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NEONATAL CHYLOTHORAX*

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Neonatal chylothorax, which may result from either congenital or traumatic causes, is an uncommon disease with a high mortality rate. It has been reported that neonatal chylothorax occurs more often in the right hemithorax (60%) and is more common in males than females, the ratio being 2:1[1].

To our knowledge, this is the first case of neonatal chylothorax to be reported from our medical center.

Case Report

Y.E., a seven-day-old male baby, born at term by spontaneous vaginal delivery, of a 22-year-old healthy mother, was admitted to the hospital because there was cyanosis and respiratory distress.

On examination he was found to be in a poor general condition, hypothermic (35°C rectal) and with a pulse rate of 168 per minute. There was cyanosis with mild icterus and cutis marmorata. In addition to the tachypnea there were also other signs of respiratory distress, such as retrosternal, intercostal and epigastric retractions. On auscultation, breathing sounds were found to be considerably weakened particularly in the right hemithorax. There was tachycardia but the heart beat was regular; there was no murmur and no pathologic sounds.

The diagnosis on admission was that of neonatal pneumonitis and cardiac failure. Laboratory tests showed that the hemoglobin was 17.25 gr/dl and the WBC was 16,400. A peripheral blood smear revealed moderate toxic granulation and a dominance of PMN leukocytes. Total bilirubin was 9.6 mg/dl and direct bilirubin was 0.8

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mg/dl. Urinalysis and blood sugar tests came out normal and the direct Coombs' test was negative. In the chest X-ray a moderate pleural effusion was detected in the right hemithorax but nothing abnormal was to be noted in the ECG, except for sinus tachycardia (Figure 1).

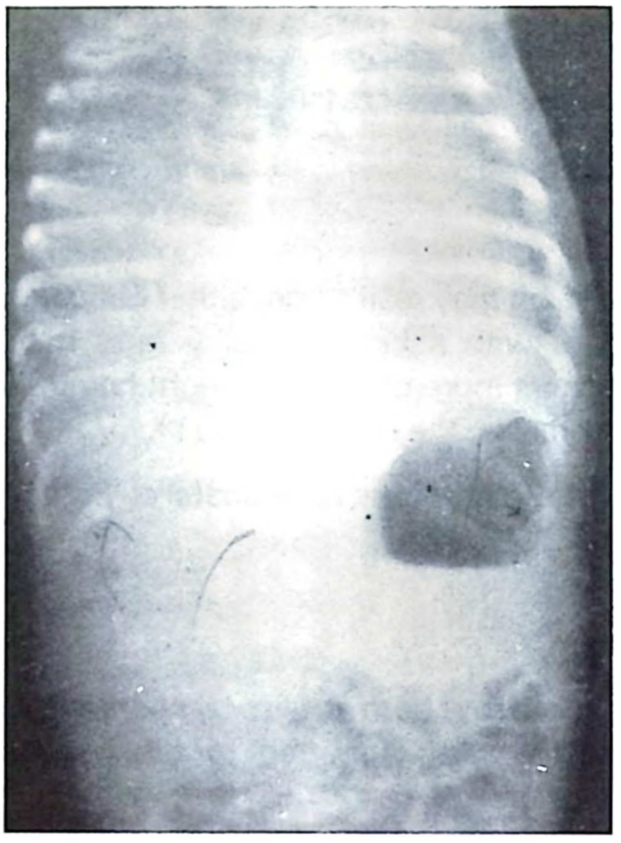

Figure 1

Chest X-ray on admission

The acidosis and hypothermia were treated immediately, digitalization was started and the infant was also put on penicillin G (100.000 U/kg, IV) and on gentamicin (5 mg/kg, IV). A few hours later, since there was a gradual worsening of the general condition and increasing respiratory distress, thoracentesis was performed at the sixth intercostal space on the posterior axillary line. After the aspiration of 40 ml of a brownish-orange exuda-like fluid, the respiratory distress decreased noticeably. The post-thoracentesis chest X-ray revealed no pleural effusion and totally expanded lungs.

Microscopic examination of this fluid with Gram stain revealed no bacteria, while the Wright stain showed a predominance of lymphocytes. The pH of the fluid was 7.5; density was 1012; the protein level was 4.2 gr/dl; and the lipid was (+) in the ether test. At the quantitative measurement cholesterol was found to be 85 mg/dl and total lipid was 570 mg/dl.

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Three days later, it was noticed that the breath sounds had decreased again in the right hemithorax and a chest X-ray revealed effusion in the right side. Thoracentesis was performed again at the same site and 60 ml of the same fluid was aspirated. The patient's clinical condition gradually improved. On the 10th day after admission the chest X-ray revealed no thoracic effusion (Figure 2); the patient was discharged. Two weeks later the clinical and radiological findings were within normal limits.

