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Histopathological Evaluation of Medicolegal Autopsy Lung Specimens - A Cross Sectional Study

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Abstract

Background: Medicolegal dissections are an obligatory lawful necessity in unnatural deaths. The facilities for medicolegal autopsies are available across all districts of our country. The autopsy, whenever joined with histopathological assessment and clinical correlation always have a great value. Usual tissues that we receive for evaluating histopathologies are from lung, heart, spleen, kidneys, liver and adrenals. Histopathological evaluation of lung specimens is being conducted in our study. This study explains different types of lung lesions exists in autopsy lung specimens.

Objective: To analyze different types of lung lesions in autopsy lung specimens.

Method: This study was conducted at Govt. medical college Palakkad. In this cross-sectional study; we collected data of 63 autopsy cases from August 2022 to July 2023. Relevant autopsy data was collected in each case, and assessed, with special reference to lung morphology. The tissue specimens were fixed in formalin and were processed. Paraffin embedding was done followed by Haematoxylin and Eosin staining. Special staining was performed wherever necessary. The lung sections were subjected to examination by consultant pathologists.

Results: In one year, 63 cases of lung specimens were studied. Lung pathologies were common among males compared to females. Most common cases we came across were pulmonary oedema, pneumonia, and chronic venous congestion. Most number of pathologies were observed in the age group of 0- 9 years. We came across 2 cases of pulmonary tuberculosis and one case of metastasis.

Conclusion: Even in the time of innovative medicine, autopsy stays as a significant device in quality appraisal of clinical findings.

Keywords: Autopsy Lung, Pneumonia, Chronic venous congestion

Methodology

The study was conducted at the Department of Pathology, GMC Palakkad. A total of 63 autopsy cases were included in the study, without regard to age or sex. Gross examinations were conducted, and adequate

sampling was performed from areas showing morphological abnormalities.

The sections were fixed in 10% formalin and subjected to processing.The samples were processed, paraffin embedded and microtomed, and the resulting sections were stained using the H&E stain. Special stains were applied as needed in specific cases. The microscopic findings were charted and then statistically evaluated using IBM SPSS version 20. Subsequently, categorical variables were analyzed, and percentage distributions and age specific distributions were calculated. The findings were organized in tabular form, and a frequency analysis along with percentage calculations for each case was conducted. The most prevalent finding was pulmonary oedema.

Results

Among 63 cases we studied we encountered with 20 (31.7%) cases of pulmonary oedema(Table 1),11 cases of pneumonia (17.46%),10 cases of interstitial inflammation (15.87%), followed by 8 cases of venous congestion (12.7%), 2 cases of pulmonary tuberculosis, and one each case of sepsis, metastasis, bullae and alveolar hemorrhage. Came across 6 cases of aspiration pneumonia. Males (42 cases) were having a greater number of lung lesions than females (21 cases) (Table 2). Congestion was observed in all age groups equally. Pulmonary oedema, a greater number of cases were observed in the age group of 30-39yrs.

Most lung lesions were seen in children less than 9 years of age group (Table 3), among those less than 2 years children had more cases. The age group of 20-29 years had the next number of cases.

Table 1: Total cases and percentage

Cases	Number	%
Aspiration Pneumonia	6	9.52%
Bullae	1	1.59%
Congestion	8	12.7%
Hemorrhage	1	1.59%
Interstitial Hemorrhage	1	1.59%
Interstitial Inflammation	10	15.87%
Metastasis	1	1.59%
Oedema Interstitial	1	1.58%
Sepsis	1	1.58%
Tuberculosis	2	3.17%
Pul Oedema	20	31.7%
Pneumonia	11	17.46%
Total	63	100 %

Table 2: Sex Ratio of cases

Sex	No. Of Patients	Percentage
Female	21	33.3
Male	42	66.7
Total	63	100.0

Table 3

Cases	< 2 Years Age
Aspiration	6
Congestion	2
Cvc	1
Interstitial Inflammation	4
Interstitial Pneumonia	1
Pneumonia	4
Pul Oedema	6
Meconium Aspiration	1

