

CARDIO ROUNDS NEWSLETTER

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IN THIS ISSUE

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “Cardio rounds” which contains latest and interesting news in the field of Cardiology

- Assessment of in-patients with cardiogenic shock secondary to unprotected Left main coronary artery-related myocardial infarction
- Prognostic Implications of LASEC with the catheter ablation of AF patients with LA dilation: A Prospective Study
- Investigation of elevated cardiac troponin I level prior to non-cardiac surgery as a predictor of postoperative Cardiac events in patients with ESRD undergoing dialysis
- Acute coronary syndrome during Infective Endocarditis: A Case Report

Assessment of in-patients with cardiogenic shock secondary to unprotected Left main coronary artery-related myocardial infarction

Cardiogenic shock is characterized as a condition of severe hypoperfusion due to cardiac dysfunction. In recent years, admissions and incidence of Cardiogenic shock has increased. Cardiogenic shock due to acute coronary syndromes (ACS) is observed in 5–10% of the patients and despite the advancement in the use of revascularization and other therapies, the in-hospital mortality of Cardiogenic shock remains remarkably high. Revascularization in the acute phase of ACS-related CS is practically the only therapeutic measure that has shown a prognostic impact.¹ However according to studies, systemic inflammatory response, complement activation, release of inflammatory cytokines, expression of inducible nitric oxide synthase, and inappropriate vasodilation plays important role in the formation of shock and also determine the outcome after shock.² Immediate coronary angiographies with the intention of revascularization is strongly recommended in this setting.¹

Roman FG et al aimed to study cardiogenic shock in patients with secondary to unprotected left main coronary artery-related myocardial infarction. This observational study enrolled 70 patients from two tertiary care centres. Primary outcome of this study was death or requirement for heart transplantation or left ventricular assist devices (LVAD) during the admission (Fig1). Of the total enrolled patients, in 75.7%, percutaneous coronary intervention (PCI) was successful. In 58.6% of patients, combined endpoint of death or requirement of hospitalization or left ventricular assist devices was observed. Among patients with profound shock and occluded left main coronary artery, the incidence of the primary endpoint was highest. Predictive model such as left ventricular ejection fraction, unprotected left main coronary artery-related myocardial infarction, thrombolysis in Myocardial Infarction flow, and severity of shock highlighted an optimal ability for predicting death or necessity for hospitalization or left ventricular assist devices during the admission.

