CECT in pulmonary thrombolism

Abstract

Introduction : Pulmonary embolism (PE) is the third most common acute heart disease after myocardial infarction and stroke and is a major public health problem. PE is a disease that has high morbidity and mortality, yet it is challenging to obtain a diagnosis.

Objective : The study aims to assess the role of MDCT-PA in the diagnosis of pulmonary embolism, and it's associated conditions in suspected cases of pulmonary embolism.

Material and Method : The study was conducted in the department of radiology in KRISHNA INSTITUTE OF MEDICAL SCIENCES DEEMED TO BE UNIVERSITY situated in KARAD equipped with a 16 slice MDCT scanner (EMOTION) manufactured by Siemens.

Result: Through the study period of one and half year and have met the inclusion criteria, a total of 90 consecutive patients who presented with suspicion of PE were referred for MDCT-PA in the department of radio-diagnosis, Krishna Hospital, Karad. A review of all the cases was done, and the results were presented in the form of tables.

Conclusion: Multidetector computed tomography pulmonary angiography can be used to confidently diagnose pulmonary embolism in which it is not contraindicated. MDCT-PA is the investigation of choice because it is a rapid, non-invasive study, highly sensitive and specific.

Keywords : Pulmonary embolism, Angiography, Ultra-sonography, Computed tomography

1. Introduction

Pulmonary embolism can be defined as partial or total occlusion of the pulmonary artery bed by a thrombus that usually originates from the veins of the pelvis or lower limb. An ultrasonographic study of patients diagnosed with pulmonary embolism detected thrombus in 29% of deep venous [1-2]. Failure to demonstrate deep vein thrombosis (DVT) in many patients with pulmonary embolism results from

detachment of the emerging blood clot or the inability of ultrasonography to show minor clots. CT is the favoured technique for the diagnosis of pulmonary embolism. With the development of multidetector-row CT technology, past limitations of CT for the diagnosis of PE had has become the investigation of choice in patients with clinical suspicion of having a pulmonary embolism [3-4]. MDCT-PA were found to be readily available, fast, minimally invasive imaging modality establishing a safe, highly accurate, and cost-effective diagnosis of PE in clinically suspected patients without a contradiction to CTPA. The role of ventilation-perfusion scintigraphy increases when the use of iodinated contrast material is contraindicated. MRI does not seem to have an essential role in practice [5-6]. The use of MPR MDCT images significantly increases confidence level and interobserver agreement among radiologists for diagnosing PE. Alternative diagnoses, involving the lung parenchyma disease (pneumonia and interstitial lung disease), isolated pulmonary arterial hypertension, pleural effusion, malignancy, hiatus hernia, are present in the most patients undergoing CTPA for the detection of pulmonary embolism [7-8]. In this cross-sectional study, we evaluated the percentage prevalence of pulmonary embolism in patients referred to our department with clinical suspicion of having a pulmonary embolism and early diagnosis of the presence of embolus was done, which helped a treating clinician for the accurate early management, thus reducing the mortality and morbidity due to pulmonary thromboembolism [9-10].

2. Literature Review

There are two practically unmistakable circulatory pathways, the aspiratory dissemination and the fundamental flow. In the aspiratory dissemination, the Pulmonary corridor is the primary vessel conveying deoxygenated blood from the right ventricle of the heart to the lungs for oxygen, and the Pulmonary veins convey deoxygenated blood back to one side chamber. Oxygenated blood in the left ventricle of the heart is conveyed to foundational organs by the aorta and its branches. The bronchial vessels that are essential for the foundational course emerge straightforwardly from the dropping thoracic aorta and supply the interstitium of the lung [11].

Pulmonary courses can be grouped by standard physical portrayals that mark the aspiratory supply routes as the primary Pulmonary vein, the right and left aspiratory

corridors - - > lobar conduits - - > segmental and subdivisional branches that first-The orders are, comparing to the subsequent request, third request and fourth request aspiratory conduits, separately [12].

