Right sided congenital diaphragmatic hernia: A rare neonatal emergency

Sir,

Congenital diaphragmatic hernia (CDH) occurs in 1 in 5000

live births. Right sided lesions are rare (10-15%) compared with left sided (85%) as liver plugs the opening. Right congenital diaphragmatic hernia carries disproportionately

Page | 228

high mortality and morbidity. Presence of liver herniation is a predictive of poor outcome.^[1] It results in caval compression, reduced preload and impaired cardiac output.^[2]

A 4-day-old baby weighing 2.3 kg born by vaginal delivery at 36 weeks. He was diagnosed antenatally as a case of CDH. In view of respiratory distress he was intubated. Ventilation was instituted by keeping peak inspiratory pressure (PIP) of 20 cm H₂O, FiO₂ of 0.6 and respiratory rate of 60/min. Circulatory support was started in the form of dopamine infusion and intravenous fluid. His echo revealed moderate pulmonary hypertension. Chest X-ray showed multiple intestinal loops with liver herniation in right sided hemithorax and severe mediastinal shift in the left side [Figure 1]. His ABG revealed pH-7.25, PCO2-44 mmHg, PO2-88 mmHg HCO₃-18 mEq/L and lactates-1.5 ummol/L. His preductual and postductal SpO2 differed by 5%. Hb was 15 g% and the rest of the investigations were normal. After 3 days of stabilization child was posted for surgical repair of the hernia.

Inside operation theater routine monitors (electrocardiogram, noninvasive blood pressure, SpO_2 , $EtCO_2$, temperature) were attached. Neonatal resuscitation trolley was kept ready. Baseline parameters of heart rate 144/min and BP-66/40 mmHg were noted. His preductal SpO_2 was 95% and posductal saturation was 90%. Continuous nasogastric suctioning was done. Intravenous (IV) fentanyl 5 ug and IV atracurium was given. Pressure controlled ventilation was started with PIP of 20 cm H₂O, respiratory rate of 50/min with FiO_2 of 0.7. Anesthesia was maintained with oxygen, air and sevoflurane. The anaesthetic goal was to avoid hypoxia, hypotension and hypothermia, which increases pulmonary vascular resistance and

Figure 1: Chest X-ray showing intestinal loops and liver herniation

worsens the right to left shunt. A right subcostal incision was made. Liver and bowel loops were reduced [Figure 2]. The defect in right hemidiaphragm was closed. Child remained stable throughout the surgery. Duration of surgery was 2 h. Intraoperative blood and fluid loss were replaced with Isolyte P. Child was electively ventilated postoperatively. IV morphine infusion was started for sedation. Muscle relaxants were avoided, and spontaneous respiration was encouraged. Child was extubated on POD 5, but could not tolerate extubation and was reintubated on the same day. On POD 8 again trial for extubation was given which he tolerated well.

The goal of preoperative stabilization includes blood pressure normal for gestational age, preductal SpO₂ of 85-95%, lactate <3 mmol/L, urine output >2 ml/kg.^[3] This was achieved in our case. Ventilation strategy first described by Wung *et al.* was used in this case.^[4] It aims at achieving adequate tissue oxygenation with minimal barotrauma. It consists of limiting PIP <25 cm H₂O, permissive hypercapnia (PaCO₂ between 45 and 60 mmHg). This strategy has shown to increase in survival and decreased use in extracorporeal membrane oxygenation. Continuous nasogastric suctioning should be done to prevent bowel distension and further lung compression.

Until date, there are no uniform guidelines for the management of CDH. Many centers lack advanced neonatal care facilities affecting the prognosis. However, still conventional technique have shown good outcome.^[5]

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Figure 2: Right congenital diaphragmatic hernia with reduced contents (liver and intestine)

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