



ISSN: 2091-2749 (Print)  
2091-2757 (Online)

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## Outcome of laparoscopic nephrectomy in benign renal disease

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### ABSTRACT

**Introductions:** Laparoscopic surgery is a rapidly emerging option in urology. With the advances in technology and instruments, currently this is viable alternative to treat complex surgical diseases as well as reconstructive surgery.

**Methods:** This was a prospective observational study to analyze the outcome of laparoscopic nephrectomy. A total of 51 patients had undergone laparoscopic nephrectomy over the period of five years. The variables analyzed were, age, sex, operative time, estimated blood loss, length of hospital stay, conversion rate and complication.

**Results:** The patients' mean age was 41.1 years (range 15-71 years). Indications for nephrectomy were non-functional kidney secondary to stone disease in 26 (50.98%). Mean operative time was 1.43 hours. Median hospital stay was 2.3 days.

**Conclusions:** Laparoscopic surgery is a safe and feasible treatment option for benign renal diseases with comparable outcomes. Non-functional kidney secondary to renal stone was the major cause of nephrectomy in this study.

**Keywords:** benign renal disease, laparoscopic nephrectomy, nephrolithiasis, non-functional kidney

## INTRODUCTIONS

Laparoscopic surgery is currently a viable alternative with decreased blood loss, shorter hospital stay, fast recovery, lower morbidity and rapid return to full activity compared to open surgery.<sup>1,2</sup>

Aim of this study was to analyze the indications, operative time, hospital stay and outcome of laparoscopic nephrectomy in a local setup.

## METHODS

This was a cross sectional study to analyze the outcome of laparoscopic nephrectomy in case of benign renal disease. The study period was from October 2011 to October 2016. The variables included were, age, sex, operative time, estimated blood loss, length of hospital stay, conversion rate and complications.

Nephrectomy was done for non-functional kidney, chronic pyelonephritis, symptomatic atrophied kidney and renal tuberculosis. Routine DTPA (diethylenetriaminepentacetate) scanning was done before surgery in patients' non-excreting kidney.

Patient with history of previous multiple surgeries in the same side, history of laparotomy and patient refusal for laparoscopy were excluded. Only patients with performance status grade 0-2 (WHO classification) were included.

After pre-anesthesia checkup, surgery was planned on a given date. The surgery was performed under general anesthesia (GA). All patients underwent laparoscopic nephrectomy through trans-peritoneal approach. Surgery concluded by three ports techniques and one additional port created in right side for liver retraction and with or without one assistant port in both side.

The decision regarding the conversion was obtained during the surgery, based on intra operative findings. All procedure done by same group of surgeons based on

international and hospital protocol. Routinely, we placed Foley catheter and Romo Vac drain of 16F in all patients with nasogastric tube in selected cases.

Patients were initially seen one week after the surgery and then after 1 month and thereafter according to need. During the follow up, patients were evaluated by complete physical examination, complete renal profile and blood counts and electrolytes, USG abdomen and pelvis whenever needed to see the status of contralateral kidney.

## RESULTS

The patients' mean age was 41.1 years (range 15-71 years). Non-functional kidneys secondary to stone disease 26 (50.98%) were most common indication for nephrectomy. Pain was the common presenting symptoms in 32 (62.74 %) patients.

Median operative time was 1.43 hours. Five patients needed conversion. Median hospital stay was 2.3 days.

**Table 1. Patient demographics and indication of laparoscopic nephrectomy**

Variables	Values
Mean Age	41.1 (15-17 years)
Male	19 (37.25%)
Female	32 (62.74%)
<b>Indication for Nephrectomy</b>	
Chronic Pyelonephritis	11 (21.56%)
Non-functional Kidney due to stone	26 (50.98%)
Non-functional Kidney due to PUJ obstruction	11 (21.56%)
Others	3 (5.8%)
<b>Clinical Presentations</b>	
Flank Pain	32 (62.74%)
UTI	8 (15.68%)
Incidental	11 (21.56%)

**Table 2. Outcome of laparoscopic nephrectomy**

Variables	Values
Median Operative time	1.43 (1.25 to 3.5 hours)
Blood Transfusion	3 cases
Number of Conversion	5 (9.8%)
Median day of hospital stay	2.3 (2-7) Days
Perioperative complication Clavien Score	
1	42 (82.35%)
2	5 (9.8%)
3a	4 (7.27%)

## DISCUSSIONS

Minimally invasive approaches in urology have become common procedure. Numerous studies show the decreased blood loss, shorter hospital stay and lower patient morbidity in laparoscopic surgeries when compared with open surgery.<sup>3-5</sup>

When Clayman et al. performed the first laparoscopic nephrectomy, it became milestone in minimally invasive surgery throughout the world. Since 1990, laparoscopy helped in removing a large solid organ without need of incision.<sup>1</sup> Since then, many institutions have verified the utility of laparoscopic approach to deal with different pathology of the kidney.

Laparoscopic surgery has its advantages but, like all other surgical therapeutic interventions, it also carries a risk of complications. In fact, with increasing laparoscopic surgical experience, the incidence and magnitude of complications have also increased because of more complex procedures performed laparoscopically.<sup>6</sup> Meticulous dissection along with timely identification and management of complications is important step in surgery; in case of delay, it can lead to significant patient morbidity.<sup>7</sup>

The overall surgical outcome of our study is comparable to other series. Several large series have demonstrated that laparoscopic nephrectomy compares favorably with open surgery with regards to decreased pain and

shorter convalescence. Hospital stay has been decreased by 50% and the time to full convalescence has been reported to be markedly less than open surgery.<sup>8</sup> Median period of hospital stay in this series was 2.3 days.

Mean operative time in our study was 1.43 hours (range 1.25 to 3.5 hours). With growing experience, current operative times have decreased dramatically and are comparable to those in the open group.<sup>9</sup> There is controversy in literature concerning the selection between trans-peritoneal and retroperitoneal laparoscopic access for nephrectomy. The chosen technique usually depends on the surgeon's own choice, expertise and training. Here all patients had undergone laparoscopic surgery through trans-peritoneal route.

Majority of the patients in this study fall in perioperative complication of Clavien score 1, only 9 (17.64 %) patients have minor postoperative complication. The overall complication rate has ranged from 6-17% in contemporary series with minor complications encountered in predominant portion. In comparison, a review of urological reports gives a vascular complication rate of 0.03-2.7%.<sup>10,11</sup> In a multi-center analysis of 153 patients undergoing laparoscopic nephrectomy for benign conditions, Gill et al. reported complications in 19 (12%) patients with most of the complications (12) occurring in the first 20 cases performed.

Five patients needed conversion in this series (9.80%); three patients due to bleeding and two due to adhesion. Conversion rates have also ranged from 5-12% with a large contemporary series by Gupta et al. reporting the need for conversion in 22 out of 351 retroperitoneoscopic nephrectomies, yielding a conversion rate of 6.3% with most of them occurring in the first 100 cases.<sup>12,13</sup> Five patients required conversion to open surgery, out of which 4 cases were amongst the first 20 that were performed in their study.<sup>14</sup> Other authors have also documented a learning curve for laparoscopic nephrectomy in terms of complication and conversion rates.<sup>15</sup> In this

study, we have seen comparable result in different variables.

## CONCLUSIONS

Laparoscopic nephrectomy can be considered as a safe and effective procedure with minimal morbidity. It has considerably, reduced postoperative pain, recovery time and improved cosmetic results. The laparoscopic approach has become the standard approach for nephrectomy in this institution especially in benign renal disease.

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