ORIGINAL RESEARCH PAPER
Volume-9 | Issue-1 | January-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EVALUATION OF MALIGNANT LUNG MASSES BY CT

Radiology

Dr Ankur Chandra 3rd Year Resident, SBKSMIRC, Pipariya, Waghodia, Baroda

Dr C. Raychaudhuri* Head of dept.,Radiodiagnosis, SBKSMIRC, Pipariya, Waghodia, Baroda *Corresponding Author

ABSTRACT

AIM AND OBJECTIVES:

- To evaluate the malignant lung pathologies on XRAY AND CT according to age, gender,occupation and habitat.
- To diagnose and confirm the pathological cell type of malignant lung mass on the basis of CT appearance and by comparison with histopathology.

MATERIALS AND METHODS: This study included 50 patients who were referred to the department of radiodiagnosis for XRAY and CT scan from OPDs of Dhiraj hospital with signs and symptoms of lung cancer .PA chest xray and CT scan were examined.Final diagnosis was based on clinical, radiological , laboratory and histopathological findings.

CONCLUSION: CT scan is a good modality for the detection of primary lung carcinoma.It can also predict the size , location of the tumor, along with evaluation of its internal characteristics like margins, calcification, necrosis, cavitations, spiculation. Associated features like mediastinal lymphadenopathy, pleural effusion and metastases to liver, lung, adrenals could also be studied accurately.However it cannot reliably separate one histological cell type from the other based on the above mentioned findings.While certain characteristics were very common in a particular histological cell type and a combination of findings could be used to distinguish one type from the other.

KEYWORDS

Lung Carcinoma, Adenocarcinoma, Smoking, Squamous Cell Carcinoma, Metastasis.

INTRODUCTION:

Lung carcinoma is the most common fatal malignancy in both men and women. It is the most common cancer in males in India with age averaged incidence ranging from 8.7 to 13.5 per 100000 in year in different parts of country. Chest radiography is the primary imaging modality for lung malignancies, however conventional radiograph is of limited use in characterising and staging. CT is a more sensitive modality for detection of lung cancer and is most widely used to evaluate the primary tumor and its extent. CT imaging provides precise information about the size, shape and location of tumours.CT scan is the most popular guiding modality for thoracic interventions. CT offers exquisite anatomical display of the thoracic structures and allows percutaneous access for biopsy.

MATERIAL AND METHODS

Patients referred. to the department of radiodiagnosis for XRAY and CT scan from . OPDs of Dhiraj hospital with signs and symptoms of lung cancer .were taken up for the study.

Study Design : Observational study

Population-Sample size of 50 patients was taken for the study.

Study period: 1.5 years

Source of data: Each patient's hospital number ,age , gender, occupation, habitat. , weight, clinical and drug history(corticosteroid/opiods) was noted down from the case paper along with the .laboratory reports of haemogram, lipid profile,renal function tests, blood sugar on the performa . Wherever indicated serum amylase and .serum lipase was also be included amongst laboratory investigation. Confidentiality. of the patients information was maintained.

Scans were carried out on 600 mA. Siemens XRAY machine and SIEMENS somatom emotion 16 Slice CT -scanner that is available in the radiodiagnosis department.

Clinical symptoms and signs with. the. clinical diagnosis were noted from case sheet.

Informed written consent in English. and vernacular languages was taken..

SELECTION CRITERIA:

Inclusion criterion

All patients. suspected with lung cancer, referred from clinical departments. and are willing were taken up for the study.

Exclusion criterion

- Patient already diagnosed and treated for lung cancer.
- Patient having primary pleural or mediastinal mass
- Patients who are uncooperative for biopsy, breathless, has altered coagulation profile or pre-existing pneumothorax .
- contraindications. for contrast agent administration, such as a known allergy to .an iodine-containing contrast agent
- reduced renal function (creatinine level _ 2.0 mg/dL [176.8 _mol/L]).
- Pregnant patients. unless absolute necessity

PROCEDURE

Contrast

Dose calculation

60 ml of 300 mg/ml non ionic. contrast (omnipaque) was used. Monophasic injection protocol was followed. and contrast injection was done at 3.5 ml/sec.

Parameters

The contrast enhanced CT. was acquired for all patients, parameters as mentioned below

Parameter	Used
KV	130
MA	113
SLICE THICKNESS	10 mm
RECONSTRUCTION INTERVAL	2.5mm
DIRECTION	CRANIAL TO CAUDAL

EQUIPMENT USED:

XRAY MACHINE :600 MA SIEMENS
CR SYSTEM:AGFA
CT machine: SIEMENS SOMATOM EMOTION (SIXTEEN Slice CT).

