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## Profile of Nephrectomy in A Tertiary Care and Teaching Hospital at Mysuru: A Retrospective Study

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**Abstract**

*Introduction:* Nephrectomy is the surgical removal of a kidney. The Indications for nephrectomy include kidney cancer, severe trauma to the kidney and benign disease such as symptomatic hydronephrosis, chronic infection, polycystic kidney disease, shrunken kidney, hypertension or renal calculus. The purpose of the present study is to investigate the indication for nephrectomy in tertiary care at Mysore, India. *Materials and Methods:* It is a retrospective study based on medical records of patients who underwent nephrectomy from period of July 2017 to October 2018. It was studied based on indication, clinical presentation. *Statistical Analysis:* The data obtained was expressed as Mean  $\pm$  S.D and percentage. The comparison was made using one-way ANOVA with a *p*-value less than 0.05 as statistically significant. *Results:* Out of the 25 nephrectomies, 21 were performed for nonmalignant condition, 4 were for malignant condition. Among nonmalignant condition most are due to obstructive pathology caused by stone (09), PUJ obstruction in 06, infective in 4, stricture in 2 patients. *Conclusion:* In spite of recent advance in diagnosis and treatment, preventable cause continues to play major role in in countries like India.

**Keywords:** Nephrectomy; Malignant; Benign; Stone; Stricture; PUJ Obstruction.

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**Introduction**

The kidney important organ in maintaining normal physiological function of body like excretion of waste in form of urea, maintaining blood pressure, maintaining fluid, electrolytes and production of red blood cells. Having many functions in same kidney will get affected in many pathological conditions that will lead to nephrectomy if left untreated.<sup>1</sup>

Nephrectomy is the surgical removal of a kidney. It is commonly performed in patients with renal cell carcinoma or other forms of kidney cancer. The Indications for nephrectomy include kidney cancer, severe trauma to the kidney and benign disease such as symptomatic hydronephrosis, chronic infection, polycystic kidney disease, shrunken kidney, hypertension or renal calculus.<sup>2</sup> The most common type of kidney cancer is renal cell cancer.

Nephrectomy either simple or radical is removal

of diseased kidney. A simple nephrectomy is indicated in patients with irreversible kidney damage due to symptomatic chronic infection, obstruction, calculus disease, or severe traumatic injury. Simple nephrectomy is also indicated to treat renovascular hypertension due to noncorrectable renal artery disease or severe unilateral parenchymal damage caused by nephrosclerosis, pyelonephritis, reflux dysplasia, or congenital dysplasia of the kidney.

Radical nephrectomy is the treatment of choice for localized renal cell carcinoma. In certain circumstances, radical nephrectomy is also indicated to treat locally advanced renal cell carcinoma and metastatic renal cell carcinoma.<sup>3</sup>

With the advent and increasingly mainstream use of abdominal CT scanning and ultrasound imaging in recent years for various abdominal and, occasionally, chest complaints, incidental detection of renal cell carcinoma has increased in asymptomatic patients. Currently, more than 50% of renal cell carcinoma cases are detected incidentally. These tumors tend to be smaller and of lower stage, resulting in better survival rates, lower recurrence rates, and lower metastasis rates than renal cell carcinoma detected in symptomatic patients. Symptomatic renal cell carcinoma presents at a significantly higher stage and grade, and tumors are substantially more aggressive than incidentally discovered lesions, particularly at later stages.<sup>4</sup>

Since, the nephrectomy has many indications for both simple and radical approaches, the present study was undertaken to gain information about the indication and complications of nephrectomy.

## Materials and Methods

This retrospective study was conducted between July 2017 to October 2018 in the department urology at Krishna Rajendra Hospital, a tertiary referral centers and teaching hospitals attached to the Mysore Medical College in Mysore, Karnataka, India. The study was conducted after the institutional ethical clearance. The total number of nephrectomies performed in the above said period were evaluated with reference to indication and condition of patients were analyzed.

