

Diagnostic value of delayed Fiberoptic Bronchoscopy in hemoptysis

Saad Mikhlef M. Salih , M.B,Ch.B(Baghd.),F.I.B.M.S

Teacher of Thoracic & Cardio-Vascular Surgery, Medical College, Al-Anbar University

Abstract

A study includes 76 patients of different age groups complaining of hemoptysis male represent 60(79%) of the patients white female represents 16(21%) patients ,age incidence varies from 17 to 75 years the peak age groups is that from 40-59 years old which includes 66%.

Most of patients in this study complained from hemoptysis of blood as blood streaks, while most of the patients 67(88%) had abnormal radiological findings.

The procedure done under local anesthesia in sitting position, trans-nasal approach is routinely done except few cases where trans-oral route used alternatively.

Visualization of trachea-bronchial tree and taking samples for cytological, bacteriological, biochemical and screening for tuberculosis were done.

Seventy eight percent of the patients had abnormal bronchoscopical finding ranged from tumor masses to paralyzed vocal cords.

The samples showed variable findings from malignant cell to chronic bacterial infections.

After collection of the direct and indirect findings we diagnose the causes of hemoptysis in a seventy two patients and this study proved that fiber optic bronchoscope is very important and valuable diagnostic tool in hemoptysis with very high sensitivity rate in cases where direct abnormal findings can visualized. This study showed in spite of that CT-scan and MRI studies are important diagnostic modalities; they will never replace the fiber optic bronchoscope in diagnosing of the causes of hemoptysis.

Endoscopy:-Is a procedure used to visualize the internal organs by passing an instrument through a natural or artificial orifice ⁽¹⁾.

Bronchoscopy:- Endoscopic procedure provides direct access to the tracheo-bronchial tree and plays an essential role in the diagnosis and treatment of patients with chest problems ⁽²⁾.

Fiber-optic bronchoscopy: - Are flexible bronchoscopes that composed of fiber optic bundles which provides both illumination and visualization pathways. Small channel with diameter (1-3) mm traverse the fiber optic scope through which suction, catheters, brush and biopsy can be taken for chemical, cytological, bacteriological, viral, protozoal and histopath-logical examination ^(3,4,5).

Diagnostic indication of bronchoscopes ^(1, 5, 6, and 7):-

1-persistent coughs.

2-hemoptysis.

3-wheeze or bronchial obstruction.

4-abnormal thoracic radiography.

5-suspected bronchogenic carcinoma.

6-airway obstruction.

Introduction:-

Hemoptysis is defined as expectoration of blood from respiratory tract and this spectrum varies from blood streaking of sputum to coughing-up large amounts of pure blood⁽⁸⁾.

Massive hemoptysis is variably defined as the expectoration of more than 100-600ml of blood over a 24 hours period.

Although the patients estimation of the amount of the blood is notoriously unreliable, expectoration of even small amounts of blood is a frightening symptom and can be a marker for potentially serious disease such as bronchogenic carcinoma⁽⁹⁾.

Large amounts of blood can fill the air way and the alveolar spaces not only seriously disturbing gas exchange but also potentially leading to suffocation.

The Common causes of hemoptysis ^(10, 11, 12, 13, 14, 15, and 16) :-

1- Tracheo-bronchial sources:-tumor, bronchitis, bronchiectasis, airway trauma and foreign body inhalation.

2-Pulmonary parenchymal sources:- pneumonia, lung abscess, TB, lung contusion.

3-Primary vascular source:-pulmonary embolism and A-V malformation.

4-Miscellaneous causes:-coagulopathy, anti-coagulant and pulmonary endometriosis.

Because blood comes from nasopharynx or the gastro-intestinal tract can mimic the blood coming from the lower respiratory tract, it is important to determine initially that the blood is not coming from one of the alternating sites.

Clue that the blood is originating from the gastro-intestinal tract includes a dark red or coffee ground appearance and an acidic PH in contrast to the typical red bright appearance and alkaline PH.

suffering from hemoptysis whom underwent flexible fiber optic bronchoscopy at period from 2005-2008 a.c.

The whole work was done in the ramadi general hospital, Thoracic and cardio-vascular surgery unit. The procedure of fiber optic bronchoscopy in this study was done in sitting position and usually through trans-nasal route of insertion.

Some time trans-oral route, all the procedures done under local without premedication.

Xylocaine gel and spray were used to anesthetize the nasal and oral mucosa, while few milliliters of Xylocaine solution (0.5-1%) were given through the side channels of the scope to anesthetize the vocal cords, trachea, and bronchial mucosa.

The examination included pharyngeal wall, vocal cords and trachea-bronchial tree.

Bronchial washes were taken from all patients; the bronchial wash was collected into sterile mucous extractor tube for every procedure.

