ICU
MANAGEMENT & PRACTICE

Surgeons Evaluate Treatment Options For Traumatic Aortic Injury, Including Minimally Invasive Technique

Their review appears in the October 16, 2008 edition of the New England Journal of Medicine.

"This type of injury to the aorta primarily affects young, healthy people and it has a very high mortality rate. For those who get to medical care quickly, our review found that treatment for blunt aortic injury has evolved and improved considerably," says David G. Neschis, M.D., a vascular surgeon at the University of Maryland Medical Center and the review's lead author. Dr. Neschis is also an associate professor of surgery at the University of Maryland School of Medicine.

"The next step in this evolution will be more widespread use of the minimally invasive treatment that allows us to place a small, tube-like device called an endograft inside of the aorta without making a large incision. It offers tremendous promise as a way to save lives, make recovery easier and limit complications," Dr. Neschis says.

"Trauma patients with this type of aortic injury often have other serious injuries that make traditional surgery risky because it requires opening their chests to repair the problem. A minimally invasive approach in these types of cases can be a valuable life-saving option for these patients," says Thomas M. Scalea, M.D., physician-in-chief at the R Adams Cowley Shock Trauma Center, and professor of surgery and director of the program in trauma at the University of Maryland School of Medicine.

With the traditional method to repair this type of traumatic aortic injury, surgeons would make a large incision to open the chest and then insert a fabric tube, or graft, to make the repair.
"Through our previous experience with traumatic injury patients, we know that the surgical repair could stabilize the injured artery. In this newer technique, we have a different way to deliver the graft, in this case, through the bloodstream," explains Bartley P. Griffith, M.D., chief of cardiac surgery at the University of Maryland Medical Center, and professor and head of the Division of Cardiac Surgery at the University of Maryland School of Medicine.

He adds, "It's extremely gratifying to know that we can now offer a life-saving procedure to patients who would not be good candidates for the open operation."

In the less invasive endograft procedure, doctors insert a catheter into an artery in the leg. Using X-ray guidance, physicians steer the catheter through the blood vessels into the aorta. At the site of the injury, doctors release the endograft, the self-expanding, tube-like device that creates a new lining in the artery.

"The minimally invasive endograft technique provides a way to fix this devastating injury with less blood loss, less operating time and faster recovery time, which can be very important for patients recovering from multiple traumatic injuries," says William Flinn, M.D., head of vascular surgery at the University of Maryland Medical Center and professor of surgery at the University of Maryland School of Medicine.

In their review of blunt aortic injury, the University of Maryland physicians also examined the mechanisms of action that cause this type of injury, which can occur with vehicle crashes, collisions, falls and crush injuries. These aortic injuries most likely involve a combination of forces, such as stretching and shearing, which damages the vital artery.

For example, in a car crash, a person traveling at a high rate of speed suddenly stops. Part of the aorta is fixed and stays put, while the mobile part of the artery continues to move. That stress tears the artery. In many cases, the aorta ruptures, killing the person. For those who initially survive, the aorta has been damaged and, almost always, needs to be repaired.

"In trauma care, we are always searching for better ways to help our patients who have complex and immediate medical needs," says Dr. Scalea. "For a trauma patient involved in a crash, the aortic injury will, most likely, not be the only immediate medical problem. There can also be brain swelling, broken bones, spinal cord damage and lung injuries. The option of a less invasive procedure to stabilize the aorta means these patients will not have to undergo the additional trauma of the open operation."

Adds Dr. Neschis, "Our experience with the endograft and our expertise in trauma, cardiac surgery and vascular surgery put the University of Maryland Medical Center in a unique position to use this minimally invasive approach. We have performed 39 of these less invasive aorta repairs in our trauma patients since 2005 with good results. In fact, at our hospital, endovascular repair has supplanted open surgery as the primary treatment option in these cases. We believe this procedure represents the next logical progression in treatment for blunt aortic injury."

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