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Case Report

Neonatal chylothorax

Tejinder P. Kaur, Gursharan S. Narang, Ashiana S.*

Department of Pediatrics, Shri Guru Ram Das Institute of Medical Science and Research, Amritsar, Punjab, India

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***Correspondence:**
Dr. Ashiana S.,
E-mail: drashiana1992@gmail.com

ABSTRACT

Chylothorax is the most common form of pleural effusion encountered in neonates. It is defined as abnormal accumulation of lymphatic fluid in the pleural space. It may be either congenital or an acquired condition. It causes respiratory and nutritional problems and significant mortality rate. Neonatal chylothorax respond to octreotide treatment. Octreotide is a long-acting somatostatin analog that can reduce lymphatic fluid production and has been used as a new strategy in the treatment of chylothorax. Initial management may include restriction of enteral feedings. Authors report a case of newborn baby born to gravida 2 mother at 32±2 weeks of gestation with left sided pleural effusion subsequently confirmed to be a congenital chylothorax with patent ductus arteriosus. USG guided tap was done, and milky fluid was aspirated.

Keywords: Chylothorax, Lymphatic fluid, Patent ductus arteriosus, Pleural effusion, Somatostatin analogue

INTRODUCTION

Chylothorax is defined as abnormal accumulation of lymphatic fluid in the pleural space and is a relatively rare condition in newborn. In neonates, chylothorax occurs in conditions causing damage to the thoracic duct, such as cardiothoracic surgery, birth trauma, and great vessel thrombosis.[1] It also occur in dysmorphic syndromes, such as turner or Noonan syndrome.

However, in many situations, the etiology of chylothorax is uncertain and is believed to be caused by abnormality of thoracic or pulmonary lymphatic system. This is termed idiopathic congenital chylothorax.[2] Regardless of the underlying mechanism, chylothorax causes respiratory, nutritional, and immunological complications.[3,4] The mortality rate has been reported to be as high as 50% depending on gestational age, presence of abnormal karyotype, additional congenital anomalies, hydrops fetalis, and the duration and severity of chyloythorax.[3]

Octreotide is a long acting somatostatin analog that acts on somatostatin receptors in the splanchnic vessels to inhibit lymphatic fluid production. Octreotide has been used in the treatment of postoperative or spontaneous chylothorax, in infants and older children.[5,6] It has also been used for the treatment of congenital chylothorax in term neonates.[7,8] However, the experience of octreotide use in preterm babies with congenital chylothorax is limited.[9,10]

Here, authors report a preterm baby identified with left sided pleural effusion, and subsequently diagnosed with congenital chylothorax after delivery. She was initially treated with emergent chest tube insertion because of respiratory distress and was successfully treated with octerotide when the chylothorax reaccumulated. Octreotide avoided the baby needing reinsertion of the chest tube or surgery.

CASE REPORT

A male baby born to gravida 2 mother at 32±2 weeks of gestation by LSCS, under G.A. (i/c peripartum

cardiomyopathy with fetal left sided pleural effusion) with birth weight of 2220 gram. It was a spontaneous conception with normal Doppler.

Vitals at admission were-HR=158/min, RR=66/min, CFT=2 sec, SPO_2=98% on room air.

Respiratory system revealed subcoastal and intercoastal retractions with decreased air entry on the left side. Chest tube was inserted. Air and clear fluid were drained. Rest of the examination done was unremarkable. CXR done was suggestive of white out lung on left side with mediastinal shift to right side as shown in (Figure 1).