3. Objective

The study aims to assess the role of MDCT-PA in the diagnosis of pulmonary embolism, and it's associated conditions in suspected cases of pulmonary embolism.

1). Early diagnosis of pulmonary embolism and it's associated conditions.

2). To determine the prevalence, age, gender and anatomic distribution of the pulmonary embolism on MDCT-PA.

3). To search for alternative diagnosis if any on MDCT-PA in clinically suspected Pulmonary embolism.

4. Material and Method

SOURCE OF DATA:

The study was conducted in the department of radiology in KRISHNA INSTITUTE OF MEDICAL SCIENCES DEEMED TO BE UNIVERSITY situated in KARAD equipped with a 16 slice MDCT scanner (EMOTION) manufactured by Siemens.

STUDY POPULATION:

The study comprised 90 consecutive patients who were referred by clinicians with a suspicion of pulmonary embolism who presented to the radiology department for MDCT-PA and had no history of contrast allergy and consented for the study were included.

Previous studies show the prevalence of pulmonary embolism as 20 %.

Sample Size was calculated based on the Prevalence of Pulmonary Embolism in the previous study- 20%.

The formula for the sample size calculation used in the study was:

N= z(square) pq/l (square)

Z= standard constant value at 95% CI= 1.96

P= prevalence=20%

Q= 100-p=80%

L= allowable error= 10%

N=(1.96) square(20) (80)/ (10)square

=62

STUDY DESIGN & DURATION:

This was a single centred, hospital-based, cross-sectional, observational, descriptive study conducted in patients who were referred to the department of radiodiagnosis with a clinical suspicion of pulmonary embolism in our institute over 18 months from December 2018 to May 2020

INCLUSION CRITERIA:

Patients of all gender and of any age group with clinical suspicion of pulmonary embolism who presented to the department of radiology of a tertiary care centre over 18 months of KIMS university.

EXCLUSION CRITERIA:

1. Patients who were allergic to the contrast agent.
2. Patients with impaired renal function.
3. Pregnant patients.

METHODOLOGY:

The patients were recruited for the study after obtaining informed consent.

MDCT-PA SCANNING TECHNIQUE:

The study was done using a 16 slice MDCT scanner (Emotion) manufactured by Siemens.

5. Result

Through the study period of one and half year and have met the inclusion criteria, a total of 90 consecutive patients who presented with suspicion of PE were referred for MDCT-PA in the department of radio-diagnosis, Krishna Hospital, Karad. A review of all the cases was done, and the results were presented in the form of tables 1 .

TABLE 1: PREVALENCE OF PULMONARY EMBOLISM (N=90)

Pulmonary Embolism	Frequency	Percentage
Present	39	43.3
Absent	51	56.7
Total	90	100.0

Out of the 90 patients, 39 (43.3%) of them had radiological evidence of pulmonary embolism, and 51 (56.7 %) patients did not have any radiological evidence of PE.

TABLE 2: GENDER DISTRIBUTION OF PATIENTS WITH SUSPECTED PULMONARY EMBOLISM (N=90),

	PULMONARY EMBOLISM		TOTAL	P-VALUE
	PRESENT	ABSENT		
GENDER	28	24	52	5.5431
MALE	53.8%	46.2%		0.01855*
FEMALE	11	27	38	
	28.9	71.1		
TOTAL	39 43.3%	51 56.7%	90	-

The above table 2 shows the gender-wise distribution of pulmonary embolism. Fifty-two male patients were referred for MDCT-PA with clinical suspicion of pulmonary embolism, of which 28 were positive (53.8%). In a total of 38 female patients who were referred for MDCT-PA with clinical suspicion of pulmonary embolism, 11 were positive (28.9%). Chi-square test association for gender distribution of pulmonary embolism done: Chi-square statistics is 5.5431. P-value = 0.01855 was statistically significant at $p < 0.05$.

There was a significant association between gender and pulmonary embolism. Odds of not having pulmonary embolism is 2.863636 (CI: 1.178183-6.960222) times more for females compared to males.

