

Frequent CT scanning for testicular cancer surveillance associated with secondary malignancies

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UC Davis cancer researchers have found that older men with early-stage testicular cancer who opt for surveillance with regular CT scans over lymph node removal are at greater risk for secondary cancers. The findings, published online last week in the journal *Cancer*, indicate that physicians should consider the risk of new cancers with surveillance when discussing treatment options with their patients.

Along with a multi-disciplinary team of UC Davis researchers, Karim Chamie, a UC Davis urology resident at the time of the study, examined the cases of 7,301 men diagnosed between 1988 and 2006 with nonseminomatous germ cell tumor, the most common type of testicular cancer. Chamie and his colleagues wanted to know if, after initial surgery, frequent computed tomography (CT) imaging of men to check for new signs of the disease increased the rate of secondary [tumor growth](#).

"This is the first study that I am aware of that shows that diagnostic CT scans cause cancer with statistical significance," said John Boone, professor in the Department of Radiology at UC Davis, study co-author and internationally known CT expert. "The organizations that recommend these protocols need to reevaluate this aggressive use of CT and maybe opt for MRI or ultrasound."

Chamie explained that men with stage-one testicular cancer are typically

offered three choices of treatment after removal of a cancerous testicle: two doses of chemotherapy, lymph node dissection or "active surveillance," which requires frequent CT scans.

According to the authors, in the 1980s active surveillance emerged as an attractive alternative to surgical removal of the retroperitoneal lymph nodes or chemotherapy in men with early-stage testicular cancer.

Chamie, now a urology fellow at UCLA, said the surveillance choice is particularly popular among younger men, who fear the potential side effects of aggressive surgery or chemotherapy such as ejaculatory dysfunction, bowel adhesions, neuropathy and other problems.

In the 1990s, nearly half of patients diagnosed with early-stage disease were treated with orchiectomy (testicle removal) alone. For those patients, the National Comprehensive Cancer Network Guidelines recommend a total of 15 CT scans in the first five years after surgery (every two to three months for the first year, then tapering off each consecutive year) to check for new signs of disease. After four years, CT scans are recommended just once annually.

Excessive CT scanning has been the subject of intense debate in recent years; as the technology has become better at detecting disease, it has been used with far more frequency, exposing more people to ionizing radiation, which can cause cancer at high doses.

"What has happened is that because CT images are so diagnostically useful, physicians request them for their patients in great numbers, so the concerns are really based upon the fact that 80 million CT scans are performed every year in the U.S.," said Boone. "That is a huge number."

Boone added that active surveillance protocols are one example where a large number of repeat CT scans are performed on a patient.

"It should be emphasized that this study involved patients who had 15 or more CT scans, not one or two," he said.

Chamie's research found that more patients who have been on active surveillance will be diagnosed with secondary malignancies after 15 years than will patients who received aggressive lymph node surgery or chemotherapy. Statistical analysis determined that of 10,000 patients put on active surveillance, 306 would get secondary malignancies, versus 233 if they had the surgery alone. That translates into 73 additional secondary malignancies. And while 73 may not seem like a big number, of the men who underwent surgery, only 50 died of [testicular cancer](#).

"The side effect is worse than the disease," Chamie said. "More men are likely to get secondary malignancies than are liable to die from their active disease."

What surprised Chamie and the other researchers is that the risk of secondary cancers after repeated CT scans was more significant in older men than in younger men. Chamie suspects that is because younger bodies can more easily repair DNA damage caused by radiation exposure.

Chamie said that 70 percent of patients with early-stage disease are cured after testicle-removal surgery, so for them, additional surgery to remove lymph nodes or chemotherapy would be unnecessary overtreatment. However, of those who opt only for active surveillance, 30 percent will go on to develop additional cancers that were not detected on CT scans.

"So, do we sacrifice the 70 percent? Or do we put 30 percent at risk of having progression and downstream effects of too many CT scans and chemotherapy?" Chamie said. "We need to do something other than active surveillance."

Chamie said he hopes the findings lead to better ways to stratify patients in terms of who should be eligible for different treatment approaches, limiting active surveillance only to those men whose cancers are least likely to progress. In addition, he suggested use of alternative imaging techniques, including ultrasound and MRI, or less frequent use of CT imaging.

Provided by University of California - Davis

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