The samples of bronchial washes being sent for cytological study, AFB, Ziehl-Neelsen stain, bacteriological study.

After each procedure the scope is cleansed with its accessories and brushed including all parts and channels by water and soap and then the scope is soaked in 2% glutaraldehyde (cidex) for about 30 minutes then rinsed with sterile water and dried before it is used for the next procedures.

Materials and Methods

This is retrospective and prospective study which was carried on 76 consecutive patients

RESULTS

Sex distribution Males represent the predominant sex with a number of 60 (79 %), while the number of females was 16 (21 %) with male to female ratio of (1:3.75) as shown in the figure below:-

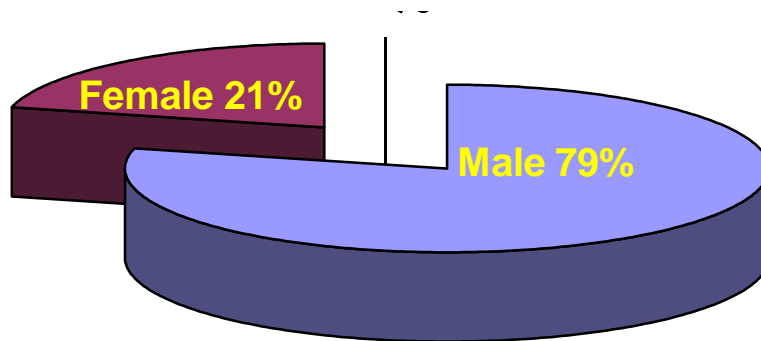


FIG.1: gender distribution

The age of our patients ranged between (17-75) years, with the mean age of (49) years.

The peak number was between (40-59years) and they were (50)(66 %), while the

least number was in age group below 20 years and this accounts for only one patient (1 %)as shown in table no.(1).

Table1.age distribution

AGE	No. of patient	Percentage
Less-20	1	1%
20-39	8	11%
40-59	50	66%
60-above	17	22%
total	76	

The major numbers of patients were having hemoptysis for less than one month and they represent 48(63 %),while the least number of

patients who have history of hemoptysis for more than 6 months 5 (7 %),as shown in

table no.2.

Table 2: duration of Hemoptysis

Duration	No. of patient	Percentage
Less than 6 months	48	63%
1-6 months	23	30%
More than 6 months	5	7%
Total	76	

Most of our patients have hemoptysis in the form of streaks of blood and represented 50(66 %).

While blood stained sputum and clots or fresh blood are equal in their presentations in this study as shown in table no. (3).

Table 3: distribution according to type of Hemoptysis

Types of Hemoptysis	No. of patient	Percentage
Streaks of blood	50	66%
Blood stained sputum	13	17%
Clots or fresh blood	13	17%
Total	76	

All patients in this study had a chest X-ray taken in postero-anterior and lateral views. Abnormalities in chest X-ray were found in 67(88 %) ,while normal chest X-ray were

found in 9 patients(12 %) as seen in table no.(4).

Table 4: distribution of cases according to chest x-ray

Radiological finding	No. of patient	Percentage
Opacity	20	26%
Hilar shadow	14	18%
Cystic lesion	06	8%
Multiple infiltrate	15	20%
Cavitational lesion	08	10%
Collapsed lung	04	5%
Normal x-ray	09	12%

Total	76	
--------------	-----------	--

The following categorized results were achieved from 76 patients who underwent fiber optic bronchoscopy:-

= (59) patients (78%) had abnormal bronchoscopical findings.

=(17) patients (22%) had normal bronchoscopical findings.