The total number of male patients who participated were 52 and the total number of female patients who participated were 38. Males patients represented 28 (71.1%), which was much more as compared to their female counterpart who represented 11 (28.9%) of 39 patients with PE. The male to female ratio of the patients having PE is 2.54:1

TABLE 3: AGE DISTRIBUTION OF PATIENTS WITH SUSPECTED PULMONARY EMBOLISM (N=90),

AGE GROUPS IN YEARS	PULMONARY EMBOLISM		TOTAL	Chi-square P-VALUE
	PRESENT	ABSENT		
<30	8 50.0%	8 50.0%	16	
31-40	2 25.0	6 75.0	8	
41-50	9 69.2%	4 30.8%	13	6.4974 0.1704
51-60	8 47.0%	9 53.0%	17	

> 60	**12** **33.3%**	**24** **66.7%**	**36**	
TOTAL	**39** **43.3%**	**51** **56.7%**	**90** **100%**	

Table 3, depicts 16 patients participated in the study who were > 30 years of age of which 8 (50.0%) had the evidence of pulmonary embolism, and 8 (50.0%) did not have any evidence of pulmonary embolism.

8 patients participated in the study were in between 31-40 years of age of which 2 (25.0 %) had the evidence of pulmonary embolism, and 4 (75.0 %) did not have any evidence of pulmonary embolism. 13 patients participated in the study were in between 41-50 years of age of which 9 (69.2 %) had the evidence of pulmonary embolism, and 4 (30.8 %) did not have any evidence of pulmonary embolism.

17 patients participated in the study were in between 51-60 years of age of which 8 (47.0 %) had the evidence of pulmonary embolism, and 9 (53.0%) did not have any evidence of pulmonary embolism.

36 patients were more than 60 years of age, of which 12 (33.3%) had evidence of pulmonary embolism, and 24 (66.6 %) did not have any evidence of pulmonary embolism.

Chi-square test association for the age distribution of pulmonary embolism done: Chi-square statistics is 6.4974.

P value = 0.1704 is statistically not significant at $p < 0.10$

Majority of the patients were in the age range of >60 years, and the lowest was in below 31-40 years.

The mean age of the study participants in the study was 53.94 years, and the age range was 19 - 93 years. The youngest patient who participated in the study was aged 16 years, and the oldest patient was aged 93 years.

The youngest patient participating in the study with pulmonary embolism was aged 20 years, and the oldest patient was of age 85 years.

TABLE 4: CLINICAL HISTORY IN PATIENTS WITH SUSPECTED PE

SYMPTOMS	PULMONARY EMBOLISM		TOTAL
	PRESENT	ABSENT	
DYSPNOEA	34 48.5%	36 51.6%	70
CHEST PAIN	12 40%	18 60%	30
HEMOPTYSIS	2 66.6%	1 33.3%	3
COUGH	5 20.8%	19 79.2%	24
FEVER	3 16.6%	15 83.4%	18
TOTAL	39	51	90

The most common symptoms arousing suspicion of pulmonary embolism was breathlessness. Dyspnoea >chest pain > cough > fever and hemoptysis.

The proportion of patients presenting with breathlessness was significantly higher than those with other presenting symptoms.

In total patients of 90, 70 patients presented with dyspnoea, 30 with chest pain, 24 with cough, 18 with fever and 3 were with hemoptysis.

Table 4,shows the symptom-wise distribution in clinically suspected cases of PE

70 patients with clinical suspicion of pulmonary embolism presented with dyspnoea, of which 34 patients who represented 48.5 % had PE and the remaining 36 patients who represented 51.6 % did not have PE.

30 patients had chest pain, of which 12 patients who represented 40.0 % had PE, and the remaining 18 patients who represented 60.0% did not have PE. 3 patients had presented with complaints of hemoptysis, of which 2 (66.6%) patients had PE and one patient (33.3%) did not have PE. 24 patients had a cough as their primary complaint and 5(20.8%) of them had PE and 19 (79.2%) did not have PE.

