Case Report

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Combined Spinal Epidural Anesthesia in a Parturient with Kyphoscoliosis, Chronic Hypertension and Transverse Lie

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Abstract

Kyphoscoliosis is associated with physical and functional problems which are challenging both to the anaesthesiologist and obstetrician. We present a parturient at 34 weeks of gestation having severe kyphoscoliosis and chronic hypertension with fetus in transverse lie. She underwent classical Caesarean section under combined spinal and epidural anaesthesia. Perioperative period was uneventful, but the neonate had multiple congenital anomalies.

Keywords: Kyphoscoliosis; Chronic Hypertension; Transverse Lie; Combined Spinal Epidural Anaesthesia.

Introduction

Kyphoscoliosis is a musculoskeletal disorder resulting in abnormal curvature of spine both in the coronal and sagittal plane. Kyphosis is the convex curvature of spine above 45^0 and scoliosis is the lateral curvature as assessed by the Cobb's angle. Pregnancy exacerbates the severity of deformity and associated cardiopulmonary problems. Systemic hypertension causes additional risk in these patients. Obstetric complications like small for gestational age, preterm delivery and malpresentation are common in them. Combined spinal epidural anaesthesia is technically demanding and controversial due to the anatomical and functional impairment in these patients.

Case Report

A 30 year old second gravida with one abortion was admitted at 34 weeks of gestation. She had progressive thoracolumbar kyphoscoliosis since childhood with respiratory dysfunction for which she had been treated several times with antibiotics, bronchodilators, corticosteroids, diuretics, oxygen therapy and non-invasive ventilation. She had breathlessness and desaturation at rest and was on intermittent oxygen through face mask at home. She was on Tab. Nifidepine and Methyldopa for chronic hypertension.

She was orthopneic with respiratory rate of 24/min. and room air oxygen saturation 89%, which improved to 98% with oxygen. She weighed 60 kg with a height of 148cm. Her pulse rate was 108/min and blood pressure 180/110 mm of Hg. Jugular venous pressure was not raised, but there was bilateral pedal edema. There was severe thoracolumbar kyphoscoliosis with air entry markedly reduced over the right lung fields. Apex beat was not palpable but the heart sounds were normally heard. Airway was Mallampatti grade II with adequate mouth opening and neck movement. Spine showed severe thoracolumbar kyphoscoliosis with hardly felt interspinous spaces. Obstetric examination revealed uterine size of 32 weeks of gestation with singleton pregnancy in transverse lie. There were no features of impending eclampsia.

Routine haemogram was normal and there was mild albuminuria. Arterial Blood Gas on room air was pH 7.42, pO_2 72 mmHg and pCO_2 59 mmHg. Chest radiograph showed severe kyphoscoliosis with convexity towards right (Cobb's angle 70^o) and mediastinal shift to right. Electrocardiogram was normal and echocardiography showed left ventricular ejection fraction 57%. CT thorax taken before pregnancy showed scoliosis to the right with loss of lung volume and bilateral bronchiectatic changes. Pulmonary function test

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was restrictive pattern with forced vital capacity (FVC) 40%, forced expiratory volume in 1 s (FEV_1) 29% of predicted value with FEV_1/FVC ratio 90%. Ultrasound revealed single live fetus of 34 weeks gestational age with transverse lie and placenta anterior grade II.

In view of worsening respiratory function, uncontrolled hypertension and transverse lie, Caesarean section was planned under high risk consent. Antihypertensives, bronchodilators, antibiotics and intermittent oxygen inhalation were continued.

