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Intrapleural streptokinase for the treatment of complicated parapneumonic effusion and empyema in 2 newborns

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Abstract The management of complicated parapneumonic effusions by conventional first-line treatment with closed intercostal tube drainage and antibiotic therapy may fail because of thick viscous fluid and multiple pleural space loculations. Intrapleural fibrinolytic treatment is a non-invasive therapeutic option. In this report, we present successful use of intrapleural streptokinase for complicated parapneumonic effusion and empyema in 2 newborns. Intrapleural fibrinolytic therapy with streptokinase appears to be a safe and effective adjunctive therapy of choice and may have significant benefit even in newborns with complicated parapneumonic effusion and empyema, and thus, it can obviate surgical intervention.

Pleural effusions and empyemas are common complications of pneumonia. Pleural effusions occur in ranging from 21% to 91% of pediatric patients diagnosed with pneumonia [1]. Pleural effusion usually resolves spontaneously when treated with appropriate antibiotics. Otherwise, as a result of leukocyte collection and bacterial products with fibrin deposition in the pleural cavity, complicated parapneumonic effusion requiring drainage develops. The traditional treatment for complicated parapneumonic effusions includes catheter drainage and systemic antibiotics [2]. Tube drainage often fails because of thick viscous fluid and multiple pleural space loculations and a surgical procedure is required [3].

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Intrapleural fibrinolytic agents are widely used in adults with complicated parapneumonic effusion and empyema to prevent storage of fibrin at pleural field and to reduce the need for invasive surgical procedures. However, experience of its use is limited in pediatric and newborn patients. In this report, we report successful use of intrapleural streptokinase as treatment option for both complicated parapneumonic effusion and empyema in 2 newborns.

1. Case reports

1.1. Patient 1

A 2470-g term female newborn to a 29-year-old mother was recorded as the third live birth of the third pregnancy of the mother. The Apgar scores were 7 and 9 at 1 and 5 min,

respectively. Physical examination revealed drooling of saliva and respiratory distress. A nasogastric tube could not be passed into the stomach and a chest radiograph showed the tube coiled in an upper esophageal pouch with normal lung fields and stomach gas. A diagnosis of esophageal atresia with tracheoesophageal fistula was made. Surgery for the esophageal atresia was performed on the second day postnatally. Enteral nutrition was started on the fourth day and the chest tube was removed on the eighth day after surgery. Routine postoperative upper gastrointestinal contrast study under fluoroscopy was performed to evaluate for a leaks on ninth day after surgery. No contrast leaks were found. Control chest radiograph showed a small bubble of air under the right dome of the diaphragm. Thoracic ultrasonographic scan revealed hematoma or abscess appearance between the diaphragm and liver. Magnetic resonance imaging for the differential diagnosis of supra-/infra-diaphragmatic lesion showed supradiaphragmatic complicated cystic mass lesion with a of size 42 × 41 × 38 mm (Fig. 1). Tube drainage and systemic antibiotics were used initially. The complicated parapneumonic effusion did not respond to this treatment (Fig. 2A). We used intrapleural fibrinolytic therapy when the chest tube drainage became insignificant. 25 000 U of streptokinase in a 20-mL saline solution was administered through the chest tube in an attempt at enzymatic debridement in order to avoid more invasive treatment such as a second operation. The tube was clamped for 4 hours. After the removal of the clamp, drainage of effusion in the chest tube was observed. No major side-effects were observed during and after the intrapleurally administration of streptokinase. On the next day chest radiography showed an almost complete resolution of parapneumonic effusion and the chest tube

Fig. 1 Supradiaphragmatic complicated cystic mass lesion (patient 1).

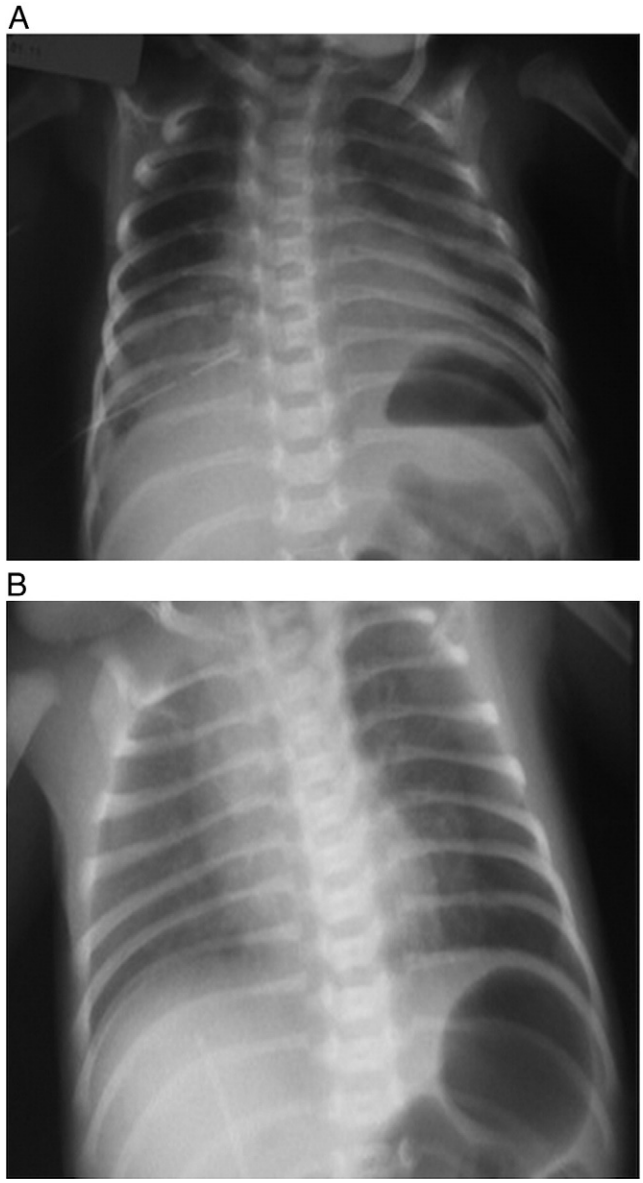

Fig. 2 A, Complicated parapneumonic effusion not respond to tube drainage and systemic antibiotics (patient 1). B, Resolution of parapneumonic effusion after the intrapleurally administration of streptokinase (patient 1).

was removed (Fig. 2B). Patient was discharged on postnatal 49th day of life.

1.2. Patient 2

A 2680-g girl with 38 weeks gestation was born to a 19-year-old mother. After a normal first examination, she was brought back at 3 hours with regurgitation of first feed, drooling of saliva and respiratory distress. A nasogastric tube could not be passed into the stomach. The diagnosis of esophageal atresia with tracheoesophageal fistula was made. She was operated on the third day. She was mechanically ventilated postoperatively with effective