Case Report

Laparoscopic Radical Nephrectomy for Large Renal Tumor with Small Wound Extraction - A Case Report and Technical Considerations in Rajavithi Hospital

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Laparoscopic radical nephrectomy is advantage superior to opened surgery in regard to perioperative morbidity, postoperative pain, time of hospitalization and convalescence. The location and size of surgical specimen extraction wound is correlated with cosmetic, pain and convalescence because of big size of incision and some location can cause of pain by cutting and retraction of wound during removed specimen. However, most studies concern tumors smaller than 7 cm and the role of laparoscopy for large primary tumors is not clearly established. The purpose of the study is to present the operative technique and to discuss several unique problems that arise during the laparoscopic procedure in patients with large renal masses by small specimen extraction wound.

Keywords: *Kidney, Large renal tumor, Radical nephrectomy, Laparoscopy*

J Med Assoc Thai 2018; 101 (Suppl. 2): S170-174
Full text. e-Journal: *http://www.jmatonline.com*

Laparoscopic radical nephrectomy (LRN) is advantage superior to opened surgery in regard to perioperative morbidity, postoperative pain, time of hospitalization and convalescence[1-3]. The location and size of surgical specimen extraction wound is correlated with cosmetic, pain and convalescence because of big size of incision and some location can cause of pain by cutting and retraction of wound during removed specimen. In some paper report many number of trocar site and incision of specimen extraction by Gibson, Pfannenstiel and flank incision but our report was used only 3 to 4 trocar site and specimen extraction at the same site of umbilical trocar[4-6]. However, most studies concern tumors smaller than 7 cm and the role of laparoscopy for large primary tumors is not clearly established. The purpose of our study is to present a single case of a large renal tumor treated laparoscopically, and to discuss the operative technique with small specimen extraction wound.

Material and Method

A 53 years old man present with left renal mass without medical problem which was diagnosed by a urologist. The physical examination revealed a palpable mass in the left subcostal area of the abdomen. The CT whole abdomen with contrast was shown a large volume tumor (10.7 cm in diameter) in the upper part of the left kidney (Fig. 1). CT and chest x-ray were negative for metastatic disease. There were normal in basic laboratory

Fig. 1 CT whole abdomen in lateral view was shown enhancing upper pole renal mass with central necrosis.

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examinations. The patient was informed and consent for surgical treatment by left transperitoneal laparoscopic radical left nephrectomy.

The surgical steps, the patient was place in a true left flank position and vertical to flat operating table. The first trocar was created at umbilicus by opened technique and insert balloon tip trocar into peritoneal cavity. The pneumoperitoneal was achieved in a standard manner at 15 mmHg. The two additional trocars (1x5 mm and 1x10 mm) were insert by under laparoscopic vision at the level of imaginary line between xyphoid process and anterior superior iliac spine (ASIS) as shown in Fig. 2. The left side colon was dissected and reflex medially in the the plain above Gerota fascia. The ureter and gonadal vein was identified and elevated to the anterior abdominal wall by striated needle suture from outside abdomen. This technique made function like an internal retractor as shown in Fig. 3. Dissection was performed along alignment of ureter and gonadal vein to identified renal vein and artery as shown in Fig. 4. The branch of left renal vein was identified and ligation was performed at adrenal vein, lumbar vein and gonadal vein by 5 mm titanium clips.

The renal artery was identified and double ligation by 10 mm Hemolock clip and the renal vein was double ligation at proximal to level of adrenal vein by 10 mm Hemolock clip. The superior and lateral aspect dissection of kidney was performed. The ureter and renal vein was ligation by 10 mm Hemolock clips. Bleeding was check and cauterization. A 5 mm closed suction drain was inserted through the port left. The specimen was inserted into Rajavithi retrieval bag and extraction through the camera trocar at umbilicus as shown in Fig. 5, 6. The operative time was 240 minutes. The blood lost during the operation was 300 ml. There were no post-operative complications. The size of specimen extract wound is 4cm as shown in Fig. 7. The time of start ambulation was 2nd day and post-operative analgesic used were only one dose. The time for resumption to oral intake was 3rd days. The suction drain was removed on the 3rd day after the surgery. The patient was discharged from hospital on the 5th day after the operation. The Pathological findings are Left renal cell carcinoma PT2b, Tumor diameter-12 cm (total

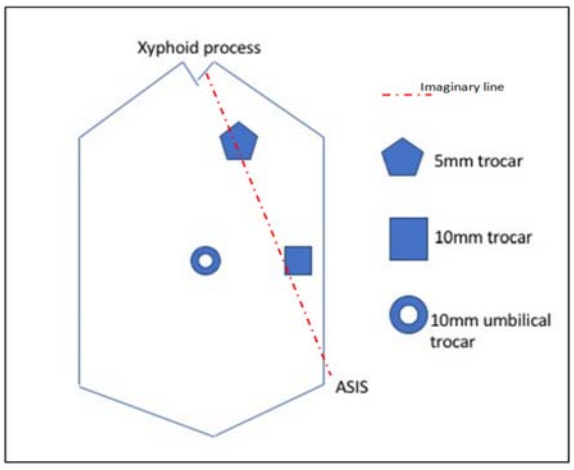

Fig. 2 Trocar position of laparoscopic left radical nephrectomy.

Fig. 3 Striated needle suture from outside abdomen to elevate ureter and gonadal vein.

