

Hypertrophic Cardiomyopathy

CoreNotes by Core Concepts Anesthesia Review, LLC

What You Must Know

1. Hypertrophic cardiomyopathy (HC) is a genetic disease associated with the development of abnormal myocytes.
2. HC is associated with a small, hyperdynamic ventricle with a large ejection fraction.
3. Twenty to 30% of HC patients develop septal hypertrophy that can obstruct the aortic outflow tract. This is referred to as obstructive cardiomyopathy and was formerly known as idiopathic hypertrophic subaortic stenosis (IHSS).
4. HC is frequently associated with exercise angina.
5. Anesthetic management of patient with HC includes maintenance of adequate filling volumes and pressures. Inotropic agents and vasodilators are contraindicated, since they are likely to enhance outflow obstruction.
6. Direct acting α -adrenergic agents increase preload and afterload and are the best choice for the pharmacologic treatment of hypotension.

Hypertrophic cardiomyopathy is a genetic disease associated with the development of abnormal myocytes resulting in ventricular hypertrophy even in the absence of ventricular overload. Approximately 20 – 30% of patients with HC can develop obstruction of aortic outflow if inadequate filling of the ventricle occurs or a hyperdynamic state develops.

Patients with HC have both systolic and diastolic dysfunction with significant loss of ventricular compliance. This results in increased left atrial pressure and pulmonary edema is common. The “stiff” left ventricle also requires high filling pressure and loss of atrial contraction can quickly cause CHF.

The management of patients with obstructive HC centers around the manipulation of three hemodynamic parameters: preload, afterload and contractility. Adequate preload and afterload maintains ventricular size, thereby reducing outflow tract obstruction. Avoidance of inotropic agents, or the administration of negative inotropic agents, such as β -blockers or calcium channel blockers, will reduce contractility and paradoxically improve cardiac output.

Intraoperative hypotension is best treated with volume replacement and direct acting α -adrenergic agents, such as phenylephrine, which can increase both preload and afterload. Inotropic agents, such as β -adrenergic agents or digitalis, are contraindicated.

Additional Reading:

Barash, PG, Cullen, BF, Stoelting, RK, Cahalan, MK, Stock, MC, and Ortega, R. Clinical Anesthesia. Philadelphia: Lippincott Williams & Wilkins, 2013:1083-1084