ORIGINAL RESEARCH PAPER
Volume - 15 | Issue - 01 | January - 2026 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MAGNITUDE AND HISTOMORPHOLOGY OF LUNG LESIONS INCIDENTALLY DIAGNOSED IN LUNG AUTOPSY AT A TERTIARY CARE HOSPITAL, HYDERABAD

Pathology

Dr. Mohammed Waseemuddin* Post Graduate Pathology, Osmania Medical College, Hyderabad. KNR University Of Medical Sciences, Telangana, India. *Corresponding Author.

Dr. Rajarikam Nagarjuna Chary Professor of pathology, Osmania medical college, Hyderabad, KNR university of medical sciences, Telangana, India.

Dr. Naval Kishore Bajaj Professor and HOD, pathology, Osmania medical college, Hyderabad, KNR university of medical sciences, Telangana, India.

ABSTRACT

Background: Autopsy-based lung histopathology provides crucial insights into undiagnosed, subclinical, or rapidly progressive respiratory diseases contributing to sudden or unexpected death. **Aim:** To assess the magnitude and histomorphological spectrum of lung lesions incidentally identified in medicolegal autopsies. **Materials And Methods:** This cross-sectional study examined 100 autopsy lung specimens received between January 2023 and May 2025. Standard gross evaluation and hematoxylin–eosin staining were performed. Lesion frequencies were correlated with age and sex. Graphical representation of findings was generated using Python-based analysis. **Results:** The study population comprised 59 males and 41 females. The highest number of cases (55%) occurred between 20–39 years. Pulmonary oedema (77%) and pulmonary congestion (65%) were the most common findings. Emphysema (11%), pneumonia (8%), granulomatous lesions (8%), atelectasis (4%), diffuse alveolar damage (2%), and rare lesions such as bronchitis, bronchiectasis, large vessel thrombus, and pulmonary alveolar microlithiasis (1% each) were observed. **Conclusion:** Pulmonary oedema and congestion were the predominant incidental autopsy findings, with a notable burden in young adults. Autopsy histopathology remains indispensable for uncovering silent lung diseases and contributes significantly to medico-legal and epidemiological understanding.

KEYWORDS

Autopsy, Lung lesions, Pulmonary oedema, Microlithiasis, Histopathology, Sudden death

INTRODUCTION

The lungs are constantly exposed to environmental pollutants, infectious agents, allergens, and toxic inhalants, making them prone to a wide variety of pathological processes. Despite technological advances in diagnostics, many respiratory conditions remain undiagnosed during life-either due to subclinical progression, misdiagnosis, or rapid terminal deterioration.

Autopsy provides a unique opportunity to uncover hidden lung pathology, especially in medicolegal cases where the cause of death is unclear. Histopathological examination plays an essential role in revealing subtle morphological changes that are not identifiable on gross inspection. These incidental findings are vital for understanding disease burden, terminal events, and regional epidemiological trends.
In India, where tuberculosis, chronic smoking, air pollution, and occupational exposures are common, studying autopsy lungs can yield important information regarding public health. This study aims to evaluate the magnitude and histomorphological patterns of lung lesions detected incidentally in autopsy lungs at a major tertiary care centre in Hyderabad.

MATERIALS AND METHODS

Study Design

Cross-sectional descriptive study.

Study Location

Department of Pathology, Osmania General Hospital, Hyderabad.

Study Period

January 2023 – May 2025.

Sample Size

100 medicolegal autopsy lung specimens.

Inclusion Criteria

All lungs received from medicolegal autopsies requiring histopathological evaluation.

Exclusion Criteria

Markedly autolyzed or decomposed lungs unsuitable for microscopic analysis.

Gross Examination

Each lung was:

- Weighed and measured
- Inspected for color changes, consistency, surface alterations
- Sectioned to assess congestion, consolidation, edema, hemorrhage, nodules, or necrosis

Tissue Sampling

Representative bits were taken from:

- All lobes
- Suspicious or grossly abnormal areas
- Bronchi and hilar regions

Histology

- Fixation: 10% neutral buffered formalin (48–72 hrs)
- Paraffin embedding
- Microtomy: 4–5 µm sections
- Staining: Hematoxylin & Eosin
- Microscopic evaluation under low, medium, high power

Statistical Analysis

Descriptive analysis using frequency and percentage. Graphs generated using Python.

