International Journal of Medicine Research
ISSN: 2455-7404; Impact Factor: RJIF 5.42
Received: 04-04-2019; Accepted: 06-05-2020; Published: 13-05-2020
www.medicinesjournal.com
Volume 5; Issue 2; 2020; Page No. 36-39

Anesthetic techniques during bronchoscopic examination

Ghanim Khaleel Qasim AL-Allaf[1], Abdulrazzaq Yaseen Mohammed AL Hobaity[2]
[1, 2] Nineveh Health Directorate, Iraq

Abstract
Anesthesia for bronchoscopy poses unique challenges for the anesthesiologist. By definition, bronchoscopy is an endoscopic technique to visualize the inside of the airways for diagnostic and therapeutic purposes. This procedure needs specific technical precision because both the anesthesiologist and operator share the same working space, that is, the airway. Advances in technology and instrumentation have made it a much safer procedure**.** Bronchoscopy may be either rigid (RB) or flexible (FB). RB is usually done for diagnosis and treatment of intra and/or extra luminal obstruction in the airway for adults and children, while FB is usually done by respiratory physicians and is the gold standard for visualizing the airway and performing various diagnostic and therapeutic interventions. RB usually requires general anesthesia (GA) while FB can be done under sedation supplemented with topical anesthesia (TA).

Keywords: aneasthesia, general, theraputic

Introduction
Anesthesia for bronchoscopy poses unique challenges for the anesthesiologist. By definition, bronchoscopy is an endoscopic technique to visualize the inside of the airways for diagnostic and therapeutic purposes. This procedure needs specific technical precision because both the anesthesiologist and operator share the same working space, that is, the airway. Advances in technology and instrumentation have made it a much safer procedure**.** Bronchoscopy may be either rigid (RB) or flexible (FB)**.** RB is usually done for diagnosis and treatment of intra and/or extra luminal obstruction in the airway for adults and children, while FB is usually done by respiratory physicians and is the gold standard for visualizing the airway and performing various diagnostic and therapeutic interventions. RB usually requires general anesthesia (GA) while FB can be done under sedation supplemented with topical anesthesia (TA) [1]. Flexible bronchoscopy can be performed as an outpatient procedure under local xylocaine anesthesia with or without conscious sedation. Yet, intra-procedure and post-procedure cough, sore nose, sore throat, and chest discomfort are very common symptoms [2]. More fundamental, and affecting the procedure outcome, possible morbidity, and even mortality, are the intra-procedural events of cough, agitation, and hypoxia, which might prematurely abrupt the procedure [3] or at least may add pressure on the operator, rendering him hasty to finish the procedure with the possibility of insufficient sampling or unsatisfactory examination. In contrast, GA is expected to totally alleviate the coughing reflex, agitation, and anxiety, in addition to compensate for any hypoxic event, which provides both the operator and, more importantly, the patient peace of mind [4]. However, it significantly increases the cost of the procedure and the post-procedural recovery time. In addition, the use of bronchoscopy through an endotracheal tube (ETT) will hinder the inspection of the vocal cords and a significant portion of the trachea. Furthermore, the use of an ETT will add a burden in the mobility of the scope, and necessitates a certain tube size that can allow the passage of the scope**.** It is proposed that the use of a laryngeal mask will allow the visualization of the whole respiratory tree from the vocal cords downwards; it will not interfere with the scope mobility, in addition to the previously mentioned benefits of alleviating the cough reflex and any hypoxic event. We aimed to compare conscious sedation with GA in achieving a safer and more painless procedure [5].

Methodology
Design of the Study
A descriptive study was conducted on the anesthetic techniques during bronchoscopic examination.

Setting of the Study
The present study was carried out in the operating room of bronchoscopy at Al- Shaheed Ghazi Teaching Hospital in Baghdad city and Baqubah Teaching Hospital in Diyala city from December 2016 to March 2017.

Sample of the study
The sample of the study consisted of 70 bronchoscopic patients aged between 4 months to 86 years that were in the operation room of the bronchoscopy selected through purposive sample. The criteria for diagnosis of cases depended on the medical decision by the physician.

Method of data collection
After extensive review of relevant literature related to the study, check-list type was developed by the supervisor because no existing tool was found to measure the desired information (Appendix 1).