TABLE 5: FREQUENCY AND PERCENTAGE OF ANATOMICAL DISTRIBUTION OF EMBOLUS (N=39),

SUBGROUP	FREQUENCY (no)	PERCENTAGE (%)
MAIN PA	6	4.4
RIGHT PA	24	17.7
LEFT PA	20	14.8
BILATERAL LOBAR ARTERIES	23	17.0
RIGHT LOBAR ARTERIES	7	5.1
LEFT LOBAR ARTERIES	4	2.9
BILATERAL SEGMENTAL A.	25	18.5
RIGHT SEGMENTAL A.	7	5.1
LEFT SEGMENTAL A.	4	2.9
BILATERAL SUBSEGMENTAL A.	9	6.6
RIGHT SUBSEGMENTAL A.	4	2.9
LEFT SUBSEGMENTAL A.	2	1.4
TOTAL	135	100

TABLE 5 shows the anatomical location-wise distribution of the embolus in the pulmonary artery and its divisions in patients with PE seen on MDCT-PA.

Most of the patients had evidence of an embolus involving bilateral segmental arteries 25(18.5%) and 24 (17.7%) patients had evidence of an embolus involving the right pulmonary artery. 23 (17.0%) involving both lobar arteries, 20 (14.8 %) involving the left pulmonary artery. 9 (6.6 %) involving bilateral sub-segmental arteries, 6 (4.4 %) involving the central pulmonary artery, 7 (5.1 %) involving the lobar arteries on the right side, and 7 (5.1%) involving segmental arteries on the right side. 4 (2.9%) patients had embolus involving the lobar artery on the left side, and 4 (2.9%) patients had evidence of embolus involving segmental arteries on the left side. 4 (2.9%) patients had evidence of embolus involving the sub-segmental arteries on the right side, and 2 (1.4%) patients had evidence of embolus in the sub-segmental artery on the left side.

TABLE 6: OTHER PARENCHYMAL AND PLEURAL FINDINGS ON MDCT-PA (N=106),

PARENCHYMAL & PLEURAL FINDINGS OTHER THAN EMBOLUS	FREQUENCY	PERCENTAGE
PULMONARY INFARCT	5	4.7%
NONE	14	13.2%
PLEURAL EFFUSION	30	28.3%
INFECTIVE	20	18.8%
ILD	3	2.8%
MOSAIC PERFUSION	5	4.7%
RIGHT ATRIAL THROMBUS	1	0.9%

PULMONARY EDEMA	2	1.8%
MALIGNANCY	4	3.8%
FIBROSIS	6	5.6%
EMPHYSEMA	4	3.8%
ATELECTASIS	9	8.4%
ARDS	3	2.8%

TABLE 6 show pleural and parenchymal abnormalities in the study sample of 113.

Pleural effusion was the most common finding comprising 30 (28%) patients, of which 12 patients are associated with PE, and 18 were without PE.

About 20 (19%) patients had consolidation/ground-glass opacities and nodular opacities in the lung parenchyma with 7 patients also having concomitant PE suggestive of infective aetiology.

5 (5 %) patients had pulmonary infarcts, and 5 patients had mosaic perfusion with chronic pulmonary embolism in 1. 3 (3%) patients had interstitial lung disease, and 1 (1%) patients had right atrial thrombus, and 2 (2%) patients had pulmonary oedema pattern. 4 (4%)patients had evidence of malignancy (carcinoma lung, carcinoma oesophagus, skeletal metastasis and metastatic lymph nodes). 6 (6%) patients had evidence of fibrosis, 3 (3%) patients had ARDS, 4 (4%) patients had changes of emphysema, and 9 patients had evidence of atelectasis.

