Anesthetic management of a patient with apical hypertrophic cardiomyopathy, a not so rare variant of hypertrophic cardiomyopathy

Dear Editor,

Apical hypertrophic cardiomyopathy (ApHCM) is a variant of HCM characterized by absence of outflow tract obstruction with dissimilar hemodynamic goals and scarce occurrence.[1] It has an incidence of 25% and 10% in Asian and non-Asian population, respectively.[2]

A 65 years old woman, scheduled for laparoscopic hysterectomy, presented for pre-operative assessment with a history of dyspnea on exertion (New York Heart Association CLASS II). Her metabolic equivalents were less than 4 preoperatively. The electrocardiogram (ECG) showed deep negative (>6 mm) T waves in V4–V6 [Figure 1]. Echocardiogram showed left ventricular (LV) hypertrophy (16 mm) restricted to the LV apex and apical narrowing of the LV cavity [Figure 2] and Grade I diastolic dysfunction. Based on these findings, ApHCM was diagnosed. Cardiac enzymes were normal. As advised by the cardiologist, she was started on bisoprolol 2.5 mg once daily and was posted for surgery a week later under American Society of Anesthesiologists class II. In the operating room, invasive blood pressure was monitored along with standard monitoring. We ensured the availability of anti-arrhythmic, direct-acting vasopressors and defibrillator. Anesthesia was administered using fentanyl 150 µg, propofol 80 mg and midazolam 1 mg, relaxant and intubation. Anesthesia was maintained using air, oxygen, and isoflurane mixture. Lithotomy position, laparoscopic surgery and diastolic dysfunction necessitated judicious fluid administration, which was aided by systolic pressure variation (SPV). Intravenous (IV) dexmedetomidine 100 mcg infusion was administered to counteract the sympathetic response. Extubation response was blunted using IV esmolol 10 mg bolus. The patient has been advised follow-up with the cardiologist.

The diagnostic criteria of ApHCM, also known as Yamaguchi syndrome, include LV hypertrophy predominating in apex (≥15 mm) and the ratio of maximal apical to the posterior wall thickness of ≥1.5 based on echocardiography or cardiac magnetic resonance imaging (CMRI).[2] Giant negative precordial T waves were the first clue in our patient. On evaluation, the patient also had apical LV hypertrophy and a ratio of maximal apical to the posterior wall thickness (>1.5).

Patients with ApHCM may have mid cavity flow obstruction with or without cavity obliteration, determining the prognosis.[3] These differences influence the hemodynamic goals [Table 1]. Invasive blood pressure helped monitor the hemodynamic fluctuations, and SPV helped optimize the preload. Preoperative beta-blocker therapy helped decrease left ventricle workload mitigating the risk of perioperative MI.[2] These patients are prone to atrial fibrillation and monomorphic ventricular tachycardia (re-entry through the apical scar), although we did not encounter any.[4]

Patients with ApHCM might require further diagnostic studies such as ventriculography ('Ace of spades' appearance)

Table 1: Hemodynamic goals for patients with Apical hypertrophic cardiomyopathy

PARAMETER	GOALS
Rate	Avoid tachycardia (shortens diastolic time)
Rhythm	Maintain sinus rhythm (ensures LV filling)
Contractility	Avoid increases in contractility
Afterload	Maintain afterload
Preload	Optimal preloading conditions

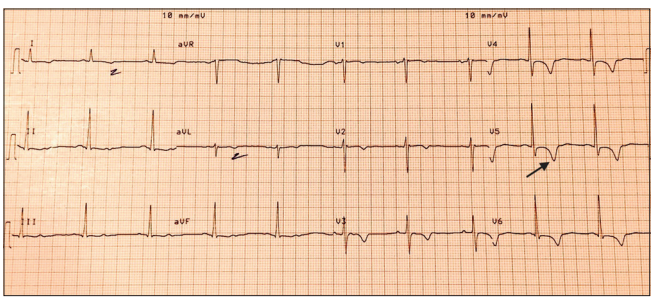

Figure 1: ECG showing deep T waves in precordial leads

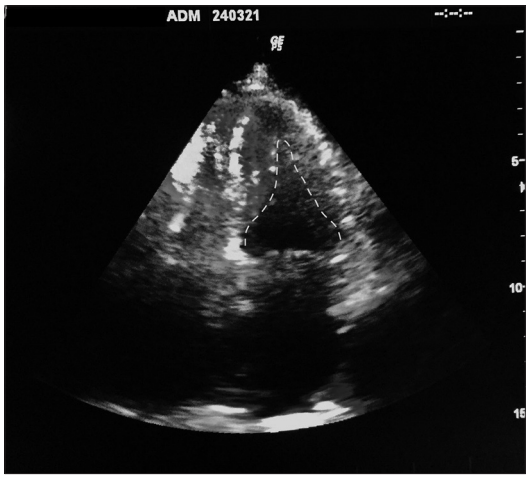

Figure 2: Echocardiogram showing LV apical hypertrophy with cavity narrowing

or CMRI.[5] Apical aneurysm, another distinct pathology common in patients with ApHCM, predicts poorer outcome.[3] Anticoagulation is a must in these patients given their increased thromboembolic risk. Though previously thought to be less risk for sudden cardiac death (SCD), recent evidence refutes it.[2] These patients need to be on follow-up so the disease progression monitored and required changes in the treatment performed. Arriving at the correct diagnosis, understanding the disease pathology, and achieving the precise hemodynamic goals ensured safe anesthesia for this patient.

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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Nil.

Conflicts of interest

There are no conflicts of interest.

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