

# Pneumectomy in a child for destructed lung secondary to lithium batterie ingestion

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## Abstract

Unperceived lithium battery ingestion in infants might be associated with significant morbidity, especially when medical assistance is restricted.

**Title:** Pneumectomy in a child for destructed lung secondary to lithium batterie ingestion

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**Short title:** Pneumonectomy in a child post-lithium battery ingestion

To the Editor,

Unperceived lithium battery ingestion in infants might be associated with significant morbidity, especially when medical assistance is restricted.

We report the case of a girl aged 3 transported from rural area of underdeveloped african country for medical investigation of one year evolution of vomiting, cough, and growth arrest. On the emergency department physical exam she was normoxemic, had abundant respiratory purulent secretions and weight below the third percentile for age. Pulmonary sounds were abolished on the left and there were crackles on the right. Chest radiograph (Figure 1) showed a round foreign body on the medial chest with double halo sign and left lung infiltrate hypotransparency. Chest CT (figure 2-A) confirmed a lithium battery in the proximal oesophagus, mediastinitis, right lung consolidation and left lung atelectasis. Endoscopy revealed oesophagus fistula to the left bronchus. The battery was removed and the fistula closed with pericardial patch and a gastrostomy constructed. Invasive ventilation was suspended seven days after surgery, with gradual progression to nocturnal non-invasive ventilation without hypoxemia. Right lung pneumonia resolved three weeks of empirical treatment with meropenem and vancomycin. She started enterical nutrition three weeks post-fistula closure with tolerance, progression and parenteral nutrition suspension after two months. Oesophageal post-procedural fistula, stenosis or dysmotility were excluded. Autonomous feeding was possible after four months. After 10 months, Chest CT (Figure 2-B) still exhibited left lung complete lung parenchyma destruction. Pneumonectomy and gastrostomy closure were performed without complications and rapid recovery was observed. Nocturnal non-invasive ventilation was suspended a week after pneumectomy. She is growing and gaining weight on 5th percentile without pulmonary hypertension, infections, or chest deformation. (Figure 3) She was able to return to her family after 14 months.

Lithium batteries ingestion has increased as result of to the increasing accessibility of electronic toys and devices to children Parental recognition, medical follow up and intervention are crucial to prevent and reduce morbidity and mortality. It might be associated with life threatening complications like oesophagobronchial fistula. In our patient unrecognised ingestion and chronic fistula resulted in left lung permanent destruction.

Destroyed lung refers to an extensive lung parenchyma lesion that rises from chronic inflammatory lesion. It is rare in children and is mostly caused by bronchiectasis, tuberculosis, and cystic fibrosis. When single lung is affected, most patients have minor symptoms in basal state. However this condition might be associated with acute life-threatening complications such as massive haemoptysis, empyema, secondary fungal infections, secondary amyloidosis, septicemia, and pulmonary-systemic shunting.

Children can easily tolerate pneumonectomy and the remaining lung expands to compensate the resection. Eren et al, and Kosar et al., report good exercise tolerance, higher lung volumes, better nutritional status and quality of life, without major skeletal deformation in the long term follow-up of children after pneumonectomy for destroyed lung.

In conclusion, lithium battery ingestion might have severe consequences to child health of which clinicians should be aware attending to the increasing exposure of children do electronic devices. Pneumonectomy is

a complex and invasive procedure, in this case it positively contributed to prevent potential life-threatening complications to the patient and allowed her to return to her origin country without significant health restrictions.

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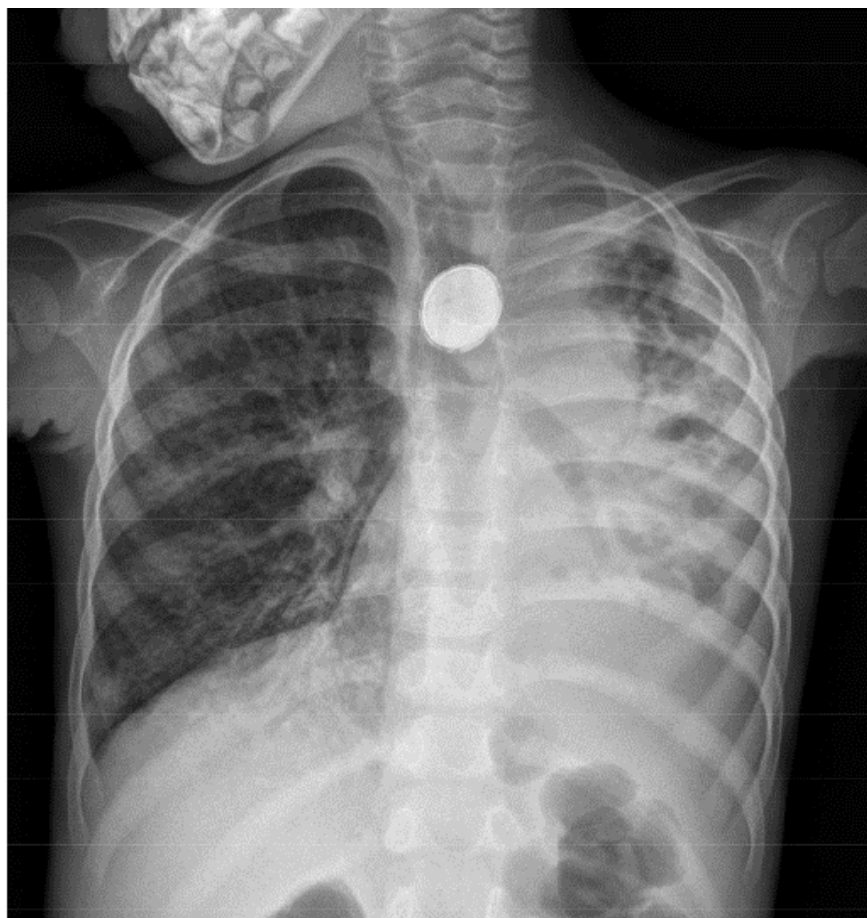