Table 7: FINAL DIAGNOSIS IN PATIENTS WITH CLINICAL SUSPICION OF PULMONARY EMBOLISM

	FREQUENCY	**PERCENTAGE**
PE	10	9.5%

PAH	5	4.7%
PE+PAH	22	20.9%
INFECTIVE	14	13.3%
PE+INFECTION	7	6.6%
NAD	14	13.3%
ILD	3	2.8%
ARDS	3	2.8%
CCF + PAH	2	1.9%
HIATUS HERNIA	3	2.8%
FIBROSIS	6	5.7%
MALIGNANCY	4	3.8%
PLEURAL EFFUSION	5	4.7%
MISCELLANEOUS	7	6.6%
TOTAL	105	100%

Table 7 show the percentage of pulmonary embolism and other possible diagnoses in clinically suspected cases of pulmonary embolism.

Out of 90 patients who were recruited into the study with clinical suspicion of pulmonary embolism, 39 (43.3%) patients were diagnosed having a pulmonary embolism. 10 (9%) of patients had a pulmonary embolism. 22 (21%) patients were diagnosed having pulmonary embolism superimposed on pulmonary arterial hypertension. 7 (6%) patients were diagnosed with pulmonary embolism with

infection. 5 (5%) of patients had evidence of isolated pulmonary artery hypertension. 14 (13%) patients were diagnosed having constellation findings of consolidation, pleural effusion and nodular opacities suggesting infective aetiology. 3 (3%) patients had reticular opacities with honeycombing suggesting the interstitial lung disease-Usual interstitial pneumonia pattern. 14 (13%) patients did not have any diagnostic abnormality on MDCT-PA.

4 patients had evidence of malignancy (carcinoma lung, carcinoma oesophagus, skeletal metastasis and metastatic lymph nodes). 6 patients had evidence of fibrosis, and 5 patients had evidence of isolated pleural effusion. 3 patients had ARDS, 2 patients had evidence of congestive heart failure with PAH. 3 patients had hiatus hernia.

One patient each had evidence of aortic dissection, partial anomalous pulmonary venous return, superior vena cava stenosis, arteria lusoria with kommerals diverticulum, pericardial effusion and lymphangioleiomyomatosis were seen.

6. Discussion

The study aimed to assess the role of MDCT-PA in the diagnosis of pulmonary embolism, and it's associated conditions in suspected cases of pulmonary embolism to accurately determine the choice of management by the clinician by early detection of pulmonary embolism.

Pulmonary embolism is a life-threatening condition and is responsible for significant morbidity and mortality. Early diagnosis and prompt treatment with anticoagulants show a considerable outcome.

Diagnosis of pulmonary embolism is difficult based on clinical history and laboratory data. Thereby imaging plays a crucial role in arriving at a diagnosis. Over the past decade, MDCT-PA has become the non-invasive technique of choice used to diagnose pulmonary embolism because it is quick, highly sensitive and specific.

In this study, more male patients had clinical suspicion of PE as compared to the females, male represented 52 (57.7%) out of 90 patients, while 38(42.3%) patients were females. 52 male patients who underwent CTPA with clinical suspicion of pulmonary embolism, 28 (53.8%) patients had pulmonary embolism while 24 (46.2%) patients were negative for PE. 38 female patients who underwent CTPA with clinical

suspicion of pulmonary embolism, 11(28.9%) patients had a pulmonary embolism. In comparison, 27(71.1%) patients were negative for PE.

Out of 90 patients in the study, 39 patients were diagnosed with PE. Of 39 patients with PE, 28 were male patients, and 11 were females.

The ratio between male and female patients with clinically suspected PE in my study was 2.54:1 differs from the above-mentioned studies.

In my study, the Chi-square test association for gender distribution of pulmonary embolism was done: Chi-square statistics is 5.5431. P-value = 0.01855 is statistically significant at $p < 0.05$.

However, there is no proper age limit at which the patient did not have a risk of thromboembolism. Pulmonary embolism or deep vein thrombosis can also occur in children. Age cut-off, can not be used to exclude the diagnosis of pulmonary embolism, but it is not very common in infants and children as compared to the adult population.

