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Breast cancer surgery preserves artery for future heart surgery

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(Medical Xpress) -- Doctors at Johns Hopkins have shown that during an increasingly popular type of breast-reconstruction surgery, they can safely preserve the internal mammary artery, in case it is needed for future cardiac surgery.

“Some breast-reconstruction patients might need a cardiac bypass in the future, so we implemented and studied a new technique that spares this artery used for that purpose,” says Gedge D. Rosson, M.D., associate professor of plastic and reconstructive surgery at the Johns Hopkins School of Medicine and lead researcher on the new report, which appears in the October issue of the journal, Plastic and Reconstructive Surgery.

The chance that any woman will need cardiac bypass surgery during her lifetime is low. But radiation therapy is sometimes required after mastectomy, and radiation damage to heart vessels is known to increase heart disease risk. Studies suggest that fatal cardiac events may be as much as two times more likely in women who have had radiotherapy for breast cancer on the left side, closest to the heart. “All else being equal, it’s better to leave this artery available, just in case,” Rosson says.

During breast-reconstruction surgeries, doctors often effectively perform a “tummy-tuck” type of operation, and use the removed flap of abdominal skin and fat to reconstruct a breast lost to mastectomy. They can attach the blood supply of the removed abdominal tissue to the chest wall by connecting it to the internal mammary artery, usually with an

"end-to-end anastomosis" in which most of the internal mammary artery is cut away and the new tissue is attached to its base.

However, the internal mammary artery is normally the first choice of cardiac surgeons when they need to bypass diseased or damaged arteries that nourish the heart, and its unavailability would leave patients with poorer options in such cases.

With a breast-reconstruction technique called "end-to-side anastomosis," a surgeon connects the stump of the abdominal artery contained in the transplanted abdominal tissue to the side of the existing internal mammary artery, eliminating the need to prune back the mammary artery.

To establish the safety of the technique, Rosson, a former chief surgical resident, John J. Apostolides, M.D., and a former Johns Hopkins research fellow, Michael Magarakis, M.D., looked at records from the 15 end-to-side and 15 end-to-end procedures that Rosson performed from mid-February to mid-October of 2009. They found that the only significant difference between the two was that the end-to-side procedure required approximately 20 minutes more surgery time. This left the transplanted tissue without blood flow longer than the standard end-to-end procedure; but the total time was still within what surgeons consider acceptable limits, and all the end-to-side surgeries were successful.

"The idea was to see if we could do this without adding too much time to the surgery or making it too difficult, and that proved to be the case," says Rosson.

Surgeons in the U.S. performed about 93,000 breast reconstructions during 2010, according to the American Society of Plastic Surgeons. Most of these surgeries involved the use of artificial implants, but in

about 20 percent of cases, surgeons rebuilt breasts using flaps of tissue cut from patients' upper backs or abdomens.

In the most common of these patients' own-tissue procedures, muscle is removed from the donor site along with skin and fat. But most patients prefer to keep their abdominal or upper back muscles intact, and a new procedure, known as a DIEP (deep inferior epigastric perforator) flap, spares the muscle while using only the abdominal skin and fat. In 2010, U.S. plastic surgeons performed about 5,000 DIEP flaps. Effectively the procedure gives patients a "tummy tuck" and uses the excised tissue to reconstruct a breast. "The new breast has a nice shape and it's soft and supple and feels natural," says Rosson. "More and more plastic surgeons are doing the DIEP flap surgery because of its advantages."

The end-to-side anastomosis simply adds a further advantage to the DIEP flap surgery, by keeping the internal mammary artery available in case of future bypass surgery needs. The artery is normally used for the most important bypass done in such procedures. "It works better for longer, compared with the saphenous veins (taken from the leg) that are normally a cardiac surgeon's second choices," says Rosson.

More information: *Plastic & Reconstructive Surgery*. 128(4):225e-232e, October 2011.

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