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CLINICAL BRIEF

# Isolated Bilateral Severe Fetal Hydrothorax: Complete Resolution following a Single Postnatal Thoracocentesis

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**Abstract** Isolated pleural effusion is a rare condition in a fetus or neonate with high mortality. When there are no other findings of hydrops fetalis or documented etiology such as inflammatory, iatrogenic or cardiac problems exist, isolated pleural effusion is considered. Timely diagnosis and management not only avoids mortality but also results in excellent prognosis. For fetal hydrothorax, intrauterine management is usually recommended. For those who present late, postnatal management includes intubation, thoracocentesis, ventilation and supportive care. The authors present isolated bilateral severe hydrothorax in a preterm neonate that resulted in severe respiratory compromise at birth. A single postnatal thoracocentesis resulted in complete resolution. No definite etiology for hydrothorax could be established. He had normal growth and development during his follow up till 1 year of age.

**Keywords** Pleural effusion · Fetus · Neonate · Thoracocentesis

## Introduction

Isolated fetal pleural effusion occurs at frequency of 1 in 12,000 to 15,000 pregnancies [1]. Although spontaneous resolution has been reported, many recommend intrauterine management. Postnatal intubation, ventilation and subsequent thoracocentesis are the therapeutic options for those who have late diagnosis [2–5]. Mortality of 37% with conservative management followed by neonatal interventions has been reported [6]. The authors describe a case with isolated bilateral pleural effusion, diagnosed around 33 wk of gestation and its successful management.

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## Case Report

A primi mother was referred to authors' centre at 33 wk gestation for assessment of polyhydramnios. Her blood pressure and previous investigations including ultrasonography (USG) were normal. USG at admission revealed gestation of 33 wk, bilateral fetal pleural effusions and polyhydramnios. Her blood group was B positive. VDRL test was nonreactive. She tested negative for HIV, HBsAg and tuberculosis. Vaginal swab did not grow any microorganism. Fetal echocardiography was normal. She underwent spontaneous vaginal delivery within a couple of days.

At birth, neonate was limp, apneic and cyanosed with heart rate of 100/min. He was immediately intubated and positive pressure ventilation initiated. He was then transferred to intensive care unit and put on ventilator (required MAP of 15.8 and $FiO_2$ 0.8 for stabilization). His weight was 2.5 kg, length, 46 cm; and head circumference, 34 cm. Chest movements and air entry were decreased on both sides. The cardiac apex and heart sounds were normal with no murmur. There was no facial dysphormology, skin or scalp edema, hepatosplenomegaly or ascites.

Emergency chest x-ray(CXR) revealed hazy lung fields on both sides with obscured costophrenic (CP) angles, suggestive of pleural effusions with passive collapse of the underlying lung (Fig. 1a). Arterial blood gas showed pH of 7.11, $pCO_2$ of 73 mmHg, $pO_2$ of 66 mmHg (FiO2, 0.8), $SaO_2$ of 85% and $HCO_3$ of 22 mmol/L. Immediate percutaneous intercostal drainage yielded 70 ml of yellowish

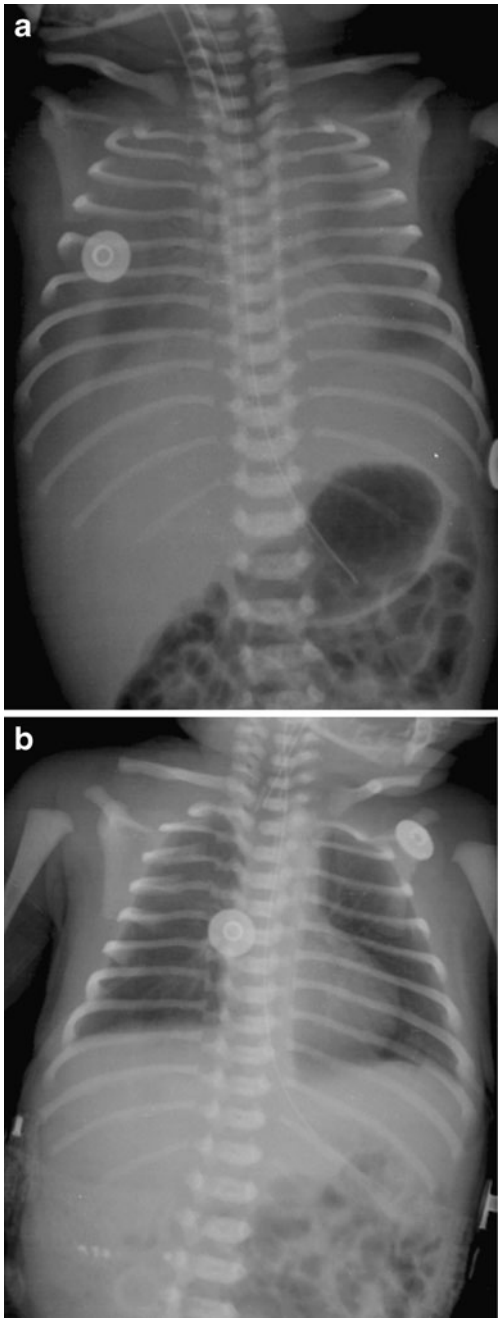


**Fig. 1 a**. Emergency chest radiograph showing bilateral pleural effusions with passive collapse of underlying lung. **b**. Follow up chest radiograph showing complete resolution of pleural effusions and lung expansion

fluid on the right side and 54 ml on the left (Fig. 1b). The blood gas was normalised by next 2 h. Repeat CXR at 24 h showed normal lung fields, CP angles and hemidiaphragms (Fig. 2).

