CARDIOLOGY UPDATES NEWSLETTER

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IN THIS ISSUE

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you "Cardiology updates" which contains latest and interesting news in the field of Cardiology

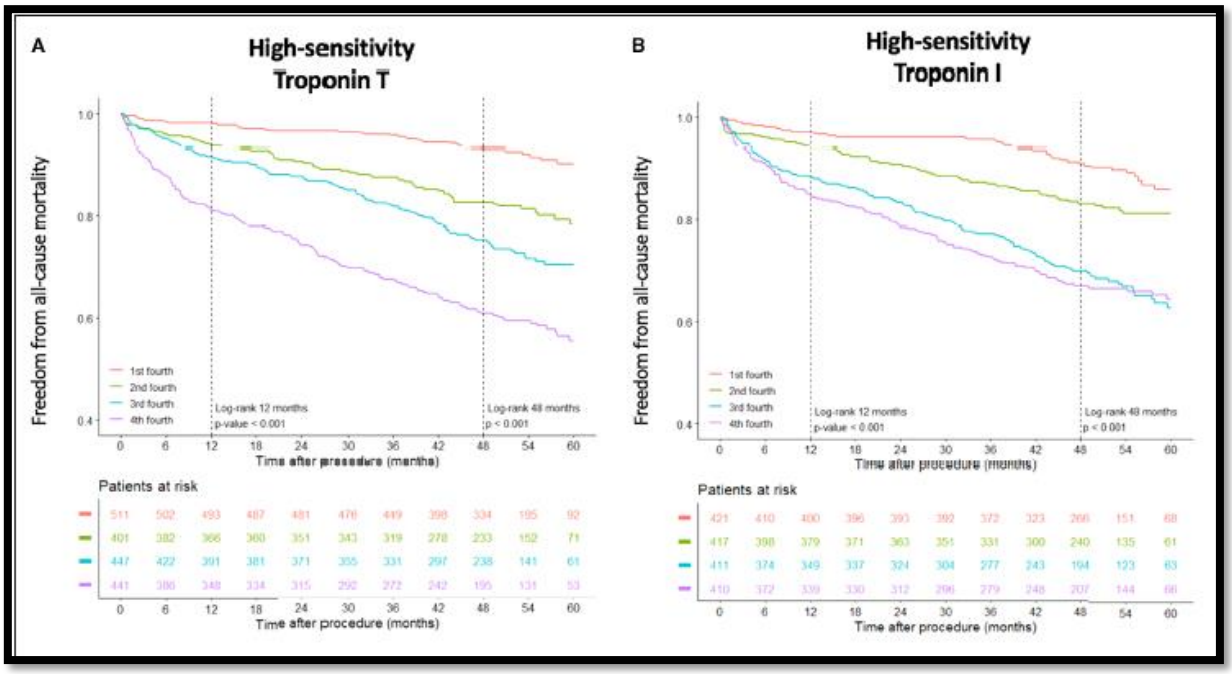
Association between High-Sensitivity Troponin T and I Blood levels with increased severity in patients with Coronary artery disease

Globally, cardiovascular diseases are considered as a leading cause of mortality and morbidity. Patients having coronary artery disease have higher chances for cardiovascular events (myocardial infarction and stroke). Severity of the disease explains the prognosis of the patients with coronary artery disease. Biomarkers such as Cardiac troponins are the important part of the contractile apparatus of the myocardium leading to form a complex with troponin T, troponin I, and troponin C, regulating actin–myosin interaction and facilitating myocardial contraction. However, Troponin are the cardiac specific biomarkers and are considered as the important parameter in the diagnosis of patients with suspected acute coronary syndromes.But, the use of Troponin and value in patients with chronic coronary syndromes is unclear.

This study aimed to analyse if the level of high-sensitivity troponin T and high-sensitivity troponin I increases with the severity of coronary artery disease and add independent predictive information for future major adverse cardiovascular events and all-cause mortality in stable patients.

To conduct this study, researchers recruited 1829 patients from the INTERCATH cohort with available coronary angiography and high-sensitivity troponin T and high-sensitivity troponin I concentrations were included. Troponin concentrations were measured using high-sensitivity troponin T and high-sensitivity troponin I. Multivariable analysis adjusting for classical cardiovascular risk factors, low-density lipoprotein cholesterol, estimated glomerular filtration rate, hs-CRP, NT-proBNP, and Gensini score were performed, to analyse the association of high-sensitivity troponin T and high-sensitivity troponin I with outcome. Of the enrolled patients, 27.9% were women.