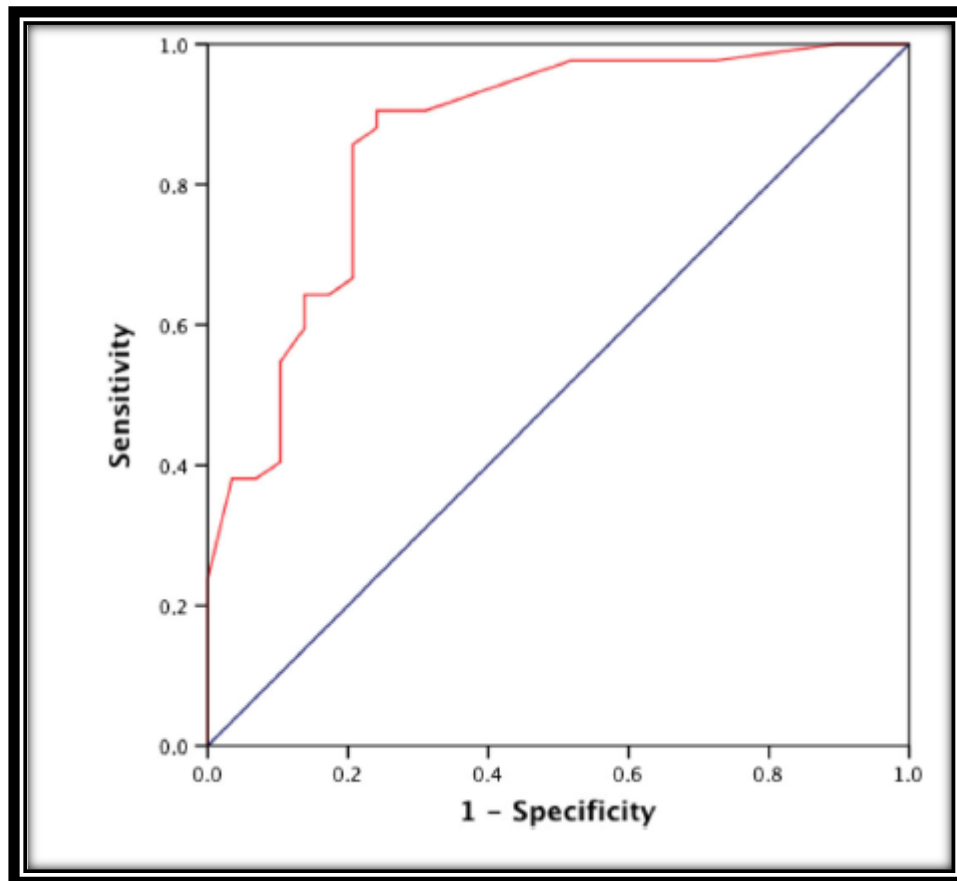


Figure 1: Receiver operating characteristic (ROC) curve for the prediction of mortality or requirement of heart transplantation (HT) or left ventricular assist devices (LVAD) during the admission

This study concluded that unprotected left main coronary artery-related myocardial infarction was associated with increase rate of in-hospital mortality or need for hospitalization or left ventricular assist devices. Prognosis was found to be poor in those patients with profound shock and baseline occluded left main coronary artery-related myocardial infarction, with very less probability of recovery despite successful PCI.

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Prognostic Implications of LASEC with the catheter ablation of AF patients with LA dilation: A Prospective Study

In patients with left atrial (LA) dilation, left atrial spontaneous echo contrast (LASEC) can be detected by transesophageal echocardiography (TEE) prior to the catheter ablation of atrial fibrillation (AF). In atrial fibrillation patients after the procedure, left atrial dilation is a well-established risk factor for predicting outcomes. Increase in the size of left atrial leads to a higher recurrence rate of atrial fibrillation treated with ablation. However, not all atrial fibrillation patients with LA dilation develops left atrial spontaneous echo contrast during transesophageal echocardiography.¹ However, another study by Gedikli et al. highlighted that the presence of dense LA SEC did not show any correlation with periprocedural thromboembolic events in patients with atrial fibrillation undergoing catheter ablation with uninterrupted anticoagulation. But, a significant association was observed with late stroke/transient ischemic attack (TIA).² Therefore, Lin C et al aimed to investigate if the left atrial spontaneous echo contrast may be of prognostic value in patients with atrial fibrillation with Left Atrial dilation.

This prospective study enrolled 123 patients with Atrial fibrillation scheduled to undergo catheter ablation. Enrolled patients were then divided into two groups: LASEC group (73 patients) and no LASEC group (50 patients). In both groups, baseline patient characteristics were found to be similar. Before performing the procedure, enrolled patients underwent transesophageal echocardiography. Primary endpoint of this study was atrial fibrillation or atrial tachycardia recurrence-free survival after 3-month of catheter ablation. patients were followed up for 18 months. Transesophageal echocardiography was conducted to exclude left atrial thrombus before catheter ablation for atrial fibrillation and was performed under local anaesthesia, with continuous monitoring of blood pressure and oximetry (Fig 2)

At the end of 18 months of follow-up, atrial fibrillation or atrial tachycardia recurrence-free survival was achieved in 33 patients in the left atrial spontaneous echo contrast group and in 34 patients in the no LASEC groups, respectively. Survival analysis revealed that the LASEC group was associated with a poor outcome of catheter ablation. During the follow-up atrial fibrillation or atrial tachycardia recurrence was observed in 30 patients in the mild SEC group and in 15 patients in severe SEC groups. In the left atrial spontaneous echo contrast group, 2 patients had Ischemic stroke



Figure 2: Representative echocardiogram of LASEC. (A) No LASEC was detected by TEE. (B) LASEC (arrow) was revealed by TEE. V stands for left side, numbers 0 and 44 stand for imaging

This study concluded that in atrial fibrillation patients with left atrial dilation, left atrial spontaneous echo contrast (LASEC) could be a predictor of the recurrence of atrial fibrillation or atrial tachycardia after catheter ablation. This study also highlighted that the higher the degree of left atrial spontaneous echo contrast, the worse the prognosis is.

