

## Histomorphological Study of Kidney Lesions in Autopsy –An Original Eight Year Study.

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**Abstract: Background:** Postmortem examination of the body is an essential procedure in medicine, because, by correlating the gross and microscopic features of the organs with the clinical features and laboratory findings, the exact cause of death can be known. Many a time, a patient is admitted, various investigations done on him and many diagnoses put forward, but, the final and accurate diagnosis is given only after postmortem examination. Postmortem examination helps in the learning process, the eyes actually see as to what from the patient was suffering. It also makes us alert so that further preventable deaths can be prevented.

Thus autopsy becomes an indispensable part of medicine. It was Giovanni Battista Morgagni (1682-1771) who demonstrated the importance of morbid anatomy. He correlated anatomy and pathology on one hand, and, clinical medicine on the other. Carl Rokitansky (1804-1878), had performed more than 30,000 autopsies and correlated the postmortem findings with the clinical features. Finally, the name Richard Bright (1789-1858) has to be included, because it was he who had studied many kidney lesions correlating the clinical features and morbid anatomy.

**Material and Method:** Autopsies with renal pathology were selected from eight year period .from 1980-1986 in Govt. Medical College Hospital. Aurangabad (MS). India. Affected kidneys were evaluated both on gross and microscopy.

**Result:** 69 autopsies out of 491 showed renal lesions. Renal pathology was the cause of death in 20 cases, whereas in remaining 49 cases cause of death was different and renal pathology was an associated finding. Out of 491 cases, 317 were males and 174 were females, M : F ratio being 1.8 : 1. Renal pathology was seen in 69 cases (14.05%)

**Conclusion:** Autopsy kidneys show clinical as well as medical lesions. We come to the exact cause of death by clinico- pathological correlation including the clinical features, the investigation reports and postmortem gross and microscopic findings. [1,2,3] Certain renal pathologies might not affect the renal function thereby not causing clinical manifestations. Thus they remain as renal medical disease which is diagnosed on autopsy study. Thus autopsy kidneys help in further preventing mortality due to renal disease or for that matter any disease. [2,3] In our study Chronic Pyelonephritis was found to be the most common lesion. Non-glomerular lesions were more common than glomerular lesions.

A complete and thorough autopsy study provides an important information in identifying risk factors and disease trends. It helps in discovering a new disease and also in quality control in health and patient management and thus resultant improved patient care. [3] This study was conducted way back in 1988 and its reliability is being compared to recent studies, though a bold step. It has come to be noticed that in recent times due to lifestyle diseases renal pathology is more prevalent and predominantly seen in autopsy kidneys [1,2].

**Key Words:** Autopsy, renal lesions, gross morphology, histopathology.

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### I. Aims and Objectives

1. To determine the incidence and type of kidney lesions in autopsy.
  2. To analyse the kidney lesions by their gross and microscopic features with respect to age and sex incidence, clinical features, and laboratory findings.
  3. To prepare a statistical data of different clinical renal lesions with their frequency, found in this hospital, which would help in future, for further studies in the same field.
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Thus the objective of this autopsy study, is, to determine the alteration in the structure occurring in the organs in relation to the clinical phenomenon. Any change in the structure of an organ results in deranged functions, which are manifested clinically. In certain occasions medical disease occurs with gross and microscopic lesions but functional derangement does not occur thereby not resulting in clinical disease. In renal diseases the changes occurring can be detected by laboratory investigations, biopsy study and finally gross and histopathological study of autopsy specimens.[5,6] Damage to the kidney associated with various pathological states is often manifested at autopsy. The lesion can be seen on gross examination or can be detected on microscopic examination. Thus morbid anatomy and histopathology form an essential element in the study of renal disorders, as in any other disorder.[7,8,9,10] Autopsy study of different kidney lesions at a time has not been dealt with. The present study, deals with the analysis of different kidney lesions that have been encountered in my alma mater from January 1980 to June 1987. This study is being compared with the recent studies of renal lesions at autopsy.

