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*Original Research Article*

# Incidental Findings on Autopsy Unrelated to the Cause of Death

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**Abstract**

*Introduction:* Autopsy plays a crucial role in arriving at the cause of death. At the same time it also unravels a multitude of findings which would not have clinically manifested. This study throws light on many such findings which would have otherwise gone unnoticed.

*Aim:* This study aims at determining the spectrum of histopathological findings including inflammatory, non neoplastic and neoplastic lesions which were found incidentally and were unrelated to the cause of death with special emphasis on interesting lesions.

*Materials and Method:* A retrospective study of medicolegal autopsies for three years i.e., from January 2017 to December 2019, was undertaken in a tertiary care centre to determine the spectrum of histopathological findings unrelated to the cause of death.

*Statistical Analysis:* Individual lesions were expressed in numbers and incidence in percentage along with the cause of death.

*Results:* The study consisted of a series of 288 autopsy cases out of which 116 cases had some incidental finding unrelated to the cause of death. Atherosclerosis was the most common incidental finding (67 cases, 57.75%) followed by fatty liver (41 cases, 35.34%).Neoplastic lesions accounted for 6.9% of all cases.

*Conclusion*: This study has elucidated common incidental findings on autopsy reflecting their prevalence in general population along with afew neoplastic lesions that were discovered incidentally like psammomatous meningioma, leiomyoma of kidney and serous cystadenofibroma of ovary.

**Keywords:** Medicolegal autopsies; Incidental finding; Atherosclerosis; Fatty liver.

## Introduction

The term autopsy is derived from a Greek word which means " to see for oneself ".[1] Apart from elucidating the cause of death, autopsy also plays an important role in exploring a variety of lesions and spectrum of disease processes which may not manifest clinically and thus escape routine histopathological examination. By studying such incidental findings on autopsy we can assess their prevalence in general population and it can also be of great value for academic purposes. This study highlights many such incidental findings unrelated to the cause of death which can be a learning tool

for pathologists. These findings also reflect the disease burden in the population and can be used for statistical purposes.[2]

## Materials and Methods

A retrospective descriptive study of medicolegal autopsies for three years from January 2017 to December 2019 was conducted in the Department of Pathology, Karnataka Institute of Medical Sciences, Hubballi. A total number of 288 cases were received for histopathological examination. The organs relevant to the case concerned were received in 10% formalin. In most of the cases they comprised of heart, liver, spleen, kidneys, brain and lungs. Representative bits from the concerned organs were processed by routine paraffin embedding and were stained with Haematoxylin and Eosin (H and E) stain. Gross and histopathologic findings were noted and the salient features were studied.

## Results

This study comprised of 288 autopsy cases which were received in the Department of Pathology, Karnataka Institute of Medical Sciences, Hubballi. Out of 288 cases, 116 cases showed an incidental finding unrelated to the cause of death. Among these 116 cases, there were 17 cases of road traffic accident, 15 cases of electrocution, 25 cases of snake bite and 59 cases of sudden death (attributable to different causes like coronary artery disease, pneumonia, hypertrophic obstructive cardiomyopathy, pericarditis, pulmonary embolism, septicaemia, aneurysm, intracranial haemorrhage., etc). There were 92 males and 24 females in this study (Table 1). Age ranged from 7 years to 75 years. The most common age group in this study was 51 to 60 years, followed by 31 to 40 years (Table 2).

**Table 1:** Sex Distribution.

| | |
|---|---|
| Males | 92 |
| Females | 24 |
| Total | 116 |

**Table 2:** Age Distribution.

| | |
|---|---|
| 0 – 10 | 01 |
| 11-20 | 03 |
| 21-30 | 24 |
| 31-40 | 25 |
| 41-50 | 19 |
| 51-60 | 27 |
| 61-70 | 14 |
| 71-80 | 03 |
| Total | 116 |

The most common incidental lesion in this study unrelated to the cause of death was atherosclerosis of aorta and coronary blood vessels (67 cases, 57.75%) followed by fatty liver (41 cases, 35.35%). Intrahepatic bile duct stasis was seen in 9 cases (7.76%) (Table 3).

