

MANAGEMENT OF NEONATAL MASSIVE ANTERIOR MEDIASTINAL TERATOMA

- A Case Report -

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Abstract

We report a challenging case of a newborn with a massive anterior mediastinal teratoma (MT), occupying nearly the right hemithorax, presenting at birth with life threatening respiratory distress (RD). Optimal approach and outcome was achieved with a coordinated, multidisciplinary approach.

Key Words: Mediastinal, Teratoma, Neonate, Anesthesia, Airway

Introduction

Teratomas are tumors composed of multiple tissues containing at least two of three germ-layer derivatives foreign to the part of the body in which they arise¹. Mediastinal Teratoma is uncommon in infants and children, constituting 7 to 11% incidence^{2,3,4}. In newborn period, these tumors can cause life threatening respiratory obstruction and must be promptly diagnosed and treated if the patient is to survive³.

Case Report

A term baby boy (39 weeks), was a product of an unbooked 30y old (G2 P1 + 0) mother with a history of prolonged rupture of membrane, for more than 24 hours, delivered by emergency (LSCS) due to failure to progress. Neoborn had a birth weight of 4.06 kg and an Apgar Score of 5 and 8 at 1 and 5 minutes, and had no dysmorphic features.

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Following delivery, the baby had marked respiratory distress (cord pH 7.24), he was resuscitated, ventilated and shifted to NICU. In NICU, chest X-ray revealed widened cardiac silhouette and a leftward mediastinal shift (Fig. 1), Cardiac evaluation revealed tiny patent ductus arteriosus and patent foramen oval which could not explain the severity of respiratory distress.

Fig. 1

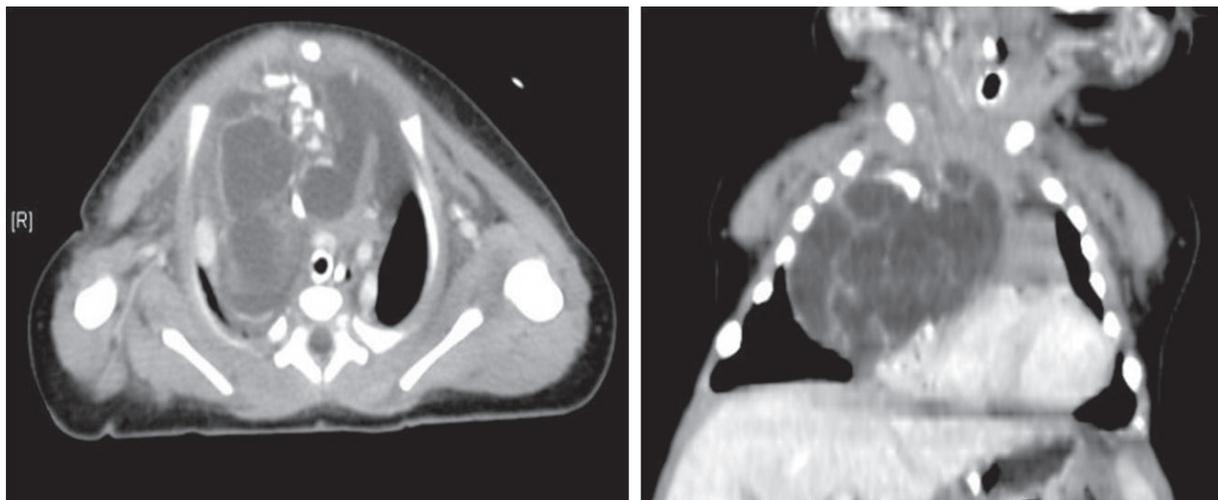
Chest X-ray shows huge mediastinal widening



CT scan showed huge multiloculated anterior mediastinal cystic mass (6.26.8 × cm); with multiple calcifications suggestive of a teratoma, causing significant displacement and shift of the mediastinum to the left side and posterior displacement of the heart and lungs (Fig. 2).

Fig. 2

Contrast-enhanced CT scan of the chest shows huge, multicystic anterior mediastinal mass containing fat and calcifications with left mediastinal shift



The diagnosis based on radiological finding was congenital anterior mediastinal teratoma, which needed urgent surgical excision. Laboratory workups were within normal limits and Alpha-fetoprotein was 1210 mg.

Pre-operatively the patient was maintained intubated (ETT size 3), sedated, SIMV mode with FiO₂ 30%. Two intravenous accesses in both arms (22G). Right thoracotomy was performed on day four, patient was positioned in left lateral decubitus position, connected to two pulse oximetries, ECG, EtCO₂, respiratory parameter, temperature, and NIBP monitoring.