RESULTS :

Demographic Profile

A total of **100 cases** were analyzed.

- **Males:** 59
- **Females:** 41
- **Mean Age:** 35.2 years
- **Age Range:** 1 month – 75 years

The majority of cases (**55%**) belonged to the **20–39-year age group**.

Table 1 : Distribution Of Cases According To Age Groups

Age Group	Males	Females	Number of Cases
0-9	12	8	20 (20%)
10- 19	0	6	6 (6%)
20-29	20	16	36 (36%)
30-39	12	7	19 (19%)
40-49	12	1	13 (13%)
50-59	1	1	2 (2%)
60-69	1	2	3 (3%)
70-79	1	0	1 (1%)
Total	59	41	100 (100%)

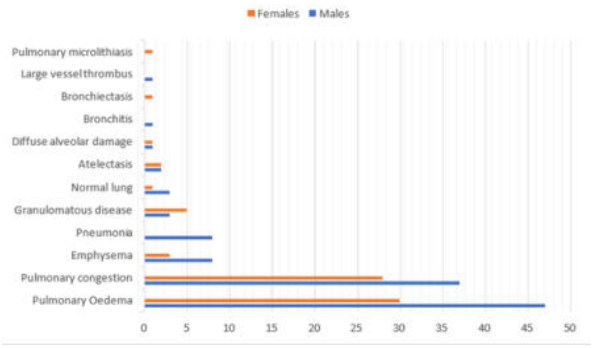


Chart 1 : Bar diagram showing distribution of lung lesions:

Pulmonary Oedema was the most common lesion observed, seen in 77% of cases. It was more frequent in males (47 cases) compared to females (30 cases) and mostly under the age group 21-50 years.

Pulmonary Congestion was the second most frequent finding, noted in 65 cases (37 males, 28 females) mostly under the age group of 20-39 years.

Emphysema was identified in 11 cases, again showing male predominance (8 males) and mainly found in the 21–50 years age groups.

Pneumonia was present in 8 cases, with all patients being male, and mostly within the 4 –30 years age group.

Granulomatous Disease was observed in 8 cases, predominantly in females (5 cases) and distributed.

Normal Lung architecture was seen in 4 cases, suggesting no significant histopathological findings.

Atelectasis was also found in 4 cases, affecting both sexes equally, and confined to younger age groups (1 month –30 years).

Diffuse Alveolar Damage (DAD) was noted in 2 cases, 3 years male and 20 years female individually indicating acute or severe insult such as ARDS.

Rare Lesions Included:
Bronchitis (1 case) – in a 32 years male
Bronchiectasis (1 case) – in a 27 years female
Large Vessel Thrombus (1 case) – in a 22 years male
Pulmonary Microlithiasis (1 case) – seen in a 38 years female

Sex-wise Distribution
Males comprised the majority across most lesions.
All pneumonia and bronchitis cases were observed in males.
Lesions like granulomatous disease, bronchiectasis, and microlithiasis had more female predominance.

Age-wise Distribution
Pulmonary oedema and congestion were more common in the 21–50 years age range.

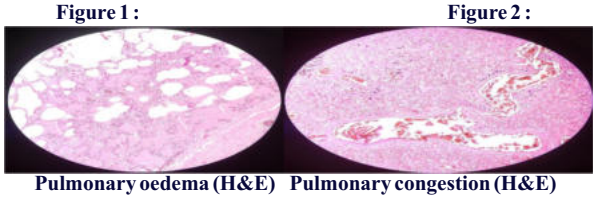
Emphysema showed increasing frequency with age.

Pneumonia, DAD, and atelectasis were predominant in the younger population (0–30 years).

Rare lesions like thrombus and microlithiasis were restricted to middle-aged groups.

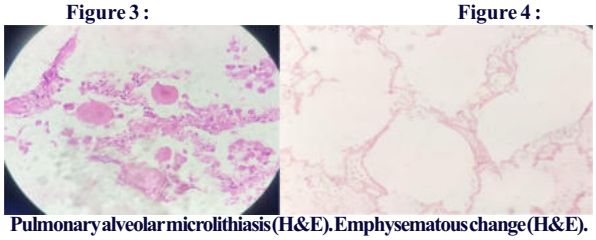
Histopathology Images :

Figure 1 : **Figure 2 :**



Pulmonary oedema (H&E) Pulmonary congestion (H&E)

Figure 3 : **Figure 4 :**



Pulmonary alveolar microlithiasis (H&E). Emphysematous change (H&E).

