Redo cardiac valve surgery and severe kyphoscoliosis: Anesthetic challenges

The Editor,

A 39-year-old lady, a known case of rheumatic heart disease and postopen mitral valvotomy, presented for double valve replacement (DVR). On examination, she had severe thoracic kyphoscoliosis and difficult airway marked by Grade IV Mallampati score. Features on chest X-ray were a severe kyphoscoliosis, hypoplasia of the left lung with Cobb’s angle measuring 75° [Figure 1]. Pulmonary function test revealed severe restrictive pattern. Transthoracic echocardiogram reported severe aortic stenosis, moderate mitral stenosis, mild mitral regurgitation, and left ventricular ejection fraction of 65%.

In operation room, a peripheral venous cannula and an invasive arterial cannula were secured and a standard American Society of Anesthesiologists monitoring was done. Lungs were preoxygenated and standard anesthetic induction was done. A 6.5 mm endotracheal tube was inserted using a gum elastic Bougie under video laryngoscopy guidance.

A transesophageal echocardiography (TEE) probe was inserted and comprehensive study was done using an ultrasound system (iE33; Philips Medical Systems). Aortic valve (AV) area was 0.72 cm² with a peak velocity of 3.9 m/s and mean gradient (MG) of 56 mmHg. The mitral valve (MV) area was 2.16 cm² with MG of 3 mmHg. Surgeons changed the surgical plan to AV replacement (AVR) as the TEE showed adequate MV size and acceptable MG across MV. Seventeen # St. Jude heart valve prosthesis was implanted in aortic position. Post-cardio pulmonary bypass (CPB) TEE showed a normally functioning prosthesis with a peak velocity of 1.8 m/s, MG of 8 mmHg, and an indexed orifice area of 0.87 cm²/m². The patient was weaned from CPB with infusion of dobutamine 5 mcg/kg/min. Trachea was extubated after 12 h of elective ventilation in the Intensive Care Unit. As postextubation blood gases showed retention of CO₂, she needed noninvasive bilevel positive airway pressure for 24 h. She was discharged on the 8th postoperative day with warfarin anticoagulation.

Redo cardiac surgeries have a multitude of technical challenges.[1] In our patient, we managed these expected difficulties by placing the arterial and venous lines under ultrasound guidance, attaching defibrillator paddles, inotropes loaded, keeping the CPB pump primed, and ready before induction of anesthesia. Problems with kyphoscoliosis[2] are (1) difficult airway, (2) restrictive pulmonary disease, and (3) decreased cardiac output. Cobb’s angle should be used to assess the severity of scoliosis and its clinical manifestations.[3] We got Cobb’s angle of 75°, showing she had decreased lung volume and needed surgical intervention (spinal fusion surgery) to correct scoliosis.[3] Since her cardiovascular status was not fit to tolerate the perioperative stress
of scoliosis surgery, she presented for heart valve replacement first. Use of noninvasive ventilation after extubation, chest physiotherapy, incentive spirometry, and aggressive pulmonary toilet was needed to reduce the postoperative respiratory morbidity.[4]

Intraoperative TEE influences the surgical decision-making.[5] Pre-CPB TEE examination by our expert consultant changed the surgical plan from DVR to AVR, which reduced the CPB time and the systemic effects of CPB.

In summary, redo cardiac surgeries in kyphoscoliosis patients are rare coincidence. Prior planning to handle the intra- and post-operative challenges will help in the successful outcome of these cases.

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