Bioresorbable vascular scaffolds in ACS: 12-month outcomes

Does gender matter in outcomes of elderly NSTEACS patients?

Risk score predicts 1-year mortality in elderly with NSTEACS

hs-cTnT assay detects myocardial injury in ACS

ACS ‘SNAPSHOT’ 2012 audit data

The role of DAPT in patients with ACS after CABG

Evolving therapies for myocardial ischaemia/reperfusion injury

Radial access preferred for women undergoing angiography?

Reperfusion times with radial vs femoral access for PCI

Assessing clinical decision values for cardiac troponin

Clinical, angiographic, functional, and imaging outcomes 12 months after implantation of drug-eluting bioresorbable vascular scaffolds in acute coronary syndromes

Authors: Gori T et al.

Summary: Scant long-term data are available for bioresorbable vascular scaffolds (BVS). This study describes 12-month outcomes in a cohort of 133 patients (mean age 62 years) who underwent coronary BVS (n=166) implantation for the treatment of thrombotic lesions in the setting of ACS (43% non–ST-segment elevation myocardial infarction [non–STEMI], 38% STEMI, 20% unstable angina). During a mean 374 days of follow-up, there were 4 deaths; 3 definite and 1 probable in-BVS thromboses (all in the first 6 months). At 12-month angiography (75 patients, 83 BVS), in-segment late lumen loss was a mean 0.19 mm, and 3 (4%) patients had developed binary restenosis. Optical coherence tomography (70 patients, 80 BVS) revealed a mean lumen area of 6.3 mm². Malaposition occurred in 21 (26%) BVS. Endothelium-dependent and -independent vasodilation occurred in 48% and 49% of the BVS, respectively.

Comment: Bioresorbable vascular scaffolds (BVS) represent a conceptually attractive technological advance in the treatment of thrombotic lesions in the setting of ACS. The absence of sudden death, patients increasingly live for decades after the first manifestation of symptoms. Among the ~2/3 of patients with ACS who undergo a PCI, for the last 20 years this has involved deployment of a metallic stent in >90% of cases. However, especially in patients aged >60 years, PCI may represent ‘surgery deferred’ for a significant proportion. In such circumstances, deployment of BVS(3) years before may avoid compromising a potential graft anastomosis site. This first experience of BVS deployment in ACS is tantalising for the many questions left unanswered, including BVS thrombosis rates and those occurring very late, which will only be addressed by a large randomised trial with late follow-up, which includes the latest metallic stent(s) in the control arm.


Abstract

Independent commentary by Professor John French, Director of Coronary Care and Cardiovascular Research at Liverpool Hospital, Sydney, and is a conjoint Professor at the University of New South Wales. After basic physician training he undertook a PhD at the University of Adelaide. Further cardiology training at Greenslane Hospital, Auckland, New Zealand, and a Wellcome Trust Postdoctoral Fellowship at University College London, UK. Prior to his current position Professor French was appointed to Greenslaine Hospital and the University of Auckland from 1993-2003. Professor French has been an investigator and co-investigator in numerous randomised controlled trials, and was on the steering committees of the SHOCK, DAT, HERO-2 and CRISP-AMI trials. Professor French has served on the clinical endpoints committees of several major trials, and is currently Co-Chair of the ACI Cardiac Network. Professor French is currently major research interests include the acute coronary syndromes especially ST elevation MI, and cardiac biomarkers especially high sensitivity troponins.
Sex-related outcomes in elderly patients presenting with non-ST-segment elevation acute coronary syndrome. Insights from the Italian Elderly ACS study

Authors: De Carlo M et al.