## II. Material & Methods

### Material

Autopsies performed in Government Medical College Hospital, Aurangabad during the period from January 1980 to June 1987 were studied for kidney lesions. Total number of autopsies were 491 during this period, out of which 69 autopsies showed kidney lesions.

### Method

All the autopsy specimens of kidneys with gross lesions, and those in which microscopic lesions were detected on histopathological study were collected for further study. The weight and size of the kidneys were noted. The capsule, external surface, cut surface-cortex, medulla renal pelvis and blood vessels were studied on gross examination. For microscopic examination, two sections were given from both the kidneys including the cortex and medulla in each section, in all the cases studied.

In case of pyelonephritis sections were taken from the renal pelvis. Sections from the renal artery were taken in case of hypertension. Sections were taken from any gross lesion when present. These sections were processed by the routine paraffin processing technique. Sections of thickness 3-4 microns were taken out and stained by the stains mentioned below. Sections to be stained by Congo Red stain were of 6 micron thickness. Sections stained by Congo Red were also viewed under polarizing microscope for green birefringence.

Following stains were used to study the histopathological sections:

- Haematoxylin and eosin stain (Bancroft, 1982).
- Periodic-Acid-Silver-Methenamine stain (Bancroft, 1982).
- Congo-Red stain (Bancroft, 1982).
- Methyl-Violet stain (Bancroft, 1982).

### Clinical Data and Laboratory Investigations.

The clinical features, laboratory investigations, gross and microscopic features of kidneys in particular, and other organs showing lesions were noted.

**Results:** In the present study, out of 491 autopsies, renal lesions were noted in 69 cases with a M:F ratio of 1.82:1 as shown in table No:1.

**Table No:1** (Chronic Pyelonephritis)

Age (yrs)	0-20	21-40	41-60	> 60
Males	03	09	07	02
Females	00	05	02	02

In the present study 422(317 M&174F) autopsy cases (85.95%) showed gross and microscopic features close to normal. Remaining 69 cases had nephropathological findings at autopsy (14.05%).

**Table No:2** Showing different kidney lesions in our study.

Histopathological findings	No:of cases	% of renal lesions
Ch.Pyelonephritis	30	6.11
Interstitial Nephritis	11	2.24
Neoplastic conditions	09	1.83
Amyloidosis	04	0.82
Nephrosclerosis	04	0.82
Glomerulonephritis	03	0.61
Kidney infarct	03	0.61
Kidney abscess	02	0.41

Histopathological findings	No:of cases	% of renal lesions
Pyonephrosis	01	0.20
Acute Tubular Necrosis	01	0.20
Perirenal hematoma (Rt)+Hydroureter(Lt)	01	0.20
Total Renal Lesions	69	14.05

**Table No:3.**Comparative study-Maximum affected age group.

Sr.No.	Study	Year	Age group
1.	Jesu et al	2014	31-35
2.	Sapna et al	2016	21-40
3.	Amandeep K et al	2018	21-40
4.	Our study	1980-1987	31-50

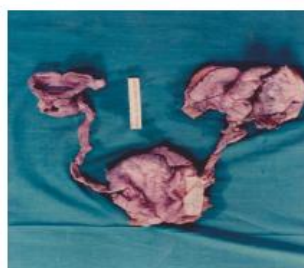
**Table No.4**Comparison of percentage of normal histology in various studies

Sr.No.	Study	Year	Cases
1.	Utsa et al	2014	23 out of 55 cases (41%)
2.	Vaneet et al	2017	27 out of 120 cases (22%)
3.	Amandeep K et al	2018	25 out of 100 cases (25%)
4.	Our study	1980-1987	422 out of 491 cases (85.95%)

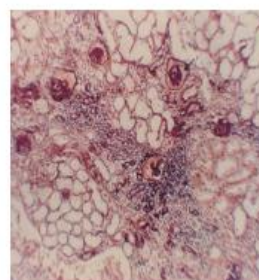
In our study we had included autopsies with renal lesions from 08 years.

