

Prostate Cancer Diagnosis: Targeted MRI/Ultrasound Beats Standard Biopsy



A large-scale study shows that targeted biopsy using new fusion technology that combines magnetic resonance imaging (MRI) with ultrasound is more effective than standard biopsy in detecting high-risk prostate cancer. Researchers found that 30 percent more high-risk prostate cancers were diagnosed with targeted fusion-guided biopsy than with standard biopsy. In addition, 17 percent fewer low-risk cancers were diagnosed with the new approach, compared to the older method.

The study of 1,003 men was conducted at the National Institutes of Health (NIH) in Bethesda, Md., from 2007-2014. Peter A. Pinto, MD, head of the prostate cancer section of the urologic oncology branch served as the senior investigator. The participants were referred for biopsy because of elevated prostate-specific antigen (PSA) or an abnormal digital rectal exam. They received targeted and concurrent standard biopsies.

The research team reported these key findings:

- 461 prostate cancer cases were diagnosed with targeted biopsy vs. 469 cases with standard biopsy. Targeted and standard biopsies produced the same results in 69 percent of the cases.
- 30 percent more high-risk cancers — those that doctors want to detect — were diagnosed through targeted biopsy than standard biopsy (173 vs. 122 cases) and 17 percent fewer low-risk cancers — those that are often over-diagnosed and over-treated (213 vs. 258).
- Adding standard biopsy to targeted biopsy led to a 22 percent increase in cancer diagnoses, the vast majority of them for low-risk cancers.

In addition, targeted biopsy was better able to predict whether the disease was low- or intermediate risk than standard biopsy or the two approaches combined. The researchers were able to make that determination by comparing biopsied tissue with tissue taken from a patient's prostate after it was later surgically removed. The results are published in JAMA.

"This study demonstrates that targeted fusion-guided biopsy could significantly enhance our ability to identify patients with high-risk prostate cancers that need more aggressive treatment," said lead author Mohammad Minhaj Siddiqui, MD, assistant professor of surgery at the University of Maryland School of Medicine and director of urologic robotic surgery at the University of Maryland Marlene and Stewart Greenebaum Cancer Center. "With fusion technology, we now have a tool to help us differentiate high-risk cancers from low-risk ones that may require minimal or no treatment."

However, Dr. Siddiqui emphasised that randomised clinical trials will be needed to determine the impact of targeted biopsy on clinical outcomes. In a targeted biopsy, MRIs of the suspected cancer are fused with real-time ultrasound images, creating a map of the prostate that enables clinicians to pinpoint and test suspicious areas. In a standard biopsy, clinicians use ultrasound guidance to take multiple random tissue samples from throughout the gland.

Dr. Siddiqui plans to use MRI/ultrasound fusion in a clinical trial to identify and biopsy questionable areas within the prostate. In cases where treatment can be deferred, he will use this technology to perform more reliable active surveillance of prostate cancer requiring fewer biopsies. If the disease requires treatment and is not widespread, Dr. Siddiqui will use focal brachytherapy (implanted radioactive seeds) to irradiate only the tumour, sparing the surrounding tissue. For patients with early-stage cancer, this method avoids many of the side effects associated with removing the prostate or irradiating the entire gland.

Prostate cancer is highly curable, with a 94 percent 15-year relative survival rate for early stages. It is often diagnosed after blood tests show elevated PSA, but the PSA test has come increasingly under fire for being unreliable.

Unlike other cancers, such as breast cancer, which can be detected through mammograms, prostate cancer is not generally diagnosed using advanced imaging. Due to an inability to differentiate aggressive cancers from nonaggressive types, physicians treat the majority of cases, which may lead to side effects such as impotence and/or incontinence. Treatments include surgery to remove the prostate, radiation therapy and active surveillance during which patients are continuously monitored.

Source: [University of Maryland Medical Center](#)

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Published on : Fri, 30 Jan 2015