Rigid bronchoscopy for airway foreign body removal - Complication related factors

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Background and Goal of Study: Airway foreign body aspiration is a risk in children, especially under the age of 3. Early removal of the foreign body by rigid bronchoscopy is crucial, but complications during the procedure may develop (1,2). One of the most frequent complications is hypoxemia (3). The goal of this study was to evaluate the development of complications during the anesthetic management of airway foreign body aspiration and also compare groups in what concerns to intraprocedural complications.

Materials and Methods:

- Type of study: retrospective, observational;
- Population: children who underwent rigid bronchoscopy (urgent and elective) under general anesthesia;
- Inclusion criteria: age > 0 and < 18 years old, and complete records of the study variables;
- Data analysis: SPSS using the chi-square test and Mann-whitney test,

Results and Discussion:

- 36 patients were included in the study with a mean age of 4,2 years;
- Among the 36 children, 2 developed complications, including hypoxemia (N=1) and cardiac arrest (N=1);
- There were no other reported incidents in the remaining patients;
- Group comparisons are shown in table 1 and 2.

Variable			P value
Type of anesthesia	Balanced general anesthesia	4 (11,1%)	0,072
	Total intravenous anesthesia	32 (88,9%)	
Ventilation mode	Manual jet ventilation	4 (11,1%)	0,018
	Automatic jet ventilation	30 (83,3%)	
	Controlled ventilation	2 (5,6%)	
Foreign body location	Trachea	3 (8,3%)	0,443
	Right main bronchus	12 (33,3%)	
	Left main bronchus	14 (38,9%)	
	Right basement pyramid	1 (2,8%)	
	Left lobar bronchi	1 (2,8%)	
	Right middle bronchus	1 (2,8%)	
	Absent	4 (11,1%)	
Duration of the procedure	Median 68,00 min		0,051
Time of emergence from anesthesia	Median 11,00 min		0,057
Foreign body removal	Successful	29 (80,6%)	0,774
	Failed	7 (19,4%)	

Table 1 (cont)

Variable			P value
Age	Median 2,50 years old		0,667
Gender	Male	21 (58,3%)	0,806
	Female	15 (41,7%)	
Weigh	Median 12,00 kg		0,188
ASA physical status	I	24 (66,7%)	0,00
	II	11 (30,5%)	
	IV	1 (2,8%)	
Procedure	Urgent	31 (86,1%)	0,129
	Elective	5 (13,9%)	
Duration of the foreign body in the airway	Median 68,00 days		0,622

Table 1

Ventilation Mode	Complications		Total
	Yes	No	
Manual jet ventilation	0	4 (11,1%)	4 (11,1%)
Automatic jet ventilation	1 (2,8%)	29 (80,5%)	30 (83,3%)
Controlled ventilation	1 (2,8%)	1 (2,8%)	2 (5,6%)
ASA physical status			
I	0	24 (66,7%)	24 (66,7%)
II	1 (2,8%)	10 (27,7%)	11 (30,5%)
IV	1 (2,8%)	0 (0%)	1 (2,8%)
Total	2 (5,6%)	34 (94,4%)	36 (100%)

Table 2

Conclusion:

- Airway management is a concern during bronchoscopy for airway foreign body aspiration;
- Our sample showed a low rate of intraprocedural complications. It can be related to the experience of the multidisciplinary team that is activated in these situations;
- The development of complications appeared to be related to the ASA physical status and the ventilation mode used;
- Subsequent studies with larger samples are needed to draw further conclusions.

References:

- 1) Chai J, et al. "A retrospective study of anesthesia during rigid bronchoscopy for airway foreign body removal in children: propofol and sevoflurane with spontaneous ventilation." Paediatr Anaesth 24.10 (2014): 1031-6.
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- 3) Shen, Xia, et al. "Propofol-remifentanyl intravenous anesthesia and spontaneous ventilation for airway foreign body removal in children with preoperative respiratory impairment." Pediatric Anesthesia 22.12 (2012): 1166-1170.