

Comparison of patients' reported quality of life following MR- and ultrasound-guided brachytherapy for localized prostate cancer, using a standardized questionnaire and multivariate analysis

Agnieszka Szot Barnes, M.D., M.S., Anthony V. D'Amico, M.D., Ph.D., Irving D. Kaplan, M.D., Judith Manola, M.S., Clare M.C. Tempany M.D., James A. Talcott, M.D., M.S.

Contact information:

Agnieszka Szot Barnes
Brigham and Women's Hospital
ASB I, L2
Room 050
Boston, MA 02115

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PURPOSE:

To prospectively compare quality of life (QoL) outcomes between patients treated with either MR- (MRBT) or ultrasound- (USBT) guided brachytherapy for localized prostate cancer.

PATIENTS AND METHODS:

Men treated for localized prostate cancer and who completed a baseline QoL questionnaire before treatment and at least one follow-up questionnaire were included. Follow up questionnaires were distributed to patients approximately 3, 12, 24 and 36 months after therapy. The questionnaires were completed over a similar time interval, with more frequent completion during the most active course of follow-up.

Inclusion criteria for US-guided procedure (USBT) were: AJCC clinical stage not higher than stage T2BNXM0, biopsy Gleason ~~score~~ sum not more than 7, and PSA less than 10ng/ml. Inclusion criteria for MR-guided procedure (MRBT) were: AJCC clinical stage T1cNXM0, biopsy Gleason sum not more than 7 and score not greater than 3 + 4, PSA less than 10 ng/ml, and endorectal coil MR stage less than T2. MR guided implants were performed in a Signa SP system, with all patients undergoing a 1.5T endorectal coil MRI prior to the procedure. The Signa SP images, in the 3D Slicer, were the primary image source used for treatment planning and the Slicer was used to contour the peripheral zone, urethra and anterior rectal wall. Near-real time needle guidance and seed implantation was achieved with multiple FRG sequences. Patients who underwent EBRT or androgen deprivation therapy before brachytherapy were included in the study; patients with prior transurethral resection of the prostate (TURP) were excluded.

The questionnaire used in this study has been validated previously.. Symptom-related items included 3 items for urinary incontinence in the past week, 5 items for urinary obstruction, 7 bowel symptom items, and 5 sexual dysfunction items. Urinary and bowel questions asked about the intensity and frequency of symptoms; sexual dysfunction items assessed the quality of erections, orgasm and ejaculation. Index scores ranged from 0 to 100 with higher number indicating greater symptom severity or distress.

Mixed models with repeated measures over time for each subject were used to explore differences between symptoms over time by treatment type. A hierarchical

compound symmetry covariance structure was assumed. The models employed the actual time from baseline in days as the time element, and the five derived points were used to form the covariance matrix.

RESULTS:

Between 1997 and 2002, 387 men were treated and returned self reported baseline QoL questionnaires. Of those, 298 received USBT (mean age 67 years, range 46-85), and 89 received MRBT (mean age 63, range 49-77) at 2 institutions. The groups did not differ in baseline PSA, clinical stage, race and marital status. USBT patients were older ($p<0.0001$) and more often received hormonal treatment prior to therapy ($p<0.0001$), whereas more MRBT patients received external beam (EB) radiation therapy prior to implant ($p<0.0001$).

The USBT group had significantly worse baseline scores for urinary incontinence ($p=0.001$), urinary obstruction/irritation ($p=0.05$) and erectile dysfunction ($p<0.0001$), but bowel function was similar.

In a mixed model of the difference between 2 groups over time adjusting for age, baseline QoL scores, and receipt of hormones/external beam radiation, MRBT patients fared better than USBT patients in incontinence ($p=0.0009$), urinary obstruction/irritation ($p<0.0001$), and erectile function ($p=0.0019$), but were similar in bowel symptoms ($p=0.35$).

CONCLUSION:

Over a period of 36 months patients treated with MRBT were less likely to develop urinary incontinence, urinary obstruction/irritation symptoms, and erectile dysfunction than those treated with USBT. Changes in bowel symptoms were similar for the two groups.