The Easier Kidney Donation

With just a tiny fiber-optic camera, a few slender stainless steel instruments and a 3-inch "extraction" incision, laparoscopic surgery empowers urologic surgeons to perform complex procedures—from dissecting tumors and diseased tissue to extracting entire organs for donation—with significantly less bleeding, fewer wound infections and shorter hospital stays than traditional surgery.

But can laparoscopy be even less invasive?

"Our thinking is that we can do some of these procedures with fewer incisions, less trauma, fewer scars, and without compromising the outcome for the patient," says Mohamad Allaf, director of minimally invasive and robotic surgery. Allaf and colleagues at the Johns Hopkins Medical Institutions are revamping traditional laparoscopic donor nephrectomy with a transvaginal approach to removal of the healthy kidney. Across the world, the pool of available kidney donors is far too small to accommodate the large number of people on transplant waiting lists.

"We thought, if we can decrease the barriers to transplantation by improving the cosmetic result and lowering the pain related to donation," says Allaf, "then perhaps more people would want to do it."

The number of live donors increased by 75 percent in the decade following this method. The patient's niece is also a donor.

"We have to make sure that the kidney is perfect," says Allaf. "Plus, she did not have any J.V. issues for pain control, which was really remarkable." The patient's niece is also recovering well.

Allaf expects to do about a dozen more transvaginal kidney donation surgeries in the next year. Since the news broke, he says, "we've been flooded with inquiries."

"We may be able to get the cancer cell to think it's being heated without actually heating it."

I n October 1996, Lance Armstrong announced that he had advanced testicular cancer that had spread to his abdomen, lungs and brain. The 19-year-old pro cyclist had surgery to remove the diseased testicle and began chemotherapy. Later he also had the necrotic brain tumors removed. The treatment worked, and Armstrong went on to win the elite Tour de France seven years in a row.

What especially intrigued urologists Donald Coffey and Robert Getzenberg is that even for men like Armstrong, whose disease had spread throughout the body, testicular cancer has an average survival rate of more than 95 percent. "Science spends a lot of time looking at things that don't work. It rarely focuses on the successes," says Coffey.

Armstrong had spread to his abdomen, advanced testicular cancer that strongly announced that he had this cancer? "What we added," he says, "was to do something that we know happens in testicular cancer and apply that to prostate cancer!"

Getzenberg and Coffey hypothesized that heat, working through the structure of the cancer cell’s nucleus, leaves it susceptible to treatment. In 2006, together with Theodore DeWeese, head of Hopkins’ Department of Radiation Oncology and Molecular Radiation Sciences, they began working on a therapy called TEMT, for thermally enhanced metastatic therapy, in which prostate cancer cells are warmed to increase the efficacy of treatment. In 2007, they received an award supported by customers of Safeway grocery stores through the Prostate Cancer Foundation to fund the project.

Prostate cancer re-thinker Robert Getzenberg

For prostate cancer, the heat is on

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Inside

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For Prostate Cancer, the Heat Is On

Shawn Lupold, a proton physicist, was the trickiest part of TEMT is selectively warming the cancer cells by escaping tissue surrounding them. The key to attacking this problem, says Getzenberg, has been a multidisciplinary team that includes urologic researchers Shawn Lupold and Prakash Kulkarni, and Robert Irvok, a chemist and physicist in Radiation Oncology who produced the coil pictured at left.

One way to do selective heating is to attach microscopic iron particles—similar to those already FDA-approved for imaging technologies—to a targeting system that binds specifically to prostate cancer cells. Once the particles are attached, the scientists then expose the whole body to an alternating magnetic field, which heats the iron pieces—and the cancer cells they’ve latched onto. This heating should enhance the cancer cell’s responsiveness to chemo-, radiation and other therapies.

The team is also analyzing the molecular response of cancer cells when they are exposed to heat. If these mechanisms are better understood, Getzenberg says, “we may be able to turn the cancer cell to think it’s being heated without actually heating it.”

So far, the research has been conducted in mouse models of prostate cancers. But, says Getzenberg, “we think this technology can be easily applied to other tumor systems as well.”

