Histopathological Findings of Lung in Autopsy – A Study of 450 Cases

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Abstract

Background: Autopsy aids to the knowledge of pathology by unveiling the rare lesions which are a source of learning from a pathologist's perspective, some of them are only diagnosed at autopsy as they do not cause any functional derangement. Many millions of people around the world suffer from preventable pulmonary diseases. The clinical and radiological findings in most of the respiratory diseases are nonspecific and correct diagnosis cannot be made solely from them. Histopathological examination serves the purpose in such cases. This study emphasizes the various incidental lesions which otherwise would have been unnoticed during a person's life.

Aim: The aim of this study was to determine the spectrum of histopathological findings including neoplastic and non-neoplastic lesions of Lung related or unrelated to the cause of death.

Material and Method: The study was done on 450 lung specimens from autopsy cases received in this department over the period of 24 months, out of which specimen received were autolysed so excluded from study, are to determine the spectrum of histopathological findings including neoplastic lesions related or unrelated to the cause of death

Result: During the period between June 2017 to June 2019, a total of 450 lungs from autopsy specimens were studied. Lung diseases were more common in males as compared to females. Most common lung pathological findings were of tuberculosis (16.7%), pneumonia (9.6%) emphysema (1.3%) and malignant lesions (1.1%) among the cases studied.

Conclusion: Advances in diagnostic technology have not reduced the value of autopsy and a goal-directed autopsy remains a vital component in the study and evaluation of the disease process. There are large numbers of cases of preventable respiratory diseases. This indicates that the autopsy has remained an important complementary tool for identifying and understanding respiratory diseases despite recent advances in diagnostic technology.

Key Words: *Autopsy, Tuberculosis, Pneumonia, Emphysema*

Introduction

The term "autopsy" is derived from the Ancient Greek word autopsia, means "to see for oneself ", autos ("oneself ") and opsis ("eye") [1,2]. A handful of histopathological findings unrelated to the cause of death are noticed in routine histopathological examination of medicolegal autopsies. These findings have proved to be of great academic value and serve as an eye opener to the infrequent lesions which go unnoticed when a person is alive. The medicolegal autopsy provides an opportunity for studying not only medically diagnosed and treated neoplasms, but also the natural evolution of untreated disease [3]. Autopsy also aids in the diagnosis of undiagnosed or misdiagnosed malignant tumours

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irrespective of underlying cause of death, which may or may not be related to malignancy [4]. But many incidental findings have been highlighted on histopathological examinations which have proven to be great learning tools for the pathologists as well as the forensic expert. Histopathological examination is also important for assessing statistics of mortality which are essential for public health and health service planning [5].

The lungs are commonly involved in various inflammatory, neoplastic, and other disease processes. They are also secondarily involved in almost all forms of terminal events due to cardiovascular causes.[6] Hundreds of millions of people around the world suffer from preventable chronic respiratory diseases.[7] A large number of conditions involve the paren-chyma of the lung, which may be associated with inflammation, fibrosis or granulomatous reactions.[8] The clinical and radiological findings in pulmonary diseases are nonspecific and prompt pathological investigation and diagnoses are essential to improve patient survival, to avoid the rapid progression of the disease and to spare the patient from more invasive procedures.[9] Therefore, it is important to determine the leading causes of death to establish correct prophylactic actions, which is the least expensive strategy for preventing further pulmonary dysfunction and avoiding the need for lung biopsies.[10]

The aim of this study was to determine the spectrum of histopathological findings including neoplastic and non-neoplastic lesions of Lung tissue received as autopsy specimens related or unrelated to the cause of death.

Material and Method

The present study was conducted on lung specimens of 450 routine autopsies received in the Department of Pathology, Autopsy section of the tertiary care hospital in Ahmedabad, Gujarat to find out the frequency of various pulmonary alterations at autopsy. All the autopsy subjects irrespective of age, sex, and cause of death were included in the study. As most of the specimens received are in pieces which are examined grossly & microscopically. The medical history and clinical history were traced. The lungs were fixed in 10% formalin, weighed and dimensions measured. Grossly, lungs were examined for colour, volume (collapsed or inflated), consistency, presence of scarring, fibrosis, bullae, consolidation, nodules, infarction, secretions, oedema, congestion, granuloma /abscess formation, the status of bronchi and pleura, and findings are recorded. Irrespective of the presences or absence of morphologically demonstrable lesions, a minimum of 2 sections per lung were studied (total 4 sections per autopsy). After routine processing and paraffin embed-ding, 4-micrometer sections were taken. All the histological sections were stained with H and E stain and mounted. All the histological sections were examined microscopically and findings were recorded.