Summary: These researchers explored sex-related differences in treatment and outcomes in elderly patients with non-ST-segment elevation ACS (NSTEMACS), by pooling population data from 313 NSTEMACS patients aged ≥75 years participating in the Italian Elderly ACS study (in which patients were randomised to undergo either an early aggressive or an initially conservative strategy) with data from a registry of 332 patients who were excluded from the trial. In this analysis, 301 of the patients were women. The 1-year primary endpoint was a composite of death, non-fatal myocardial infarction (MI), disabling stroke, cardiac rehospitalisation and severe bleeding. Women were slightly older than men (mean 82.1 years vs 81.2 years; p=0.02), had lower haemoglobin levels (mean 12.5 g/dL vs 13.3 g/dL; p<0.001) and underwent fewer coronary revascularisations during the index admission (37.2% vs 45.0%; p=0.04). In-hospital adverse event rates were similar between men and women. The 1-year primary endpoint was less frequent in women (27.6% vs 38.7%; p<0.01). One-year mortality rates were 3-fold higher among women who were not revascularised compared with those who were, both in hospital (8.5% vs 2.7%; p=0.05) and at 1 year (21.6% vs 8.1%; p=0.002).

Comment: It has become increasingly accepted that ‘the elderly’, if defined as those ≥75 years of age, should generally undergo an early invasive strategy. However, the definition of elderly has shifted by ~a decade in the last 30 years, and many cardiologists now consider that debates about appropriateness of an invasive approach are largely reserved for those aged >80 years. Reassuringly, there were good outcomes in women aged >75 years, without the cost of increased bleeding. However, the median age of the elderly women was 82 years; this commentator would have appreciated specific outcome data on the >80-year-olds.


A risk score for predicting 1-year mortality in patients ≥75 years of age presenting with non-ST-elevation acute coronary syndrome

Authors: Angeli F et al.

Summary: This article describes the development and validation of a simple risk prediction score for 1-year mortality in patients aged ≥75 years with NSTEMACS. The derivation cohort comprised 313 NSTEMACS patients aged ≥75 years from the Italian Elderly ACS trial; the validation cohort included 332 patients with NSTEMACS meeting the same inclusion criteria as for the Italian Elderly ACS trial but excluded from the trial for any reason. The researchers developed a logistic regression model to predict 1-year mortality. The risk score included 5 statistically significant covariates: previous vascular event, haemoglobin level, estimated glomerular filtration rate, ischemic electrocardiographic changes, and elevated troponin level. The model allowed a maximum score of 6. The score demonstrated a good discriminating power (C statistic, 0.739) and calibration, even among subgroups defined by gender and age. The model allowed a maximum score of 6. The score demonstrated a good discriminating power (C statistic, 0.739) and calibration, even among subgroups defined by gender and age. The scoring system confirmed a strong association with risk for all-cause death when validated in the registry cohort. Moreover, patients who were most likely to benefit from an invasive approach were identified by a score of ≥3 (the highest baseline risk group).

Comment: As the authors comment, those aged ≥75 years represent ~1/3 of ACS admissions. Other studies have shown that clinicians do not appear to utilise risk scores in decisions regarding an early invasive approach in ACS patients. This risk score outlines a rationale for recommending an invasive approach in elderly ACS patients. Whether this elderly risk score gains currency in guiding such decisions rather than ‘the end of the bed test’ may depend on whether it is adopted by various ACS guidelines committees.

Reference: Am J Cardiol. 2015;116(2):208-13
Implications of introducing high-sensitivity cardiac troponin T into clinical practice. Data from the SWEDEHEART registry

Authors: Melki D et al.

Summary: This study analysed data from 48,594 patients with suspected ACS admitted to Swedish hospitals using a high-sensitivity cardiac troponin T (hs-cTnT) assay. All patients were enrolled in the nationwide SWEDEHEART registry. Patients were divided into 4 groups based on maximal hs-cTnT level: Group 1 comprised 5,790 patients with hs-cTnT <5 ng/L; Group 2, 6,401 patients with hs-cTnT 6–13 ng/L; Group 3, 10,476 patients with hs-cTnT 14–49 ng/L (i.e. a group in which most patients would have had a negative cardiac troponin T with older assays); and Group 4, 25,837 patients with hs-cTnT ≥50 ng/L. In Groups 1, 2, 3 and 4, the proportions of patients with MI were 2.2%, 2.6%, 18.2% and 81.2%, respectively. During follow-up, the likelihood of significant coronary stenoses, left ventricular systolic dysfunction, and death increased in a stepwise fashion from Group 1 through Group 4. When the study cohort was divided into 20 groups according to hs-cTnT level, adjusted mortality started to increase at an hs-cTnT level of 14 ng/L (HR 1.94; 95% CI, 1.47 to 2.56) and rose continuously above that threshold.

