



ANAESTHETIC MANAGEMENT OF SEVERE AORTIC STENOSIS POSTED FOR ELECTIVE CEASERAN SECTION

Pavan Kumar Vecham*, Mrunalini Patel, Dhara Patel, Shakuntala Goswami, I.A. Chadha

Dept of Anaesthesia, B. J. Medical College, Civil Hospital, Ahmedabad, 380016, India.

Corresponding Author: - **Pavan Kumar Vecham**

E-mail: pavan.vecham@gmail.com

<p>Article Info Received 25/08/2014 Revised 29/08/2014 Accepted 14/09/2014</p> <p>Key words: Aortic stenosis, Stroke volume.</p>	<p>ABSTRACT Aortic stenosis is characterised by obstruction to ejection of blood from left ventricle into the aorta due to decrease in the aortic valve area (N-2.5 to 3.5cm²) which necessitates an increase in left ventricular pressure to maintain stroke volume. Most common causes: Degeneration, Calcification, Rheumatic infection, Infective endocarditis. More common in bicuspid (cong) than tricuspid valve. Severe as: 1) Valve area < 0.8cm², 2) Trans valvular pressure gradient > 50 mmHg.</p>
---	--

INTRODUCTION

Pathophysiology

Patients with aortic stenosis coming for noncardiac surgery are at high risk of major perioperative cardiac complications, and the risk of these complications increases with the complexity of the surgery, hence, the importance of ascertaining the severity of the aortic stenosis preoperatively.

Anaesthetic considerations for a patient with aortic stenosis

Avoid bradycardia or tachycardia, Maintain normal sinus rhythm, Avoid hypotension, Optimize intravascular fluid volume to maintain venous return and left ventricular filling.

CASE HISTORY

- 38 yr old parturient with severe AS posted for Elective LSCS.
- C/o breathlessness on exertion (NYHA 2),
- Pedal oedema : 2 mths(physiological)
- K/C/O: RHD since 15yrs Asthma 6yrs on treatment.
- Drug history: Inj penidura every 21 days iv.
- T.Frusemide (40 mg)/OD T.Atorvastatin (10mg)/OD Rotacap (Beclomethason + Levosalbutamol)/ (sos).

- No history of DM / HT/ IHD / TB / other diseases / drug allergies / blood transfusions
- P/H: Previous LSCS under GA 2½ yrs back with ICU admission (1 day) on mechanical ventilator.

Examination

- Wt** : 55 kgs.
Ht : 155 cms
PR : 96/minute, regular
BP : 110/70 mm Hg
Temp : normal
RR : 14 -16/ minute.
 No pallor/cyanosis/jaundice/clubbing.
 B/L pedal oedema noted (physiological)
RS : BLAE heard, clear
CVS : S1 S2 heard, pan systolic murmur (+) in all 4 areas, palpable murmur (+), carotid bruit (+), other systems normal.

Spine : Normal.

Airway : Mallampathi grading -1, Normal dentition.

Cardiologist opinion: T.Frusemide 40mg, T.Atorvastatin 10mg. Vasodilators to be avoided.

Investigation

Routine Investigations

Hb : 12.3



TC	: 8270
PC	: 2.55
Na/k	: 127/3.8
Sr.Urea	: 16.2
Sr.Creatinine	: 0.7
Total bilirubin	: 0.64
RBS	: 102.2
INR	: 0.93
ASO/CRP	: Negative
Bed side PFT	: BHT - 15
	SBC - 15

Special Investigations

- 2D Echo-EF-60%
- RVSP-40mmhg, AV- sclerosed & thick MV-thick
- TV/PV-Normal
- Chambers normal
- Pericardial effusion (+)
- RHD with mild MS, mild TR with mild PAH, concentric LVH, Severe AS, Good LV function
- ECG: Concentric LVH

Anaesthetic Management

Informed and written consent for ASA IV taken. Patient was kept in supine position with tilt towards left.

Monitoring

ECG, NIBP, IBP, CVP, SPO₂, ETCO₂, PNS, U/O, Temp. Defibrillator was kept ready

Base Line Vitals

- PR - 80/ min.
- BP – 122/70 mm of Hg.
- RR - 14-16/ min
- SPO₂ on air – 98-99%.

