

Original Research Article

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Study of 46 nephrectomies in rural India

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ABSTRACT

Background: The first planned nephrectomy was performed by the German surgeon Gustav Simon on August 2, 1869 in Heidelberg since then nephrectomy has been an essential part of urologic practice. Elective nephrectomy is done for both benign and malignant diseases of the kidney. The objective of this study was to know the various causes their pre-op factors like age, gender, laterality of disease, and intra operative factors like duration of surgery, blood loss and post-operative complications and histopathological report of the nephrectomy specimens of elective nephrectomy in a rural medical college of India

Methods: In our series, we have studied all the elective nephrectomies done in Pravara Rural Hospital, Loni during a span of three years from January 2018 to March 2021.

Results: We have analyzed 46 cases of nephrectomies regarding their pre-op factors like age, gender, laterality of disease, and intra operative factors like duration of surgery, blood loss and post-operative complications and histopathological report of the nephrectomy specimens. Out of 46 cases, 21 were males and 26 females. Comparing the laterality right nephrectomy was done in 41% cases and left nephrectomy in 59% cases. In our series, 76% cases of nephrectomies were done for benign causes and 24% cases for malignant causes. Among the benign causes, pyelonephritis was the leading cause followed by neglected renal calculi and resultant non-functional kidney. On the other hand, renal cell carcinoma was the most common malignant pathology requiring nephrectomy.

Conclusions: In our series, majority cases of nephrectomies were done for benign causes.

Keywords: Nephrectomy, Non-functional kidney, Benign and malignant renal conditions

INTRODUCTION

The first planned nephrectomy was performed by German surgeon Simon. Simple nephrectomy is an extirpative procedure commonly performed for nonfunctional kidney due to benign causes. Indications for simple nephrectomy include non-functioning kidney due to calculas disease or PUJ obstruction

Emphysematous pyelonephritis, chronic pyelonephritis etc. Radical nephrectomy is commonly performed in malignant renal mass. In today's era of advanced medical science the better understanding of disease, its causative factors, gender prevalence, stages and changing patterns of the clinical presentation of the patient demands high

clinical suspicion and more refined methods for further management of the disease. Nephrectomy can be performed by laparoscopy or open surgical approach even though laproscopy offers certain set of advantages like short hospital stay and less post-op analgesia, open methods are preferred in the rural centers due to lack of essential resources where laparoscopic in more advanced centres.^{1,2} In this study we retrospectively analyzed the patient records who underwent nephrectomy at our centre for varying conditions. We have analyzed different age groups, gender, ratio, etiologies, preponderance, laterality of age disease, histopathological findings of the elective nephrectomy patients. The main objective of this study was to know the various causes their pre-op factors like age, gender, laterality of disease, and intra-operative

factors like duration of surgery, blood loss and post-operative complications and histopathological report of the nephrectomy specimens of elective nephrectomy in a rural medical college of India.

METHODS

Study type

The study type was retrospective cross sectional observational nonanalytical study.

Study place

The study was carried out at Pravara rural hospital, Loni.

Study duration

The study duration was 3 years from January 2018 to March 2021.

Selection criteria

Inclusion criteria

Patients with following criteria's were included- (a) undergoing nephrectomy for various causes at Pravara Rural Hospital Loni; and (b) with age group 0 to 90 years.

Exclusion criteria

Patients who were above 90 years of age were excluded.

Procedure

A total number of 46 cases of nephrectomies were studied from clinical records in. Data included age, gender, laterality of disease, and intra operative factors like duration of surgery, blood loss and post-operative complications and histopathological report.

RESULTS

According this study age group observed with patients between age 41 to 50 years had maximum nephrectomies. The predominant cause of nephrectomies in age group below 45 years was due to benign causes and above 45 years were due to malignant causes. In age group below 15 years maximum nephrectomies were due to benign

causes in which PUJ obstruction was single most leading cause followed by non-functional kidney due to various causes like renal calculi pyonephrosis and renal dysplasia followed by 2 cases of multi-cystic dysplastic kidney and 1 case of polycystic kidney and only one nephrectomy was due to a malignant cause. Out of 46 nephrectomies 21 were performed on male patients and 26 were performed on female patients male to female ratio was 1:1.19. Right sided nephrectomy was performed in 41% of cases and left sided nephrectomy was performed in 59% cases. Right to left laterality ratio was 1:1.42.

