

An Interesting Example of Dynamic Obstruction in Double-Chambered Right Ventricle

Letter to
Editor

Renu Upadhyay

Department of Cardiac Anaesthesia, Seth G.S. Medical College and KEM Hospital, KEM Hospital, Parel, Mumbai, Maharashtra, India.

Corresponding Author: Renu Upadhyay, MBB, DNB, DM, Department of Cardiac Anaesthesia, Seth G.S. Medical College and KEM Hospital Second Floor, CVTC Building, KEM Hospital, Parel, Mumbai 400012, Maharashtra, India.

Tel.: +91 9653164956, **E-mail:** rupadhyay46@gmail.com

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Double-chambered right ventricle is an uncommon congenital or acquired malformation with anomalous muscle bundles in the right ventricle (RV). It is most frequently associated with perimembranous ventricular septal defect (PM-VSD)^[1].

Presentation is usually breathlessness, decreased exercise tolerance, chest pain and syncope or even cyanosis if the muscle bundles are located distal to the VSD (60%), leading to right-to-left shunting across the VSD^[2].

Surgical treatment is suggested in patients with significantly elevated midventricular pressure gradient of more than 40 mmHg^[3].

For the dynamic component of obstruction, β -blockers or calcium channel blockers should be started and intraoperative use of inotropes should be avoided. Hemodynamic goals in such situation will be maintaining RV preload, left ventricular afterload and a sinus rhythm^[4].

We present an interesting example of intraoperative dynamic obstruction due to anomalous RV muscle bundle.

A 11-year-old female presented with symptoms of progressive shortness of breath and exertional chest pain. She was a known case of VSD diagnosed in childhood but did not undergo any intervention. On physical examination, pansystolic murmur (grade IV/VI) was heard at the left sternal border. Chest radiograph had RV type of apex in cardiac shadow. ECG suggestive of RV hypertrophy.

Transthoracic echocardiogram showed a large PM-VSD with left-to-right shunt. In addition, a muscular septation was noted within the RVOT causing obstruction with a peak gradient of 136 mmHg. The pulmonic valve has doming.

The patient was planned for intracardiac repair of PM-VSD and muscle bundle coring to relieve obstruction.

After standard ASA monitors were attached, anesthesia was induced with sevoflurane/oxygen and fentanyl (2 μ g/kg) followed by rocuronium (0.1 mg/kg) and intubation with 6-mm ID-cuffed ETT. Right internal jugular central venous line and right femoral arterial were secured after induction. Blood pressure of 108/66 mmHg, heart rate of 88/min NSR, SpO₂ of 100 % and CVP of 5-cmH₂O was noted as baseline. Maintenance was done with sevoflurane/oxygen/air.

After adequate heparinization, aortic cannulation was done. To our surprise, on SVC cannulation, blood was overflowing through the cannula, so clamped (Figure 1) and simultaneously ETCO₂ fell from 34 to 29 mmHg. It was instantaneously followed by tachycardia (120/min) and fall in BP to 70/32 mmHg. Keeping in mind the muscle bundles in RV leading to probable dynamic obstruction, we started fast i.v. fluid and phenylephrine 20 μ g. As aortic and svc cannula were already inserted, immediate initiation of CPB was done.

We reported this case as dynamic obstruction would have happened at any time in the preoperative period or during induction or with sympathetic stimulation during surgery. It warrants knowledge and implication of dynamic obstruction due to muscle bundles and prompt recognition and its management.



Fig. 1: Intraoperative surgical field, showing SVC cannula full of blood column.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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