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Research Article

Histopathological study of Lung lesions using Autopsy

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ABSTRACT

An autopsy (also known as a post-mortem examination or necropsy) is the examination of the body of a dead person and is performed primarily to determine the cause of death, to identify or characterize the extent of disease states that the person may have had, or to determine whether a particular medical or surgical treatment has been effective. Autopsies are performed by pathologists, medical doctors who have received specialty training in the diagnosis of diseases by the examination of body fluids and tissues. During this retrospective study, data of 100 autopsy cases from June 2015 to Feb 2017 were collected and assessed. The histomorphological pattern of various Lung lesions were observed and described.

During period from June 2015 to February 2017, total of 150 lungs from autopsy specimens were studied. Lung diseases are more common in males as compared to females. Most common lung pathological findings are of pneumonia (15%), emphysema (10%), tuberculosis (5%) & malignant lesions (2%) among the cases studied.

Autopsy has remained an important complementary tool for identifying and understanding respiratory diseases despite of recent advances in diagnostic technology.

Key words: Lung, Autopsy, Smoking, Histopathological patterns, tuberculosis

INTRODUCTION:

The lungs are ingeniously constructed to carry out their cardinal function: the exchange of gases between inspired air and blood.1 During their functional course, lungs can become vulnerable for a wide range of inflammatory, neoplastic and other lesions, and almost always involved secondarily by terminal events of cardiovascular causes.2 Millions of people all over the world suffer by various chronic respiratory diseases, which can be prevented, if diagnosed timely.3 Most of the time clinical and radiological findings in pulmonary diseases are non specific hence prompt pathology investigations and diagnosis are essential to improve patient's survival and to reduce further morbidity and mortality.4 Autopsy is an important and most

useful way to find out the condition of internal organs, for this a systematic examination of organs was undertaken according to standardised research protocol, to evaluate diseases or injury that may be present and to determine cause and manner of death.5

Lungs are one of the vital organs in body and participate in exchange of gases between inspired air and blood. Millions of people around the world suffer from preventable chronic respiratory diseases, which are based on various factors such as age, sex, socioeconomic status, food habits, lifestyle, locality, associated infections and endemic diseases.

Lungs are common organs involved in various types of inflammation, non-neoplastic, neoplastic, occupational and other diseases. Lungs are secondarily involved in almost all forms of terminal events in cardiovascular diseases and also common site for metastasis.(6-12)

Autopsy as a word means self-study of dead body. It is an important way to find out the condition of internal organs, to evaluate disease or injury that could explain the cause and manner of person's death. Examination of all the three cavities of body including cranium, thorax and abdomen are an essential part of autopsies. In thorax, lungs examination is the most important part of both the medicolegal as well as clinical autopsies. The medicolegal autopsy is carried out by forensic expert to help the law by establishing identity, cause of death, time of death, and ante-mortem or post-mortem nature of crime. The clinical autopsy or pathological autopsy is usually performed by pathologist to establish the cause of death and to study the disease process which led to death.

Autopsy is often followed by histopathological examination of tissues from various organs. In cases where tissue is not properly preserved in fixative or the tissue is a non-representative sample, final histopathological report is often not possible. However, despite pitfalls like delays in carrying out autopsies, improper sampling, improper preservation and transport, microscopic examination of tissues is still considered a very useful method to study the disease process in situ, thus enriching the medical knowledge. Studies have reported a significant major and minor discrepancies between clinical and autopsy diagnoses (13-16)

It is important to determine the leading causes of death in this population to establish correct prophylactic actions, which is the least expensive strategy for preventing further pulmonary dysfunction and avoiding the need for lung biopsies. (17,18)

An autopsy is a medical procedure that consists of a thorough examination performed on a body after death, to evaluate disease or injury that may be present and to determine the cause and manner of a person's death. An autopsy may be required in deaths that may have medical and legal issues.(19)

The Autopsy may reveal diagnosis which may not be suspected clinically or may, in some way, discredit. In addition to ascertain clinico-pathological differences, the development of new understanding of old diseases and provision of opportunity to discover new diseases, should be emphasized. The lungs are involved in various kinds of inflammatory, neoplastic and other lesions, but they are secondarily involved in almost all form of terminal diseases.(20)

The aim of this study was to present the pulmonary histopathological alterations identified in autopsies of patients who died from respiratory diseases, as well as to determine whether underlying diseases and associated comorbidities increase the risk of developing specific histopathological patterns.

