

Stent grafts: a better way to treat blunt trauma injuries

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Endovascular repair—fixing an injury in a blood vessel from inside that vessel—is a better option for individuals who receive highly lethal injuries from high-speed collisions or falls (together referred to as blunt trauma) and is shown to save more lives and nearly eliminate paraplegia (the loss of the ability to move and/or feel both legs), a complication of surgical repair for thoracic aortic aneurysms.

"Analysis of the available data provides unequivocal support for endovascular repair to replace open surgery as the procedure of choice for repair of the most common traumatic aortic injury," said Eric K. Hoffer, the director of vascular and interventional radiology at Dartmouth Medical School. "This minimally invasive interventional radiology technique can decrease the death rate by half and diminish the risk of paraplegia by 75 percent as compared to open surgical repair," he added.

Injuries causing thoracic (chest) aortic trauma are life-threatening, often resulting in significant disability or death. Injuries to the body's largest artery account for as much as 25 percent of all motor vehicle trauma-related deaths, and most of these individuals die at the scene of the injury, said Hoffer. The 10?? percent who survive and make it to the hospital may die within hours of hospitalization. These injuries may cause partial tears of the artery wall and may not be obvious initially. If left untreated, the artery could expand and eventually rupture, resulting in massive bleeding into the chest that is invariably fatal, said Hoffer.

During surgery, a patient is at increased risk of paraplegia because the thoracic aorta is clamped, cutting off blood to the spinal column. The interventional radiology treatment does not interrupt the blood supply. By entering a branch of the aorta through a small incision in the groin and using long, thin tubes called catheters,

interventional radiologists guide and deliver a stent graft (a tube composed of fabric supported by a metal mesh) through the blood vessels. When expanded within the artery, the stent graft bridges the injury, reinforcing an artery's weak spot (the tear), and when successful, eliminates the risk of continued expansion and rupture, said Hoffer. This advance in treatment provides a less invasive option with less pain, less recovery time and a lower risk of complications than open surgery.

Researchers systematically reviewed 50 reports with 722 endovascular repairs for this study, published in the *Journal of Vascular and Interventional Radiology (JVIR)*, the official journal of the Society of Interventional Radiology. According to the study, the "endovascular advantage" was demonstrated in relation to contemporary intensive care and surgical methods, which over the past 30 years decreased operative mortality rates from 45?? percent to 18?? percent. Endograft repair further reduced mortality to 8?? percent. The improved survival rate "may be a result of the decreased systemic stress that endovascular repair affords," said Hoffer, "which is important with this group of patients where additional severe injuries are common."

Interventional radiologists, working in multidisciplinary teams with cardiothoracic surgeons and vascular surgeons, pioneered the application of the stent-covered graft for blunt trauma injuries, said Hoffer. Interventional radiologists introduced the idea of taking off-the-shelf stents and vascular graft material to combine them into handmade stent grafts, using these devices to repair lesions from within a blood vessel. This year, SIR celebrates 35 years of quality patient care innovation. "This study provides another indication of the tremendous innovation in the development of new devices and techniques that interventional radiology continues to offer," said Hoffer.

Source: Society of Interventional Radiology

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