



Catecholamines, Cardiomyopathy, and Complexity: A Team-Based Approach to Preoperative Optimization

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INTRODUCTION

- Pheochromocytoma presents significant intraoperative risks due to catecholamine surges causing severe intraoperative hypertension and arrhythmias
- Hypertrophic cardiomyopathy (HCM) further complicates management as these patients are sensitive to preload, afterload, and heart rate variability
- This case highlights the unique challenge of balancing these conflicting hemodynamic goals during preoperative optimization for laparoscopic adrenalectomy

CASE DESCRIPTION

Patient History

- 62-year-old male with a history of HCM status post myectomy, chronic ischemic heart disease with implantable cardioverter-defibrillator, atrial fibrillation, hypertension, bladder cancer, and newly diagnosed pheochromocytoma

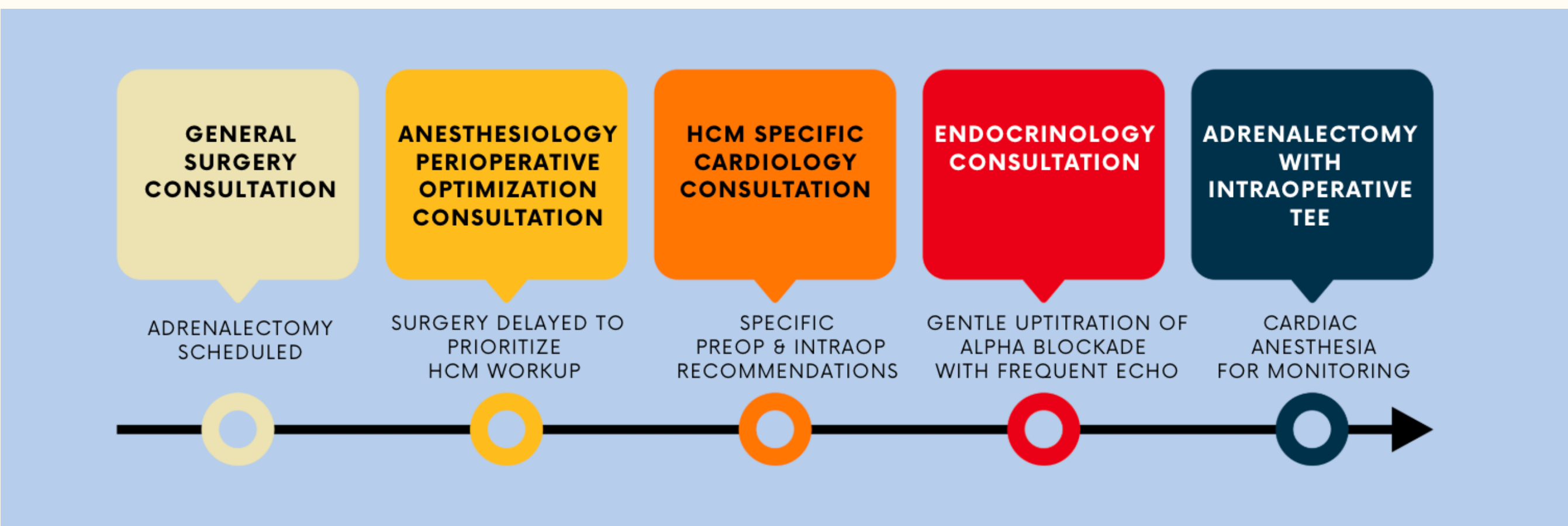
CPM Evaluation and Multidisciplinary Decision Making

- Referral to the Center of Perioperative Medicine out of concern for titrating alpha-blockade in HCM management
- Due to patient's recent near syncope, CPM arranged a multidisciplinary collaborative approach involving anesthesiology, endocrinology, and the specialized HCM clinic, with continued discussion of patient risk and his symptomatology
- HCM team recommended low dose alpha-blockade with close symptom monitoring and uptitration of alpha blockade with frequent transthoracic echocardiography monitoring prior to surgery
- Other considerations such as septal ablation were not felt to be necessary