**Table 3:** Distribution of Incidental Findings With Respect to Cause of Death.

| Incidental finding | No.of cases | RTA | Elec | Snake bite | Pn | CAD | Sept | HOCM | TB | Per | PE | C Hge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ath | 67 | 10 | 13 | 19 | 18 | – | 05 | – | – | – | 02 | – |
| Fatty liv | 41 | 05 | 03 | 05 | 12 | 11 | 02 | 01 | 01 | 01 | – | – |
| IHBS | 09 | 03 | 01 | 02 | 01 | 02 | – | – | – | – | – | – |
| Cirr | 05 | 02 | – | 01 | – | 01 | – | – | – | – | – | 01 |
| SRC | 05 | 01 | – | – | 01 | 02 | – | 01 | – | – | – | – |
| CPN | 07 | 02 | – | 03 | – | 02 | – | – | – | – | – | – |
| TB | 04 | 01 | 01 | – | – | 02 | – | – | – | – | – | – |
| P men | 01 | 01 | – | – | – | – | – | – | – | – | – | – |
| CGN | 01 | – | 01 | – | – | – | – | – | – | – | – | – |
| LVH | 06 | – | – | 03 | 01 | – | 02 | – | – | – | – | – |
| LM | 01 | – | – | – | 01 | – | – | – | – | – | – | – |
| SCA | 01 | 01 | – | – | – | – | – | – | – | – | – | – |

RTA – Road traffic accident; Elec – Electrocution; Pn – pneumonia; Sept – Septecemia; CAD – coronary artery disease; HOCM – Hypertrophic obstructive cardiomyopathy; TB – Tuberculosis; Per – pericarditis; PE – pulmonary embolism; C Hge – cerebral haemorrhage; Ath – atherosclerosis; Fatty liv – Fatty liver; IHBS – Intrahepatic bile stasis; Cirr – cirrhosis; SRC – simple renal cyst; CPN – chronic pyelonephritis; P men – psammomatous meningioma; CGN – chronic glomerulonephritis; LVH – ventricular hypertrophy; LM – leiomyoma; SCA –serous cystadenofibroma

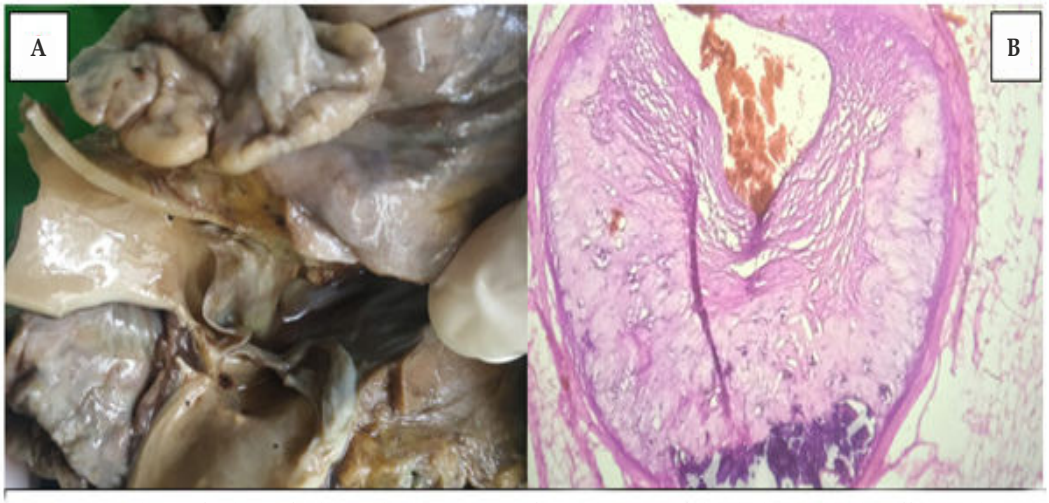


**Fig. 1 (A):** Incidental finding of atherosclerotic plaque of aorta in case of death due to road traffic accident

**Fig. 1 (B):** Microscopic picture of the same showing cholesterol clefts and areas of calcification (10xHematoxylin and Eosin)