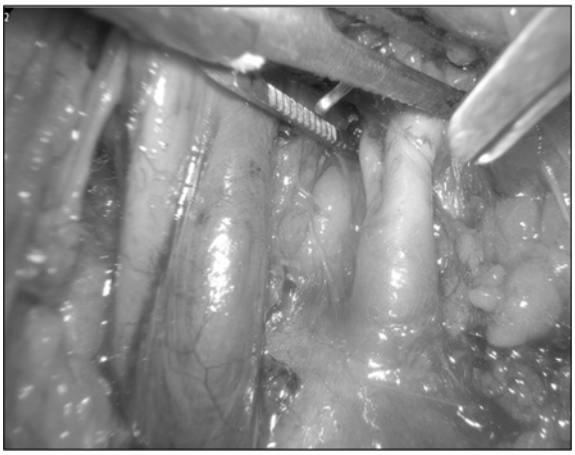

Fig. 4 Left renal vein and artery.

Fig. 5 Rajavithi retrieval bag.

Fig. 6 Rajavithi retrieval bag remove through umbilical trocar.

Fig. 7 Surgical scar and size of specimen extraction wound.

Fig. 8 Gross specimen of left kidney.

size of kidney is 14 cm), clear cell, Fuhrman: G3, free margin. The gross specimen was shown in Fig. 8.

Discussion

According to 2017 guidelines of European Association of Urology, laparoscopic nephrectomy is recommended in T2 and smaller tumors not suitable for nephron sparing surgery[7]. Progress in laparoscopy makes it possible to treat tumors greater than 7 cm, which form the T2 category of primary tumors. Many series paper were report tumor volume increase[8,9], several unique technical problems arise during the laparoscopic procedure. The operation is usually more difficult because of: strong limitation of working space, greater likelihood of nodal involvement, and renal vein thrombus, and problems with the operator's orientation caused by displacement of the surrounding organs. The author is familiar with intraperitoneal approach because of large work space and familiar anatomy identification. The laparoscopists were needed meticulous dissection to prevent associated organ injury. Once injury are occur, the early detection and correction is more important in reduce morbidity and mortality. The transperitoneal approach seem to be safer for the patient with large tumor and easier to entrap the large specimen in to the Rajavithi retrieval bag (High Density Polyethylene specimen bag)[10]. The Author was used only 3 trocar for LRN compare to the other literature were used 5 to 6 trocar. The number of trocar were reduced by technique of internal retractor. The

internal retractor technique was used striated needle suture to elevated ureter and gonadal vessel without increase number of trocar. This technique was advantage in renal pedicle identification like anatomy landmark especially in more internal fat and large tumor that distort anatomy which difficult to dissection. In this report the author used the umbilical port for site of specimen bag extraction. Because of the umbilicus had curve elastic skin fold and no muscle in this line that can extract the large renal tumor and less post-operative pain. The one more important thing to reduce the specimen extraction wound is Rajavithi retrieval bag that strong to hold specimen during extraction without rupture of bag[10]. LRN in large renal tumors may result in the increase of the operative time but such increase usually does not result in any adverse patient outcome[11]. Our operation time was 300 min and was slightly longer than the mean operative time for LRN, which is 240 min at our institution. Blood loss during the operation was 300ml, however, in the literature a trend can be noted toward a greater EBL for patients with large tumors[9,13,14]. In the Author's patient was not found complication. Gong et al. demonstrated that the postoperative complication rate and length of stay after LRN were similar in patients with clinical Stage T1 and T2 tumors[13]. Steinberg et al. reported that patients with T2 tumors had perioperative parameters comparable to patients with Stage T1. The patients also showed decreased perioperative morbidity and shorter convalescence than those having an open radical nephrectomy performed[9]. The important parameters of laparoscopic oncological surgery are 5 years survival rate, local recurrence, and port-site recurrence. The data on the above parameters available the results of laparoscopic radical nephrectomy for large renal tumors (T2N0M0) with the results of open radical nephrectomy reported that there was no difference in 5 years survival data between the compared groups. There were also no local or port site recurrences after laparoscopy[11]. The oncological results were similar to those presented by other authors for T2 tumors[12] and The EAU guideline 2017 mention oncological outcome for T!-T2a tumor are equivalent between laparoscopic and opened radical nephrectomy[7]. In Rajavithi Hospital, laparoscopic radical nephrectomy has been for over 10 years a standard procedure in patients who are not candidates for nephron sparing, the results of the technique equal the results of open surgery. Laparoscopy in large tumors has some advantages comparing to open surgery, such as a smaller scar (standard incision for radical nephrectomy is approximately thrice the size of ours) and better visualization of the hilar vessels. Furthermore, the blood loss is usually negligible and the operating time in skilled hands is comparable to open nephrectomy. It seems to us that laparoscopic nephrectomy in large renal tumors can be safely performed in more cases center, but because of several unique technical problems mentioned above it should not be a standard of care at the beginning of the learning curve.

Conclusion

The Author opinion the advantages that laparoscopy offers in terms of analgesic requirement, hospital stay, blood loss, ambulation, and return to normal activity persist for larger tumors with no additional complications. This report study used only 3 trocar position and specimen extraction through same 1 in 3 trocar at umbilicus that can cause reduce pain and cosmetic advantage. However LRN in large volume tumors is a technically demanding procedure with several unique technical that should be performed by experience urological laparoscopist but for the beginner laparoscopist can be apply this technique in T1 renal cell carcinoma to develop skill before step to apply in large tumor.

What is already known on this topic?

Laparoscopic Radical nephrectomy can perform in large tumor in selected case and improve post operative pain by small specimen extraction wound

This technique can reduce port site by internal retractor.

What this study adds?

The factor of successful in operation is case selection by CT scan evaluation in renal vascular pedicle and tumor invasion to adjacent structure. The umbilicus has skin fold that advantage for specimen remove and Rajavithi retrieval bag was more strong to keep specimen during extract specimen The both of them were important factor to reduce extracted wound size.

Potential conflicts of interest

None.

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