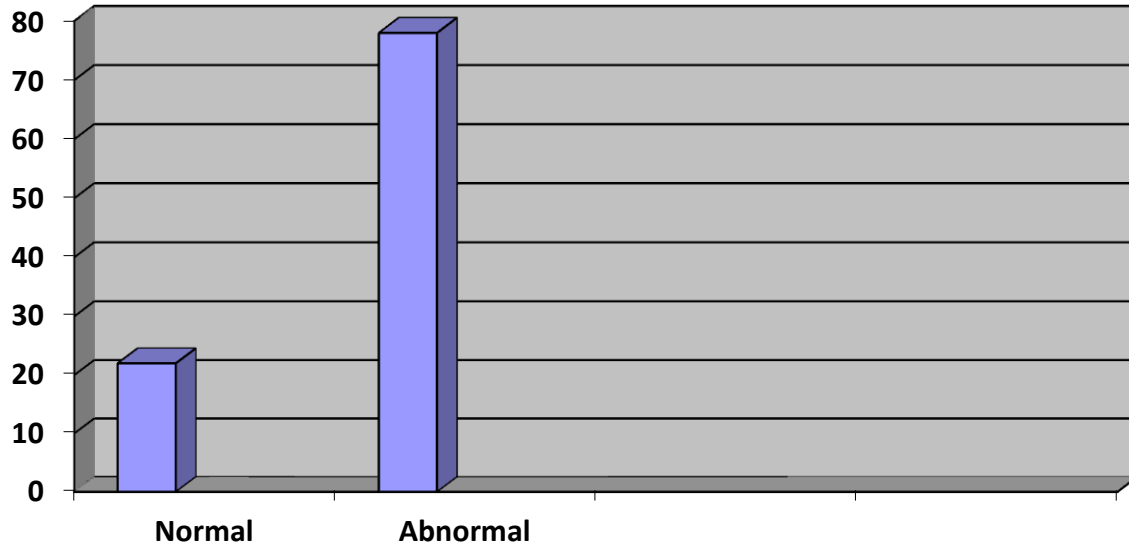


Fig.2: Normal and abnormal findings

The type of bronchoscopic findings were varied from fungating tumor mass in 30 patients (67 %) which represents the peak incidence in this study to only paralyzed

vocal cords which represent only one case (2%). The findings can be categorized in the following table:-

Table 5: pathological findings

Pathology	No. of Patient	Percentage
Fungating mass	30	67%
Bronchiectatic changes	19	32%
Abnormal mucosa	09	16%
Paralyzed V.C	01	2%
Total	59	

From the entire seventy six patients who underwent the procedure of fiber optic bronchoscopy bronchial wash were taken and

sent for cytology, bacterial C/S and AFB studies. The results of laboratory studies can be classified as shown in the following table:-

Table 6: laboratory findings

Lab. Finding	No. of patient	Percentage
Squamous cellcarcimona	28	37%
Adenocarcinoma	10	13%
Carcinoid tumor	02	3%
Acid fast bacilli	07	9%
H,C ruptured	01	1%
Mixed inflammation	15	19%
Negative	13	17%
total	76	

The peak incidence of those no visible lesion bronchoscopy were positive for AFB which represents eight patients (47 %).ruptured h.c

represent only one Patient (6 %),These findings can be classified in the following table:-

Table 7: non tumor findings

Lab. results	No. of patient	Percentage
AFB +ve	4	23%
Mixed inflammation	8	47%
H.C(ruptured)	1	6%
-ve findings	4	23%
Total no.	17	

The numbers of patients with negative bronchscopical findings were 4 patients (6 %) from whom 13 patients had abnormal laboratory findings proved by bronchial wash.

Total final results

The numbers of patients with direct abnormal bronchscopical findings were 72 patients (94 %).

Table 8: Total Results

Finding	No. of patient	Percentage
Direct finding	59	94%
Indirect finding	13	6%
Total no.	72	

Discussion

Endoscopy: is a procedure used to visualize an internal organ by passing an instrument via a natural or artificial orifice⁽¹⁷⁾.

The fiber optic bronchoscopy has revolutionized the respiratory medicine and became available in the 40 years ago⁽¹⁸⁾.

It provides the biggest single advanced diagnostic technique for the chest in recent years. It is used widely and has largely superseded the rigid bronchoscope.

Fiber optic bronchoscope is a safe procedure and it is an accepted out-patient procedure, and patients do not require hospitalization⁽¹⁹⁾.

The development of fiberoptic bronchoscopy makes a new challenge in diagnosis of hemoptysis with normal chest radiography in many lung disorders⁽²⁰⁾.

Generally, the procedure is safe, valuable and most of the complications are avoidable⁽²¹⁾. minor complications may be occur like irritative cough, temporary respiratory distress, and minor epistaxis but they are minor and tempotary, no need for post-procedure therapy or hospitalization.

Since introduction of flexible fiber optic bronchoscopy by Ikeda in 1967, fiberoptic bronchoscopy has assumed prominent role in the diagnosis and management of broncho-pulmonary disorders.

The development of instrumentation for brushing, biopsy and drainage purposes had enhanced the technique for diagnosis and management of pulmonary conditions.

Patients included in our study were those with hemoptysis of variable duration, etiology, X-ray presentation and variable type of hemoptysis.

The majority of our patients were male sex (79%) with age group of 40-59 years (66 %).

Most of patients had hemoptysis for less than one month this explain awareness of hemoptysis which makes the patients seek for medical attention early. The peak incidence of hemoptysis was streaks of blood (66 %).

The procedure done after hemoptysis stopped or controlled this makes the patients more stable and the site of bleeding localized easily. Bronchial wash and brush taken from all patients without taking biopsy even from visible lesion.

67 patients had abnormal chest x-ray while 9 patients have non-suggestive (normal) radiological study. The commonest radiological findings were opacity 20 patients (26%) followed by multiple infiltrate 15 patients (20 %) and the Hilar shadow 14(18 %).

