

## Pathological Findings of Liver in Autopsy with Emphasis on Incidentally Detected Lesions

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### Abstract

*Introduction:* To study the spectrum of histopathological changes in liver with an emphasis on the rare incidental lesions of liver in autopsies. *Methods:* A retrospective study of medicolegal autopsies for six years was conducted in the Department of Pathology, JSS Medical College, Mysuru, Karnataka. The gross and microscopic findings of liver specimens were taken into consideration to establish the presence of liver diseases and also to find out the types of liver diseases in relation to the age and sex of the cases. *Results:* The present study consists of a series of 284 autopsy cases from JSS Hospital, Mysuru, conducted over a period of six years. A total of 121 liver specimens sent were studied, out of which 16(13.2%) were normal and 8(6.6%) were autolysed. Histopathological lesions were seen in 97(80.1%) liver specimens, out of which 46(47.4%) showed fatty change, 9(9.3%) cases showed chronic venous congestion along with 8(8.2%) cases of cirrhosis, 3(3.1%) cases of hepatitis and 8(8.2%) cases of interesting fortuitous findings comprising of Dubin Johnson syndrome, von Meyenburg complex, large bile duct obstruction, metastatic deposits of carcinoma of cervix, neuroendocrine tumor, vaso-occlusive sickle cell crisis, amebic liver abscess and tuberculosis with coexistent fatty change. *Conclusion:* Fatty change of liver was the commonest incidental pathologic finding of liver with the commonest age group for liver disease being 41-60 years. This study has contributed a handful of findings to the pool of rare liver lesions in pathology emphasising the indispensable contribution of autopsy to the knowledge of pathology.

**Keywords:** Autopsy; Dubin Johnson Syndrome; Incidental; Vaso Occlusive Sickle Cell Crisis; Von Meyenburg Complex.

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### Introduction

The autopsy study aids to the knowledge of pathology by unveiling the rare lesions which are a source of learning from a pathologist's perspective. Autopsy studies serve as invaluable substrates for the study of natural evolution of certain diseases and also provide an insight into the true prevalence of diseases or lesions [1]. Quite rightly liver is, called as "The custodian of milieu interior" and is vulnerable to a variety of metabolic, toxic, microbial and circulatory insults [2]. The disease can be primary or secondary to cardiac de-compensation, alcoholism or extra hepatic infections. Most of the chronic liver

diseases are only diagnosed at autopsy as they do not cause any functional derangement and remain asymptomatic [2].

Liver is the commonest internal organ sent for histopathologic study in autopsies as it reflects the changes secondary to hemodynamic changes, drugs, toxins or infections and helps ascertain the cause of death and also the mechanism of death. These findings have an immense academic value and hence this article serves as an eye opener into the spectrum of histopathological findings of liver in autopsies and also the incidental liver lesions which go unnoticed when a person was alive.

### Materials and Methods

A retrospective study of medicolegal autopsies for six years from 2008-2013 was conducted in the Department of Pathology, JSS Medical College, Mysuru, Karnataka. Liver specimens were received either as a part of examination of multiple viscera, or

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only liver was sent for pathological examination in 10% formalin. Representative bits were processed in a routine manner. All sections were stained with haematoxylin and eosin (H & E) stain and special stains were used as and when required. The gross and microscopic findings of liver specimens were taken into consideration to establish the presence of liver diseases and also to find out the types of liver diseases in relation to the age and sex of the cases.

## Results

The present study consists of a series of 284 autopsy cases from JSS Hospital, Mysuru, conducted over a period of six years. A total of 121 liver specimens sent were studied, out of which 16(13.2%) were normal and 8(6.6%) were autolysed. Histopathological lesions were seen in 97(80.1%) liver specimens (Table 3), out of which 46(47.4%) showed fatty change, 9(9.3%) cases showed chronic venous congestion along with 8(8.2%) cases of cirrhosis, 3(3.1%) cases of hepatitis and eight cases (8.2%) of interesting fortuitous findings (Table 4) comprising of two cases of metastatic neoplasms one from

squamous cell carcinoma of cervix and the second was metastatic neuroendocrine tumor, remainder were non-neoplastic lesions one each of Dubin Johnson syndrome, von Meyenburg complex, large bile duct obstruction, vaso-occlusive sickle cell crisis, amebic liver abscess and tuberculosis with coexistent fatty change.