MATERIALS AND METHODS:

This is a retrospective study, conducted at pathology department, Tandal hospital, Maharashtra. Retrospective data of total 120

autopsy cases (medicolegal & clinical) were collected from June 2015 to February 2017.
Inclusion Criteria: Lung specimens from cases with irrespective of cause of death were taken.

Study Design: cross – sectional study.
Gross pathologic examination of autopsy lungs gave information regarding status of lung, i.e. collapsed or hyper inflated, congestion, presence of firm to hard areas with tubercles and necrosis, fibrosis, bullae, consolidation, nodules, infarction, secretions, abscess formation and also provides information regarding status of bronchi and pleura (thickening and nodule formation) which provides hint to the diagnosis.
Data Collection Procedure: Autopsy information regarding name, age, address and other significant history were obtained from the record section. All these autopsies were performed by a forensic expert. Tissue bits from lungs were preserved in 10% formalin. All the histological sections were stained with Haematoxylin& Eosin stain and mounted. Ziehl-Neelsen stain and Periodic Acid- Schiff (PAS) stain were also done, wherever required.
They were then examined microscopically and findings were recorded.

RESULTS:
The results obtained are as follows.
The study population ranges from Jun2015 - feb201704 month upto 75 years with 75 male & 25 female cases with M:F ratio was 3:1. The demographic data shown in table no. 1

Table 1. Number of cases according to age group (n=120)

Age group in years	0–18	19–25	26–35	36–45	46–60	61-75
No.of cases	05	05	25	20	25	20
Percentage (%)	5	5	25	20	25	20

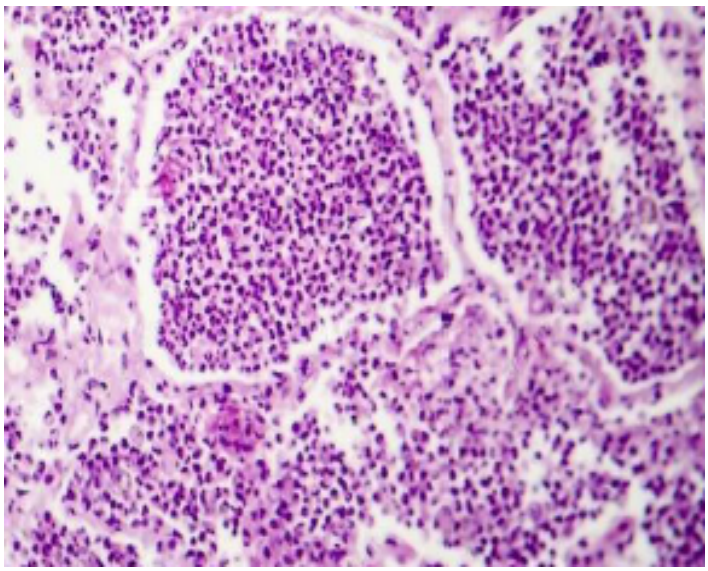

Fig1: abundant acute inflammatory cell infiltrate, focal areas of edema and congestion (pneumonia, H, and E stain)

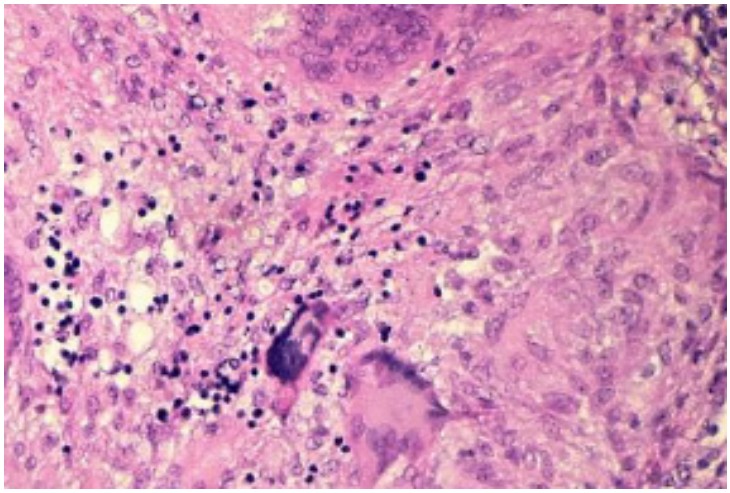

Figure 2: Langhans' giant cell (tuberculosis, H, and E stain)