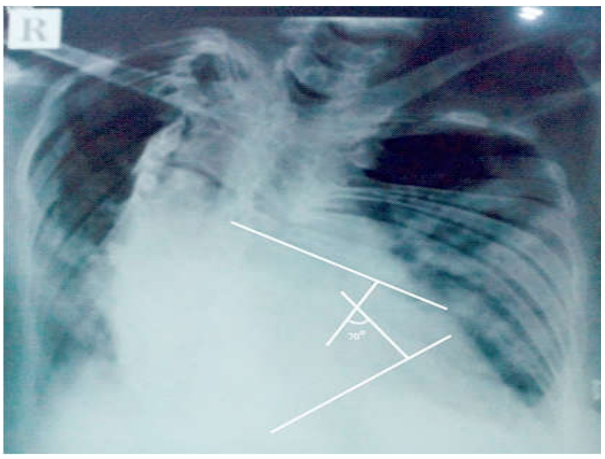

Fig. 1: Chest radiograph showing Cobb's angle 70°

Fig. 2: Patient positioned sitting for anaesthesia

Fig. 3: Epidural catheter in situ and subarachnoid puncture

She was given Ranitidine 50mg and Metoclopramide 10 mg intravenously and shifted to the operation theatre and was positioned sitting with oxygen inhalation, supported by an assistant. Intravenous co-loading was done with 250ml of ringer lactate. ECG, NIBP and pulse oximeter were attached which showed acceptable values. Epidural space was entered in the first attempt at L2-3 interspace by left paramedian approach using loss of resistance technique by 18G Tuohy needle. Epidural catheter was fixed 3cm inside and test dose of 2ml 2% lignocaine with 1:400,000 adrenaline was given. Subarachnoid puncture was then done at L3-4 interspace using 25G Quincke needle, by left paramedian approach in a single attempt and 1.4 ml of 0.5% bupivacaine heavy with 25µg fentanyl was administered.

Patient was positioned supine with wedge under the right buttocks and 30^0 head up tilt with oxygen inhalation. Level of anaesthesia up to T6 level was achieved, and patient was hemodynamically stable. Caesarean section was done by classical approach since the lower uterus segment was not formed and surgically inaccessible. Preterm male baby weighing 1400g was delivered with APGAR 9 at 1 minute, and was shifted to neonatal ICU. Oxytocin 10 units was infused, and the uterus contracted satisfactorily. Due to high maternal risk in future pregnancy due to the progressive cardiorespiratory compromise, maternal sterilization was done alongwith. Continuous epidural analgesia was initiated with continuous infusion of 0.625 % bupivacaine for post-operative analgesia. She was observed in intensive care unit for 48 hours, which was uneventful and later transferred to the postoperative ward.

Evaluation of the neonate revealed multiple congenital anomalies with low set ears, high arched palate, hypospadias and intracardiac left to right shunts.

Discussion

Kyphoscoliosis occurs due to the imbalance between structural and dynamic components of neuromuscular elements of the spine. About 80% are idiopathic due to genetic and environmental factors. The incidence of adolescent idiopathic kyphoscoliosis is about 4 per 1000 population with females affected four times more. Scoliosis often presents itself, or worsens during the adolescent growth spurt, more often in females. Pregnancy exacerbates both the severity of the deformity and cardiopulmonary problems associated with kyphoscoliosis. Congenital kyphoscoliosis can be due to the malformation of spine or due to failure of formation or segmentation resulting in abnormally shaped or fused vertebrae, leading to abnormal curvature of the spine. Congenital disorders like Von Reckilnghausens' neurofibromatosis and Marfan's syndrome are often associated with kyphoscoliosis. Secondary causes are commonly neuropathic or myopathic conditions causing loss of muscular support so that the spinal column is pulled in abnormal directions, which include muscular dystrophy, poliomyelitis and cerebral palsy.

Severity of kyphoscoliosis is graded by measuring Cobb's angle, which is the angle between two perpendicular lines drawn from the outer surfaces of the uppermost and the lowermost vertebrae involved. It is classified as mild (11–25^{o}), moderate (25–50^{o}), or severe (>50^{o}). Clinical symptoms occur in those with Cobb's angle above 25^{0} and surgical correction is usually advised in those above 40^{0}. In our case, Cobb's angle was 70^{o} which was a severe deformity.

Cardiopulmonary manifestations of kyphoscoliosis results from the restrictive lung defect and atelectasis due to the chest wall deformity causing respiratory failure, pulmonary hypertension and right heart failure. Mediastinal shift caused by the deformity further compromises the functional disability. In severe cases fatality occurs by fourth to fifth decade due to cardiorespiratory dysfunction.

Kyphoscoliosis especially those involving lower spines distorts the pelvic anatomy causing fetal malpositions increasing the incidence of operative or instrumental deliveries. Chronic maternal hypoxia increases the chance of congenital abnormalities in the fetus, intrauterine growth restriction and preterm delivery. Caesarean section is often technically difficult due to anteflexion of the uterus in the small abdominal cavity and inaccessibility of lower uterine segment, which may necessitate classical approach.

