

Single Centre Experience of Transperitoneal Radical Tumour Nephrectomy

Rana Ata ur Rehman, Fazal Ur Rehman Khan, Shahzad Ashraf, Nadir Khan, Nasir Abraham, Muhammad Muzammil Tahir and Muhammad Usman Khan

Department of Urology and Kidney Transplantation, Shaikh Zayed Hospital, Lahore

ABSTRACT

Objective: To share the experience of radical nephrectomy through transperitoneal approach. **Material and methods:** After approval from ethical committee and the consent from patients a retrospective study was conducted extending from January 2012 to January 2014 to identify clinical characteristics of renal cell carcinomas, staging, per operative and early post operative complications. The study included all renal cancer patients presented to Sheikh Zayed Hospital Lahore with in this specified period. Detailed history and physical examination was performed. Haematological and radiological investigations including abdominopelvic ultrasonography and CT scan abdomen and pelvis were performed to stage the renal tumour. High resolution CT chest was performed where indicated. Radical nephrectomy performed through transabdominal approach and outcomes measured in terms of per-operative and early postoperative complications. **Results:** There were total of 50 cases. The male to female ratio was 3:2. Mean age of patients was 52.38 (18-93) years. Most common clinical presentation was gross haematuria (66%). The mean tumour size was 8.34 (3-24) cm. Operative findings were suggestive of tumor limited to Gerota's fascia in 40 patients (80%) and in 6 (12%) tumor was extending into renal vein or inferior vena cava. In these cases, venacavotomy had to be performed. Lymphadenectomy was performed in 2 patients (4%) who were having enlarged hilar lymph nodes. Total operative time ranged between 120 to 180 minutes. Intra-operative splenic injury was seen in 2 (4%), while aortic injury was observed in one (2%) patient. Post operatively one (2%) developed pulmonary embolism, 2 (4%) chest infection while 2 (4%) developed wound infection and 3 patients (6%) required blood transfusion. Tumour histology was clear cell in (84%), papillary transitional cell carcinoma (12%) and oncosytoma contributed 4%. **Conclusion:** We observed that large number of the patients presented with haematuria and most of them were male. Radical nephrectomy along-with removal of tumour thrombus is a valuable method for the treatment of renal cell carcinoma having tumour thrombus either in renal vein or inferior vena cava. Common pathological type was clear cell carcinoma.

Key Words: Renal cell carcinoma, Clinical presentation, Radical nephrectomy.

INTRODUCTION

PPrimary renal tumours in adult are renal cell carcinomas, which are responsible for 80-85% of tumours, followed by transitional cell carcinoma (TCC). Renal cell carcinoma is relatively rare in pediatrics where it is replaced by William's tumour. Globally; the incidence of RCC varies widely from region to region with the highest rates observed in the Czech Republic and North

America¹. Over last decades the incidence of RCC has been increased and the size of mass decreased at diagnosis and so the stage, with proportional increases in 5years survival rate. This may be due to wide use of new imaging techniques and incidental diagnosis which approached more than (50%) along with early surgical intervention. There are number of environmental and clinical factors which may be the possible cause of RCC.^{2,3} These including hypertension, acquired cystic disease of the kidney

(typically associated with dialysis), obesity, hepatitis C, smoking, occupational exposure to toxic compounds such as cadmium and asbestos, analgesic abuse nephropathy. Genetic abnormalities are also responsible such as Von Hippel-Lindau gene, which are found in 50-60% of cases, deletion of chromosome 3p and mutations in the p53 gene had been implicated.^{2,4,5,6,7}

Symptoms associated with RCC may be due to some factors, such as local tumour growth, hemorrhage, para neoplastic syndromes or metastatic disease. With the more frequent use of non-invasive imaging for the evaluation of nonspecific symptom, more than 50% of RCCs are now detected incidentally.⁸ The classic trait of flank pain, hematuria and abdominal mass present in about 10–15 % of patient and indicate an advance disease.

An estimated 4% to 10% RCCs have a tumor thrombus present in the venous circulation, specifically the renal vein and IVC and in 1% of cases it has extension into the right atrium. Despite advances in radiation, chemotherapy, and immunotherapy the reference standard for RCC with tumor thrombus remains surgical resection. Several studies have demonstrated 5-year survival rates of up to 60% in the absence of metastatic disease in patients who have venous tumor thrombus treated with radical nephrectomy and tumor thrombectomy.⁹

Robson presented the operative principles of radical nephrectomy in the 1960s, which became the “gold standard” treatment for localized RCC. Open renal surgery may be carried out by four principal routes: extraperitoneal flank approach, dorsal lumbotomy, abdominal incision, or thoraco-abdominal incision. The standard technique of open radical nephrectomy includes early control of hilar vessels, removal of kidney with perirenal fat and Gerota’s fascia. It has been suggested in many studies that the removal of ipsilateral adrenal gland is not necessary if the tumour is located in the lower pole of the kidney or is smaller than 5cm in diameter.¹⁰

Most important point in the management of renal cell carcinoma is early identification, yet unfortunately, the classic signs of a renal cancer (gross hematuria, flank pain and renal mass) often

represent advance disease. However, not all signs and symptoms caused by renal cell carcinoma imply advance disease nor do they have prognostic implications. Many are, in fact, reversible following treatment of the cancer.

