

## Original Research Article

# Pattern of histopathological lesions in lung autopsy

Chandni B. Patel\*, Komal Patel, Vasudha M. Bhagat, Pinkal Shah

Department of Pathology, Government Medical College, Surat, Gujarat, India

**Received:** 07 November 2017

**Accepted:** 08 December 2017

**\*Correspondence:**

Dr. Chandni B. Patel,

E-mail: [dr.chandni.patel86@gmail.com](mailto:dr.chandni.patel86@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** A large number of pathologic conditions involve the lung parenchyma like inflammatory, neoplastic and others. The lungs are also involved in almost all terminal events of cardiovascular disease. Autopsy is an important and most useful way to find out the condition of internal organs and to evaluate any localized lesions or systemic disease and hence determine cause of death. Aims and objectives of study are to identify the histopathological spectrum of lung disease. To find out frequency of various lung pathologies in respect to age and sex.

**Methods:** This study was retrospective and done on 649 cases of medico legal autopsies. The tissue specimens were fixed and processed. Routine paraffin sectioning was done followed by Hematoxyline and eosin (H and E) staining. Special stains were done whenever required. Relevant clinical and postmortem findings, gross and microscopic examination findings were recorded.

**Results:** After thorough histopathological examinations, of total 649 cases, various pulmonary lesions were identified in 348(53.6%) cases while in 301(46.4%) cases no significant pathology was seen. Most commonly affected age group was 30-49 years 43.1% followed by age group of >60years 17.8%. Majority of diseased were male 285 (81.9%). Most common lung pathology found was Edema and congestion in 93 cases (26.72%), chronic venous congestion in 92 cases (26.44%) pneumonia in 65 cases (18.68%) followed by Tuberculosis/Tuberculous pneumonia in 29 cases (8.3%).

**Conclusions:** In our population, the present study reveals that infectious disease are still the most common cause of mortality, despite recent advances in diagnostic technology, the autopsy has remained an important complementary tool for identifying and understanding pathology of disease.

**Keywords:** Edema and congestion, Histomorphological pattern, Lung pathology in autopsy, Pneumonia, Tuberculosis

### INTRODUCTION

Lung disorders have varied and complex presentations. As a result, despite availability of modern advanced diagnostic methods, diagnosis is often challenging task for clinicians. Sometimes rapid progression of the disease leaves lesser time for thorough diagnostic workup and invasive procedures. Therefore, it is a crucial to determine the leading cause of death in order to adopt correct prophylactic actions for prevention of pulmonary

dysfunctions. In that matter histopathological examination of lung autopsy is of great value. Even if the cause of death is established ante mortem, performing clinical autopsy help to study process in situ and enriches medical knowledge.<sup>1</sup> The lungs are vulnerable for a wide range of inflammatory, infectious, neoplastic and other pathologic conditions and almost always involved secondarily by terminal events of cardiovascular disease.<sup>2,3</sup> Pathologic examination of lung specimen give valuable information such as lung collapse or hyperinflation, stage and distribution of fibrosis, abscess/

bullae, consolidation, infarction, congestion/edema, granuloma/necrosis, nodular lesions, status of bronchi, hilar nodes and pleura which may provide hint to the diagnosis.<sup>4,5</sup>

**METHODS**

This is a retrospective study done in the department of pathology of government medical college over a period of 1 year from January 2015 to January 2016. The study was conducted on lung specimens of 649 routine autopsies. All the autopsy subjects irrespective of age, sex and cause of death were included in the study. Patient information regarding age, sex, brief history of illness, any medical/clinical findings/investigations, and in situ postmortem findings were obtained from the request form. All specimens were adequately fixed in 10% formalin. Gross examination of lungs included size, weight, color, consistency, presence of consolidation, nodule, bullae, abscess, necrosis/infarction, fibrosis/scarring, congestion, edema, secretion, status of bronchi and pleura were recorded. Sections from

representative areas were taken. After routine processing and paraffin embedding, section was cut and stained with H and E stain according to standard procedure. Special stains were used whenever required. All the histological sections were examined microscopically, and findings were noted. Pathological findings of other organ specimens were also recorded, and relevant findings were correlated for systemic involvement.

**RESULTS**

In the present study a total of 649 specimens of lungs were studied during a period of January 2015 to January 2016. After thorough histopathological examinations various pathological lesions identified in 348 (53.6%) cases while in 301 (46.4%) cases no significant pathology was identified.

Maximum numbers of cases, in age group of 30-39 years were 76 cases (21.84%) followed by in age group 40-49 years were 74 cases (21.26%). followed by age group of > 60years 17.8% (Table 1).

