

Histopathological spectrum of lung findings in autopsy cases



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ABSTRACT

Background: The incidence of lung pathology is the most common autopsy finding and is responsible for a great deal of mortality and morbidity. It is affected by a wide variety of respiratory pathogens and is involved in many systemic diseases. It is secondarily involved in almost all forms of terminal disease. Radiological findings are usually nonspecific in lung diseases and need prompt histopathological examination to find out the exact cause of death. **Aims and Objectives:** The aim is to study the spectrum of histopathological findings in lung in autopsy cases. **Materials and Methods:** This is a retrospective study done in the Department of Pathology at Government Kilpauk Medical College and Hospital during the year 2022. Lung specimens were received from the Forensic medicine department. Gross findings were noted. Following adequate formalin fixation, the tissue specimens were processed and paraffin sectioning was done followed by hematoxylin and eosin staining. The findings were documented and the results were analyzed. **Results:** Among 100 cases studied during year maximum cases were seen in the age group of 31–40 years (32%). Males (72%) were more commonly affected than females (28%). The most common findings are Pulmonary edema (34%) followed by congestion (32%) and other findings include emphysematous change (13%), pneumonia (10%), tuberculosis (6%), metastatic adenocarcinomatous deposits (1%), primary well-differentiated adenocarcinoma (1%), pulmonary chondroma (1%), and bronchiectasis (1%). **Conclusion:** The most common finding observed was pulmonary edema. In our study, male preponderance was noted. This study emphasizes to scrutinize the histopathological findings in the lung, especially following a sudden death.

Key words: Lung; Autopsy; Pulmonary edema; Congestion

INTRODUCTION

Autopsy includes detailed external examination and dissection of organs from cranial, thoracic, abdominal, and pelvic organs. These findings are further correlated and confirmed by histopathological findings. A final cause of death is given by forensic experts only after correlating with histopathological findings.¹ Millions of people around the world suffer from preventable lung diseases.² The presentation of lung diseases is varied and complex. Diagnosis is often challenging for clinicians despite the availability of modern advanced diagnostic methods. Early histopathological features of well-documented disorders of the lung still

remain a mystery as these are not easily subjected to biopsy. Hence, histopathological examination of lung biopsy is of great value to diagnose respiratory cause of death.³ The clinical and radiological findings are usually nonspecific and histopathological examination is necessary to find out the exact cause of death.⁴ This study aimed to determine the spectrum of histopathological findings including neoplastic and non-neoplastic lesions of lung received as autopsy specimens related or unrelated to the cause of death.

Aims and objectives

To study the spectrum of histopathological findings in lung in autopsy cases.

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MATERIALS AND METHODS

This is a retrospective study done in the Department of Pathology at GOVERNMENT KILPAUK MEDICAL COLLEGE AND HOSPITAL during the year 2022 irrespective of age and gender. Lung specimens were received from the Forensic medicine department. Gross findings were noted. Following adequate formalin fixation, the tissue specimens were processed and paraffin sectioning was done followed by hematoxylin and eosin staining. The findings were documented and the results were analyzed.

Statistical analysis

Data analysis was done and data were entered into Microsoft Excel sheet.

RESULTS

A total of 100 cases were included in the study. A histopathological examination was carried out. Relevant tables were made. Age-wise distribution of the autopsy cases is shown in (Table 1). Maximum cases were seen in the age group of 30–39 years (32%), followed by 16% in the age group of 20–29 years and 15% in the age group of 10–19 years. Males (72%) are more commonly affected than females (28%). The most common pathology noted was pulmonary edema (34%) followed by congestion (31%) and other findings include emphysematous change (13%), pneumonia (10%), tuberculosis (6%), metastatic adenocarcinomatous deposits (2%), primary well-differentiated adenocarcinoma (1%), pulmonary chondroma (1%), and bronchiectasis (1%) (Table 2).

Microscopic picture (Figure 1) shows pulmonary edema of varying sizes with marked interstitial congestion and alveoli filled with eosinophilic fluid material. The next common pathology was congestion. (Figure 2) Microscopic picture shows alveoli of varying sizes with widening of alveolar septa and congested blood vessels and hemosiderin laden macrophages. Emphysematous change was found in 13 cases in which microscopic picture shows abnormally large alveoli with focal alveolar destruction (Figure 3). There are 10 cases of pneumonia which includes a

case of aspiration pneumonia. The microscopic picture shows lung parenchyma exhibiting septal wall edema and dense inflammation. The alveolar septal capillaries are congested and exhibit distension with inflammatory cells.

