# A chance encounter with a case of hypertrophic cardiomyopathy

Hypertrophic cardiomyopathy (HCM) is one of the commonest cardiac diseases of genetic origin.<sup>[1]</sup> However, given the heavy burden of coronary artery disease, it has not gained prominence as far as structured programme of disease detection, genetic counselling and further management is concerned, especially in a country like India.<sup>[2]</sup>

A 26-year-old male with Left Acromioclavicular Joint Dislocation operated in September 2018 was scheduled for implant removal. The previous surgery was done under Interscalene Block and the anaesthesia plan was similar this time too. Preoperative evaluation did not reveal any significant past history. After appropriate written informed consent, the patient was taken in the OT, using all standard monitoring procedures, cleaned and draped for performing the block. However, since the ECG leads were interfering in the field, they were removed before the procedure and reapplied after the block. The lead that is commonly monitored in the OT is lead II; however, the monitor was set on Lead I that day which showed T wave inversions. On checking other leads, Lead II was found to be normal but Lead III showed a deep dagger-like Q wave and T inversion. A 12 Lead ECG taken in the OT showed the findings as depicted in Figure 1. Physician was consulted and the initial impression was of Old Inferior wall MI with anterolateral ischaemia.

Considering the fact that this was a young, totally asymptomatic combatant performing moderately strenuous exercise prior to the injury and was haemodynamically stable, the surgery was allowed to progress which was uneventful. He later underwent a comprehensive cardiovascular evaluation. Positive physical findings were a split second heart sound on auscultation, a grade III mid systolic murmur best heard at left sternal border, without radiation, decreasing on hand grip and standing. Notably, this murmur was present in the perioperative period but was not elicited 4 days after the surgery, neither during preoperative evaluation, demonstrating the dynamic nature of this ailment. Echocardiography showed normal ejection fraction, asymmetric hypertrophy of the interventricular septum, and no systolic anterior motion and no left ventricular outflow tract obstruction. Cardiac MRI showed a diffuse thickening of the interventricular septum measuring

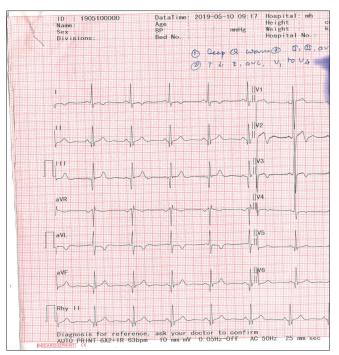


Figure 1: ECG recording in perioperative period showing T wave inversions Lead I, aVL, V2-V4 with Q in inferior leads

15.6 mm at mid-ventricular level with septal to lateral LV wall thickness ratio of 2.0. A focal hypokinetic segment was also seen in the anterosuperior part of the septum from mid-ventricular to basal level. No other abnormality was noted. Based on the above findings, an impression of asymmetric septal HCM with regional wall motion abnormality was made. The patient was placed on beta-blockers and regular follow-up.

HCM is characterised by marked left ventricular asymmetric hypertrophy with normal chambers without an obvious cause for such hypertrophy.<sup>[3]</sup> ECG abnormality is detected in up to 90% patients with HCM; however, it may be nonspecific changes like T wave inversions, Q waves and strain pattern.<sup>[4]</sup> Q in HCM is deep dagger-like in contrast to Q waves in MI. This brings us to the question whether a 12 lead ECG is routinely necessary in all patients less than 40 years of age, considering the high burden of the disease, or a more vigilant monitoring of all 3/5 leads in the operation theatre would be all that is required for chance detection in perioperative period.<sup>[5,6]</sup> The 2-D echocardiography criteria that may aid in diagnosis are maximal wall thickness more than 15 mm in any segment, which is unexplained, or septal to posterior wall thickness ratio of more than 1.3 in normotensive or more than 1.5 in hypertensive patients.<sup>[3]</sup>

Unrecognised HCM is of particular relevance to anaesthesiologists as sudden severe hypotension and

dynamic obstruction to the left ventricular outflow tract may occur unexpectedly. Diastolic dysfunction may lead to acute congestive cardiac failure in some patients. Malignant arrythmias and myocardial ischaemia may also occur. It is imperative to take a thorough personal and family history preoperatively including history of sudden cardiac death, followed by clinical examination for detection of cardiac murmurs. However, it is difficult to diagnose non-obstructive variant of HCM without echocardiography. ECG may be a simple pointer to more sophisticated investigations. Invasive cardiovascular monitoring is warranted in these patients to detect haemodynamic changes early. Transesophageal echocardiography may be an ideal monitoring tool in diagnosed cases undergoing non-cardiac surgery to monitor outflow obstruction and haemodynamic changes associated with fluid and drug administration. Hypotensive episodes in the intraoperative period need to be managed with volume replacement and vasoconstrictors like phenylephrine and norepinephrine.<sup>[4,7]</sup> In case of sudden cardiac arrest and CPR, it is important to be aware that patients with HCM behave differently and vasoactive drugs may paradoxically increase obstruction by increasing contractility and producing tachycardia.<sup>[8]</sup>

Last, instead of instilling fear of sudden cardiac death, it will be worthwhile to formulate the guidelines for the correct level of exercise that is safe and does not interfere with practising a healthy lifestyle.<sup>[9]</sup>

We write this letter to emphasise the role of anaesthesiologist as perioperative physician exercising constant vigilance and perseverance in following up cases to its logical conclusion. In addition, with increasing use of ultrasound in the perioperative period, it will be worthwhile for all anaesthesiologists to have a working knowledge of bedside echocardiography.

### **Declaration of patient consent**

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

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#### **Conflicts of interest**

There are no conflicts of interest.

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