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Researchers find high-tech way to stop surgery goofs

By LEE BOWMAN
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The same sort of detection technology that's used to discourage retail theft could help locate sponges left inside patients during surgeries, according to a new study.

Leaving foreign objects behind in the body is one of the more serious goofs surgical teams can make during an operation, increasing the risk for infection and complications and sometimes death. Two-third of the objects left behind are surgical sponges.

The study published Monday in the Archives of Surgery demonstrated that detection technology could locate such sponges inside the body before surgeries end.

Currently, surgical teams count sponges at least three times before and during an operation. Even so, one study in Massachusetts found that an object is left behind in one out of every 10,000 operations.

Another recent study reported that surgical patients with instruments or sponges left behind faced an average of four added days of recovery in the hospital in 2000, and 57 died from the errors that year.

"The risk significantly increases in emergencies, with unplanned changes in procedures and with patients who have a higher body mass index," said Dr. Alex Macario, a professor of anesthesia at Stanford University and lead author of the study.

The test was done during eight operations involving elective abdominal or pelvic surgery at Stanford. Macario and colleagues used sponges developed by ClearCount Medical Solutions of Pittsburgh that are equipped with a 20-millimeter-diameter radio-frequency ID (RFID) chip. All the patients consented to having the test done.

During each surgery, a surgeon inserted one or two of the tagged sponges while the patient's incision was still open. Another surgeon then used a prototype detection wand attached to a frequency generator about the size of a toaster oven to detect the sponges while the other doctor held the incision closed.



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In each case, the surgeon accurately located the tagged sponge or sponges in less than three seconds. The wand never failed to detect a sponge and never indicated a sponge when none was present.

In a survey given as part of the study, surgeons said they liked the speed and accuracy of the technique, but most found the prototype wand to be somewhat cumbersome. The company is testing a smaller device elsewhere, Macario said.

Operating-room teams also expressed some concern that human error could still interfere with the system's effectiveness.

Macario and his colleagues agree that any technical tracking system should be used to supplement manual counting of sponges and other surgical gear. "We need a system that is really fail-safe; where, regardless of how people use this technology, the patient doesn't leave the operating room with a retained foreign body," the researcher said.

He added that it's likely that in the future, RFID tags will track all surgical items and supplies as they enter and leave a patient's body. "The technology to achieve this is not there yet because tagging a small pair of steel scissors or even a small sponge has not been entirely worked out."

In fact, the tiny tags used in the test are larger than some instruments used for microsurgery. And there's concern that the tags may interfere with the use of some instruments.

The study was funded by the National Institutes of Health, and Macario has no financial interests in the tags. But two co-authors, Dean and Sharon Morris, are a director and nursing consultant, respectively, of ClearCount and hold several patents related to RFID-tagged sponges.

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