To the Editor,
Cardiac resynchronization therapy (CRT) reverses ventricular remodelling and improves clinical outcomes in patients with advanced heart failure due to dilated cardiomyopathy (DCMP) not optimally manageable with maximal medical therapy.[1] Although transvenous lead placement is the current modality of choice, there are implantation failure rates of 10%-15% due to altered coronary sinus (CS) anatomy requiring direct placement of epicardial left ventricle (LV) lead by an antero-lateral thoracotomy (ALT).[2] Epicardial LV lead positioning has the advantage of direct visualization and selection of the most suitable surface of LV, also avoiding areas of epicardial fat or fibrosis that can cause increase in pacing thresholds. Position of the LV lead is a primary determinant of the acute hemodynamic effect of biventricular pacing and studies have confirmed that mid-lateral LV region is the best.[3]

A 71-year-old female weighing 85 kg, a diagnosed case of DCMP was admitted for cardiac resynchronization therapy (CRT)-Defibrillator insertion. She was having refractory symptomatic chronic heart failure (New York Heart Association Class III), severe left ventricular (LV) systolic dysfunction (LV ejection fraction 20%) with global hypokinesia and mild mitral regurgitation, and LV dys-synchrony (QRS width of approximately 180 m). The CRT-defibrillator (Protecta XT; Medtronic, Minneapolis, MN, USA) was initially attempted via transvenous approach in cardiac catheterization laboratory. Both right atrial and right ventricle lead were implanted through transvenous approach. But, there was difficulty in implanting LV lead because of small cardiac veins. So, left ALT approach for LV lead implantation under GA was planned. The generator was placed in a pocket below the left infraclavicular region. After discussion with the surgeon, GA with controlled ventilation and lung isolation using double lumen tube (DLT) along with continuous epidural analgesia was planned for the procedure. Patient was instructed for nil per oral for 8 hours. Inside the operation theatre, all standard ASA monitors were applied. Invasive blood pressure monitored from right radial artery. Right internal jugular vein was cannulated for triple lumen central venous catheter. Epidural catheter was inserted at T6-7 intervertebral space before GA induction in lateral decubitus position. An initial dose of 8 cc of 0.25% ropivacaine (in aliquots) was injected into the epidural space followed by continuous infusion of 0.25% ropivacaine at 5 ml/hour. Anesthesia was induced with ketofol (30 mg of ketamine + 30 mg of propofol) and endotracheal intubation was facilitated with 6 mg of vecuronium. A total of 100 µg of fentanyl was given during induction time. Trachea was intubated with a 35-Fr left-sided DLT and proper placement was confirmed using fibre-optic bronchoscope. After tracheal intubation, a transesophageal echocardiography (TEE) probe was inserted. TEE examination showed severe LV dysfunction with ejection fraction of 20% with moderate mitral regurgitation. TEE helped in measuring cardiac output and assessing volume status during intraoperative period. Left ALT was done in fifth intercostal space. One lung ventilation (OLV) was instituted and GA was maintained with sevoflurane in air and oxygen. LV lead was fixed epicardially in obtuse marginal artery territory on the mid-anterosuperior wall of LV. Wire was tunnelled through subcutaneous region and connected to the generator, which was placed in a pocket below left infraclavicular region. The patient was extubated on table after reversal of neuromuscular blockade and was shifted to intensive care unit (ICU) for observation. Postoperative analgesia was maintained with continuous epidural infusion of 0.125% ropivacaine at 5 ml/hour. In the ICU, the position of the LV lead was verified by chest X-ray. Ejection Fraction was improved to 40% in the postoperative period. Patient was discharged from hospital after 5 days.

Goals of anaesthetic management consist of (1) avoidance of myocardial depression, (2) maintaining normovolemia, (3) titration of drugs to its effect during induction as circulation time is slow, (4) avoidance of increase in ventricular afterload, (5) maintenance of sinus rhythm, (6) adequate postoperative analgesia to promote normal breathing and (7) providing optimal surgical exposure.[4]

OLV significantly decreased the surgical duration by providing adequate surgical exposure and a quiet field to the surgeon. Also it minimised heart manipulations which helped in maintaining hemodynamics. Lateral thoracotomy allowed the surgeon to put the LV leads in much lateral position in the obtuse marginal artery zone which has the best LV pacing results for synchronization among both the ventricles. Epidural ropivacaine provided good analgesia which helped in on table extubation. Postoperative analgesia was maintained with epidural which avoided postoperative opioid usage and provided hemodynamic stability. Yamaguchi et al. used ketamine and propofol as total intravenous anaesthesia combined with continuous epidural analgesia in DCMP.[5] Cardio-protective role of sevoflurane and maintaining normal systemic vascular resistance justified its usage in this case.[6]

Clinical Pearls
1. DCMP patients are very prone for hemodynamic instability due to general anaesthetics, more so to inhalational agents
Letters to the Editor

2. Regional anaesthesia decreases general anaesthetics requirements in them
3. OLV aids proper surgical exposure and lead placement without manipulating the heart
4. Prophylactic use of inotropic agents to maintain hemodynamics does not help in these patients because of negligible myocardial reserve, hence wise choice of anaesthesia technique is of utmost importance.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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