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Investigation of elevated cardiac troponin I level prior to non-cardiac surgery as a predictor of postoperative cardiac events in patients with ESRD undergoing dialysis

Compared to patient without CKD, Patients with chronic kidney disease (CKD) have a higher risk of cardiovascular (CV) disease as CKD increases the risk of arteriosclerosis progression. On the other hand, most patients with CKD have comorbidities like hypertension and diabetes mellitus which increases the chances of CV disease. Elevated level of serum cardiac troponin I (cTnI) have been used while diagnosing myocardial infarction and predicting the risk of cardiac events.¹ Cardiac troponin I also known as a contractile protein is located within myocyte is a diagnostic test of stress on the heart which is closely related to perioperative mortality. Newer generation cardiac troponin test with high sensitivity decreases the number of potentially missed coronary artery disease patients and increases prognosis in those disease that do not originate in the coronary arteries including congestive heart failure, pulmonary embolism and chronic kidney disease.² According to studies, serum cTnI levels also increases during myocardial wall distension due to volume and pressure overload. Therefore, when cardiac troponin I levels gets increased in CKD patients, especially undergoing dialysis, it becomes difficult to interpret whether this is due to MI or CKD.¹

Park BE et al aimed to investigate if elevated cardiac troponin I (cTnI) serum levels before non-cardiac surgery were predictors of postoperative cardiac events in patients with end stage renal disease undergoing dialysis. To conduct this study, 703 patients with end stage renal disease undergoing dialysis who underwent non-cardiac surgery were included. cTnI serum levels were measured prior to the procedure in all patients. Composite of cardiac death, myocardial infarction (MI), and pulmonary oedema during hospitalization or within 30 days after surgery in patients with a hospitalization longer than 30 days after surgery were the primary endpoint.

Result of this study showed that Postoperative cardiac events occurred in 6.8% patients. Diabetes mellitus, previous ischemic heart disease, and congestive heart failure were more common in patients with postoperative cardiac events. Higher Peak cTnI serum levels were seen in patients with postoperative cardiac event. Even in patients with postoperative cardiac events, elevated peak cTnI levels > 45 ng/L were commonly observed. According to Multivariate logistic regression analysis, Diabetes mellitus and serum peak cTnI levels ≥ 45 ng/L were independent predictors for the primary outcome of cardiac death, MI and pulmonary oedema. Also, cTnI levels ≥ 45 ng/L showed increased prognosis to the revised cardiac risk index and to the combined revised cardiac risk index and left ventricular ejection fraction