The choice of anaesthesia for caesarean section is decided by the anatomical severity, functional reserve, experience of anaesthesiologist and patient preference. General anaesthesia with endotracheal intubation and controlled ventilation can ensure airway control and hemodynamic stability. However difficult airway due to altered anatomy, problems with positioning, maternal changes due to pregnancy and poor cardiorespiratory reserve often makes it non-attractive. Subarachnoid and epidural blocks are technically difficult and unpredictable level of anaesthesia can occur due to the alteration in spinal anatomy. However if technically feasible, it can be advantageous in providing good intraoperative and post-operative analgesia with an awake mother and reduced blood loss. Unsuccessful or multiple attempts, hypotension and pulmonary oedema due to autotransfusion from the uterus and on return of vascular tone are the inherent risks.

Though technically difficult, we have chosen combined spinal and epidural anaesthesia for the following reasons. This was a planned procedure and adequate time could be taken to establish the blockade. The patient was co-operative, and preferred sitting position, which was comfortable also for the anaesthesiologist. In case of inadequate or failed subarachnoid block, epidural could be used to supplement the anesthesia and can be extended for post-operative analgesia. General anaesthesia could be avoided due to the inherent risks in the obstetric patient and the added risk of airway and the compromised cardiopulmonary function due to severe kyphoscoliosis.

Classical caesarean section was done in this patient due to technical feasibility. Since the lower uterine segment was not formed and surgically inaccessible, uterine incision was put on the upper segment. As future pregnancy will be life threatening to the mother, sterilization was performed concurrently. The baby delivered was preterm, small for date and with multiple congenital anomalies which may be the result of maternal anatomical aberrations and chronic hypoxemia.

Conclusion

Maternal kyphoscoliosis increases the peripartum

morbidity and mortality for both mother and the neonate. Chronic maternal uncontrolled hypertension and Caesarean section for a preterm fetus in transverse lie significantly increases the risk. Successful conduction of combined spinal and epidural anaesthesia provided good operative conditions and post-operative analgesia in this patient. Classical Caesarean section was done due to the anatomical variations and the mother was sterilized to avoid future pregnancy which can be life threatening in this high risk patient who had delivered a preterm small for date neonate with multiple congenital anomalies.

References

1. Bergofsky EH. Respiratory failure in disordersof the thoracic cage. Am Rev Dis, 1979; 119:643.
2. Kumar R, Singh K, Prasad G, Patel N. Repeat spinalanesthesia after a failed spinal block in a pregnant patient with kyphoscoliosisfor elective cesarean section. J Obstet Anaesth Crit Care, 2014; 4:84-6.
3. Korula S, Ipe S, Abraham SP. Parturient with severe kyphoscoliosis: An anesthetic challenge. J Obstet Anaesth Crit Care, 2011; 1:81-4.
4. Sujay Mysore, Laxmi Priyanka Karri, Merajuddin S, Venugopalan V. M, RaghunathRavirala. "Anesthetic Management of an Anemic Parturient with Severe Kyphoscoliosis and Bilateral Poliomyelitis for Emergency Caesarean Section". Journal of Evolution of Medical and Dental Sciences, 2014 May 19; 3(20):5461-5466.
5. C. Bowens, K.H. Dobie, C. J. Devin and J. M. Corey. An approach to neuraxial anaesthesia for the severely scoliotic spine. BJA Advance Access 2013.
6. Kyphoscoliosis And Pregnancy - A Case Report Dr. Sunanda Gupta Dr. GeetaSingariyaIndian J. Anaesth. 2004; 48(3):215-220.
7. Chopra S, Adhikari K, Agarwal N, Suri V, Sikka P. Kyphoscoliosis complicating pregnancy: Maternal and neonatal outcome. Arch Gynecol Obstet. 2011; 284:295-97.
8. Kumari BG, Samantaray A, Kiran Kumar VA, Durga P, Jagadesh G. Spinal anaesthesia in poliomyelitis patients with scoliotic spine: A case control study. Indian J Anaesth, 2013; 57:145-9.
9. Veliath DG, Sharma R, Ranjan RV, Rajesh Kumar CP, Ramachandran TR. Parturient with kyphoscoliosis (operated) for caesarean section. J Anaesth Clin Pharmacol. 2012; 28:124-6.