His blood group was B positive. CBC revealed PCV of 42.3, total leucocytes of 23,100/mm$^3$ with 51% neutrophils, 46% lymphocytes and 3% eosinophils, platelets of 2,58,000/mm$^3$ and ESR of 0/1st h. Direct Coomb's test

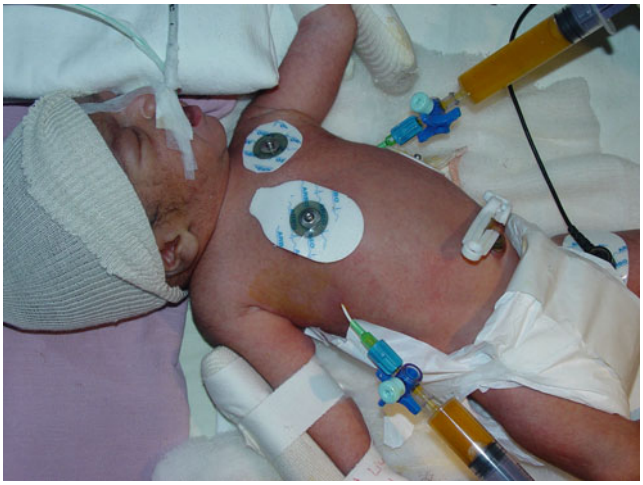

**Fig. 2** Percutaneous needle drainage of bilateral pleural effusions in a ventilated, stabilised newborn

and TORCH titres were negative. Karyotyping was normal. DNA PCR test for parvovirus was negative. Pleural fluid analysis showed cells of 19,200/mm$^3$ with 100% lymphocytes, no bacteria or pus cells on gram stain, albumin of 2.0 g/dL (serum albumin, 2.5 g/dL), LDH of 110 IU/L and glucose of 104 mg/dL. Pleural fluid culture remained sterile. Triglyceride estimations were not done.

Neonate was weaned to room air by day 3 and extubated. Subsequently, he was started on breastfeeds and discharged by day 12. His neurosonogram, abdominal ultrasonography and echocardiography were normal. He remained asymptomatic and had normal examination at 1 month. He has been followed up regularly. His development was normal at 1 year of age with length and weight of 76 cm and 10 kg respectively.

## Discussion

Pleural effusions are rare in the fetus or neonate [1, 2]. Common causes include congenital malformations of the lymphatics, thoracic duct trauma, surgical interventions, chromosomal, immunological or systemic disorders and those following infections. When there is no documented etiology or fetal hydrops, it is designated as isolated pleural effusion [2–6]. In the present case, etiology could not be documented and there was no hydrops. Chromosomal anomaly like Down syndrome may be associated with isolated pleural effusion [5]. Karyotyping in the present case was normal. There was polyhydramnios in the present case. Polyhydramnios occurs secondarily because of extrinsic oesophageal compression by extensive bilateral pleural effusions [3].

USG usually detects pleural effusion prenatally [4]. Intrauterine treatment options include pleuroamniotic shunt,

or single or multiple thoracocentesis. The choice depends primarily on the severity of effusion and gestational age. USG guided inutero thoracocentesis carries a risk for both the mother and the fetus. Withdrawal of large quantities of pleural fluid may induce considerable fetal distress. In addition, fetal position may limit this procedure [6]. Spontaneous resolution of fetal hydrothorax in 2 out of 8 cases was reported by Pijpers et al [3]. Non-invasive antenatal management and immediate neonatal ventilation followed by pleural fluid drainage resulted in good outcome in remaining cases.

Isolated severe pleural effusions present with severe respiratory distress at birth. The present case neonate had severe respiratory distress and respiratory acidosis at birth. Immediate stabilisation and pleural fluid drainage established rapid lung expansion, alveolar gas exchange, normalisation of blood gas without hypoxia and finally an excellent long term outcome. Neonatal pleural effusions mostly require multiple thoracocentesis or continuous drainage. In the present case, a single thoracocentesis resulted in complete resolution. Similar observation has been reported earlier [7]. Isolated fetal pleural effusions generally have a poor outcome. Neonatal death rates vary from 30% to 55% depending on time of diagnosis [6]. In conclusion, early recognition and timely treatment could result in an excellent prognosis in fetal/neonatal pleural effusions.

**Contributions** RB; involved in treatment and follow up of the case, literature search, preparing and drafting the manuscript, NK; involved in literature search and manuscript writing.

**Conflict of Interest** None.

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