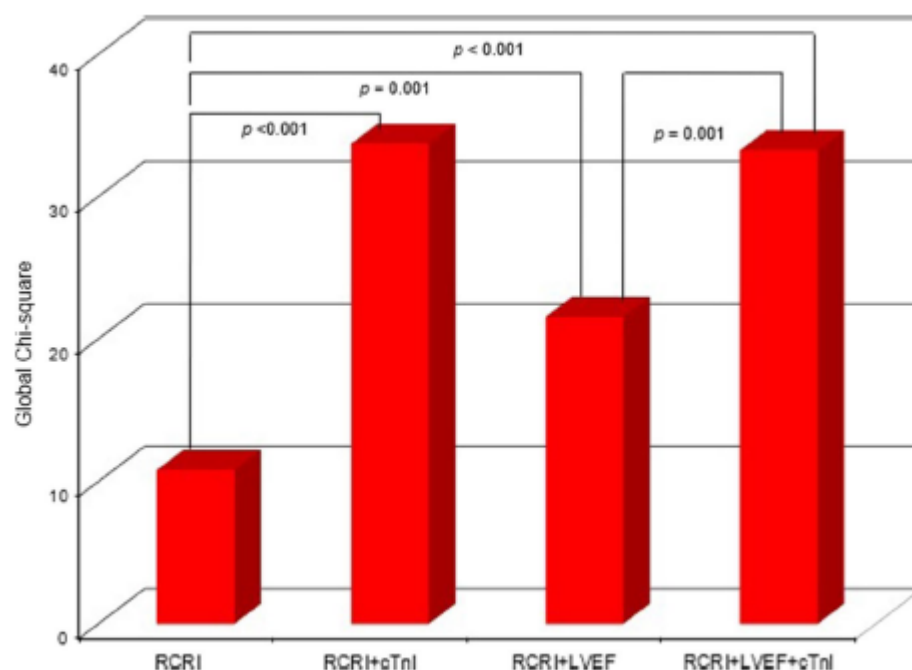


Figure 3: Incremental prognostic value of sequential RCRI, cTnI, and LVEF. Global Chi-square on the Y axis indicates the incremental prognostic value of sequential RCRI, cTnI, and LVEF. RCRI revised cardiac risk index; cTnI cardiac troponin I; LVEF left ventricular ejection fraction

This study concluded that increased level of preoperative cTnI are predictors of postoperative cardiac events, including cardiac death, MI, and pulmonary oedema in patients with end stage renal disease undergoing non-cardiac surgery. Thus, measurement of cTnI from relatively easy blood tests may be helpful for the clinicians to assess the postoperative cardiac risks events in patients with end stage renal disease

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Acute coronary syndrome during Infective Endocarditis: A Case Report

In patients with endocarditis, Acute Coronary Syndrome is an uncommon complication associated with high mortality.¹ Infective endocarditis is also defined as a disease of high mortality and morbidity, despite the advancement in diagnosis and surgical treatment.²

Endocarditis, requires quick and appropriate treatment strategies to cure the patient. Management of infective endocarditis with ACS requires an endocarditis team, including the specialties of interventional and non-interventional cardiology, cardiothoracic surgery, and infectious diseases. Boulouiz, S et al presented a case of patient with coronary syndrome in the setting of infective endocarditis of the aortic valve.

A 52-year-old patient was admitted to the emergency department with the chief complaint of acute chest pain of infractoid appearance, established 5 hours' prior admission. Patient was an active smoker. No signs of cardiac insufficiency, cardiopulmonary auscultation was noted but the presence of an inflammatory placard in front of the right wrist joint, with redness and limitation of active and passive mobility were observed. ECG revealed an atrial fibrillation rhythm with a heart rate of 154 bpm (fig 4), with a diffuse ST-segment undershift and an ST-segment over shift in the anterior territory. Diagnosis of an acute coronary syndrome without ST-segment elevation at very high ischemic risk was made. Coronary angiography found an angiographically normal coronary network. Elevated CRP of 456mg/l, hyperleukocytosis of 22376 elements/mm³ with PNN predominance, severe renal insufficiency with a creatinine of 24mg/l and a clearance of 24ml/min was recorded. Transthoracic echocardiography revealed normal segmental and global right and left ventricular function with an Ejection fraction estimated at 57% in SBP, with a tri-commissural aortic valve with two vegetations appended respectively to the left coronary and noncoronary cusps.

Three hemocultures at 1h of interval showed negative, Rheumatoid factor was positive, the fractions of the complement C3 and C4 are normal. Injected Cerebro-thoraco-abdomino-pelvic scanner revealed an aspect of splenic infarction with an articular effusion of the right glenohumeral joint associated with a thickening and enhancement of the synovial membrane making evoke in first a septic arthritis. Brain MRI revealed signalling abnormalities of the left basifrontal subcortical white matter in favor of microfocuses of vascular accidents that may be related to septic microemboli. Vegetation on the aortic valve, fever, embolic syndrome and inflammatory phenomena, suspected the diagnosis of infective endocarditis (according to the modified Duke criteria :1 major and 3 minor criteria). Immediately, patient was put on on amoxicillin and Gentamycin and given the size of the vegetation and the embolic complications, and was referred to surgery. On 4th day patient underwent an aortic valve replacement with a mechanical SJM valve and a vegetectomy, with simple postoperative follow-up and rapid withdrawal of vasopressors. Later the patient was put on Vancomycin, acenocoumarol 2mg/d, ceftriaxone 2g/d for 6 weeks as the culture of the vegetations came back inconclusive. On day 26, patient was discharged with a negativation of the infectious balance sheet

