showed a rate of up to 6.7% conversion to on-pump surgery [2,4]. However, this rate is similar to OPCAB without LMD [2,5]. The patient mentioned in his report is one example, and we also had one case that converted to on-pump coronary artery bypass grafting (CABG). Furthermore, the mode of decompensation of this patient is based on an assumption that may be questionable. The ischaemia resulting in this situation may not be embolus-related and may be aggravated by an otherwise ischaemia or a mitral valve regurgitation. This spiral is not necessarily triggered by a ruptured plaque. If so, how did the authors locate the optimal site of anastomosis? Was there any trans-oesophageal echocardiogram (TEE) done on the table? Was there a regional or global left ventricular (LV) dysfunction? How was the pattern of ST changes? Displacement of plaques is not the only cause of haemodynamic instability and ventricular fibrillation (VF) during OPCAB with LMD. Extensive manipulation of the heart, especially when the circumflex territory is addressed, often exposes it to critical ischaemia by kinking of left main stem, decompensation of LV or it can worsen an already valvular incompetence, ultimately leading to VF. In our institution, in case of critical LMD, the left anterior descending (LAD) artery will be bypassed first, then right coronary artery (RCA), because they require less manipulation whilst providing sufficient coronary perfusion. Some surgeons prefer pre-conditioning of the heart. Calcification and sites of cannulation in aorta and femoral artery are routinely investigated by preoperative ultrasound in our institution. We think that the combination of transthoracic echocardiogram (TTE), intra-operative TEE, and meticulous examination of the ascending aorta (AA) by surgeons is sufficient to locate the calcification and take a decision. Computed tomography (CT), which has never occurred in our cohort, is rarely used in our institution in this circumstance. Unless the patient has extremely calcified porcelain ascending aorta, CT might not be superior whilst it actually increases the costs for patient.

Calcified AA can be addressed by various techniques. HEARTSTRING device [3], no-touch or anaortic technique [5], T or Y graft and total arterial revascularisation are available options in our centre. We have never encountered difficulty with severely calcified AA and LMD and would not consider it as the contraindication of OPCAB. However, the surgeons must always be ready for conversion to on-pump, as the chance is similar to OPCAB without LMD. In our practice, the site of cannulation at AA or groin, wherever suitable, will be prepared or exposed, so conversion to on-pump will not take a long time, when necessary. In case of severely calcified AA, it is necessary to prepare for femoral cannulation. However, on-pump beating heart cases were not included in our study.

Although the mobilisation of plaques has never happened to our patient, yet we agree that this is a considerable risk one should be aware of. However, it might be minimised by careful planning of the procedure and manipulation of the heart. The necessity of on-pump CABG in LMD with calcified AA needs to be answered by a separate study. In our experience, OPCAB is still safe and efficient for LMD and calcified AA.

The most significant conclusion from our study is that OPCAB in a patient with LMD is as safe as OPCAB in a patient without LMD, given that the surgeons are qualified enough. Comparing the benefit of OPCAB to potentially adverse effects of on-pump CABG and considering their similar safety, we think that surgeons should be encouraged to use OPCAB in patients with LMD, graft in the appropriate sequence and prepare for plan B.

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Letter to the Editor

Surgical pericardioscopy with rigid endoscope: a risky technique for an incomplete result

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We read with interest the article written by Ryolski and colleagues about a new minimally invasive surgical technique for treatment of delayed cardiac tamponade after open heart surgery [1]. Indeed, the conventional technique in these cases, especially if clots are present, remains re-sternotomy to obtain complete removal of clots, satisfactory pericardial exploration after cleansing and, eventually, surgical repair of a bleeding site. However, re-sternotomy needs longer hospital stay and carries a risk of mediastinitis, and some surgeons may prefer subxiphoid approach with the drawbacks of incomplete exploration of pericardium and clot removal. The improvement of this approach by optical guidance with an endoscope, called surgical pericardioscopy, may combine theoretically the two advantages of complete pericardial...
expansion and clot removal with a minimally invasive technique, decreasing mediastinitis risk and hospital stay.