Fig:1 Event-free survival across high-sensitivity troponin T and high-sensitivity troponin I quartiles



When compared to patients without coronary artery disease, troponin blood level was found to be increased in patients with coronary artery disease. Linear regression model revealed current smoking, arterial hypertension, estimated glomerular filtration rate, hs-CRP, NT-proBNP, were associated with high-sensitivity troponin levels. All-cause mortality (fig:1) was predicted by high-sensitivity troponin T and high-sensitivity troponin I and only high-sensitivity troponin I remained as an independent predictor of major adverse cardiovascular events.

Conclusion: Cardiovascular risk factors such as LDL-C, eGFR, hs-CRP, NT-proBNP, CAD severity, high-sensitivity troponin T and high-sensitivity troponin I blood levels were associated with all-cause mortality. However, only high-sensitivity troponin I was found to be linked with major adverse cardiovascular events in stable patients undergoing coronary angiography

References: Bay B etal. Association of High-Sensitivity Troponin T and I Blood Concentrations With All-Cause Mortality and Cardiovascular Outcome in Stable Patients-Results From the INTERCATH Cohort. J Am Heart Assoc. 2022 Jul 19:e024516.

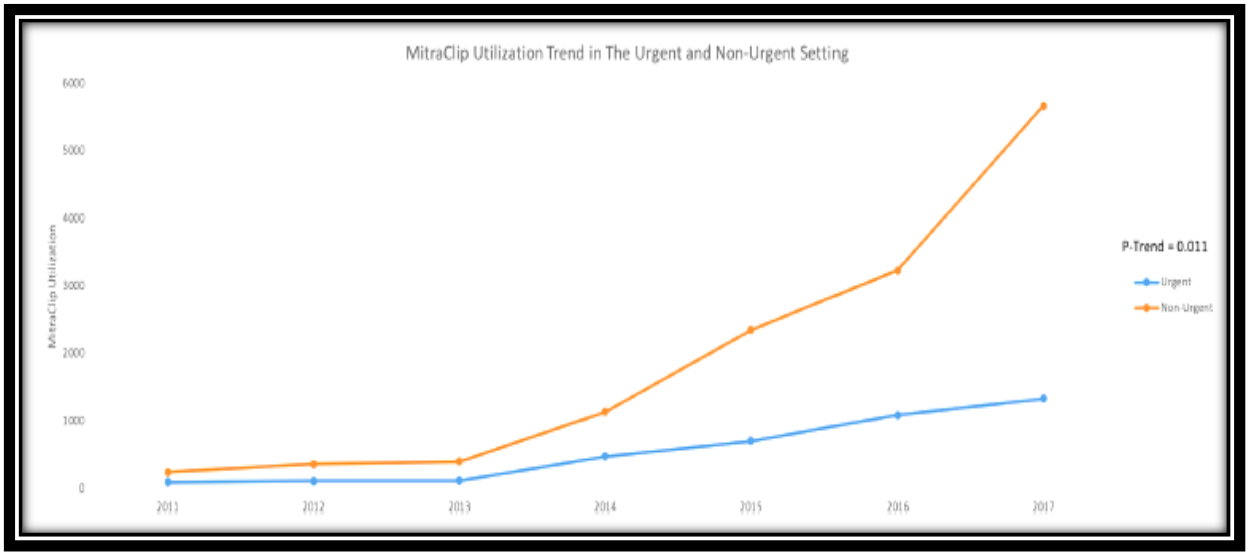
Analyzation of the outcome of percutaneous mitral valve repair using MitraClip in patients with mitral regurgitation in the urgent setting vs in a non-urgent setting

Mitral valve regurgitation, a common valvular heart disease has a prevalence rate of more than 2 million patients. For those, who are not candidates for surgical repair, percutaneous mitral valve repair is a preferred option to control severe mitral regurgitation. Only approved percutaneous device for mitral valve repair by USFDA is MitraClip. For critically ill patients not able to survive surgery, MitraClip seems an attractive option. Unfortunately, such patients have been excluded by clinical trials, for which data on such patients remains.

This study aimed to analyse the outcome of percutaneous mitral valve repair using MitraClip in patients with mitral regurgitation in the urgent setting vs in a non-urgent setting. To conduct this study, Nationwide Inpatient Sample database years 2011–2017 was used and hospitalizations for MitraClip in the urgent setting were identified. To compare the patients who underwent MitraClip in urgent vs non-urgent settings, propensity score matching was used.