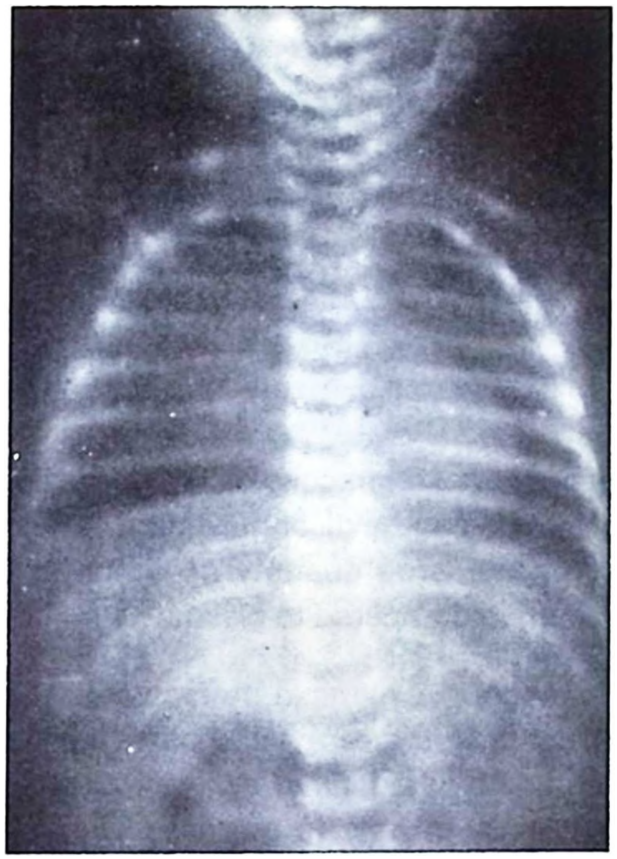

Figure 2

Chest X-ray before discharge

Discussion

Pleural effusion in the early neonatal period, without any sign of infection, should suggest the possibility of neonatal chylothorax. Despite its rarity, neonatal chylothorax is recognized as an important disease, one which causes severe hypoxia and asphyxia, and which has a high mortality rate (25%) [1,2].

The treatment of neonatal chylothorax may not be successful unless the problem is diagnosed immediately. It has been reported that the antenatal diagnosis of fetal chylothorax by ultrasonography and the treatment of the problem by multiple intrauterine thoracenteses is reasonably effective[3-5].

Multiple intrauterine thoracentesis, aided by this technique, lead to the expansion of the lungs and prevent any possible hypoxic state, during the period between birth and the first postpartum thoracentesis[6,7].

Birth trauma or any resuscitation procedures used immediately after delivery are generally regarded as common causes of neonatal chylothorax[6]. It is thought that the sudden rise of venous pressure caused by these might lead to a rupture of the ductus thoracicus; extravasated chyle might then drain into the pleural cavity.

Congenital fistulas between the ductus thoracicus and the pleural cavity are another reported cause of neonatal chylothorax[8]. This condition has been observed in some patients who have been operated on for neonatal chylothorax. In our case there were no such fistulas demonstrable and no birth trauma.

Diagnosis of neonatal chylothorax is only possible by thoracentesis. The thoracentesis fluid changes in quality after the child has been formula or breast-fed; it then becomes exactly chylous, whereas immediately after delivery it is clear, yellowish and serous.

In a microscopical examination of thoracentesis fluid in chylothorax, lipid globules can sometimes be seen. Chyle can be distinguished from any other kind of pleural effusion by its sterility, by the large quantity of lymphocytes, and by the lower protein and higher lipid content compared to plasma[9].

Beside its importance in diagnosis, multiple thoracenteses are, it seems, the treatment of choice in neonatal chylothorax[10]. One cases has been reported in which 1955 ml of chyle were successfully drained away in 27 successive thoracenteses, undertaken over a period of 30 days[10]. In our case, only two thoracenteses were necessary and these were performed three days apart.

In the past treatment was more frequently by tube drainage and thoracotomies; these, however, have a higher mortality rate[6,11,12]. Should treatment by multiple thoracentesis fail, however, then closed thoracostomy and water sealed drainage become the treatment of choice.

Since multiple thoracenteses may cause an excessive loss of protein and lipid, the alimentation of a baby receiving such treatment is of particular importance, and a special diet rich in medium-chain fatty acids has been recommended[13]. In our case, breast milk was being given and no kind of special hyperalimentation program was followed.

Thoracotomy of the right side and ligature of the ductus thoracicus has also been suggested for those rare instances when, after two to three weeks of treatment with thoracentesis or tube drainage, such treatment is found to be ineffective.

Summary

A case of neonatal chylothorax in a seven-day-old, effectively treated with multiple thoracenteses, is presented, and various methods of treatment are discussed.

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