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EARLY STAGE PROSTATE CANCER

A Radiation Oncology Perspective

Prostate cancer remains, regardless of race, the most common malignancy diagnosed in American men. More than 180,000 men in the United States are initially diagnosed and more than 40,000 will die of the disease. These statistics make it the second most common cancer killer of U.S. men after Lung cancer. The routine surveillance of men with serum P.S.A. has allowed us to detect the disease in a much earlier stage and often at earlier ages than in the past. Many patients are in their prime working years and their treatment may differ from a man who is in his 70s or 80s. Modern Prostate Cancer treatment has become, by necessity, very individualized. It is evolving into a multi-specialty/multi-modality team approach. Patient Selection is the key to successful outcomes. Comprehensive Cancer Centers of Nevada's (CCCN'S) mission is to facilitate and coordinate this multi-modality approach for Prostate Cancer as well as other Hematologic and Oncologic diseases.

EARLY-STAGE PROSTATE CANCER: Prostate Cancer that is truly confined to the gland and has "low risk factors" (i.e. Gleasons 2-6, PSA <10) has several potentially curative options. The historically most popular approach has been the radical prostatectomy for men <70 yrs. Old. It still remains a very effective treatment for low risk patients, especially for those <60yrs old. However, Prostate Brachytherapy is rapidly growing in popularity as alternative to surgery. It was the published 10-yr.+ data that has led to the explosion in patients and doctors choosing brachytherapy.

Brachytherapy is essentially the placement of either permanent or temporary radioactive substances into the prostate to deliver an ultimate "conformal" high radiation dose to the prostate. The Radiation Oncologist and the Urologist in a surgical suite do it as a team approach. The technique uses hollow needles to deliver the radiation isotope (i.e. "Seeds"- size of a grain of rice) in Low Dose Rate Brachytherapy (LDR)[outpatient]; or by computer control through hollow catheters in the radiation suite for High Dose Rate Brachytherapy (HDR) [inpatient] given over 2 days as a temporary implant.

The LDR approach can be done as a pre-planned two-step approach (patterned after Seattle researchers) and a real-time approach (patterned after a Mt. Sinai-New York researchers). At CCCN, Dr. Andrew Cohen and myself (Dr. Curtis) are able to provide both techniques for patients on the East and West side of the City. Between us, we have performed more than 100 procedures in the last several years with excellent clinical results and very acceptable morbidity. A CT scan post-implant for quality improvement analyzes all of our implants. In addition, at the Summerlin office (located at the Cancer Institute of Nevada), we are a member of ProQura quality control program through the Seattle Prostate Institute.

The LDR procedure, in brief, involves the assessing of the prostate volume or doing a formal volume study of size and shape of the gland. Next we develop a pre-plan (on a 3D Varian tx. Planning system) for the two- step approach. The patient then is scheduled for the outpatient procedure and the seeds are specially ordered for that specific patient. The procedure takes about an hour. It is done with ultrasound viewing from the rectum and with the use of fluoroscopy. The radiation oncologist and urologist are present and participate in the procedure. There is a relatively rapid recovery at home. Patients are often able to go back to work in just a few days. The major morbidity is Urinary irritation from a traumatic and then radiation induced prostatitis and cystourethritis. It is usually self-limited and rarely a long-lived problem. Other morbidity includes proctitis, bladder outlet obstruction (10-15% require a temporary catheter) and bleeding which are less common. The 10-year results have been published by several groups in peer-reviewed journals and compare very favorably to the best surgical studies-65-75% biochemical control (PSA<0.5). These results do not appear to be going down at the 12-14 year mark. Our plans are to expand our brachytherapy practice to our facility in Henderson at the Siena campus of St. Rose under the supervision of Dr. Craig Donaldson to better serve our referral physicians and patients in this ever-expanding city.

