

The efficacy of miniaturized TEE imaging in the management of a patient S/P CABG with hypotension and RV failure

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Abstract

A 75 year-old male with low LV ejection fraction and severe CAD developed hypotension requiring an IABP before CABG. The patient had low CI (1.81 L/min/m²) post-operatively on epinephrine, milrinone, neosynephrine, and amiodarone; an EKG showed new atrial fibrillation and changes consistent with inferior wall infarction. Acute right heart failure was detected with a miniaturized TEE probe designed for hemodynamic management in the ICU (ImaCor hTEE, ImaCor Inc, Garden City, NY), and managed by weaning off epinephrine, increasing fluids and inodilators (milrinone) under hTEE guidance. Cardiac index improved to 2.8 L/min/m² and biventricular function became normal over 72 hours under further hTEE-guided management.

The case

A 75-year-old male with a history of angina underwent stress testing, which revealed EKG changes consistent with multi-vessel ischemia. The patient was admitted for emergent catheterization demonstrating severe ostial left main stenosis with severe disease of the right coronary artery. Left heart catheterization estimated the ejection fraction at 30%; right heart cath was not done. The patient subsequently developed pre-op hypotension requiring placement of an IABP. Emergent CABG x 3 was done.

The patient was intubated and admitted to the SCCU post-operatively on epinephrine, milrinone, neosynephrine, and amiodarone. Initial CI was

1.81, CVP 18 mmHg, and PAP 28/15 mmHg. EKG showed new atrial fibrillation and changes consistent with inferior wall infarction. Post-op enzymes were positive.

A miniaturized TEE probe designed for hemodynamic management in the ICU (ImaCor hTEE) was placed to assess cardiac function. TEE imaging demonstrated hyper-dynamic and under-filled LV. The RV demonstrated moderately to severely decreased systolic function consistent with acute right heart failure. These findings led to changing management by weaning off epinephrine, increasing fluids and increasing milrinone.

Additional TEE imaging revealed improvement in cardiac function as inodilators decreased right-sided filling pressures. The patient's CI increased from 1.81 to 2.8, CVP decreased from 18 mmHg to 6 mmHg, and the PAP normalized. Further TEE imaging demonstrated euolemia with normal contraction of both the right and left ventricle while adjusting inotropic support. The patient's pressure normalized, the IABP was removed, and the patient was extubated.

Discussion

Acute RV failure due to post-op cardiac surgery requires aggressive fluid management and inotropic therapy. Severe fluid overload may result in hypoxia, prolonged intubation, and renal insufficiency. Moreover, "Acute volume loading in this situation may lead to further deterioration of myocardial function due to RV failure, a condition which cannot be diagnosed readily at the bedside with the usual monitoring techniques."¹

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Although post-operative RV dysfunction has long been readily diagnosed with TEE², the large size of conventional TEE probes has made TEE-guided management of these patients challenging. The overall utility of a TEE probe to address these limitations was recently cited in a recent editorial in *Anaesthesia*.³ In the present case, the ImaCor hTEE system helped guide the medical management and selection of inotropes in a patient with acute right heart failure, illustrating the utility of episodic hemodynamic assessment by TEE (hTEE) to guide management in the acute setting of patients who become hemodynamically unstable post-cardiac surgery.

References

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