

CASE REPORT

Open Access



Anesthetic management of a parturient with Ebstein anomaly posted for medical termination of pregnancy

Roshan Andleeb^{1*} and Rajnish Kumar²

Abstract

Pregnancy in Ebstein anomaly could cause acute decompensated heart failure. Therefore, medical termination of pregnancy is the next course of action in such cases. We present a case of 25-year-old primigravida with Ebstein anomaly posted for termination of pregnancy at 8 weeks of gestation. The patient had dyspnea on minimal exertion with a recent episode of upper respiratory tract infection. Caudal epidural in place of lumbar epidural or general anesthesia was chosen in view of the recent episode of respiratory infection and minimal hemodynamic changes and early recovery of motor blockade associated with the former. Pregnancy was terminated successfully with minimal intraoperative hemodynamics variation.

Hence, for minor gynecological procedure like termination of pregnancy, caudal epidural anesthesia provides an alternative option especially in cases where hemodynamic variation is least desired like decompensating congenital heart condition.

Keywords: Ebstein anomaly, Caudal anesthesia, Parturient

Background

Ebstein anomaly is a rare cardiac congenital condition with a prevalence of 0.3–0.5% of all congenital heart diseases (Attenhofer Jost et al. 2005). It is a morphological and functional malformation of the tricuspid valve and right ventricle which results in tricuspid regurgitation and atrialization of proximal portion of the right ventricle, leading to the formation of a poorly contractile thin-walled right ventricle and an enlarged right atrium.

Most patients with Ebstein anomaly survive until reproductive age. Physiological cardiovascular changes of pregnancy (increased blood volume, increased cardiac output, decreased systemic vascular resistance) and declining right ventricular function of Ebstein anomaly often worsen the tricuspid regurgitation, and patient lands into acute decompensated heart failure (Donnelly et al. 1991; Connolly and Warnes 1994). According to current guidelines, women with Ebstein anomaly without cyanosis and heart failure usually tolerates pregnancy well (The Task Force on the Management of

Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC) 2011; Katsuragi et al. 2013), but the presence of arrhythmia or cyanosis in the mother is associated with increased maternal and fetal risk (Donnelly et al. 1991). Therefore, symptomatic patients with cyanosis and/or heart failure should be treated before pregnancy or counseled against pregnancy.

Here, we report a case of medical termination of pregnancy in a parturient with Ebstein anomaly conducted under caudal epidural.

Case report

Written, informed consent was obtained from the patient for publication of this case report. Institutional Ethical Board (Indira Gandhi Institute of Medical Science, Patna, Bihar, India) approval is not required for publication of isolated case reports. The patient was a 25-year-old primigravida, referred from the cardiology unit to the obstetric unit of Indira Gandhi Institute of Medical Science, Patna, Bihar, India, for medical termination of pregnancy at 8 weeks of gestation. The patient had Ebstein anomaly with severe tricuspid regurgitation and severe right ventricle dysfunction and was receiving

* Correspondence: roshan8978@gmail.com

¹Department of Anaesthesiology, AIIMS, Rishikesh, Uttarakhand, India
Full list of author information is available at the end of the article

treatment (digoxin and diuretic) under the supervision of cardiology unit.

On examination, the patient was conscious, coherent, but restless with a complaint of breathlessness on minimal exertion and peripheral cyanosis. Pulse rate—96/min regular, normal in volume; respiratory rate—36/min; blood pressure—98/60 mmHg; oxygen saturation (Spo₂)—88–90% on room air.

On examination of the cardiovascular system, jugular venous pressure was raised and a pansystolic murmur was heard in the tricuspid area. On auscultation of the lung, bilateral wheeze was present. There was a history of recent lower respiratory tract infection for which the patient was taking antibiotic. Investigation showed hemoglobin of 13 g/dl, total leukocyte count 16,000/cmm. Renal function, liver function, and thyroid function were within normal range. Electrocardiogram was showing tall p wave, wide QRS with ST-T changes, and T wave inversion in III, aVF, and chest leads. Echocardiography was showing dilated right atrium and right ventricle with prolapse of anterior leaflet with severe tricuspid regurgitation and severe right ventricular dysfunction (right ventricle ejection fraction—20% and left ventricle ejection fraction—60%). A patent foramen ovale with intracardiac shunting was also present.

