Original Research Article

AUTOPSY LUNG LESIONS – A HISTOPATHOLOGICAL OVERVIEW

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Abstract

Background: The lungs are the major organs involved in almost all the terminal diseases. Various infectious, inflammatory and neoplastic diseases involve lungs. Autopsy is an important tool to identify the cause and manner of death and hence to establish preventive methods. The objectives of this study are to analyse histomorphological patterns of lungs in postmortem specimens received in the pathology department, Madurai medical college during the year 2019. **Materials and Methods:** This study was done in autopsy specimens of lungs, received in Madurai medical college during the year 2019. The fixed surgical specimens were processed and sections of 5-micron thickness were cut and stained with haematoxylin and eosin. **Result:** Out of the 100 specimens examined, 30 specimens show congestive changes, 24 specimens show broncho pneumonia, 14 specimens show pulmonary edema, 8 specimens show tuberculosis, 5 specimens show pulmonary haemorrhage, 5 specimens show acute lung injury, 3 specimens show emphysematous changes, and 1 specimen show calcified hydatid cyst. 10 specimens show normal histology. **Conclusion:** Thus infections are the most common pathology involved in lungs. If we reduce the infections in lung the mortality can be reduced.

INTRODUCTION

Autopsy also called as necropsy or post-mortem examination means dissection and examination of a dead body and its organs and structures. As pathological examination of lungs gives valuable information, autopsy is performed to know the distribution and progression of diseases and to detect undiagnosed lung diseases. It is done to detect the underlying disease pathology and manner of death. Autopsy contributes to public health surveillance through detection of contagious diseases, identification of environmental hazards, and contribution of accurate vital statistics. Autopsy cases provide a unique opportunity for clinical teams to correlate their physical and laboratory findings with the pathologic changes of disease and it is a gold standard for evaluating the accuracy of diagnosis and the outcome of therapy. At autopsy, pathologists can identify or define hereditary diseases. This information not only provides the basis for genetic counseling but also may indicate preventive care for relatives.

Lungs exchange oxygen and carbon dioxide between inhaled air and blood.[1,2] Various inflammatory, occupational, non-neoplastic, neoplastic and metastatic diseases involve lungs.[3] Terminal cardiovascular diseases also show changes in lungs.

Since these diseases show non specific clinical and radiological findings detailed autopsy and histopathological examination will help to arrive at the cause of death. This knowledge will help to improve patient's survival and reduce further morbidity and mortality.

Pathologic examination of lung specimen give valuable information such as lung collapse or hyperinflation, stage and distribution of fibrosis, abscess. In addition to ascertain clinico-pathological differences, autopsy has a role in the development of new understanding of old diseases and facilitate the opportunity to discover new diseases.[4]

MATERIALS AND METHODS

Inclusion Criteria
Autopsy lung specimens that came to the department of pathology, Madurai medical college during the period of January 2019 to December 2019

Exclusion Criteria
1. Lung specimen collected from autopsy performed on poorly preserved bodies because of the possibility of autolytic changes.
2. Autopsy specimens from perinatal deaths.

Methods: The specimens were received in 10% buffered neutral formalin. Lungs and pleura were examined for gross morphological changes like collapse, inflation, consolidation, and scarring.

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For histopathological examination small bits of 2-3 mm thick were taken randomly as well as in the gross morphological pathological sites in the usual way. Processing done in an usual way and sections of 5-micron thickness were cut and stained with routine Haematoxylin and eosin stain.

RESULTS

Among the 100 specimens received and studied at our pathology department, majority (30%) of cases showed Chronic venous congestion [Figure 1]. This was followed by Pneumonia [Figure 2] contributing to about 24%. Tuberculosis impacted 8 cases making 8% contribution to the total 100 cases. Pulmonary edema [Figure 3] observed in 14 cases. Emphysematous changes [Figure 4] were seen in 3% cases and 5 cases showed Pulmonary hemorrhage. Calcified hydatid cyst and adenocarcinoma was each seen in 1 case. Normal histology was observed in 10 cases. The morphological spectrum is shown in [Table 1] and the incidence is shown in [Table 2].

Most common age group of lung involvement was 31-40 years(31%) [Table 3]. Males were more commonly (74%) affected compared to females (26%) [Table 3]. Highest number of cases of pneumonia were seen in 41- 60 years of age group. Among all cases of pneumonia 22 cases were that of bronchopneumonia. This was followed by interstitial pneumonia (2 cases).

Excluding pulmonary involvement in terminal stages, pneumonia was the most common disease involving lungs in both males and females.

Tuberculosis was seen with peak incidence in 31-60 years of age group. In 7 cases males were affected by tuberculosis and in 1 case female was affected [Table 3].

