

SCA 129

DOXAZOSINE FOR PREOPERATIVE ALPHA ADRENERGIC BLOCKADE IN A PATIENT WITH PHEOCHROMOCYTOMA AND SINGLE VENTRICLE

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Introduction: Preoperative alpha adrenergic blockade is established before surgical resection of pheochromocytomas to control hypertension, re-expand the contracted intravascular space, and up-regulate alpha adrenergic receptors. It may result in hypotension and reflex tachycardia. We present the management of a patient with pheochromocytoma, a single ventricle, and a history of SVT, pulmonary edema and renal failure in whom afterload reduction, fluid loading, and tachycardia were a potential concern.

Case Report: Our patient was a 27 year old female diagnosed with pheochromocytoma during workup for hypertension following episodes of pulmonary edema.

Cardiac status: Initial anatomy was a DORV/PA/ hypoplastic LV. Following multiple procedures, she now had a single ventricle, discontinuous pulmonary arteries with a classic Glenn (superior cavopulmonary) shunt to right sided pulmonary arteries and a central aortopulmonary graft shunt to the left. Her ventricular function was mildly decreased. Baseline oxygen saturation was in the 80s%, hematocrit in the 50s%. She had a history of SVT responsive to Valsalva maneuvers. She was on furosemide, atenolol, losartan, ASA.

Endocrine status: Plasma norepinephrine was 7147 pg/ml (normal 70-750), plasma epinephrine was normal and dopamine mildly elevated. CT revealed a right adrenal mass of 2.3x1.9cm.

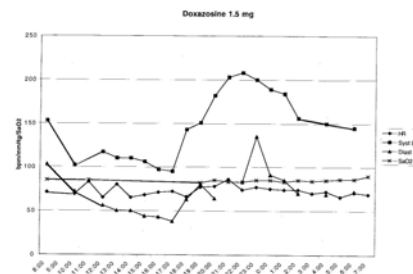
Preoperative preparation: The patient was admitted to the cardiac ICU. Furosemide, losartan and ASA were stopped and atenolol was reduced. She was started on doxazosine at 0.5 mg and the dose was increased to 1.5, 3, 5, 6, 8 and 10 mg with close monitoring of heart rate, blood pressure and oxygen saturation. Intra-venous hydration was added. Blood pressures normalized from peaks > 200 mm Hg systolic to maximum systolic < 150 mm Hg. Asymptomatic orthostatic hypotension could be demonstrated. Heart rate and oxygen saturation remained stable (figure 1). Weight increased from 54 to 56.1 kg.

Intraoperative management: Adrenalectomy was performed under a balanced anesthetic with sufentanil and isoflurane. Magnesium sulfate and fenoldopam infusions were used for vasodilation before and a brief infusion of phenylephrine was used immediately after tumor removal. Hemodynamic course was stable throughout the surgery without requirement of vasodilator or vasopressor bolus doses. The patient was extubated in the operating room and returned to the cardiac ICU without any cardiovascular support. Reduced doses of atenolol and furosemide were restarted postoperatively. She remained normotensive with normal heart rate and oxygen saturation in the 80s% postoperatively (figure 1, right panel). The patient was discharged home on POD 3.

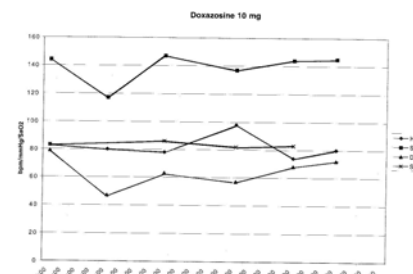
Discussion: Management concerns for this patients were:

1. Decreased SVR in this patient's cardiovascular physiology can result in decreased pulmonary perfusion and desaturation both during alpha blockade and following tumor removal.
 2. Fluid management: decreased preload reduces flow via the cavo-pulmonary shunt resulting in desaturation, excessive fluid loading had resulted in pulmonary edema previously.
 3. Reflex tachycardia could aggravate this patient's arrhythmia risk.
- Doxazosine* was chosen over phenoxybenzamine for preoperative alpha blockade [1]: its non-competitive alpha blockade would have allowed hypotension management with alpha agonists. Its shorter half life made persistent postoperative hypotension less likely. Its selective alpha-1 antagonism reduced the risk for reflex tachycardia, attributed in part to presynaptic alpha-2 blockade by phenoxybenzamine.

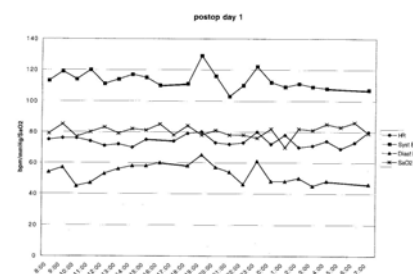
Figure 1: heart rate, systolic/diastolic blood pressure, and oxygen saturation pre- and postoperatively:



Doxazosine 1.5 mg (scale:0-250)



Doxazosine 10 mg (scale 0-160)



postop.day 1 (scale 0-140)

Reference: [1] Prys-Roberts C. Pheochromocytoma – recent progress in its management. *Br J Anaesth* 2000; 85: 44 – 57.