Instruments used:

True cut gun biopsy
Lumbar puncture .needles (18–22 gauge).
Syringes. (10 cc and20 cc).
Hypodermic needles.
Antiseptic solution
Dressing material
Marking pen and scale

DISCUSSION:

The study was aimed at established of the CT characteristic of

malignant lung mass either primary or secondary and pathological cell type of primary lung cancer based on the CT feature. 50 cases of malignant lung cancer, 46 primary and 4 secondary lung cancers, were studied and CT scan of thorax was obtained and the patient was subjected to a CT guided biopsy of the mass lesion for establishment of the final histopathology.

Out of the 50 cases studied 17 were those of adenocarcinoma, 12 squamous cell carcinoma,8 small cell carcinoma,4 large cell, 2adenosquamous, 1 carcinoid, 1 adenocystic carcinoma,1 secondary lymphoma and rest 4 secondary from different primary.

Out of the randomly selected patients, more number of male patients (40) came to our department with carcinoma lung than female (10). The most common histologic cell type in both the sexes was adenocarcinoma. The percentage of adenocarcinoma was higher in males35% compared to 33% in females. The majority (65%) cases of adenocarcinoma were seen too be peripheral in location compared to 33% of squamous cell carcinomas. Squamous cell carcinomas and small cell carcinoma were seen too be central in location, 72% and 62.5% respectively. Large cell carcinoma (75%) and adenosquamous (50%) were peripheral in location. Hence peripherally located tumours included adenocarcinomas, large cell and adenosquamous variety of carcinomas.

Most of the adenosquamous,small and large cell carcinoma were necrotic masses, 100% ,50% and 50% respectively of which showed internal necrosis. Approximately 41% of adenocarcinoma and 25% of squamous carcinoma also showed internal necrosis.

Most common carcinomas to cavitate were adenosquamous cell carcinoma (50%), followed by 25% of large cell carcinoma,17%of squamous cell carcinoma,12.5% of small cell carcinomas and 12% of the adenocarcinomas.

Air bronchogram was seen most commonly seen with squamous carcinomas (80%),largecellcarnioma (25%) and adenocarcinoma (12%).

Spiculation was seen in 75% of squamous cell carcinoma ,59% in adenocarcinoma ,50% in large and adenosquamous cell and 37.5% in small cell carcinoma.

While 100% of the carcinoid and adenocystic carcinoma showed mediastinal lymphadenopathy ,small cell carcinomas presented with 75%lympahednopathy .50% of squamous ,large cell carcinoma and lymphoma showed mediastinal lymphadenopathy .Adenocarcinoma presented with 47% lymphadenopathy.

Pleural effusion was seen most commonly in adenocarcinomas (47%) and small cell carcinomas (37.5%) and large cell carcinomas (25%). It was seen less commonly in other forms of primary lung cancers.

Central bronchus is involved in 50% cases of squamous cell carcinoma, while approx. 25% of adenocarcinomas, large cell and small cell carcinoma showed involvement of the central bronchus. Extra thoracic invasion was less common in all types of primary lung cancer, being approx50% in adenosquamous carcinoma and 25% in large cell carcinoma, while it was, uncommon in all other types of carcinoma.

Collapse and consolidation was associated most commonly with adenocystic carcinoma, squamous cell carcinoma, and adenosquamous tumor, followed by the other varieties, however it was least commonly seen with lymphoma and carcinoid types.

Most common dissemination of the adrenal gland was seen involving the small cell carcinoma in 50% cases, while 25% of the large cell carcinomas showed metastases to the adrenal glands. Less common involvement was seen in adenocarcinoma 12% .

Dissemination to the liver was seen most commonly in the small cell carcinoma (37%) followed by adenosquamous carcinoma (50%)and large cell carcinoma (25%) It was seen less commonly in the adenocarcinoma and squamous cell carcinoma at presentation.

Metastases to the lung were seen most commonly with adenocarcinoma (40%), followed by small cell carcinoma. It was seen much less commonly with other varieties like squamous cell carcinoma and large cell carcinoma. 21% of the non small cell lung cancers were disseminated with distant metastases at presentation.

Secondary lung metastasis shows well defined margin (93.5%), multiple in number (87%) and lower lobe predominance (73%). Cavitation of metastasis is common with metastasis from squamous primary mass.

SUMMARY AND RESULTS:

1. CENTAL VS PERIPHERAL LOCATION:

While majority of the lung cancers of adenocarcinoma, large cell carcinoma ,and lymphoma variety were peripheral in location and squamous cell carcinoma ,carcinoid ,adenocystic and small cell carcinoma were central in location.

1. CAVITATION:

Cavitation was most common in adenosqumaous variety followed by large cell carcinoma. In secondary metastasis, cavitation common in primary squamous mass variety.

2. NECROSIS:

The most commonly necrotic tumour were adenosquamous, small cell and adenocarcinoma.