During the study it was seen that out of 25 females 6 females underwent radical nephrectomy for malignant cause and 19 females underwent simple nephrectomy for benign causes and in out of 21 males 5 males underwent radical nephrectomy for malignant cause and 16 males underwent simple nephrectomy for benign cause. In our series total, 76% cases of nephrectomies were done for benign causes and 24% cases for malignant causes. Among the benign causes, non-functional kidney due to neglected renal calculi and PUJO out of which was the leading cause followed by neglected renal calculi and resultant non-functional kidney. On the other hand, renal cell carcinoma was the most common malignant pathology requiring nephrectomy. In the benign causes non-functional kidney due to neglected renal calculi and PUJO had 18 cases followed by non-functional kidney which had 7 cases as a result of stag horn calculi, pyelonephritis and. Among them 80 percent were nephrectomy and 20% nephroureterectomy. nephroureterectomy was performed due to presence of distal ureteric stone. Followed by acute pyelonephritis had 3 cases, nephrectomy was done in acute pyelonephritis due to xanthogranulomatous pyelonephritis in one case, acute suppurative changes and necrotizing pulp of kidney in another case.

Followed by multi cystic dysplastic kidney, polycystic kidney and renal dysplasia one case each. Among malignant causes radical nephrectomy was performed in 63% cases for renal cell carcinoma 18% cases of squamous and 10% cases of Wilms and urothelial carcinoma respectively. Radical nephrectomy with bladder cuff excision was done in transitional cell carcinoma. Mean operative time for simple nephrectomy was around 2 hours and that for radical nephrectomy was around 3 hours. Post-operative stayed for both simple as well as radical nephrectomy was on an average 10 days of hospital stay.

Table 1: Benign and malignant cause of nephrectomies.

Causes of nephrectomy	No. of patients	Percentage (%)
Benign causes	35	100
Non-functional kidney due to neglected renal calculi and PUJO	18	51.43
Non-functional kidney due to stag horn calculi	4	11.43
Non-functional kidney due to pyelonephritis	3	8.57
Acute pyelonephritis	3	8.57
Emphysematous pyelonephritis	2	5.71
Multi cystic dysplastic kidney	3	8.57

Continued.

Causes of nephrectomy	No. of patients	Percentage (%)
Polycystic kidney	1	2.86
Renal dysplasia	1	2.86
Malignant causes	11	100
Renal cell carcinoma	7	63.60
Squamous cell carcinoma	2	18.20
Urothelial carcinoma	1	9.10
Wilms tumour	1	9.10

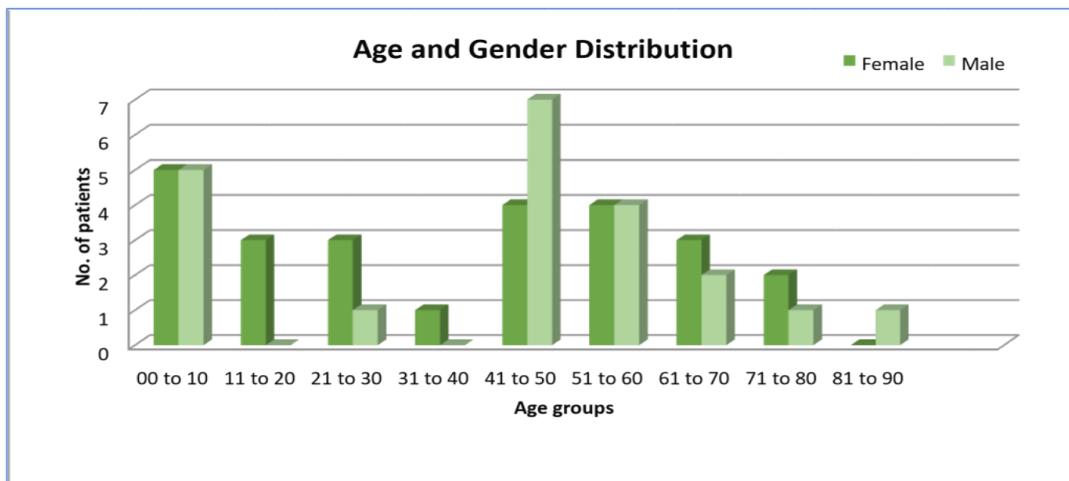


Figure 1: Age and gender distribution.