The patient was scheduled for medical termination for pregnancy by dilatation and curettage under caudal epidural. The anesthetic plan, risks, benefits, and options were discussed with the patient and informed consent obtained.

The patient was premedicated with ranitidine 150 mg orally on the night before surgery. Antibiotic prophylaxis (ampicillin 2 g and gentamycin 80 mg) were given intravenously 30 min before shifting to operating room on the morning of surgery. All routine and emergency drugs and equipment including defibrillator were kept ready in operation theater. Intravenous fluid (Ringer's lactate) was started as per maintenance requirement. Proper precautions were taken to avoid air bubbles in the peripheral venous lines. All standard monitors were placed and in the left lateral position sacrococcygeal area was cleaned and draped. The sacral hiatus was located by first palpating the coccyx and then sliding the palpating finger in a cephalad direction until a depression in the skin was felt. A 22-G needle was used to pierce the sacrococcygeal ligament, and after repetitive negative aspiration, 25 ml 0.5% ropivacaine was injected in the caudal space.

Level of sensory block was assessed by pinprick method and motor block by the modified Bromage scale (Breen et al. 1993). Time of onset was 25 min for the sensory blockade and 32 min for the motor blockade. Sensory level was 12th thoracic dermatome and motor blockade was grade 1 as per the modified Bromage scale.

Procedure lasted for 24 min, and in intraoperative, blood pressure was 96–110/58–66 mmHg, heart rate 96–104/min, and Spo₂ 92–94% with O₂ flow at 6 L/min via oxygen mask. The patient shifted to the intensive care unit for postoperative monitoring. The duration of sensory blockade and motor blockade was 205 min and 162 min, respectively. There was no postoperative urinary retention. Postoperative period was uneventful. The patient was transferred on 2nd postoperative day to the cardiology unit.

Discussion

Maintenance of preload and afterload, sinus rhythm, and prevention of any increase in left to right shunt, which may occur due to decrease in systemic vascular resistance or increase in pulmonary vascular resistance or with increased intrathoracic pressure, are the basic principles of anesthetic management (Rathna et al. 2008a) in patients of Ebstein anomaly.

Literature provides many case reports in which these patients are successfully managed with general anesthesia and lumbar epidural anesthesia (Chatterjee et al. 2008; Macfarlane et al. 2007; Misa and Pan 2007; Rathna et al. 2008b).

We overruled intravenous sedation or general anesthesia in the view of lower oxygen saturation, the presence of bilateral wheeze, and the recent episode of lower respiratory infection.

We preferred caudal epidural in lieu of lumbar epidural because caudal block does not routinely result in sympathetic blockade of lower extremities and does not cause hypotension to the degree witnessed with lumbar epidural blockade (Saint-maurice et al. 1993; Hadric 2007). Caudal epidural block results in sensory and motor block of lower lumbar and sacral root (L5-S5) whereas lumbar epidural block causes blockage of the thoracolumbar sympathetic outflow (T10-L2) (Saint-maurice et al. 1993) which are responsible for maintaining hemodynamics status (Hadric 2007). Thus, caudal anesthesia provides maximal hemodynamic stability, profound perioperative analgesia, and early recovery of motor blockade (Hadric 2007).

Vergheese et al. (2018) in their research article concluded that caudal block in the adult does not disturb sympathetic outflow and thus does not cause hypotension; also, intravenous fluid loading and/or vasopressors are not warranted as for spinal and lumbar epidural block.

Wong et al. (2004) found that the caudal block produces minimal hemodynamic changes with moderate rapid onset of surgical anesthesia and early recovery of motor blockade along with short-term need for postoperative monitoring or care. Thus, caudal epidural block

offers an effective, safe, and reliable option in anesthesia for ambulatory patients.

Caudal anesthesia was found to have no definite correlation with postoperative urinary retention by Pappas et al. (1997). Wong et al. (2004) in their study conducted minor gynecological surgery under caudal anesthesia with success. Abouleish (1976) has given labor analgesia by caudal epidural. Chen et al (1987) first reported the use of caudal block in vaginal delivery.

