Transthoracic echocardiography after heart surgery: could pleural view be of some help?

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Received 8 June 2009; accepted after revision 4 August 2009; online publish-ahead-of-print 2 September 2009

The pericardial effusion localized on the upper portion of the right atrium is a classical complication of the post-operative heart surgery setting. This issue is most likely not visualized by transthoracic echocardiography and needs the transoesophageal approach. The present case reports a situation where an associated bilateral pleural effusion permitted a new view of the heart which has been helpful to confirm the diagnosis of tamponade and to re-transfer the patient to the operative room.

A 69-year-old diabetic man, without any relevant medical history, was admitted to the emergency following the occurrence of a progressive dyspnoea during the last 3–4 weeks. On the admission, he presented dyspnoea at rest with an incessant dry cough. He never denoted chest pain at rest or after stress. His initial clinical examination revealed normal vital signs, clinical signs of right and left ventricular failure, with a notably bilateral pleural effusion (transudate on liquid analysis) on chest ray. The blood sample revealed a slightly elevated troponin, without creatine kinase elevation. EKG displayed sinus rhythm with diffuse ischaemic repolarization abnormalities. A transthoracic echocardiographic showed a diminished left ventricular ejection fraction (LVEF, 45%) with a basal akinesia and an inferior hypokinesia. The right ventricle had a normal size with an altered longitudinal function, and no pericardial effusion. Before coronary angiography, he received a double anti-aggregation medication regarding the expected percutaneous coronary intervention therapeutic option.

The coronarography objectivated a triple vessels disease (a 70–90% stenosis of the proximal left anterior descending artery, a 50–70% stenosis of the first marginal, and 70–90% of the second marginal arteries and a subocclusion of an occlusion of the distal right coronary). As echocardiography, ventriculography showed a moderate diminution of the LVEF. He was then planned for quadruple coronary artery bypass grafts; despite he received double anti-aggregation therapy. The surgery included right coronary artery revascularization as a myocardial viability has been demonstrated in this segment.

In the intensive care, the post-operative scene was manifested by haemodynamic instability related to haemorrhagic shock (drains bleeding) with increasing doses of norepinephrine and raised lactates serum level. Oxygen mixed venous blood saturation (SVO₂) was of 50% and cardiac index <2 L/min/m², despite an intra-aortic balloon pump (IABP) inserted following cardiopulmonary bypass. Echocardiography performed using a Philips HD11 ultrasound system (Philips, Andover, MA, USA) and an S3-1 transducer (1–3 MHz extended frequency range) with acoustic windows in standard incidences was non-optimal, despite harmonic imaging, due to physical barriers such as chest wall dressing and poor ultrasounds penetrations as result of obesity. Thus, we performed a view, through a left pleural effusion, using a posterior-lateral thoracic approach (i.e. the fifth intercostal space; Figure 1 and see Supplementary data online, Video). This showed an important pericardial effusion with right-sided cardiac chamber compression (Figure 1). Another echocardiographic exam performed using transoesophageal echocardiography displayed an important pericardial effusion with haematoma in front of right-sided cardiac chambers. The patient was re-addressed to surgery and 3 L of intra-pericardial blood was evacuated. The post-operative evolution was progressively favourable and the patient could be weaned from the mechanical ventilation and rapidly extubated. Afterward, 3 days later, he could leave the intensive care unit.

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Discussion

It should be noted that using this pleural view, the upper portion of right atrium and IABP were visualized without need for transoesophageal echocardiography (see Supplementary data online, Movie). The present finding is not new as already evoked in the literature.1–4 Naqvi and Huynh have found that posterior transthoracic approach can help to assess heart morphology using echo in patients presenting pleural effusion.2 Moreover, as in the setting of cardiac surgery, the incidence of pleural effusion is higher,1 intensivists could more frequently use this approach than regular views, in case of technically challenging transthoracic approach.1 Indeed, echocardiographic image quality remains technically challenging in as many as 20% of critically ill patients.5 This new posterior transthoracic view should be checked in all patients presenting haemodynamic instabilities in the setting of post-operative cardiac surgery with drains bleeding as time to surgery could be decreased in case of cancelled transoesophageal echocardiography.

Supplementary data

Supplementary data are available at European Journal of Echocardiography online.

References