The study comprised of 60 specimens from males (61.%) and 37(38.1%) from females (Table 2), age group ranging from 19 years to 81 years (Table 1). Causes of death were road traffic accident (RTA) in 61 cases, poisoning in 13 and hanging in 11 cases. There were 3 cases each of burns and myocardial infarction, 2 cases each of drowning and unidentified bodies. Cause of death was not established in 2 cases.

Dubin Johnson Syndrome was diagnosed postmortem in a 25 year old male after death from hanging. Pieces of liver with blackish discoloration displayed hepatocytes with abundant grey brown cytoplasmic pigment along with grade 1 micro and macrovesicular steatosis (Figure 1A). The pigment

**Table 1:** Spectrum of lesions noted at autopsy

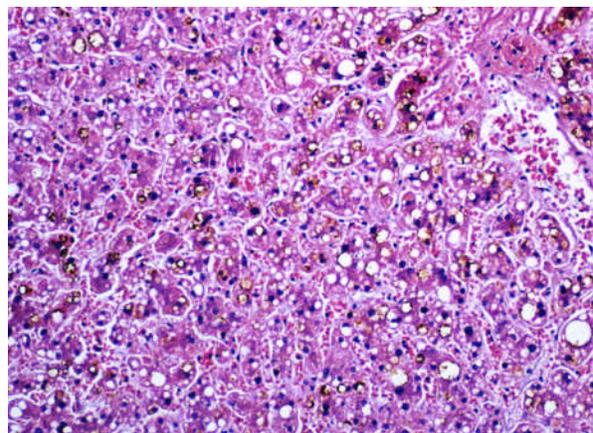
Sl. No.	Histopathological finding	No of cases
1	Atherosclerosis	55
2	Fatty liver	40
3	Pulmonary edema	26
4	ATN	25
5	Pneumonia	8
6	Tuberculosis	7
7	Cirrhosis	6
8	Neoplastic lesions	5
9	Infarction intestine	4
10	Erosive gastritis	3
11	Pancreatitis	2
12	Meningitis	2
13	Uterus-leiomyoma	2
14	Cvc spleen	1
15	Autolysed	16
	Total	202

**Table 2:** Gender distribution of autopsy cases

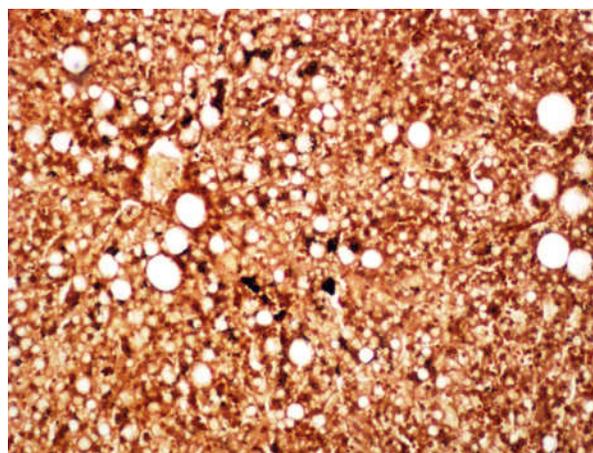
Gender	No of cases
Male	162
Female	107
Total	269

**Table 3:** Age distribution of autopsy cases

Age group	No of cases
0-20	6
21-40	131
41-60	107
61-80	18
>80	7
Total	269



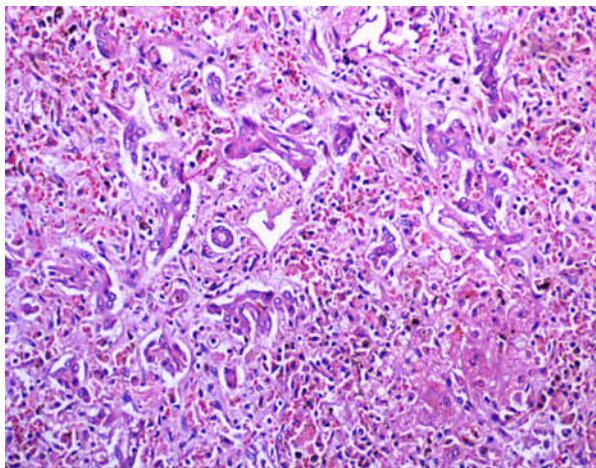
**Fig. 1A:** Liver displaying features of Dubin Johnson syndrome. H&E, x100