Conclusion

Due to technical simplicity and safe profile (no respiratory involvement, less hemodynamic changes, and no clinical adverse outcomes), caudal epidural offers adequate anesthesia for minor gynecological procedure with satisfactory lesser recovery time especially in those cases where hemodynamic instability is least desired.

Acknowledgements

Nil

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Authors' contributions

RA had done the design, the clinical studies, and the manuscript preparation. RK had done the definition of the intellectual content and the manuscript editing. Both authors read and approved the final manuscript.

Funding

Nil.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Institutional Ethical Board (Indira Gandhi Institute of Medical Science, Patna, Bihar, India) approval is not required for publication of isolated case reports.

Consent for publication

Written, informed consent was obtained from the patient for publication of this case report.

Competing interests

The authors declare that they have no competing interests.

Author details

¹Department of Anaesthesiology, AIIMS, Rishikesh, Uttarakhand, India.

²Department of anaesthesiology, AIIMS, Patna, Bihar, India.

Received: 11 January 2019 Accepted: 11 October 2019

Published online: 13 November 2019

References

- Abouleish E (1976) Caudal analgesia for quadruplet delivery. *Anesth Analg* 55:61–63
- Attenhofer Jost CH, Connolly HM et al (2005) Ebstein's anomaly: review of a multi-faceted congenital cardiac condition. *Swiss Med Wkly* 135:269–281
- Breen TW, Shapiro T, Glass B, Foster-Payne D, Orio NE (1993) Epidural anesthesia for labor in an ambulatorypatient. *AnesthAnalg* 77:919–924

- Chatterjee S, Sengupta I, Mandal R, Sarkar R, Chakraborty PS et al (2008) Anaesthetic management of caesarean section in a patient with Ebstein's anomaly. *Indian J Anaesth* 52(3):321–323
- Chen JS, Lau HP, Chao CC (1987) Caudal block in vaginal delivery. *Ma Zui Xue Za Zhi* 25:145–150
- Connolly HM, Warnes CA (1994) Ebstein's anomaly: outcome of pregnancy. *J Am Col Cardiol* 23:1194–1198
- Donnelly JE, Brown JM, Radford DJ (1991) Pregnancy outcome and Ebstein anomaly. *Br Heart J* 66:368–371
- Hadric A (2007) *NYSORA Textbook of Regional Anesthesia and Acute Pain Management*. McGraw-Hill Education, China
- Katsuragi S, Kamiya C, Yamanaka K et al (2013) Risk factors for maternal and fetal outcome in pregnancy complicated by Ebstein anomaly. *Am J Obstet Gynecol* 209:452.e1–452.e6
- Macfarlane AJ, Moise S, Smith D (2007) Caesarean section using total intravenous anaesthesia in a patient with Ebstein's anomaly complicated by supraventricular tachycardia. *Int J Obstet Anesth* 16:155–159
- Misa VS, Pan PH (2007) Evidence-based case report for analgesic and anesthetic management of a parturient with Ebstein's anomaly and Wolff-Parkinson-White syndrome. *Int J Obstet Anesth* 16:77–81
- Pappas ALS, Sukhani R, Hatch D (1997) Caudal anesthesia and urinary retention for ambulatory surgery. *Anesth Analg* 85:706
- Rathna R, Tejesh CA, Manjunath AC, Mathew KT (2008a) Anesthesia for incidental surgery in a patient with Ebstein's anomaly. *SAARC J Anesth* 1:85–87
- Rathna TCA, Manjunath AC et al (2008b) Anaesthesia for incidental surgery in a patient with Ebstein's anomaly. *SAARC J Anaesth* 1:85–87
- Saint-maurice C, Laundais A, Othmani H, Khalloufi M (1993) The trans-sacral route can be the technique be sapmlified ? *Cah Anesthesiol* 41:235–236
- The Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC) et al (2011) ESC Guidelines on the management of cardiovascular diseases during pregnancy. *Eur Heart J* 32:3147–3197
- Vergheese DC, Sonya K, Aftab S, David S (2018) Reinventing adult caudal epidural block: a retrospective analysis. *Eur J Pharm Med Res* 5(4):318–323
- Wong S, Li J, Chen C (2004) Caudal epidural block for minor gynecologic procedures in outpatient surgery. *Chang Gung Med J* 27:116–121

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)