Chattagram Maa-O-Shishu Hospital Medical College Journal
Volume 23, Issue 2, July 2024

Original Article

Initial Experience of Laparoscopic Radical Nephrectomy for Patients with Localized and Locally Advanced Renal Cell Carcinoma

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Date of Submission : 27.03.2024
Date of Acceptance : 30.04.2024

www.banglajol.info/index.php/CMOSHMCJ

Abstract

Background: *There has been a dramatic increase in the interest X Practice of Laparoscopic urological procedures. Leparoscopic Nephectomy for both Berign and Melignant Diseases of Kidney is incuesingly being performed. The aim of the study to evaluated the results of our initial experiences of laparoscopic nephrectomy cases performed in patients with local and locally advanced renal cell carcinoma.*

Materials and methods: *It was a retrospective study. From July 2020 to July 2023, 17 patients underwent laparoscopic nephrectomy for local and locally advanced renal cell carcinoma. The duration of operation , blood loss, total hospital stay, perioperative complications and follow-up time were evaluated.*

Results: *The mean age of the patients was 56.8 (33-72). Mean duration of operation was 140.4 (75-190) minutes and the duration of hospital stay was 3.2 (2-5) days. Renal vein thrombus in 3 patients perirenal fat tissue invasive in 9 patients. In 2 patients, the tumor exceeded the fascia gerota. The mean follow-up period was 18.3 (6-42).Two patients had lung metastasis during follow- up. Two patients died in the 5th and 36th months following the operation.*

Conclusion: *Radical nephrectomy improves the survival in patients with local and locally advanced renal tumors. Although laparoscopic approach has some difficulties in these patients but the minimal invasive treatment can be safely performed by experienced surgeons.*

Key words: Laparoscopy; Locally advanced stage; Renal cell carcinoma.

INTRODUCTION

Renal Cell Carcinoma (RCC) accounts approximately 2-3% of all malignancies.[1] More than 50% of renal masses are detected incidentally where they do not causes symptoms until progress into advanced stages.[2,3] At diagnosis, 20% of patients had localized and locally advanced disease, 25% had metastatic one.[4] The primary treatment of kidney tumor is surgery. With the recent development of minimal invasive techniques, better visualization due to magnified field, less bleeding, less morbidity, less hospital staying, reduce analgesic requirement and better cosmetic results were observed in laparoscopic surgery compare to open surgery.[5,6] The initial limitation of longer operative times and high cost is now considered less prominent issue due to wide adoption and increasing experience. European Urological Association (EUA) recommends Laparoscopic Radical Nephrectomy (LRN) for localized and locally advanced masses where partial nephrectomy cannot be done.[7,8] Recently it is shown that LRN can be done safely in locally advanced cases, though some technical difficulties had shown in some previous experiences.[9-11] In this study, we aimed to share our initial experiences of LRN in case of localized and locally advanced RCC.

MATERIALS AND METHODS

Data of 17 patients who underwent Laparoscopic Radical Nephrectomy (LRN) in three tertiary hospital (Chittagong Medical College Hospital, MAX Hospital and Royal Hospital, Chattogram) by same surgical team between July 2020 to July 2023 were retrospectively analyzed. Inclusion criteria; patients with localized and locally advanced renal tumor (T2, T3 or positive lymph nodes), patients without metastasis in preoperative imaging, patients without contraindication of laparoscopic surgery. CT Urogram with angiogram phase was performed to all patients preoperatively. Age, body mass index, tumor size, operation time, blood loss, hospital stay, perioperative complications, histopathology and follow up periods were evaluated. Intraoperative and postoperative complications were graded according to Clavein- Dindo classification.

All operation were performed transperitoneally. Perurethral catheter and nasogastric tube were inserted after general anesthesia. Patients were placed in modified lateral decubitus position. Pneumoperitonium was established by transperitoneal Verses needle technique. Three to five port were used. First 10 mm port was placed lateral to the umbilicus. A second 10 mm port was placed under 1/3 lateral of the line between anterior superior iliac spine and umbilicus under direct vision. Third port was placed on the midclavicular line 1-2 cm below the costal border. Other extra ports were used for liver or other organ retraction and haemostasis source. Harmonic Scalpel or LigaSure were used as energy source during dissection. The peritoneum lateral to the colon was incised and colon was reflected medially. The ureter was identified and dissected upto the renal hilum. The hilar vessels were dissected carefully and the renal artery was clipped first followed by the renal vein. The vessels were cut by using a Hem-o-lok clip. In patients with renal vein thrombus, margins of the tumor thrombus were identified by the prominence of renal vein. Grasper was used to compressed and milking the thrombus back before applying Hem-o-lok clip. All operations were performed by the same surgical team with experience in laparoscopy in tertiary level hospitals.