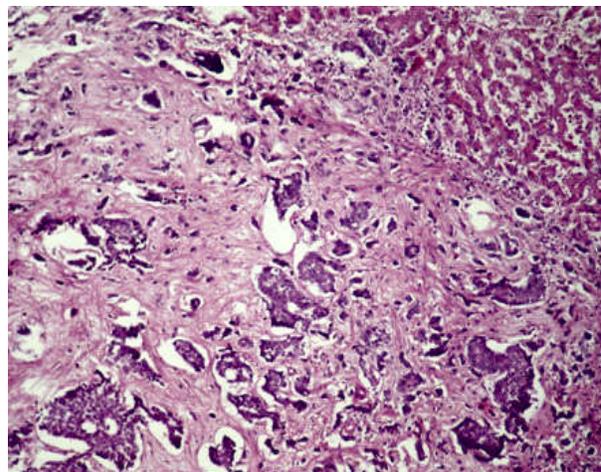
**Fig. 1B:** Hepatocytes with brown pigment. Masson Fontana, x100

**Table 4:** Incidental findings in autopsy

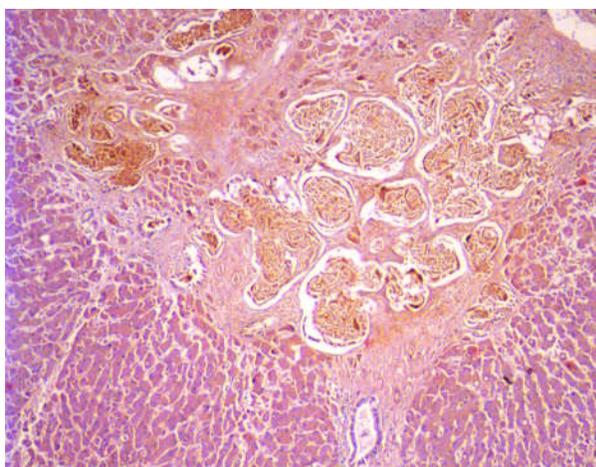
Sl. No.	Age/Sex	History / indication of autopsy	Histopathological findings
1	68/M	Snake bite	Tumor to tumor metastases –gastric adenocarcinoma mets into oncocytoma of kidney
2	40/M	Massive hemoptysis	Lungs-Tuberculosis Kidney-Clear cell RCC Liver-cirrhosis
3	38/M	OP poisoning	Kidney-Multilocular Cystic Renal Cell Carcinoma(MCRCC)
4	45/M	RTA	Adult polycystic kidney disease
5	25/M	Hanging	Dubin-Jhonson Syndrome
6	40/M	RTA	Bile duct hamartoma
7	30/M	Poisoning	Large bile duct obstruction
8	35/M	RTA	Liver-carcinoid
9	45/F	RTA	Amebic liver abscess
10	52/M	Massive hemoptysis	Lungs-Tuberculosis
11	39/M	RTA	Lungs-Tuberculosis Liver- Tuberculosis with fatty change
12	23/M	RTA	Sickle cell anaemia with vaso-occlusive crisis
13	38/F	Unidentified body	Thyroid-follicular adenoma



**Fig. 1C:** Liver displaying features of von Meyenburg complex. H&E, x100



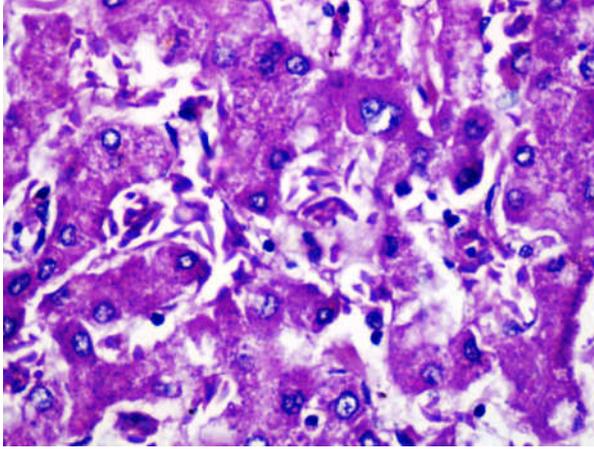
**Fig. 2A:** Specimen of liver showing multiple grey white nodules



