

# Histopathological Spectrum of Heart Diseases in Autopsy Specimens

Dr Akhtar Un Nisa Salaria.

Department of Pathology, Government Medical College Jammu.

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**Abstract- Background:** Objective of the study was to analyze the histopathological spectrum of heart diseases in autopsy specimens that play a major role as cause of death.

**Methods:** During the period from January 2018 to December 2018, 400 autopsy specimens were received in Department of Pathology at Government Medical College Jammu. Out of 400 Autopsy specimens 350 specimens of heart were received. Out of these specimens of heart, 36 specimens were autolysed and eight specimens had only small pieces of heart, which were not included in the study. Study was conducted for 308 specimens of heart. Gross and microscopic findings on H&E stained sections were studied.

**Results :** Out of 308 cases, 219 cases showed atherosclerosis, 14 Cases showed features of myocardial infarction, 12 cases showed myocardial hypertrophy, 2 cases showed myocarditis. There was one case showing cysticercosis in the lumen of anterior descending artery.

**Conclusion :** Atherosclerosis is the leading cause of cardiovascular related deaths in cases subjected to medico legal autopsies.

**Index Terms-** Coronaries, Heart, Postmortem.

## I. INTRODUCTION

Incidence of cardiac deaths has been increasing all over the world particularly in urban population during last five decades. In India incidence of ischemic heart diseases has increased to about 10% [1].

Autopsies can be valuable source for epidemiological information in addition to providing valuable information to deceased family [2].

Autopsy is therefore a tool of real value for assessment of pathologies that are difficult to access in living [3]

Many a times it has been found that when gross pathology could not help to evaluate the cause of death, histopathology can conclusively opine the involved cardiac pathology.

The aim of the present study is to identify the various histopathological lesions of the heart found incidentally which play a major role as a cause of death.

## II. METHODS

The present study was carried out at the Department of Pathology Government Medical College Jammu from January

2018 to December 2018. Total of 400 Medico legal autopsies were received during this period .Out of 400 autopsy specimens 350 autopsy specimens included heart .There were 36 autolysed specimens of heart and 6 specimen comprised of only pieces of heart which were not included in the study. Total 308 specimen of heart were included in the study. Epidemiological data and postmortem findings were collected from the postmortem papers and police papers.

**Gross Examination** of the heart, weight and dimensions of whole heart were recorded .The external surface was looked for any pericardial pathology and for any evidence of recent or old infarct .The heart was dissected /opened by inflow outflow technique. Measurement of thickness of ventricular ,atrial walls and interventricular septum was measured. The valves were checked for their number, stenosis and calcification. All the coronary arteries were examined using regular sections every 4 to 5 mm. The ascending aorta was checked for dilatation, thickening or atheromas.

## Microscopic Examination:

Sections were taken from Aorta, Pulmonary artery ,both the Atria and both the ventricles and coronary arteries. In addition sections were taken from inspected pathological lesions.

## III. RESULTS

Age in years	No. of Patients	Percentage
0 -10	-	
11- 20	2	1%
21- 30	40	12.5%
31- 40	56	18%
41- 50	86	28%
51-60	90	29%
61 – 70	33	11%
71- 80	1	0.5%