Comment: The foresight and drive of our Swedish colleagues, who introduced prospective data collection of ACS patients nationally ~1.5 decades ago, is to be admired. The paper on the clinical introduction of hs-cTnT by Melki et al. is another high-quality initiative from this registry. Described are trends of the maximum Hs-cTnT level measured (a limitation) among 48,594 patients admitted with a suspected ACS. Somewhat similar to the much smaller recent Australia and New Zealand experience, ~50% of these patients had an MI as a diagnosis. Interestingly, among those with a Hs-cTnT level ≤14 ng/L, the upper reference limit, only 18% of 10,476 patients (~21% of the cohort) with levels 14–49 ng/L had an MI diagnosis, suggesting that such patients need careful evaluation in emergency departments for optimal disposition to in-patient teams. Also of note, at all levels of elevations in Hs-cTnT, those with non-cardiac diagnoses had higher mortality than those with ACS; those with non-ACS cardiac diagnoses tended to have an intermediate prognosis.

Reference: J Am Coll Cardiol. 2015 Apr 28;65(16):1655-64

Abstract

Comparison of the management and in-hospital outcomes of acute coronary syndrome patients in Australia and New Zealand: results from the binational SNAPSHOT acute coronary syndrome 2012 audit

Authors: Ellis C et al.*

Summary: Data from the Australian and New Zealand ACS ‘SNAPSHOT’ audit were used for this analysis of patient management and outcomes of 3381 Australian and 1006 New Zealand patients admitted with a suspected or confirmed ACS between 00.00 h on 14 May 2012 and 24.00 h on 27 May 2012. Australian patients were slightly younger (67 vs 69 years; p = 0.0044). Of the 2356 patients with confirmed ACS, Australian patients had a lower cardiovascular risk with a lower median Global Registry Acute Coronary Events (GRACE) score (147 vs 154; p = 0.0008), but were as likely to receive an invasive coronary angiogram (59% vs 54%; p = 0.082), or revascularisation with PCI (52% vs 31%; p = 0.09) or coronary artery bypass graft surgery (70% vs 5.6%; p = 0.33). Of the 1957 non-STEMI/unstable angina pectoris patients, Australian patients had a shorter time to angiography (46 h vs 67 h; p < 0.0001). However, at discharge, Australian non-STEMI unstable angina pectoris survivors were less likely to receive aspirin (84% vs 89%; p = 0.0079), a second antplatelet agent (57% vs 63%; p = 0.050), or a beta-blocker (67% vs 77%; p = 0.0002). In-hospital mortality rates did not differ (2.7% in Australia vs 3.2% in New Zealand; p = 0.05).

Comment: This report from the Australia and New Zealand ACS-SNAPSHOT showed some interesting differences in the care of patients admitted with a suspected ACS in 2012. Compared to their Australian counterparts, New Zealand patients were older, had higher GRACE risk scores and received more evidence-based secondary prevention therapies. However, they did not have more coronary angiograms as their higher risk profile should confer, and these angiograms occurred almost a day later. The reasons for (some of) these differences are not well characterised, but may reflect slightly different Trans-tasman admission criteria among this predominantly NSTEACS cohort, as ~40% were “troponin–ve” — that is, they had the syndrome of unstable angina pectoris, which exhibits clinical heterogeneity.

* John French is a co-author.


Abstract

Dual antplatelet therapy after coronary artery bypass grafting in the setting of acute coronary syndrome

Authors: Bomb R et al.

