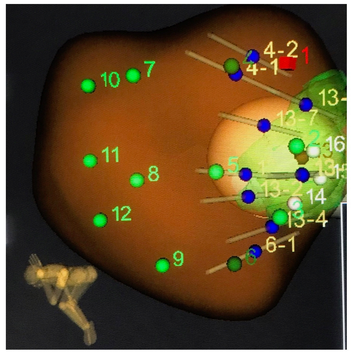

Fig. 2: Example of extensive follow-up biopsy at 6 months after hemi-gland cryoablation (Artemis reconstruction).

Brown area = prostate
Green area = ROI from prior MRI
White dots = prior positive sites
Blue dots = 6 mo. biopsy sites
Tan lines = biopsy cores
Green dots = systematic template

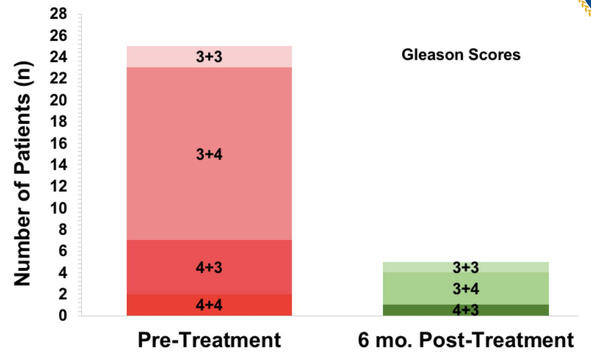

Fig. 3: Results of MRI-guided biopsy.

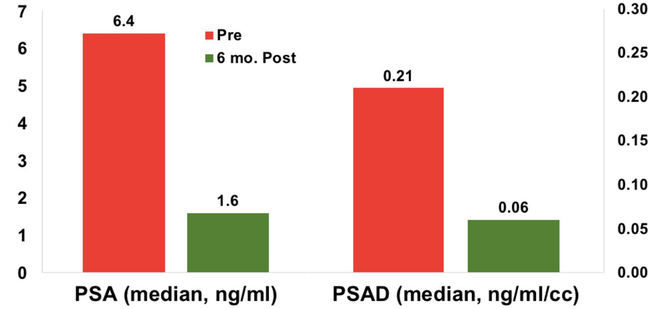

Fig. 4: PSA and PSA density.

Conclusions

Hemi-gland cryoablation for intermediate risk prostate cancer is well-tolerated and, when evaluated at 6 months by MRI/US fusion biopsy, has an apparent cure rate of 80%.

Acknowledgments

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References

1. Onik G, Vaughn D, Lotenfoe R, et al.: "Male lumpectomy": focal therapy for prostate cancer using cryoablation. Urol 2007; **70**: 16-21.
2. Ward JF and Jones JS: Focal cryotherapy for localized prostate cancer: a report from the national Cryo On-Line Database (COLD) Registry. BJU Int 2012; **109**:1648-54.
3. Bahn D, de Castro Abreu AL, Gill IS: Focal cryotherapy for clinically unilateral, low-intermediate risk prostate cancer in 73 men with a median follow-up of 3.7 years. Eur Urol 2012; **62**:55-63.