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## ORIGINAL ARTICLE

# VIDEO ASSISTED MEDIASTINOSCOPY FOR DIAGNOSIS AND STAGING OF LUNG CANCER

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## ABSTRACT

**Objective:** Accurate staging of lymph nodes in lung most become cases had important to decide the alternatives of treatment modalities, analysis. tissue analysis could be achieved by C.T guided biopsy, endobronchial ultrasound-guided transbronchial needle aspiration (E.B.U.S-T.B.N.A), endoscopic ultrasound-guided satisfactory needle aspiration (E.U.S-F.N.A). Positive effects do no longer want similarly confirmation video assisted mediastinoscope had a gold fashionable minimum invasive technique approach for staging of lung bosom, it had the best sensitivity, specificity for staging of lymph in lung most bosoms sufferers.

**Aim of the work:** The intention of this take a look at to assess the critical of video-assisted-mediastinoscopic for diagnosis, staging of lung most bosoms.

**Patients and Methods:** Cases with parenchymal lung lesions more than 3cm had included in our look at with or without L.N enlargement recognized via C.T or P.E.T.S, parenchymal lung lesions less than 3 cm in diameter.

Overall of cases underwent video assisted mediastinoscopy, prolonged video assisted mediastinoscope underneath fashionable anesthesia with a unmarried-lumen endotracheal tube. The affected person supine with a roll beneath the shoulders to offer extension of the neck. Stations 2, four, 7 nodes had without difficulty accessible for excisional biopsy with fatty tissue around L.N.

**Results:** A overall of 60 sufferers with lung lesions 3cm in diameter underwent Video Assisted Mediastinoscope (with mean age of 52.5±nine.8 years They had 40 cases, 20 ladies. The maximum common place affected sufferers, observed by means of lymph station changed into gathering 7 in 33.Three% of mixed lymph nodes involvement in 21.7% of sufferers, in which station 7 become also the most typical website online mixed with different lymph stations Adenocarcinoma in 48.Three%, Squamous cellular carcinoma in 36.7%

**Conclusion:** Video assisted mediastinoscope had a gold general minimum invasive technique approach for staging of lung bosom

## INTRODUCTION

Video assisted mediastinoscopy had a gold fashionable minimum invasive technique method for staging of lung most bosoms, it had the highest sensitivity, specificity for staging of lymph in lung bosom cases.(1)

Accurate staging of lymph nodes in lung most bosoms cases had crucial to decide the picks of remedy modalities, diagnosis.(2)

Mediastinoscopy had added through Carlens in 1959 it became very simple, depend on naked eye imaginative, prescient. Now days there had more upgrading the

mediastinoscope, its units with H.D. camera with huge viewing perspective to would increase its feasibility, drawing near special lymph stations with clean visualization of essential shape as recurrent laryngeal nerve, phrenic nerve, pulmonary artery, vein, other large vessels, without difficulty might be differentiated from lymph nodes.(3)

Its critical depend on the examiner, amount of lymph nodes stations, tissue acquired at some point of the technique but improvement of its generation, obtaining skill lower the false negative end result of lymph biopsies, staging hence increasing its sensitivity, specificity.(4)

Tissue analysis could be achieved through C.T guided biopsy, endobronchial ultrasound-guided transbronchial needle aspiration (E.B.U.S-T.B.N.A), endoscopic ultrasound-guided quality needle aspiration (E.U.S-F.N.A). Positive consequences do no longer need similarly affirmation. In the case of bad results, due to insufficient tissue sampling, video-assisted cervical mediastinoscopy (V.A.C.M), video-assisted mediastinoscopic lymphadenectomy (V.A.M.L.A), transcervical prolonged lymphadenectomy (T.E.M.L.A) had proven to be beneficial for tissue analysis, staging of lung most bosoms. (5)

Computed tomography (C.T), positron emission tomography (P.E.T) had beneficial, diagnostic towels for prognosis, staging of lung most bosoms without or with lymphadenopathy but they still not as good as the V.A.M.L.A mediastinal, hilar lymph nodes so it had able to be used for detecting publish-operative recurrence.(4)

When it had compared with conventual technique, it reduced pain, shorter clinic stay, better beauty effects, stepped forward upkeep of pulmonary function specially higher-danger cases when as compared by way of other technique modalities for tissue prognosis of lymph adenopathy.(6)

Aim of the work.