Fungating tumor mass was found in 30 patients (67%) this explained that hemoptysis commonly associated with central masses than peripheral lesions.

The bronchial wash showed that sequamous cell carcinoma (37 %) has higher fraction of finding than Adenocarcinoma (13 %) this could be explained by the fact that patient with hemoptysis had more central than peripheral lesions.

Broncho-alveolar lavage is useful technique to remove material from the terminal and alveolar sacs, espicialy in negative results.

Conclusion

- 1- Fiberoptic bronchoscopy is very valuable tool in diagnosis of the causes of hemoptysis.
- 2- The procedure can be done safely after control of the attacks of hemoptysis.
- 3- The procedure carries very high sensitivity in cases of visible lesion and has acceptable results in cases of normal chest radiography.
- 4- Bronchial wash for cytology is vital to determine the type of malignancy as step for the lines of treatment; it is useful technique for obtaining microbiological specimens, especially in immunocompromised patients.
- 5- CT-scan or MRI of the chest can determine the site of the lesion but still the cytopathological examination depends on the bronchial wash obtained by Fiberoptic bronchoscopy.
- 6- Training the doctors and distribution the bronchoscopic instrument in the general hospitals.

Reference

1. Sackner MA.: Bronchofibroscope, Am. Resp. Dis., 1975, 111: 62-88.
2. Anderson HA, Faber LP: Diagnostic and therapeutic applications of the bronchoscope. Chest. 1978; (suppl): 685.
3. Arther D. Body: Endoscopy: Bronchoscopy and Oesophagoscopy in David Sabiston, Frank C. Spencer: Surgery of the chest, vol. 1, 6th edition Philadelphia. W.B Saunders Co. 1996: 69.
4. Mark Toddler, and Ross Manque: Bronchoscopy, DAVID C. Sabiston, jr., text book of surgery, 15th ed. W.B. Saunders company, 1977.
5. Richard B. Mc Elvin: Bronchoscopy, Arthur E. Bane, Glenn's thoracic surgery, Vol. 1, 5th ed. Prentice Hall international Inc. 1992, 147-150.
6. Ikeda, S.: Atlas of flexible bronchoscopy. Baltimore, University park press, 1974.
7. Peter Stradling: Diagnostic bronchoscopy a teaching manual. 6th ed. Edinburgh. Churchill Livingstone. 1993.
8. Steven E. Weinberger, Eugene Braunwald. Cough and hemoptysis. Harrison's principles of internal medicine (15th ed. McGraw and Hill) p. 203, 2002.
9. Cahill BC, Ingbar DH: Massive hemoptysis: Assessment and management. CL in chest Med. 15: 147, 1994.
10. Fernando HC et al: Role of bronchial artery immobilization in the management of hemoptysis. Arch Surg. 133: 862, 1998.
11. Hirshberg B et al: Hemoptysis: Etiology, and outcome in a tertiary referral hospital. Chest 112: 440, 1995.
12. Primach SL et al: Diffuse pulmonary hemorrhage: clinical, pathologic and imaging features. AJR 164: 295, 1995.
13. Liebler-JM; Markin-CJ: Fiberoptic bronchoscopy for diagnosis and treatment. Crit.-Care-Clin. 2002 Jan.; 16(1): 83-100.
14. Fioucci-F et al: Idiopathic pulmonary hemosiderosis: Recent Prog.-Med. 1996 May; 87(5): 223-6.
15. Chang-Jc; Gregler-LL: Hemoptysis in patient with congestive heart failure and pulmonary emboli. J. Natl.-Med.-Assoc. 1994 May; (5): 383-6.
16. De-Gracia- J et al: The use of fibrinogen-thrombin via endoscope in the treatment of massive hemoptysis. Arch.-Bronconeumol. 1995 May; 31(5): 227-32.
17. Poe-RH; Israel- RH; Martin- MG et al: Utility of Fiberoptic bronchoscopy in patient with hemoptysis and non localizing chest roentgenogram. Chest. 1988 Jan. (1): 70-5.

18. Flower-CD: Fiberoptic bronchoscopy in thoracic diagnosis. J. Thorac-Imaging. 1987 Apr.;2(2):61-5.
19. Ahmed-M et al: the safety of out patient transbronchial biopsy: Chest. 1986 Sep.;90(3):403-5.
20. Lee-CJ et al: the role of Fiberoptic bronchoscopy in patient with hemoptysis and abnormal chest roentgenogram. Chang-Keng-I-Hsue H. 1989 Sep.20;12(3):136-40.
21. Kassab K. Azhar: the role of flexible Fiberoptic bronchoscope in diagnosis of carcinoma. J.Fac.Med.Bag. 1996;38:24-28.