INTRODUCTION
During pregnancy, a woman undergoes adaptations to better accommodate the embryo or fetus. These anatomical and physiological changes include cardiovascular, haematologic, metabolic, renal and respiratory changes, that become very important in the event of complications.

Mediastinal region contain vital structures. A mass in this region can compress these structures and leads to increased morbidity and mortality during pregnancy.\(^1\) Pregnancy with mediastinal mass leads patient more at risk of hypoxia and any cardiorespiratory event which can be fatal.

This report describes the anaesthetic management for caesarean section of one such case.

CASE REPORT
A 38 years old female with no prior co-morbid, 31 weeks pregnant, came for emergency caesarean section due to per vaginal leaking. She had history of mild to moderate cough for 2 months, which became severe since 2 weeks, associated with severe orthopnea so that she could not lie down in any position.

On her work-up, chest X-ray showed mediastinal widening, therefore, CT scan of chest was required. This showed a huge mediastinal mass involving anterior and middle mediastinum, encasing aorta completely, invading the right bronchus and right upper lobe of lung. Complete blood picture and serum electrolytes were normal but coagulation profile and liver function tests were deranged.

Due to severity of symptoms, patient was admitted in medical ICU and oncologist gave three chemotherapy trials (Doxorubicin) for symptomatic relief in addition to intravenous antibiotics and nebulization. Her vital signs showed heart rate of 138/minute, blood pressure of 130/80 mmHg, respiratory rate of 30/minute, afebrile status and SPO2 showed 88% saturation at room air and 93% with 6 liters oxygen. Severe pedal edema was also present due to pressure symptoms and continuous sitting position.

Cardiothoracic surgeon and the obstetrician collectively planned the procedure as caesarean section followed by mediastinal biopsy. High risk consent was taken and family was explained regarding possible need of post-operative ventilation and difficulty in weaning. The family refused for biopsy due to non-urgency and after discussion with oncologist, biopsy was planned after two sessions of chemotherapy after emergency caesarean section.

For caesarean section, Combined Spinal-Epidural (CSE) anaesthesia was given with spinal dose (7.5 mg) of 0.75% bupivacaine in sitting position followed by local infiltration of 2% plain xylocaine (10 mls), given by the surgeon. Semi-sitting position was made due to severe breathlessness and oxygen at 5 liters was applied via plain mask throughout the surgery. Afterwards 10 mls of pure xylocaine with adrenaline was given via epidural and patient remained hemodynamically stable. No intravenous sedation or analgesia was given intra or postoperatively. In the postoperative period, the patient
was shifted to ICU and kept in propped-up position with oxygen and back to back nebulization. Epidural infusion 0.1% bupivacaine at 5 - 8 mls was continued. Liver function tests and coagulation profile started settling on first and consecutive postoperative days. The condition of new-born was normal with APGAR scores of 8/10 and 9/10 at 1 and 5 minutes respectively.

On the third postoperative day, two chemotherapy trials were given and cardiothoracic surgeon planned biopsy of mediastinal mass under local anaesthesia, which was later diagnosed as non-Hodgkin's lymphoma.

**DISCUSSION**

Anaesthetic management of caesarean section with mediastinal mass is a great challenge for an anaesthesiologist. Pregnancy significantly elevates the risks imposed by mediastinal mass. A reduced functional residual capacity coupled with mass and increased blood volume can significantly diminish the cardio-respiratory reserve in pregnant subjects. Maternal malignancy is unusual during pregnancy (0.1%) and mediastinal tumours are particularly rare.

Hodgkin's lymphoma predominantly affects women of childbearing age and the incidence has been reported to be 1 in 1,000 to 6,000 pregnancies. The incidence is high because the peak incidence of Hodgkin’s lymphoma lies in the female reproductive age group. Non-Hodgkin lymphoma is also rare. It is imperative that a multidisciplinary team comprising of oncologist, paediatrician and obstetrician should provide care for such a patient especially in the first and second trimester of gestation. A mediastinal mass causes three types of intra-thoracic compromise-compression of the tracheobronchial tree, compression of the pulmonary artery and heart and Superior Vena Cava Obstruction (SVCO).

Beside a thorough history and physical examination, a chest X-ray should be available. Computerized Tomography (CT) of the thorax can assess the size of the tumour and degree of airway compression. Flow-volume loops may be performed in co-operative patients to quantify the degree of functional airway narrowing. Flexible fibre-optic bronchoscopy under local anaesthesia allows assessment of airway compression in response to changes in posture. An echocardiogram is helpful in the diagnosis of cardiac tamponade and reduction in cardiac output. However, patients with severe dyspnoea may not tolerate these procedures well.