The purpose of this observe to evaluate the critical of video-assisted-mediastinoscopic for prognosis, staging of lung most bosoms via lymphadenectomy (V.A.M.L.A), its technical feasibility, obstacles, hassle.

#### **PATIENTS AND METHODS**

A retrospective examine of V.A.M.L.A accomplished from January 2018 to March 2021 for diagnosis, staging of lung cancer in zagazig college medical institution. Written informed consent was obtained from all participants, the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans Sufferers with parenchymal lung lesions extra than 3cm had included in our look at with or without L.N enlargement recognized by means of C.T or P.E.T.S, parenchymal lung lesions much less than 3cm in diameter or lung bosom diagnosed through tissue biopsies, staged by using different modalities Total of sufferers underwent video assisted mediastinoscopy, prolonged video assisted mediastinoscope had carried out to explore lymph enlargements after taking consent from the sufferers. General anesthesia with a single-lumen endotracheal tube.The affected person supine with a roll under the shoulders to offer extension o the neck.

Instruments, method

Linder—Dahan video assisted-mediastinoscope (Richard Wolf, Knittlingen, Germany) changed into used, inserted via a Small suprasternal incision wherein paratracheal fascia approached, opened with blunt dissection by using finger in the pretracheal aircraft till reaching the bifurcation of trachea

Endoscopic graspers, biopsy forceps, dissectors, clips applicator, scissors had also used whilst indicated. The trachea, advanced vena cava, azygos vein, proper foremost pulmonary artery, left recurrent laryngeal nerve had well identified, every now, then the top pulmonary vein would become seen caudally to the pulmonary artery.

Stations 2, 4, seven nodes had without difficulty reachable for excisional biopsy with fatty tissue around L.N.

Dissection of the nodes (organization 7) separated in a blunt style to keep away from injury to the esophagus, for safety if vascular structure changed into suspected we did needle aspiration,for controlling of

teenybopper hemorrhages, coagulation, gauze compression, or clips had used. Drainage turned into not hired in any sufferers. All L.N samples had then sent to histopathology.

### RESULT

Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0) (Statistical Package for the Social Sciences) software for analysis. According to the type of data qualitative represent as number and percentage , quantitative continues group represent by mean  $\pm$  SD the following

tests were used to test differences for significance:

- Chi square Test ( $\chi^2$ ): was used to study comparison and association between two qualitative variables.

- Fisher's Exact: correction for chi-square when more than 20% of the cells have expected count less than 5.

- t-Test: was used for comparison between two groups having quantitative variables with normal distribution (for parametric data).

- A P-value of  $\leq 0.05$  was considered statistically significant &  $\leq 0.001$  for high significant result for two tailed tests.

General of 60 cases with lung lesions 3cm in diameter underwent Video Assisted Mediastinoscope (VAM) had protected on this take a look at with suggest age of  $52.5 \pm 9$ . Eight (45-70) years They had 40 adult cases, 20 cases.

. Preoperatively, all cases had categorized in step with lymph involvement into gathering A through C.T chest with IV assessment study (n=40), institution B with the aid of P.E.T test to the chest (n=20).

C.T chest experiment revealed that(25%) cases had lung lesions without a L.Ns involvement N0, 37.5% had N1, 25% had N2, 12.5% had N3. Chest P.E.T test discovered that 30% OF cases had N0, 40 % had N1, 20 % had N2, 10% had N3

Lymph nodes had excised by means of V.A.M from one of a kind stations inside the mediastinum as shown in Table 2. The most not unusual affected cases, observed by lymph station changed into organization 7 in 33.3% of mixed lymph nodes involvement in

21.7% of sufferers, wherein station 7 had additionally the most typical website combined with different lymph stations

Although all sufferers successfully completed the operations, some associated complications (Table 2), maximum of them had minor, controlled, had determined. Five cases had intraoperative slight bleeding which controlled via percent compression, usage of hemostatic materials. Two cases had hoarseness of voice developed postoperatively, disappeared after weeks. One affected person died within the early put up-operative length because of bleeding from the proper pulmonary artery wherein gauze percent become carried out via mediastinoscope, sternotomy had carried out, pericardium become explored however try for hemostasis, manipulate of the bleeding failed. There had no injuries to the tracheobronchial tree, esophagus or thoracic duct.

