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TO STUDY THE ROLE OF SEMIRIGID THORACOSCOPY IN THE DIAGNOSIS OF PLEURAL EFFUSION IN SUSPECTED CASES OF LUNG CARCINOMA IN A TERTIARY CARE CENTRE IN NORTH INDIA

General Medicine

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ABSTRACT

Diagnosis of malignant pleural effusion is highly challenging. Malignant pleural effusion, mostly due to malignant progression is a common complication of malignant tumor. Methods like cytology, chest CT, immunology, bronchoscopy, percutaneous closed pleural biopsy are used to diagnose malignant pleural effusion, but in more than 20% of patients diagnosis cannot be confirmed[1]. Thoracoscopy has significantly improved the diagnostic yield of pleural diseases. The procedure is simple and done under local anaesthesia. Interventional thoracoscopy is gaining upper hand in the management of many pleural diseases obviating the need for invasive surgical procedures.

KEYWORDS

INTRODUCTION

Pleural effusion is excess fluid that accumulates in the pleural cavity, the fluid-filled space that surrounds the lungs. This excess can impair breathing by limiting the expansion of the lungs. Malignant pleural effusions are caused most commonly by carcinoma of the breast, lung, gastrointestinal tract or ovary or by lymphoma. Effusions may be secondary to impaired pleural lymphatic drainage from mediastinal tumor and not due to direct pleural invasion.[2] Effusion may be presenting sign of cancer or they may develop after cancer is diagnosed. Only 50% of the effusions that develop in cancer patients during the course of their illness are malignant. Correct diagnosis of the cause of effusion is necessary in their management[2]. A cancerous pleural tumor is most often secondary. Primary tumours are rare, in which mesothelioma is most common.

Once a pleural effusion is diagnosed, the cause must be determined. Pleural fluid is drawn out of the pleural space in a process called thoracentesis, and it should be done in almost all patients who have pleural fluid that is ≥ 10 mm in thickness on CT, ultrasonography, or lateral decubitus x-ray and that is new or of uncertain etiology. In general, the only patients who do not require thoracentesis are those who have heart failure with symmetric pleural effusions and no chest pain or fever; in these patients, diuresis can be tried, and thoracentesis avoided unless effusions persist for ≥ 3 days.4

Thoracoscopy is a minimally invasive procedure that provides access to the pleural space, parietal pleura, lung, and other structures within the thoracic cavity using an endoscope. This procedure provides physicians a window into the pleural space, to perform biopsy of the parietal pleura under directvisual guidance, particularly for biopsies in cases of exudative effusions with unclear origin, chest tube placement, and pleurodesisto prevent recurrent pleural effusion or pneumothorax in selected patients.

The semirigid thoracoscope (model LTF 160, Olympus, Japan) is similar in design and handling to a video bronchoscope. It allows the performance of thoracoscopy in a fashion analogous to flexible bronchoscopy. The thoracoscope consists of a handle and a shaft that measures 7 mm in outer diameter and 27 cm in length. The shaft is made up of two sections: a 22 cm, proximal, rigid portion; and a 5 cm, flexible, distal end, which can be moved using a lever on the handle. It also has a 2.8 mm working channel that accommodates biopsy forceps, needles, and other accessories and that is compatible with various electrosurgical and laser procedures. The thoracoscope is inserted through a 10mm disposable plastic trocar (Olympus, Japan) and allows autoclaving (model LTF160), thereby obviating important issues related to asepsis.[7]

AIM & OBJECTIVES:

To observe the incidence of malignant pleural effusion, paramalignant pleural effusion, exudative pleural effusion and transudative pleural effusion in cases of undiagnosed pleural effusion with suspected lung carcinoma.

MATERIALS AND METHOD

SETTING:

Patients attending indoor/outdoor of PG Department of Medicine S.N. Medical College, Agra during the study period.

Study Design

It is a Cross sectional study.

Study Time

1st January 2019 to 30th June 2020.

INCLUSION CRITERIA:

Patient with suspected lung carcinoma presenting with pleural effusions who fulfil one or more of following criteria:

1. X-ray chest suggestive of lung carcinoma and pleural effusion.
2. CT scan thorax suggestive of lung carcinoma and pleural effusion.
3. Bronchoscopic findings suggestive of lung carcinoma and pleural effusion.

