Company adapts military tech for more precise, less invasive surgery

by Terri Somers

Technology originally developed by the military to help fighter pilots immerse themselves in air combat is now helping surgeons performing minimally invasive surgery be more precise when removing a diseased prostate or completing a hysterectomy.

Like the pilots, surgeons using the system slip a pair of sophisticated goggles over their head. But rather than seeing radar images, night vision or other perspectives of the pilot's battlefield, the surgeon is immersed in the patient. Projected before the doctor in three-dimensional video is a view of the operation from within the patient's body.

NEW MEDICAL TECHNOLOGY - This headset allows a surgeon to see three-dimensional images. With a voice command, the system will display a secondary image on the screen, such as a CT scan or an X-ray. CNS Photo courtesy of Technology Inc.The image is projected to the headset in visual stereo by two tiny cameras inserted through tiny incisions into the patient, just as their surgical tools are inserted below the skin. A simple voice command by the surgeon can prompt a second picture to be shown simultaneously on the screen, giving the doctor additional perspective by referring to an ultrasound, X-ray or CT scan, said Dr. Julio Pow-Sang, a surgeon at the H. Lee Moffitt Cancer Center & Research Institute in Tampa, Fla. "Three-D makes a huge difference because you can be more precise and see the difference between different tissues, which helps when I'm trying to preserve the neurovascular bundles around the prostate so the patient can retain function," said Pow-Sang, chief of genitourinary oncology.

He performs about seven laproscopic prostatectomies a week using the 3-DI Digital Vision System developed by San Diego's Viking Systems.

In Moffitt and hospitals around the world, surgeons are increasingly switching to minimally invasive surgical techniques, such as laproscopy. Since the surgery is performed through small incisions, recovery times are faster and hospital stays are shorter. That means lowers costs for hospitals.

Moffitt bought one of the Viking systems in October 2005 after considering a much more expensive robotic system made by Intuitive Surgical, a Sunnyvale, Calif., company with a $3.5 billion market capitalization.

The robotic system, called the da Vinci Surgical System, was very effective, Pow-Sang said. It requires the surgeon to sit in a small room and operate joysticks that control a robot, which does the surgery. The surgeon watches the operation through a device that looks like a microscope, he said. But the system costs about $1.6 million with a $130,000 yearly maintenance fee and about $1,500 a surgery in disposable parts, Pow-Sang said. Major medical centers that have bought the da Vinci, sometimes after having fundraisers to get the money, often market the technology aggressively.

Meanwhile, Viking's 3-DI system has received little media attention. And many Wall Street analysts who cover Intuitive Surgical have never heard of the 35-employee Viking, whose shares trade over-the-counter.

Founded in April 2004, Viking lost $8.74 million in the first half of 2006, compared with a loss of $2.74 million in the first half of 2005. Chief Executive Donald Tucker said the company spent the money last year improving itself internally by pumping up a sales force and strengthening management and development teams, and is now ready to become profitable in 2007. It's not necessarily shooting for the major medical centers for customers.

"Smaller hospitals ready to upgrade and update is our major market opportunity," Turner said. His company's technology is the only 3-D high resolution alternative to the da Vinci robot, he said.

The Viking system costs $1,200 to $1,800, depending on the amount of informatics attachments a hospital requests, said Greg Decker, the company's chief financial officer. Up to three headsets can be attached to each system, allowing the surgeon's assistant and scrub nurse a 3-D view of the action rather than having to look at a video screen near the operating table, Pow-Sang said.

Because it is on a cart, it can be moved to operating rooms on different floors, he said. After using one system for a year, Moffitt recently ordered three more. Closer to home, Viking recently announced that it sold several systems to Hoag Hospital in Newport Beach, Calif., where they are being used in gynecological surgeries. The company's 100 systems in operation around the world are at hospitals in Sweden, Korea, Russia and Puerto Rico.

Moffitt figured that if the Viking equipment is used for about 200 prostatectomies a year, its cost is about $160 per patient, Pow-Sang said. The da Vinci system would have to perform at least 600 operations a year to break even, he said. "It's very ergonomic," Pow-Sang said of Viking's system. "You're using a headset so you don't have to be turning your head and looking at a screen for a couple of hours. And it allows you to move around. The robot requires you to sit down and look through a microscope-type device for several hours like a pathologist - remember, like Quincy on TV," he said.

Viking's technology has been around for quite some time. It was originally purchased from the military by San Diego-based Vista Medical Technologies, founded in 1993 as a spinoff from what is now known as Rockwell Collins. Vista saw the technology's promise in the medical field, and poured money into developing it, primarily for cardiac cases. But heart surgeons have been slow to adopt minimally invasive techniques. So Vista began to develop it for bariatric procedures.

By 2000, the company's focus had shifted exclusively to providing consulting services to hospitals that offer

gastric bypass surgery, an increasingly popular and lucrative procedure for helping morbidly obese people lose weight. At the same time, Tucker, a partner at the Accenture consulting firm, was looking for investments in the biomedical field. He learned of Vista and its desire to sell its vision systems. For 28 years, Tucker led Accenture's biomedical device unit. And Vista, he thought, was offering up what he thought would be a worthwhile investment.

"This technology should be at the value center of the hospital, which is the surgery center for most providers," Tucker said.

With hospitals increasingly pushing outpatient care and minimally invasive surgery, the technology had a clearly defined and growing market, he said.

And the 3-D technology was so different, it was somewhat disruptive to the way people were doing business, he said. "Three-D is so important on the diagnostic front, why not when you are doing surgery?" Tucker reasoned. Meanwhile, it has the capacity to add medical informatics, allowing for the screen-in-screen viewing, he said.

In the future, Tucker thinks the informatics will allow surgeons to call up a patient's medical records and other data on command. With a 78 percent personal stake in the newly acquired technology, Tucker spun it out into a company by buying a shell corporation. Then he slowly began to build a team. In May, Chief Executive Tom Marsh retired, and Tucker moved into the position. The company hired software expert and entrepreneur Mark C. Surles to the newly created position of vice president, advanced systems with the charge of expanding the informatics platform.

In late November, the company signed a distribution agreement with Platinum Medical of Las Vegas, a company that sells devices to hospitals. The deal essentially doubled the number of sales people offering Viking's products.

In June, the company received $8 million in private equity financing, which it is using to support the commercialization of the company's core products, the three-dimensional and two-dimensional systems; continue growing its original equipment manufacturing segment, which designs and manufactures cameras and other components for large medical device companies; and expand its informatics offerings.

It is informatics, now, where Tucker sees the future of his company.

"We have a tremendously powerful strategic opportunity in front of us: Bring more clinical information into the surgical environment. That is where we are going."

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