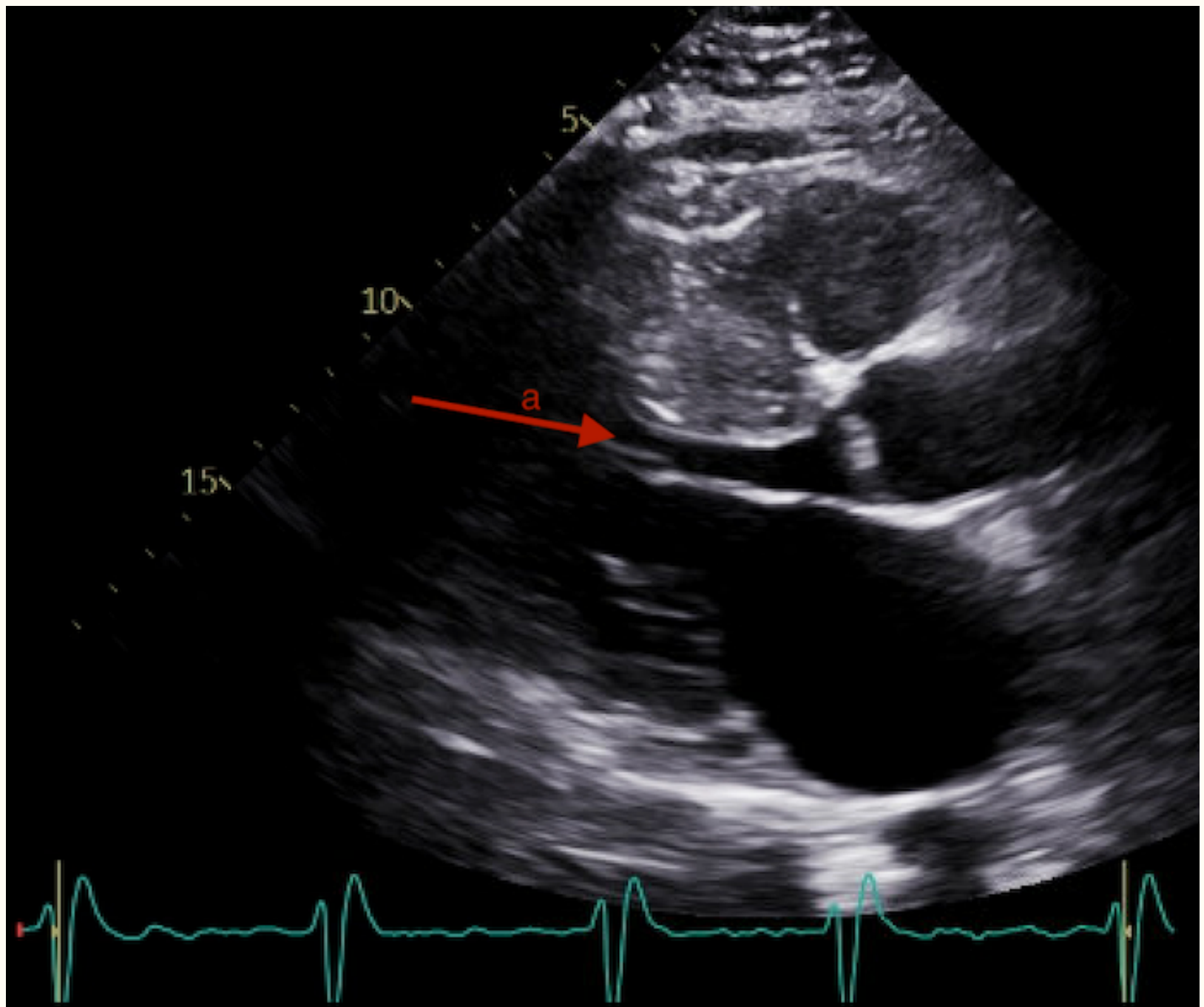
LEARNING OBJECTIVE

To develop a preoperative management strategy that balances the conflicting hemodynamic goals of hypertrophic cardiomyopathy (HCM) and pheochromocytoma in a patient undergoing laparoscopic adrenalectomy. This case exemplifies the challenges of managing a medically complex patient and recognizes the importance of a patient-centered, multidisciplinary approach to preoperative optimization.