Table1: Agewise distribution of cases

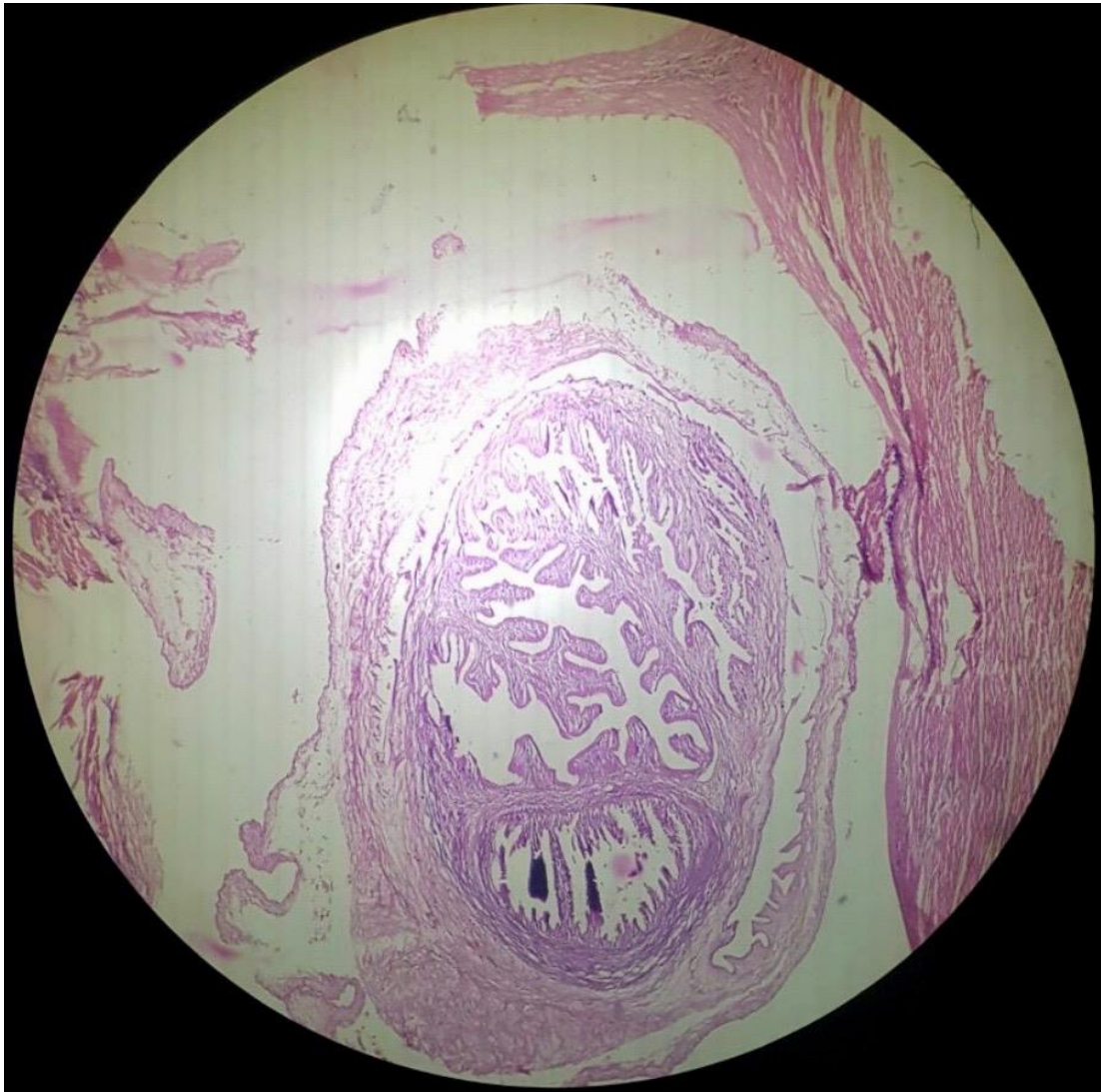
Sex	Number	Percentage
male	215	70%
female	93	30%

