



A STUDY ON HISTOMORPHOLOGICAL SPECTRUM OF LUNG LESIONS IN AUTOPSY SPECIMENS FROM A TERTIARY CARE CENTRE.

Pathology

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ABSTRACT

Background: Autopsies are carried out to establish the identity, cause of death, time of death, and ante-mortem or post-mortem nature of death. In autopsy, the lungs are examined for disease, injury and other findings suggesting cause of death or related changes. **Aim and Objectives:** The aim of this study was to assess the distribution and frequency of various lung lesions encountered on histopathology at autopsy. **Material and Methods:** It was a retrospective study conducted on 200 lung tissue pieces from all medicolegal autopsies received in the Department of Pathology, Shaheed Hasan Khan Mewati Government Medical College, Nalhar, Nuh, in a period of one year (2023-2024). The specimens were examined grossly, processed and paraffin embedded sections obtained were stained with H&E stain and examined under microscope. **Results:** A total of 200 lung specimen were taken in the study out of which 99% were non neoplastic. Majority of the patients were males constituting about 73% cases. Congestion/oedema/nonspecific inflammation accounted for maximum number of cases (64.5%). Tuberculosis was seen in 26 (13%) of cases. Pneumonia accounted for 3.5% cases. Two cases of Fungal etiology and two cases of metastatic adenocarcinoma were also noted. Three cases of Chronic obstructive lung disease were seen in males aged 60 years and above. Two cases of Hyaline membrane disease were also noted. **Conclusion:** Histopathological examination of lung autopsy specimens helps to highlight many incidental findings, establishes underlying cause of death, serves as a learning tool and also holds scope for detection of newer diseases.

KEYWORDS

Autopsy, Lung, Histopathology, Tuberculosis

INTRODUCTION

The lungs are vital organs responsible for gaseous exchange between blood and inspired air (1,2). They are affected by a wide spectrum of inflammatory, neoplastic, non-neoplastic, and occupational lesions, and are also secondarily involved in most terminal events related to cardiovascular causes (3). A significant proportion of the global population suffers from preventable chronic respiratory diseases (4). Lung disorders often present with diverse and complex features, while clinico-radiological findings are usually nonspecific. Therefore, pathological investigations remain crucial for accurate diagnosis, improving survival, and reducing morbidity and mortality (5).

Autopsy is one of the most reliable methods to study internal organ pathology. It refers to the systematic examination of a body after death for medical, legal, and scientific purposes. Autopsies help establish identity, cause and manner of death, and time since death, and are often complemented by histopathological examination of tissues (6). At autopsy, lungs are examined grossly for evidence of disease, injury, or abnormalities such as scars, bullae, fibrosis, consolidation, nodules, infarction, or cavities that may suggest the cause of death or underlying conditions (7). Histopathological examination of lung tissue obtained at autopsy provides insights into disease processes, reveals incidental findings, and enhances our understanding of pulmonary histology in both health and disease (8–10).

The present study aims to assess the distribution and frequency of various lung lesions encountered on histopathology at autopsy.

MATERIALS AND METHODS

This study was conducted on 200 routine autopsies received in the Department of Pathology, Shaheed Hasan Khan Mewati Government Medical College, Nalhar, Nuh, over a period of one year (January 2023 to December 2023).

All autopsy specimens were included irrespective of the age and sex of the deceased, while autolyzed specimens were excluded. Each lung specimen was examined both grossly and microscopically. Gross

features such as color, consistency, fibrosis, granulomas, consolidation, and bullae were recorded. The specimens were routinely processed, paraffin-embedded, sectioned, and stained with hematoxylin and eosin (H&E). Special stains, including Ziehl-Neelsen and periodic acid-Schiff (PAS), were used where necessary. Findings were documented and tabulated.

RESULTS

A total of 200 lung specimens were examined over one year, irrespective of age, sex, or cause of death. Of these, 198 cases (99%) were non-neoplastic, while 2 cases (1%) showed neoplastic lesions. The male-to-female ratio was 2.7:1, with males comprising 146 cases (73%) and females 54 cases (27%).