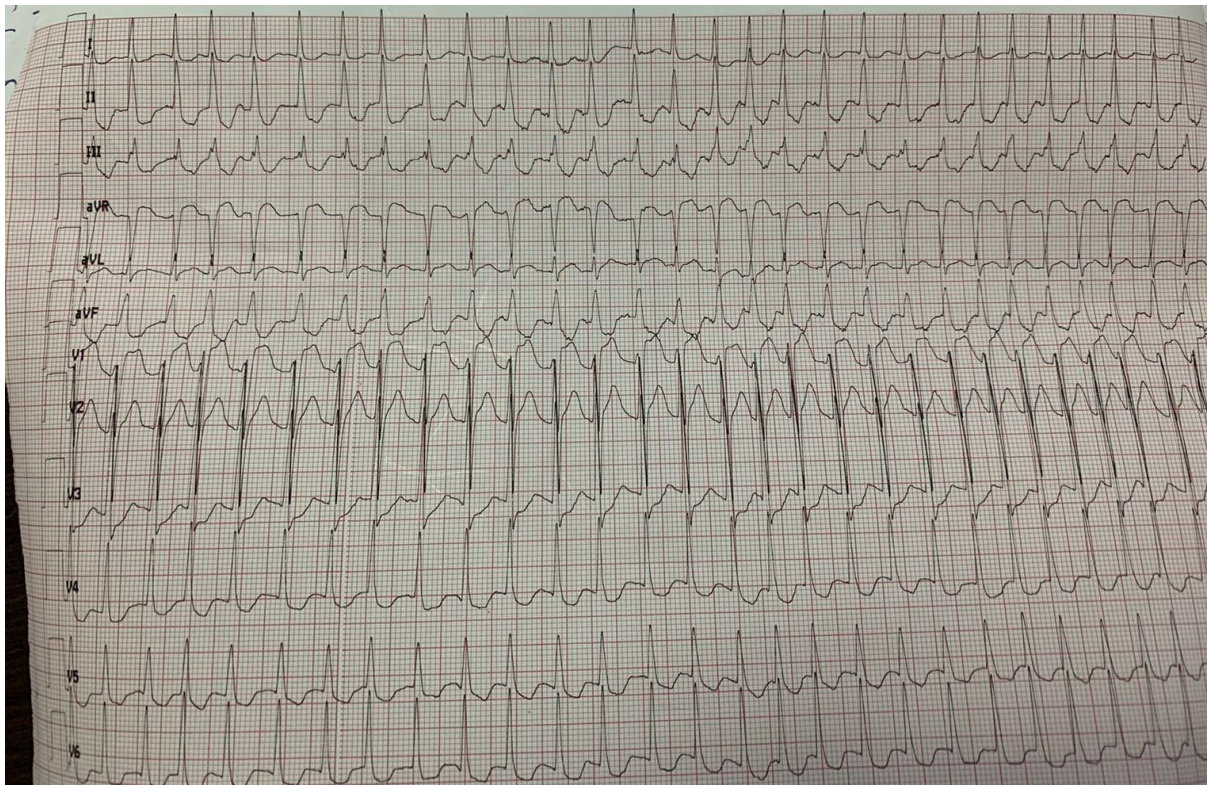


Figure 4:ECG showed an atrial fibrillation rhythm

This study concluded that a thorough clinical examination and additional tests must be done to confirm Infective endocarditis in any patient without usual cardiovascular risk factors presented with an ACS accompanied by fever and elevated inflammatory markers.

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