**Table 2: Sexwise distribution.**

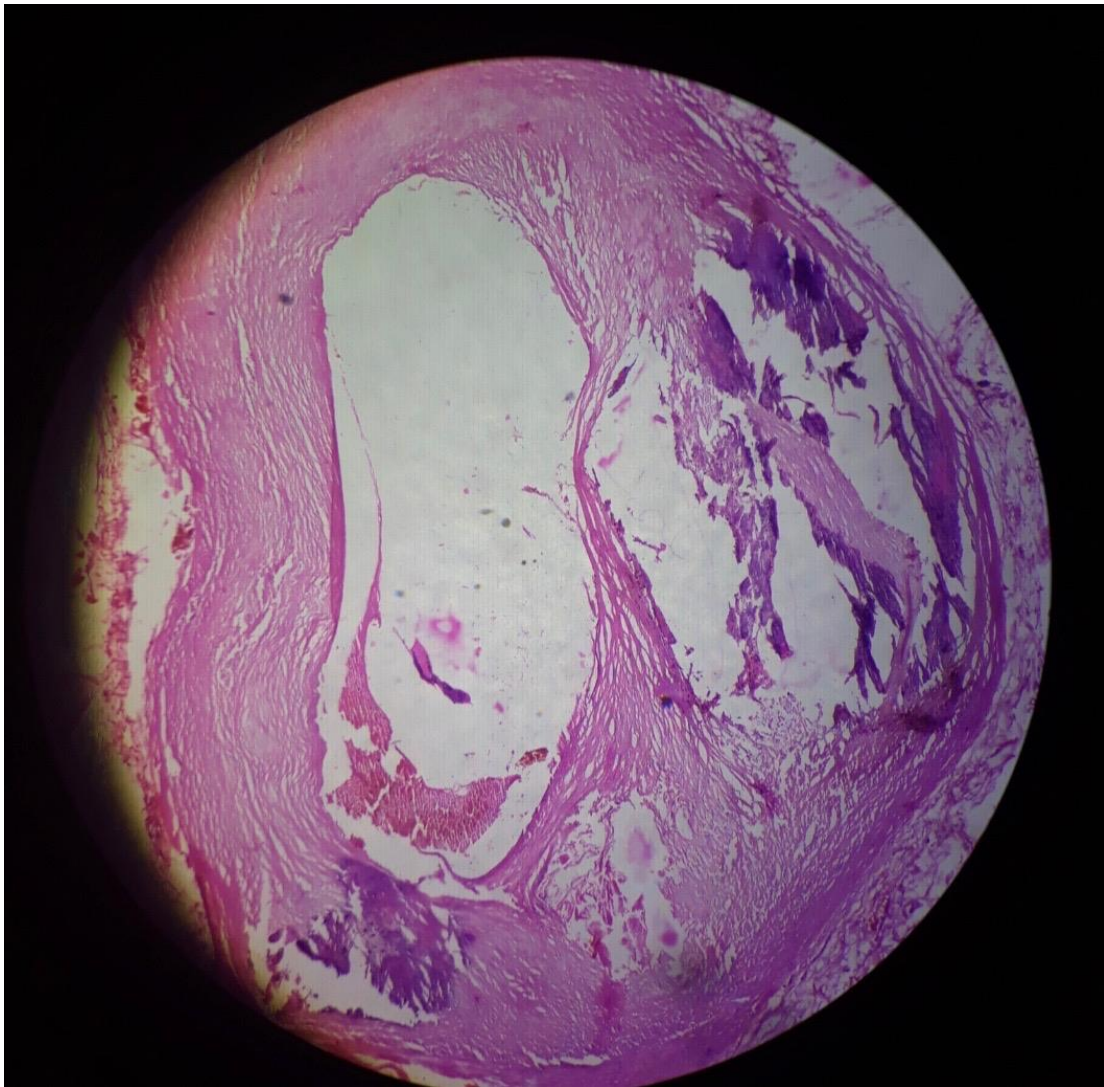
No specific findings	60	19.5%
Myocardial infarction	14	4.5%
Myocardial hypertrophy	12	4.0%
Myocarditis	2	0.75%
Cistecercosis	1	0.25%

