PP14.
In-stent Restenosis after Carotid Angioplasty and Stenting: Post-Carotid Endarterectomy Lesions Fare Equally as Well as True De Novo Lesions

Christopher L Stout1, Albert J Richardson, II1, Susanna H Shin1, Rasheh M Shah1, Jean M Panneton1.
1Division of Vascular Surgery, Eastern Virginia Medical School, Norfolk, VA; 2Department of General Surgery, Eastern Virginia Medical School, Norfolk, VA

Objectives: Restenosis following carotid endarterectomy (CEA) can be treated with carotid angioplasty and stenting (CAS), but concerns about durability exist. Data for CAS restenosis following CEA is limited and conflicting and includes arteries that have been radiated. The disease process of radiated arterial restenosis is different. We compare the long-term results of CAS performed after ipsilateral CEA to results of CAS for true de novo carotid stenosis.

Methods: 269 consecutive CAS procedures between January 2003 and August 2008 were performed on 254 patients. 18 patients were excluded for neck radiation therapy to represent true de novo lesions for comparison. Seventy four procedures were performed for post-CEA indication and 175 procedures for de novo lesions. Standard statistical analysis was used. In-stent restenosis was defined as >50% stenosis using duplex ultrasound internal carotid artery peak systolic velocity ≥220 centimeters per second (cm/s) and internal to common carotid artery peak systolic velocity ratio ≥2.7.

Results: Mean age was 73 years (range: 43.7-90.4). 55% were male and 45% female. Caucasians comprised 90% and African-Americans 8%. Mean follow up was 13 ± 8.8 months (range: 0.6–115). Demographic information and risk factors were similar except for age (73.8 years de novo versus 71.1 years post-CEA; p = 0.035), smoking (62% post-CEA versus 42% de novo; p = 0.004), symptomatic (27% post-CEA versus 45% de novo; p = 0.008), and embolic protection use (92% post CEA versus 99% de novo; p = 0.001). Overall, 30-day risk of stroke was 3.2%, death was 1.2%, and myocardial infarction was 0.8% with no group differences (p = 0.273, p = 0.53, and p = 0.16, respectively). Three year overall survival was not significant: de novo group at 75% compared to 53% for post-CEA group (p = 0.074). At four years the overall freedom from stroke was 96% with no group difference (p = 0.19). Primary patency at three years was similar, 89% for post-CEA and 91% for the de novo group (p = 0.211). Only 3 patients (p = NS) had duplex ultrasound criteria indicative of >80% stenosis, none required reintervention.

Conclusion: There is not an increased rate of in-stent restenosis following CAS for post-CEA restenosis compared to non-radiated true de novo lesions.

Author Disclosures: C.L. Stout, None; A.L. Richardson, None; S.H. Shin, None; R.M. Shah, None; J.M. Panneton, None.

PP15.
Radial Force of Carotid Stents: Uncovered Ground With Potential Clinical Consequences

Michiel T Voûte1, Johanna M Hendriks1, Jorinde H H Van Laanen1, Peter M T Pattynama1, Bart E Muhs2, Hence J M Verhagen1.
1Erasmus Medical Centre, Rotterdam, Netherlands; 2Department of General Surgery, Eastern Virginia Medical School, Norfolk, VA

Objectives: Carotid angioplasty and stenting (CAS) is an increasingly used procedure for the treatment of carotid stenosis. The radial force of the stent leads to an increase in pressure that can give rise to hypoperfusion of the brain as a result of overstimulation of the baroreceptors and can cause clinical symptoms. Therefore, the radial force of the stent needs to be precisely and reliably measured. We performed two tests, one of stent deployment and one simulation of a clinically relevant stenosis.

Methods: We tested the radial force of four different carotid stents. Two open cell nitinol stents (Acculink® and Protégé®), one hybrid nitinol stent (Cristallo Ideale®) and a braided eiligoty stent (Wallstent®). Five stents of each type were deployed in three loops of bopper film. These loops were attached to aluminium rods with copper strain gauges, forming a half Wheatstone bridge. The radial force of the stent leads to a change in resistance which is measured by the strain gauge. We performed two tests, one of stent deployment and one simulation of a clinically relevant stenosis.