**Table 1: Age wise distribution of pulmonary lesions.**

Histopathological findings	0-9 years	10-19	20-29	30-39	40-49	50-59	>60	Total
Chronic venous congestion(CVC)		1	7	12	27	24	21	92
Edema	2	9	15	29	15	11	12	93
Pneumonia	11	3	5	13	8	12	13	65
Tuberculous pneumonia		1	1		2		1	5
Pulmonary Tuberculosis	1		5	6	9		3	24
Granulomatous lesion				1	2	2	1	6
Hemorrhage	3		2	5	2	1	2	15
Hemorrhage and edema		1	2	3	2	1	5	14
Emphysematous changes	0	0	1	3	6	2	3	15
<b>Neoplastic</b>								
Metastatic Mucinous adenocarcinoma in hilar lymph node						1		1
b. Infiltration by acute leukemia				1				1
<b>Others</b>								
Presence of Foreign body	1		2	1	1			5
Bronchiolitis		1				2		3
Diffuse alveolar damage	1		1	1				3
Pulmonary thromboembolism			1					1
Meconium aspiration	2							2
Microfilariasis				1		1		2
Asthma							1	1
<b>Total</b>	<b>20</b>	<b>16</b>	<b>43</b>	<b>76</b>	<b>74</b>	<b>57</b>	<b>62</b>	<b>348</b>

Out of total 348 cases, 285 cases (81.9%) were males and 63 cases (18.1%) were females. The male to female ratio was 4.5:1. (Table 2).

Out of total 348 cases congestion and edema were the most common findings seen in 93(26.72%) cases.

Pneumonia was found in 65 (18.68%) out of 348 cases. Among which 45 cases (69.2%) were males and 20 cases (30.8%) were females.

Majority of cases were in 30-39 years age group and more than 60 years of age group 26 cases (40%).

Tuberculosis was the next most common observed pathology seen in 24 (6.9%) out of 348 cases.

Among these 19 cases (79.2%) were males and 5 cases (20.8%) were females. The most common age group

affected was 40-49 years 9 cases (37.5%). Among the 24 cases of tuberculosis of lung, systemic involvement or milliary lesions were noted in other organs like liver and spleen in 7 cases (29.2%). Tuberculous pneumonia was found in 5(1.44%) cases.

**Table 2: Sex wise distribution of pulmonary lesions (n=348).**

Histopathological diagnosis	Male	Female	Total Number of cases (%)
Congestion and Edema	75	18	93(26.72%)
Chronic venous congestion (CVC)	87	5	92(26.44%)
Pneumonia	45	20	65(18.68%)
Tuberculous pneumonia	3	2	5(1.44%)
Pulmonary Tuberculosis	19	5	24(6.9%)
Granulomatous lesion	6	0	6(1.72%)
Hemorrhage	11	4	15(4.31%)
Hemorrhage and edema	12	2	14(4.02%)
Emphysematous changes	12	3	15(4.31%)
<b>Neoplastic</b>			
Metastatic Mucinous adenocarcinoma in hilar lymphnode	1	0	1(0.29%)
Infiltration by leukemia	0	1	1(0.29%)
<b>Others</b>			
Presence of Foreign body	5	0	5(1.44%)
Bronchiolitis	1	2	3(0.86%)
Diffuse alveolar damage	4	0	3(0.86%)
Pulmonary thromboembolism	1	0	1(0.29%)
Meconium aspiration	1	1	2(0.57%)
Microfilariasis	2	0	2(0.57%)
Asthma	1	0	1(0.29%)
<b>Total</b>	<b>285(81.9%)</b>	<b>63(18.1%)</b>	<b>348(100%)</b>

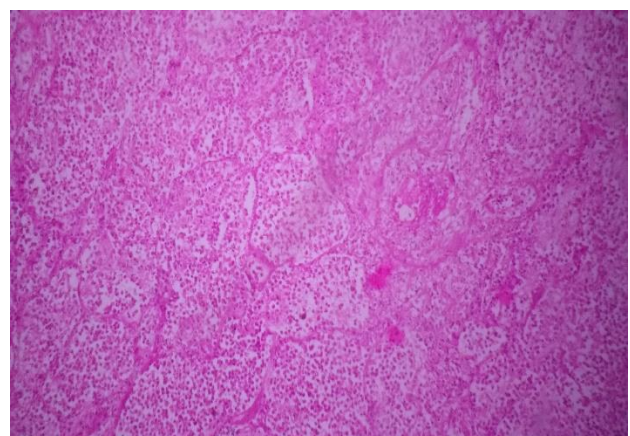
**Table 3: Concomitant lesions observed in lungs.**

Histopathological diagnosis	Number of cases
Pneumonia with diffuse alveolar damage	7
Pneumonia with lung abscess	1
Pneumonia with bronchiolitis	2
Tuberculous pneumonia	5
Pulmonary Tuberculosis with pneumoconiosis	1
Pulmonary thromboembolism with diffuse alveolar damage	1
<b>Total</b>	<b>16</b>

Granulomatous lesion was found in 6(1.72%) cases. Out of total 6 cases 1 case showed non caseating granuloma with presence of multiple asteroid bodies so diagnosis of sarcoidosis was offered. In another 5 cases diagnosis of granulomatous lesion probably tuberculosis was offered.