**Table 3: Histopathological findings.**

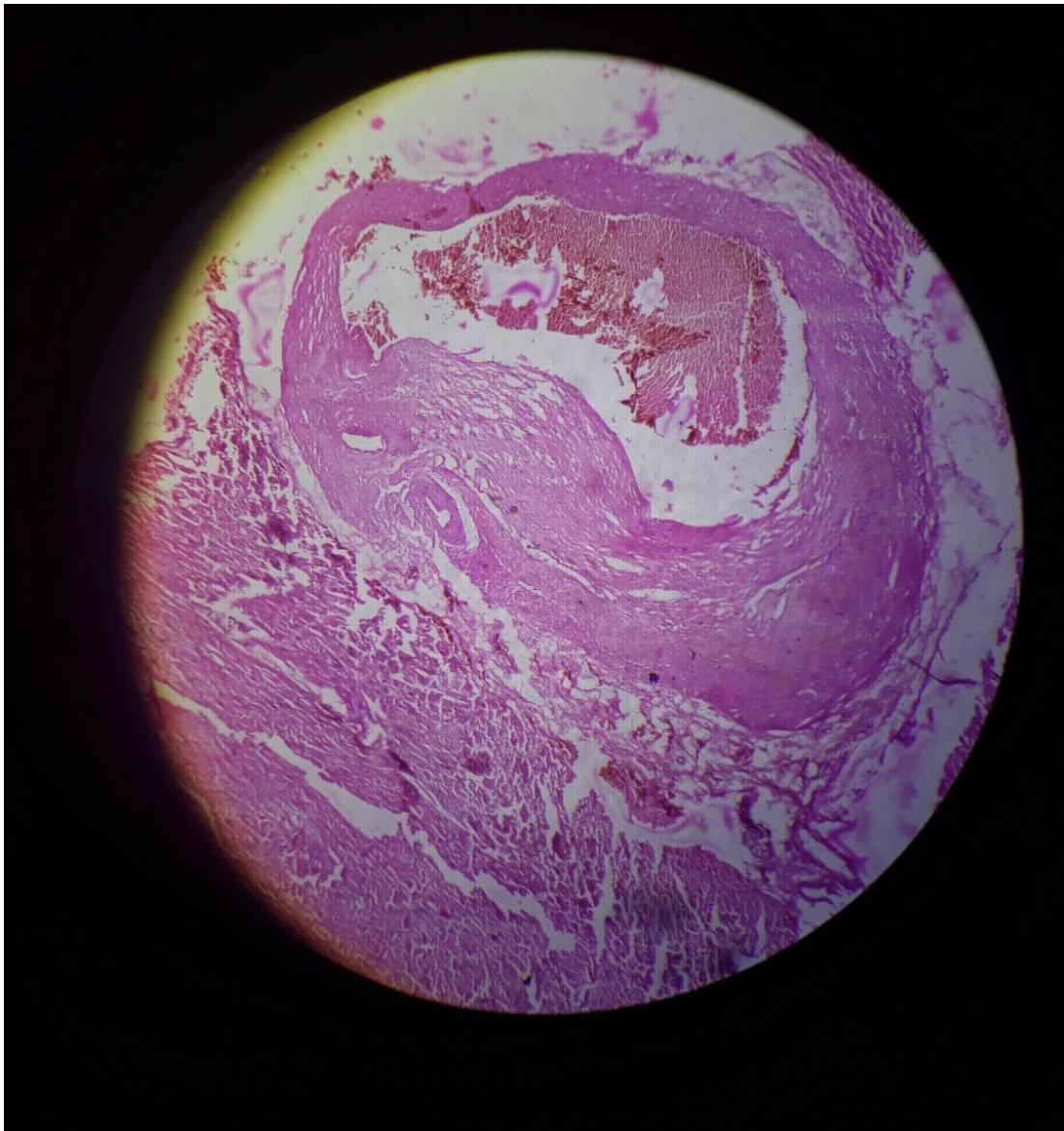
Findings	No. of cases	Percentage
Atherosclerosis	219	71.0%



**Figure 1:** Microphotograph depicting cysticercosis in the lumen of anterior descending artery of an unidentified male.



**Figure 2: Atherosclerosis with medial calcification.(H&E x20)**



**Figure 3: Atheromatous plaque .**

<b>Findings</b>	<b>No. of cases</b>	<b>percentage</b>
Atherosclerosis	114	52%
Atherosclerosis with calcification	97	44%
Atherosclerosis with thrombus	8	4%

**Table 4: out of 219 cases**

In this study 308 specimens of heart were included. This study included cases between 11 to 80 years. Maximum number of cases were present between the age group of 51 to 60 years . Out of 308 cases 215 were males and 93 were females. There was remarkable male dominance [Table 2].