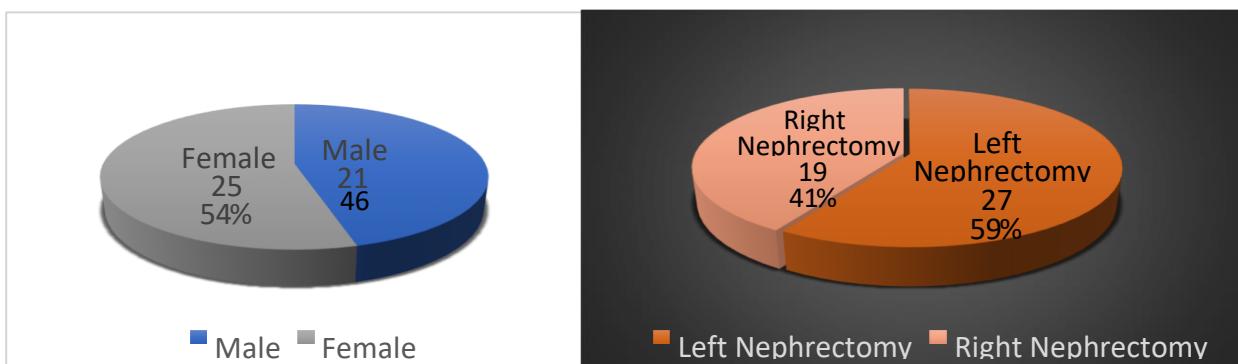


Figure 2: Gender distribution and laterality of nephrectomies.

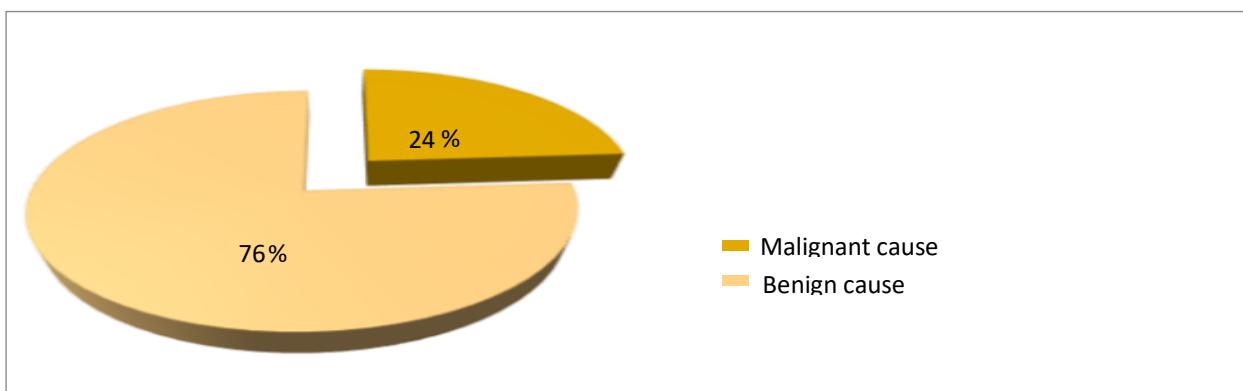


Figure 3: Comparison between malignant and benign cause of nephrectomies.

DISCUSSION

Nephrectomy definitely has a variation according to socio-economic background and availability of health care facility. Most common age group to undergo nephrectomy was between 40-50 years. This is in concordance with the study done by Swarnalatha et al where, the most common age group affected is 5th decade.⁵ This is variable with other studies done by Reddy et al and Kumar et al where the maximum number of patients were in 4th decade.^{3,4} However, in a study done by Aimenet et al most common age group affected is 2nd to 3rd decade.⁵

In our study there was female preponderance with F:M ratio of 1.19:1. This finding was in variable with studies done by Reddy et al, Ashima et al, Ajmera et al, Bharti et al which, have showed male predilection.^{3,5,8,9} In a study done by Shanmugaswamy et al there was equal male and female preponderance.⁶ In our study, non-neoplastic lesions were most common with 35 cases (76%) than neoplastic lesions 11 cases (24%). Similar findings were seen with studies of Reddy et al, Amin et al, Shanmugaswamy et al, Kumar et al where non-neoplastic lesions were most common indications for nephrectomy.^{3,4,6,7} In present study, non-functional kidney due to renal calculi and PUJO was the most common lesion followed by multi-cystic dysplastic kidney, acute pyelonephritis and xanthogranulomatous pyelonephritis. This is in concordance with findings of study done by Raffique et al where the most common indication for nephrectomy cases in non-neoplastic lesion was renal stone disease.⁹ This was in variation with study by Amin et al where chronic pyelonephritis with hydronephrosis was the most common lesion followed by multi-cystic renal dysplasia.⁷

Chronic pyelonephritis was also the most common lesion in other studies like Reddy et al, Aiman et al, Devi et al, Shanmugaswamy et al and Kumar et al.³⁻⁸ In our study nephrectomies due to malignant cause was 24% and that due to benign causes was 76%. The reported rates of nephrectomy for renal malignancies accounted for 66.70% of all indications from studies in Boateng et al at Ghana and by Kyei et al renal malignancy accounted for 54% of all nephrectomies from Nigeria and Norway were 67.3 and 68%, respectively.^{10,11,13} In a recent series of adult nephrectomies from Nigeria, 63% cases were performed for malignant conditions of the kidney.¹²

