

- Reversal agents can theoretically precipitate skeletal muscle contraction by facilitating depolarization of NMJ, but adverse responses do not predictably occur.

Postoperative Period

- Increased sensitivity to respiratory depressant effects of opioids or sedatives, including epidural opioids
- Postop pain to be managed with NSAIDs, regional blocks, and acetaminophen if possible
- Pulm complications due to poor cough possible

- Cardiac and respiratory monitoring and early chest physiotherapy

Anticipated Problems/Concerns

- If myotonia develops intraop, neither GA nor RA nor NMBs will attenuate it. Local infiltration of involved muscles may help. Even asymptomatic pts may have some degree of cardiomyopathy. Beware of premar-ture extubation, and consider postop ventilation.

- 57% of these pts have conduction defects, with one-third having primary block unresponsive to atropine. It is advisable to have antiarrhythmics and trans-thoracic pacing readily available as many anesthetic agents can increase vagal tone.
- For numerous reasons, it is advisable to avoid GA (e.g., myocardial depressants, conduction effects, link to malignant hyperthermia). Pts should have proce-dures done with RA if at all possible.

Myxoma

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Risk

- Although primary cardiac tumors are rare (<0.01%), myxoma is the most common type (50%).
- 75% develop in LA, with most attached to the inter-atrial septum.
- Rarely develop in ventricles.
- More common in females (70%).

Perioperative Risks

- May be friable and may embolize (30–40% of pts)
- LV- or RV-inflow obstruction with resultant hypotension
- May simulate pulm Htn and/or constrictive pericar-ditis physiology

Worry About

- Hypotension due to obstruction of ventricular inflow and/or incompetence of tricuspid (right) or mitral (left) valve, may be positional.

- Tumor flips on a stalk across valves, causing stenotic and/or incompetent symptoms.
- RV hypertrophy can occur because of longstanding left ventricular–inflow obstruction.
- There is the possibility of pulm or systemic embolization.

Overview

- Is a true neoplasm and distinct from a thrombus
- Usually polypoid, pedunculated with a 1–2 cm stalk, and round with smooth margins
- Typically grows very slowly before the patients becomes symptomatic (10–20 y)

Etiology

- Typically arises from the endocardium and rarely extends deeper.
- Polyhedral cells with small nuclei are separated by an afibrillar, eosinophilic myxomatous stroma that is predominantly a mucopolysaccharide.

- Although benign, this tumor rarely can undergo malignant degeneration.

Usual Treatment

- Surgical, usually curative
- Cardiopulmonary bypass required
- Median sternotomy, atriotomy with transseptal approach through fossa ovalis
- Resection including the root of the pedicle and the full thickness of the adjacent septum and then ASD closure

Assessment Points

System	Effect	Assessment by Hx	PE	Test
CV	Mitral or tricuspid stenosis or insufficiency syndromes	Edema and CHF	Atrial enlargement Systolic murmur (regurgitation) Diastolic murmur (stenosis)	ECHO, ECG, CXR CT, MRI
RESP	Pulmonary emboli (right)	DOE and cough	Rales, wheezing, and increased P ₂	ECHO, CXR, ECG
GI		CHF	Hepatic enlargement	Hepatic enzymes (if symptoms of CHF)
RENAL	Emboli (left)			Urinalysis Cr clearance
CNS	Stroke (left)	CNS dysfunction	CNS dysfunction	ECHO
GENERAL	Constitutional symptoms	Fever and malaise	Weight loss	ESR, CRP, Hct (anemia)

Key References: Reynen K: Cardiac myxomas, *N Engl J Med* 333(24):1610–1617, 1995; Essandoh M, Andritsos M, Kilic A, Crestanello J: Anesthetic management of a patient with giant right atrial myxoma, *Semin Cardiothorac Vasc Anesth* 20(1):104–109, 2016.

Perioperative Implications

Preoperative Preparation

- Differential Dx: Mitral stenosis/insufficiency (left), tricuspid stenosis/insufficiency (right), constrictive pericarditis, pulm Htn, and subacute bacterial endocarditis.
- Mitral stenosis: Hemodynamic aim is to keep pt in normal sinus rhythm with adequate preload and high-normal afterload (see Mitral Stenosis).
- Mitral insufficiency (regurgitation): Hemodynamic aim is to keep HR normal or fast and to vasodilate.
- Hemodynamics can mimic any or all of the above, depending on load-dependent variables prevailing in the cardiac cycle at the time (e.g., preload, after-load, HR)

Monitoring

- Routine monitors otherwise needed for cardiopul-monary bypass (e.g., standard ASA monitors, tem-perature, ECG, coagulation, Foley).
- Intra-arterial catheters.
- Beware of central line with right-sided atrial myxoma (may cause dislodgment of friable debris as pulm

emboli); TEE guidance (bicaval view) of guidewire placement may be helpful.

- TEE: Most sensitive way to guide hemodynamic management and assess the therapeutic approach.

Airway

- Routine

Preinduction/Induction

- Pt may develop hypotension if preload is decreased or HR is increased; best managed with a vasopressor (no or judicious use of inotropes).
- Insert a central venous catheter carefully and avoid a PA catheter in pt with a right-sided tumor.
- Intraop TTE is helpful/diagnostic (before induc-tion) if there is concern about right inflow obstruc-tion exacerbated by PPV and for monitoring of IV fluid administration.
- Avoid/treat atrial dysrhythmias.
- Have a surgical team present on induction in case of CV collapse.
- Initiate PPV carefully.

Maintenance

- May dislodge pieces during CPB venous cannula-tion; direct assessment of anatomy, physiology, and

even placement of venous cannulas should be guided by TEE.

- If pedunculated, a tumor may obstruct inflow tract, and hemodynamics may present as low BP, low CO, or increased CVP (right)/increased PCWP (left).

Extubation

- Expect separation from CPB with minimal support and overall excellent recovery with primary myxoma-tous lesion.
- Extubation criteria should be based on myocardial protection techniques and post-CPB bleeding risk.
- Early extubation consideration is reasonable.

Postoperative Period

- Beware of residual ASD (as tumors typically origi-nate in the atrial septum in the region of the fossa ovalis).
- Beware of conduction and rhythm disturbances (esp. in pediatric pts).
- Symptoms of pulm Htn usually regress quickly.

Anticipated Problems/Concerns

- Hypotension with inadequate preload when the lesion obstructs ventricular inflow