Pulmonary hemorrhage and emphysematous changes were seen in 5 (5%) and 3 (3%) cases respectively and are more commonly found in 16-30 years and ≥60 years of age group in that order [Table 3].
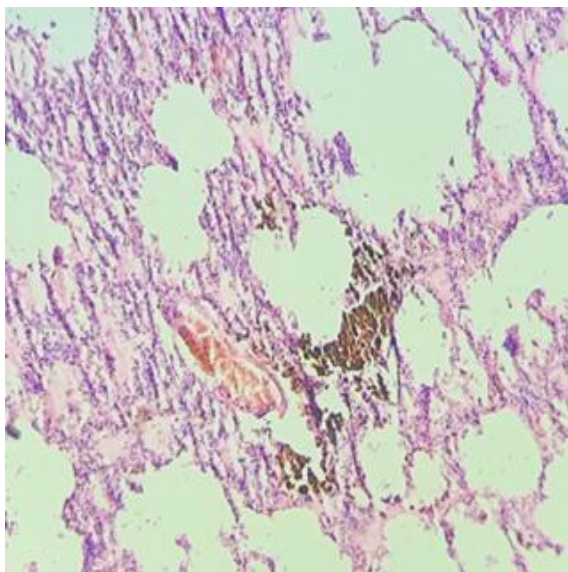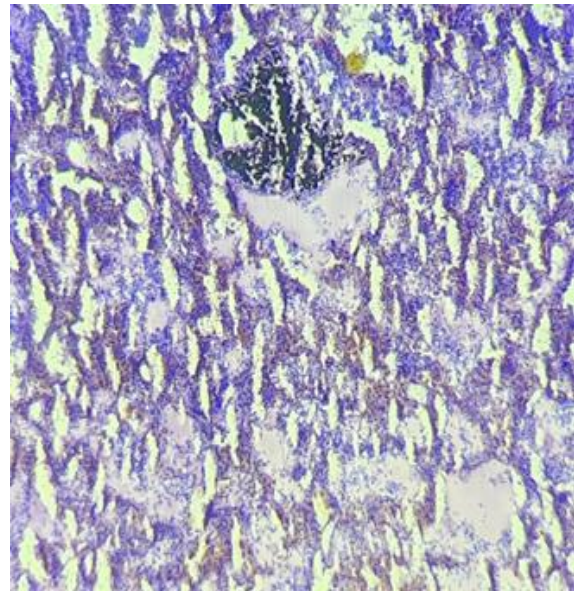

Figure 1: Chronic venous congestion
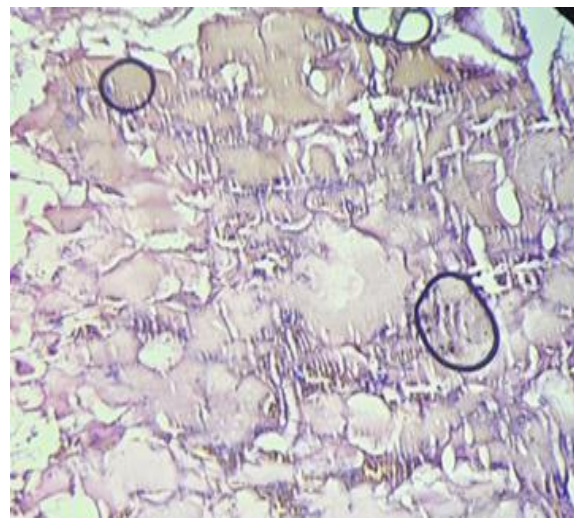

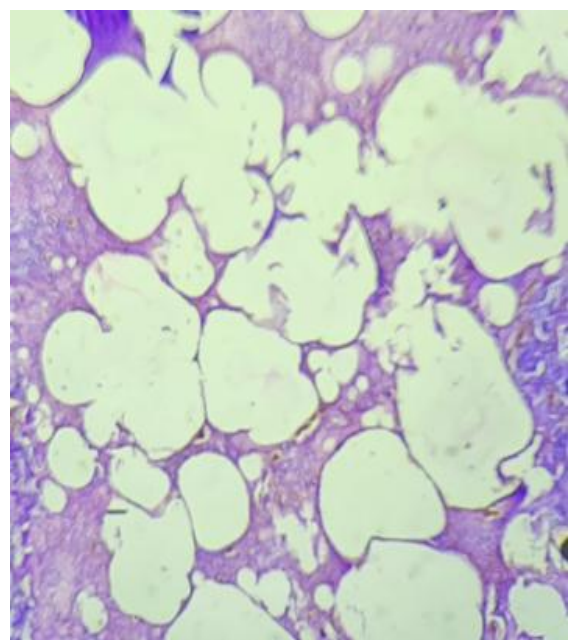Figure 2: Pneumonia with anthracotic pigment.

Figure 3: Pulmonary edema.

Figure 4: Emphysema

Table 1: Distribution of Various Morphological changes in the Specimens.