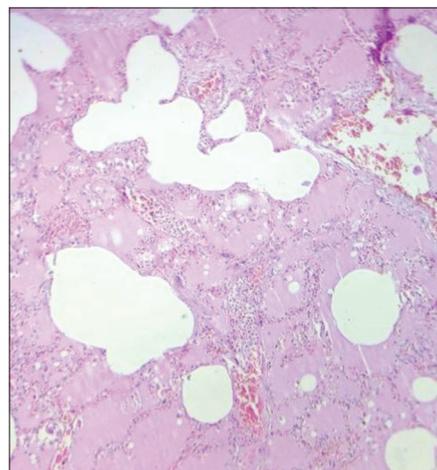


Figure 1: Pulmonary edema

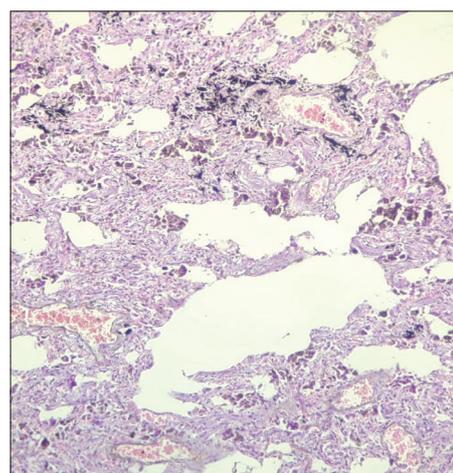


Figure 2: Congestion

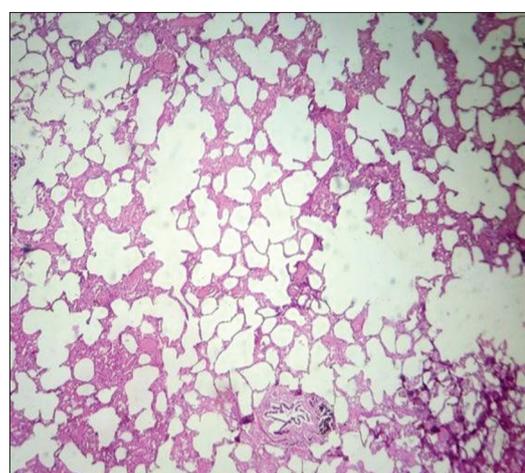


Figure 3: Emphysema

Table 1: Age-wise distribution of lung lesions

Age	Percentage of cases
0–9	4
10–19	15
20–29	16
30–39	32
40–49	14
50–59	9
>60	10

The terminal bronchioles and alveoli show amorphous eosinophilic material and focal inflammatory cells. The above-mentioned features are consistent with aspiration pneumonia (Figure 4).

Metastatic adenocarcinomatous deposits were found in 2 cases. Microscopy shows an infiltrating malignant neoplasm arranged in irregular glands (Figure 5). Another case, on cut surface reveals a firm to hard circumscribed gray-white lesion of size 1 cm in diameter was noted. (Figure 6) Microscopy shows lobules of mature cartilage separated by septa with surrounding normal lung parenchyma showing features of pulmonary chondroma. (Figure 7) is the gross picture of bronchiectasis which shows dilated bronchioles.

DISCUSSION

In our study, the most common age group affected was 30–39 years, which is comparable with studies done by Dhruw et al.,⁵ Patil et al.,¹ Patel et al.,⁶ Akarte et al.,⁷ Guru

et al.,⁹ as shown in Table 3. Male preponderance was noted in our study which is also seen in studies done by Kaur et al.,² Chauhan et al.,⁴ Patel et al.,¹⁰ Kour et al.,¹¹ Jhaveri and Dudhatra¹² The most common finding in our study is pulmonary Edema. The studies done by Dhruw et al.,⁵ Kour et al.,¹¹ Patel et al.,⁶ Manjula and Srinivasa Reddy⁸ also had pulmonary edema as the most common finding as shown in Table 4. Pulmonary edema is a terminal event in many systemic disorders such as cardiac failure, liver failure, and renal failure.¹³ Emphysematous change is

