International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Epidural Volume Extension Technique - A Novel Approach for Anaesthetic Management of RHD with Severe AR Posted for Elective LSCS

Dr. Mangalagouri G Bhat[1], Dr. Priti Devalkar[2]

[1]Junior Resident, Department of Anaesthesiology – Seth GS Medical college & KEM Hospital

[2]Additional Associate Professor, Department of Anaesthesiology – Seth GS Medical college & KEM Hospital

Abstract: ***Background: Epidural volume extension technique is emerging as one of the safe Anaesthetic technique especially in high risk obstetrics cases. We routinely practice this method in elective cases in Obstetric OT. Case description: 22 year old primigravida with 38 weeks of gestation in a K/C/O RHD with severe AR since the age of 12 years was admitted for safe conception. She c/o occasional palpitation on exertion, O/E she was found to have bounding pulse which is regular. Diastolic murmur was heard on auscultation in aortic area (Grade 3) and suprasternal pulsations were present.2D echo was s/o severe AR, 12 lead ECG – s/o LVH. On day of surgery, Combined spinal epidural anaesthesia was given & Epidural volume extension was done with Normal saline immediately post spinal. Procedure was done uneventfully without any hemodynamic instability & epidural supplements.***

Keywords: Combined spinal epidural, Epidural volume extension, RHD with severe AR

1. Introduction

Obstetric patients who require caesarean sections and have reduced cardiac function may pose a special challenges to the anaesthesiologist and may call upon their knowledge of regional anaesthesia [1]. The anaesthesia method should be selected so that it causes the fewest haemodynamic disturbances and has the highest safety profile for both the mother and the foetus.

The combined spinal epidural (CSE) is a common anaesthetic technique today. It can be used for postoperative analgesia and has a quick onset and long duration. Another kind of CSE is epidural volume extension (EVE). This technique involves injecting normal saline into the epidural space after injecting local anaesthetics intrathecally (2)

2. Case Description

22 year old Primi with 38 weeks of gestation was posted for elective LSCS. She is a K/C/O of RHD with severe AR, mild MR since 12 years of her age. She was started On Benzathine penicillin prophylaxis every 21 days since 2010. Tablet Lasix 20mg OD was started by cardiologists since 8th month of gestation

On pre anaesthetic evaluation: Pulse - 98 BPM - tapping in nature, BP - 120/50 MMHG. Cardiovascular system examination revealed**diastolic murmur** in **aortic area** which was **grade 3** without palpable thrill. **Suprasternal pulsations were present.**

Other systemic examination were within normal limits

INVESTIGATIONS: HB/TC/PLT – 12.1/7890/2.5 lac, BUN/creatinine - 6/0.9, SGOT/SGPT - 27/18
Na+/K+/Cl - = 135/3.6/103, PT/INR - 12.4/0.94 , **12 lead ECG – S/o LVH**

2D ECHO - EF 60%, Rheumatic affection of AV/MV, severe AR, mild MR MVA - WNL, LVIDs – 45 mm

On the day of surgery – We confirmed NMB status, Informed consent from patient and relative.

ICCU Standby, Blood & Blood products were confirmed.

Patient was then takeninside OT – standard ASA monitors were attached, 2 wide bore IV taken Aspiration &Antibiotic prophylaxis given. Preloading started slowly with Ringer lactate. A wedge was placed under the right hip joint till baby delivery.

Combined spinal epidural anaesthesia (18G/27G) was planned for the procedure in sitting position.

18G Tuohy's epidural needle was inserted at **L3 - L4** interspace by loss of resistance technique.

Once the epidural space was confirmed, **27G whitacre spinal** needle inserted through epidural needle. **Inj Bupivacaine Heavy 0.5% 1.2 ml + Inj Fentanyl 25 microgram** injected intrathecally

Epidural volume extension was done with **5 ml** of Normal saline 0.9%

T10 level was achieved within 3 minutes & T6 level was achieved within 5 minutes.

After baby delivery injoxytocin 10 U was started as slow infusion. Inj Lasix 5mg iv was given (As there is risk of cardiac overload after placental autotransfusion)

Procedure was done uneventfully. Patient was Hemodynamically stable throughout the procedure. There was no need of vasopressor supplementation or need of epidural top up during surgery.

Patient was shifted to HDU for further monitoring.

3. Discussion

Epidural volume extension involves injection of normal saline into the epidural space soon after an intrathecal injection, with the aim of augmenting the sensory block height. (3)

Even low concentrations of local Anaesthetics like Lignocaine, Bupivacaine can be used instead of Normal saline, but they may cause more hemodynamic instability compared to normal saline.

Disadvantage with normal saline is that sometimes level may recede faster and we may need to give more supplementation with local Anaesthetics.

It provides adequate level of anaesthesia and analgesia with minimum hemodynamic disturbances with maximum safety profile for both mother and fetus (3)

It has advantages over GA as the airway manipulation and the accompanying stress response, which has adverse effect on the patient's cardiovascular status is avoided and also faster motor recovery. (4, 5)

Advantage with this technique is that, we can also use epidural in postoperative period for analgesia (6)

In aortic regurgitation, regional anaesthesia is more preferred compared to general anaesthesia as there is decreased systemic vascular resistance which helps left ventricle to pump effectively.

We routinely practise this technique in our institute for high risk and normal pregnancy patients and we have had a successful outcome

4. Conclusion

Epidural volume extension technique can be safely used in high risk cardiac patients coming for LSCS to achieve the desired level of surgical anaesthesia without causing adverse hemodynamic disturbances.

References

[1] Pandya ST, Chakravarthy K, Shah PJ, Trikha A. Obstetric anaesthesia as a career. *Indian J Anaesth.*2021; 65: 43–7. [PMC free article] [PubMed] [Google Scholar]
[2] Kane T, Tubog TD, Kane JP. Effect of epidural volume extension on quality of combined spinal –epidural anaesthesia for caesarean delivery: A systematic review and meta analysis. *AANA J.*2018; 86: 109–18. [PubMed] [Google Scholar]
[3] Epidural volume extension technique in high risk obstetric patients – Case series Y Smitha and CP Naveen Kumar
[4] Tiwari AK, Singh RR, Anupam RP, Ganguly S, Tomar GS. Epidural volume extension: A novel technique and its efficacy in high risk cases. *Anesth Essays Res.*2012; 6: 233–5. [PMC free article] [PubMed] [Google Scholar]
[5] Yeoh SB, Leong SB, Heng AST. Anaesthesia for lower - segment caesarean section: Changing perspectives. *Indian J Anaesth.*2010; 54: 409–14. [PMC free article] [PubMed] [Google Scholar]
[6] Kumar A, Sinha C, Kumar A, Kumari P. Epidural volume extension for caesarean section in a patient with severe pulmonary stenosis and moderate tricuspid regurgitation. *Indian J Anaesth.*2019; 63: 242–3. [PMC free article] [PubMed] [Google Scholar]
[7] Kaplan book of cardiac anaesthesia & Miller's anaesthesia