Nephrectomy of all the functional kidneys were included. Whereas, that of the nonfunctional kidney was excluded. A non-functioning kidney is defined as the one having thin parenchyma on USG /CT, no contrast uptake in intravenous urography and

having decreased (<15%) renal function on nuclear scan.

## Statistical Analysis

The data obtained was expressed as Mean  $\pm$  S.D and percentage. The comparison was made using one-way ANOVA with a *p*-value less than 0.05 as statistically significant.

## Results

In the present study period, we found a total of 25 nephrectomy conducted. Out of which, 11 were males and 14 were females (Fig. 1).

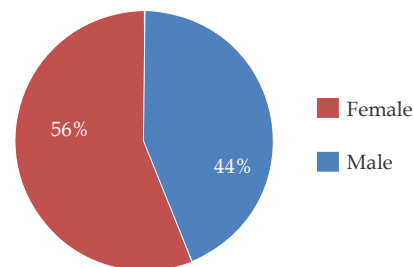


Fig. 1: Gender wise distribution of patients underwent nephrectomy during the study period.

Out of 25 nephrectomies, 21 (84%) were conducted for benign reason (84%) and only 4 (16%) were for malignant condition (Fig. 2).

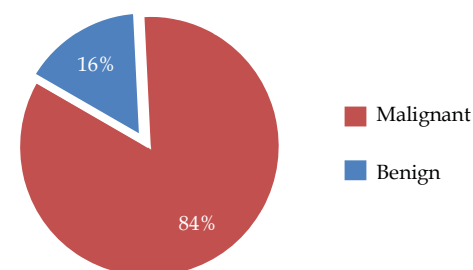


Fig. 2: Number of nephrectomies based on cause during the study period.

When the age-wise distribution of patients underwent nephrectomy during the study period, depending on the cause was analyzed, we found that patients belongs to age group of 1-11 years, only benign cause was observed, similarly more benign case was seen in the age group of 19-30 years. Whereas, in the age group of 31-50 years and >50 years, malignant cases were more and malignant case was significantly higher ( $p < 0.001$ ) as compared to benign case in the patients above 50 years of age (Fig. 3).

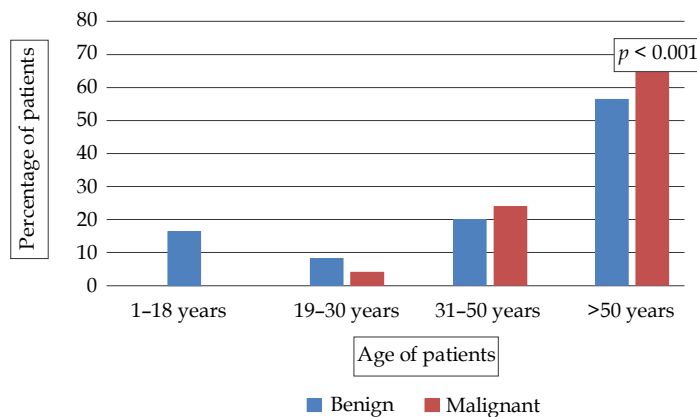


Fig. 3: Age-wise distribution of patients underwent nephrectomy during the study period.

Out of 21 patients who underwent nephrectomy in the benign group during the study period, 9 had stone related etiology, 3 had stricture, 4 patients had etiology secondary to pyonephrosis and 5 patients had etiology pelvic ureteric junction (PUJ) obstruction. On comparison, the stone related

etiology was significantly higher ( $p < 0.001$ ) as compared to other cause (Fig. 4). Among malignant causes, renal cell carcinoma is significantly higher ( $p < 0.001$ ). 3 were detected in Stage 2 carcinoma and one patient had sever disease adherent to surrounding important structure (Fig. 5).

