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Carotid Stenting Prior to Coronary Bypass Surgery: An Updated Systematic Review and Meta-Analysis

Paraskevas KI, Nduwayo S, Saratzis AN, Naylor AR. Eur J Vasc Endovasc Surg 2017;53:309-19.

Objectives: The aim was to determine 30-day outcomes in patients with concurrent carotid and cardiac disease who underwent carotid artery stenting (CAS) followed by coronary artery bypass grafting (CABG).

Methods: This was a systematic review with searches of PubMed/Medline, Embase, and Cochrane databases. "Same-day" procedures involved CAS + CABG being performed on the same day, and "staged" interventions involved at least 1 day's delay between undergoing CAS and then CABG.

Results: There were 31 eligible studies (2727 patients), with 80% being neurologically asymptomatic with unilateral stenoses. Overall, the 30-day death/stroke rate was 7.9% (95% confidence interval [CI] 6.9-9.2), while death/stroke/MI was 8.8% (95% CI 7.3-10.5). Staged CAS + CABG was associated with 30-day death/stroke rate of 8.5% (95% CI 7.3-9.7) compared with 5.9% (95% CI 4.0-8.5) after "same-day" procedures. Outcomes following CAS + CABG in neurologically symptomatic patients were poorer, with procedural stroke rates of 15%. There were five antiplatelet (APRx) strategies: (a) no APRx (death/stroke/MI, 4.2%; no data on bleeding complications); (b) single APRx before CAS and CABG, then dual APRx after CABG (death/stroke/MI, 6.7%; 7.3% bleeding complications); (c) dual APRx pre-CAS down to one APRx pre-CABG (death/stroke/MI, 10.1%; 2.8% bleeding complications); (d) dual APRx pre-CAS, both stopped pre-CABG (death/stroke/MI, 14.4%); (e) dual APRx pre-CAS and continued through CABG (death/stroke/MI, 16%). There were insufficient data on bleeding complication in the last two strategies.

Conclusions: In a cohort of predominantly asymptomatic patients with unilateral carotid stenoses, the 30-day rate of death/stroke was about 8%. Notwithstanding the effect of potential biases, this meta-analysis did not find evidence that outcomes after same-day CAS + CABG were higher than after staged interventions. However, outcomes were poorer in neurologically symptomatic patients. More data are required to establish the optimal antiplatelet strategy in patients undergoing same-day or staged CAS + CABG.

Cranial Nerve Injury After Carotid Endarterectomy: Incidence, Risk Factors, and Time Trends

Kakisis JD, Antonopoulos CN, Mantas G, Moulakakis KG, Sfyroeras G, Geroulakos G. Eur J Vasc Endovasc Surg 2017;53:320-35.

Objective/Background: To review the incidence of post-carotid endarterectomy (CEA) cranial nerve injury (CNI), and to evaluate the risk factors associated with increased CNI risk.

Methods: The study was a meta-analysis. Pooled rates with 95% confidence intervals (CIs) were calculated for CNIs after primary CEA. Odds ratios (ORs) were calculated for potential risk factors. A fixed-effects model or a random effects model (Mantel–Haenszel method) was used for non-heterogeneous and heterogeneous data, respectively. Meta-regression analysis was performed to examine the influence of publication year upon CNI rate.

Results: Twenty-six articles, published between 1970 and 2015, were included in the meta-analysis, corresponding to 20,860 CEAs. Meta-analysis revealed that the vagus nerve was the most frequently injured cranial nerve (pooled injury rate 3.99%, 95% CI 2.56-5.70), followed by the hypoglossal nerve (3.79%, 95% CI 2.73-4.99). Fewer than one seventh of these injuries are permanent (vagus nerve: 0.57% [95% CI 0.19-1.10]; hypoglossal nerve: 0.15% [95% CI 0.01-0.39]). A statistically significant influence of publication year on the vagus and hypoglossal nerve injury rate was found, with the injury rate having decreased from about 8% to 2% and 1%, respectively, over the last 35 years. Urgent procedures (OR 1.59, 95% CI 1.21-2.10; $P = .001$), as well as return to the operating room for a neurological event or bleeding (OR 2.21, 95% CI 1.35-3.61; $P = .002$) were associated with an increased risk of CNI, whereas no statistically significant association was found between CNIs and the type of anaesthesia, the use of a patch, redo operation, and the use of a shunt.