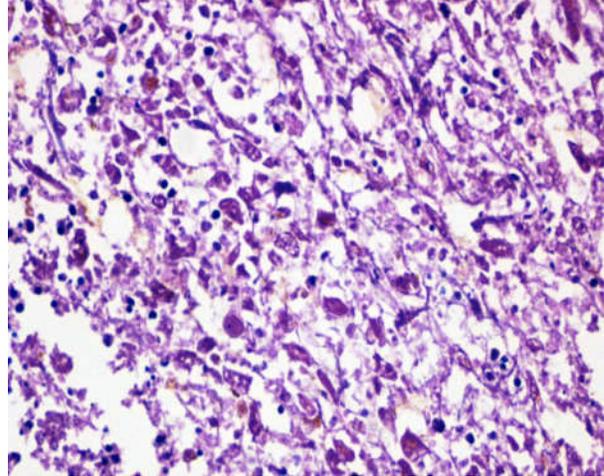
**Fig. 1D:** Liver displaying features of Large bile duct obstruction. H&E, x100



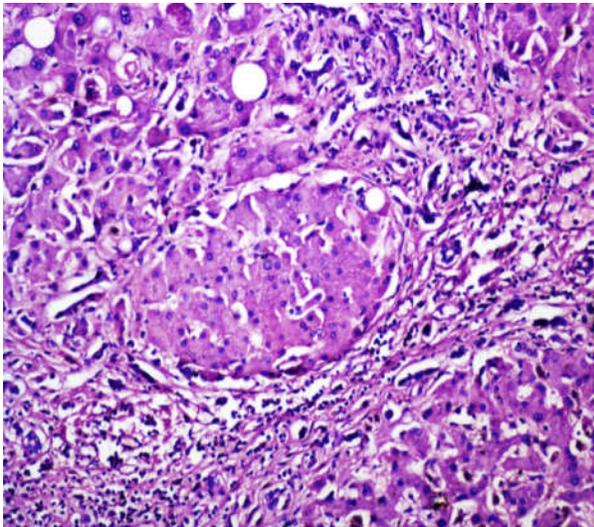
**Fig. 2B:** Nests and trabeculae of neuroendocrine cells amidst hepatocytes. H&E, x100)



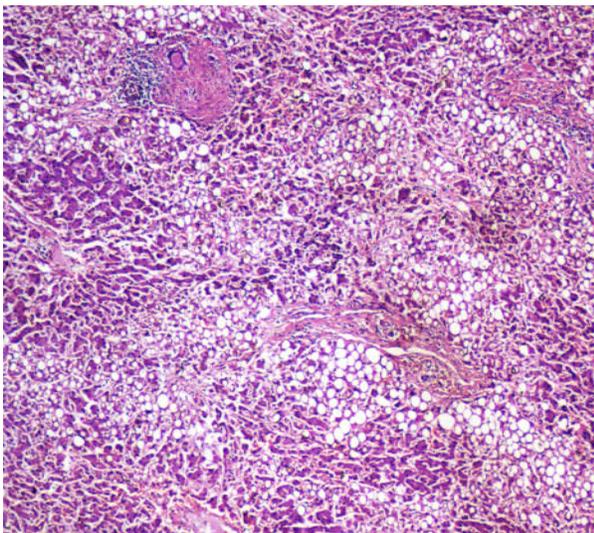
**Fig. 2C:** Hepatic sinusoids filled with sickled rbc's. H&E, x400



**Fig. 3B:** Trophozoites of Entamoeba Histolytica. H&E, x200



**Fig. 2D:** Hepatic parenchymal nodules separated by fibrosis- Cirrhosis. H&E, x200



**Fig. 3A:** Liver displaying epithelioid granuloma and fatty change. H&E, x100

was not stained with Perl's Prussian blue while Masson Fontana stain confirmed the brown granular pigment in hepatocytes (Figure 1B).

