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Pulmonary Hypertension Following Mitral Valve Replacement: Insights From the National Echocardiography Database of Australia

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Background: The prevalence and prognostic implications of pulmonary hypertension (PH) after mitral valve replacement (MVR) are poorly understood.

Aims: We utilised the National Echocardiography Database of Australia (NEDA) to identify patients having undergone prior MVR and documented the prevalence of PH and subsequent mortality data.

Methods: The study cohort consisted of adults >18 years with at least one echocardiogram performed after MVR. Patients were considered to have PH if echocardiographically-derived systolic pulmonary artery pressure (sPAP) was >40mmHg. Linked mortality data was provided by the Australian National Death Index, with census performed on 21 May 2019.

Results: Data from 10,994 patients were identified between 23 July 1985 and the census date (mean age 65.2±16 years; male 55%) representing 46,717 patient-years follow up. The prevalence of PH (sPAP >40mmHg) post MVR was 64.1% (7,042/10,994 individuals). Of those with PH, 4,506/7,042 (64.0%) had severe PH (sPAP >60mmHg). A total of 3,952/10,994 (35.95%) individuals died during follow up. Mortality was significantly greater in those with PH compared to those with sPAP <40mmHg [41.1% (2,894/7,042) vs 26.29% (1,039/3,952), p-value <0.001]. Cox proportional hazards model with correction for age and sex demonstrated a hazard ratio for PH of 1.60 (95% CI 1.49-1.71). Mortality was greater in those with higher degrees of PH with mild PH also conferring an adverse prognosis.

Conclusions: In a large cohort of patients undergoing MVR, PH is prevalent with significant morbidity noted. Further studies are required to determine modifiable factors that may limit mortality complicating PH after MVR.

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Recurrent VF, An Unusual Presentation of Vasospastic Angina

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Case: A rural 62-year-old male patient survived an out of hospital cardiac arrest with a long down time (approximately 40 minutes).

The patient was a mechanic, heavy smoker and reported recurrent chest pain which had been investigated prior to the arrest. He no significant past medical or family history and denied use of illicit drugs. He made a complete neurological recovery.

No reversible cause was found for the arrest was identified. Coronary angiogram revealed only minor disease and echocardiogram and cardiac MRI demonstrated normal systolic function. He received an implantable cardiac defibrillator (ICD) and was discharged with home monitoring on guideline directed medical therapy.

Nine months later, the ICD remote monitoring alerted an episode of VF treated with a single shock and the patient was referred to hospital. Repeated angiogram revealed significant coronary artery obstructions in the LAD and RCA. The night following the angiogram he developed chest pain and the ECG revealed inferior STEMI. The pain was managed with high dose nitrates and the ECG normalised. CT coronary angiogram performed the following day on GTN infusion confirmed only minor disease. The patient was managed for severe coronary artery spasm with optimisation of his medical therapy. Three months post discharge the patient was alive and pain free.

Discussion: This case highlights the difficulties in diagnosing coronary artery spasm and managing patients in remote areas. It also highlights how two disease processes often co-exist. The use of remote monitoring for ICDs is advantageous, especially in areas with reduce access to specialist care.

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Reduced Presentations and Increased Ischaemic Times for Patients With Acute Coronary Syndromes During the COVID-19 Pandemic

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Background: The COVID-19 pandemic has led to unprecedented stress on health care systems affecting acute coronary syndrome (ACS) treatment at every step. This study examined the impact of the COVID-19 on patients presenting with ACS during the first and second pandemic waves in Melbourne, Victoria.

Method: A retrospective cohort study of adults presenting with ACS during the first pandemic wave from 01 March



2020 to 31 April 2020 and the second pandemic wave from 01 June 2020 to 31 August 2020 was compared to a control period from 01 March 2019 to 31 April 2019 at a single centre in Melbourne, Victoria, servicing a catchment area with a high incidence of COVID-19 cases.

