

hTEE-guided Management of a Patient with a Cardiac History and Presumed Sepsis: Pressor Weaning and Aggressive Fluid Resuscitation

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Abstract

A 68-year-old male with a cardiac history presented with elevated troponins and abnormal ECG one day status post-abdominal surgery, with BP maintained by norepinephrine and a diagnosis of presumed sepsis. The differential diagnosis and subsequent treatment can be challenging in such cases – cardiac output depends upon preload (volume), contractility and afterload, and typical sepsis protocols call for both fluids and pressors. TEE has long been recognized as the gold standard in assessing cardiac filling and function, but can frequently be impractical to use as a management tool over the course of resuscitation. This case illustrates the use of a miniaturized hemodynamic transesophageal echocardiography probe (ClariTEE®, ImaCor, Inc., NG tube-sized) to perform hemodynamic TEE (hTEE™) assessment and management over a period of 29 hours. hTEE management led to aggressive fluid resuscitation and weaning from pressors, resulting in near normal cardiac filling and function.

Case Presentation

A 68-year-old male with a cardiac history presented with elevated troponins and abnormal ECG one day status post-abdominal surgery. ARF, elevated WBC, BP 96/59, HR 73, CVP 6, EF 40% by TTE on norepinephrine, presumed sepsis. The first hTEE imaging session revealed a thick, hyperdynamic (at odds with TTE), and under-

filled LV. A bolus of 1000 cc lactated Ringer's solution was ordered based on findings. The treatment plan was changed to rapid fluid resuscitation and weaning from pressors. A second hTEE imaging session five hours later, after a total of 2000 cc of lactated Ringer's had been administered, revealed an only slightly more filled LV, BP 98/65, HR 74, and CVP 7 on norepinephrine 0.03 µg/kg/min. A third hTEE imaging session the following afternoon, after over 4000 cc of fluids had been administered, found a slightly under-filled LV with continued excellent function. BP 110/70 and CVP 8 on norepinephrine 0.01 µg/kg/min. Patient was much more awake and aware.

Discussion

The anesthesiologist successfully changed management to aggressive fluid resuscitation and weaning from pressors under hTEE guidance. Elevated cardiac troponins are observed in 40-50% of critically ill medical and surgical patients (Lim, 1999) and “indicate damage to myocardial cells, but [do] not indicate the mechanism” (Lim, 1999). In another study of 46 patients, cardiac troponins “cTnI and cTnT were exclusively associated with LV dysfunction ($p < 0.0001$). ... These findings suggest that in septic shock, clinically unrecognized myocardial cell injury is a marker of LV dysfunction. The latter condition tends to occur more often in severely ill older patients with underlying cardiovascular disease. Further studies are

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needed to determine the extent to which myocardial damage is a cause or a consequence of LV dysfunction." (ver Elst et al., 2000). Mehta et al. (2004) state, "A close monitoring of patients with septic shock and elevated levels cTnI is warranted." In this case, hTEE assessment revealed a thick, hyperdynamic, and under-filled LV as the

problem to be treated and aggressive fluid therapy under hTEE guidance addressed the problem.

References

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