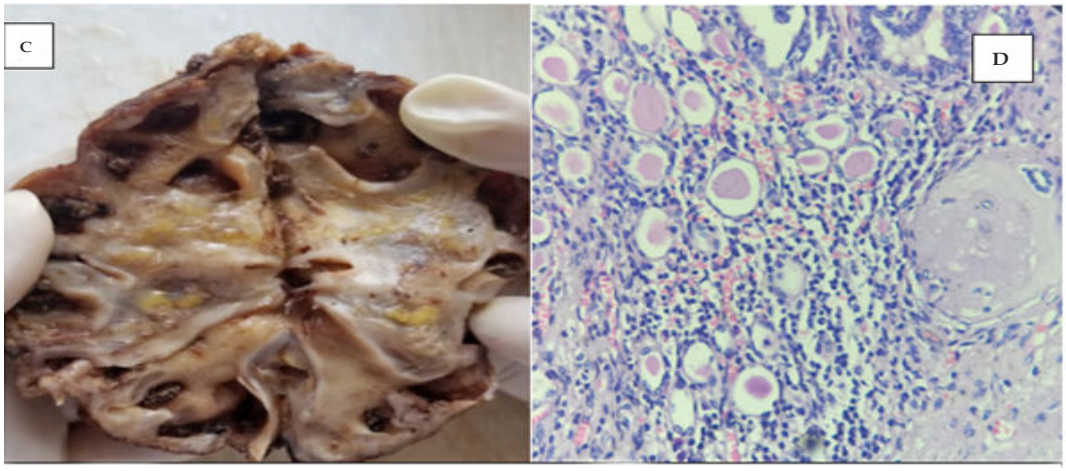


**Fig. 2 (C):** Incidental finding of chronic pyelonephritis in a case of death due to snake bite showing dilated pelvicalyceal system.

**Fig. 2 (D):** Microscopic picture of the same showing thyroidization of renal tubules, dense chronic infiltrate and glomeruloselerosis (40x Hematoxylin and Eosin)

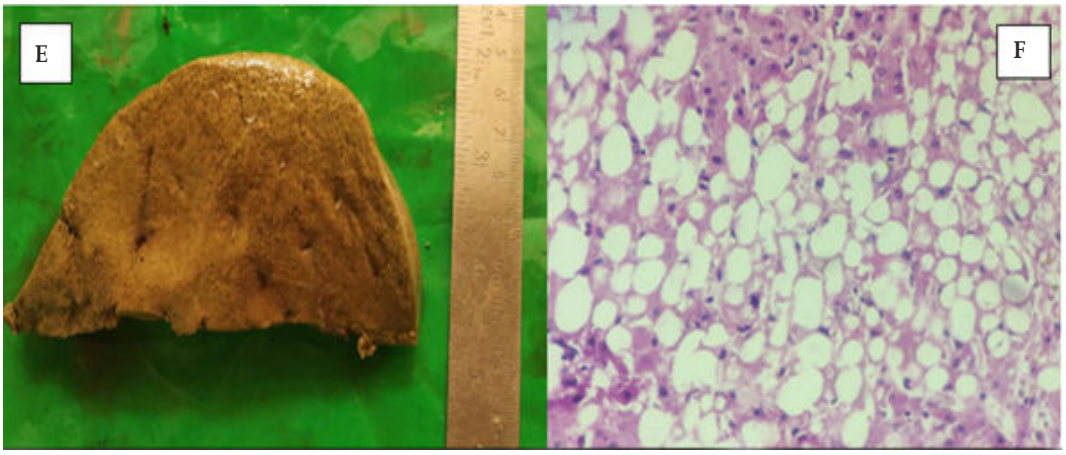


**Fig. 3 (E):** Incidental finding of fatty liver in a case of death due to electrocution showing yellowish discoloration of liver.

