rioperative Anesthesia Considerations for HOCM: A Case on Laparoscopic Ivor Lewis Esophagector

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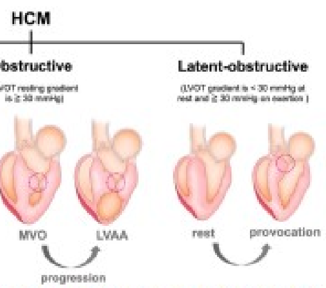
ODUCTION

CM) is an autosomal dominant disease of
myocardial disarray
ctions, and at times, lethal arrhythmias
monstrated in **Figure 1**
ventricular outflow tract (LVOT), patients
urmur or have mild symptoms
symptoms include dyspnea, angina, and

ystolic murmur at the left sternal border or
m of >15 mm, but definitive diagnosis is



cular outflow tract. LVOTO = left ventricular outflow
struction. LVAA = left ventricular apical aneurysm.

Y & CHALLENGES

phagus cancer and HOCM presented for
tomy and gastrostomy tube takedown
>30°) reverse Trendelenberg positioning
dural placement
rent with Mavacamten for 2 months

MENT PLAN

agement
le cart available in OR
ready on pumps
albumin for rehydration
dose or bolus given
r anxiolysis
all team members from preop throughout

TREATMENT PLAN (CONTINUED)

Induction and Intraoperative Management

- Preinduction arterial line placement; induction with fentanyl and etomidate
- Norepinephrine infusion at 0.02 mcg/kg/min started at induction
- 9Fr 2-Lumen MAC introducer with Swan-Ganz catheter in R internal jugular vein to monitor heart function intraoperatively
- Metoprolol 2 mg IV for heart rate control
- Maintenance anesthesia with sevoflurane, fentanyl, and rocuronium
- During reverse Trendelenburg, norepinephrine increased to 0.1 mcg/kg/min
- After patient was leveled, norepinephrine weaned
- Intraoperative epidural test dose neg; bupivacaine 0.125% started at 6 mL/hr
- One-lung ventilation uneventful
- At case end, hydromorphone 1 mg titrated to RR; emergence uneventful

DISCUSSION

The goals for perioperative management of HOCM are to maintain, normovolemia, normal sinus rhythm, normocardia, low inotropy, and high preload and afterload. Preoperatively, it is important to ensure the patient has taken a β-blocker, treat anxiety conservatively, and administer a fluid bolus. Surgical positioning is another important consideration that the anesthesiologist must plan for because certain positions like reverse Trendelenberg can cause decreased venous return and preload, which exacerbate HCM. For similar reasons, assessing and managing fluid status preoperatively is essential for optimal patient care in the operating room.

Induction is a critical time for these patients. It is recommended that a pre-induction arterial line is placed as well as a β-blocker like esmolol or metoprolol is given for rate control during intubation. In terms of maintenance, volatile anesthetic gases work well since they are myocardial depressants. Sevoflurane may be the best option because it has little to no effect on heart rate, though isoflurane may also be considered because it better preserves cardiac output—at the cost of increasing heart rate. There is some controversial evidence that suggests nitrous oxide may increase pulmonary arterial pressure, so it may be best to avoid using it for maintenance. One should also take extreme caution to monitor fluid status and surgical progress throughout the operation. It is also recommended to give the epidural test dose in the operating room, where there is an arterial line in place and pressors ready.

DISCUSSION (C

Other intraoperative events that may occu
and hypotension. For acute a-fib, cardio
control. For hypotension, effective interven
and treatment with vasopressors. Two ef
these scenarios are phenylephrine (α-1 ag
and β-1 agonist). As the goals of intra
tachycardia, hypotension, low systemic v
excessive inotropy, there are tradeoffs to u
both are effective options.

In addition to the standard ASA monito
(TEE) when available is a critical advanc
can assess intravascular status, evaluate th
disease, analyze myocardial function, and
TEE uses to consider are measureme
measurement of LVOT gradient in extreme

HOCM Periop Goals	
Normovolemia	
Normocardia	β-b
Low inotropy	Volatil
High preload	
High afterload	Vaso
Anxiolysis	

Table 1. HOCM Perioperative Goals an

REFEREN

1. Angelotti T, Fuller A, Rivera L, et al: Anesthesia for older patients with hypertrophic cardiomyopathy
2. Bellas JJA, Sánchez C, González A, Forteza A, López V, Fernández JG. Hypertrophic cardiomyopath
techniques. *Saudi J Anaesth*. 2021;15(2):189-192. doi:10.4103/sja.sja_952_20
3. Butterworth JF, Mackey DC, Wasnick JD. Morgan & Mikhail's Clinical Anesthesiology. McGraw Hi
4. Gajewski M, Hillel Z. Anesthesia management of patients with hypertrophic obstructive cardiomyop
5. Jain A, Jain K, Bhagat H, et al: Anesthetic management of a patient with hypertrophic obstructive car
prostate. Ann Card Anaesth 2010;13:246-248.
6. Kitai T, Xanthopoulos A, Nakagawa S, Ishii N, Amano M, Triposkiadis F, Izumi C. Contemporary D
Echocardiography and Multimodality Imaging. *Journal of Cardiovascular Development and Disease*
Ikezaki H, Tsuzaki K. Cardiovascular monitoring in patients with hypertrophic obstructive cardiomyo
doi:10.4103/sja.sja_379_21
7. Lanier W, Prough DS: Intraoperative diagnosis of hypertrophic obstructive cardiomyopathy. Anesthe
8. Maron BJ, Desai MY, Nishimura RA, et al. Management of Hypertrophic Cardiomyopathy: JACC St
doi:10.1016/j.jacc.2021.11.021
9. Moitra V, Mulakkal TA. Anesthesia for patients with hypertrophic cardiomyopathy undergoing nonca
https://www.uptodate.com/contents/anesthesia-for-patients-with-hypertrophic-cardiomyopathy-under
10. Poliac LC, Barron ME, Maron BJ: Hypertrophic cardiomyopathy. Anesthesiology 2006;104:183-192
11. Rozner M: Implantable cardiac pulse generators: pacemaker and cardioverter-defibrillators. In: Mille
Churchill Livingstone; 2005. p. 1415-1435.
12. Xuan TM, Zeng Y, Shu WL: Risk of patients with hypertrophic cardiomyopathy undergoing noncardi