Exclusion criteria: 34 specimens of received lung pieces were fully autolysed are not included in study.

Results

During a period from June 2017 to June 2019, a total of 450 specimens of lungs from autopsy subjects received at autopsy section of Pathology Department at a tertiary care hospital in Ahmedabad were studied. Age wise distributions of these autopsy cases are shown in Table 1.

Table 1: Age-wise distribution of lung lesions (n=450)

Findings	0-9 years	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	>=60 years	Total (%)	
Pneumonia	3	4	6	3	5	13	9	43	(9.6%)
Tuberculosis	5	12	17	8	8	15	10	75	(16.7%)
Emphysema	0	0	0	0	2	1	3	6	(1.3%)
Abscess	0	0	1	0	0	0	0	1	(0.2%)

Cont... **Table 1: Age-wise distribution of lung lesions (n=450)**

Malignant	0	2	0	0	0	1	2	5	(1.1%)
Terminal Stages	6	11	13	27	38	67	56	218	(48.4%)
Autolysed	0	2	9	9	10	4	0	34	(7.5%)
Normal lung	2	14	12	9	19	10	2	68	(15.1%)
Total	16	45	58	56	82	111	82	450	(100%)

Table 2: Sex wise distribution of lung lesions (n=450)

Findings	**Male**	**Female**	**Total no. of cases**
Pneumonias	35	08	43
Tuberculosis	58	17	75
Emphysema	05	01	6
Abscess	01	00	1
Malignant	03	02	5
Terminal stages	134	84	218
Autolysed	11	23	34
Normal lung	35	33	68
Total	356 (79%)	94 (21%)	450

Table 2 shows the sex wise distribution of lung lesions. Out of the 450 autopsy study of lungs, 356 (79%) were males and 94 (21%) were females.

Granulomatous (tuberculous) lesions are seen in 75(16.7%) out of 450 cases. Interstitial Among these cases, 58 males affected (12.9%) as compared to 17 females (3.8%). Granulomatous lesions found more commonly in 2nd and 3rd decade of life (6.4% cases).

Pneumonia is seen in 43(9.6%) out of 450 cases. Among which 35(7.8%) are males and 8(1.8%) are females. Interstitial pneumonia is seen in 8(1.7%)cases and bronchopneumonia is seen in 12(2.6%). Majority of cases (3.1%) were in the 6th and 7th decade of life.

Emphysematous lesions are seen in 6(1.3%) cases. It was found more commonly in the age >40 years. 5 (1.1%) males affected out of 450 cases and 1(0.2%) females affected out of 450cases.

There were 5 cases of malignant lesions, among which 3(0.6%) cases were in males above 40 years of age. Among malignant lesions, there were 3 case of metastatic carcinoma one is probably of renal origin and another is from metastatic breast carcinoma and one poorly differentiated of unknown origin, 1 cases of poorly differentiated carcinoma and 1 case of leukemic infiltration of lung tissue.

Discussion

The results of this study show that among the pulmonary diseases, most common cases were of tuberculosis, 75(16.7%) out of 450 cases, among which 11 cases (16.7%) are of miliary tuberculosis involving lung, liver, kidney,and spleen. Granulomatous lesions are more common in males than females, occurring more commonly in 2nd and 3rd decade of life (6.4% cases). In our study, 58 male cases (12.9%) and 17 female cases (3.8%) have granulomatous lesions (Figure 1). These findings are comparable to Hjortn et al study and similar results also found in Sanefugi et al study, in which 19% of cases are of miliary tuberculosis among all tuberculosis cases.[11,12]

In our study, cases of pneumonia were 43 (9.6%) cases out of 450.Males (18%) are more commonly affected than females (2%). One case is of fungal pneumonia associated with fungal myocarditis in 70 year old male patient with unknown past history and immunocomprosmised status. (Figure 2).