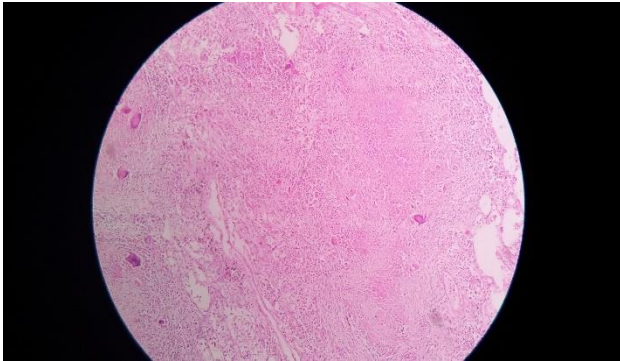
The cause of death was due to extra pulmonary pathology, but the lungs were showing associated findings like chronic venous congestion in 92 cases (26.44%). Remaining cases of primary lung pathology

were of diffuse alveolar damage, emphysematous changes, pulmonary hemorrhage, malignant lesions, infiltration by acute leukemia, and presence of foreign body, bronchiolitis, pulmonary thromboembolism, asthma, asbestosis meconium aspiration and microfilariasis.

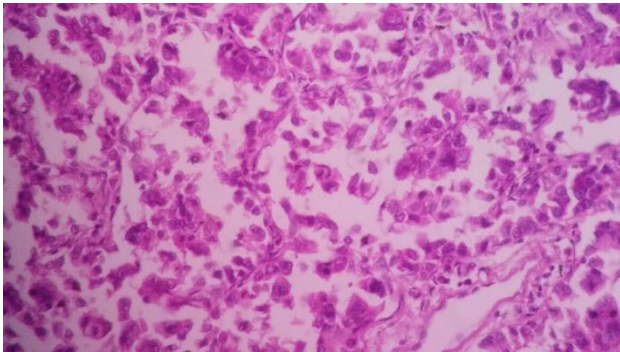


**Figure 1: Shows abundant acute inflammatory infiltrate, focal areas of edema and congestion (pneumonia, H and E X 100).**

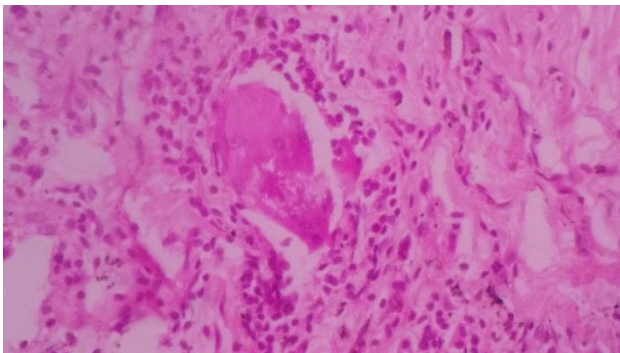
2 cases of malignant lesion were identified among which 1 (0.29%) case of metastatic mucinous adenocarcinoma in hilar lymphnode and other was of infiltration by acute leukemia.



**Figure 2: Shows granuloma formation, areas of caseous necrosis and Langhan's giant cell (tuberculosis, H and E X 10).**



**Figure 3: Shows tumor cells arranged in acinar pattern. (adenocarcinoma, H and E X 40).**



**Figure 4: Shows multinucleated giant cell containing asteroid body (sarcoidosis x 100).**

## DISCUSSION

In present study, age wise distribution of pulmonary disease showed the maximum number of cases in 30-49 age group (43.1%) which is comparable to study done by Chauhan G et al (35.8%) and Tahir TM et al (56.3%) followed by age group of >60 years age group

62(17.8%), which is comparable with study done by Chauhan G et al (23.9%).<sup>3,4</sup>

In our study male (81.9%) were more commonly affected than female which was comparable with study done by Bal MS et al, Amin NS et al and Sweta et al which showed 80%, 79.5% and 88% of male respectively.<sup>6-8</sup>

Pneumonia was found in 65(18.68%) cases which was comparable with study of Chauhan G et al, Amin NS et al and Kurawar et al who found 14.62%, 20% and 19.16% of cases respectively, however Mangal K et al and Tahir TM et al have lesser number of cases 7.99%, 4% respectively and Udayashankar SK et al found higher number of cases 31.81%.<sup>4,7,9,2,1</sup> This difference may be due to difference in study population or geographic variation and environmental factors.