Info: urology.jhu.edu

For immediate assistance please call or text 410-955-5358 (Hopkins Access Line).
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Across the world, the pool of available kidney donors is far too small to accommodate the large number of people on transplant waiting lists. “We thought, if we can decrease the barriers to transplantation by improving the cosmetic result and lessening the pain related to donation,” says Allaf, “then perhaps more people would consider donating.”

The number of live donors increased by 75 percent in the decade following the first laparoscopic kidney donation surgery, also developed at Hopkins, he says.

On January 29, Allaf and Robert Montgomery, chief of Hopkins’ transplant division, performed the world’s first transvaginal kidney donation surgery—a 3.5-hour procedure in which they funneled the kidney in an impermeable plastic bag to the organ through the vagina. The operation went off without a hitch. “The patient walked the night of the surgery and went home the next day,” says Allaf. “Plus, she did not use any IV narcotics for pain control, which was really remarkable.”

The patient, 48, was donating her kidney to her niece. Allaf cites two major hurdles: the pain related to donation, says Allaf, “and the potential of the kidney not con nected to blood vessels or stored in a cool place, they performed the extr action in less than three minutes.

To avoid contamination, the surgeons first grafted the patient’s lower abdomen, then scrubbed the vagina with antiseptic solution. During the surgery, they placed the kidney in an impermeable plastic bag to the organ through the vagina. The operation went off without a hitch. “The patient walked the night of the surgery and went home the next day,” says Allaf. “Plus, she did not use any IV narcotics for pain control, which was really remarkable.”

No anesthetic is necessary for a half-hour operation.

Allaf expects to do about a dozen more transvaginal kidney donation surgeries in the next year. Since the first attempt, surgeons have learned a lot. “We have improved the kidney donation process,” says Montgomery. “We’ve learned how to manage the pain involved, how to make the patient more at ease.”

To refer a patient: 410-502-7707. Info: urology.jhu.edu

In October 1996, Lance Armstrong announced that he had advanced testicular cancer that had spread to his abdomen, lungs and brain. The 31-year-old pro cyclist had surgery to remove the diseased testicle and began chemotherapy. Later he also had the necrotic brain tumors removed. The treatment worked, and Armstrong went on to win the elite Tour de France seven years in a row.

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Getzenberg hypothesized that the heat, working through the structure of the cancer cell’s nucleus, leaves it susceptible to treatment. “If these mechanisms are better understood, Getzenberg says, “we think this technique has the potential to kill cancer cells.”

The duo had a hunch that it had something to do with heat. Testicular cells, sitting outside the body, are kept a few degrees cooler than cells inside the body. When cancerous cells in the tests spread to other areas of the body, they’re warmed up significantly. Could this extra heat make them more vulnerable to chemotherapeutic, radiation therapeutic or immunotherapeutic treatments?

People have used heat for cancer treatment for centuries, Getzenberg points out, starting at least as early as the hot baths of ancient Greece. “What we added,” he says, “was to ask, how can we replicate what we know happens in testicular cancer and apply that to prostate cancer?”

Getzenberg and Coffey hypothesized that heat, working through the structure of the cancer cell’s nucleus, leaves it susceptible to treatment. “In 2006, together with Theodore DeWeese, head of Hopkins’ Department of Radiation Oncology and Molecular Radiation Sciences, they began working on a therapy called TEMT, for thermally enhanced metastatic therapy, in which prostate cancer cells are warmed to increase the efficacy of treatment. In 2007, they received an award supported by customers of Safeway grocery stores through the Prostate Cancer Foundation to fund the project. Human body temperature is tightly regulated—raising it even a few degrees is dangerous.—so the trickiest part of TEMT is selective warming of the cancer cells and not the tissue surrounding them. The key to attacking this problem, says Getzenberg, has been a multidisciplinary team that includes urologic researchers Shawn Lupold and Prakash Kulkarni, and Robert Ivkov. a chemist and physicist in Radiation Oncology who produced the coil pictured at left.

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