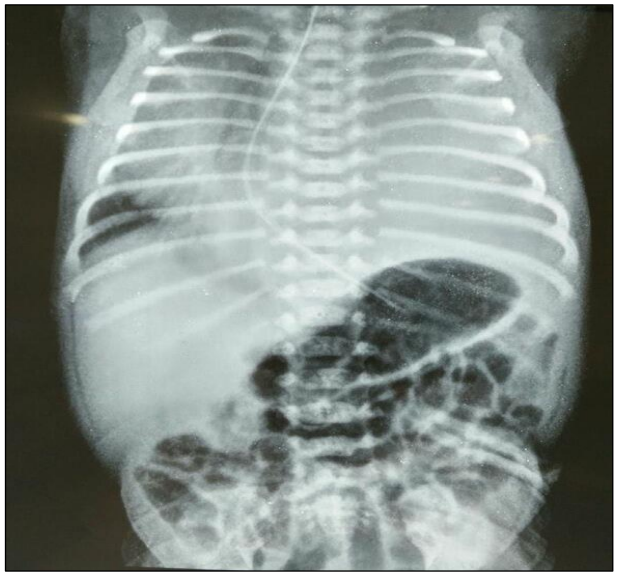

Figure 1: Mediastinal shift towards right side on DOL 1.

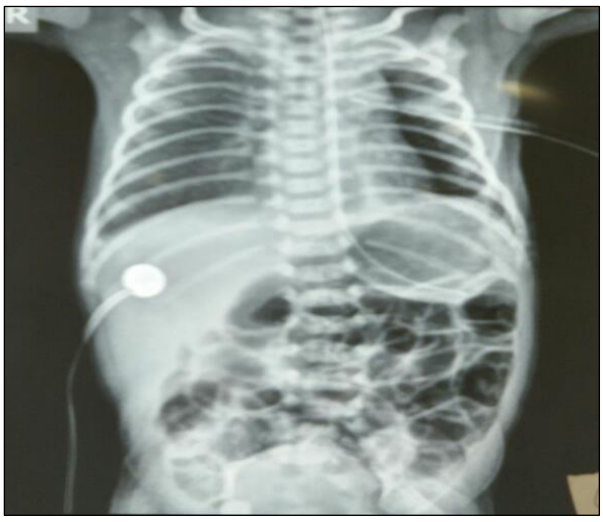

Figure 2: Resolving mediastinal shift on DOL 5.

Bed side echo was done suggestive of PDA 2.1 mm with left to right shunt.

Distress improved on DOL 5, so baby was started on OG feeds. X-ray of baby on DOL 5 as shown in (Figure 2).

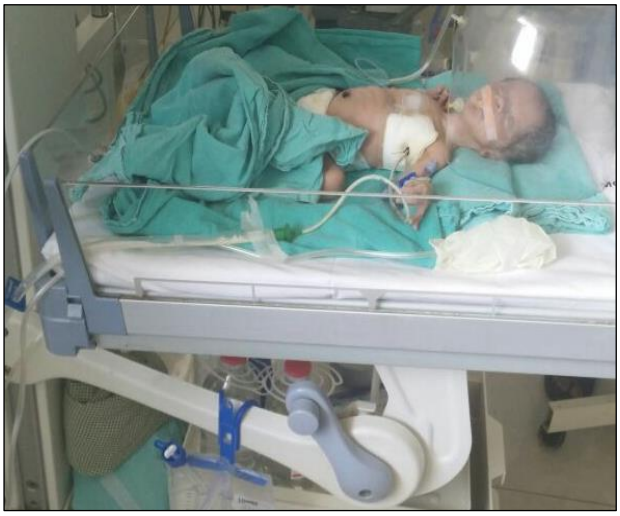

Figure 3: Milky white fluid in the chest tube.

Pleural fluid became thick, milky chylous as shown in (Figure 3).

Lipid profile of pleural fluid was done which showed low cholesterol levels-46mg/dl, high triglycerides-886 (>110 mg/dl) it (Figure 3).

As the feed were increased fluid became thicker and milkier suggesting chylous fluid. Pleural fluid/serum TGs ratio was 12.2 (>1), and pleural fluid to serum cholesterol ratio was 0.4 (<1). Fluid cytology showed predominantly T-lymphocytes

These all investigations were suggestive of chylothorax. Lymphoscintigraphy was done but had inconclusive results.

Baby was gradually weaned off CPAP and shifted on oxygen by prongs. Baby was initially kept NPO and TPN was started.

Octreotide infusion was started at 1 mcg/ kg/ min. Amount of pleural fluid decreased and again became clear from milky. Feeds were restarted and TPN was stopped.

