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Original Research Paper

Urology

ETIOLOGY AND OUTCOMES OF SIMPLE NEPHRECTOMY FOR NON FUNCTIONING KIDNEY: INSIGHTS FROM OUR INSTITUTIONAL EXPERIENCE

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ABSTRACT Here we present 50 cases operated for simple nephrectomy in the department of urology, which is studied over the period of two year (June 2022- June 2024). Simple nephrectomy done in both open and laparoscopic approach. In our study, Open nephrectomy done in 35 cases, rest 15 cases in laparoscopic approch. 6 out of 15 cases (40%) were converted to open because of technical difficulties like dense adhesion, torential bleeding. As repeated or persistent infection and inflammation may lead to scarring, fibrosis, and adhesions and poses more surgical challenges during dissection The etiology of non-functional kidney may vary case to case. This include of Pelvi-ureteric junction obstruction (PUJO), Xanthogranulomatous pyelonephritis (XGPN), Emphysematous pyelonephritis (EPN), PUJ/ ureteric stone, Ureteric stricture, Duplex system with non-functioning kidney and Ectopic kidney with PUJO. Renal stones are most common benign cause responsible for most of the nephrectomies and PUJO is the 2nd most common etiology. Surgical approach should tailored on individual case to case basis.

KEYWORDS : Inflammation, non-functioning kidney, simple open nephrectomy, laparoscopic simple nephrectomy

INTRODUCTION

Simple Nephrectomy being one of the most commonly performed procedure by a urologist.

Simple nephrectomy for benign disease is a surgical technique that involves the removal of a non-functional kidney. The loss of renal function may be caused by a variety of benign conditions. Most of these causes are of preventable nature. Patients undergoing simple nephrectomy requires thorough pre-operative planning as they represent a very diverse groups. Some individual cases present major challenges for urologist at every step of the process Nephrectomies were performed for pain, recurrent UTIs (urinary tract infection), gross hydronephrosis or hydroureteronephrosis. There is increase in surgical difficulties because of the inflammatory processes, scarring, fibrosis which are involving renal hilum and surrounding perirenal tissues. Therefore, complications may be encountered more often in simple nephrectomies than radical nephrectomies.

Aim and Objective

The aim of the study was to study indications, demographic details and complications of patients undergoing simple nephrectomy.

The study was to identify the various etiologies contributing for the same.

Inclusion criteria

All the patients presenting with Non functioning kidney (Diagnosis supported by functional study i.e. DTPA (diethylenetriamine pentaacetic acid) Renogram, DMSA (dimercaptosuccinic acid) scan.

Exclusion criteria

1. Malignant renal tumor.
2. Chronic kidney disease.
3. Donor nephrectomy.
4. Emergency trauma nephrectomy.

MATERIALS AND METHODS

A retrospective study was done for 50 patients operated for simple nephrectomy in our institute for a 2 year from June 2022 to June 2024.

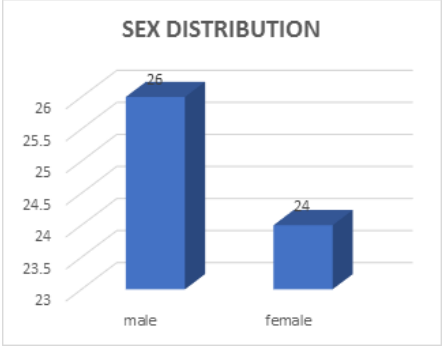
The data of patients who underwent laparoscopic nephrectomy and open simple nephrectomy with non-functional kidney were collected retrospectively for the study. Patients with non-functioning kidney were enrolled into the study-based DTPA (diethylenetriamine pentaacetic acid) and DMSA (dimercaptosuccinic acid) scans. The sociological data of the patients such as sides of kidney, percentage of non-functioning kidney, duration of the hospital stay. Surgical complications, catheter removal day and drain removal day were documented. Preoperative assessment was done with routine investigations, such as complete blood count, renal blood test, coagulation profile, urine routine, urine culture, blood grouping, and typing and viral markers. If urine culture is positive, the required antibiotic is given for appropriate time period and the urine culture is repeated and preceded for the surgery if the urine culture is negative. General anesthesia was used during open simple nephrectomy and laparoscopic nephrectomy. A foley catheter and nasogastric tube were inserted for patients undergoing surgery. The laparoscopic nephrectomy was done in lateral position. The open simple nephrectomy was done in lateral position with flexed operation table and flank approach.

RESULT

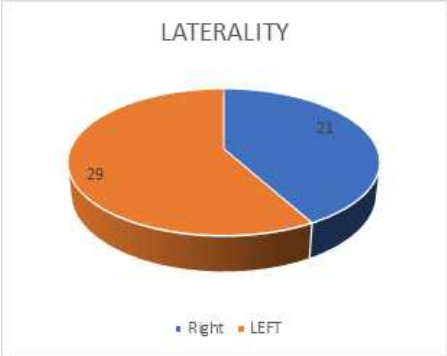
50 patients were included in the study.