In reference [2], we published our experience on surgical pericardioscopy, which was proposed to 17 patients who underwent an operation for surgical drainage of the pericardium (11 medical and six postoperative pericardial effusions) and benefited from a pericardial exploration with a mediastinoscope or rigid thoracoscope (Karl Storz, Tuttlingen, Germany). In the six postoperative cases, clots were visualised, and the pulmonary cannula of a right ventricular assist device (Thoratec, Pleasanton, CA, USA) was also perfectly controlled. The occurrence of bleeding was reported in one case and suspected in another, but required total re-sternotomy to be repaired in both cases. In addition, visualisation of the left lateral part of the heart was still very difficult, with the risk of leaving clots and likely favouring future pericardial constriction [3]. Furthermore, if peroperative assessment of the remaining pericardial cavity was possible with a satisfactory resolution, frequent cleansing of the endoscope tip with a compress was necessary, with multiple mobilisation of the device, due to direct contact of the tip with clots or the beating heart.

In our opinion, even if neither mortality nor morbidity due to the technique was observed in our series, this technique needs to be greatly improved by a flexible optical device with tip protector for optimal visualisation and also to avoid any cardiac compression and rhythmical complications during procedure with rigid device. This was very recently demonstrated on a pig model with single-port subxiphoid rigid videopericardioscopy, with arrhythmia and haemodynamic consequences, especially if the target is located deep and far from the pericardiotomy [4]. Another complementary solution which may be of real clinical interest would be to compensate the cardiac motion to avoid any cardiac compression. We are then currently working on a robotic assistance of pericardial exploration by offering a three-dimensional (3D) reconstruction of the surface motion, enabling the real-time tracking and compensation of the physiological motion [5].

So far, especially if clots and haematoma are present, resternotomy, with complete, and safe pericardial cleansing and drainage, must remain the gold standard.

References


Letter to the Editor

Subxiphoid echocardiography-guided pericardiocentesis with extended catheter drainage for delayed cardiac tamponade

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An interesting innovative method was used by Rylski et al. [1] as a safe modification of conventional surgery, avoiding re-sternotomy and its complications. Endoscopic treatment was successfully performed in three patients with delayed cardiac tamponade. What is remarkable in their report is that Rylski et al. made no allusion in their discussion to a previous and well-established method, which is echo-guided subxiphoid pericardiocentesis.

Since 2002, we performed 75 echo-guided subxiphoid pericardiocentesis with extended catheter drainage at our institution, and during the same period we performed 4000 open cardiac surgeries. All these procedures were performed successfully by cardiac surgeons for delayed tamponade after cardiac surgery without major complications.

We and others [2] have used a simple and safe technique that involves performing a percutaneous drainage of the pericardial effusion using the Pericardiocentesis Kit (Merit Medical Systems, Salt Lake City, Utah, USA) under local anaesthesia. Through the space between the xiphoid and the left costal cartilage, we introduced an 18-gauge × 9 cm needle. The needle was advanced aiming the left shoulder while gentle continuous suction was performed. Fifty millilitres of fluid from the pericardial effusion was evacuated to alleviate the haemodynamic consequences of tamponade.

Then the emulsion formed from 9 ml of saline solution shaken with 1 ml of air was injected through the needle under echocardiographic monitoring to confirm the proper location. Using the Seldinger technique, a guide wire was advanced into the pericardial cavity. A 6-Fr multiple-hole flexible 30-cm-long catheter was passed into the pericardial space after dilation of the track by a number 6-Fr dilator. The pericardial fluid was drained and the catheter was connected to a closed drainage system and left in place for at least 24 h.

This technique has numerous advantages: (1) it can be carried out at the bedside by one operator under local anaesthesia; (2) it is well tolerated and can be performed quickly even in unstable patients; (3) pericardial catheter may remain in place without compromising patient mobility; (4) the necessary equipment is widely available, portable and not expensive; (5) the technique is simple and reproducible with a short learning curve; (6) major complications are exceptional and conversion rate to the classic procedure is rare [2]; and (7) complete or near-complete drainage is achieved in all cases. Two limitations of this technique are