Premedication: (Aspiration prophylaxis)

10 min before induction : Inj.Ondansetron 4 mg/iv, Inj.Ranitidine 50 mg/iv , Inj.Glycopyrrolate 0.2 mg/im.

Epidural analgesia

In left lateral position with all aseptic and antiseptic precautions, Epidural catheter was placed in L3 –L4 space. Inj. Bupivacaine 0.125% 8.0cc with Inj.Fentanyl 50 mcg in 5.0cc NS (13cc total) was injected. Pt was oxygenated throughout the procedure.

Invasive Monitoring

Intra-arterial cannulisation was done in left radial artery using 20G IV cannula and IBP monitoring started. Central venous catheterisation was done in right internal jugular vein using Seldingers techniques with 22G HDN then using 16G long needle and catheter secured fixed and monitoring started.

General Anaesthesia

Pre oxygenation: 100% O₂ at 8 Lit/min with Bains circuit.

Induction

Inj Pentothal sodium 100mg/iv + Inj.Vecuronium 6mg/IV + Sevoflurane followed by IPPV for 3 min. Inj.Xylocaine 2% 3.0cc/iv 1min before intubation.

Intubation

7.5mm portex, cuffed, ETT. B/L air entry checked.

Maintenance

O₂ + Sevoflurane + Inj.Vecuronium bromide through controlled ventilation.

A live male child of 2.7 kg was extracted after 15 min of induction. Inj.Oxytocin drip (40 unit in 350 ml NS) started. Inj.Methergine and Prostaglandins were avoided.

Other drugs

Inj.Dexona 8mg/IV, Inj.Esmolol infusion started and titrated as per heart rate and blood pressure.

General Anaesthesia

- Intra operative fluid : 400ml
- Urine output : 100ml
- Blood loss : 500-600ml
- Reversal of anaesthesia:

- 1) Inj.Glycopyrrolate 0.3mg/iv, after 2-3min,
- 2) Inj.Neostigmine 2.5mg/iv given
- 3) Inj.Xylocard 2% 3.0cc/iv

Salbutamol inhaler puffs were administered through ETT and ventilated.

- Thorough oral and endo tracheal suctioning was done.
- Patient was extubated after full consciousness with adequate respiratory efforts and good muscle tone.
- Patient was then observed for 30 -45 min on OT table.
- Intra operative period was uneventful
- Patient was transferred to post-operative recovery room with all due monitoring set up made available.

POSTOPERATIVE MANAGEMENT

- Nil by mouth for first 24 hours.
- Continuous monitoring of the patient vitals through a multipara monitor.
- Oxygen support, head end elevation, strict input and output charting.
- CVP guided fluid administration (6 – 8mm Hg).
- Post-operative analgesia was given through epidural catheter with Inj. Fentanyl 50 mcg in NS for 48 hours. Post-operative period was uneventful.

CHOICE OF ANAESTHESIA

Regional Anaesthesia

- Sympathetic blockade.
- Decrease SVR -↓ cardiac output.
- Hypotension and bradycardia.
- So sole regional anaesthesia is not preferred.

General Anaesthesia

- Prevents sympathetic block



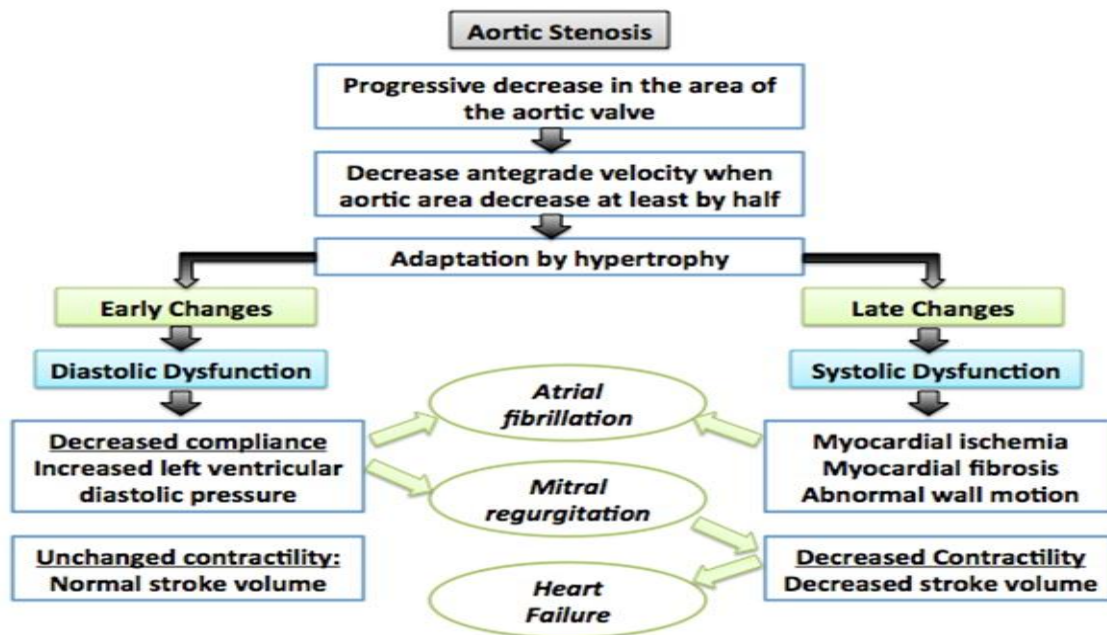
• Stress of surgery – increase heart rate can be controlled by beta blocker (as we preferred esmolol)