The perioperative plan is complex and best managed by a well-coordinated multidisciplinary team. There is a dilemma of whether to have radiotherapy or chemotherapy for some shrinkage of the tumour mass before delivery. The benefits of symptom relief are often precluded by a number of maternal and foetal problems. The upward displacement of the diaphragm by the gravid uterus reduces lung size, causing the mediastinal mass to occupy most of the intra-thoracic area and radiotherapy may increase the risk of radiation-induced pulmonary damage if performed before delivery. Advice about the design and use of shielding in pregnant patients is not currently available and there is likely to be scattered radiation to the foetus. There are concerns about foetal organogenesis, growth retardation, preterm labor and stillbirth associated with poor nutrition, weight loss, and anaemia. There should be a team agreement that, in case of an emergency, maintaining the well-being of mother would maintain utero-placental perfusion and thus the well-being of the foetus, therefore, resuscitation of the mother has priority over the foetus.

There is a high incidence of mortality and morbidity associated with general anaesthesia in patients with anterior mediastinal mass and SVCO. This combination with pregnancy adds additional risk. Pregnancy-induced weight gain, upper airway oedema and breast enlargement contribute to the possibility of a difficult airway. Reduction of functional residual capacity due to pregnancy, loss of muscle tone due to general anaesthesia (with or without muscle relaxant), and further loss of lung volume from the mediastinal tumour make pre-oxygenation less effective. Turning the patient prone to relieve complete tracheobronchial obstruction is technically challenging. Emergency airway equipment, including a fiber-optic laryngoscope, rigid bronchoscope and high frequency jet ventilator should be present in the operating room and there should be an immediate access to cardiopulmonary bypass in the event of airway or cardiovascular collapse. A regional

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**Table I:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Heart rate Beats/min</th>
<th>Systolic BP mmHg</th>
<th>Diastolic BP mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base line BP reading</td>
<td>130</td>
<td>130</td>
<td>75</td>
</tr>
<tr>
<td>At epidural insertion</td>
<td>140</td>
<td>135</td>
<td>70</td>
</tr>
<tr>
<td>10 mins after Epidural insertion</td>
<td>135</td>
<td>128</td>
<td>80</td>
</tr>
<tr>
<td>15 mins after Epidural insertion</td>
<td>142</td>
<td>135</td>
<td>80</td>
</tr>
<tr>
<td>At baby delivery</td>
<td>145</td>
<td>125</td>
<td>72</td>
</tr>
<tr>
<td>5 mins after baby delivery</td>
<td>125</td>
<td>110</td>
<td>62</td>
</tr>
<tr>
<td>10 mins after baby delivery</td>
<td>138</td>
<td>140</td>
<td>65</td>
</tr>
</tbody>
</table>
rather than general anaesthetic technique is sensible to reduce the risk of potentially lethal airway collapse. A single shot subarachnoid block is not recommended because of rapid and unpredictable hypotension and level of block in the semi-sitting position. An epidural catheter or small incremental dose continuous spinal technique allows more gradual onset of block and makes it easier to treat maternal sympathetic block. With a spinal catheter, possible post-dural puncture headache will be aggravated by the sitting position and could be difficult to differentiate from headache due to SVCO. Appropriate vasopressor to treat hypotension during regional anaesthesia would be phenylephrine since foetal acidosis has not been demonstrated when it is used liberally to maintain maternal blood pressure.9 Ephedrine should be avoided because it may precipitate palpitations and tachy-arrhythmias in the context of pre-existing anxiety due to shortness of breath. Performing caesarean section in an unusual position decreases surgical exposure and is a challenge for the obstetrician. With compromised venous return, postpartum haemorrhage is poorly tolerated. Replacement of blood loss by colloid or blood should be rapid and care should be taken to avoid fluid overload and, consequent, pulmonary oedema. Pharmacological treatment for uterine hypotonia should be administered with extreme caution, as it can cause profound cardiopulmonary disturbance. Ergot alkaloids can cause hypertension and peripheral vasoconstriction. Prostaglandin F2-alpha (carboprost) can cause arterial oxygen desaturation, pulmonary oedema, hypertension and bronchospasm.10

REFERENCES