EXCLUSION CRITERIA:

1. Patient less than 12 years of age.
2. Pregnant and lactating mother.
3. Patients with coagulation disorder.
4. Patients having co-morbid conditions like coronary artery disease, cerebrovascular disease, chronic liver disease and chronic kidney disease.
5. Patients with poor lung function ($PaCO_2$>50 mmHg).
6. Patients having excessive rib crowding.
7. Patients not willing to give consent for thoracoscopy.

METHOD

Patients attending the indoor/outdoor of the P.G. Department of Medicine, S.N. Medical College, Agra will be enrolled after informed consent.

RESULTS AND DISCUSSION

The age of the patients in the study group ranged from 20 to 70 years; mean age was 45.8 years. Out of 75 patients, maximum number of patients i.e. 18 (24%), belonged to age group of 51-60 years.

Out of 75 patients in the study, 51 (68%) were males and 24 (32%) were females. Male:Female ratio was 3.25:1.

Table-1: Distribution of cases according to chief complaints (symptoms) of the patients

Symptoms	Total no. of cases (N)= 75	
	Number	Percentage
Breathlessness	56	74.67
Chest pain	45	60
Fever	41	54.67
Loss of appetite	38	50.67
Weight loss	30	40

Cough with expectoration	35	46.67
Dry cough	29	38.67
Hemoptysis	42	56

Most common symptom was breathlessness in 56 patients (74.67%), followed by chest pain in 45 patients (60%), fever in 41 patients (54.67%), loss of appetite in 38 patients (50.67%), weight loss in 30 patients (40%), cough with expectoration in 35 patients (46.67%), dry cough in 29 patients (38.67%) and hemoptysis in 42 patients (56%).

Table-2: Distribution Of Patients According To Duration Of Symptoms

Duration of symptoms	**Total no. of cases (N) = 75**	
	Number	**Percentage**
≤ 2months	40	53.33
2-4 months	30	40
4-6 months	00	00
>6 months	5	6.67

Out of 75 patients in our study, maximum number of patients i.e.40 patients (53.33%) had duration of symptoms <2months. The duration of symptom was 2-4 months in 30 patients (40%), 5 patients (6.67%) had duration of more than 6 months). Mean duration of symptoms was 2.2 months.

Table-3: Smoking status of the patients

Smoking status	**Total no. of cases (N)= 75**	
	Number	**Percentage**
Smoker	45	60
Non Smoker	30	40

Out of 75 patients in study, 45 patients (60%) were smokers and 30 patients (40%) were non-smokers.

Table-4: Severity of pleural effusion on basis of chest X-ray finding

X-ray findings	**Total No of cases (N)=75**	
	Number	**Percentage**
Small pleural effusion	8	10.67
Moderate pleural effusion	19	25.33
Large pleural effusion	43	57.33
Loculated pleural effusion	5	6.67

On chest X-ray, out of 75 patients in the study, maximum 43 patients (57.33%) showed large pleural effusion followed by moderate effusion in 19 patients (25.33%), small in 8 patients (0.67%), and 5 patients (6.67%) had loculated pleural effusion.

Table-5: Distribution of cases according to side of pleural effusion

Side of involvement	**Total No. of cases (N)=75**	
	Number	**Percentage**
Right	49	65.33
Left	22	29.33
Bilateral	4	5.33

In 49 patients (65.33%) right sided pleural effusion was seen while in 22 patients (29.33%) left side was involved. 4 patients (5.33%) had bilateral pleural effusion.

Table-6: Distribution of cases according to Pleural fluid appearance

Appearance of pleural fluid	**Total no. of cases with pleural effusion (N) = 75**	
	Number	**Percentage**
Haemorrhagic	46	61.33
Straw coloured	26	34.67
Turbid	3	4

Out of 75 patient the appearance of pleural fluid was haemorrhagic in majority of the patients i.e. 46 patients (61.33%). Pleural fluid was straw coloured in 26 patients (34.67%) and turbid in 3 patient (4%).

Table-7: Thoracoscopic findings on gross examination of pleura

Thoracoscopic findings	**Total no. of cases-75**	
	Number	**Percentage**
Nodules	36	48
Adhesions	9	12
Plaques	13	17.33
Erythema	6	8
Mixed	9	12
No Obvious Lesion	2	2.67

On thoracoscopic examination, most common finding was nodules which were found in 36 patients (48%). Other findings were plaques in 13 patients (17.33%), adhesions in 9 patients (12%) and erythema in 6 patients (8%). Mixed findings were in seen in 9 patients (12%). No Obvious lesion found in 2 (2.67%) patient.

