

hTEE-guided rapid weaning from pressors in a post-cardiac surgery patient with an ischemic gut

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Abstract

This case report describes the use of a miniaturized transesophageal echo probe (ClariTEE®, ImaCor Inc., Garden City, NY) to diagnose and monitor hemodynamic instability in a patient following surgery for an occluded superior mesenteric artery due to aortic dissection. Hemodynamic TEE (hTEE™) management revealed the specific cause of hemodynamic instability as severe diastolic dysfunction. Continued hTEE management allowed the physician to confidently and rapidly wean down pressors. This was particularly important as excessive pressors in this patient could have caused further gut ischemia, inflammatory mediator release, and further diastolic dysfunction.

Case Report

A 37-year-old man with a history of hypertension initially presented with a ruptured type A dissection. He underwent aortic valve resuspension, total arch replacement, and replacement of the ascending aorta. Echo on post-op day five showed normal biventricular function.

The patient did well but complained of severe abdominal pain and increasing distress on day seven. Lab work revealed new onset coagulopathy, acute renal failure, hyperkalemia, increased white blood cell count, and rising lactate levels. The patient became progressively hypotensive requiring phenylephrine support at 150 mg/min and ICU admission. Additional pressor support at this time included 12 mcg/min of epinephrine, 16 mcg/min of norepinephrine, and 0.08 units/min of vasopressin.

The patient was afebrile with pulse 125 BPM, blood pressure 100/50 mmHg, CVP 45 mmHg, SvO₂ >

80%, PA 45/30 mmHg, respiratory rate 20, and SpO₂ of 97%. Bedside transthoracic echo (TTE) showed normal biventricular function. CT angiography revealed a flap compromising the superior mesenteric artery (SMA) and celiac artery origins. Emergent thoracic endovascular aortic repair and exploratory laparotomy were performed. The patient required CPR following cardiac arrest in the OR. Exploratory laparotomy revealed only dusky gall bladder and gut. The patient was left open.

The patient was hemodynamically unstable at high levels of pressor support. hTEE revealed adequate systolic function, leading the physician to conclude that diastolic dysfunction was the cause of hemodynamic instability.

Diastolic dysfunction refers to either abnormalities in relaxation and/or stiffness that are independent of systolic dysfunction and/or clinical symptoms. Cardiac dysfunction after intestinal reperfusion has been described in rats¹. Pressors were rapidly weaned and fluid administered under TEE monitoring. The patient was subsequently extubated and discharged from the ICU in stable condition.

Discussion

We were able to confidently wean down pressors because hTEE revealed satisfactory systolic function throughout the process. This was particularly important as excessive pressors in this patient could have caused further gut ischemia, inflammatory mediator release, and further diastolic dysfunction. hTEE in the ICU with a miniaturized probe is a valuable addition for assessing cardiac function. Vieillard-Baron et al. had

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previously reported that “by its ability to accurately evaluate hemodynamic status qualitative TEE could be useful for intensivists in managing circulatory failure in septic shock². More generally, Poelaert and Schüpfer concluded that “echocardiography permits a rational approach to the problem of hypotension” and to overall hemodynamic management³. Charron et al. added, “Echocardiography has been widely demonstrated to predict fluid responsiveness accurately. There is now a complete and noninvasive tool able to accurately determine hemodynamic status in circulatory failure⁴.

Conclusion

hTEE management using a miniaturized disposable probe (ClariTEE) is a valuable addition to the

armament of the critical care team in assessing patients’ cardiac function. Further studies to evaluate its impact on efficacy and clinical outcomes are warranted.

References

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