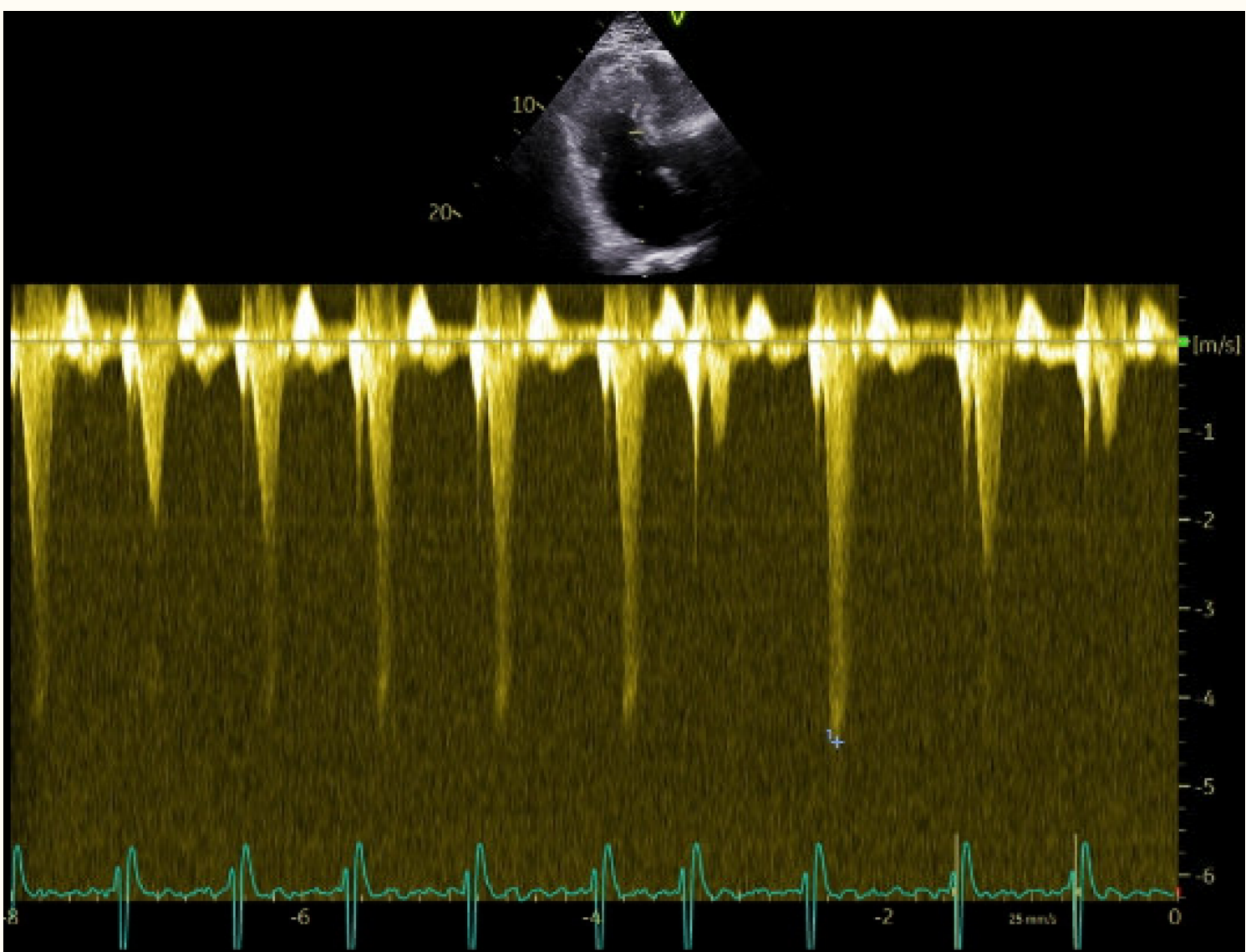
MULTIDISCIPLINARY PREOPERATIVE WORKUP



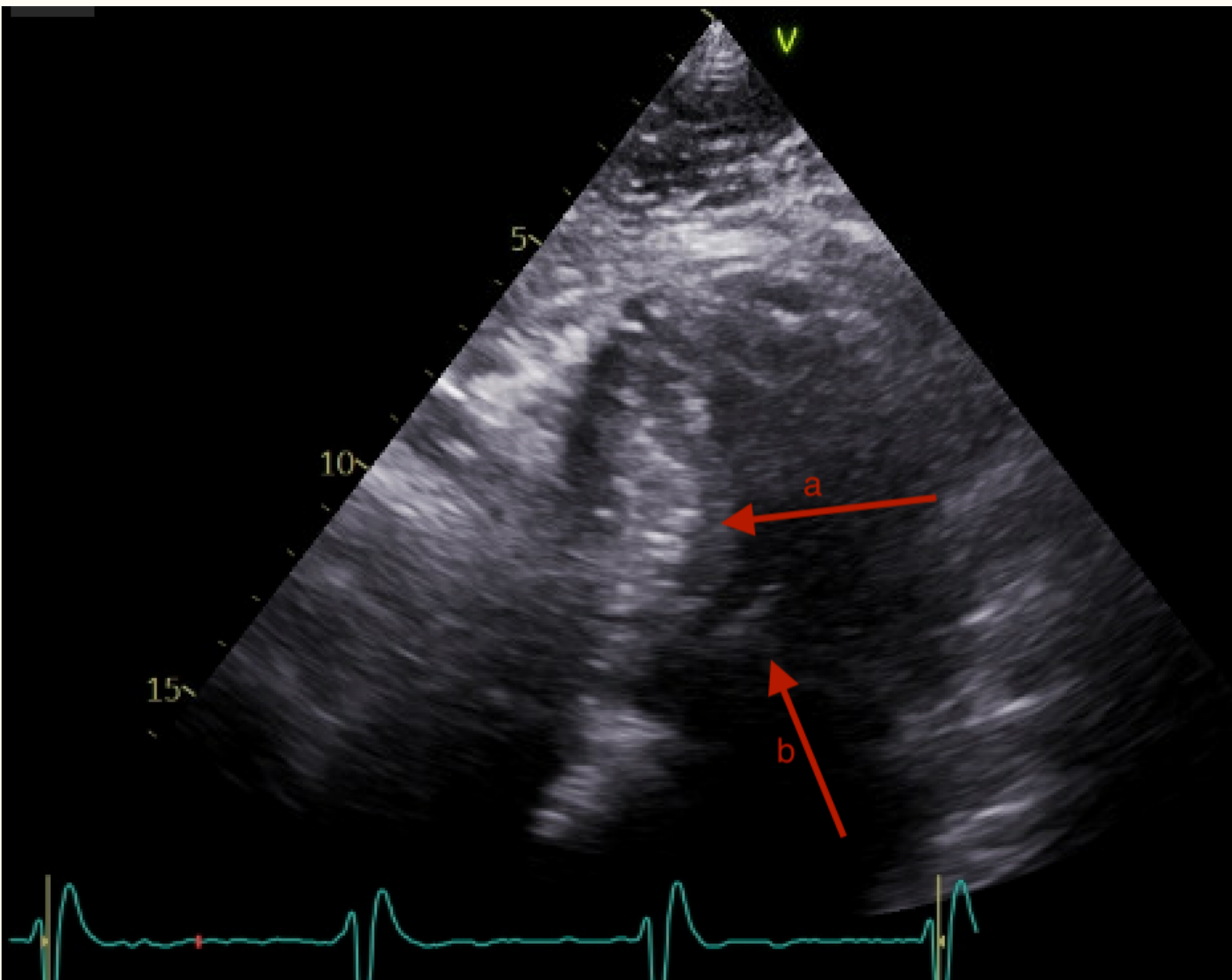
Below are the exercise stress echocardiography views and pressure gradients performed to evaluate the degree, if any, of LVOTO preoperatively given symptomatic dyspnea/near syncope.