A case of subcapsular bile duct hamartomas (von Meyenburg's complexes) was found in a patient aged 40 years after death in a road traffic accident who also had emphysematous changes in the lungs (Figure 1C). The changes in hepatic architecture secondary to large bile duct obstruction were noted in a 30 year old male after suicidal death from poison consumption, who had a past clinical history of obstructive jaundice and microscopy revealed bile duct proliferation with perivenular bilirubinostasis accompanied by portal tract edema and inflammation, suggestive of changes due to large bile duct obstruction (Figure 1D).

Among the neoplastic lesions of liver, two metastatic neoplasms in liver were discovered. A case of carcinoma cervix with metastatic deposits in lung, brain and liver in a 38 year old female and the other was metastatic carcinoid in a specimen of liver displaying multiple grey white nodules, largest measuring 2x1.8cms, suggestive of metastatic deposits (Figure 2A & 2B).

A postmortem diagnosis of vaso-occlusive Sickle cell crisis was made in a 23 year old male who died in road traffic accident. The patient had intracerebral bleed, collapsed lungs and hemorrhagic contusion of liver, where the cause of death was attributed to cardiorespiratory arrest. On histopathology, multiple sections from lung showed macrophages and blood vessels filled with sickled erythrocytes among areas of consolidation, liver displayed congested sinusoids filled with sickled erythrocytes (Figure 2C) and brain had large areas of edema displaying congested cerebral blood vessels packed with sickled erythrocytes.

Among the eight cases of cirrhosis, a rare coexistence of cirrhosis of liver, clear cell carcinoma of kidney and pulmonary tuberculosis was incidentally detected in a 40 year old male after death from massive hematemesis where the lungs showed cavitary lesions with caseating granulomas and Langhan's giant cells, liver was nodular and on microscopy, displayed cirrhotic parenchymal nodules with bridging septae, characteristic of macronodular cirrhosis (Figure 2D) and the lower pole of right kidney harbored clear cell renal carcinoma. A case of extrapulmonary tuberculosis involving liver with coexistent fatty change (Figure 3A) was incidentally seen in a 39 year old male.

Among the inflammatory conditions, an undiagnosed abscess showed multiple trophozoites of *Entamoeba Histolytica* in a friable specimen of liver with dark coloured pus (Figure 3B).

## Discussion

In concurrence with the findings of several workers, liver diseases predominated in males in the present study (61.9%) and this may be attributed to the fact that men indulge themselves more to alcohol and smoking as compared to women (38.1%) [2,3,4,5].

The commonest age group affected in the present study was between 41-60 years concurrent with the other studies by R. Thamil Selvi with the age group of 50-70 years [3], Devi PM with result of 41-50 years [2] and Alagarsamy J in their study inferred 4<sup>th</sup> and 6<sup>th</sup> decades as the commonest age group affected in liver disease [5].

Most of the chronic liver diseases even in advanced stages may cause no prominent clinical signs and symptoms and are diagnosed only during autopsy [2,3]. The spectrum of lesions that are reported in a series of autopsy findings of liver are fatty change, venous congestion, cirrhosis of liver, malignancy, hepatitis and chronic abscess, fatty change being the predominant finding [4]. Another autopsy study of fifty cases of liver specimens reported fatty change, venous congestion, cirrhosis of liver, neoplasm and hepatitis with chronic venous congestion being the predominant finding [5]. The spectrum of pathologic changes in our series is similar to these studies with an addition of rare cases such as Dubin Johnson syndrome, von Meyenburg complexes, large bile duct obstruction, vaso-occlusive sickle cell crisis and extrapulmonary tuberculosis of liver into the pool of interesting lesions of liver.

R. Thamil Selvi and colleagues studied 120 cases and fatty change was the commonest finding in 26.9% followed by congestion (16.7%), hepatitis (13.9%), cirrhosis & abscess (7.4%) and malignancy (1.9%) [3]. Bal MS et al. in their study inferred fatty change being the predominant pathologic finding [4]. The findings in our study are comparable to these studies with fatty liver being the commonest lesion in contrast to a study by Devi PM and colleagues where cirrhosis was the commonest finding in 25% of the total cases [2]. In our study, cirrhosis had a lower incidence of 8.2%. Alagarsamy J in their study of 50 cases found congestion as the commonest finding in 26% cases and fatty change in 20% of cases as the second most common finding, whereas in our study congestion was the second commonest pathologic finding seen in 9.3% of cases [5].

