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Midterm results of laser generated in situ fenestration of the left subclavian artery during thoracic endovascular aneurysm repair

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Objective: To analyze the midterm result of in situ fenestration (ISF) of the left subclavian artery (LSA) during thoracic endovascular aneurysm repair (TEVAR).

Methods: In this clinical study, between 2014 and 2016, ISF for LSA revascularization was attempted during TEVAR in 10 patients (7 males; median age, 68 years). An excimer laser, placed from the left brachial artery, was used to create a fenestration and all fenestrations were stented with covered stent grafts. Follow-up included computed tomography scans 1 month postoperatively and annually thereafter. Survival was analyzed according to Kaplan-Meier.

Results: Nine of the 10 laser-assisted ISF were successful. No 30-day mortality occurred. One patient had a transient ischemic attacked in the left carotid territory. After a median follow-up of 27 months, all fenestrations were patent. At 1 month, computed tomography follow-up showed nonspecific endoleaks of unknown origin in five of the nine patients. At 27 months follow-up, only two endoleaks remained. One reintervention was done after 24 months owing to a type Ic endoleak from the LSA. Overall TEVAR success, defined as survival with no aneurysm expansion, was eight of nine. One patient showed aneurysm expansion after 14 months. Two deaths occurred (at 33 and 31 months postoperative), one of unknown reason and one aneurysm related.

Conclusions: Laser fenestration might be an option for LSA revascularization during emergent or semiurgent TEVAR and electively in patients with hostile neck anatomy (eg, previous neck radiation, short and adipose necks) that might make a carotid—subclavian bypass difficult. The LSA fenestration has excellent patency and TEVAR success was not affected by nonspecific endoleaks around the LSA.

Thoracic endovascular aortic repair for retrograde type A aortic dissection

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Objective: The efficacy of thoracic endovascular aortic repair (TEVAR) for retrograde type A aortic dissection (r-TAAD) with the entry tear in the descending aorta has not been clarified.

Methods: The medical records of 31 patients who underwent TEVAR for r-TAAD at three institutions between May 1997 and January 2016 were retrospectively reviewed.

Results: The mean age of the patients (30 men and 1 woman) was 64 ± 11 years. The entry tear was located in the descending thoracic aorta in all patients. Seven patients (23%) had dissection-related complications. The false lumen of the ascending aorta was patent in 13 patients (42%) and thrombosed in 18 (58%). The maximum diameter of the ascending aorta was 45 ± 4 mm. TEVAR was performed in the acute phase in 24 patients (77%) and in the subacute phase in 7 (23%). Only one patient (3%) died of aortic rupture within 30 days after TEVAR. Early aorta-related adverse events were observed in eight patients (26%), of whom five underwent additional interventions. The mean follow-up period was 99 ± 69 months. There were no late aorta-related deaths, although five patients died of other causes during follow-up. Overall survival rates at 1 year, 5 years, and 10 years were 97%, 93%, and 80%, respectively. Late aorta-related adverse events were observed in seven patients (23%), of whom five underwent additional interventions. Aorta-related event-free survival rates at 1 year, 5 years, and 10 years were 58%, 58%, and 51%, respectively.

Conclusions: TEVAR for r-TAAD seems promising in terms of survival. However, the incidence of postoperative aorta-related adverse events is not negligible, so careful selection of patients is important. In addition, close follow-up is mandatory after TEVAR to avoid catastrophic consequences.

A population-based cohort study examining the risk of abdominal cancer after endovascular abdominal aortic aneurysm repair

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Objective: Endovascular aneurysm repair (EVAR) has increasingly been used as the primary treatment approach for abdominal aortic aneurysm (AAA). This study examined the hypothesis that EVAR leads to an increased risk of

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abdominal cancer within the radiation field compared with open AAA repair.

Methods: The nationwide English Hospital Episode Statistics database was used to identify all patients older than 50 years who received an AAA repair in 2005 to 2013. EVAR and open AAA repair groups were compared for the incidence of postoperative cancer using inverse probability weights and G-computation formula to adjust for selection bias and confounding.

Results: Among 14,150 patients who underwent EVAR and 24,645 patients who underwent open AAA repair, follow-up was up to 7 years. EVAR was associated with an increased risk of postoperative abdominal cancer (hazard ratio [HR], 1.14; 95% confidence interval [CI], 1.03-1.27) and all cancers (HR, 1.09; 95% CI, 1.02-1.17). However, there was no difference between the groups in the risk of lung cancer (HR, 1.04; 95% CI, 0.92-1.18) or obesity-related nonabdominal cancer (HR, 1.12; 95% CI, 0.69-1.83). Within the EVAR group, use of computed tomography surveillance was not associated with any increased risk of abdominal cancer (HR, 0.94; 95% CI, 0.71-1.23) or all cancers (HR, 0.97; 95% CI, 0.81-1.17).

Conclusions: This study suggests an increased risk of abdominal cancer after EVAR compared with open AAA repair. The differential cancer risk should be further explored in alternative national populations, and radiation exposure during EVAR should be measured as a quality metric in the assessment of EVAR centers.

