# Congenital Pulmonary Airway Malformations in neonates and infants: Do we need one lung ventilation?

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## Introduction:

- Congenital Pulmonary Airway Malformation (CPAM) is a rare developmental abnormality of the lower respiratory tract with a reported incidence of 1:7200 to 1:27,400 (1)
- Literature on anesthetic management of CPAM is scarce
- Given the anesthetic challenges of these cases and the frequent request for one-lung ventilation in these small infants, we did a retrospective chart review to study the airway management of CPAM resection at our hospital
- To our knowledge, this will be the first case series describing the anesthetic management of CPAM

## Methods:

- IRB approval was obtained
- Fetal center records were reviewed retrospectively from January 2010 to July 2016 for children who had been operated for CPAM
- Data was also collected on demographics, techniques of anesthetic induction, maintenance, use of regional anesthesia, one lung ventilation, and postoperative intensive care
- The variables were compared between the VATS (Video Assisted Thoracoscopic Surgery) group and open thoracotomy group
- Data were analyzed using Fischer's exact test or Student t test as appropriate. p value of < 0.05 was considered significant.

## Results:

- A total of 74 patients underwent CPAM repair between January 2010 and July 2016
- There were 65 resections in the final analysis (others were excluded). The demographics were comparable between the groups
- The surgical time was significantly longer in the VATS group (Table 1)
- One lung ventilation was required in all VATS procedure (except in one patient where the mass removed thoracoscopically with two lung ventilation).
- Regional anesthesia was more commonly used in the open thoracotomy group
- There was no significant difference between the groups in the amount of intraoperative narcotic use, invasive monitoring of blood pressure or extubation in the operating room

| | Total n=65 | VATS n=28 (43%) | Open n=37 (57%) | P value |
|---|---|---|---|---|
| Weight (Kg) | 7 ± 2.4 | 7.6 ± 1.8 | 6.5 ± 2.7 | 0.984 |
| Anesthesia time (min) | 331 ± 105 | 366 ± 117 | 304 ± 88 | 0.055 |
| Surgery time (min) | **200 ± 91** | **234 ± 106** | **174 ± 69** | **0.008*** |
| Fentanyl (mcg) | 42 ± 33 | 44 ± 32 | 40 ± 35 | 0.68 |
| Regional Anesthesia | **35 (54%)** | **7 (25%)** | **28 (76%)** | **< 0.0001*** |
| Lung Isolation | **30 (46%)** | **27 (96%)** | **3 (8%)** | **< 0.0001*** |
| Extubation in OR | 55 (85%) | 26 (93%) | 29 (78%) | 0.167 |
| Length of stay (days) | **5.8 ± 11.3** | **2.9 ± 2.3** | **7.9 ± 14.5** | **0.02*** |
| Arterial line | 38 (58%) | 19 (68%) | 19 (51%) | 0.212 |

VATS – Video Assisted Thoracoscopic Surgery, OR – Operating Room

## Conclusion:

- **Patients undergoing VATS repair are more likely to require one lung ventilation as compared to open repairs**
- **CPAM patients having VATS repair are less likely to have epidural catheter placement for postoperative pain control and have shorter length of hospital stay compared to open thoracotomy repair**

## References:

1.Lau CT, et al. Is congenital pulmonary airway malformation really a rare disease? Result of a prospective registry with universal antenatal screening program. Pediatr Surg Int. 2017 Jan;33(1):105–8.

2.Mattioli, et al. Congenital Lung Malformations: Shifting from Open to Thoracoscopic Surgery. Pediatrics & Neonatology. 57(6):463–6.