Dial-up Doctor

Surgeons perform robotic procedure from across the Atlantic

By Adam Marcus
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THURSDAY, Sept. 20 (HealthScoutNews) -- Using a computer-controlled robot, surgeons in New York have successfully removed the gall bladder of a woman in Strasbourg, France, which is 4,000 miles and an ocean away.

The team, headed by Dr. Jacques Marescaux, of the Louis Pasteur University, performed the 54-minute operation on Sept. 7. It took them 16 minutes to set up the Zeus robot, which communicated with surgeons at Mount Sinai Medical Center in Manhattan over trans-Atlantic fiber optic cables.

Delays between when the doctors issued a command to the sensor-equipped robot and when the machine's movements appeared on their video monitors were a barely perceptible 150 milliseconds. The 68-year-old patient recovered without complications from the laparoscopic procedure -- which uses tiny incisions and is considered minimally invasive -- and was sent home from the hospital two days later. The operation is described in the journal Nature.

Zeus was designed by Computer Motion, which has received regulatory approval for the machine in Europe and the Middle East but not yet in the United States, says Stephen Pedroff, a spokesman for Goleta, Calif.-based firm. The company hopes to market the device for minimally invasive operations on a wide range of organs, from the prostate gland to heart valves, Pedroff says.

Robotic surgery was initially developed under the auspices of the United States military, which envisioned deploying the technology to treat soldiers injured on distant battlefields.

Dan Stoianovici, who runs the URobotics program at Johns Hopkins
University in Baltimore, calls the latest operation "a great thing."

Even so, Stoianovici says there are two chief barriers to performing a remote surgery. The first is getting a clean communications link between the operating area and the surgeons who are continents or oceans away. The French team used a point-to-point fiber optic hookup that, while faster than conventional phone lines, requires a physical connection, he says.

But Zeus and other robots can in theory be manipulated using a satellite phone, although such a hookup is prone to potentially dangerous interference and delays. The Hopkins team reported earlier this year that they had performed more than a dozen remote laparoscopic surgeries on kidney patients in Rome, transmitting without fiber optics.

The second hurdle, Stoianovici says, is the size of the robot itself. The Zeus system is small, he says, but "I'm not sure whether they are at the point of carrying it around. The robot that performs the operation is not necessarily portable. It could potentially be made that way, but not at this point."

More likely, Stoianovici says, is the prospect of deploying robots on aircraft carriers or other ships, and using state-side doctors to assist in operations.

Dr. Rick Satava, a Yale University surgeon, was one of the pioneers of the military's robotic surgery program when it began in the late 1980s.

Satava helped conduct a 1996 test of a robot surgeon in which the mechanical arms were mounted inside a Bradley Fighting Vehicle and controlled from a field hospital by wireless signals. "The technology is fine," Satava says. "We showed on the battlefield that we could do it."

However, robotic surgery was initially intended to be used in conventional battles, not the kinds of small-scale conflicts America has engaged in since the Gulf War -- and may now face in Afghanistan, Satava says. If a response to last week's terrorist attacks involves small numbers of troops in an area where armored carriers aren't welcome, remote-controlled robots probably won't be deployed, he says.

Nevertheless, advocates of the technology say it's already making a significant impact on medicine both in the United States and abroad.

Hospitals now use robots to help perform minimally invasive surgery on everything from the prostate gland to the heart, says Jonathan Linkous, executive director of the American Telemedicine Association in Washington, D.C. And radiologists are frequently consulted from hundreds or thousands of miles away to give their real-time opinions about organ scans, he says.

The advantage of telemedicine, Linkous says, is that "You can get access to world-renowned sub-specialists who frankly aren't available" anywhere else.
Linkous adds that there is another compelling case for minimally invasive robotic surgery: Clinical studies have shown it has a higher success rate and quicker recovery time than conventional operations.

The French procedure reportedly cost about $1 million -- more, certainly, than flying a surgical team to Europe for a week -- but Linkous says the price tag of future procedures should drop substantially as the technology is streamlined and becomes more familiar to doctors.

Yet, as Satava notes, the debate about civilian applications of the technology has always revolved around whether people would use it widely enough to justify its expense, and that will only become clear with time.

"The only way you can tell is to use it," he says.

**What To Do**

If you want to be operated on by a specialist on the other side of the world, you'd better buy a plane ticket right now. As the researchers say, the technology is not ready for mass use just yet.

This article from [National Geographic](http://www.nationalgeographic.com) tells more about the trans-Atlantic operation. And Zeus has also been involved in [heart bypass](http://www.heartbypass.org) operations.

To find out more about robotic surgery, try [Johns Hopkins University](http://www.jhu.edu).