Figure 1 – Admission X-ray showing medial radiopaque round foreign body with double halo sign, typical of round lithium batteries; mediastinum enlargement with left lung extensive hypotransparency and infiltrate granulomatous infiltrate of the right lung

(A)



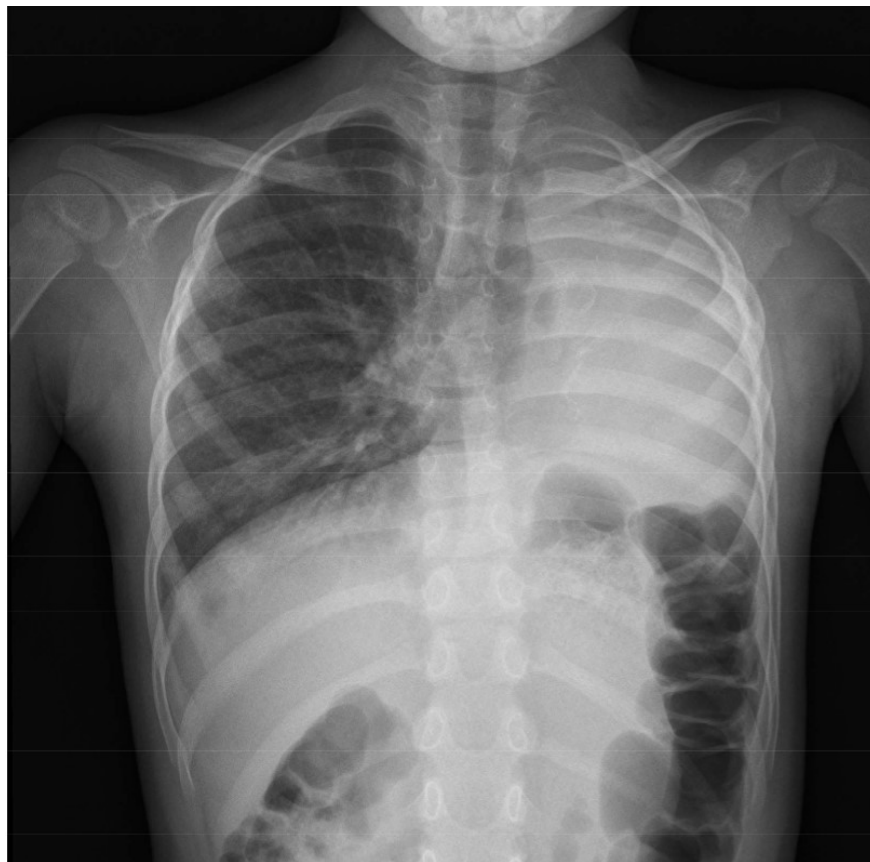


(B)

Figure 2 – Chest CT. At admission (A) - showing lithium battery in proximal oesophagus; probable oesophagus fistula; chronic mediastinitis without collection, abscess or pneumomediastinum; right lung consolidation of the superior and inferior lobes; reduced caliber various left main bronchus with complete atelectasia of the left lung, multiple cystic and varicose bronchiectasis; left non fibrous pleural effusion and left mediastinum deviation. Ten months after fistula closure, (B) showing complete fibrose of the left lung parenchyma with multiple varicose bronchiectasia, left mediastinal deviation without pleural effusion; right lung with preserved parenchyma with moderate expansion



(A)



(B)

Figure 3 - Three months post-pneumectomy. Chest wall (A) without major deformities. Chest X- Ray (B) with residual pleural effusion on the left,