**Abbreviations C.T= Computed Tomography; PET=Positron emission tomography.**

Regarding final pathological types, malignancies had found in 51 cases (adenocarcinoma: n=29, squamous cell carcinoma: n=22), benign diseases had found in 9 cases (tuberculosis: n= 4, sarcoidosis n=3, nonspecific inflammatory lymph nodes: n=2). Tuberculosis, sarcoidosis had high incidences in all cases

**Abbreviations:TB = Tuberculosis**

**Accuracy of V.A.M, C.T, P.E.T for malignant, benign diseases**

The diagnostic accuracy of V.A.M changed into 100% because it efficiently discover all malignant lesions, benign illnesses. In C.T organization, histopathological analysis discovered that C.T effectively detected malignant lesions in staging 22 cases. 10 sufferers had underestimated, didn't stumble on unsuspected benign lesions in eight sufferers. Thus, the accuracy of C.T turned into 22/fifty (fifty five%). In P.E.T gathering, sixteen sufferers had the identical pathological level, three cases had underestimated. Also, P.E.T scan did not come across unsuspected benign lesions in one case. Thus, P.E.T accuracy become 16/20 (80%). According to these comparisons,

V.A.M changed into an essential, correct tool in each diagnosis, staging of lung mass greater than C.T, P.E.T experiment. Also, P.E.T test to the chest changed into superior to the C.T chest with IV contrast observe regarding the decreased quantity of underestimated lesions (Table 4)

#### **Video assisted mediastinoscope, disease management**

According to data obtained by V.A.M, histopathology, all cases had classified into

four gatherings for disease management (Table 5). Gathering 1: included 8 cases in which lung mass had >3cm in diameter with negative lymph pathology, they underwent tumor resection. Gathering 2: included 19 cases had N1, they underwent tumor resection, resection of the involved lymph node. Gathering 3: included 24 cases had N2-3, they underwent chemo-radiotherapy. Gathering 4: included 9 cases with unsuspected benign diseases, they had managed specifically.

**Table1:** Characteristics, preoperative staging of all cases (n=60)

<b>IV contrast Chest C.T (n=40)</b>		<b>Number (Percentage)</b>
	N0	10(25%)
	N1	15(37.5%)
	N2	10(25%)
	N3	5(12.5%)
<b>Chest P.E.T Scan (n=20)</b>		<b>Number (Percentage)</b>
	N0	6(30%)
	N1	8(40%)
	N2	4(20%)
	N3	2(10%)

C.T chest experiment revealed that(25%) cases had lung lesions without a L.Ns involvement N0, 37.5% had N1, 25% had N2, 12.5% had N3. Chest P.E.T test discovered that 30% OF cases had N0, 40 % had N1, 20 % had N2, 10% had N3

**Table 2.**lymph stations, complication associated with V.A.M

<b>Stations</b>	<b>Number of cases (percentage)</b>
2R	1(1.6%)
2L	1(1.6%)
4R	16(26.7%)
4L	9(15.0%)
7	20(33.3%)
Combined stations	13(21.7)
<b>Complications</b>	<b>Number (Percentage)</b>
<b>Mild bleeding</b>	5(8.0%)
<b>Major bleeding</b>	1(1.6%)
<b>Recurrent laryngeal nerve palsy</b>	2(3.0%)

There had no injuries to the tracheobronchial tree, esophagus or thoracic duct.

**Table3.Final overall pathological Types after video assisted mediastinoscopy, subsequent histopathology**

Malignant disease	Number (Percentage)	Benign diseases	Number (Percentage)
Adenocarcinoma Squamous cell carcinoma	29(48.3%)	Nonspecific inflammation	2(3.3%)
	22(36.7%)	TB Lymphadenitis	4(6.7%)
		Sarcoidosis	3(5.0%)

Tuberculosis, sarcoidosis had high incidences in all cases

**Table 4.** Contrastive analysis of the diagnostic sensitivity of V.A.M, PET, C.T for malignant, benign diseases

Contrastive analysis between V.A.M, PET		
Diseases	VAM	PET
<b>Malignant</b>		
Confirmed (n=19)	19	16
Underestimation	0	3
Unconfirmed (n=1)	1	0
<b>Benign</b>		
Confirmed (n=1)	1	0
Unconfirmed (n=0)	000	0
Contrastive analysis between V.A.M, C.T		
Diseases	VAM	CT
<b>Malignant</b>		
Confirmed (n=32)	32	22
Underestimation	0	10
Unconfirmed (n=8)	8	0
<b>Benign</b>		
Confirmed (n=8)	8	0
Unconfirmed (n=0)	0	0

P.E.T test to the chest changed into superior to the C.T chest with IV contrast observe regarding the decreased quantity of underestimated lesions.

