High Dose Rate Monotherapy for Prostate Cancer

Lionel Schour, M.D., D. Jeffrey Demanes, M.D, Gillian Altieri, C.M.D. David Brandt, M.A., Marie-Claire Barnaba, M.S.N.,RN, Pat Skoolisariyaporn, M.S.

California Endocurietherapy Cancer Center, (CET), Oakland, California

Purpose: To report the 5 and 8 year outcomes of High Dose Rate (HDR) monotherapy for low and early intermediate risk prostate cancer.

Methods: Between Jan. 1996 and Dec. 2003, 117 consecutive patients median age 64 years were treated with 2 implants performed a week apart. Each implant received 3 fractions of 8.75-7.25 Gy/Fr. Cohort characteristics were T1c (82%) and T2 (18%), Gleason 6 (64%) and 7 (35%), PSA <10 (84%) and 10-20 (16%), and risk group low 75% and intermediate 25%. The total HDR dose was escalated from 38 to 43.5 Gy over time. The planning volume was calculated at least 5mm beyond the prostate capsule except posteriorly where the margin varied according to the proximity of the anterior rectal wall. The normal tissue dose constraints were anterior rectum 85%, bladder 85%, and urethra 105%. Median follow-up was 25 months (mean = 31 months). The ASTRO, two consecutive rises > 0.5 ng/ml, and nadir + 2 ng/ml definitions of PSA progression were analyzed. Morbidity was based upon RTOG criteria.

Results: The KM PSA progression free survival at 5 and 8 years are the same: 0.96 ASTRO, 0.94 nadir + 2, and 0.98 two rises of <0.5 ng/ml. All but one patient had clinical disease control. Upon further follow-up, the two patients who were ASTRO failures were not true failures. The cause specific survival was 100%. The median time to nadir was 51 months. RTOG late GI morbidity was negligible. One patient with ulcerative colitis had G1 morbidity. The late urinary morbidity was G2, G4, G5. The G2 cases consisted of 1 dilation for urethral stricture, 2 self-catheterizations, and 1 laser TUR for BPH.

Conclusion: The CET HDR monotherapy protocol is safe and effective therapy for low and early intermediate risk group prostate cancer.

Advantages of HDR monotherapy:

- Fewer side effects than with combined HDR/EBRT protocols for low to early intermediate risk patients.
- Doses to both target and nearby tissues are known before any radiation given to patient.
- The treatment is delivered in minutes, with patient in same position as planning images, adding to treatment deliver accuracy.
- The implant is checked radiographically or fluoroscopically before every treatment to ensure treatment catheter position consistency.
- The ability to deliver the prescription dose accurately to any distance away from prostate capsule, with no concern about seeds shifting or migrating.
- The D90 values are ALWAYS 105-120%.
- The V100 values are ALWAYS 97% or better.
- The ability to control the dwell times is like having an infinite supply of seeds of any activity to achieve the highest level of dose conformity available.
- No radiation exposure to others.