3. SPICULATION:

Speculation is a feature of malignant lesions and is most commonly seen with adenocarcinomas and squamous cell carcinoma.

4. COLLAPSE AND CONSOLIDATION:

adenocysticcarcinoma ,squamous and adenocystictumor show more tendency to cause distal collapse and consolidation,

5. MEDIASTINAL LYMPHADENOPATHY:

Adenosquamous,carcinoid and adenocystic carcinoma show the highest propensity of mediastinal lymphadenopathy.

6. MEDIASTINAL INVOLVEMENT

Mediastinal involvement was also common in the squamous cell carcinoma and adenosquamous carcinoma

7. PLEURAL EFFUSION:

Pleural effusion is common in the adenocarcinoma, small cell carcinoma compared to other carcinoma.

8. DISSEMINATION TO ADRENALS:

It is most commonly associated with small cell carcinoma compared to other variety.

9. METASTASES TO OTHER SITES :

Metastases to the liver, bone and lung was more common with small cell carcinoma and adenocarcinoma compared to other variety.

10. Primary versus secondary.

Secondary metastasis were multiple number, well marginated and lower lobe & random distribution, on other hand primary solitary, lobulated, ill-defined margin and central or peripheral in location.

CT scan is a good modality for the detection of primary lung carcinoma. It can also predict the size , location of the tumor, along with evaluation of its internal characteristics like margins, calcification, necrosis, cavitations, spiculation Associated features like mediastinal lymphadenopathy, pleural effusion and meta stases to liver, lung, adrenals could also be studied accurately.

However it cannot reliably separate one histological cell type from the other based on the above mentioned findings.

While certain characteristics were very common in a particular histological cell type and a combination of findings could be used to distinguish one type from the other.

DISTRIBUTION OF NUMBER AND PATHOLOGICAL TYPE BY SEX

	Male	Female
Total number cases	40	10

Pathological type:	Male (40)	Female(10)
Adenocarcinoma	14(35%)	3 (30%)
Squamous cell carcinoma	10 (25%)	2 (20%)
Small cell carcinoma	6 (15%)	2 (20%)
Large cell carcinoma	3 (7.5%)	1 (10%)
Adenosquamous cell carcinoma	2(5%)	0
Carcinoid	1 (2.5%)	0
Lymphoma	1 (2.5%)	0
Adenocystic carcinoma	1(2.5%)	0
Secondary Metastasis (other than primary lung)	2 (5%)	2 (20%)

PERCENTAGE AND NUMBER DISTRIBUTION OF TUMOUR

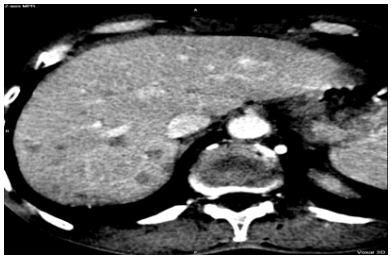
Pathological type:	Total number	Percentage
Adenocarcinoma	17	34
Squamous cell carcinoma	12	24
Small cell carcinoma	8	16
Large cell carcinoma	4	8
Adenosquamous cell carcinoma	2	4
Carcinoid	1	2
Lymphoma	1	2
Adenocystic carcinoma	1	2
Secondary metastasis	4	8

CHARACTERISTIC OF SECONDARY LUNG METASTASIS

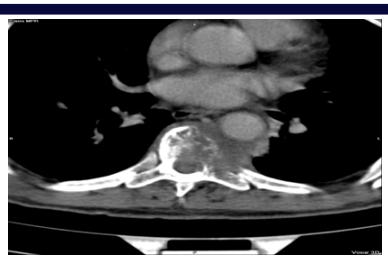
Characteristic	**Number**	**Percentage**
well defined margin	14	93.3
multiple in number	13	87
basal predominance	11	73.3
Cavitation	1	6.7
Calcification	0	0
Lymphangitic spread	1	6.7

Large heterogeneously enhancing right hilar mass encasing right pulmonary artery with mediastinal invasion and SVC obstruction- Small cell carcinoma

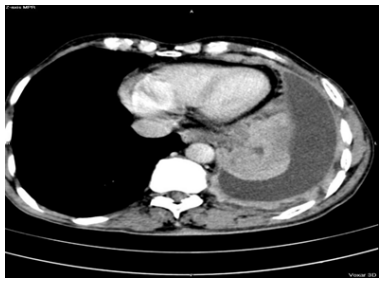
Left hilar and infrahilar mass invading left main bronchus and abrupt cut off left lower lobe bronchus with distal collapse-consolidation. Adjacent bone metastasis with soft tissue component- Squamous cell carcinoma



Liver metastasis from small cell carcinoma of lung



Osteolytic bone metastasis with soft tissue component from adenocarcinoma of lung



Pleural effusion and pleural metastasis from adenocarcinoma of lung