

# Case Report

## Lung-Lavage in severe alveolar proteinosis

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*Pulmonary alveolar proteinosis (PAP) is a disease of unknown etiology where the alveoli are filled with phospholipid (surfactant) and other proteins. Symptoms include dyspnea, coughing, chest pain and weight loss.*

### Introduction

Lung lavage can provide relief to patients with severe PAP. Large volumes of irrigation fluid are needed (30-40 liters per lung) to achieve symptom reduction. The fluid has to be tempered to avoid hypothermia. It is thus a necessity to have a system that allows reliable heating of the irrigation fluid at high flow rates. We have used the Fluido® Warming System.

### Anesthesia

Ten milligram of Diazepam as premedication. Total intravenous anesthesia with propofol (target controlled infusion), remifentanyl and Cisatracurium, Antibiotics, Double lumen endotracheal tube, A-line and urinary catheter with temperature probe. Multiple blood samples are drawn to check oxygenation/ ventilation and electrolytes.

### Method



The lung is filled and drained in repeated cycles with approximately 1,000 to 1,500 ml of fluid. During one-lung ventilation, the fluid line is connected to the non-ventilated tube/lung. Stop cocks and positioning of the operating table are used to direct the flow in and out of the lung. Influx of fluid is stopped when the fluid-pressure in the lung being irrigated is 20-25 mm Hg. (As the air is evacuated, more fluid can be filled before the pressure limit is reached). When the fluid has entered the lung the physiotherapist vibrates the chest as the fluid is drained from the lung.

It is necessary to have fluid tubing that allows high speed influx and efflux, such as the Fluido® Irrigation Set. By avoiding the extra pressure on the fluid-bag, we reduce the risk of lung injury. We achieved a flow-rate of approx 700 ml/min with a temperature around 38°C. This is possible without using extra pressure to the three liter irrigation bag of NaCl 0.9 mg/L fluid. We did not try or want to achieve a higher speed. By avoiding the extra pressure on the fluid-bag, we reduced the risk of lung injury. Prior to the use of the Fluido®, we irrigated one lung per session. The patient then had to be hospitalized again one week later for treatment of the other lung. Now, both lungs are irrigated successively in one procedure that lasts for about 5 hours with no drop in body temperature.



The picture below demonstrates the amount of sediment washed from one lung by the first four liters of irrigation fluid.



### Conclusion

By using the Fluido® Irrigation Set we achieved to keep the patient normothermic without using any other warming technology. This resulted in a reduced treatment frequency, time and hospital stay.