The mean age of the patients was 45 ± 14.

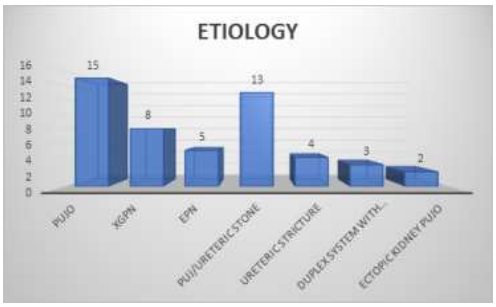
The 26 patients were male and 24 were female included in study.



There were 29 patients having done right sided nephrectomy and 21 patients having left sided nephrectomy.



There having various etiologies that caused non functioning kidney in our studies like there were 15 cases of pelvi ureteric junction obstruction (PUJO), 8 cases of xanthogranulomatous pyelonephritis (XGPN), 5 cases of emphysematous pyelonephritis (EPN), 13 cases of PUJ/ ureteric stone, 4 cases of ureteric stricture, 3 cases of duplex system with non functioning kidney and 2 cases of ectopic kidney with PUJO.



The overall complication rate was 10 % with 9 Clavien Dindo II complications that being managed conservatively and 1 Clavien Dindo V complication (death).

The mean hospital stay 6.79 ± 1.39 days.

Open nephrectomy done in 35 cases, rest 15 cases done using laparoscopic approch.

Out of 15 cases attempted laparoscopically, 6 cases were converted to open because of technical difficulty.

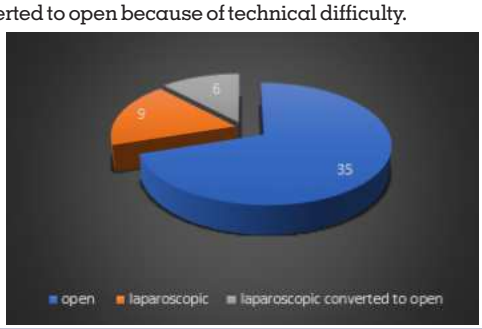


fig. (a) fig. (b) fig. (c)

fig a- cut section of non functioning kidney with large impacted PUJ stone
fig b- x ray showing multiple intrarenal, upper ueretric and lower ureteric calculi
fig c- cut section of non functioning kidney with multiple intrarenal and upper ureteric stone.

DISCUSSION

Simple nephrectomy is indicated for benign and non functioning kidney, which caused by stones, infection and obstruction. In developing countries delayed referral is also a main cause of nephrectomies due to benign reasons. Repeated or persistent infection and inflammation may lead to scarring, fibrosis, and adhesions. These factors poses more surgical challenges during dissection, especially near hilar region of kidney.

The etiology of non-functional kidney may vary case to case. This include of Pelvi-ureteric junction obstruction (PUJO), Xanthogranulomatous pyelonephritis (XGPN), Emphysematous pyelonephritis (EPN), PUJ/ ureteric stone, Ureteric stricture, Duplex system with non-functioning kidney and Ectopic kidney with PUJO.

Simple nephrectomy can be much more challenging than radical nephrectomy. This is because recurrent infections cause an intense inflammatory reaction and the kidneys become adherent to the surrounding tissues. Besides, severe inflammatory reactions developed around the renal pedicle in these patients, which may make the dissection of the renal pedicle difficult and sometimes impossible via the laparoscopic route.

Conversion to open surgery is often observed in laparoscopic benign nephrectomies. Its rate is even higher in patients with xanthogranulomatous pyelonephritis.

In our study, the mean age of the patients was 45 ± 14 and there was no gender preponderance. There were 29 patients having done right sided nephrectomy and 21 patients having left sided nephrectomy.

In our study, the main cause of non-functional kidneys were stones There were total 21 cases caused directly or indirectly by stone diseases i.e. (8 cases of XGPN + 13 cases of PUJ/ ureteric stones). And the PUJO being the second most common cases i.e total of 17 cases (15 cases of PUJO + 2 cases of Ectopic kidney with PUJO). Other causes like Emphysematous pyelonephritis (EPN), Ureteric stricture, Duplex system with non-functioning kidney were also contributed.

In our study, there were 9 clavian dindo grade 2 complications, that was managed conservatively with medical management. And among 50 patients there were 1 death.

In our study, Open nephrectomy done in 35 cases, rest 15 cases done using laparoscopic approch. 6 out of 15 cases (40%) were converted to open because of technical difficulties like dense adhesion, torential bleeding.

CONCLUSION

Renal stones are most common benign cause responsible for

most of the nephrectomies and PUJO is the 2nd most common etiology. The choice between laparoscopic and open simple nephrectomy should be individualized based on patient's characteristics, surgeon expertise and institutional resources. Surgical approach should tailored on individual case to case basis.

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