**Fig. 3 (F):** Microscopic picture of the same showing fatty change of the hepatocytes (40xHematoxylin and Eosin).

*Incidental Findings in Heart*

The gross findings in cases detected with atherosclerosis of aorta and coronary blood vessels ranged from fatty dots, fatty streaks, atheromas and in some cases fibrocalcific plaque. Corresponding microscopic changes were seen with variable number of lipid laden macrophages, foam cells, necrotic debris seen below the fibrous cap and calcification in some cases (Fig. 1).

Left ventricular hypertrophy was found incidentally in 6 cases, out of which 3 died due to snake bite, 1 due to pneumonia and 2 due to septicemia. Left ventricular wall thickness in all these cases was more than 1.5 cm and on microscopy the myoctes were hypertrophied with abundant eosinophilic cytoplasm and box shaped nucleus.

*Incidental Findings in Liver*

Fatty livers were enlarged or of normal size with yellow greasy external and cut surfaces. Microscopically, hepatocytes showed fatty change with few of them showing periportal inflammatory cell infiltrate (Fig. 3).

Liver cirrhosis was discovered in 2 cases of road traffic accident and 1 case each in death due to snake bite, cerebral haemorrhage and coronary artery disease. Grossly these cases had shrunken liver with nodular external surface with yellow cut surface. On microscopy, there was distortion of the architecture, bridging fibrosis and regenerating nodules.

*Incidental Findings in Kidney*

Incidental renal lesions comprised of chronic pyelonephritis (7 cases, 6.03%), simple renal cysts (5 cases, 4.31%), leiomyoma (1 case, 0.86%) and chronic glomerulonephritis (1 case, 0.86%). In cases diagnosed with chronic pyelonephritis, kidneys were grossly shrunken to variable degrees with dilated pelvicalyceal system and thinning of cortex. Microscopically, there was thyroidization of renal tubules, variable degrees of fibrosis, inflammatory cell infiltrate and arteriolosclerosis (Fig. 2).

Cases diagnosed with simple renal cysts showed thin walled cortical cysts which drained serous fluid on cut surface. On microscopy, cyst wall was lined by flattened or cuboidal epithelium with cyst wall composed of fibrocollagenous tissue.

One case of chronic glomerulonephritis was discovered in a 28 years old female who died due to snake bite. Grossly, the kidneys were symmetrically contracted with granular surface and on microscopy there was focal glomerulosclerosis, interstitial fibrosis and lymphocytic infiltration.

One case of leiomyoma of kidney was found in a 30 years old male who died due to lobar pneumonia. Grossly, it was a well circumscribed lesion with grey white whorled areas on cut surface and on microscopy, it showed benign spindle cells arranged in fascicles.

*Incidental Findings in Lungs*

There were 4 cases of pulmonary tuberculosis that were discovered in 2 cases of death due to coronary artery disease, 1 case of road traffic accident and 1 case of electrocution. All these cases showed a cavitatory lesion of lung which on microscopy showed caseous necrosis, epithelioid cell granulomas and Langhan type of giant cells.

*Incidental Finding in Brain*

There was one case in which a 70 years old female died in a road traffic accident and on autopsy psammomatous meningioma was discovered incidentally. Grossly, it was a well circumscribed tumor attached to the duramater and on microscopy, there were syncytial nests of meningothelial cells with psammoma bodies.

*Incidental Finding in Ovary*

There was one case of serous cystadenofibroma discovered in a 45 years old female who died in a road traffic accident. Grossly, the cyst was 5 cm in diameter, uniloculated with fibrotic thickened wall. Microscopically, cyst wall was lined by squamous epithelium with plenty of fibroblasts and fibrocollagenous stroma in the wall.

