

# Focal Low Dose Rate Brachytherapy for Unifocal Low Intermediate Prostate Cancer – Preliminary Experience

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## Introduction

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Definitive treatment for localized prostate cancer is associated with significant morbidity. Focal therapy for patients with low-intermediate risk features is an emerging modality aimed at reducing treatment-related toxicity. With the development of accurate diagnostic imaging using MRI, focal treatment with low dose rate (LDR) brachytherapy has become a viable ablation option.

## Aims

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This pilot study aimed to evaluate the feasibility and the early toxicity of focal brachytherapy in highly selected localized prostate cancer patients.

## Methodology

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Between August 2015-February 2020, a prospective database of eligible patients was maintained. Only patients with unifocal MRI-visible low-intermediate grade tumours on targeted plus template transperineal biopsy were included. Men received LDR via a single monotherapy implant using Iodine 125 seeds to deliver a prescribed dose of 145Gy. All patients underwent a post implant dosimetry scan at day 30 to assess seed position. Follow up at 3 and 6 months included clinical exam, PSA test and toxicity review using RTOG scoring criteria. Patients underwent a repeat mpMRI and targeted and template TP prostate biopsy at 12 months post-therapy.

## Results

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A total of 28 patients completed assigned treatment with the mean operating time of 36min (23-47min). Baseline characteristics included mean: age 69 (52-82), prostate volume 40ml (15-90) and PSA 7.2 (3.5-15.3). Most patients, 26 (92%) had Gleason score (GS) 3+4, while 2 (7%) had GS 3+3. The mean total implanted activity (mCi) was 16.75 (8.2-32.25) with 25% of the prostate irradiated on average. Excellent or good post implant dosimetry outcomes were achieved in 24/28 (85%) patients with minimal radiation to at risk organs (urethraV200>0.00cc=0%,RectumV100>4.0cc=0%). Serum PSA measurements decreased after treatment and stabilized at 6 months. No RTOG grade ≥3 toxicity was observed. To date, 8 (28%) patients have completed their post-treatment biopsy date. Sampling of the index lesion post treatment found 4 men with no cancer and 4 men with cancer of indeterminate grade due to treatment effect. No patient had cancer detected in the remainder of the gland. One patient (3.5%) proceeded to radical treatment following biochemical failure at 36m. He was re-biopsied, finding a small foci of GS 4+3 at the treatment zone and underwent an uncomplicated radical prostatectomy.

## Conclusions

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Our initial experience with focal LDR brachytherapy highlights its ease of implementation in the hands of an experienced brachytherapist, lack of toxicity and a high rate of successful ablation of significant prostate cancer. These results have formed the basis of the prospective LIBERATE registry for focal brachytherapy.