

Technique a key to enabling “male lumpectomies” and avoiding unneeded prostatectomies

3D PROSTATE MAPPING BIOPSIES SAVE GLANDS, COMPLICATIONS *By Todd Neff*

A recent study showed that traditional prostate treatment cost 48 men their prostates for every man saved.

A new method of mapping out the precise size and location of prostate cancers is giving patients highly nuanced options in the treatment of a disease diagnosed 192,000 times each year.

University of Colorado Denver urologist Al Barqawi, MD, pioneered the 3D mapping biopsy method, and University of Colorado Hospital is the

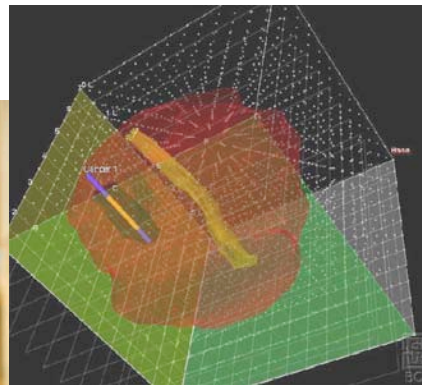
only academic medical center using the technique, Barqawi says.

Prostate cancer is the second-most common cancer among American men, behind skin cancer, with one in six men suffering the disease during his lifetime. It is also the second-leading killer, after lung cancer, according to the American Cancer Society.

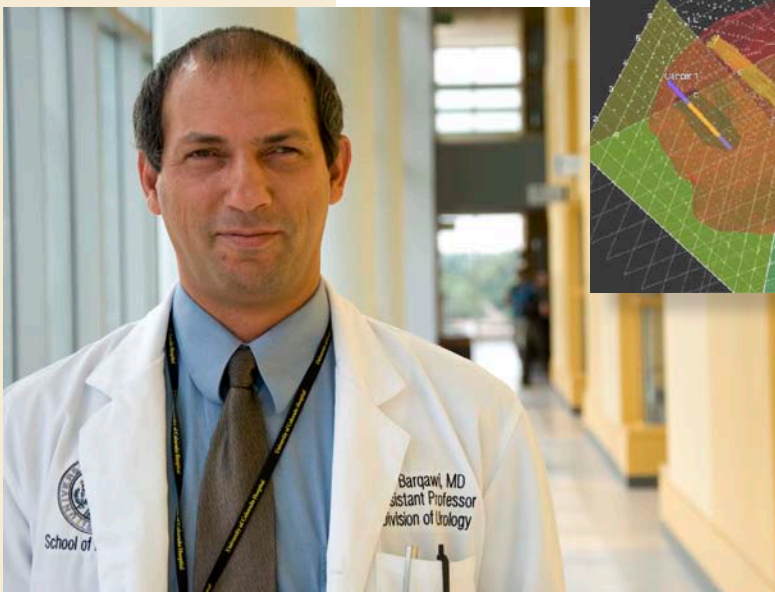
At UCH alone, Barqawi estimates that 300 men undergo prostatectomies (complete removal of the prostate) each year.

The new mapping method could help sharply reduce that number, which improves the survival odds of men with prostate cancer only marginally and also can have severe side effects, by improving clinicians' ability to find and visualize tumors. With better images, they can then offer patients a wider range of treatment options.

Barqawi is now studying the new method to compare its effective-



A 3D map of a prostate. The purple bar indicates a sampling location, the yellow portion of it being the cancer. A 3D mapping biopsy involves several dozen such samples, enabling a detailed understanding of where a cancer might reside.



Al Barqawi, MD, has helped pioneer 3D imaging and tumor mapping of the prostate.

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ness against traditional treatments.

Forty-eight for one. To understand the long-prevailing philosophy of prostate cancer care, consider an analogy. You twist your ankle tripping over the family dog, then visit an orthopedic specialist who looks at it, takes an X-ray and concludes you have two options: doing nothing or having your leg amputated below the knee.

Ludicrously extreme, of course. But a recent article in the *New England Journal of Medicine* showed this type of binary approach to treatment prevails in prostate care. The study, which included 182,000 European men, showed 20 percent fewer deaths among those screened regularly. But for every life saved, 48 men were treated with radical prostatectomy or radiotherapy, which involves subjecting the prostate gland to a high dose of radiation.

“That means we do about 48 radical treatments to save one guy,” said Barqawi, “and 47 are done without any benefit for survivability. But there are quality of life consequences.”

Side effects of prostate removal or radical radiotherapy include impotence and incontinence.

But thus far, men have had to choose either to endure the consequences of radical treatment options or risk death.

Prostate in 3D. Barqawi’s ultrasound-guided 3D prostate mapping provides prostate patients alternatives to the

extremes of “watchful waiting” and radical treatments.

Rather than making such decisions based on PSA (prostate specific antigen) screening and the standard, blind 12-needle biopsy, his patients can request a 3D mapping biopsy, which involves taking 40 or more samples along a grid spaced with sampling points at 5-millimeter intervals and sending each one to pathology for analysis.

Barqawi integrates the results from pathology into 3D renderings of the prostate, derived from virtual stacks of two-dimensional ultrasound images, with the help of software he conceived and tapped Colorado Springs software developer BCSi, Inc. to create.

So far, about 200 patients have chosen 3D mapping biopsies, roughly half of whom came from outside of Colorado – some from as far away as Sweden and Iceland, Barqawi said. Among them was Denver 7 News anchor Mike Landess, who won a 2008 regional Emmy award for his stories documenting his treatment under Barqawi and others at UCH.

Roughly half the study participants learned their cancers were more serious than initial testing had shown and underwent prostatectomies, radiotherapy or total cryotherapy. But about 15 percent found out their cancers were minor, and required no immediate action. Another 30 percent learned their cancers were localized to a particular part of the prostate and could thus be

treated with targeted focal therapy, in which physicians freeze cancerous areas of the prostate, using argon gas, while leaving the rest alone. This was the case for Landess, for example.

Focus on focal treatment. In addition to giving patients more data with which to determine their course of treatment, the 3D approach offers “a road map to where the cancer is, localizing it so we can focally treat it,” Barqawi said. “It’s very similar with what we do with breast cancer.”

Focal treatment is to radical prostatectomy what lumpectomy is to radical mastectomy, Barqawi explains. It was, in fact, his studies in breast cancer in the early 1990’s that led to his interest in focal therapy for prostate cancer. Although focal treatment is rapidly going mainstream, it’s 15 years behind breast cancer treatment, he says.

“The long-term survival benefit of focal treatment remains undetermined,”

Barqawi said. “We started doing breast lumpectomies in the early 1990s, but it took more than 12 years to prove it was equal to radical mastectomy in terms of long-term survivability.”

Barqawi spent last Friday in California, working with an ultrasound manufacturer on a device capable of generating 3D ultrasound prostate maps without the need for his software. He is also preparing to do the first-ever targeted focal prostate therapy with a laser normally used by brain surgeons. The technique, if successful, could provide treatments even more targeted than those that use chilled argon, and could mean fewer complications.

In the end, Barqawi says, he aims to minimize complications and maximize the state of knowledge about a particular patient’s prostate.

“We’re trying to avoid treating patients who don’t need to be treated,” he said.