Table-8: Diagnosis based on Histopathological examination of Semirigid thoracoscope guided pleural biopsy specimen

Type	**Total no of cases (N)= 75**	
	Number of patients	**Percentage**
Tubercular	7	9.33
Adenocarcinoma	28	37.33
Non-specific Inflammation	2	2.67
Squamous cell Carcinoma	10	13.33
Malignant Mesothelioma	7	9.33
Poorly Differentiated Carcinoma	3	4
Lymphocytic Lymphoma	3	4
Papillary Mesothelioma	5	6.67
Anaplastic Carcinoma	2	2.67
Small Cell Carcinoma	2	2.67
Fibroconnective tissue	4	5.33
Inadequate biopsy	2	2.67

In our study adenocarcinoma was seen in 28 patients (37.33%), squamous cell carcinoma in 10 patients (13.33%), malignant mesothelioma in 7 patients (9.33%), poorly differentiated carcinoma in 3 patients (4%) and lymphocytic lymphoma in 3 patients (4%). 5 (6.67%) patient papillary mesothelioma, 2 patients each (2.67%) anaplastic carcinoma and small cell carcinoma was also encountered. Tuberculosis was seen on pleural biopsy in 7 patients (9.33%), Fibroconnective tissue in 4 patients (5.33%).

The diagnostic yield of thoracoscopy was 92.16%. Out of 75 patients, semirigid thoracoscopy helped in reaching diagnosis of 53 patients. In 1 patient, biopsy sample was inconclusive.

Table-9: Duration of tube insertion (ICD insitu)

Duration	**Total no of cases (N)=75**	
	Number	**Percentage**
<15days	4	5.33
15 days to 1 month	37	49.33
1month to 2 month	29	38.67
>2 month	5	6.67

ICD tube was placed in all 75 patients after thoracoscopy. It was placed for less than <15 days in 4 patients (5.33%), 15 days to 1 month in 37 patients (49.33%), 1 month to 2 month in 29 patients (38.67%) and for more than 2 months in 5 patient (6.67%). Mean duration was 25.43 days.

Table-10: Post-thoracoscopic complications in patients

Complications	**Total Number of cases (N)=75**	
	Number of patients	Percentage
Post-operative fever	3	4.0
Surgical emphysema	2	2.67
Pain	2	2.67

The procedure was well tolerated and patients developed minor and transient complications such as pain at the thoracoscope insertion site, hypoxia, and tachycardia. Total 3 patients (4%) developed minor complications. Post-operative fever was encountered in 3 patients (4%), that was controlled by antipyretics within few days. 2 patient (2.67%) developed subcutaneous emphysema, which resolved spontaneously within 8 days. 2 patient (2.67%) experienced pain at the site of tube insertion which was shortly controlled by analgesics. No serious complication or death occurred during the procedure. However, within 30 days of thoracoscopic procedure, 2 deaths occurred, but they were due to disease itself or comorbidities, not due to thoracoscopic procedure. One case was of poorly differentiated carcinoma and other was of malignant mesothelioma.

CONCLUSION:

Thoracoscopy is an excellent procedure for the diagnosis of suspected malignant pleural effusion. The semirigid instrument has its own

advantages over the rigid thoracoscope. Semirigid thoracoscopy is safe, simple, and accurate tool with a high diagnostic yield in the diagnosis of suspected malignant pleural effusion. It is well tolerated and is devoid of major complications. Diagnostic delay will be less with the increased use of semirigid thoracoscopy.

REFERENCES:

1. Xie Q,Chen Q,Yuhong LI et al.Application of Flexi-rigid Thoracoscopy Under Local Anaesthesia to diagnose Malignant Pleural Effusion.Chinese Journal of Lung Cancer. 2009;12(5):1
2. Malignant pleural effusion.http://meds.com/pdq/effusion_pro. html
3. *Light RW, Macgregor MI, Luchsinger PC et al. Pleural effusions: the diagnostic separation of transudates and exudates. Ann Intern Med. 1972; 77 (4):507-513.*
4. *Light RW. Pleural Effusion."Merck Manual for Health Care Professionals. Merck Sharp & Dohme Corp*. Retrieved 21 August 2013.
5. Lee P, Colt HG. State of the Art: Pleuroscopy. J ThoracOncol. 2007; 2: 663–670.
6. Lee P & Colt HG .Rigid and semirigid pleuroscopy:The future is bright.Respirology .2005;10:418-25.
7. Lee P and Colt HG.State of the Art:Pleuroscopy.J Thorac Oncol. 2007;2:663-70.