**Table 5.**Cases management according to V.A.M, histopathology

Types of management	Tumor resection	Tumor, L.Ns resection	Chemo-radiotherapy	Specific management
Number of cases	9	19	24	9
Lymph nodes	N0	N1	N2-3	Benign diseases

According to data obtained by V.A.M, histopathology, all cases had classified into four gatherings for disease management,

## DISCUSSION

The prognosis, tissue biopsy, staging of lung lesions with enlarged lymph nodes had difficult. (1)

Lists of noninvasive, invasive investigations had used for organising the analysis, T.N.M staging of lung bosom consisting of radiological Computed tomography with IV

contrast study, MRI, bronchoscope, open biopsy. (3)

18-fluoro-2-deoxy-D-glucose P.E.T—C.T (18FDG P.E.T-C.T) Lymph nodes with a standardized uptake fee (Suva) >3 had taken into consideration positive in our sufferers (4) Lymph stations had categorized in our sufferers consistent with the American Thoracic Society. (7)

All sufferers had protected on this observe, had lung lesion greater than 3 cm in diameter (8), that they had categorized into agencies (institution A) underwent C.T chest with IV assessment observe handiest, (organization B) underwent P.E.T-C.T, the facts obtained preoperatively had amassed, in comparison with each other's.

Video assisted mediastinoscope (V.A.M) had a minimum invasive technique had a golden position for tissue analysis, staging of lung most bosoms as the alternative less invasive modalities had an inadequate visualization, exploration of L.N or didn't take ok tissue biopsy. (9)

V.A.M changed into carried in OT under GA thru cervical incision, proceeded to the pretracheal fascia for visualization, sampling of enlarged lymph nodes for histopathological exam. Intra operative, postoperative facts had accrued, analyzed.

The lymph nodes in stations five, 6, 10 lymph nodes could be reached by means of extended video assisted mediastinoscope from the same cervical incision, extended between the innominate artery, left not unusual carotid artery the procedures had described as a viable technique within the experienced centers with nicely-trained folks (10)

in our centers different modalities for staging, sampling the hilar, L.N in stations 5,6 including Antero lateral mediastinotomy or VATS, cases sufferers had excluded from this study for other one-of-a-kind modalities.

The cases had mean age of fifty two.5±nine.8 (45-70) years, 66.7% of them had guys, our outcomes corresponded to many authors, that they had close to end result. (11)

Cases of organization A had evaluated with the aid of greater C.T chest with IV comparison look at to assess the lung lesions without or with lymph enlargement, aiming to

localize their stations, to distinguish among lymph from surrounding vital structure. C.T chest changed into dependable clean to be performed with low price, give accurate places, L.N stations.

Cases underwent P.E.T-C.T test had 33.Three%, this became notably decreased in evaluating to different reviews, (4) this because of the fee of P.E.T scan, its availability within the facilities wherein our examine had performed.

The suggest time of interval between C.T chest, V.A.M turned into 39.5±8.7 at the same time as 18FDG P.E.T-C.T, technique treatment had 24.5±four.Eight,there had full-size decreased in the meantime among P.E.T test, technique operation in comparing with the time of interval among C.T chest, procedure, this contributed that each one cases had screened first with the aid of C.T chest, the c programming language times among technique operation, C.T chest had significantly reduced in other reviews pronounced by using different authors, the c language ranged among 2, three weeks (9) (11) (12),the beneath predicted lymph staging had expanded with an increasing c language between investigations, V.A.M, this concluded by means of exceptional authors (9)

VAM

paratracheal, stations had explored by V.A.M, lymphadenectomy had accomplished Concerning to vicinity, lymph (institution 7) had the most not unusual L.N station affected in 33.Three % by myself or mixed with different lymph station in 21.7 % the excessive prevalence of lymph growth turned into suggested in unique research (13)

even as 4 R,4L 2R 2L had affected in 26.7%, 15%,1.6%,1,6 % respectively, the places depend on the site, nature of number one lesions in the lung (14)

In extraordinary reviews , the number of lymph excised at some point of technique had ranged from three, five, 8, 11, whilst the range of lymph excised at some stage in in our cases had ranged from (1—3), there had great reduced in wide variety of V.A.M lymphadenectomies, this because of limited numbers of our cases in evaluating to other

research, radical lymphadenectomies had done for the duration of technique treatment for management of lung most bosoms. (15)