Table 4

	0-9 Years	10-19	20 - 29	30 - 39	40 - 49	50 - 59	≥ 60 Years	Total
Aspiration pneumonia	6							6
Bullae						1		1
Congestion	4		1		2		1	8
Hemorrhage			1					1
Interstitial Hemorrhage			1					1
Interstitial Inflammation	7		2	1				10
Mets						1		1
Oedema Interstitial			1				1	2
Pneumonia	6	1	1	1	2			**11**
Ptb						1	1	2
Pul Oedema	7	2	3	4	2	2		20
Meconium Aspiration	1							1

Discussion

Pulmonary oedema (Fig. 1) emerged as the predominant observation among the 63 cases we gathered. The subsequent frequent observation was the presence of pneumonia(Fig 4,5). Among children under the age of 2, the prevailing occurrence was aspiration pneumonia,(Fig 2) with interstitial inflammation being a common subsequent finding. We encountered two instances of pulmonary tuberculosis(Fig. 6) and one case of metastasis. There was a single case of sepsis. Additionally, a single case of emphysematous change was also observed.

Among the cases we encountered, the most frequent finding was pulmonary oedema(Fig I), which aligns with the findings reported in studies conducted by Hanmante R D et al[4], Uday Shankar et al[5], Soeiro AM et al[6], and Yasmin Et al[7].

Similar observations were also made by many authors in their study series [Selvam, Pathak][8,9]. This can either be due to post death related change or end result of cardiovascular pathology.

A male preponderance was observed in all the cases. Male cases accounted for 66.7% of the total, while female cases represented 33.3%(Table 2).

Among the infectious diseases, pneumonia (Fig 4,5) ranked at the top, constituting 17.4% of the cases, which corresponds to the results reported by Uday Shankar et al and Yasmin Et al[5,7].

Incidence of chronic venous congestion was 4.7%(Fig 3), these findings are close to findings of Shweta et al.[11] and Yasmin et al[7]. Pneumonic changes were discordant with gross findings in the case of bronchopneumonia, which was similar to the study of Kandy NC et al[12] . Similar observations were noted in study by Hunt CR et al[10].

Tuberculosis is a treatable condition; however, its fatality is often linked to its association with cases of HIV infection. In their study, Prateek Rastogi et al.[13] identified tuberculosis as the primary and most significant cause of sudden unexpected death related to the respiratory system. Tuberculosis of the lung was seen in 3.1% cases in our study which is similar with Selvam et al [8] Soeiro AM et al[14] and Bal MS et al [15]and Hjortn et al (1995). We could observe caseous necrosis with epitheloid cell collection and Langhans Giant cells. Which was confirmed by AFB or ZN staining[16].

Aspiration as well as aspiration pneumonia can lead to choking. 6 cases of aspiration pneumonia were found in less than two years of age infants. Its common among new born babies(Table 3).

Meconium aspiration was found in one case. It was also common in children of less than years of age group.

Diffuse lung changes were common according to Jane Et als [17]study. Which was also common in our study .

There were interstitial changes also seen commonly in children less than 2 years (Table 3).

In case of sepsis there were pneumonia-like changes along with bacterial colonization within vasculature and within alveoli.

Bullae was observed in one condition, which may be associated with chronic obstructive pulmonary diseases.

What we found difficult in our study is that, we couldn't obtain whole lung specimens and couldn't get exact history in those cases