The histopathological findings are summarized in Tables 1–3. Normal lung morphology was seen in 14.5% of cases. Congestion, edema, nonspecific inflammation, and pulmonary hemorrhage accounted for the majority of cases (64.5%). Tuberculosis was identified in 26 cases (13%), of which 16 were acid-fast bacilli (AFB)-positive, while the rest showed necrotizing granulomatous inflammation. Most tuberculosis cases occurred in individuals aged 31–45 years. Pneumonia was present in 7 cases (3.5%), all in individuals aged 30 years and above. Additionally, 2 cases of fungal infection, 2 cases of metastatic adenocarcinoma, 3 cases of chronic obstructive lung disease (all in males over 60 years), and 2 cases of hyaline membrane disease were observed.

Table 1: Distribution of Cases

Total no. of Cases	Male	Female
200	146	54

Table 2: Sex Wise Distribution of Lung Lesions (n=200)

Lesion	Male (146)	Female (54)	Total (200)
No pathological change	16	13	29
Congestion/edema/nonspecific inflammation /hemorrhage	99	30	129

Pneumonia	6	1	7
TB/granulomatous inflammation	17	9	26
Fungus	1	1	2
Metastasis	2	0	2
ARDS	2	0	2
Emphysema	3	0	3
Total	146	54	200

Table 3: Age Wise Distribution of Lung Lesions:

Lesion	0-15 years	16-30 years	31-45 years	46-60 years	>60 years	Total
No pathological change	1	18	10	0	0	29
Congestion/edema/nonspecific inflammation/hemorrhage	02	36	42	37	12	129
Pneumonia	0	0	3	3	1	7
TB/Granulomatous Inflammation	0	8	12	4	2	26
Fungus	0	0	2	1	0	3
Metastasis	0	0	0	1	1	2
ARDS	2	0	0	0	0	2
Emphysema	0	0	0	0	2	2
Total	5	62	69	46	18	200

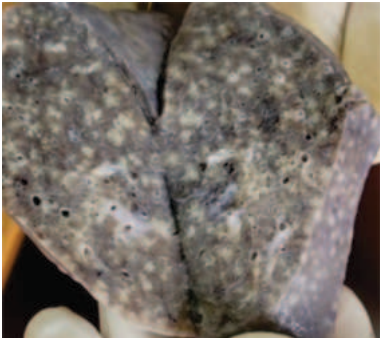


Figure 1: Gross Photograph From a Lung Specimen of a Case of Bronchopneumonia

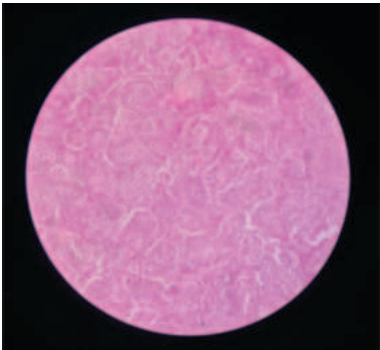


Figure 2: Photomicrograph From a Lung Section Showing and Diffuse Infiltration of Acute Inflammatory Cells in Alveolar Spaces in a Case of Pneumonia (H&E, 10x)

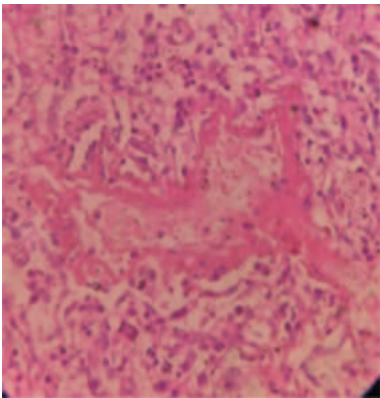


Figure 3: Photomicrograph From a Lung Section Showing Hyaline Membrane Disease (H&E, 40X)