Parasternal long axis view with asymmetric septal hypertrophy characteristic of HCM (a)



Elevated LVOT pressure gradient of 81.51 mmHg upon Valsalva maneuver with flow velocity 4.52 m/s

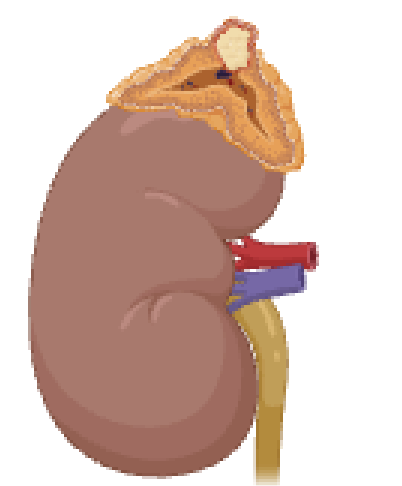


Apical 4-chamber view with intraventricular septal hypertrophy (a) & anterior mitral valve leaflet bowing (b)

DISCUSSION

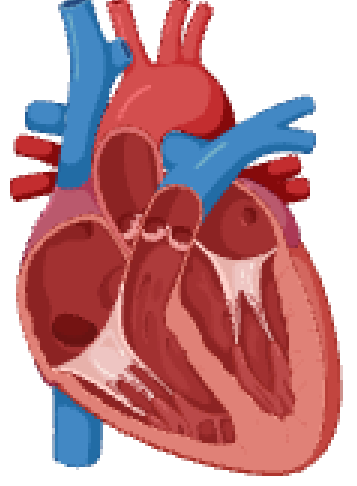
- Management of pheochromocytoma -- preoperative alpha-adrenergic blockade to prevent intraoperative hypertensive crises
 - Alpha-blockade reduces preload & afterload (SVR), which may create obstruction
- Management of HCM -- reducing LVOTO by increasing SVR, maintaining adequate preload, and avoiding tachycardia
 - Risk of decreased preload & increased HR with catecholamine surge during adrenalectomy
- Intraop TEE with cardiac anesthesiology expertise will be utilized to monitor for obstruction and aim to facilitate stable hemodynamics throughout

Pheochromocytoma



Alpha-blockade prevents catecholamine surges

Hypertrophic Cardiomyopathy



Sensitivity to preload, afterload, and heart rate

Complex and Conflicting Hemodynamic Goals



Requires Interdisciplinary Planning and Timing

REFERENCES

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- 2 Nama RK, Parikh GP, Patel HR. Anesthetic management of a patient with hypertrophic cardiomyopathy with atrial flutter posted for percutaneous nephrolithotomy. *Anesth Essays Res*. 2015;9(2):284-286. doi:10.4103/0259-1162.156372