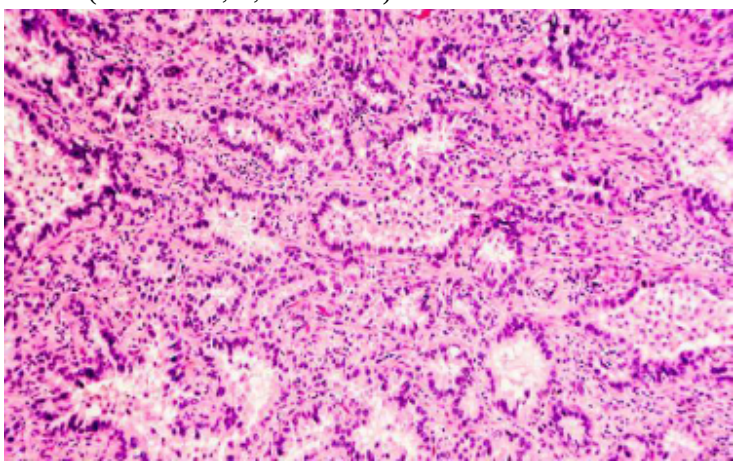

Figure 4: Malignant cells infiltrating into lung tissue (Metastatic Carcinoma of Lung, H and E stain).

Kandy NC et al., quoted that even in the era of high-tech medicine the autopsy remains an important tool for quality assessment of clinical diagnoses.

DISCUSSION:

In our study, the most common histopathological pattern found was the 'Pulmonary edema ' which is similar in result with study by Soeiro AM et al (2011).(17)

Autopsy studies in lungs should be done by taking large sample of cases which will broaden the range of histopathological lesions and give much more accurate estimate of frequency of different types of lesions in lungs.

In the present study, pneumonia was the second most common lung lesion and our findings were comparable to Chauhan et. al and Rupali et.al.**(21-22).** Where pneumonia accounts for 23 % (23/100) cases. The findings of the other workers are Emphysema accounts for 6.7 % (8/120) cases in our study while Tariq M. T. et al (2013) reported emphysema was the commonest histopathological pattern seen in his study, accounting for 40 % (324/810) cases. Emphysema was predominantly seen in male in our study which is fairly correlated with the findings of Tariq M. T. et al (2013).(19)

Smoking cessation improves respiratory symptoms and bronchial hyperresponsiveness, and prevents accelerated decline in lung

function, in all smokers, with or without chronic obstructive pulmonary disease. In chronic obstructive pulmonary disease, the underlying fibrosis and loss of alveolar attachments is probably irreversible, explaining why the forced expiratory volume in one second does not normalise after smoking cessation in these patients.

A total of 100 cases were received during the period of study along with relevant clinical details and autopsy findings. Histopathological examination was carried out in each case. Among these 100 cases, in 2 cases (2%) the tissue was autolysed and in another 40 cases (40%) histopathology was unremarkable.

Tuberculosis of Lung was seen in 2 % (2/100) cases in our study which is similar with Hjortn et al (1995) [11] 01 % (1/100) and Soeiro AM et al (2011)(17) 3.6 % cases. While Tariq M. T. et al (2013) (11,19) reported 19 % (154/810) cases of tuberculosis.

CONCLUSION:

Autopsy study is of great value in improving the vision and diagnostic setup for better clinical assessment. It act as best educational tool to detect discrepancy between clinical and autopsy diagnosis. Despite recent advances in diagnostic technology, the autopsy has remained an important complementary tool for identifying and understanding diseases in ARF patients.

Furthermore illustrative studies are needed to know the complete pathophysiology of each pulmonary disease and it's development in to the respiratory failure.

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