Results: 335 patients were hospitalised for ACS across all three time periods. A reduction in total number of patients presenting with ACS occurred during the pandemic, with a higher proportion of ST elevation myocardial infarctions. Ischaemic times increased with time from symptom onset to first medical contact rising from 191 minutes in the control period rising to 292 minutes in the first wave ($p=0.06$) and 271 minutes in the second wave ($p=0.06$). Coronary angiography with subsequent revascularisation significantly increased from 55% in the control period undergoing revascularisation to 69% in the first wave ($p<0.001$) and 74% in the second wave ($p<0.001$).

Conclusions: A clinically significant and concerning reduction in ACS presentations occurred during the COVID-19 pandemic, associated with longer ischaemic times. It is crucial public awareness campaigns are instituted to address the contributing patient factors.

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Re-Thrombolysis of a Reoccluded STEMI in a Remote Patient



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Case Introduction: A 52-year-old country patient with anterior STEMI presented within 15 minutes of the onset of symptoms to a local hospital. He was thrombolysed at 3pm with good resolution of his pain and ECG. He was started on appropriate post thrombolysis management including a heparin infusion. Four hours later, just prior to boarding an hour-long flight to Perth, he had reoccurrence of his chest pain and elevated anterior ST segments. The national guidelines do not provide guidance on the management of such patients [1].

Discussion: In geographically large and developed countries such as Australia and Canada, thrombolysis is still a noteworthy management option for STEMI patients. If primary PCI is delayed more than 90 minutes, thrombolysis is preferred [1,2]. A 2001 retrospective study of the patients in GUSTO I and ASSCENT 2 databases showed that reinfarction can occur in 4% of patients with successful thrombolysis initially. Re-thrombolysis and interventional revascularisation had better 30-day mortality outcomes compared to those managed conservatively. Moreover, patient with re-thrombolysis which formed 20-30% of the re-infarcted population had comparable outcomes to those interventional revascularised. This suggests that re-thrombolysis can be safe in appropriate patients [3].

Case Conclusion: After discussion of the risks and benefits, the patient was consented for repeat thrombolysis with good effect. An early coronary angiography, the following morning, confirmed a severe proximal LAD stenosis. An echocardiogram showed preserved left ventricular function

with only mild antero-apical hypokinesis. A minor addition to current guidelines is recommended to allow treating physicians to expect and plan for re-occlusion.

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Retinal Microvascular Endothelial Function is Impaired in Subjects With Chronic Kidney Disease



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Background: Endothelial dysfunction is a sentinel precursor to atherosclerosis and is implicated in the common coexistence between cardiovascular disease (CVD) and chronic kidney disease (CKD). We examined whether retinal microvascular endothelial dysfunction is present in subjects with CKD and further predictive of long-term CKD progression.

Methods: In a single centre prospective observational study, 253 subjects with coronary artery disease and CVD risk factors underwent dynamic retinal vessel analysis. Microvascular dysfunction was quantified by measuring retinal arteriolar and venular dilatation in response to flicker light stimulation. Serial assessment of renal function was performed over a median period of 9.4 years.

Results: Flicker light-induced retinal arteriolar dilatation (FI-RAD) was impaired in subjects with baseline eGFR <90 mL/min/1.73 m², compared to those with normal renal function (eGFR ≥ 90 mL/min/1.73 m²) (1.0% [0.4-2.1] vs. 2.0% [0.8-3.6]; $p < 0.01$). In patients with normal renal function, a gradient was observed, where subjects with the lowest FI-RAD responses exhibited the greatest annual decline in eGFR. In uni- and multivariable analysis (baseline eGFR ≥ 90 mL/min/1.73 m²), a 1% decrease in FI-RAD was associated with a more rapid decline in eGFR of 2.0 (0.8, 3.5; $p=0.03$) and 0.07 mL/min/1.73 m² per year (0.00, 0.14; $p=0.06$), respectively. FI-RAD was not predictive of CKD progression in subjects with baseline eGFR <90 mL/min/1.73 m².

Conclusions: Endothelial dysfunction is an early pathological process in the course of CKD. Dynamic retinal vessel