

Bilateral fetal hydrothorax accompanying with absent umbilical arterial end-diastolic flow, trisomy 21 and polyhydramnios

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INTRODUCTION

Fetal hydrothorax, which is the result of accumulation of fluid in the foetus's chest cavity, is a rare condition that occurs with incidence ranging from 1/10,000 to 1/15,000 [1]. Accumulation of fluid in the pleural space may result in pulmonary hypoplasia and compression of the oesophagus leading to polyhydramnios [2]. According to the origin, it can be classified as a primary or secondary hydrothorax. Trisomy 21 was found in 4.9–8.9% of cases with fetal hydrothorax [3]. The prognosis is hard to predict and ranges from spontaneous resolution to perinatal death.

Fetal pleural effusion can be classified as primary and secondary fetal hydrothorax. Primary, also known as congenital chylothorax, can result from multiple lymphatic vessel anomalies or thoracic cavity defects caused by external force, a tumor or cardiovascular diseases. It can occur unilaterally or bilaterally and affects males more than females at a ratio of 2:1. It has a perinatal mortality rate of 22% to 53%. Secondary fetal hydrothorax is a feature of immune and non-immune hydrops. Autoimmune conditions include Rh or ABO blood type incompatibility; non-immune factors include chromosomal abnormalities, genetic disorders, infections, congenital cardiac anomalies, congenital lung anomalies, hematologic diseases, metabolic diseases, and noncardiac anomalies. Hydrops is usually bilateral, and is also often associated with ascites, pericardial effusion, subcutaneous edema, hydramnios, and placental thickening. The most common causes of non-immune hydrops are chromosomal anomalies such as Down syndrome and Turner syndrome, which can also be present with additional structural abnormalities.

CASE REPORT

A 41-year-old woman at 31+3 weeks of gestation was admitted due to bilateral fetal pleural effusion and absent end-diastolic flow in the umbilical artery (estimated fetal weight was 1972 g — adequate to gestational age). The patient was previously diagnosed for congenital thrombophilia (factor V Leiden mutation) and hypothyroidism. The patient's obstetric history included seven pregnancies (5 miscarriages, 1 labour at full term and 1 preterm). Her current medications included enoxaparin, acetylsalicylic acid, levothyroxine.

Microbiology tests were run but did not reveal any significant aberrations. Due to the risk of pulmonary hypoplasia, it was decided to perform ultrasound-guided percutaneous placement of bilateral fetal thoraco-amniotic shunts (Fig. 1). Because of increasing and symptomatic polyhydramnios, the procedure was extended to amnioreduction, and 1410 ml of amniotic fluid was drained, the karyotype testing showed a 47, XY, +21. The whole procedure went uneventful.

Three weeks after procedure, premature rupture of membranes and preterm labour occurred. Patient did not agree for vaginal birth after caesarean delivery and according to current recommendations of Polish Society of Gynaecologists and Obstetricians patient was qualified for c-section on a gestational age of 35 weeks and one day. The birth weight was 3350 grams and length 55 centimetres. The assessment in the Apgar scale was respectively 4, 5, 7, 7 points in 1,3,5 and 10 minutes.

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Figure 1. Prenatal ultrasound (US) examination **A.** Hydrothorax in sagittal and transverse section; **B.** Bilateral hydrothorax in transverse; **C.** Condition after placement of bilateral fetal thoraco-amniotic shunts, the ends of shunt showed by arrows

The post-caesarean course was uneventful, and the mother was discharged on the second postoperative day. As for the child, after being born he was intubated, and both chest cavities were drained (80 mL fluid on the right, 40 mL left). Phenotypic features of Down syndrome were present. Moreover, fluid in the abdominal cavity was observed. The examination revealed a significant difference in heart rate between the lower and upper limbs, whereas increased flow rate in the aortic isthmus was seen during the echocardiography. Hence the child was consulted cardiologically for aortic isthmus stenosis and dinoprostone was added to the treatment. On the eighth day of life, the newborn was transferred to the neonatal intensive care unit in University Child Hospital.

CONCLUSIONS

One of the effective forms of diagnosis and treatment of hydrothorax is thoracentesis or pleural shunt, which increases the chance of prolonging the pregnancy and reduces the risk of respiratory failure in the newborn. Thoracentesis or thoracoamniotic shunting to drain the pleural effusion are considered to improve the perinatal outcomes [3]. According to the literature, thoracoamniotic shunting in fetuses with severe hydrothorax results in an overall survival rate of 59% [4]. In the case of symptomatic polyhydramnios, the procedure can be extended to include amnioreduction. However, it is known in which conditions there is a higher probability of fetal pleural effusion, the causes remain unclear.

Article information and declarations

Conflict of interest

None of the authors reports any conflict of interest.

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