It was found that from the year 2011 to 2017, almost 15,993 patients underwent MitraClip procedures while 24.6% were in urgent settings and 75.4% were in non-urgent. Younger patients were found in the urgent group with a higher burden of comorbidities such as diabetes, atrial fibrillation, renal failure and pulmonary circulatory disorders. Multivariable logistic regression revealed no statistically significant difference in mortality between urgent and non-urgent groups. Propensity score matching revealed no statistically significant difference in the in-hospital mortality between urgent and non-urgent groups. Urgent group showed higher risks of acute kidney injury and discharge compared to non-urgent group. A statistically significant increase in trend in the utilization of MitraClip in urgent settings from 27.7% in 2011 to 23.4% in 2017 has been observed **(Fig:2)**

Fig:2 Utilization trend of MitraClip in the urgent setting over the study period



Conclusion: This study highlighted that there were no statistically significant differences in in-hospital mortality between urgent percutaneous mitral valve repair using MitraClip procedures when compared to patients in the non-urgent setting

Reference

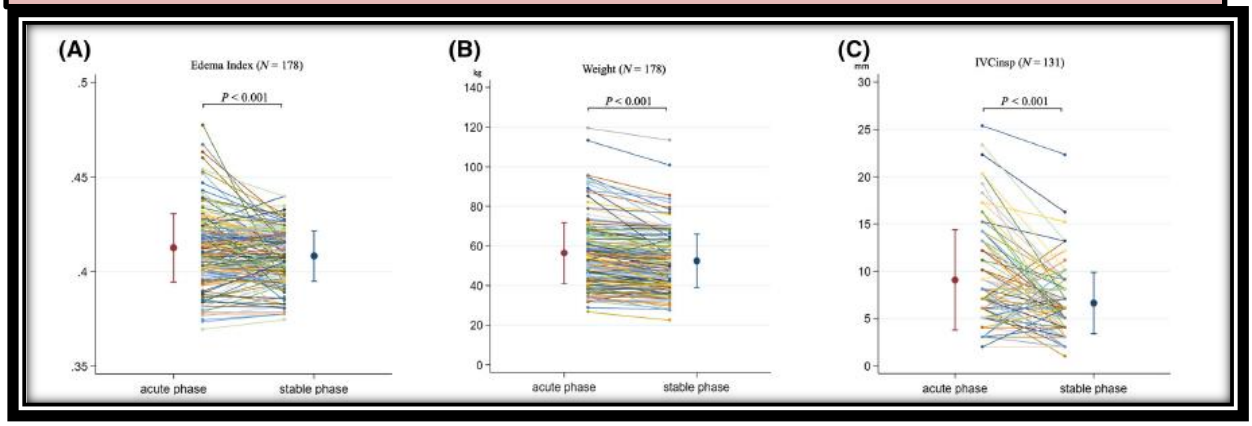
Al-Khadra Y,et al. National outcomes of urgent vs. non-urgent percutaneous edge-to-edge transcatheter mitral valve repair. Int J Cardiol Heart Vasc. 2022 Jul 16;41:101087.

Usages of bioelectrical impedance analysis in the Assessment of differences in extracellular fluid volume between acute heart failure patients with and without high systolic blood pressure

Most of the patients with heart failure have a combination of both intravascular congestion and tissue congestion. Patients with predominant intravascular congestion usually have acute onset and do not require diuretics for treating heart failure, while patients with predominant interstitial congestion have a gradual progressive pulmonary and peripheral oedema. According to studies, hypertensive heart failure defined as systolic blood pressure > 140 mmHg on admission is due to intravascular congestion. Therefore, it becomes important to assess the quantity of fluid retention while treating heart failure. Bioelectrical impedance analysis is a commonly used tool for the assessment of body composition not only in the fields of cardiology but also in the field of hepatology, nephrology, and nutrition.

This prospective single-centre study aimed to analyse the differences in extracellular fluid volume assessed by bioelectrical impedance analysis between acute heart failure patients with and without high systolic blood pressure. Around 178 patients hospitalized with acute heart failure were enrolled to conduct this study. Extracellular water, intracellular water, total body water, and Extracellular water -to- total body water ratio by Bioelectrical impedance analysis were evaluated. Conventional parameters such as weight, *N*terminal pro brain natriuretic peptide values, and echocardiography parameters on admission and before discharge were analysed and recorded. All cause death and re admission due to heart failure was considered as 1 year outcomes.