The incidence of carotid in-stent stenosis is underestimated ≥50% or ≥80% and its clinical implications

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Background: The incidence of carotid in-stent stenosis has been reported to vary between 1% and 30%. Most published studies have short follow-up, which may lead to underestimation of the incidence of in-stent stenosis. This study analyzed the incidence of ≥50% and ≥80% in-stent stenosis using validated duplex ultrasound criteria and its clinical implications.

Methods: This is a retrospective analysis of prospectively collected data of 450 carotid artery stenting (CAS) procedures (February 6, 2001-December 19, 2016). All patients had postoperative carotid duplex ultrasound examination, which was repeated at 1 month, 6 months, and every 6 to 12 months thereafter. A Kaplan-Meier analysis was used to estimate rates of freedom from ≥50% in-stent stenosis (internal carotid artery peak systolic velocity of ≥224 cm/s) and ≥80% in-stent stenosis (internal carotid artery peak systolic velocity of ≥325 cm/s), freedom from reintervention, and survival.

Results: The mean age was 68.3 years, with a mean follow-up of 40.3 months. A total of 201 patients (45% [201/450]) had CAS for symptomatic disease. Primary CAS was done in 291 patients (65%); in the remaining 35%, CAS was done for postcarotid endarterectomy (CEA) stenosis. A total of 101 patients (23%) had ≥50% late carotid in-stent stenosis, and of these, 33 (7.4%) had ≥80% in-stent stenosis. Nineteen patients (4.3%) developed late transient ischemic attack and three (0.7%) late stroke. Twenty-three (5.2%) patients had late reintervention. Rates of freedom from ≥50% in-stent stenosis in the whole series were 85%, 79%, 75%, 72%, and 70% at 1 year, 2 years, 3 years, 4 years, and 5 years, respectively. The rates of freedom from ≥50% in-stent stenosis for primary CAS and CAS for post-CEA stenosis were not statistically significant (P = .540). The rates of freedom from ≥80% in-stent stenosis for the whole series were 96%, 95%, 93%, 90%, and 89% at 1 year, 2 years, 3 years, 4 years, and 5 years, respectively. The rates of freedom from ≥80% in-stent stenosis for primary CAS and CAS for post-CEA stenosis were also not statistically significant (P = .516). Rates of freedom from reintervention were 98%, 96%, 93%, 93%, and 91% at 1 year, 2 years, 3 years, 4 years, and 5 years, respectively, and there were no significant differences between primary CAS and CAS for post-CEA stenosis (P = .939). The overall late survival rates were 99%, 97%, 96%, 94%, and 91% at 1 year, 2 years, 3 years, 4 years, and 5 years.

Conclusions: The incidence of ≥50% in-stent stenosis is relatively high; however, the rates of ≥80% stenosis and late neurologic events are low. Longer follow-up of patients with ≥50% carotid in-stent stenosis may yield higher incidence of ≥80% stenosis.

Effect of stent design on clinical and radiologic outcomes of carotid artery stenting: A meta-analysis

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Objective: Procedural characteristics, including stent design, may influence the outcome of carotid artery stenting (CAS). A thorough comparison of the effect of stent design on outcome of CAS is thus warranted to allow for optimal evidence-based clinical decision making. This study sought to evaluate the effect of stent design on clinical and radiologic outcomes of CAS.

Methods: A systematic search was conducted in MEDLINE, Embase, and Cochrane databases in May 2018. Included were articles reporting on the occurrence of clinical short- and intermediate-term major adverse events (MAEs; any stroke or death) or radiologic adverse events (new ischemic lesions on postprocedural magnetic resonance diffusion-weighted imaging [MR-DWI], restenosis, or stent fracture) in different stent designs used to treat carotid artery stenosis. Random effects models were used to calculate combined overall effect sizes. Metaregression was performed to identify the effect of specific stents on MAE rates.

Results: From 2654 unique identified articles, two randomized, controlled trials and 66 cohort studies were

eligible for analysis (including 46,728 procedures). Short-term clinical MAE rates were similar for patients treated with open cell vs closed cell or hybrid stents. Use of an Acculink stent was associated with a higher risk of short-term MAE compared with a Wallstent (risk ratio [RR], 1.51; $P = .03$), as was true for use of Precise stent vs Xact stent (RR, 1.55; $P < .001$). Intermediate-term clinical MAE rates were similar for open vs closed cell stents. Use of open cell stents predisposed to a 25% higher chance (RR, 1.25; $P = .03$) of developing postprocedural new ischemic lesions on MR-DWI. No differences were observed in the incidence of restenosis, stent fracture, or intraprocedural hemodynamic depression with respect to different stent design.

Conclusions: Stent design is not associated with short- or intermediate-term clinical MAE rates in patients undergoing CAS. Furthermore, the division in open and closed cell stent design might conceal true differences in single stent efficacy. Nevertheless, open cell stenting resulted in a significantly higher number of subclinical postprocedural new ischemic lesions detected on MR-DWI compared with closed cell stenting. An individualized patient data meta-analysis, including future studies with prospective homogenous study design, is required to adequately correct for known risk factors and to provide definite conclusions with respect to carotid stent design for specific subgroups.