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Case Study

Think Beyond Ischemia: Cardiac Arrest in Elderly Hypertrophic Cardiomyopathy

Phang Eng Meng*, Gurjeet Singh a/l Harvendhar Singh

Department of Emergency Medicine, Hospital Selayang, Lebuhraya Selayang-Kepong, 68100 Batu Caves, Selangor, Malaysia

**Corresponding Author's Email: yingming1017@gmail.com*

Abstract

Hypertrophic Cardiomyopathy (HCM) has traditionally been recognized as a condition predominantly affecting younger individuals, often presenting with sudden cardiac death, which left limited treatment options. This misconception has resulted in the underappreciation of HCM in elderly patients, leading to significant implications for timely diagnosis and emergency care. With advancements in cardiovascular medicine, including enhanced imaging technologies, the prevalence of late-onset HCM in the elderly population is increasingly recognized. Recent studies show that a substantial number of elderly patients with HCM present with emergency conditions, including cardiac arrest, emphasizing the need for heightened awareness in this age group. This case report highlights a 68-year-old male with a history of dyslipidemia and ischemic heart disease who suffered an out-of-hospital cardiac arrest while playing badminton. Despite initial resuscitation and treatment for acute coronary syndrome, findings such as left ventricular hypertrophy and systolic anterior motion of the mitral valve raised suspicion of HCM. The patient's condition was confirmed as a potential case of HCM, showcasing the importance of considering this diagnosis in elderly patients presenting with cardiac events. This report underscores the importance of early detection and diagnosis of HCM in older adults, as it can lead to better management, reduced morbidity, and improved quality of life. With increasing use of electrocardiograms and echocardiography, timely identification can significantly reduce hospital visits and prevent disease progression. Through early intervention, the risk of sudden cardiac events can be minimized, ultimately improving patient outcomes in this growing demographic.

Keywords: *Cardiac Arrest; Echocardiography; Elderly Patients; Hypertrophic Cardiomyopathy; Sudden Cardiac Death*

Introduction

HCM is an inherited myocardial disease characterized by cardiac hypertrophy (wall thickness ≥ 15mm) that is not explained by abnormal loading conditions or left ventricular obstruction greater than or equal to 30mm Hg (Veselka et al., 2017). Traditionally considered a condition more commonly seen in the second decade of life, there has been increasing recognition of late-onset disease in the elderly population, with data from recent registries showing that the average age at diagnosis falls in the fifth decade of life (Canepa et al., 2020). A study conducted in the Emergency Department found that 22.1% of HCM patients visited EDs within a one-year period, with the majority (71.1%) of these patients aged ≥ 60 (Choi et al., 2022). We present a case of a 68-year-old man who experienced an out-of-hospital cardiac arrest (OHCA), during which features of HCM were identified.

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Case Description

A 68-year-old man with a history of dyslipidemia and ischemic heart disease presented to the emergency department after experiencing a cardiac arrest while playing badminton. Immediate bystander CPR was performed at the scene, and an ambulance was called. Family and friends reported that he had been well prior to the event.

In the emergency department, resuscitation and defibrillation were carried out according to protocol. He experienced recurrent ventricular arrhythmias, including torsades de pointes. After the return of spontaneous circulation, bedside echocardiography revealed a left ventricular septal wall thickness of 1.67 cm, a septal/posterior wall ratio of 1.40, and systolic anterior motion (SAM) of the mitral valve (Figure 1). The ECG showed a right bundle branch block (RBBB) (Figure 2).

The patient was initially treated for cardiac arrest presumed to be caused by acute coronary syndrome. However, based on the history, presentation, and POCUS findings, a high index of suspicion for HCM was raised. As a result, he was referred with HCM as a differential diagnosis and admitted to the Coronary Care Unit.