**Table No:5.**Comparison of percentage of glomerular lesions in various studies.

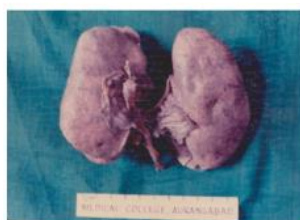
Sr.No.	Study	Year	Cases
1.	Monga et al	1997	25 out of 120(20.83%)
2.	Hailemariam S et al	2001	28 out of 237(11.81%)
3.	Amandeep K et al	2018	17 out of 100 (17%)
4.	Our study	1980-1987	03 out of 69 (0.61%)



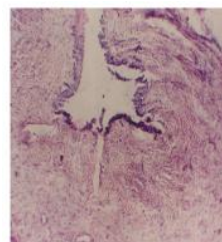
**Fig 1.** Gross Photograph from a case of Chronic Pyelonephritis with a contracted coarsely granular right kidney with dilated ureter. The left kidney is hydronephrotic and the bladder wall is thickened.



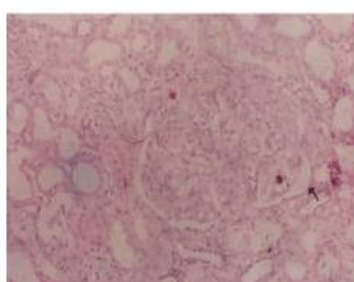
**Fig 2.** Micro photograph from the same case showing focal lymphocytic interstitial infiltrates along with few glomeruli showing periglomerular fibrosis (PASM X 10).



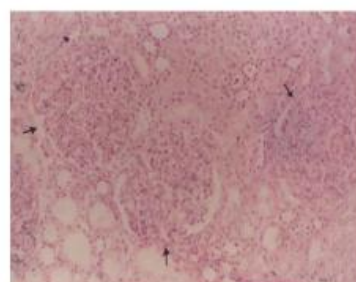
**Fig 4.** Gross Photograph from a case of Chronic Glomerulonephritis with a mildly contracted granular kidneys showing adherent capsule at places.



**Fig 3.** Micro photograph from the same case showing mild fibrosis with chronic inflammatory infiltrate under the calyceal epithelium. (H&E X 40)



**Fig 6.** Micro photograph from a case of membrano proliferative glomerulonephritis showing prominent glomerular capillary wall along with normal tubules. (H&E X 40)



**Fig 5.** Micro photograph from a case of acute proliferative glomerulonephritis showing three hypercellular enlarged proliferative glomeruli with normal renal tubules and interstitium (H&E X 40)

### III. Discussion

In our study males were affected more than females. Male: Female ratio: 1.8:1. Maximum deaths occurred in 31-50years-age group 491 autopsies studied in 08 years from 1980-1987. Renal lesions detected in 69 cases (14.05%). Thus renal pathology was seen to be less when compared to the present day studies [2]. In Amandeep Kaur et al study 75% of autopsy kidneys showed nephropathology. This study included mostly the farming population who were exposed to the fertilizers and pesticides. They consumed well water that was contaminated with pesticides and fertilizers that affected the kidneys adversely [1]. Slightly lower count was observed by Monga et al. Study conducted by Hailemariam S et al on 237 autopsies showed presence of glomerular and vascular lesions in 28%, non-glomerular lesions in 33% and combined lesions in 29% [9]. In our study in 0.61% (Glomerulonephritis) and 0.82% (Benign Nephrosclerosis) and 0.61% (Kidney Infarct). Out of 69 autopsies, renal pathology was the cause of death in 20 cases. In remaining 49 cases cause of death was different and renal lesion was an associated finding [2]. Other renal lesions mentioned in our study Table.2 were not encountered in other studies.

### IV. Conclusion

We conclude that renal lesions though clinically silent sometimes can be detected in postmortem histopathological study. Glomerular lesions are less common than the non-glomerular lesions. It should be noted that through autopsy large number of preventable renal lesions can be discovered and hence can be prevented in future management of patients. Medical autopsies are dwindling these days which ought to be revived. Thus autopsy kidneys do carry much significance in proper diagnosis and patient care. In the present times life style diseases are more rampant all affecting the kidneys so much so the study of autopsy kidneys becomes very essential. In our present institution also autopsy and surgical kidney specimen study would be carried out by us further to study the disease trends.

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