The commonest pathological change observed in our study was fatty change with both micro and macrovesicular steatosis. The causes of hepatic steatosis can be attributed to alcohol abuse or Nonalcoholic fatty liver disease (NAFLD). Alcohol is implicated in more than 50% of liver related deaths in the United States and complications of alcoholism contribute to a quarter of million deaths annually [2]. Alcoholic liver disease is presently the most common chronic liver disease in western and developing countries like India. Alcohol abuse generally leads to three pathologically distinct liver diseases viz. fatty liver, hepatitis and alcoholic cirrhosis. One or all of the three can occur at the same time and in the same patient. Nonalcoholic fatty liver disease (NAFLD) includes a spectrum of liver diseases, ranging from simple steatosis to steatohepatitis, advanced fibrosis and cirrhosis [2,3].

In most of the cases of Dubin Johnson syndrome, patients have asymptomatic hyperbilirubinemia with well preserved hepatic functions. Although patients present with hyperbilirubinemia or cholelithiasis, our patient had an asymptomatic course which was undiagnosed before death [6]. Bile duct hamartomas (von Meyenburg's complexes) of the liver are usually detected at laparotomy or autopsy as an incidental finding as in our study and are usually multiple [7,8]. The changes in liver architecture in cases of obstructive jaundice secondary to large bile obstruction can be studied usually in postmortem examination as a liver biopsy is rarely indicated in such cases, contributing to the study of natural evolution of such diseases and the pathomechanism.

Bal MS and colleagues found 3% cases of metastatic tumors in their study [4], with a slightly lower rate of 2.1% in our study. The study by R. Thamil Selvi and colleagues is comparable to our study

with a rate of 1.9% malignant tumors [3]. Our study had 2 metastatic neoplasms in liver, one from squamous cell carcinoma of cervix and the other was metastatic carcinoid. Carcinoids being the most common gastrointestinal endocrine tumors, metastases frequently involve liver. Primary hepatic carcinoids are solitary in contrast to metastatic carcinoids [9]. Most hepatic carcinoids are metastatic rather than primary with multiple nodules in the liver similar to our case [9,10].

The case of vaso-occlusive sickle cell crisis was a rare finding in our study, as the clinical profile of sickle cell anemia patients is reported to be less severe in India compared to that of African countries and is characterized by delayed presentation, pauci symptomatic cases, less frequency of vaso occlusive crisis and low mortality. Therefore, most of the patients remain undiagnosed similar to our case [11]. The strongest factor in sickle cell trait (SCT) patients implicating intravascular sickling with tissue injury and even death is hypoxia leading to intravascular sickling [11,12,13]. In our case, the road traffic accident with resultant bleeding leading to hypoxia probably triggered intravascular sickling and vaso-occlusive crisis contributing to the catastrophic events leading to death.

Our study found a case of extra-pulmonary tuberculosis with fatty change and pulmonary foci of tubercular lesions. Tuberculosis (TB) remains a major respiratory cause of morbidity and mortality worldwide and has been identified as a 'global emergency' by the WHO [14]. Many cases of tuberculosis remain undiagnosed and are diagnosed only at autopsy [5]. In a study of tuberculous lesions at autopsy, 8.7% cases of active tuberculosis were found, of which 90% had pulmonary tuberculosis, 10% suffered from military tuberculosis and 30% had extra-pulmonary tuberculosis. The lungs were the most frequently affected organ [16]. The rare coexistence of cirrhosis of liver, clear cell carcinoma of kidney and pulmonary tuberculosis was incidentally detected in a 40 year old male after death from massive hematemesis, which would have not been diagnosed during the person's life time. Such detection of rare cases contributes to the true prevalence of some of the diseases in pathology.

### Conclusion

We conclude from our study that fatty change of liver was the commonest incidental pathologic finding of liver with the commonest age group for liver disease being 41-60 years. The study also

emphasizes the various incidental liver lesions which otherwise would have been unnoticed during a person's life. Autopsy studies help in the detection of unexpected findings significant enough to have changed patient management had they been recognized before death contributing to the knowledge of liver pathology. Despite the growing complexity and dependence on newer diagnostic methodologies, the traditional role of histopathology in autopsy remains as important as it has been in the past.

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