Summary: Data are conflicting on the use of dual antplatelet therapy (DAPT) in patients with ACS who undergo coronary artery bypass grafting (CABG). Recommendations are unclear in national guidelines, which propose single antplatelet therapy with aspirin or DAPT with the combination of aspirin and clopidogrel. These researchers conducted a comprehensive literature search and identified 12 clinical trials with efficacy outcomes. Most of these studies are retrospective, non-randomised single-centre trials. Only 1 prospective, multicentre, randomised trial has been published at the time of this report. This review concludes that clear consensus is lacking regarding the use of DAPT in patients after CABG.

Comment: DAPT is guideline-recommended for all patients with ACS irrespective of whether they undergo PCI, CABG, or do not undergo a revascularisation procedure, based on trial evidence of improved outcomes. Furthermore, recent evidence from the DAPT trial suggests a benefit of DAPT in MI prevention in non-culprit arteries. However, the application of DAPT to patients following CABG is variable, as described in this paper, and these authors recommend a large clinical trial to address this issue, which is logical where equipoise exists among clinicians. In the interim, existing principles of applying clinical trial results to the overall study population would suggest DAPT should be restarted post-CABG when the surgeon considers the bleeding risk acceptable, except perhaps in those at very high bleeding risk including those requiring oral anticoagulation.

Reference: Am J Cardiol. 2015;116(1):148-54

Abstract

Evolving therapies for myocardial ischaemia/reperfusion injury

Authors: Ibáñez B et al.

Summary: The undisputed success of reperfusion therapies in STEMI has resulted in a shift from efforts aimed at reducing mortality (already low) to tackling the downstream consequences of survival: post-infarction heart failure. This paper discusses therapies (past, present and evolving) designed to reduce ischaemia/reperfusion injury.

Comment: While mortality rates from STEMI have reduced significantly in the last 3–4 decades, mainly due to successes of various reperfusion strategies, as the authors of this review comment, "the times have come to focus efforts on therapies to reduce reperfusion injury". The aim of this approach is reducing heart failure rates post-STEMI, which in turn will reduce further very late mortality rates. While current adjunctive pharmacological strategies have reduced rates of microvascular obstruction and slow-flow/no-flow, these are still significant limitations to the success of myocardial reperfusion. Some treatments remain experimental and trial design will need to answer mechanistic questions often using cardiac magnetic resonance imaging parameters associated with infant size, as surrogate endpoint(s).

Reference: J Am Coll Cardiol. 2015;65(14):1454-71

Abstract

Radial versus femoral access for coronary angiography/ intervention in women with acute coronary syndromes. Insights from the RIVAL trial (Radial Vs femorAL access for coronary intervention)

Authors: Pandie S et al.

Summary: This subgroup analysis of the RIVAL (Radial Vs femorAL access for coronary intervention) trial compared outcomes among 1861 women and 5160 men randomised to radial versus femoral access. There were no gender-related differences according to access site for the primary composite endpoint of death, MI, stroke, and non-CABG bleeding (women: 3.9% vs 5.0%; HR 0.77; 95% CI, 0.50 to 1.19; men: 3.54% vs 3.5% HR 1.00; CI 0.75 to 1.34; interaction p = 0.325). Overall, major vascular complications occurred more often in women than in men (4.7% vs 1.7%; p < 0.0001). In multivariable analyses, female sex was an independent predictor of major vascular complications (HR 2.39; 95% CI, 1.76 to 3.25; p < 0.0001). Major vascular complications were significantly reduced with radial access in women (3.1% vs 6.1%; HR 0.50; 95% CI 0.32 to 0.78; p = 0.002) and in men (0.7% vs 2.6%; HR 0.27; 95% CI, 0.17 to 0.45; p < 0.0001; interaction p = 0.092). Crossover to femoral access occurred 2.1% of radial was higher than in the other direction in women (11.1% vs 1.9%; HR 5.86; p < 0.0001) and also in men (6.3% vs 1.9%; HR 3.32; p < 0.0001; interaction p = 0.054). High PCI success rates were seen in women and men irrespective of access site (women: HR 1.05; p = 0.471; men: HR 1.00; p = 0.888; interaction p = 0.674), with no differences in PCI complications.