Beisland et al have also reported a change in the indications for nephrectomy in Norway during the last few decades, with an increase in the number of nephrectomies being performed for malignant conditions of the kidney.¹³ There was also a change in the indications for nephrectomy in a center of Korea where 13.75% cases of nephrectomy were done for renal tumor in the period from 1980 to 1987 whereas 57.12% cases of nephrectomy were done for renal tumor in the period from 2000 to 2005.¹⁴

Philips et al also reported that in a series of 121 cases, 52 (75.3%) cases of laparoscopic nephrectomy were done for malignant diseases and 69 (24.7%) cases for benign cause.¹⁶ Similarly, in our study of 46 nephrectomies at Pravara rural hospital, Loni, Maharashtra 24% were due to malignant causes and 76% due to benign causes. This is comparable with studies from north east India, Bangalore, Rajasthan and Pakistan these have a lower socioeconomic status and lesser availability of healthcare facilities and thus the benign conditions are being ignored at primary level leading to nephrectomy.

Whereas in socio-economically advanced and resourceful places malignant kidney disease was the predominant cause.

CONCLUSION

In our series, majority cases of nephrectomies were done for benign causes. Although in developed countries most of the nephrectomies are performed for malignant diseases, benign conditions of the kidney are the leading cause in the developing world. Screening and education programmes are needed to decrease the rate of nephrectomy for preventable causes as due to pyelonephritis and non-functional kidney due to neglected renal calculi.

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Ethical approval: Not required

REFERENCES

1. Partin AW, Peters CA. Campbell-Walsh Urology. 3rd ed. USA: Elsevier; 2020.
2. Clinicopathological study of nephrectomy specimens Rajiv Gandhi University of health sciences, Karnataka, Bangalore. 2020.
3. Reddy KD, Gollapalli SL, Chougani S, Shivalalitha S, Mohammed A. A clinicmorphological spectrum of nephrectomy specimens-an experience from a tertiary care hospital. Int J Health Sci Res. 2016;6(11):67-72.
4. Kumar A. A histopathological study of non-neoplastic lesions in nephrectomy specimens. Int J Med Human Res. 2017;3(2):137-8.
5. Ajmera S, Ajmera R. Histopathological spectrum of lesions in nephrectomies- A five year study. Int J Sci Res. 2017;6(7):44-6.
6. Shanmugasamy K, Anandrajvaithy VK, Kotasthane DS. Histopathological spectrum of nephrectomy specimen in a tertiary care centre: with an emphasis on chronic pyelonephritis. Ann Path Lab Med. 2017;4(5):573-8.
7. Aiman A, Singh K, Yasir M. Histopathological spectrum of lesions in nephrectomy specimens. A five year experience in a tertiary care hospital. J Sci Soc. 2013;40(3):148-54.

8. Amin AN, Pai P, Upadhyaya K. A Histopathological spectrum of nephrectomy specimens in a tertiary hospital in southern India. *Int J Biol Med Res.* 2013;6(3):5173-8.
9. Rafique M. Nephrectomy: indications, complications and mortality in 154 consecutive patients. *J Pak Med Assoc.* 2007;57(6):308-11.
10. Otu-Boateng K, Amoah G, Appiah K, Azorliade R, Gyasi-Sarpong C, Maison P, et al. Analysis of Adult Nephrectomies at the Komfo Anokye Teaching Hospital, Kumasi, Ghana. *Open J Urol.* 2020;10:93-100.
11. Kyei MY, Klufio GO, Mensah JE, Gyasi RK, Attee S, Ampadu K. Nephrectomy in adults: Experience at the Korle Bu Teaching Hospital, Accra, Ghana. *Saudi J Kidney Dis Transpl.* 2015;26(3):638-42.
12. Eke N, Echem RC. Nephrectomy at the University of Port Harcourt Teaching Hospital; A ten year experience. *Afr J Med Sci.* 2003;32:173-7.
13. Beisland C, Medby PC, Sander S, Beisland HO. Nephrectomy-indications, complications and post-operative mortality in 646 consecutive patients. *Eur Urol.* 2000;37:58-64.
14. Badmus TA, Salako AA, Sanusi AA, Arogunta A, Oseni GO, Yusuf BM. Adult nephrectomy: Our experience at Illefe. *Niger J Clin Pract.* 2008;11(2):121-6.
15. Kim K, Cho C. Analysis of the causes of nephrectomy in 1980-2005. *Urology.* 2007;70 (3):34.
16. Phillips J, Catto JW, Lavin V, Doyle D, Smith DJ, Hastie KJ, Oakley NE. The laparoscopic nephrectomy learning curve: a single centre's development of a de novo practice. *Postgrad Med J.* 2005;81(959):599-603.

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