In my study, the most of the participants with suspicion of pulmonary embolism were more than sixty years of the age, and the lowest was in below 31-40 years compared with the Tambe J et al.37studies. The youngest patient participated in the study with pulmonary embolism was aged 20 years, and the oldest patient was of age 85 years.

The mean age of the patients who participated in the study was 53.94 years. The youngest patient was of age 19 years, and the oldest patient aged 93 years old.

Chi-square test association for the age distribution of pulmonary embolism done: Chi-square statistics is 6.4974. P value = 0.1704 is statistically not significant at $p < 0.10$

In this study, the percentage of patients presenting with shortness of breath was significantly higher than those patients presenting with chest pain, cough, fever or hemoptysis.

In this study of ninety patients, seventy patients had complaints of dyspnoea, and thirty patients had complaints of chest pain, twenty-four patients had a cough, eighteen patients had a fever and three of them presented with hemoptysis.

In this study, the percentage of patients presenting with breathlessness was (87.25%), chest pain (30.7%) was the next common symptom followed by cough (12.8%), fever (7.6%) and hemoptysis (5.1%).

In a study done by Lee, EY et al.36, which was done to assess the common risk factors in patients with pulmonary embolism amongst children and young adults who underwent MDCT-PA for assessment of pulmonary embolism. They evaluated a total

of 116 patients in their study, of which 16 patients (14%) were found to have evidence of pulmonary embolism on CTPA. The most commonly associated risk factors in their descending order were inactivity, followed by the previous history of deep vein thrombosis and heart disease.

In this study, out of thirty-nine patients with evidence of pulmonary embolism eight (20%) patients had a history of prior deep vein thrombosis, six (15 %) patients had a history of inactivity, four (10%) patients had a previous history of surgery in the past four weeks, three (8%) patients presented with evidence of malignancy, and three (8%) had a history of covid-19 infection, and one patient had a history of OCP use. 14 (36%) patients with pulmonary embolism did not have any significant history.

In my study, the significant risk factor in patients of pulmonary embolism (N=39), was deep venous thrombosis in the lower limbs.

In a study which was done on one hundred and sixteen patients by Lee E Y et al.36 sixteen (14%) patients had evidence of pulmonary on MDCT-PA. The segmental arteries were more commonly involved in 16 / 31 cases (52%) of pulmonary embolism. The lobar branches of pulmonary artery were involved in eight patients (26%), the sub-segmental branches were involved in five patients (16%), and main pulmonary artery was involved in two cases (6%).

Eighty-four children were studied by Kritsaneepaiboon et al33. The main pulmonary artery, lobar branches and segmental branches were easily visualized, but the visualization of the sub-segmental pulmonary arteries was difficult in 78 (80%) cases. In thirteen (15.5%) children, there was evidence PE in the form of filling defects on MDCT-PA. Pulmonary embolism could be localized to the lobar branches in twelve (39%) patients, the segmental branches were involved eleven (35%) patients, the sub-segmental branches were involved in five patients(16%), and the main pulmonary artery was involved in three (10%)patients.

Winer-Muram HT et al.27did a study on patients with clinical suspicion of pulmonary embolism to determine the diagnostic accuracy of MDCT-PA in an emergency room and inpatient populations which was compared to pulmonary angiography findings in ninety-three patients.

The pulmonary angiography findings showed the involvement of fifty vessels in eighteen patients (19%) (five patients showed embolism in central and interlobar branches, twenty-four patients had segmental branch involvement, and in twenty-one patients, sub-segmental arteries was involved), seventeen patients (18%) had a

pulmonary embolism at more than one site. At computed tomography, pulmonary embolism was seen in seventy-one vessels in twenty-six patients (28%) (twenty-four patients had the involvement of main pulmonary artery, and/ or interlobar branches, thirty-three patients had segmental involvement, and sub-segmental branch involvement was seen in fourteen patients). Twenty patients were having pulmonary embolism in more than one site. It was concluded that MDCT-PA was much better in demonstrating large vessel involvement, while pulmonary angiography was better is detecting small vessel thrombi.

