Questions Around Popular Technique For Ruptured Abdominal Aortic Aneurysms

A new study raises a cautionary note about the increasing use of a minimally invasive procedure to repair ruptured abdominal aortic aneurysms, according to vascular surgeon Dr. Jae Sung Cho of Loyola University Medical Center. A ruptured abdominal aortic aneurysm (AAA) causes massive internal bleeding that requires immediate emergency surgery to save the patient. The rupture can be repaired either with an open surgery or with a newer, less-invasive endovascular technique that involves the use of a catheter.

At first glance, the endovascular technique would appear to be a better option because it is minimally invasive and has lower complication rates. It's being increasingly used to repair ruptured AAAs. However, a study in the *Journal of Vascular Surgery* found that the endovascular technique does not conclusively improve survival. In the retrospective study, Cho and colleagues compared 37 patients with ruptured AAAs who underwent emergency endovascular surgery and 241 patients with ruptured AAAs who underwent open surgery.

The endovascular group's probability of survival was 50 percent after the first year and 42 percent after three years. By comparison, the open surgery group's probability of surviving was 54 percent after the first year and 47 percent after three years. The overall complication rate was 66 percent in the open surgery group and 54 percent in the endovascular surgery group, but this difference was not statistically significant.

Cho and colleagues wrote that preferential use of the endovascular technique "should be deferred until results of prospective, randomized trials are available and predictive factors for its success are identified. Some patients may be harmed by indiscriminate insistence on (the endovascular technique)." The study was conducted at the University of Pittsburgh Medical Center, where Cho practiced before recently joining Loyola as chief of vascular surgery. Cho is a professor in the Department of Surgery, Division of Vascular Surgery and Endovascular Therapy at Loyola University Chicago Stritch School of Medicine.

Risk factors for AAAs include smoking, high blood pressure, high cholesterol, male gender, emphysema, genetic factors, obesity and increasing age. The bulge typically develops slowly over many years. The larger the aneurysm, the more likely it is to rupture and cause massive bleeding. About 15,000 people per year die from ruptured AAAs. Many die before getting to the hospital.

In the open surgery technique, the surgeon makes a large incision and opens up the abdomen. The surgeon clamps the aorta to stop the bleeding, then replaces or bypasses the ruptured section with an artificial blood vessel.

In the endovascular technique, the surgeon inserts a catheter in a groin artery and guides the catheter through blood vessels to the site of the burst aneurysm. The surgeon deploys a device called a stent graft. The device, shaped like an inverted Y, is made of GoreTex® or Dacron®, and is supported by metal webbing. After it is deployed from the catheter, the stent graft expands outward to the walls of the artery. This allows blood to flow safely through the stent graft, rather than gushing into the abdominal cavity.

While much less invasive than open surgery, the endovascular technique has drawbacks, Cho said. There can be more internal bleeding because of a delay in clamping the aorta. And even after a successful stent graft placement, there may be ongoing blood loss. Also, the large amount of blood left in the abdomen can compress other organs and the chest cavity and may require surgery to remove the blood. The endovascular technique also can put a significant strain on hospital resources. The hospital must stock various sizes of stent grafts, which cost at least $12,000 each, and skilled endovascular, radiologic and nursing teams must be available around the clock.

"It is not pragmatic to undertake such systemic and systematic changes in the absence of clear evidence of (the endovascular technique's) superiority," Cho and colleagues wrote. Cho is a nationally known expert in the treatment of AAAs and other vascular diseases. He said he uses his best judgment to decide whether a particular patient should undergo endovascular surgery or open surgery.

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