Morphological changes noted	Present	Absent
Congested blood vessels	30	70
Anthracosis	16	84
Pulmonary edema	14	86
Emphysematous changes	3	97
Inflammatory Infiltrate	24	76
Eosinophilic material in alveolar spaces	8	92
Hemosiderin laden macrophages	14	86

Table 2: Frequency of Lung Pathology

Lung Pathology	Frequency	Percentage
Chronic Granulomatous Inflammation	8	8
Chronic Venous Congestion	30	30
Pneumonia	24	24
Pulmonary Edema	14	14
Normal histology	10	10
Calcified Hydatid Cyst	1	1
Acute Lung Injury	5	5
Emphysema	3	3
Pulmonary Hemorrhage	5	5

Table 3: Age and sex distribution of various lung pathologies.

Lesion	Age group	Male: female
Granulomatous Inflammation	31 – 60 yrs	7: 1
Pneumonia	41 - 60 yrs	23 : 1
Pulmonary Congestion	16 – 45 yrs	17:13
Normal histology	0-15 & 31-45 yrs	1 : 4
Pulmonary Hemorrhage	16 – 30 yrs	4 : 1
Emphysematous changes	60 yrs	3: 0

DISCUSSION

This present study was done in 50 cases. An attempt has been made to analyse the histomorphological patterns, age distribution and gender distribution of the cases. The present study correlates with similar studies in many aspects.

In the present study the normal histology was there in 10 cases. In the study done by rupali et al the normal histology was observed in 3% of cases.[5]

Terminal changes

Terminal changes were noted in 52% of the cases. These included the presence of pulmonary oedema, emphysematous changes, congested blood vessels and presence of haemorrhages. This was similar to the study by Chauhan et al in which these terminal changes were noted in 182 out of 335 cases (54.32%).[6]

Emphysematous changes were noted in only 3% of the cases in the present study which was lower when compare to the study done by Sevlambigai et al in 2016,[7] where emphysematous changes were noted in 16% of the 100 autopsy cases studied.

Urer et al studied 66 autopsy cases having diffuse alveolar damage showing alveolar histiocytic desquamation,[8] alveolar fibrosis, chronic inflammation and alveolar fibrin. such pathological changes were noticed in 5% of cases in the present study.

Anthracosis was noted in 16% of the cases in the present study. No similar findings were noted in the previously conducted studies.

Rosen et al conducted a study which showed reactive epithelial hyperplasia in majority of the cases where inflammation was more prominent.[9] However, these findings were not observed in the present study.

Pneumonia

In the present study, pneumonia was noted in 24 cases which accounted for 24% of the total cases. This was higher when compared with the study conducted by Chauhan et al (2015) (6) where pneumonia was seen in 49 out of 335 cases (14.62%).[6] and also Tariq et al observed a slightly lower percent of pneumonia cases (4%).[10] Udayshankar et al,[11] (2013) reported a relatively higher percentage of pneumonia cases (31.81%).

Of these 24 cases of pneumonia, 1 was female, and 23 were males(M:F-23:1). In the study done by Udayshankar pneumonia cases were seen in 2 females and 5 males(11) (M:F-2.5:1). However, the study by Chauhan et al,[6] observed that out of the pneumonia cases 18 were females and 31 were males (M:F- 1.72:1). Tariq et al reported equal distribution of pneumonia in males and females (M: F-1:1).

Granulomatous Diseases

In the present study, 8 cases of granulomatous diseases (Tuberculosis) were noted which accounted for 8 % of the total cases. This was in concordance with the study done by Chauhan et al,[6] (2015) in which 21 cases of granulomatous pathology was reported (6.26%). However, the percentage of granulomatous pathology noted was higher in the study by Tariq (2013) et al (19%) and Udayshankar et al (2013) (22.72%).[10,11] In the present study, male preponderance of granulomatous lesion was noted (M:F-7:1). This was in concordance with the studies done by Chauhan et al (M: F-2:1), Tariq et al (M: F-3.8:1).

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Majority of the granulomatous cases in this study were seen in the age group of 31-60 years (4 out of 6 cases). However, in the study of Chauhan et al, the majority of the cases were seen in the age group of 30-39 years. Gupta et al studied 40 cases diagnosed as pulmonary tuberculosis with a mean age was 41 years with a male preponderance (92.5%) which was not consistent with the present study.[12] A study was done by Meel et al on 200 cases which showed granulomas with carbon and silica particles in 1% males and 7% females.[13] These non- tuberculous (dust reticulation) granulomas were not observed in the present study.

CONCLUSION

Though the recent diagnostic methods helps the clinician for the accurate diagnosis, autopsy has a vital role in understanding the various stages of the disease and in establishing the cause of death. Autopsy throws light into refined clinical diagnosis and treatment methods. Histomorphological study of lung in autopsies often discloses common diseases affecting lungs and their contribution towards death. The present study was a single institutional experience with analysis of 100 cases. The age, sex, and pathologic features encountered in our study were in agreement with the studies reported from India and other parts of the world.

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