In addition, we are currently expanding our High Dose Rate (HDR) brachytherapy program across the Las Vegas Valley and Henderson to all of our facilities in addition to its current location at our Central office near Valley Hospital and University Medical Center Hospital overseen by Dr. Raul Meoz. Our Summerlin and Siena facilities are especially suited for Prostate HDR treatment because of their physical attachment to the Hospital. Briefly, Prostate HDR involves the initial placement of hollow catheters in a certain pattern within the prostate by the radiation oncologist and urologist. The patient is then put through a CT scanner, and from that a sophisticated 3D custom plan is developed on the treatment-planning computer. The catheters remain in the patient who is now an inpatient. Next, the patient is brought down to the radiotherapy suite, and the hollow catheters are connected to the HDR delivery device, which under computer control delivers a very high activity source into each of the catheters. This is repeated ~2 more times over a total of two days and the patient is subsequently discharged. HDR is today given in combination with 5 weeks of 3D conformal external beam radiation or IMRT. The morbidity is less as far as urinary symptoms, but the patients may experience more rectal side effects from the external beam and some discomfort while in the hospital from the catheter and hollow needles. The clinical results are just as good as LDR and may be somewhat better for higher risk patients, and more appropriate for patients with large prostate volumes or severe urinary symptoms pre-implant. It is yet another choice for a specific patient. It is our goal to have this technique for Prostate cancer available in our practice by the fourth quarter of this year.

I would be remiss if I did not mention our External Beam Radiotherapy program. Modern external beam radiotherapy for prostate cancer has gotten much more sophisticated in the last decade due to the rapid improvements in imaging and treatment planning systems. Our standard approach is 3-D conformal radiotherapy using digital information from CT scans interfaced with our treatment planning computer to deliver a custom "dose cloud" around the target and spare much more normal tissue and thus morbidity which allows for higher delivered doses over ~8 weeks, 5 days/week. It is an excellent non-invasive option, especially for men over the age of 65 and who may have other co- morbidities. The survival at 10 years is not significantly different from the brachytherapy options. But the PSA control may be somewhat less by strict criteria. Whether this translates to poorer survival or quality of life is a matter of current debate. Treatment related morbidities are similar to the brachytherapy options with somewhat less acute urinary symptoms, but more rectal and erectile problems. It remains another potentially curative option for the appropriate patient.

In addition, CCCN- radiation oncology was the FIRST to offer the newest external beam option in Southern Nevada, that is- Intensity Modulated Radiotherapy (IMRT). This technique uses computer modulation of the beam to deliver a much tighter "dose-cloud" around the target volume (i.e. Prostate) and less dose to normal surrounding tissue than traditional external beam treatment. It also allows the potential for "dose escalation" to higher than traditional doses in order to potentially increase biochemical control and improve survival. It requires methodical attention to detail and quality control, especially as one escalates to higher doses, to avoid significant normal tissue morbidity. It is currently available at our east side and Henderson offices through Drs.: Farzaneh Farzin, Craig Donaldson, Andrew Cohen and Raul Meoz. [CCCN-Radiation Oncology is the only radiation oncology practice awarded accreditation by the American College of Radiology in southern Nevada. The ACR review carefully assesses a radiotherapy group's attention to quality control prior to awarding this accreditation.] Prostate cancer is uniquely suited to using IMRT due to its anatomical location and well imaged anatomy. This is yet another fine option for those patients who do not wish an invasive approach.

In conclusion, it is my belief that all prostate cancer patients should be evaluated and educated by the treating urologist, a radiation oncologist as well as a medical oncologist in the high-risk groups or to help the patient make a decision between the radiotherapy and surgical options. The current approach to Breast Cancer may be a template for the future approach to Prostate Cancer. Prostate Caner treatment remains a challenging and ever changing paradigm as we learn more and more regarding its behavior, response to treatment, and develop more accurate risk assessment for individual patients. The future breakthroughs in Prostate Cancer will come, in my opinion, with an improved understanding of the proper role of adjuvant treatment-including androgen suppression, anti- androgens, chemotherapy, targeted molecules and their integration with ever improving local therapy including radiotherapy and surgery. The quality of life issues and the individual patient "values" will, however, be the deciding factor in how rapidly new breakthroughs in treatment find their way into our community oncology and urology clinics.