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A Case of Cardiac Tamponade for Pericardiocentesis at NORA.

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Introduction

The management of acute cardiac tamponade in a NORA site is challenging. We describe here the successful management of such a case where we gave high priority to hemodynamic goals.

Case Description

A 68-year-old male presented with cardiac tamponade for CT-guided pericardiocentesis at NORA radiology site. He presented with acute onset of shortness of breath and required high-flow oxygen to maintain saturation greater than 90%. His heart rate was in the 120's with a blood pressure range of systolic 140-150 mm Hg. The ideal hemodynamic goals in cardiac tamponade are higher preload, faster heart rate and higher systemic vascular resistance. These were successfully achieved with monitored anesthesia care with intermittent doses of ketamine and fentanyl and simultaneous intermittent administration of phenylephrine. The perioperative course was uneventful.

Clinical Features of cardiac tamponade[1]	
Tachycardia	Tachypnea
Dyspnea	Jugular venous distention
Pulsus paradoxus	Cold, clammy extremities due to hypoperfusion
Decreased urine output secondary to hypoperfusion	Hypotension
In severe cases, cardiogenic shock	

	Echocardiographic features of cardiac tamponade[2]
1.	Early diastolic collapse of free wall of right ventricle
2.	Right atrial collapse
3.	Left atrial collapse
4.	Further fluid accumulation leads to intraventricular septal shift from right to left, resulting in paradoxical motion of the interventricular septum
5.	Lack of septal shift differentiates cardiac tamponade from hypovolemia

	Hemodynamic goals in cardiac tamponade
1.	Increased preload
2.	Faster heart rate
3.	Higher afterload or systemic vascular resistance (SVR)

	Anesthetic management of pericardiocentesis cardiac tamponade[2]
1.	Local anesthetic infiltration
2.	Monitor anesthesia care with ketamine, midazolam and fentanyl
3.	Administer adequate vasopressors to maintain SVR
4.	Avoid afterload-reducing agents such as propofol
5.	If general anesthesia is required, maintain spontaneous ventilation with sevoflurane
6.	Avoid mechanically-controlled ventilation

Complications of mechanical ventilation in cardiac tamponade[2]

1. Increases pulmonary vascular resistance
2. Decreases right ventricular outflow
3. Further exacerbates leftward septal shift
4. Impairs left ventricular filling

Management of undesirable mechanical ventilation in a patient with cardiac tamponade[2]

1. Low tidal volume
2. Low peak airway pressure
3. Avoid auto-PEEP

Large volume pericardiocentesis may lead to acute pulmonary edema. The etiology of such edema is unclear, but may be due to a sudden increase in preload and left ventricular filling. This results in left ventricular wall stress, global dysfunction and, in turn, acute pulmonary edema.[2]

CONCLUSION

Careful attention to hemodynamic goals, avoidance of SVR-reducing anesthetic agents, administering vasopressors to maintain SVR, maintenance of spontaneous ventilation, and avoidance of mechanical ventilation are the desired optimum management tools for a patient with acute pericardial tamponade presenting for pericardiocentesis.

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2. Christopher J. O'Connor CJ, Tuman KJ : The Intraoperative Management of Patients with Pericardial Tamponade Anesthesiology Clinics2010: 28: 87-96