In Children up to 9, years most common pulmonary lesions were pneumonia (11/20). In age group of >50 years age group of maximum number of cases were also of pneumonia. This is due to high vulnerability of this age group to infectious disease due to low immunity.

In present study there were 24(6.9%) cases of pulmonary tuberculosis and 7 cases (29.2%) showed millitary tuberculosis involving lung, liver and spleen. These findings are comparable with the study of Bal MS et al (8.7%), Chauhan G et al (6.26%) and Garg M et al (8.7%).<sup>6,4,10</sup>

2(0.58%) cases of malignant lesion were identified among which 1 case was of metastatic mucinous adenocarcinoma in hilar lymph node and another was of infiltration by acute leukemia, which is comparable with study done by Mangal K et al Chauhan G et al Bal MS et al and Amin NS et al which showed 0.41%, 2.08%, 2% and 1.7% malignant lesions respectively.<sup>2,3,5,6</sup>

Emphysematous changes were seen in 15(4.31%) cases in present study which is consistent with Chauhan G et al, Amin NS et al and Khare P et al 7.76%, 6.6% and 8.75% cases respectively.<sup>3,6,11</sup>

Among the extra pulmonary cause of death in which lung showed associated findings were most commonly of edema, congestion, CVC in 53.16% cases in our study. This is comparable to study done by Udayashankar SK et al Chauhan G et al and Bal MS et al which showed 54.54%, 54.32% and 58% cases respectively.<sup>1,3,5</sup>

## CONCLUSION

Pneumonia and pulmonary tuberculosis are most common observed pathology in our set up which suggest infectious disease are still remaining to be the common cause of mortality. Public awareness of these disease, timely diagnosis and proper treatment are valuable for reducing preventable cause of death.

Pathological examination of autopsy organ is important diagnostic tool to know the spectrum of various disease, to understand disease process or pathogenesis, to assess various morphological pattern of same disease and provide opportunity to discover new disease.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

## REFERENCES

1. Udayashankar SK, Shashikala P, Kavita GU, Pruthvi D. Histomorphological pattern of lung in medicolegal autopsies. *Internat J Sci Res.* 2015;4(7):1937-9.
2. Mangal K, Dhakar P, Yadav A, Gupta K, Gandhi S. Magnitude of pulmonary disease-incidentally diagnosed on autopsy- at largest hospital and medical college of Rajasthan. *Int J Cur Res Rev.* 2016;8(8):37-43.
3. Selvambigai G, Amudhavalli S, Chakravarthi DCD, Ravi S. Histopathological study of lung in autopsy cases: a prospective study. *Int J Res Med Sci.* 2016;4(11):4816-9.
4. Chauhan G, Agrwal M, Thakkar N, Parghi B. Spectrum of histopathological lesion in lung autopsy. *J Res Medic Dental Sci.* 2015;3(2):109-12.
5. Tahir TM, Rehmna F, Anwar S, Kamal F. Pattern of pulmonary morphological lesions seen at autopsy. *Biomedica.* 2013;29:64-8.
6. Bal MS, Sethi PS, Suri AK, Bodal VK, Kaur G. Histopathological pattern in lung autopsies. *JPAFMAT.* 2008;8(2):29-31.
7. Amin NS, Shah PY, Patel RG, Khant VS, Prajapati SG. Histopathological alterations in lung tissue received as autopsy specimens- a study of 410 cases. *Int J Med Sci Public Health.* 2017;6(2):327-330.
8. Shweta, Mahajan D, Mahajan V, Angmo P. Histopathological pattern in lung autopsy in government medical college Jammu. *J Evolut Medic Dent Sci.* 2015;4(91):15694-6.
9. Kurawar RR, Vasaikar MS. Spectrum of Histomorphological Changes in Lungs at Autopsy: A 5 Year Study. *Annals of Pathol Laborat Medic.* 2017;4(1):A106-A112.
10. Garg M, Aggarwal AD, Singh S, Kataria SP. Tuberculous lesions at autopsy. *J Indian Acad Forensic Med.* 2011;33(2):116-9.
11. Khare P, Gupta R, Ahuja M, Khare N, Agarwal S, Bansal D. Prevalence of Lung Lesions at Autopsy: A Histopathological Study. *J Clinic Diagnostic Res.* 2017;11(5):EC13-6.

**Cite this article as:** Patel CB, Patel K, Bhagat VM, Shah P. Pattern of histopathological lesions in lung autopsy. *Int J Res Med Sci* 2018;6:279-83.