



Brachytherapy for prostate cancer

What is brachytherapy?

Brachytherapy for prostate cancer is a technique that involves implanting 'radioactive seeds' in the prostate. These 'seeds' emit small amounts of radiation that affect tissue in a small area. In the case of localised prostate cancer the aim of brachytherapy is to stop the cancerous cells in the prostate from growing.

What is the Society's stance on brachytherapy for prostate cancer?

The Executive of the Urological Society of Australasia, having reviewed results of recent trials of this therapy, confirms that it appears to be one of a range of therapeutic options patients with localised prostate cancer could consider.

When was brachytherapy developed?

Brachytherapy is not new. Throughout this century, several types and routes of implantation of radioactive seeds have been used to treat prostate cancer. Radioactive Iodine (I125) seeds were widely used during the 1970s and 1980s at the Memorial Sloan Kettering Cancer Center in New York. At this time, the seeds were placed in the body via an incision in the abdomen.

Other radioactive seeds - e.g. gold and palladium 103 - have been tried, however, I125 had the significant advantage of long duration of action and short tissue penetration, i.e. the radioactive seeds implanted would work for a long period of time, and they would only affect the part of the body they were very close to.

The treatment eventually fell into disfavour because results showed the cancer was not always controlled, especially in the region around the prostate.

Why was brachytherapy developed when radiotherapy already existed?

External beam radiotherapy, where a beam of radiation is focused onto a particular part of the body, is used to treat a range of cancers. When external beam radiotherapy is used to treat prostate cancer, the beam, while affecting the cancer cells in the prostate, can also have damaging effects upon surrounding, otherwise healthy tissues, such as the bladder and rectum. It was thought that if the radioactive material was put into specific parts of the body, the effects of incidental irradiation would be lessened.

When the prostate-specific antigen (PSA) test was developed, it led to the diagnosis of prostate cancer at an earlier stage than previously, and an increase in surgical removal of the prostate, or radical prostatectomy. While this operation has been shown to cure cancer in many cases, it can have significant side effects, such as incontinence and impotence. Radiotherapy can produce the same rate of cure as radical prostatectomy, however, it also has worrying side effects. With this in mind, the use of radioactive seeds was considered.

When is brachytherapy appropriate?

Recent trials of brachytherapy have used a new method of implantation. Rather than a surgical incision, radioactive seeds, under ultrasound control, have been placed in the prostate using a needle through the perineum. It is probable that using this technique leads to more accurate seed placement than earlier techniques, however the treatment effects are the same.

If patients with probable localised disease undergo brachytherapy, cure rates, in the short-term, are similar to those achieved with radical prostatectomy. Patients likely to have localised disease include those with:

- PSA <10



- Well-differentiated disease on biopsy (Gleason score <7)
- Small or impalpable cancers on digital rectal examination
- Patients with prostate cancer with these characteristics may also do well with surgery, radiotherapy or a policy of 'watchful waiting', with early or delayed hormonal therapy.

What is the latest data on brachytherapy?

In Australia, only a relatively small number of patients have undergone brachytherapy.

At a meeting of the American Urological Association, Dr Gerry Blasko of Seattle presented the results of his study of brachytherapy in 634 patients over the period 1987-95. Several different types of radioactive seeds were used in this study, and many of the patients participating were treated with brachytherapy combined with external beam radiotherapy. This combined approach increases both the cost and duration of treatment, and the side-effect profile is similar to that of radiotherapy alone.

A total of 403 patients in the study underwent brachytherapy alone, and the median time of follow-up was 5 years. At 8 years follow up, 68% of patients showed survival with no evidence of cancer. However, only 14 patients were followed for this period of time. At this stage long-term results are unavailable.

What are the side effects of brachytherapy?

In Blasko's study almost all patients experienced urinary frequency and urgency. Perineal pain was experienced by 10% of patients, as were rectal irritative symptoms. Of concern, the risk of urine retention was approximately 20%. Patients who required surgical resection of the prostate after brachytherapy had a 32% risk of incontinence.

The risk of impotence was 30%.

Where is brachytherapy available in Australia?

Brachytherapy with I125 is offered in a number of centres in Australasia, in both public and private institutions. Some centres use brachytherapy alone, while others use a combined treatment approach with external beam radiotherapy. This will make it difficult to compare results from different institutions.

Patients should be aware that randomised, controlled trials comparing brachytherapy to other treatment options, such as surgery, radiotherapy, observation and/or hormonal treatments, have not been completed. At this time, treatment choices are difficult. There is simply no study, currently available, to prove increased longevity in exactly comparable groups, using any one treatment approach compared to any other.

Clearly, research needs to continue into effective treatments for prostate cancer, and the Urological Society of Australasia is strongly supportive of increased funding for these efforts.

Resources

Two books are currently available for consumers that deal with issues that may arise for men with prostate cancer.

- "Your prostate, your choices", G Hirst & S Wilde. Bantam Books, 1999.
- "Your prostate questions answered", P Rashid & G Watters, 1999.