Short-Term Androgen Blockade, External Beam Irradiation and high Dose Rate Brachytherapy Boost are Effective in the Management of Locally Advanced Prostate Cancer

Hayes JK[1], Hansen RS[1], Rogers CL[1], Stephenson RA[2], Swallow CT[3], Gange SN[4], Childs LC[4], Crouch RH[5], Campbell CM[6], Alder SC[2]

[1]GammaWest Brachytherapy, Salt Lake City, Utah; [2]University of Utah School of Medicine, Salt Lake City, Utah; [3]Budge Clinic, Logan, Utah; [4]Western Urological Clinic, Salt Lake City, Utah; [5]Valley View Hospital, Cedar City, Utah; [6]McKay Dee Hospital, Ogden, Utah

Purpose: To evaluate the efficacy of treating high risk prostate cancer with high-dose rate (HDR) interstitial brachytherapy boost.

Material and Methods: We reviewed the post treatment course of 211 men with a minimum of 3 years follow up.

• Each had locally advanced prostate cancer defined as one of more of the following risk features:

- PSA ≥ 20.0 ng/ml
- Gleason Score 8 to 10
- Clinical Stage T3 or T4.

• 97% received maximum androgen blockade, most commonly a 4-month course beginning 2 months before the start of external beam radiation therapy (EBRT).

• Each received 45 Gy pelvic EBRT (45 Gy in 25 fractions) and an HDR brachytherapy boost, typically one week later.

• Brachytherapy needles were placed, along with 4 interstitial gold marker seeds, using ultrasound and fluoroscopic guidance, with needles secured by a Syed template. The most frequent number of needles was 17. Posterior needles were placed in the semial vesicles. Treatment planning was performed using CT stimulation with a radio-opaque foley catheter, bladder and rectal contrast.

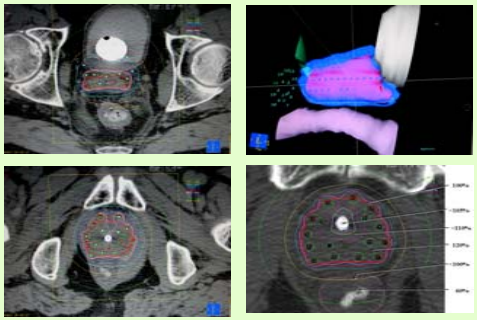
• The HDR brachytherapy prescription dose was 19.5 Gy in three fractions over 24 hours (n=189), excepting patients with prior TURP (n=22), who were prescribed 18.0 Gy in three fractions. Needle localization radiography was used to verify correct needle position with respect to interstitial gold seed fiducials.

Results:

•Follow-up time: Mean = 49.5 Months

•Age at diagnosis: Mean = 70.2 years

• Pre-treatment PSA: Mean = 18.6 ng/ml
(range 1.7 ng/ml – 103.9 ng/ml)



Results (cont):

•T-stage:
T1c, n=32 (15%)
T2a, in 46 (22%)
T2b/c, in 28 (13%)
T3 ,in 102 (49%)
T4 in 3 (1%).

Gleason's Score:
4 – 6, n=53 (25%)
7, n=65 (31%)
8-10, n=93 (44%)

# of Risk Features:
One, n=155 (73%)
Two, n=49 (23%)
Three, n=7 (3%)

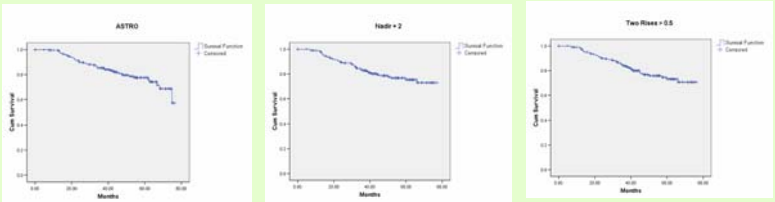
• Treatment time (start of IBRT to end of HDR): Mean = 44.9 days

• Five-year Kaplan-Meier Estimates of Biochemcial DFS:

ASTRO, 77.6% (48 patients at risk)

Nadir + 2 ng/ml, 75.8% (50 patients at risk)

2 rises of > 0.5 ng/ml, 75.6% (48 patients at risk)



Results (cont):

• For patients with at least 5 years follow-up (n=63), 43 (68.3%) have a PSA value of ≤ 0.2 ng/ml.

• 5-year rate of freedom from androgen ablative therapy was 80.8%.

• Pre-treatment risk features were analyzed using a proportional hazards model:

- •PSA ≥ 20, relative risk=1.91(p=0.051)
- •Gleason's score 8-10, relative risk=3.17 (p<0.001),
- •Stage T3-4, relative risk=3.97 (p<0.001).

• 5 year actuarial biochemical failure (ASTRO definition):

- • One feature: 85.8%
- •Two features: 57.2%
- •Three features: 42.9%

Conclusions: We report on a large cohort of patients with high risk prostate cancer and a minimum of 3 years of follow-up, the majority of whom are disease free without the use of androgen ablation.

Also, the majority of patients with multiple risk features achieved biochemical NED status. The majority of patients followed beyond 5 years have undetectable PSA levels.

These data attest to the efficacy of aggressive treatment using short course androgen ablation, EBRT and HDR brachytherapy boost in high-risk patients.

These data support a growing body o literature contending that high risk prostate cancer no longer carries a dismal prognosis when treatment protocols, such as ours incorporating HDR brachytherapy, are employed.