In histopathological evaluation most common finding was atherosclerosis [Table 3] followed by Myocardial infarction and myocardial hypertrophy.

In 60 cases no specific pathological findings were identified during gross and microscopic examination [Table 3].

Among 308 Case 219 revealed atherosclerotic changes .97cases had calcification with plaque and 8 cases had superimposed thrombus formation.

#### IV. DISCUSSION

The autopsy study provides a means of understanding, the basic process that sets a stage for clinically significant atherosclerotic cardiovascular diseases. There is no valid method of sampling of living population .It was therefore considered that death suspected due to cardiovascular pathology, probably provide

the best sample of living population for studying the cardiovascular diseases [4].

In this study most of cardiovascular deaths occurred within the age range of 40 to 60 years. Similar findings were reported by Ramazan Karanfil et al (17 – 78 Yrs. ) and Chandrakala Joshi ,41 – 60 yrs.[2,5].

Similar findings were observed in a study conducted by Garg S et al [6]. Who observed most of cardiovascular deaths within age range of 41 to 60 years. This reveals that age is a powerful risk factor for heart disease. The development of atherosclerosis increases markedly with age up to an age of about 65 years.

In the present study males were 215 (70%) and females were 93(30%). This observation was similar to the observation of Garg S et al in which there were 76% males and 24% females. In comparison of histopathological findings in this study coronary atherosclerosis was most common finding present in 219 (71%) cases[6]. Similar findings were reported by Ramazan karanfil et al (75%), Stavroula A et al 77% and Chandrakala Joshi 64% (2,5,7). Similar observation was seen in the study conducted by Garg S et al 78(55.3%), [6].

Plaque calcification is found more frequently in advanced lesions, it may also occur in small amounts in early lesions, which appear in second and third decade of life. Histopathological investigation had shown that plaques with microscopic evidence of mineralization are larger, however the relation of arterial calcification to the probability of plaque rupture is unknown [4]. In this study the evidence of myocardial infarction was present in 14 (6%) cases. Similarly bora Ozdemir et al, reported myocardial infarction in 48% cases which is higher than this study [8]. Wang H Y et al reported ischemic heart disease in 7% cases and is lower than the present study [5,9]. In the study conducted by Garg S et al myocardial infarction was observed in 20(14.15)% cases [6]. The difference may be due to time variability between onset of ischemia and time of death. Because microscopic features depend upon the time period between onset of ischemia and death.

Next common lesion was myocardial hypertrophy which was present in 12(4%)cases in this study .In the literature similar incidence that is 7% was reported by CristinoBasso et al and Wang H Y et al [9,10].Ramazan Kanafil et al Chandrakala et al ,reported much higher incidence of cardiac hypertrophy in 66% and 52% cases respectively[2,5]. In the study conducted by Garg S et al there were 10 cases 7.09% reported as myocardial hypertrophy [6].

There was only one case of cysticercosis seen in an 35 years old unidentified male in the lumen of anterior descending artery. Review of literature revealed case reports of rare cases of cardiac and disseminated cysticercosis as reported by Sanjay k et al [11].

Cardiovascular diseases contribute the most common cause of sudden death .It is well known that lifestyle modifications and drug therapy in selected individuals can reduce the risk of cardiac events but current Framingham risk assessment is suboptimal .So

in medico legal autopsies it is proposed that every possible organ must be sampled for histopathological examination and must be examined with a multidisciplinary approach (medical history, scene investigations, biochemical, microbiological, toxicological etc.).

Histopathology of various organs is very helpful to the forensic surgeons in arriving to a conclusion regarding cause of death.

## V. CONCLUSION

To conclude this study most common cause of death was myocardial ischemia due to atherosclerosis. Histopathological studies provide the most accurate clues to a better understanding of human cardiovascular diseases with better insight into disease pathophysiology, novel interventions could be introduced to improve care and future outcomes for patients undergoing cardiovascular diseases.

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## AUTHORS

**First Author** – Dr Akhtar Un Nisa Salaria., Department of Pathology, Government Medical College Jammu.