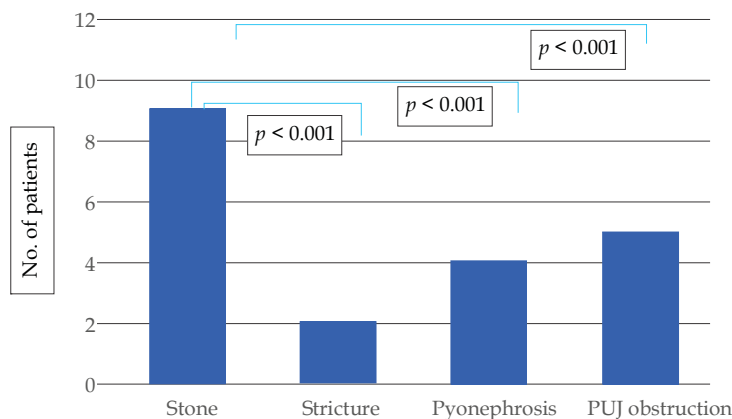


Fig. 4: Number of patients with different cause in the benign group underwent nephrectomy during the study period.

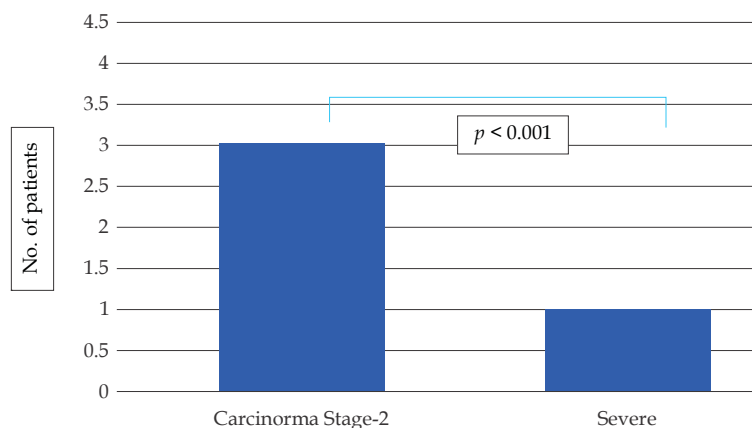


Fig. 5: Number of patients with different cause in the malignant group underwent nephrectomy during the study period.

Number of patients underwent nephrectomy based on the side involved during the study period was shown in (Table 1). In the benign case group, 12 had nephrectomy of right side whereas, 9 patients

had nephrectomy of left side. In the malignant case, 2 had nephrectomy of right side and 2 patients had nephrectomy of left side.

**Table 1:** Number of patients underwent nephrectomy based on the side involved during the study period.

Cause	Right kidney	Left kidney	Total
Benign	12	09	21
Malignant	02	02	04
<b>Total</b>	<b>14</b>	<b>11</b>	<b>25</b>

## Discussion

The kidney like other organs is liable to different diseases vary from congenital diseases, inflammatory and neoplastic lesion. First successful nephrectomy was done by Dr. Gustav Simon in the year 1869. Since then various approaches, techniques, types have been developed and practiced.<sup>1,2</sup> In report of a study conducted at Sudan<sup>3</sup> and Saudi Arabia around 70% cases were performed for benign condition.<sup>4</sup> Similar study from other parts of India showed that, more than 60% of nephrectomy was for benign condition.<sup>5</sup> Similarly, in a series of 135 nephrectomies reported from Pakistan,<sup>6</sup> 76.6% cases were due to benign causes.

Our present study is concordance with these studies. The nephrectomies performed were 25. Benign causes for nephrectomies were 84% as compared to malignant causes which were 16%. In most of the study series from developing countries<sup>1-3</sup> apart from Nigeria,<sup>7,8</sup> benign disease was leading cause for nephrectomies.

The incidence of nephrectomies for benign conditions is decreasing in developed countries. Reason behind this is early detection and better treatment modalities that prevent the need for surgeries are available for benign lesions of kidney in developed countries compare to developing country.<sup>9,10</sup>

## Conclusion

In spite of recent advance in diagnosis and treatment, preventable cause continues to play major role in cause/indication for nephrectomy, i.e. obstruction which is secondary to stone/stricture in countries like India.

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