## Discussion

*Incidental Findings In Heart*

The most common incidental finding in this study was atherosclerosis of aorta and coronary arteries seen in 67 cases (57.75%). Patel S et al also found atherosclerosis as the most common incidental finding in their study of incidental lesions at autopsy.[3] Atherosclerosis is a chronic inflammatory disease which may cause acute cardiovascular manifestations like angina, myocardial infarction and sudden death. The fact that these complications are preceded by a long subclinical period has

been elucidated by several studies including the present study.[4] This finding is also supported by Framingham Offspring Study cohort which revealed that in a cohort of randomly selected 318 asymptomatic individuals, 41% of men and 38% of women showed atherosclerosis.[5]

Left ventricular hypertrophy was discovered incidentally in 6 cases in this study. Left ventricular hypertrophy can be caused by several causes like valvular heart diseases like aortic stenosis, aortic regurgitation and mitral regurgitation and congenital heart diseases like patent ductus arteriosus, coarctation of aorta and tricuspid atresia which lead to severe symptoms. However, hypertension, especially when it occurs as a part of metabolic syndrome, is the most frequent cause of long standing asymptomatic cases of left ventricular hypertrophy.[6] This study, therefore, reflects the burden of metabolic syndrome prevalent in our population that escapes screening during life.

*Incidental Findings in Liver*

Fatty liver was the second most common incidental finding in the present study seen in 41 cases (35.35%). There were 9 cases (7.75%) which showed intrahepatic bile stasis either in isolation or with fatty liver. These findings are consistent with study done by Patel S et al who found fatty liver as the second most common incidental finding.[3] Alcohol consumption is the most common cause of fatty liver, however non alcoholic fatty liver disease is on the rise which can be attributed to rising incidence of metabolic syndrome.

In the present study, it was observed that there were 11 cases which had coexistent atherosclerosis and fatty liver. This finding correlates with study done by Lee SP where it was concluded that non alcoholic fatty liver disease could be related to atherosclerosis even in the absence of metabolic syndrome which can be assessed by measurement of carotid intima-media thickness.[7]

There were five cases of liver cirrhosis in this study who died of a cause unrelated to liver pathology. But due to lack of relevant history it is difficult to comment whether these cases were symptomatic or not.

*Incidental Findings in Kidney*

Incidental renal lesions in this study included 7 cases of chronic pyelonephritis followed by 5 cases of simple renal cyst and 1 case of chronic glomerulonephritis. In the absence of ascending infectious pathology, chronic pyelonephritis may be caused by obstructive cause which may lead to long standing cases with minimal symptoms.[8] Simple renal cysts, detected whether on autopsy or incidentally on routine examination, are nearly always asymptomatic.

There was one case of leiomyoma of kidney discovered incidentally in a 30 year old male who died due to lobar pneumonia. Leiomyoma, the most common gynaecological neoplasm, can have varied localization and unusual growth patterns. Isolated leiomyoma of kidney is an extremely rare finding. When present, they are usually small (<2 cm), cortical, multiple and asymptomatic tumors occurring commonly in young females.[9] However, they can also be single large tumors as seen in the present study.

*Incidental Findings in Lung*

There were 4 cases of pulmonary tuberculosis discovered incidentally. Pavic et al found in their study that clinically unrecognized active TB occurred more commonly in men especially in younger age group which was consistent with the present study as well.[10] This may reflect habits and living conditions like smoking, poorly ventilated spaces etc. This finding also highlights the importance of the precautionary measures that the autopsy personnel must take while handling the cases with unknown history and background. Exposures as brief as 10 minutes with a case of TB in the autopsy room have resulted in transmission.[11]

*Incidental Finding in Brain*

There was one case of psammomatous meningioma in this study who died in a road traffic accident. Due to lack of relevant history, it is difficult to say whether the case was symptomatic and was seeking medical attention or not.

*Incidental Finding in Ovary*

Serous cystadenofibroma of ovary was discovered incidentally in a 45 year old female who died in road traffic accident. Valentin L et al in their study of adnexal lesions in autopsy, concluded that benign adnexal cysts are so common in the perimenopausal women who would have died of some other causes that they can be considered normal findings.[12]

## Conclusion

From this study it can be concluded that atherosclerosis was the commonest histopathologic finding followed by fatty liver irrespective of the cause of death. Several of the above mentioned incidental findings would not have come to clinical attention during life, but gross and microscopic examination following autopsy helped us to know the nature and extent of these lesions. These findings can therefore be of paramount importance for academic purposes. Such retrospective and prospective studies can also provide an insight into the true prevalence of diseases or lesions in the population.

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