Implications of haemodynamic monitoring during left ventricular assist device support

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I congratulate the successful perioperative management done for the patient with a left ventricular assist device (LVAD), whose medications were adjusted considering remotely monitored pulmonary artery pressure that CardioMEMS supplied [1]. Our team recently demonstrated that optimized haemodynamics was associated with reduced haemocompatibility-related adverse events including heart failure recurrence [2], and efforts to optimize haemodynamics by adjusting LVAD speed and medications are recommended for successful LVAD therapy. One of the major limitations of this strategy is the invasiveness of right heart catheterization to measure haemodynamics, particularly in LVAD patients under anticoagulation and antiplatelet therapy. CardioMEMS, a non-invasive procedure, might overcome such limitations and enable us to repeat haemodynamic assessments.

However, we should pay attention to the 'decoupling' between diastolic pulmonary artery pressure and pulmonary capillary wedge pressure (PCWP). Almost half of the clinically stable LVAD patients have such decoupling [3]. Many LVAD patients may have 'normal' PCWP despite 'abnormally' elevated pulmonary artery pressure. In other words, the pulmonary artery pressure may not always be an alternative to PCWP in LVAD patients. CardioMEMS-guided medication adjustment, blinded to the actual level of PCWP, may carry a risk of inflow cannula sucking due to excessive uptitration of diuretics.

Nevertheless, I once again congratulate them on their successful management using CardioMEMS. Such a strategy would pave the way for the concept of a 'smart pump', which adjusts LVAD speed automatically using monitored haemodynamic parameters.

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Reply to Imamura

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We thank Imamura for his comments on our recently published case report [1, 2]. We demonstrated that the use of haemodynamic feedback, provided by the CardioMEMS device, during the optimization phase prior to left ventricular assist device (LVAD) implantation, leads to further haemodynamic optimization [2]. This strategy allows for daily haemodynamic monitoring, provides direct feedback on medical therapy and is less invasive when compared with continuous or repeated haemodynamic Swan–Ganz measurements. Furthermore, this technique carries minimal risk of bleeding or infection complications, which are known limitations of central lines needed for continuous monitoring using Swan–Ganz measurements [3].

We hypothesize that the CardioMEMS device is a very useful tool for postoperative monitoring and also the management of LVAD patients, as it provides daily information on the pulmonary artery pressure in a remote and non-invasive way. However, it has been shown that decoupling of pulmonary artery and pulmonary capillary wedge pressures occurs in LVAD patients [4]. We agree with Imamura [1] that this decoupling between pressures might limit the use of this remote monitoring strategy in LVAD patients, especially when clinicians use only pulmonary artery pressure for patient management and medication titration. This could lead to excessive uptitration of diuretics, leading to dehydration of the LVAD patient, potentially resulting in suction events or other related adverse events.

However, at this moment, no information in the literature is available describing the effect of decoupling on this monitoring strategy. Currently, we are investigating the safety and utility of the combination of LVAD therapy and remote haemodynamic monitoring using the CardioMEMS for the first time [5]. Our results will provide more insight into the effects of remote monitoring of LVAD patients using the CardioMEMS device.

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Atrio-oesophageal fistula after the cryomaze procedure: the devil is in the details

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We read with great interest, the case report from Wang *et al.* [1]. They reported for the first time, a rare but lethal surgical complication after a cryomaze ablation was performed by sternotomy, during an aortic valve