Results: In stent deployment, the Protégé® produced a peak radial force of 62cN, the Wallstent® 38cN, the Acculink® 35cN and the Cristallo Ideale® 15cN (p < 0.05). In the simulated stenosis (figure 1) the Protégé® had the greatest peak radial force of 328cN and the Wallstent® produced the lowest radial force of 84cN (p < 0.05).

Conclusions: Radial forces exerted by carotid stents vary significantly between various stent designs. In both tests the Protégé® stent generates a radial force far greater than all the other stents. Clinical results of CAS may be better defined by the specific stent used and may thereby not be generalizable for all carotid stent systems. In our opinion, besides flexibility and free cell area, an objective comparison of radial force is necessary for a well-considered choice of stent type in the individual patient.

Author Disclosures: M.T. Voûte, None; J.M. Hendriks, None; J.H.H. Van Laanen, None; P.M.T. Pattynama, None; R.E. Muhs, None; H.J.M. Verhagen, None.

PP16.
Carotid Stenting (CAS) Vs. Carotid Endarterectomy (CEA): Patients Choice

Kenneth Granke1, Brennada Allende1, Micheal Bojalian1, Angelikea Vouyouka2, Jacob Gordon1, John Malecis3.
1Wayne State Medical School, Detroit, MI; 2Mt Sinai Hospital, New York, NY

Introduction: Trials on CAS, typically in high risk patients, suggest a 1% higher stroke rate but show equivalency to CEA. Unfortunately, the CEA results usually exceed the accepted limits of proven benefit set in ACAS and NACET. To assess benefit at one institution, patients were prospectively offered their choice of CAS or CEA, regardless of risk status.

Methods: Between October 2002 and May 2007, with IRB approval, consecutive patients at a VA hospital were analyzed after they selected either CAS or CEA. They were informed of a possible 1% greater risk of stroke with CAS. A single Neurologist (JG) verified neurological exams. Variables compared: age, beta-blocker use, diabetes (DM), hypertension (HTN), coronary artery disease (CAD), respiratory disease (RD), intermittent claudication (IC), stroke, TIA, amaurosis fugax, operative room time, transfusion, length of stay (LOS), myocardial infarction, nerve injury, hematoma, stroke and death. Statistical analysis was performed using Fischer’s Exact and Mann-Whitney Tests.

Results: 92 patients underwent 98 procedures (48 CEA /50 CAS). Although 78% were high risk, there were no differences in high/low risk, asymptomatic/symptomatic patient choice of CAS vs. CEA, nor between age, HTN, DM, CAD, IC. The CEA group had a higher incidence of RD (p = 0.015), TIA (p = 0.008) and smoking (p = 0.002). Operative time was higher in CEA vs. CAS (2.1 hr. vs. 1.3 hr; P = 0.02). There was no difference in LOS or transfusion. CEA had higher major complications: MI (2 vs. 0%), nerve injury (4 vs. 0%) and hematoma (11 vs. 3%) compared to CAS (p < 0.01). The 30 day stroke/mortality rates were no different: 0/2% and 2.1/0% for CEA and CAS, respectively. Mean follow-up was 27.2 ± 22.8 months for CEA vs. CAS, respectively with no late neurological symptoms and similar deaths. One restenosis in each group was treated with CAS. Four patients had contra lateral treatments (3 CEA underwent CAS and 1 CAS underwent CEA).

Conclusion: When both surgical and endovascular treatment outcomes are within established standards, pre-operative risk status need not be the factor for recommending CAS. Consideration should be given to in-dividual and/or institutional periprocedural outcomes to guide reimbursement recommendations to allow the patient a choice between CEA and CAS.

Author Disclosures: K. Granke, speaker, king pharmaceuticals; B. Allende, None; M. Bojalian, None; A. Vouyouka, None; J. Gordon, None; J. Malecis, None.

PP17.
Transcranial Doppler Monitoring is Vital in Thoracic Endograft Placement

Jean Bismuth, Zsolt Garami, Houssam K Younes, Patricia Harris, Joseph Naoum, Mark Davies, Eric Peden, Alan Lumsden. Methodist DeBakey Heart & Vascular Center, Houston, TX