Conclusion: The vagus nerve appears to be the most frequently injured cranial nerve after CEA, followed by the hypoglossal nerve, with only a small proportion of these injuries being permanent. The CNI rate has significantly decreased over the past 35 years to a point indicating that CNIs should not be considered a major influencing factor in the decision making process between CEA and stenting.

Robotic Arch Catheter Placement Reduces Cerebral Embolization During Thoracic Endovascular Aortic Repair (TEVAR)

Perera AH, Riga CV, Monzon L, Gibbs RG, Bicknell CD, Hamady M. Eur J Vasc Endovasc Surg 2017;53:362-9.

Objective: Stroke caused by cerebral embolization constitutes a principal risk during arch manipulation and thoracic endovascular aortic repair (TEVAR). This study investigates the incidence of cerebral embolization during catheter placement in the aortic arch, and compares robotic and manual techniques.

Methods: Intra-operative transcranial Doppler (TCD) was performed in 11 patients undergoing TEVAR. Wire and catheter placement in the arch was performed by two experienced operators. Manual and robotic catheter placement and removal were compared for each patient; 44 manoeuvres were studied in total. A conventional 5Fr pigtail catheter was used for manual cannulation via a 5Fr access sheath. The 6Fr/9Fr co-axial Magellan endovascular robotic system was used for robotic navigation operated from a remote workstation. The number of high intensity transient signals (HITS) detected by TCD during different stages of TEVAR was recorded.

Results: The median procedural embolization rate was 173 (interquartile range 97-240). There were significantly fewer HITS detected during robotic catheter placement with six in total (median 0, IQR 0-1), compared with 38 HITS (median 2, IQR 1-5) during manual catheter placement ($P = .018$). There were no HITS detected during robotic catheter removal by auto-retraction as per manufacturer instructions. On two occasions, however, when the robotic catheter system was removed manually without correcting for articulation, it resulted in one HIT in one case and 11 HITS in the second case.

Conclusions: Robotic catheter placement is feasible during TEVAR, and results in significantly less cerebral embolization compared with manual techniques. The active manoeuvrability, control, and stability of the robotic system is likely to reduce contact with an atheromatous aortic arch wall, and thereby reduce dislodgement of particulate matter and result in less embolization. The importance of adhering to manufacturer instructions during use and removal of the robotic catheter is also highlighted.

Not All Patients with Critical Limb Ischaemia Require Revascularisation

Santema TB, Stoekenbroek RM, van Loon J, Koelemay MJW, Ubbink DT. Eur J Vasc Endovasc Surg 2017;53:371-9.

Objectives: International guidelines recommend revascularisation as the preferred treatment for patients with critical limb ischaemia (CLI). Most contemporary research focuses on the outcome of invasive procedures for CLI, but little is known about the outcome of conservative management. Amputation free survival (AFS) and overall survival (OS) was investigated in patients with CLI who did or did not receive revascularisation, and characteristics associated with clinical outcomes were explored.

Methods: This was a retrospective cohort study of consecutive patients with chronic CLI between 2010 and 2014 in a Dutch university hospital. CLI was defined as the presence of ischaemic rest pain or tissue loss in conjunction with an absolute systolic ankle pressure < 50 mmHg or a toe pressure < 30 mmHg. Patients were divided into invasive (revascularisation within 6 weeks), deferred invasive (revascularisation after 6 weeks), or permanently conservative treatment groups. Univariable and multivariable survival analyses were used to identify factors associated with AFS and OS.