• Intra op pain can be controlled with epidural analgesia (Bupivacaine and Fentanyl).

Table 1. Severity of aortic stenosis measured by echocardiography

MESUREMENT	MILD	MODERATE	SEVERE
Mean Transvalvular Pressure Gradient	<20	20-50	>50
Peak Transvalvular Pressure Gradient	<36	>50	>80
Aortic Valve Area	1.0-1.5	0.8-1.0	<0.8

Figure 1. Characteristics of Aortic stenosis



DISCUSSION

The patient with aortic stenosis has a fixed stroke volume and to maintain cardiac output must elevate SVR and heart rate which compromises left ventricular filling. Pregnancy will aggravate symptoms of AS by decrease SVR and fluctuation of CO during labour pain. (Elective caesarean section is preferred). The pregnant woman with aortic stenosis is extremely intolerant of change in left ventricular pre load. A decrease in preload can produce cardiogenic shock (regional anaesthesia). An increase in preload can precipitate pulmonary oedema.

Choice for GA is made on the basis that the avoidance of sympathetic blockade which occurs with regional anaesthesia decreases the risk of significant hypotension following a reduction in systemic vascular resistance. We preferred balanced anaesthesia technique (GA + Epidural analgesia):

To decrease the stress of surgery by providing analgesia& to maintain heart rate & preventing in hypotension as well as maintaining intra vascular volume.

In our case the goals of anaesthetic management were achieved by

1) CVP guided fluid therapy

Optimised fluid management and maintaining intravascular volume.

2) Invasive Blood Pressure

Monitoring beat to beat variation of blood pressure to control hypotension.

3) Selecting cardio stable drugs

Fentanyl, Sevoflurane, Vecuronium bromide, Esmolol and Xylocard (precise control of heart rate and blood pressure)

4) Role of Defibrillator

Cardiopulmonary resuscitation is not effective in patients with aortic stenosis because it is difficult to create an adequate stroke volume across a stenotic aortic valve with cardiac compression.

5) Epidural analgesia

For adequate pain relief peri operatively which prevents tachycardia there by maintaining coronary perfusion.

CONCLUSION

Anaesthetic management of parturient with severe aortic stenosis requires meticulous preparation and



multidisciplinary approach to maintain cardiovascular stability. We could manage such a patient successfully by maintaining normal sinus rhythm, adequate intra vascular

volume as per CVP monitoring and providing perioperative analgesia.

REFERENCES

1. Roberta L Hines, Katherine E Marschall, *Stoelting's Anesthesia and Co-Existing Disease*. 5th ed, Philadelphia: Churchill livingstone, 2008.
2. Subhamay Ghosh, Lajos Bogar and Ahmed Sabry. *Anaesthetic Considerations for Patients with Severe Aortic Stenosis, Aortic Valve Stenosis*, 2011.
3. Ronald D. Miller, MD, Lars I. Eriksson, Lee A. Fleisher, MD, Jeanine P. Wiener-Kronish, MD and William L. Young. *Miller's text book of anaesthesia* 7th edition, 2010.
4. Dan Longo, Anthony Fauci, Dennis Kasper, Stephen Hauser. *Harrisons* 18th Edition of Internal Medicine, 2011.