Fig:3 Changes in oedema index and conventional parameters from the acute phase to the stable phase



Systolic blood pressure > 140 mmHg on admission [clinical scenario 1 (CS1) group] was compared with Systolic blood pressure of ≤140 mmHg on admission (non-CS1 group).It was found that, odema index on admission of 83 patients in the CS1 group was lesser than 95 patients in the non-CS1 group. From the day of admission to before discharge, the change in odema index was not significant in the CS1 group but was significant in the non-CS1 group **(Fig:3).** However, delta-extracellular water, delta- intracellular water, delta-total body water, and delta oedema index of the CS1 group were significantly smaller than those of the non-CS1 group. During the 1-year follow-up period, 15% patients were found to be deaths and 28%, patients had to re-admit due to acute HF. Patients having higher oedema index before discharge had significantly more cardiac events than patients with low oedema index. According to Cox regression analysis, higher oedema index was significantly associated with worse outcome in non-CS1 group but not in CS1 group

Conclusion: In patients with high systolic blood pressure**, o**edema index on admission was not elevated. However, in patients with low systolic blood pressure, changes in extracellular water, intracellular water, total body water, and oedema index were higher than those in patients with high systolic blood pressure.

References: Namba Y,et al. Differences in extracellular fluid volume between acute heart failure patients with and without high systolic blood pressure. ESC Heart Fail. 2022 Jul 13.

Postoperative infection in liposuction: A Case Report

Liposuction is a surgical procedure that helps in the removal of localized subcutaneous fat deposits by suction and curettage for the tretament of obesity or any other esthetic contour defects. Globally, Liposuction surgery is one of the most popular cosmetic surgical operations .Along with the popularity, the occurrence of post-operative complication of liposuction is also increasing, such as postoperative infection, thromboembolic disease, skin irregularity, fat embolism, pulmonary oedema. Although liposuction is considered as a low-risk surgical procedure, there is still a life-threatening risk if patients get infected

A 24-year-old female patient was presented in the emergency department with a state of coma. It was found that 2 days earlier, patient had undergone liposuction in the bilateral lower limbs. The patient was unconscious, and had bilateral equal-sized round pupils, no light reflex was observed. Blood pressure of the patient was low (71/33 mmHg), heart rate was 133 bpm, and an SpO2 of 70%. Patient had bilateral limb swelling, extensive ecchymosis **(Fig 4)** in the lower abdomen and bilateral thighs, local crepitus, blisters, weak pulses on the femoral artery and dorsalis pedis, high skin tension, and haemoglobin of 32 g/L. Patient underwent debridement surgery and vacuum drainage, on the day of admission. A large amount of subcutaneous, red, and foul smelling effusion was identified and was sent for bacterial culture. During the procedure,necrotic and devitalized fat tissues were removed. 500 mL dextran was immediately injected to expand the volume, adrenaline was injected along with IV RBC and plasma to increase the BP. However, at 7:00 pm, BP rose just to 72/23 mmHg with an HR of 100 bpm.

Fig4: Extensive ecchymoses on abdomen, waist, butt, perineum, and bilateral lower limbs with blood blisters

Also, Succinyl gelatin injection, dextran, and albumin were given for volume expansion, still patient's BP continued to decrease. Bacterial culture showed positive for organism *Clostridium perfringens* infection and the antibiotic regimen given was imipenem and cilastatin sodium 1 g Q12h, penicillin 800 × 105iu Q8h and linezolid 600 mg Q12h. Later, at 8:28 pm, patient was declared clinically dead after a horizontal line and spontaneous respiration ceased was shown in the electrocardiograph.

According to this case report, death of the patient was because of gas gangrene. Two different diagnoses could be differentiated from gas Gangrene: Cellulitis (which can also be caused by *C. perfringens)* and necrotizing fasciitis (though rarely caused by *C. perfringens)*

Conclusion: This case report highlighted that surgical disinfection and environmental contaminants could be the reason for *C. perfringens* infections. That is why, it is important to improve the standard of the environmental disinfection of the operating room, and upgrade the sterile conditions of the operation staff and patients prior and during operation. Though, Liposuction surgery necrotizing fasciitis is rare but a fatal complication may occur, if diagnosis get delayed.

References: Lu J,etal. Infectious shock after liposuction. BMC Infect Dis. 2022 Jul 15;22(1):617.