



## Echo-Guided Recruitment of Lung Atelectasis after Pediatric Cardiac Surgery

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### Abstract

Lung ultrasound is a useful tool in intensive care unit. In addition to imaging various lung and pleural diseases, LUS could guide interventional procedure. We describe a case of manual recruitment of atelectasis under lung ultrasound guidance in a child after surgical ligation of patent ductus arteriosus.

### Keywords

Lung ultrasound, Congenital heart disease, Atelectasis

### Introduction

Lung ultrasound (LUS) is gaining consensus in the diagnosis and management of lung disease in intensive care unit also in children [1]. Moreover, besides the imaging of various lung and pleural diseases, LUS can guide invasive or interventional procedures as thoracentesis, and needle biopsy of the pleura [2]. In this case report, we describe a manual recruitment of atelectasis under LUS in a child after surgical closure of patent ductus arteriosus.

### Case Report

An 11-month-old female baby underwent a surgical ligation of a large patent ductus arteriosus. On first post-operative day, a right apical atelectasis was documented at both lung ultrasound (LUS) (Figure 1A) and chest X-ray (Figure 1B) while the patient was still intubated. LUS was performed with a conventional approach [1,3] using a linear probe, L12-4s, of Mindray M9 ultrasound system, Shenzhen, China. Three major scanning areas (anterior, lateral and posterior) delineated by the parasternal, anterior axillary and posterior axillary line have been identified for each hemithorax; each area has been further divided into the upper and lower half. Manual recruitment of the atelectasis under ultrasonographic guidance was attempted. After manual recruitment, LUS showed the resolution of the right apical atelectasis (Figure 1C, Video 1).

### Discussion

Pulmonary complications are very common in pediatric cardiac surgery and LUS can provide findings that the clinician has to integrate with those provided by conventional radiology. In particular, LUS may allow differential diagnosis in common post-operative conditions (i.e. effusion versus atelectasis) and provide a deeper understanding in the physiology of pulmonary complications, even if focused studies are necessary. LUS also offers the advantage of being a radiation-free, easy, and cheap tool [4,5] who can be repeated whenever necessary. Thus, LUS may help to follow rapid and dynamic pulmonary changes occurring post cardiac surgery and to actively monitor invasive/non invasive manoeuvres, such as one we have described.

In conclusion, we reported an interesting application < of LUS in paediatric cardiac surgery intensive care setting.

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**Figure 1: A)** Right apical lung atelectasis at lung ultrasound; **B)** Chest X-ray showing atelectasis at the apex of the right lung; **C)** LUS showing the resolution of the atelectasis after manual recruitment.

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## Video Legend:

**Video 1:** Movie (supplement data)-LUS during manual recruitment.

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