



Radiation Oncology Consultants

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ROC July 2013 Newsletter

Illinois Cyberknife (ILCK) at Lutheran General Hospital is one of only a few dedicated stereotactic radiosurgery programs in the Chicagoland area. This treatment modality employs a highly-precise robotic radiation delivery system to deliver high-dose radiation to tumors in the brain and body in only one to five treatments. Cyberknife treats benign and malignant tumors of brain and spine, as well as oligometastasis involving lung, liver, adrenal gland, lymph nodes, primary lung cancer, pancreatic cancer and prostate cancer. The physicians at ILCK work collaboratively with all oncologic specialties to determine an appropriate treatment course, and integrate treatment with other aspects of care.

We are please to share with you a case study of an exciting treatment option for your patients with low or intermediate risk adenocarcinoma of the prostate. You will learn that Cyberknife stereotactic body radiotherapy offers a non-invasive alternative which is completed in 4-5 treatments, yielding excellent clinical outcomes with minimal toxicity.

If you are interested in learning more about our treatment approach at ILCK, or wish to send a patient for consideration of treatment, please call our physicians, Arica Hirsch, M.D., Majid Mohiuddin, M.D., James Ruffer, M.D. and Patrick Sweeney, M.D. at 847-723-0100.



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ILLINOIS CYBERKNIFE[®]
AT ADVOCATE LUTHERAN GENERAL HOSPITAL

PROSTATE CANCER: CASE STUDY

Patient Spotlight

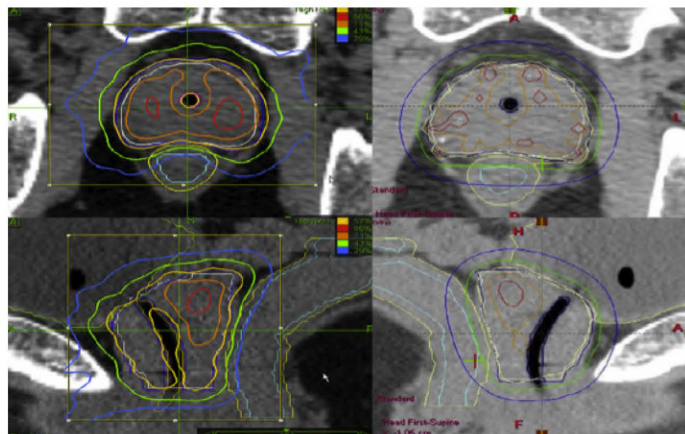
66-year-old male presented with symptoms of dysuria and an elevated PSA of 5.03ng/mL. Physical examination demonstrated a non-enlarged prostate gland without palpable nodule. In further evaluation, transrectal ultrasound with biopsy was performed, revealing adenocarcinoma, Gleason score 3+3=6, involving the left base and left mid-lobe. CT abdomen and pelvis and bone scan were negative for metastasis.

Cyberknife Treatment Rationale

Several treatment options were discussed with the patient, including active surveillance, radical prostatectomy, external beam radiotherapy, and brachytherapy. The unique radiobiology of prostate cancer suggests particular sensitivity to large-dose-per-fraction (hypofractionated) radiation treatment regimens. In support of this, good biochemical disease control with few serious side effects has been reported for primary high-dose rate brachytherapy with Ir-192, prescribing 38Gy in 4 fractions (1). Robotic Cyberknife stereotactic body radiosurgery (SBRT) can achieve dose distributions similar to that of brachytherapy, and is ideally suited for delivery of large hypofractionated doses.

The CyberKnife employs the use of several hundred non-coplanar beams from a Linear accelerator supported by a robotic arm, achieving highly conformal dose plans with the ability to track prostate motion live. Fiducial markers are placed in the gland, to verify organ position in real time via a pair of orthogonal electronic x-ray imaging devices. The Cyberknife adjusts the beam trajectory per the movement of the prostate gland. The resultant dose-distributions create a “dose-painting” effect, with high-doses centered within the gland, sparing urethra, rectum and bladder.

Comparison of dose distributions:
Cyberknife (left)
HDR brachytherapy (right)



Following a consultation with a radiation oncologist, the patient decided on CyberKnife treatment. Five treatment sessions were necessary, each lasting about 45 minutes. No acute side effects were experienced following his treatment.

Post-Treatment

At six months post-treatment, the patient's PSA was 2.1. Treatment was well tolerated and minimal side effects were reported, as the patient noted good urinary and bowel function following treatment. The patient also noted he was having normal erections without medication following treatment. At one year, the patient's PSA was 0.8. No urinary symptoms were reported during the follow-up period.

Cyberknife Prostate Cancer Treatment Outcomes

Over 10,000 prostate patients have been treated with Cyberknife SBRT. A few representative studies which report on outcome and toxicity for low and intermediate-risk prostate cancer are summarized in the table below:

Study	Dose (Gy)	N	FU (mo.)	bDFS (%)	Late Gr3 GU(%)	Late Gr3 GI (%)
King (2-3)	36.25 /5 fractions	67	32	97	3.5	None
Friedland (4)	35/5 fractions	112	24	98	<1	None
Katz (5-6)	35-36.25/5 fractions	304	60	97	2	None
Freeman (7)	35-36.25/5 fractions	41	60	93	<1	None
Jabbari (8)	38/4 fractions	38	18	100	None	None

CyberKnife Advantages

- Patient had an excellent response to Cyberknife with minimal side effects and toxicity
- Urinary function was spared using Cyberknife's unique tracking capabilities for treated a moving target
- Treatment is quick—only five fractions were necessary
- No recovery time was necessary after treatment
- Cyberknife continues to be a great alternative to surgery and other radiation therapy treatment options

References:

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