Procedure
The data was collected through:
1. Review of patients records.
2. Interview method.
3. Observing and recording during bronchoscopy procedure.

Statistical Analysis

1. Frequencies (F) and percentage (%).
2. Tables.
3. Chi-Square.

There was certain set of probability levels to determine the significance of the test as

1. Nonsignificant (Ns) p> 0.05.
2. Significant (S) p< 0.05.
3. Highly significant (Hs) p< 0.01.

Results

The results showed (table 1) that 67.1% of the patients were males and 32.9% were females. The majority of the patients (30%) were under 5 years of age, and 24.3 were above 60 years.

Table 1: Distributions of the sample according to their age and gender.

Age/ Years	Gender					
	Male		Female		Total	
	No.	%	No.	%	No.	%
4m. up to 5y.	14	20	07	10	21	30
6-17	07	10	03	4.3	10	14.3
18-40	04	5.7	04	5.7	08	11.4
41-60	11	15.7	03	4.3	14	20
61 and more	11	15.7	06	8.6	17	24.3
Total	47	67.1	23	32.9	70	100 X^2 = s

Table (2) showed that 54.29% of the sample was under general anesthesia and all of them performed RB procedure, while 45.71% were under topical anesthesia and all of them performed FB procedure.

Table 2: Distributions of the sample according to type of anesthesia and type of bronchoscopy.

Type of anesthesia	Type of bronchoscopy					
	Rigid		Flexible		Total	
	No.	%	No.	%	No.	%
General	38 (100%)	54.29	0	0	38	54.29
Topical	0	0	32 *(100 %)*	45.71	32	*45.71*
Total	38	54.29	32	45.71	70	100

The result showed in table (3) that the majority 37.14% of the indications were foreign body, 17.14% lung tumor and mass, while the lowest percentage (1.43%) was thick secretion. There was 36 (51.4%) of the sample was obtained tissue specimens. All the cases involved with tissue specimen's procedure (mostly lung tumor and mass) except foreign body and esophageal problems.

Table 3: Distributions of bronchoscopy indications and tissue specimens obtained.

Indications	No.	%	Tissue specimens	
			No.	%
Foreign body.	***26***	37.14	1	2.77
Lung tumor and mass.	12	17.14	12	33.33
Esophageal problem.	08	11.43	0	00.00
Pneumonia and chest infection.	08	11.43	7	22.22
Ca. lung.	06	8.57	6	16.66
Bronchiectasis.	04	5.71	4	11.11
Pulmonary lesion.	03	4.29	3	8.33
Tuberculosis.	02	2.86	2	5.55
Thick secretion.	01	1.43	1	2.77
Total	70	100	36 (51.4%)	100

The results as showed in table (4) that 57.14% of the sample was for diagnostic purpose while 42.86% for therapeutic purpose, also 54.29% of the sample were on rigid bronchoscopy while 45.71% were on FB. 65.8% of RB used for therapeutic purpose while 84.4% of FB used for diagnostic purpose.

Table 4: Distribution of the sample according to the type of bronchoscopy and their purpose.

Type of Bronchoscopy	Purpose				Total	
	Diagnostic		Therapeutic			
	No.	%	No.	%	No.	%
Rigid	13	18.57 (34.2)	25	35.71 (65.8)	38	54.29 X2 = s
Flexible	27	38.57 (84.4)	05	07.14	32	45.71 X2 = s
Total	40	57.14 X2 = s	30	42.86 X2 = s	70	100 X2 =N s

The results as showed in table (5) that the majority of the cases (90%) lasted less than 20 minutes under bronchoscopy procedure especially those who were under flexible bronchoscopy.

Table 5: Distributions the sample according to time and type of procedure.

Total time of procedure (Minute)	Type of bronchoscopy						
	Rigid		Flexible		Total		
	No.	%	No.	%	No.	%	
6-10	15	21.4	7	10.0	22	31.4	90
11-15	10	14.3	13	18.6	23	32.9	
16-20	7	10.0	11	15.7	18	25.7	
21-25	2	2.9	1	1.4	3	4.3	
26-30	2	2.9	0	0	2	2.9	
31-35	1	1.4	0	0	1	1.4	
36-40	1	1.4	0	0	1	1.4	
Total	38	54.3	32	45.7	70	100	