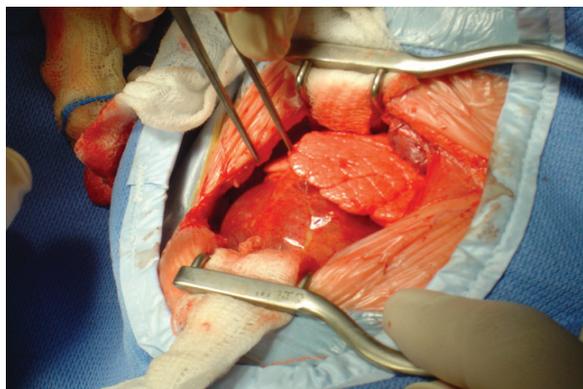
Balanced anesthesia was used, combination of sevoflurane, fentanyl 5 µg followed by another 5 µg rocuronium (3 mg initially then 2 mg.h⁻¹). Mechanical ventilation was maintained by pressure support mode using RR 30 per minutes.

Through 4th intercostal space (Fig 3) and after meticulous dissection from the great vessels and trachea, a cystic mass was completely excised. Lung expansion was synchronized with the movements of the surgeon, and there was no complication with minimal blood loss of 10 ml.

During the progress of surgical excision of the mass (Fig. 4), an increasing airway pressure and hypoxia were noted: oxygen saturation dropping to 60-75 % on two occasions that necessitated interruption of surgery, managed by using manual ventilation in the first occasion, and on second occasion by ETT

Fig. 3

Right thoracotomy showing the huge mass adherent medially. In this view the thymus gland covering the mass partially anterior



suction which resulted in some thick mucus secretions blocking the airway. This was followed by a dramatic increase oxygen saturation up to 96% and maintaining meanwhile, normocapnia. In addition, during surgical traction on the mass tachycardia and decrease in blood pressure were noted, mostly related to compression on major blood vessels. That was well managed well with bolus of fluid plus the maintained fluid at 25ml/h, with urine output 2 ml/kg/h.

Fig. 4

Intraoperative view showing the tumor just before complete surgical excision. Notice the traction on mediastinal structure medially

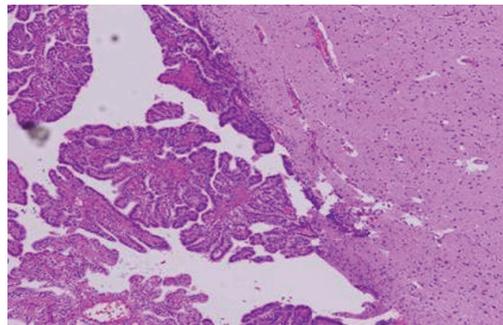


Following surgery the patient was send back to NICU, intubated and ventilated with stable hemodynamics: BP 85/40 mmHg and 140 b.p.m., SpO₂ 96%.

Pathology revealed a lobulated 6 x 6 cm, 78 g mass. Histology confirmed an encapsulated immature cystic teratoma with muscle and cartilage, and primitive neuroepithelium with no malignancy (Fig. 5).

Fig. 5

Histopathology examination showing a mixture of epithelium with no malignancy



Up to 14th postoperative day, there were two incidences of failure to ETT extubation, one week apart. This raised a high suspicion of a pressure effect of this huge mass which can lead to tracheomalacia. Diagnostic Rigid bronchoscope (3 mm) was done at day 16 It showed normal tracheobronchial patency with no evidence of tracheomalacia. A decision was made to ETT extubation in O.R. under observation. The oxygen saturation was well maintained by nasal cannula oxygen support, and patient was sent back to NICU, where he initially was maintained on nasal CPAP, then to room air within 4 days. The baby tolerated full oral feeding, and was discharged home on the 28th day of life.

He is currently followed-up in Pediatric Oncology, Neonatology Clinic, Pediatric surgery Clinic for more than one year. He gained weight, doing well and is free of symptoms.

Discussion

In infants and children, mediastinal teratomas are uncommon, constituting 7 to 10% of all teratomas^{1,2} In newborns, however, immature teratomas are rare and constitute less than 1% of all mediastinal teratomas.

This case of MT was presented at birth with respiratory distress and without fetal diagnosis. It was fully investigated until the diagnosis of anterior mediastinal teratoma was established.

Two reported series from Middle East tackled this issue but one included a neonatal MT³, and another exclusively MT analysis in patients ranging 5-56 years of age with a mean age of 29 years; 10 females and 4 males⁴. Imaging plays a very major role in the pre-

operative diagnosis of these conditions and proper pre-operative resuscitation dramatically improves the outcome of surgery. This holds true in the absence of antenatal intrauterine fetal diagnosis or immediate postpartum surgery.

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The credit for the successful outcome of this a case is the **role played by the modern medical imaging in the diagnosis, surgical, anesthesia and neonatal intensive care modern advances.**