

Focal therapy for localised prostate cancer

By Kalli Spencer

The main goal of focal therapy is the targeted focal destruction of cancer tissue with the preservation of surrounding healthy prostate tissue. There have been conflicting opinions on the definition, but it seems the consensus is “ablation of the dominant or index lesion”¹. The principle of targeted therapy has been applied to other cancers such as breast, liver, brain, and thyroid. It represents the middle ground between active surveillance and treatments such as radical prostatectomy and radiation therapy. The reported benefit of focal therapy is the preservation of sexual function and urinary continence. This is because the energy destroying the cancer is focused only on the affected area within the prostate, sparing any injury to nerves running on the outside of the prostate that supply the external urinary sphincter or the erectile mechanism of the penis.

Over 90% of patients present with cancer in multiple areas within the prostate (multifocal) and only 20–40% have cancer in one area. Despite the multifocal nature of prostate cancer, many cancerous prostates have “a single substantial lesion” (index lesion). It has been proposed that the characteristics of the index lesion predict the behaviour of disease in the rest of the prostate and its metastatic potential. So by targeting the index lesion in men with low and intermediate-volume prostate cancer it will provide satisfactory oncological outcomes. Patients should have a life expectancy (> 5 years); a performance status of 0/1 and a Gleason score < 8. High grade prostate cancer has to be excluded with a template guided prostate biopsy and the prostate is mapped with an MRI. For the procedure to be successful there should be at least a 3mm margin around the index lesion¹.

Several energy modalities exist to target the cancer including irreversible electroporation, laser ablation, high intensity focused ultrasound (HIFU), cryotherapy, and photodynamic therapy. The rest of this blog will discuss three modalities currently available in Australia: Irreversible electroporation, HIFU, and laser ablation.

Irreversible electroporation

This treatment is delivered using the Nanoknife system with a low-energy direct current to the focal region. The lesion is delineated by needles which are positioned with ultrasound guidance. Electropulses cause complete ablation with no thermal damage. In a cohort study of 112 patients, Professor Phillip Stricker from St Vincent’s Hospital found an overall survival rate of 100%, metastasis-free survival of 99%, failure free survival of 97% at three years². With regard to incontinence, 98% remained pad free and 76% had no change in erectile function. Twelve patients had to have a repeat treatment.

HIFU

Uses ultrasonic waves to initiate cellular damage. 'High-intensity' refers to the power of these sound waves. The ultrasound probe is placed in the rectum allowing real-time visualization of prostatic tissue and also delivering energy to destroy the desired target

Level 8, 1 Chandos Street, St Leonards NSW 2065 | PO Box 499 St Leonards NSW 1590

Telephone: +61 2 9438 7000 | Facsimile: +61 2 9438 7099 | Freecall: 1800 22 00 99 | pcfa.org.au

PROSTATE CANCER FOUNDATION OF AUSTRALIA LIMITED (ABN 42 073 253 924) AS TRUSTEE FOR PROSTATE CANCER FOUNDATION OF AUSTRALIA (ABN 31 521 774 656)

area. The procedure can be technically challenging if the prostate has numerous large calcifications. Isolating the focal area is complex and can result in retreatment rates of up to 34%, more researched is required here. Professor Peter Royce from the Alfred Hospital in Melbourne prefers a whole gland approach as reported in his study of 70 men with a 8 year follow up. Failure-free survival was 71.2% at 7 years and 7.1% of men developed metastases with median metastasis-free survival of 75.4 months. Whole gland HIFU preserved urinary continence and demonstrated erectile function approximate to a nerve-sparing radical prostatectomy.

Laser ablation

A laser probe is introduced through the perineum into the prostate under MRI or ultrasound guidance, facilitated using a grid. Once in position, ablation is monitored using the aforementioned imaging modalities, which indicate whether adequate temperatures have been achieved to destroy cancerous tissue. Professor Celi Varol from the Nepean Hospital in his series of 49 patients found a significant PSA drop and MRI improvement at 18 months⁴. There was no impact on urinary and sexual function. Persistent cancer was found in 10 patients.

Locally access to these therapies is either through a clinical trial or at specific private institutions and may not always be supported by private health funds.

Comparison between treatment modalities is troublesome given the large variation in treatment administration and follow-up protocols in various studies. In general patient requires follow up with PSA monitoring and regular MRIs. Any rise in PSA or suspicious lesion on MRI would warrant a repeat prostate biopsy. At present there is limited consensus on the definition of treatment failure and success.

Many of the trials require longer follow up outcomes. As experience in focal therapy broadens however, extended periods of follow-up data will soon become available which will be useful to create standardised guidelines for many of these treatment approaches in this select patient population.

References

Perera, M., Krishnananthan, N., Lindner, U. Lawrentschuk N. An update on focal therapy for prostate cancer. *Nat Rev Urol* 13, 641–653 (2016).

Blazevski A, Scheltema MJ, Yuen B, Masand N, Nguyen TV, Delprado W, Shnier R, Haynes A, Cusick T, Thompson J, Stricker P. Oncological and quality-of-life outcomes following focal irreversible electroporation as primary treatment for localised prostate cancer: A biopsy-monitored prospective cohort. *European Urology Oncology* 2020; 3 (3)283-290.

Royce PL, Ooi JJY, Sothilingam S, Yao HH. Survival and quality of life outcomes of high-intensity focused ultrasound treatment of localized prostate cancer. *Prostate Int.* 2020 Jun;8(2):85-90.

Al-Hakeem Y, Raz O, Gacs Z, Maclean F, Varol C. Magnetic resonance image-guided focal laser ablation in clinically localized prostate cancer: safety and efficacy. *ANZ J Surg* 2019; 89(12) 1610-14.



About the Author

Kalli Spencer
MBBCh, FC Urol (SA), MMed (Urol), Dip.Couns (AIPC)

Kalli is an internationally renowned Urological Surgeon, specialising in oncology and robotic surgery. He trained and worked in South Africa, before relocating to Australia where he has worked at Macquarie University Hospital and Westmead Hospital. His passion for what he does extends beyond the operating room, through public health advocacy, education and community awareness of men's health, cancer and sexuality.

Kalli has been involved with the Prostate Cancer Foundation of Australia for many years, advocating for improved cancer care and facilitating community prostate cancer support groups.