RESULTS

We included total 17 patients in our study where 7 men and 10 women whose mean age was 56.8 (33 - 72). The mean tumor size was 101.5 (68 -170) mm. Mean operation time was 140.4 (75 -190) minutes and the estimated blood loss was 135.5 (30 - 300) ml. Two patients converted to open method due to vascular injury during laparoscopic dissection of renal pedicle and required two units of blood transfusion. The mean duration of hospital stay was 3.23 (2 -5) days. Only two patients had short term post operative fever with UTI that responded to medical therapy. Four patients had renal vein thrombus and in 3 patients tumor extended up to fascia gerota. Adrenalectomy was also performed in 2 patients because the mass was in the upper pole and adherent to adrenal gland. But adrenal gland invasion was not found in any case. Surgical margin of all the patients were found free. The mean follow up period was 18.3 (6 -42) months. Metastasis was detected in 3 patients (Lung, liver). Two patients were died in 7th and 36th month following operation. Demographic and perioperative data of the patients are shown in Table I.

Table I Demographic and perioperative data of patients

Parameter	Values
Number of patients (n)	17
Men: Women	1 : 1.45
Mean Age (Years)	56.8 (33 - 72)
Left/ Right	9 / 8
Mean Tumor Size (mm)	101.5 (68 - 170)
Mean Operative Time (min)	140.4 (75 - 190)
Mean Blood Loss (ml)	135.5 (30 - 300)
Hospital Stay (Days)	3.23 (2 - 5)
Mean Follow-up Time (Months)	18.3 (6 -42)
Pathology	
Clear Cell RCC	10 (66.67%)
Papillar RCC	4 (26.67%0
Chromophore RCC	1 (6.6%)

DISCUSSION

Laparoscopic Radical Nephrectomy (LRN) was first performed by Clayman et al.[12] Later on, a tremendous improvement has been noticed in laparoscopic urology with modern minimal invasive surgery and increased surgical experience. Approximately 61% of radical nephrectomy is now performed laparoscopically.[13] LRN has a definite role in localized stage of RCC. It has been to be more advantageous in terms of blood loss, need of analgesia, length of hospital stay and healing process compare to open surgery and has similar oncological results.[2,4,14] For these benefits of laparoscopic surgery, it was thought that LRN could be performed in patients with locally advanced stage of RCC.[15] Bragaryac, et al. performed laparoscopic/robotic radical nephrectomy in 67 patients with pT3 and pT4 stage RCC and Open Radical Nephrectomy (ORN) in 105 patients. Mean operative time was 294 minutes, mean estimated blood loss was 270 cc and the mean hospital stay was 3.5 days in laparoscopic/ robotic group. They concluded that, hospital stay and blood loss were more advantageous than open procedure.[10] Nayak et al. shared the results of 176 patients of T3 RCC who underwent laparoscopic surgery where the mean tumor size was 7 cm, mean operation time of 124 minutes and mean estimated blood loss was 150 cc .[15] According to Stewart GD et al, the mean operative time of LRN patients for locally advanced RCC was 150 minutes, mean estimated blood loss was 100 ml, the conversion from laparoscopy to open surgery was 6.4% and the hospital stay was 5 days.[16] Laird, et al. compared 25 LRN and 25 ORN for T3 RCC patients in their study. In LRN group, tumor size was 8.7 and mean operation time was 135 minutes, mean estimated blood loss was 100 ml and the hospital stay was 4 days.

Perioperative results were better in LRN group.[9] In our study, the mean tumor size was 10.5 cm, mean operation time was 2 hours 20.4 minutes and the mean estimated blood loss was 135.5 ml. The mean duration of hospital stay was 3.23 days. The perioperative results showed that LRN can be safely applied in case of locally advanced RCC.

The most important step of cancer surgery is how it affects in oncological outcomes. Bragayrac LA. et al, showed that the patients with locally advanced RCC who underwent ORN and LRN/Robotic RN were followed up for an average of 32.8 months where there was no significant difference in overall survival (p=0.8) between two groups.[10] Nayak et al, followed 176 patients of T3 RCC who underwent LRN for a mean of 22.6 months. Distal metastasis seen in 43 patients, 3 patients had local recurrence and 6 patients died during follow up.[15] In another study, involving 94 patients who underwent LRN foe locally advanced RCC, the follow up period was 24.8 months where 12 patients had distant metastasis and 5 patients had local recurrence.[13] In a study, Laired A et al. comparing patients who underwent LRN and ORN with stage T3 RCC, the mean follow-up period was 54.6 months in LRN group and 57.6 months in ORN group. Overall survival was not different between the two groups.[9] In our study, the mean follow-up period was 18.7 (6-42) months. Two patients noticed lung metastasis during follow-up. No local recurrence was observed. Two patients died following radical nephrectomy in 5th and 36th months.

Locally advanced renal tumors are a bit difficult for laparoscopic surgery due to thrombus in renal vein or vena cava and hemorrhage caused by excessive neovascularization of large tumors. Therefore, case selection and the experience of the surgeon are very important. In our study, all cases were operated by the same surgical team experienced in laparoscopy.

LIMITATION

We faced some limitation in this study. The number of cases is small and the absence of patients with vena caval thrombus in the locally advanced staged RCC may be affect the perioperative results. Overall survival and cancer specific survival were not evaluated due to low sample size. Finally, the follow up period was short.

CONCLUSION

Laparoscopic Radical Nephrectomy (LRN) appears to be a safe and effective minimal invasive treatment option in selective cases in patients with localized and locally advanced RCC when performed by experienced surgeons. To confirm and established our results, prospective randomized studies with more number of patients and longer follow up time are required.

DISCLOSURE

All the authors declared no competing interest.

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