Discussion

The results as showed in (table 1) that 67.1% of the patients were males and 32.9% were females. The majority of the patients (30%) were under 5 years of age, and 24.35% were above 60 years. There was significant relationship between bronchoscopy procedure and gender ($P<0.05$) [19]. The bronchoscopy can be performed for all age groups and both gender. This result may be due to small size of sample and some causes like foreign body among children group, smoking among old group especially males' patients and lung diseases of the aged patients [20]. Table (2) showed that 54.29% of the sample was under general anesthesia and all of them performed RB procedure, while 45.71% were under topical anesthesia and all of them performed FB procedure. Ideal anesthesia requires hypnosis, analgesia and muscle relaxation. General anesthesia mostly performed for RB that induced with some of drugs like propofol, ketamine, halothane, fentanyl and short acting muscle relaxants (suxamethonium), bronchodilator (hydrocortisone, decadron), neostigmine and atropine used as a reversal agent of residual neuromuscular block, vocal cords sprayed with lignocaine to prevent post-operative laryngospasm[1,21]. Topical anesthesia was performed in FB to make patient more comfortable with sedation. Anesthesia of nostrils, oropharynx and hypo pharynx were used to suppressed cough reflex and allows the procedure to take place easily. Application of xylocaine (lidocaine) due to its rapid onset, short duration of action and low toxicity profile [1, 17] on nasal mucosa and spraying the oral cavity with lignocaine to anaesthetize the tongue and nasopharynx. The result showed in table (3) that the majority 37.14% of the indications were foreign body, 17.14% lung tumor and mass, while the lowest percentage (1.43%) was thick secretion. There was 36 (51.4%) of the sample was obtained tissue specimens. All the cases involved with tissue specimens procedure (mostly lung tumor and mass) except foreign body and esophageal problems. This result supported by other study mention that the most indications for RB include airway bleeding, foreign body retrieval while FB for deeper tissue biopsy specimens [12,15]. Bronchoscopy is the basis of diagnosis and enactment of tracheal neoplasms [22]. Other study showed that indications for bronchoscopy varied with age, with solitary pulmonary nodule, mass, or lymphadenopathy being more common in older patients. Invasive sampling methods were used more often with increasing age, but variation in disease processes between age groups accounted for the difference in sampling method performed [23]. The results as showed in table (4) that 57.14% of the sample was for diagnostic purpose while 42.86% for therapeutic purpose, also 54.29% of the sample were on RB while 45.71% were on FB. 65.8% of RB used for therapeutic purpose while 84.4% of FB used for diagnostic purpose. The result showed that most of the indications for FB were diagnostic rather than therapeutic while the RB was therapeutic rather than diagnostic [24]. The results as showed in table (5) that the majority of the cases (90%) lasted less than 20 minutes under bronchoscopy procedure especially those who were under FB. These results agree with similar study showed that the bronchoscopy test is relatively quick, lasting about 30 minutes [25].

Conclusion

The bronchoscopy procedure can be performed for all age groups and both gender. General anesthesia mostly performed for RB while topical anesthesia performed fore FB. Bronchoscopy is the basis of diagnosis and enactment of foreign body, tracheal neoplasms, esophageal problem, deeper tissue biopsy specimens and other tracheobronchial problems. Most of the indications for FB were diagnostic rather than therapeutic while the RB was therapeutic rather than diagnostic. The bronchoscopy tests were relatively quick and in most of cases lasted less than 20 minutes.

Recommendation

Further study is recommended to make a comparison between indications of rigged versus flexible bronchoscopy.