Octreotide was continued for 15 days and then stopped. Baby was shifted to breast and spoon feeds. No drain was present in the chest tube bag, so it was removed, and baby was discharged in a stable condition.

DISCUSSION

The strategy of treating chylothorax is the same regardless of the etiology of chlyothorax. The first step is aspiration of pleural fluid for initial drainage and diagnostic purpose. However, continuous drainage of

chyle with a chest tube is indicated if the effusion causes respiratory distress or the accumulation of effusion recurs.[5] Chest tube may be required for a period of time because it takes time for chyle leakage to heal. However, long term insertion of chest tube has been reported to be associated with lung injury, leading to prolonged hospitalization and emotional stress to the family.[2,4]

Nutritional support in the management of chylothorax is aimed at providing adequate caloric intake while minimizing the chyle flow in the thoracic duct to wait for spontaneous healing of the leakage site. This is usually achieved by feeding with formula high in MCT, which bypass the intestinal lymphatic system and is absorbed directly to the portal vein.[11] It is noteworthy that even water intake by mouth can produce thoracic lymph flow and formula containing MCT with up to 87% of the fat can also cause re-accumulation of pleural effusion.[3,12,13] Therefore, complete enteric rest using TPN until the output of pleural effusion is minimal and the cardiopulmonary status is stable. Then, a trial of feeding with MCT-enriched formula can be given with close monitoring of re-accumulation of pleural effusion, either by chest tube drainage or ultrasound.[3]

Surgical interventions of chylothorax, including direct ligation of the thoracic duct, pleural abrasion, pleurodesis, or pleural to peritoneal shunts, should be considered if medical treatment fails to decrease chyle flow and allow healing of the thoracic duct. The timing of the surgery is not clearly defined. Most authors suggest at least 3- 5 weeks of the medical therapy before proceeding to surgery.[14] However, if a chyle-leaking site could be well identified and the flow is high, which makes the spontaneous healing less likely, early surgery is suggested.[15] Successful surgery shortens the duration of chest tube insertion and thus, reduces the risks of its complications and shorten the duration of hospitalization.

Somatostatin is a polypeptide secreted from the paraventricular nucleus of the hypothalamus. It has an inhibitory effect on the secretion of growth hormone, glucagon, and insulin. Octreotide, a synthetic somatostatin analog, is more potent in inhibiting endocrine system and has a much longer half-life. In gastrointestinal tract, somatostatin receptors to reduce intestinal blood flow by vasoconstriction of the splanchnic vessels; decrease gastrointestinal motility; and inhibit gastric, pancreatic and biliary secretions, thus reducing intestinal fat absorption and lymphatic flow in the thoracic duct.[6] Somatostatin and octreotide have been used to treat a variety of diseases, including acromegaly, carcinoid syndrome, secretory diarrhea, severe gastrointestinal bleeding, post-gastromy dumping syndrome, chemotherapy-induced diarrhea, and persistent hyperinsulinemia hypoglycaemia.[16,17] Octreotide has been used in the treatment of postoperative or spontaneous chylothorax in infants and older children.[5,6] It has also been used for the treatment of chlythorax in term neonates.[7,8] There is no consensus on the route, dosage and duration of octreotide administration for chylothorax. It could be administered as a continuous infusion or given twice daily as an intravenous bolus or subcutaneously. The effective daily doses were from 7.2 mcg/kg to 240 mcg/kg for intravenous infusion and from 2mcg/kg to 68 mcg / kg for subcutaneous administration. The duration of administration ranged from 3 days to 43 days.[6] Authors started subcutaneous octreotide at a lower dose of 16 mcg/kg/d for safety reason and reached a final dose of 48 mcg/kg/d.

Octreotide is generally considered to be safe, with only occasional side effects. The side effects of octreotide are mainly related to its vasoconstrictive and antisecretory actions. The reported adverse reactions include cramps, flatulence, nausea, diarrhea, necrotizing enterocolitis, hyperglycaemia, transient hypothyroidism, and liver dysfunction.[6] No aforementioned side effect was observed in our patient.

CONCLUSION

In conclusion, octreotide in the treatment of a premature baby with congenital chylothorax appear to be safe and effective adjunct therapy.

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