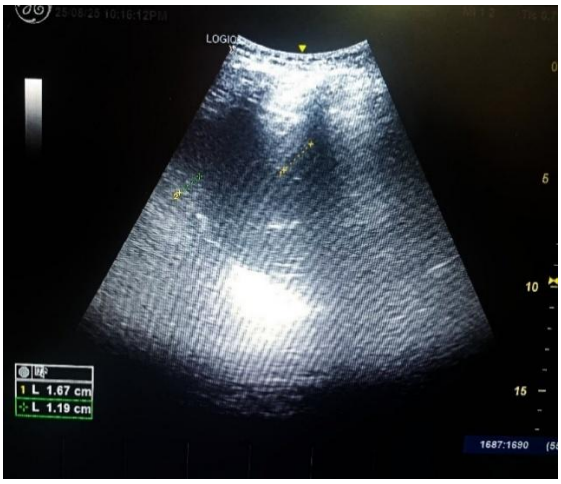

Figure 1: Bedside Echocardiography

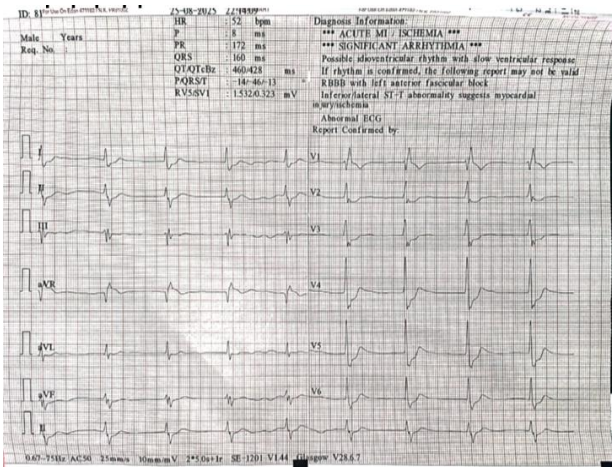

Figure 2: ECG

Discussion

HCM is often under-recognized in older adults, frequently overlooked due to the perception that the disease only affects younger individuals (Lever et al., 1989). The increased diagnosis of HCM in the elderly population can be attributed to the greater use of advanced imaging techniques, such as electrocardiography and echocardiography, along with improved physician awareness (Pelliccia et al., 2019; Sharma et al., 2017). However, genetic testing may be negative or inconclusive.

Most elderly patients with HCM are often asymptomatic, enjoying a normal life expectancy without developing complications or functional disability, even without therapeutic intervention. However, the disease may progress to heart failure, left ventricular outflow tract obstruction (LVOTO), and arrhythmias (Autore & Ferrazzi, 2022), with atrial fibrillation (AF) reported in up to 25% of cases as the most common rhythm (Mizia-Stec et al., 2025). Sudden cardiac arrest with frequent ventricular arrhythmias may present as the first clinical event, although the risks are relatively lower compared to younger patients.

Many elderly patients with HCM have multiple chronic comorbidities, such as hypertension, diabetes, heart failure, stroke, and chronic kidney disease. Studies have shown that they have a higher frequency of ED visits, higher hospitalization rates, and increased mortality (Choi et al., 2022). The female population tends to have a higher symptom burden, more frequent sudden cardiac death events, and greater ED utilization compared to the male population, although the latter has a higher prevalence of HCM. The most common reasons for ED visits in HCM patients are related to manifestations of cardiovascular disease.

In a study by Lewis & Maron (1994), the mechanism of LVOTO differs between younger and older patients. Mitral annulus calcification (MAC), an age-related degenerative process, restricts the motion of mitral valve leaflets, causing anterior displacement of the mitral valve during systole. Together with posterior septal motion, this mechanism promotes systolic anterior motion, resulting in LVOTO in older patients with HCM. Table 1 shows the different features that can be observed in echocardiograms comparing elderly and younger patients with HCM.

Table 1: Comparative Features of Hypertrophic Cardiomyopathy in Elderly vs. Younger Patients

Feature	Elderly Patients (≥ 65 years)	Younger Patients (15–35 years)
Left ventricular wall thickness	Usually only mild to moderate thickening	Often marked or severe thickening
Distribution of hypertrophy	Most often confined to the septum	More frequently extends beyond the septum to other ventricular walls
Pattern of septal hypertrophy	Usually, a uniformly thickened septum with a smooth, elliptical cavity; less often bulging into the cavity	More likely to show asymmetric septal bulging that distorts the cavity
Left ventricular cavity shape	Commonly elliptical and symmetric when hypertrophy is uniform	More often distorted or asymmetric due to bulging pattern
Dynamic outflow obstruction	Frequently present, usually due to restricted mitral leaflet motion and posterior septal motion	Also common, but often related to pronounced mitral valve motion and vigorous obstruction
Overall severity	Generally modest and localized structural changes	Typically, more extensive and pronounced hypertrophy

HCM was once considered a rare condition with limited effective management strategies. However, with advancements in cardiovascular medicine over the years, significant improvements have been made in both diagnosis and treatment (Maron et al., 2014). The risk of sudden death has decreased, with mortality rates dropping to 0.5% per year, largely due to the introduction of implantable cardioverter-defibrillators. Currently, death is more commonly attributed to heart failure, which has become the leading cause of mortality. Medical treatments using negative inotropic agents, such as beta-blockers or verapamil, are effective in relieving symptoms. Surgical options, including septal myomectomy or percutaneous alcohol septal ablation, can also help manage heart failure symptoms.

Conclusion

Hypertrophic Cardiomyopathy is no longer considered solely a disease of the young, and it is essential to recognize the condition in elderly patients. Simple investigations, such as electrocardiograms and bedside echocardiography, can be invaluable in raising suspicion of HCM when a patient presents to the ED. Early recognition and diagnosis will lead to timely treatment and further investigation, prevent disease progression, reduce morbidity and mortality, and ultimately decrease ED visits, admission rates, and improve quality of life.

Conflict of Interest

The author(s) declare that there is no conflict of interest regarding the publication of this article.

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