The suggest operative time depend upon the enjoy of surgeons, primary lesions of lung, adhesions within the mediastinum, the size, numbers of lymph adenectomy (7) in our had a look at the operative time became ninety±10.Eight minute even as The length of V.A.M changed into appreciably different in other research which ranged from 20-130mins depending upon the numbers of resected lesions,the affected lymph stations, the purpose of technique treatment both for biopsy or radical resections.(13)

difficulty

Rongxin Xiao ,et al (8), pronounced the complications of V.A.M had bleeding price in 0.Sixteen% to at least one.4%, of cases with fatal bleedings from huge pulmonary artery ranged from 0.03% to 0.2%, the slight intraoperative bleeding became mentioned in 8% in our case during V.A.M, it changed into of teenage technique importance, become managed by compression, packages of clips at some point of V.A.M

Fatal hemorrhages from greet vessels as azygos vein superior vena cava, massive pulmonary artery had rare in the course of V.A.M due to development of V.A.M technology with precise vision, magnifications of operative field structures, gaining skill, so the essential shape became in reality diagnosed [14].

There become one case died throughout V.A.M due to bleeding from the right pulmonary artery in which gauze percent became carried out via mediastinoscope followed by using widespread sternotomy, pericardium changed into explored however attempt for hemostasis, manage of the bleeding failed, case died.

There had no accidents to the tracheobronchial tree, esophagus, or thoracic duct. With general early intraoperative mortality had 1.7%

Recurrent laryngeal nerve palsy changed into pronounced after V.A.M in zero.15% to 6% in extraordinary meta-analysis research, bipolar coagulation became suggested to decrease the occurrence of nerve palsy. (12),

our examine pronounced three% of sufferers had recurrent laryngeal nerve palsy, recovered inside three weeks after V.A.M, this turned into inside the predicted incidence of worry pronounced by means of others.

Histopathological finding

We labelled each L.N excised by using V.A.M in keeping with their website online, despatched for histopathology, the maximum frequent histo-pathological locating turned into adenocarcinoma in 48.3%, accompanied through squamous cell carcinoma in36.7 % Our consequences had corresponded to the consequences obtained through other authors wherein the adenocarcinoma changed into the commonest lesions observed via squamous mobile carcinoma. (14) (16)

Inflammation became the traditional, maximum commonplace reasons of fake end result of P.E.T-C.T, tuberculosis became the commonest purpose of unsuspected lesions (15). We said TB lymphadenitis in 6.7%, nonspecific inflammation in 3.Three%, sarcoidosis in five%, this agreed with the consequences obtained with the aid of other authors (17).

Post-VAM staging

P.E.T-C.T, C.T chest had used for evaluation of intra- thoracic lymph staging, but P.E.T-C.T changed into pronounced to had sensitivities, specificities better than 80%, it become superior to C.T chest on my own, plenty of authors had concluded that P.E.T-C.T had greater correct in diagnosis, staging of lung most bosoms when in comparison to C.T chest. (1)

There turned into massive discordance among preoperative prognosis, staging of lymph by means of C.T chest, P.E.T-C.T, they had insufficient for exact analysis, correct staging of lymph node, tissue biopsies commonly needed through V.A.M so the plan of management for each case might be obtained. (2)

After V.A.M the plan of control become taken consistent with the direct visualization of mediastinum, the end result of histopathology, in gathering 1 13.Three% of sufferers, there had lung lesions greater than three cm in diameter without lymph growth (N0), the tumor turned into resected in step

with the affected lobe, the identical protocol of control became ordinary via others (18), in institution 2, blanketed 31.7% of cases had N1, that they underwent tumor resection, resection of the concerned ipsilateral lymph node. The block dissection of lymph in non-small cellular lung bosom had a remember of dialogue in the long time end result for morbidity, mortality but no debate approximately the function of V.A.M in diagnosis, staging of lung bosom hence the definite plan of management could be determined (18), our method for resection of lymph in lung most bosoms with ipsilateral lymph could also need long time comply with for assessing the morbidity, mortality.

Gathering 3 had 40% of cases with N2-three, they underwent chemo-radiotherapy, the identical protocol of management become concluded in special research (18), in Gathering 4 covered 15% of cases had unsuspected benign illnesses, they had managed particularly. (18)

### CONCLUSION

video assisted mediastinoscope had a gold fashionable minimum invasive technique for staging of lung most bosoms, it had the highest sensitivity, specificity for staging of lymph in lung most bosoms sufferers.

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