Table 2: Percentage of different types of lung lesions

Lung lesion	Percentage
Pulmonary Edema	34
Congestion	32
Emphysematous change	13
Pneumonia	10
Tuberculosis	6
Well-differentiated adenocarcinoma	1
Adenocarcinomatous deposits	2
Pulmonary chondroma	1

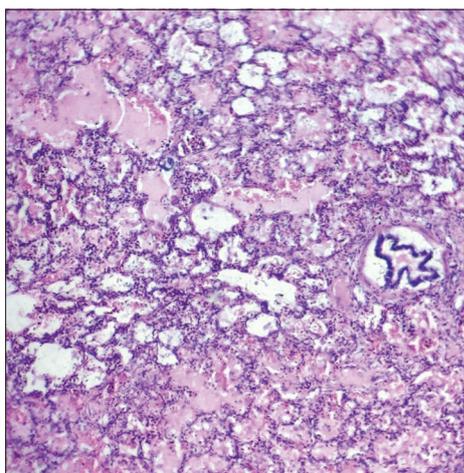


Figure 4: Aspiration pneumonia

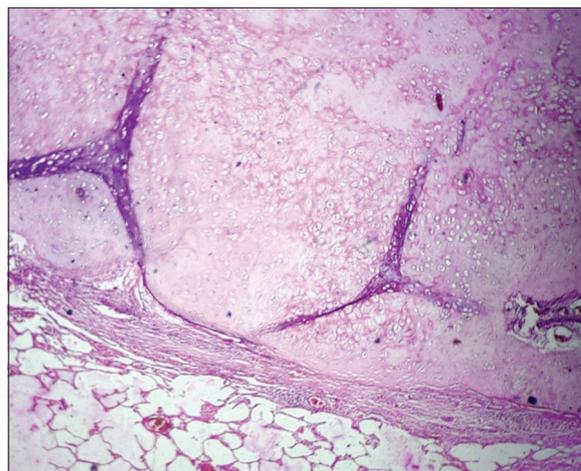


Figure 6: Pulmonary chondroma

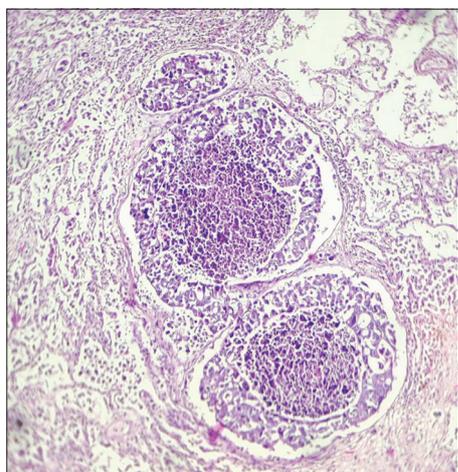


Figure 5: Microscopic picture of Metastatic adenocarcinomatous deposits

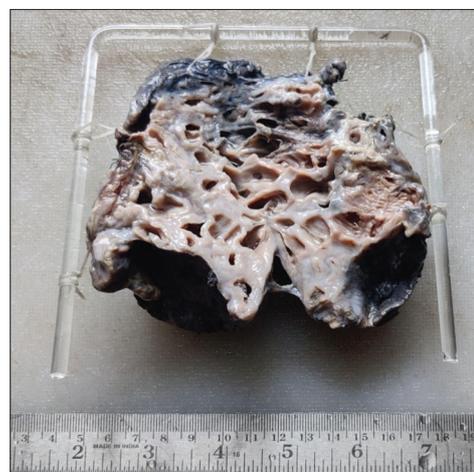


Figure 7: Bronchiectasis

Table 3: Comparison of age-wise distribution of lung lesions in autopsy cases reported by other authors (in percentage)

Age (years)	Present study	Dhruw et al. ⁵	Patil et al. ¹	Patel et al. ⁶	Akarte et al. ⁷
0–9	4	3	10	6	6
10–19	15	13	7	5	6
20–29	16	22	21	12	20
30–39	32	30	22	22	22
40–49	14	18	13	21	11
50–59	9	9	18	16	18
>60	10	5	9	18	17

Table 4: Comparison of histopathological findings of lung reposted by other authors

