

BRACHYTHERAPY - TEMPORARY VERSUS PERMANENT SEED PLACEMENT

By: Gil Lederman, M.D.

There are many ways of treating prostate cancer in this day and age. The possibilities extend from surgery to radiation to even no treatment. The most common surgery is radical prostatectomy often performed in an attempt to spare the nerve responsible for sexual function. There are many different types of radiation including external beam radiation, conformal radiation, body radiosurgery, permanent seed implantation and temporary seed placement.

One would think there are many advantages to temporary seed placement including the fact that the same seeds that temporarily are used to treat one patient can be used to treat another patient. It is removed and used again and again. This represents an economy of seed. Is an insurance company's saving likely to benefit the patient? Also, since seeds are placed into the patient in a shielded room there is nearly no radiation exposure to medical personnel a big plus for us!!

It should be pointed out that we in general offer permanent seed placement most commonly and have one of the largest experiences worldwide.

Thus, from a financial and radiation protection point of view, temporary seed placement can make sense. There are, however, limitations to the technology.

These limitations include the placement of catheters under surgical insertion. After catheter placement the patient would need to remain in the hospital for radiation seed treatment through the catheter access over the ensuing days. Pain is usually associated with this procedure unlike permanent seed placement where the patient leaves the hospital after several hours and returns, in general, to his normal functions. Remember Rudy Giuliani marching in a parade the next day?

Usually multiple treatments via this transient seed route are performed. Also, multiple CT scans are performed to confirm the accuracy of the catheter's placement before each treatment. New physics plans are produced each time. Because the catheter extends from the prostate externally through the skin, there can be movement. This movement may end up causing dislocation of the catheter. If the catheter is dislocated, then the treatment would go to the wrong area. That would more likely cause harm and is less likely to result in a curative outcome. Both are undesired outcomes.

My personal preference is towards permanent seeds. I, personally, have placed 200,000 seeds into cancerous prostates. Our group has a vast track record, experience and results that are enviable.

When we place permanent seeds, they tend to stay in the designated target. Also, they emit radiation in a more uniform pattern than the great intensive doses administered over a short period of time using the afterloading catheter technique.

In addition to the technical details of the treatment, there is the fact that the patient undergoing permanent seed implantation goes home generally hours after seed placement. The seed placement takes about a half hour. There is generally no catheter left in and no incision ever. There is no suturing or sewing of a wound. There is no wound, only puncture sites where the needles are placed to inject radioactive seeds.

The seeds are placed through a very small needle directed under computerized guidance to the prostate. Our group even uses computers in the operating suite to re-confirm accuracy of seed placement and dose distribution. Once the seeds are placed, the patient feels little and returns to

his normal activities.

The most important detail, of course, is the likelihood of being cancer-free. Recently a paper published in the Journal of Clinical Oncology from William Beaumont Hospital, evaluated external beam plus temporary seed implantation for patients with a PSA greater than 10, Gleason score equal or greater than 7 or Stage T2B or T3C. These would be considered high-risk patients. Kestin in the Journal of Clinical Oncology described the afterloading technique.

They treated 161 patients from 1991 to 1998 with locally advanced prostate cancer. Patients received 4600 rad (measurement of radiation dose) between 1991 and 1995 and three implants between 1991 and 1995 or two implants from 1995 to 1998. Thus, every patient received 4600 rad with external beam radiation and three doses of afterloading in 1991 through 1995 or two doses between 1995 and 1998 using Iridium high dose rate implantation through the perineal approach. Iridium is a common isotope used to treat in this manner. We had the first modern equipment in New York City to utilize this technology although we have preferred the permanent seed approach.

The dose was escalated from 550 rad to 1050 rad per implant. Eight patients or 5% had Grade III acute toxicity. Seven patients or 4% developed Grade III late complications at a 2.4-year interval. Grade III late toxicity included urethral stricture, dilatation and urinary incontinence in one patient requiring transurethral resection. Twenty-nine percent of patients were said to have developed impotence.

We took the liberty of comparing our patients treated with permanent seeds plus shaped radiation or radiosurgery in the same category having no Lupron therapy patients in the above study for purposes of statistical analysis. Biochemical failure was defined by ASTRO guidelines. ASTRO is the national society of therapeutic radiation oncology and has defined guidelines to measure success for prostate cancer.

Based upon this criteria, there were 263 similar risk patients in our analysis versus 161 in Beaumont's analysis. Furthermore, at five years there were 76 patients in this defined group in our analysis versus 30 patients in theirs. More patients overall and more at the five year endpoint gives more importance and confidence in our program.

Essentially, in every category of patients, which would be considered a high-risk group because of the PSA equal or greater than 10, Gleason - equal or greater than 7, or Stage T2B or T3C, data was remarkable for the greater benefits of our permanent seed plus radiosurgery program. That means a higher likelihood of being prostate cancer-free.

For patients with PSAs of 10 to 20 who have a Gleason score of 7 or higher and T2B or T3C stage, we have an 80% success rate at 5 and 7 year disease-free survival versus their 56% at 5 years!! For patients with a greater than 20 PSA, Gleason score of 7 or higher, our success rate is 68% at 5 years compared to their 54% within the same time frame.

For patients with Gleason score 7, PSA greater than 10, Stage T2B or T3C, we have an 83% disease-free survival at 5 and 7 years, while the afterloading technique has a 70% disease-free survival at 5 years.

Most dramatically, patients with a Gleason score of 8, 9 or 10, PSA greater than 10, Stage T2B or T3C, have a 75% disease-free survival at 5 and 7 years versus only 40% at William Beaumont using the afterloading technique.

Thus in essentially every category, a man with prostate cancer is more likely to be cancer-free going through our permanent seed plus radiosurgery technique versus Beaumont's radiation plus afterloading technique.

This data is particularly important for those with recently diagnosed prostate cancer evaluating best treatment options. It is also important for those having gone through the program. We have treated nearly 2000 men and it is critical that men know the rationale of their treatment. Of course, men when coming through the consultation part of the program are informed of this information. Ongoing data collection is critical as is comparison analysis. Many men come from throughout the United States and around the world for treatment here. The rationale is to try to save lives with minimal adverse effects of radiation. Quality of life issues are mainly focused around urinary control and sexual function.

Until further improvement in results of temporary seed placement is achieved, it will be difficult to recommend this therapy. Of course, it remains an option for most every man with prostate cancer. There are centers dedicated to its study today, nevertheless. Why it would be selected is a difficult judgment call today. There are better treatment options with higher disease-free survival and more years of follow-up with no hospitalization required.

We believe men should have this data available before making treatment decisions – since the decision can have such a dramatic effect on life itself.