Comment: This prospectively defined substudy of the RIVAL trial examined outcomes following radial, compared to femoral arterial access, in female patients with ACS undergoing angiography/ intervention. It is not surprising that the rate of crossover from a radial to a femoral approach was ~11% among women, approximately twice the rate of switching from radial arterial access to that in men. It is of note that even using radial access, women still had 4-fold higher rates of vascular complications, although reassuringly, this did not translate into a higher rate of major cardiovascular events.


Abstract
Reperfusion times for radial versus femoral access in patients with ST-elevation myocardial infarction undergoing primary percutaneous coronary intervention: observations from the Cardiac Care Network Provincial Primary PCI Registry

Authors: Cantor WJ et al.

Summary: These researchers obtained records from a database that prospectively collected clinical and procedural characteristics for all urgent PCI procedures performed between June 2010 and September 2011 in Ontario for STEMI, including time of arrival in the catheterisation laboratory and time of first balloon inflation. The analysis included 2947 patients. Predictors of radial access included younger age and male sex. After propensity score matching, the median time from arrival in the cardiac catheterisation laboratory to first balloon was 27 minutes (25%–75%, 21–34) for the femoral group and 30 minutes (25%–75%, 24–39) for the radial group (p<0.001). When hospitals were stratified based on the proportion of primary PCI cases that were performed using radial access, treatment times did not differ between radial and femoral access in those hospitals that used radial access most frequently. There were no significant differences in mortality or 30-day MI rates.

Comment: This 2010–11 report from the Ontario provincial registry of PCI found that the delay in (cath lab) door-to-balloon among patients undergoing primary PCI (excluding prior CABG or cardiogenic shock) averaged 3 mins when the radial arterial access route was used compared to the femoral route. The delay was longer in inexperienced radial sites and there was no delay in predominantly radial sites. There were no mortality differences. There were experienced operators averaging ~250 cases per year, so the findings may not be translatable to many Australian sites, which have a lower case volume per operator.

Abstract

Reperfusion times for radial versus femoral access in patients with ST-elevation myocardial infarction undergoing primary percutaneous coronary intervention: observations from the Cardiac Care Network Provincial Primary PCI Registry

Authors: Wildi K et al.

Summary: This study investigated currently approved clinical decision values (CDVs) for cardiac troponin used in the diagnosis of acute MI (AMI). Clinically available hs-cTn assays (hs-cTnI, Abbott; hs-cTnT, Roche) were used in 2300 patients with suspected AMI. AMI was the adjudicated diagnosis in 473 patients (21%), 86 (18.2%) of whom had inconsistent diagnoses when the approved uniform CDV was used. When sex-specific CDVs were used, 14.1% of female and 22.7% of male AMI patients had inconsistent diagnoses. Biologically equivalent CDVs reduced inconsistencies to 10% (p<0.001). These findings were confirmed with parallel measurements of other hs-cTn assays. Inconsistencies were reduced to 7.0% when assays were used with CDVs that were nearly biologically equivalent. Patients with inconsistent AMI diagnosis were more likely to have events in the first year after MI compared with consistent diagnoses. CDVs have been defined for each assay at the 99th centile of normal. As this interesting study describes, these have different CDVs for biologically equivalent levels of myocardite injury. Indeed, for the highly sensitive cTnI (Abbott) there was an 18% difference (lower) in AMI diagnosis (blindly adjudicated) when compared to the hs-TnT assay (Roche). However, this difference was largely obliterated when using a CDV for cTnI derived from the biologically equivalent hs-TnT level. It would be helpful if the next iteration of the universal definition of MI includes this concept to clarify diagnostic thresholds for MI for clinicians.

Abstract

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