

1. Introduction:

Cardiac tamponade is a not uncommonly encountered complication of cardiac interventions. Sometimes, it can become so disastrous that a simple pericardial drain insertion is not sufficient to tackle the problem. Implementation of advanced haemodynamic support are needed in these cases and knowledge proficiency in these devices and ability to troubleshoot when difficulty arises is lifesaving in these desperate situations.

2. Patient presentation

78 year-old asian female, has a past medical history of paroxysmal atrial fibrillation and hyperlipidemia. She was diagnosed with severe aortic stenosis on echocardiogram with NYHA Class II-III heart failure. Her case was brought forth to HEART team meeting for multidisciplinary discussion, she was deemed to be of intermediate risk for open heart surgery. After discussion with patient, she opted for TAVI instead of open heart surgery. TAVI was performed under local anaesthesia with difficult valve positioning with unstable valve positioning due to thick septum infundibulum. Patient developed shock with systolic blood pressure of 30mmHg after a few valve positioning.

3. Diagnosis and Management:

Urgent transthoracic echocardiogram performed showing pericardial effusion with cardiac tamponade. Urgent pericardiocentesis performed with fresh blood aspirated. Patient was intubated with TEE inserted, TAVI device was deployed. Repeated echocardiogram showed no more pericardial effusion with slightly improved LV ejection fraction; Over 3L of blood was drained out, IV fluid and packed cells were being transfused. With the rapid and huge blood loss, the scare blood product was not sufficient to support the transfusion requirement. Autotranfusion was implemented.

Autologous transfusion was first documented almost 2 centuries ago and cumulative studies have confirmed its safety. Recently in 2016, a meta-analysis on autologous transfusion for cardiac surgery patients have shown that it reduces the need for homologous blood transfusion without any difference in mortality or morbidity

However, despite autologous transfusion, blood pressure remained at 50mmHg. Due to the rapid blood loss, open repair was needed but patient's circulation has to be stabilised first. VA ECMO was set up. Initially the blood flow was good but it dropped to 0.29L/min within minutes, which was obviously insufficient in circulatory support. If we continue to have active suction from pericardial drain, high pressure gradient will be maintained between the pericardial space and the LV, further increasing the leakage rate, devolumizing the left heart or arterial side, resulting in decreased ECMO flow. If we clamp the drain, pericardial tamponade will ensues, which would also decrease ECMO flow.

Facing such a dilemma, we decided to clamp the drain and continue with blood and IVF resuscitation to maintain the Right heart or venous volume. Meanwhile closely observing the effusion by echocardiogram. If there was tamponade effect, we unclamped the drain and let out just sufficient fluid to relieve the tamponade. In that way we could maintain some pressure effect on the leakage site, reducing the flow rate, maintaining the left heart or arterial side volume as well; This is a similar approach to what we do to patients with type A aortic dissection with haemopericardium.

After the pigtail was clamped and there was increased pericardial effusion but the ECMO flow gradually increased. Patient was then transferred to operation theatre with LV apex defect repaired. She remained haemodynamically stable intra-operatively.

4. Outcome

Patient underwent an intensive course of post operative rehabilitation. She was discharged 2 weeks after the operation and was able to walk unaided, with independent activity of daily living. Echocardiogram was performed 1 month post-op which revealed normal LVEF and TAVI valve function.

5. Conclusions

?TAVI and various cardiac interventions carry rare but potential serious/life-threatening complications

?Even higher degree of alertness is needed for minimalistic TAVI/Structural interventions

?Autotransfusion is safe and should be considered, especially in emergency situations.

?Knowledge on physiology and troubleshooting of VA ECMO is important

?Controlled tamponade can potentially be life saving in desperate situation.