Figure 1: Pulmonary oedema ,400x

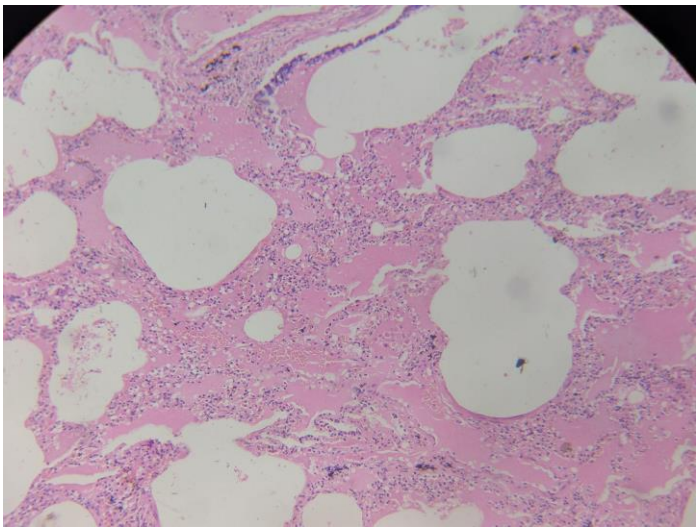

Figure 2: Aspiration pneumonia 400x

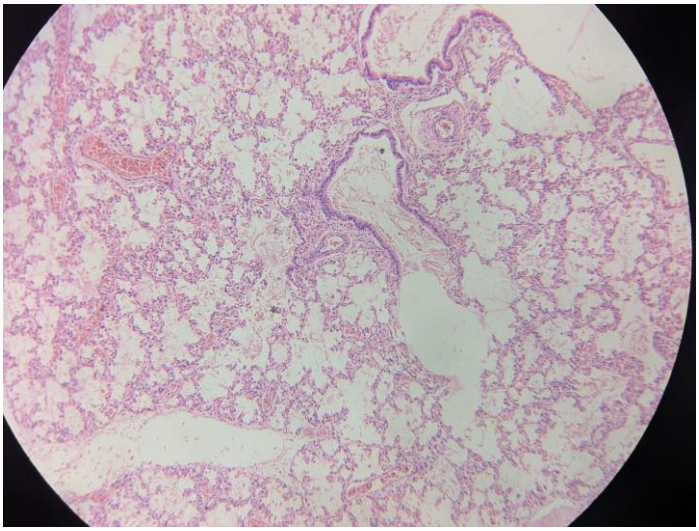

Figure 3: Chronic venous congestion, 1000x

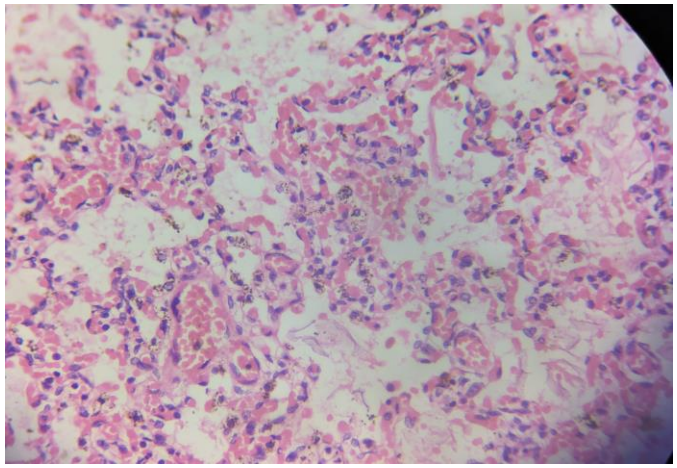

Figure 4: Pneumonia ,Gross

Figure 5: Pneumonia, Low power 1000x

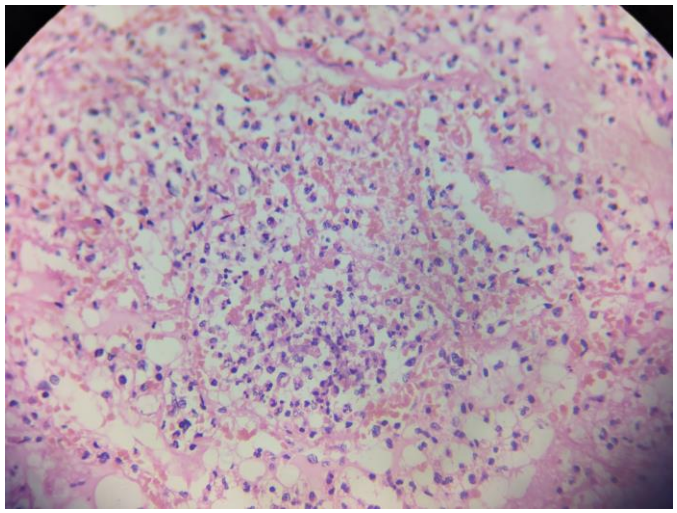

Figure 6: Cavity Lung, TB

Conclusion

Autopsy study is of great importance in validating clinical diagnosis. Autopsy exists as a crucial adjunctive method for the identification and comprehension of respiratory diseases. Despite recent advancement of technology and methods it still serves as a reassuring and educative tool in identifying and establishing the underlying cause of death.

Present study showed more pulmonary oedema cases followed by pneumonia which may be directly or indirectly related to the cause of death. The difficulty we encountered was non receival of the entire lung specimen.

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