Ghaye B et al.7 in their study concluded that by using image reconstruction of 1.25 mm slice thickness sections permitted the demonstration of sub-segmental branches up to the fifth order.

In this study of 90 patients, 39 patients were diagnosed to have pulmonary embolism on MDCT-PA.

Most patients had embolus in bilateral segmental arteries which were seen in twenty-five patients (18.5%). Twenty-four (17.7%) patients had evidence of embolism in the right pulmonary artery. It was present in bilateral lobar arteries in twenty-three (17.0%) patients; the left pulmonary artery was involved in twenty patients (14.8 %). The involvement of bilateral subsegmental arteries was seen in nine patients (6.6 %), six patients (4.4 %) were detected of having an embolus in the main pulmonary artery, right lobar arteries were involved in seven cases (5.1 %), and so were the right segmental arteries. There was embolism in the left lobar artery in four cases (2.9%), and four patients (2.9%) also showed evidence of embolism in the left segmental arteries. Patients had embolus in the right subsegmental artery was involved in 4 patients (2.9%), and two cases (1.4%) showed embolism in the left subsegmental artery

About 20 (19%) patients had consolidation/ground-glass opacities and nodular opacities in the lung parenchyma with 7 patients also having concomitant PE suggestive of infective aetiology. 5 (5 %) patients had pulmonary infarcts, and 5 patients had mosaic perfusion with chronic pulmonary embolism in 1. 3 (3%) patients had Interstitial lung disease, and 1 (1%) patients had right atrial thrombus, and 2 (2%) patients had pulmonary oedema. 4 (4%) patients had evidence of malignancy (carcinoma lung, carcinoma oesophagus, skeletal metastasis and metastatic lymph nodes). 6 (6%) patients had evidence of fibrosis, 3 (3%) patients had ARDS, 4 (4%) patients had changes of emphysema and 9 (8%) patients had evidence of atelectasis.

In my study, the sample size comprised 90 patients who underwent MDCT- PA with symptoms in clinical suspicion of PE.

Out of 90 patients, 39 (43.3%) patients were diagnosed with PE. Of the 39 patients with pulmonary embolism 22 (56.5%), patients had pulmonary embolism with concomitant pulmonary arterial hypertension, and 7 (17.9%) patients had PE with infection.

Out of 90 patients, 10 (9.5 %) were diagnosed with isolated pulmonary arterial hypertension, 14 (13.3%) patients had nodular opacities in the lungs with consolidation suggesting infective aetiology, 3 (2.8%) patients had interstitial lung disease usual interstitial pneumonia.

4 patients had evidence of malignancy (carcinoma lung, carcinoma oesophagus, skeletal metastasis and metastatic lymph nodes). 6 patients had evidence of fibrosis, and 5 patients had evidence of isolated pleural effusion. 3 patients had ARDS, 2 patients had evidence of congestive heart failure with PAH. 3 patients had hiatus hernia.

One patient each had evidence of aortic dissection, partial anomalous pulmonary venous return, superior vena cava stenosis, arteria lusoria with kommerals diverticulum, pericardial effusion and lymphangioleiomyomatosis were seen.

7. Conclusion

Multidetector computed tomography pulmonary angiography can be used to confidently make a diagnosis of pulmonary embolism in whom it is not contraindicated. MDCT-PA is the investigation of choice as it is a quick, non-invasive study, highly sensitive and specific. It allows direct demonstration of endoluminal thrombus and extent of the thrombus in the pulmonary arteries and branch vessels, thereby facilitating the early detection of fatal pulmonary thromboembolism and adequate management of the same, thus reducing the morbidity and mortality due to pulmonary thromboembolism. CTPA a non-invasive technique has produced a paradigm shift that has raised the standard of care for patients with the pulmonary thromboembolism.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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