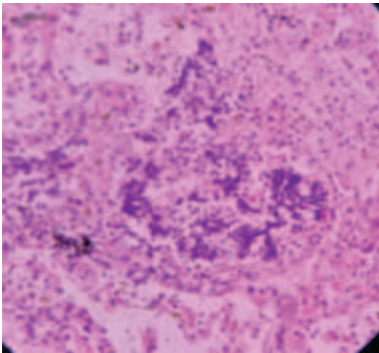


Figure 4: Photomicrograph From a Lung Section Showing Fungal Hyphae in a Case of Fungal Pneumonia(H&E,10X)

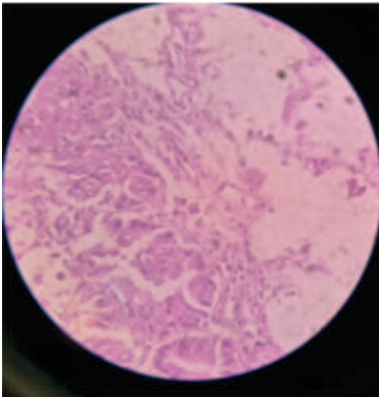


Figure 5: Photomicrograph From a Lung Section Showing Metastatic Deposits in Lung From a Case of Cholangiocarcinoma (H&E,40X)

DISCUSSION

Autopsy plays a vital role in confirming the cause and manner of death, establishing identity, differentiating antemortem and postmortem changes, and providing valuable insights into disease processes leading to death. Histopathological examination of lungs at autopsy is particularly useful for understanding various pulmonary lesions (11).

In this study, 200 lung specimens were analyzed over one year. Of these, 198 cases (99%) were non-neoplastic and only 2 (1%) were neoplastic. Similar findings were reported by Sumaya et al. (99.06%) (12) and Selvam et al. (90% of cases) (13), supporting the reliability of our results.

Males were more frequently affected (73%) compared to females (27%), consistent with observations by Sumaya et al. (12). This may be attributed to greater occupational exposure, smoking, and alcohol use (16).

Congestion, edema, nonspecific inflammation, and pulmonary hemorrhage accounted for the majority of cases (64.5%). Comparable findings were reported by Gupta et al. (14) and Jhaveri et al. (15). These changes may reflect pollution, smoking, cardiovascular disease, and restrictive lung conditions leading to fibrosis.

Normal lung morphology was observed in 14.5% of cases, consistent with findings by Manjula et al. (17).

Tuberculosis was present in 13% of cases, higher than the incidence reported in studies by Selvam et al. (2.8%), Chauhan et al. (6.26%), Bal et al. (8.6%), and Mangal et al. (4.08%) (13,18–20). Udayshankar et al. reported a 22.72% incidence (21), which aligns more closely with our findings. The high prevalence in our study may reflect the impact of poverty, overcrowding, and poor hygiene in the region. Most cases were seen in the 31–45 year age group.

Pneumonia accounted for 3.5% of cases, similar to the findings of Tahir et al. (4%) and Sumaya et al. (4.7%) (12,22). This could be linked to smoking and hospital-acquired infections.

Two fungal infections were documented, both in immuno-

compromised patients, showing diffuse hyphal invasion of the lungs, liver, and heart. Three cases of emphysema were noted, characterized by bullae on gross examination, with a history of smoking. Two cases of metastatic adenocarcinoma were also identified—one with a known primary cholangiocarcinoma and the other with an unknown primary.

CONCLUSION

This study highlights the histopathological spectrum of lung lesions at autopsy. Our findings are largely consistent with previous research. Tuberculosis and pneumonia were notable as frequently undetected during life, yet contributing to mortality. Autopsy provides valuable insights into their true prevalence and emphasizes the need for preventive measures, early diagnosis, and treatment to reduce mortality. Histopathological examination of lung specimens not only aids in identifying incidental findings and underlying causes of death but also serves as a learning tool and supports the detection of emerging diseases.

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