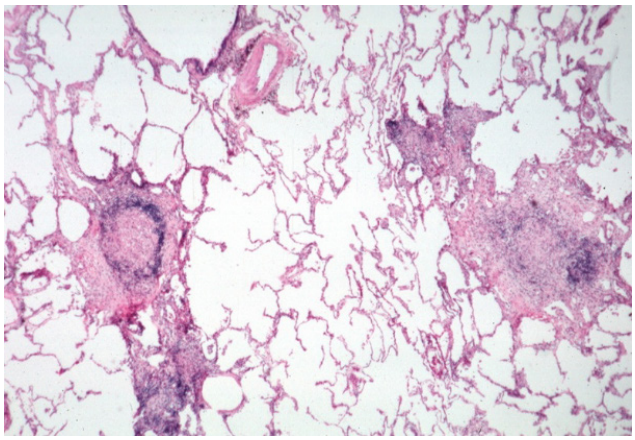

Figure 1: Shows granuloma formation with central area of caseation,

Langhans' giant cell at periphery (tuberculosis, H, and E stain)

In our study, the result showed that there are 6 (1.3%) cases of emphysema out of 450 cases. Emphysema most commonly were affected 5(1.1%) males.

In our study, we found 5(1.1%) cases of malignancy, most commonly occurring in male above the age of 40 years. We found 1 case of leukemic infiltration of lung tissue present in female aged 17 year(figure 3 &4).

In rest of cases, the majority were showing changes of terminal events like interstitial edema, congestion,and changes due to cardiovascular causes e.g. pulmonary embolism. These cases more commonly associated with cardiac pathology e.g. myocardial infarction. In 34 cases, lungs were autolysed and 68 cases showed the morphology of normal lung.

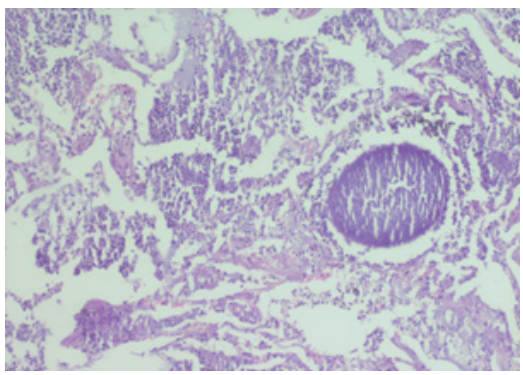

Figure 2: Shows Fungal inflammation involving lung tissue (Fungal pneumonitis,PAS stain)

Figure 3: shows gross feature of Metastatic lung carcinoma.

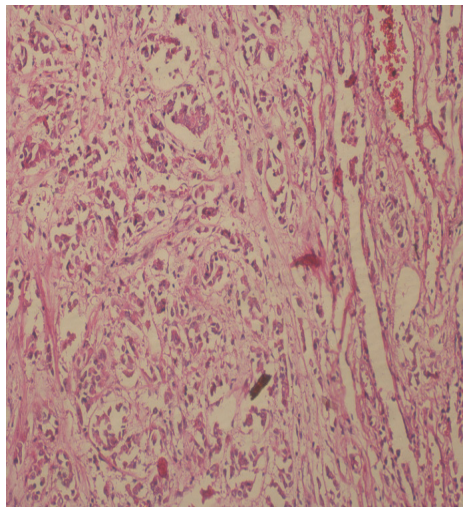

Fig 4:shows malignant cells infiltrating into lung tissue (Metastatic Carcinoma of Lung, H and E stain)

Conclusion

The study shows the incidence of various lung lesions in the autopsy specimens received in a tertiary care hospital in Ahmedabad. Tuberculosis is the most common pathological change observed in this study. Lung lesions are more common in males as compared to females. Such retrospective and prospective studies also provide an insight into the true prevalence of diseases or lesions.

Ethical Clearance- All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For retrospective

studies, formal consent is not required.

Source of Funding- Self

Conflict of Interest – Nil

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