Study name	Most common finding	Second most common finding	Third most common finding
Dhruw et al. ⁵	Congestion and pulmonary edema	Congestion, pulmonary edema, and hemorrhage	Bronchopneumonia
Kaur et al. ²	Congestion/edema	Pneumonia	Tuberculosis
Patel et al.	Terminal stage events (Interstitial edema, congestion)	Pneumonia	Tuberculosis
Manjula and Srinivasa Reddy ⁸	Pulmonary edema	Lobar pneumonia	Congestion
Present study	Pulmonary edema	Congestion	Emphysema



Figure 8: Gross picture of Metastatic adenocarcinomatous deposits

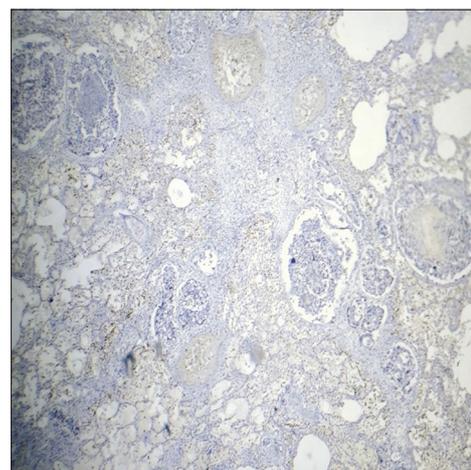


Figure 10: Immunohistochemistry Picture showing TTF-1-positive in lung parenchyma

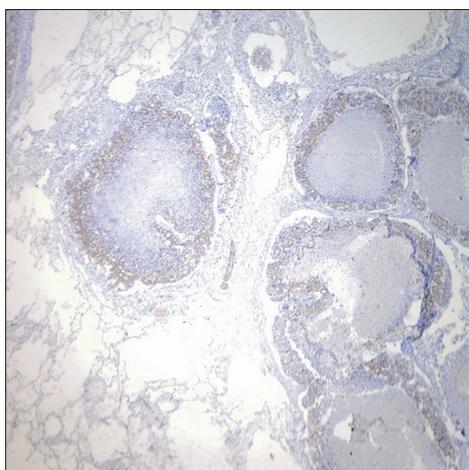


Figure 9: Immunohistochemistry Picture showing CK20-positive in tumour deposits

seen in 13% of cases among which 10% of them were found to be smokers. The study done by Amin et al.,¹⁴ also had the association of emphysema with smoking. There was one case of Aspiration pneumonia noted in a 8-month-old baby who had collapsed following milk aspiration. There were 6 cases of Tuberculosis and with the advent of new treatment protocols for drug-resistant tuberculosis, mortality has decreased. We had two cases of metastatic adenocarcinomatousdeposits. One case was grossly thought to be military Tuberculosis as the cut surface of the lung showed multiple small nodules was shown in Figure 8. Microscopy showed malignant glands infiltrating the lung parenchyma and reported as metastatic adenocarcinomatous deposits as it was positive for CK 20 was shown in Figure 9. and negative for TTF1 was shown

in Figure 10. The other one was a known case of gastric adenocarcinoma which is biopsy-proven. We had received a portion of the lung, liver, and stomach from autopsy. The stomach shows a ulceroproliferative growth and multiple nodules in the liver and lung. The case is finally reported as metastatic adenocarcinomatous deposits in the lung from the stomach. The next case is pulmonary chondroma. Chondroma is a benign tumor, originating in chondrocytes. It is common in long bone but rarely occurs in the lung parenchyma. It has an incidence of about 0.1% of all benign lung tumor types. Grossly, we thought of healed pulmonary tuberculosis but microscopically it turned out to be pulmonary chondroma.¹⁵

Limitations of the study

Only a portion of the lung was received in many cases. Histopathological reporting will be more precise if the whole lung was received from the autopsy. Lack of clinical history had made us very difficult to come to final definite diagnosis in few of the cases.

CONCLUSION

The study shows the spectrum of lung lesions in autopsy cases in Government Kilpauk Medical College and Hospital during the year 2022. Pulmonary Edema is the most common finding observed in our study. Lung lesions are more prevalent in males.

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Author's Contributions:

GP- Implementation of study protocol, data collection; **BS-** Data analysis, manuscript preparation; **VR-** Preparation and revision of the manuscript; **KM-** Article submission, and article revision; **AP-** Statistical analysis, interpreted the results.

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