References

1. Meenu C, Mayank K, Alok B. Anesthesia for bronchoscopy. Indian J Anaesth. 2015; 59(9):565-573.
2. Diette GB, White P Jr, Terry P, Jenckes M, Wise RA, Rubin HR. Quality assessment through patient self-report of symptoms prefiberoptic and postfiberoptic bronchoscopy. Chest. 1998; 114:1446-1453.
3. Gasparini S. It is time for patients to undergo bronchoscopy without discomfort. Eur Respir J. 2011; 38:507-509.
4. Facciolongo N, Patelli M, Gasparini S, Lazzari Agli L, Salio M, Simonassi C, *et al*. Incidence of complications in bronchoscopy. Multicentre prospective study of 20,986 bronchoscopies. Monaldi Arch Chest Dis. 2009; 71:8-14.
5. Raafat H, Abbas M, Salem S. Comparison between bronchoscopy under general anesthesia using laryngeal mask airway and local anesthesia with conscious sedation: a patient-centered and operator-centered outcome. Egypt J Bronchol. 2014; 8:128-37.
6. Du Rand IA, Blaikley J, Booton R, *et al*. (British Thoracic Society Bronchoscopy Guideline Group). British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults: Accredited by NICE. Thorax. 2013; 68(Suppl 1):i1–i44. doi: 10.1136/thoraxjnl-2013-203618. [PubMed] [Cross Ref].
7. Kar Kurt Ö1, Talay F, Karğı A, Yaşar Z, Tuğ T. Sedation for fiberoptic bronchoscopy: review of the literature. Tuberk Toraks. 2015; 63(1):42-7.
8. Dr. Chinmayee P. Joshi. A Retrospective study of rigid bronchoscopy 8 paediatric cases with acute respiratory distress. International Journal of Scientific and Research Publications. 2014; 4(12):2250-3153.
9. Jump up RD. Delmar's Guide to Laboratory and Diagnostic Tests. Cengage Learning. pp. 163–. ISBN 978-1-4180-2067-5, 2009. Retrieved 30 May 2010.
10. Jump up RKW, Burke K. Chapter 39. Foreign Bodies. In: Lalwani AK, ed. Current Diagnosis & Treatment in

Otolaryngology-Head & Neck Surgery. 3rd ed. New York: McGraw-Hill.
11. Andrew R. Haas, Anil Vachani, and Daniel H. Sterman. Advances in Diagnostic Bronchoscopy. AJRCCM Sep, 2010, 182(5).
12. Daniel G. Nicastri, MD. Rigid Bronchoscopy: Indications and Techniques. Spring. 2012; 17(1):44-51.
13. David LS, Kathleen MR, Thomas JP. Complications of bronchoscopy: A concise synopsis. Int J Crit Illn Inj Sci. 2015; 5(3):189-195.
14. Vikas P, Ian W, Kamran M, Momen W, Neil M, *et al*. Ventilation and anesthetic approaches for rigid bronchoscopy. All Annals ATS Issues, 2014, 11(4).
15. Armin Ernst. Introduction to bronchoscopy. Cambridge University Press São Paulo, 2009, pp78-81.
16. Thomas F, Jan F, Meike J, Anna B, Hendrik S, Tobias W, Jens G, Mark G, *et al*. Topical nasal anesthesia in flexible bronchoscopy – A Cross- Over comparison between two devices. PLoS One. 2016; 11(3):e0150905.
17. James English, Andrew Norris, Nigel Bedforth, and Nigel Bedforth. Anaesthesia for airway surgery. Oxford Journals, 2006, 6(1).
18. Matsuo T, Colt H. Evidence against routine scheduling of surveillance bronchoscopy after stent insertion. Chest. 2000; 118:1455-9.
19. Mnejjaa M, Chakrouna Am, Bougachaa L, Smaouib L, Ben Salaha M, *et al*. Bronchoscopy for foreign body inhalation in the pediatric population: Lessons learned from 223 cases. PMID. 2012; 19(6):670-674.
20. Sun Jiaqiang, Sun Jingwu, Hu Yanming *et al*. Rigid bronchoscopy for inhaled pen caps in children. Journal of Pediatric Surgery. 2009; 44 (9):1708-1711.
21. Vila E, Mases A, Fernandez JL, Vela E, Gallart L. Anesthesia technique and patient and bronchoscopist satisfaction during endobronchial ultrasound-guided transbronchial needle aspiration performed under conscious sedation: 5AP4-4. European Journal of Anaesthesiology: June, 2011, 28-78.
22. Uma B, Verma UC, Rautela RS. Anesthetic management for bronchoscopy and debulking of obstructing intratracheal tumor. Saudi J Anaesth. 2015; 9(4):484-488.
23. Boyd TH, Edward H, *et al*. The relationship between age and process of care and patient tolerance of bronchoscopy, Journal of the American Geriatrics Society. 2003; 51(7):917-922.
24. Amir S, Qazi I, Farooq A, Muhammad Y K. Indications and complications of bronchoscopy: an experience of 100 cases in a tertiary care hospital. Home. 2008; 22(3).
25. Written by Erica Roth, medically reviewed by Deborah Weatherspoo