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Objectives: Spinal cord ischemia (SCI) after open or endovascular thoracoabdominal aortic aneurysm (TAAA) repairs is a serious complication with adverse effects on quality of life and long-term survival. Many risk factors for SCI after open surgery have been identified; however, the pathophysiology of SCI after endovascular repair is less understood. Our aim was to identify factors associated with postoperative SCI after multibranched endovascular aneurysm repair (MBEVAR) for TAAA.

Methods: From July 2005 to October 2013, 116 patients with TAAA (30 women; mean age, 73.4 ± 7.7 years) were treated in a prospective, single-center trial for MBEVAR. Symptomatic patients and those with dissection were excluded. SCI was classified into lower extremity paralysis (LEP), permanent lower extremity weakness (pLEW), and transient LEW (tLEW). Perioperative spinal cord protection measures included cerebrospinal fluid (CSF) drainage and permissive hypertension.

Results: Postoperative SCI occurred in 24 of 116 patients (20.6%). Most patients had tLEW (15 of 116 [12.9%]) with full recovery, and less frequently pLEW ($n = 3$ of 116 [2.6%]) or LEP ($n = 6$ of 116, 5.2%). Onset of 79% of SCI events (19 of 24) was delayed (>6 h postoperative), were transient in 62.5% (15 of 24), and symptoms resolved within a median of 1 day (interquartile range, 1-3.5 days). Prolonged postoperative hypotension was associated with SCI (odds ratio, 5.0; 95% confidence interval, 1.6-16.1; $P < .01$). Aneurysm extent or the presence of a postoperative endoleak was not associated with SCI events. The change in C-reactive protein levels from baseline to peak was 1.8-times greater in patients with SCI than those without ($P = .03$).

Conclusions: Most episodes of SCI after MBEVAR are transient and do not occur in the operating room. Increased systemic inflammation may have an adverse effect on spinal cord perfusion and play a role in the delayed onset of SCI. Current adjunct strategies to maintain spinal cord perfusion, including permissive hypertension and CSF drainage, may help prevent permanent SCI.

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SS4.

In Patients Stratified by Preoperative Risk, Endovascular Repair of Ruptured Abdominal Aortic Aneurysms Has a Lower In-Hospital Mortality and Morbidity Than Does Open Repair

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Objectives: Endovascular repair (EVAR) of ruptured abdominal aortic aneurysms (RAAA) is reported to have a lower postoperative mortality than open repair (OR). However, comparisons have involved heterogeneous populations that lack adjustment for preoperative risk. We hypothesize that for RAAA patients stratified by a validated measure of preoperative mortality risk, EVAR has a lower in-hospital mortality and morbidity than does OR.

Methods: In-hospital mortality and morbidity after EVAR and OR of RAAA were compared in patients from the Vascular Quality Initiative (2003-2013) stratified by the validated Vascular Study Group of New England (VSGNE) RAAA Risk Score into low (score 0-1), moderate (score 2-3), and high (score 4-6) risk groups.

Results: Among 592 patients who underwent EVAR and 703 patients who underwent OR of RAAA, EVAR had lower in-hospital mortality (23% vs 36%, $P < .001$). In risk-stratified patients, EVAR trended towards a lower mortality in the low risk group ($n = 631$; EVAR 11% vs OR 16%; $P = .07$), had a significantly lower mortality in the moderate risk group ($n = 460$; EVAR 37% vs OR 48%; $P = .02$), and no advantage in the high risk group ($n = 84$; EVAR 95% vs OR 80%; $P = .17$). Across all risk groups, cardiac complications (EVAR: 28% vs OR: 38%; $P = .0003$), respiratory complications (EVAR: 27% vs OR: 46%; $P < .0001$), renal insufficiency (EVAR: 23% vs OR: 37%; $P < .0001$), and bowel ischemia (EVAR: 4% vs OR: 10%; $P < .0001$) were reduced significantly after EVAR. Across all risk groups, intensive care unit length of stay (LOS) for EVAR (2 days; interquartile range [IQR], 1-5 days) vs OR (6 days; IQR, 4-13 days; $P < .0001$) and hospital LOS for EVAR (5 days; IQR, 3-11 days) vs OR (13 days; IQR, 8-22 days; $P < .0001$) were lower after EVAR than OR.

Conclusions: This first risk-stratified comparison using a national clinical database shows that EVAR of RAAA has a lower mortality and morbidity compared with OR in patients of low and moderate risk, and EVAR should be used to treat these patients when feasible. For RAAA patients at highest preoperative risk, there is no benefit to using EVAR compared with OR.

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SS5.

Antibodies Against Malondialdehyde-Acetaldehyde Adducts Can Identify Patients With Abdominal Aortic Aneurysm

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