Table 2. Comparative Frequency Of Lung Lesions In Various Autopsy Studies

Lesion	Present Study	Sakhawane et al	Dhruwet al	Guptaet al	Remarks
Pulmonary Oedema	77%	72%	74.25 %	45.4%	Consistent with terminal hypoxia
Pulmonary Congestion	65%	68%	8.64%	68%	Common in circulatory collapse
Pneumonia	8%	18.8%	5.26%	5%	Slightly lower prevalence
Granulomatous Lesions	8%	1.4%	1.48%	6%	Reflects TB burden in Hyderabad
Emphysema	11%	8%	0.63%	—	Early smoking-related changes
Atelectasis	4%	2%	3%	5%	Comparable
Diffuse Alveolar Damage	2%	1%	3%	—	ARDS/shock-related
Microlithiasis	1%	0%	0%	0%	Rare; detected due to microscopy

DISCUSSION

This study documents the spectrum of lung pathology incidentally detected during medicolegal autopsies. The findings demonstrate that pulmonary oedema and congestion accounted for the majority of lesions, consistent with the physiological responses seen in shock, trauma, poisoning, seizures, and cardiac failure.

A major observation was that over half of cases belonged to the **younger age group (20–39 years)**. This age group is particularly vulnerable to trauma, substance abuse, occupational exposure, and sudden unexpected deaths.

Granulomatous inflammation (8%) was predominantly caseating, indicating active or healed tuberculosis, consistent with TB endemicity in Telangana. Emphysema was observed mainly in males, reflecting smoking and occupational dust exposure.

Rare entities such as pulmonary alveolar microlithiasis were detected due to microscopic examination, demonstrating the diagnostic importance of autopsy histopathology.

Comparison with previous Indian studies reveals similar trends, validating the accuracy and representativeness of the present dataset.

CONCLUSION

Pulmonary oedema and congestion were the most frequently observed incidental lung lesions in autopsy cases, particularly affecting young adults. Histopathology remains an indispensable tool in identifying hidden pulmonary diseases, contributing to both medico-legal evaluation and public health epidemiology.

Autopsies continue to play a critical role in understanding fatal pathological events, especially in sudden, unexplained, or accidental deaths.

REFERENCES :

1. Kurawar RR, Vasaikar MS. Histomorphological patterns of lung lesions at autopsy: A 5-year study in Maharashtra. *Indian J Pathol Microbiol*. 2016;59(2):158-164.
2. Chauhan G, Patel S, Shah H. Incidental lung lesions in medicolegal autopsies: A study from Gujarat. *J Forensic Med Toxicol*. 2017;34(1):45-51.
3. Jhaveri S, Vyas S. Spectrum of pulmonary pathology in autopsies: A retrospective review. *Int J Med Sci Public Health*. 2017;6(4):716-720.
4. Amin NS, Buch AC, Trivedi R. Autopsy-based histopathological study of lung lesions:

An 18-month analysis. *National J Med Res*. 2018;8(2):123-127.
5. Patel CB, Shah SP, Parikh A. Histomorphological spectrum of lung lesions in medicolegal autopsies: A study of 649 cases. *GCSMC J Med Sci*. 2019;8(2):120-126.
6. Kour B, Jha M, Bhat D. Pulmonary pathology in autopsy lungs: A one-year study from North India. *JK Sci*. 2018;20(3):162-167.
7. Dhruw D, Yadav P, Singh A. Histopathological examination of autopsy lungs: A ten-year retrospective study. *Chhattisgarh J Health Sci*. 2021;9(1):32-38.
8. Travis WD, Brambilla E, Nicholson AG. WHO Classification of Tumours of the Lung, Pleura, Thymus and Heart. 4th ed. Lyon: IARC Press; 2015.
9. Kumar V, Abbas AK, Aster JC. *Robbins and Cotran Pathologic Basis of Disease*. 10th ed. Philadelphia: Elsevier; 2021.
10. Castellana G, Castellana G, Gentile M. Pulmonary alveolar microlithiasis: Review of 500 cases. *Resp Med*. 2015;109(6):658-664.