We share the experience of radical nephrectomy through transperitoneal approach in patients of renal cell carcinoma presented in Shaikh Zayed Hospital, Lahore in a period extending from Jan 2012 to Jan 2014.

MATERIAL AND METHODS

After approval from Ethical Committee and consent of patients, a retrospective analytical study was conducted between January 2012 and January 2014. A total of 50 patients were admitted in Urology Department of Shaikh Zayed Hospital, Lahore. Data was collected from the available record providing details about the bibliography, detailed history, physical examination, tumour size, intra-operative and early post operative complications, Fuhrman grade, classification and histological subtype.

We diagnosed and staged the cases preoperatively based on computed tomography (CT) scans of the abdomen, pelvis; chest radiographs; serum electrolytes; and liver function test results. HRCT chest was performed in specific case. Only 6 patients underwent MRI to assess the venous extension (renal vein and inferior vena caval involvement). Chest X ray was the tool for lung and chest wall metastases, performed in all patients.

Radical nephrectomy was performed transperitoneally through an anterior sub-costal incision either unilateral or bilateral, depending upon the size of tumor and involvement of renal vein and inferior vena cava (Fig. 2a).

In our study we assessed total operative time, intraoperative and immediate postoperative complications and managed accordingly. After discharge from hospital, patients were followed up two weeks after the surgery and then three months after first visit.

We classified tumors according to the 2002 TNM staging system and according to Fuhrman grade. Tumour size, defined as the greatest diameter in centimeters, was based on pathological specimens.

RESULTS

Data analysis of fifty patients was done, out of fifty patients 30 (60%) were male while 20 (40%) females, male to female ratio was 3:2. Majority of our patients were aged more than 50 years (66%). Mean age of patients was 52.38 ± 12.58 years. About 75% of patients have duration of more than one month when presented to us first time. Most of the patients presented with gross haematuria 33 (66%), detail of clinical presentation is given in Table 1.

Table 1: Clinical presentation of renal tumor.

Clinical presentation	No.	%
Haematuria	33	66
Loin Pain	24	48
Asymptomatic (Incidental)	8	16
Loin mass	6	12
Systemic symptoms	5	10
Classical triad	4	8

The mean size of the tumour was 8.34 ± 4.48 cm. Majority of tumours were left sided.



Fig. 1: CT Scan showing level III thrombus (Thrombus at the level or above the hepatic veins, but below the diaphragm).

Operative findings suggestive of tumor limited to Gerota’s fascia in 40 patients (80%) and in 6 (12%) tumor was extending into renal vein or inferior vena cava. Of these 6 patients, 3 patients had level 1 thrombus (Thrombus extending into IVC, <2cm above renal vein), two (4%) with level II thrombus (Thrombus extending >2cm above the renal vein but below the hepatic veins) while one

patient had level III thrombus (Thrombus at the level or above the hepatic veins, but below the diaphragm). In these cases, venacavotomy had to be performed (Fig.1). Lymphadenectomy was performed in 2 patients (4%) who were having enlarged hilar lymph nodes (Fig. 2b and 2c).



Fig. 2a: Shows chevron incision for transperitoneal radical nephrectomy.

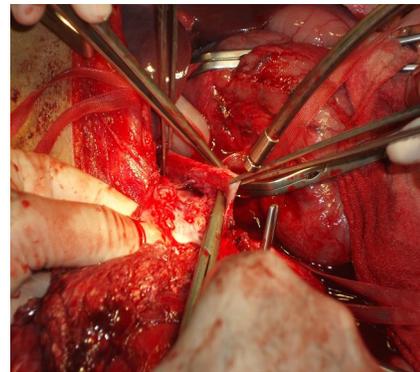


Fig. 2b: Shows venacavotomy and removal of thrombus.

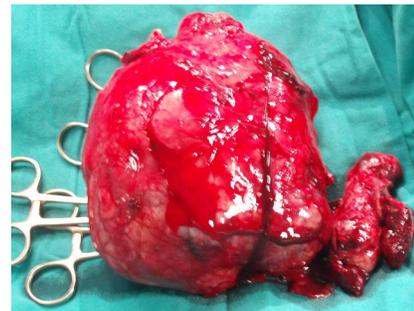


Fig. 2c: Shows radical nephrectomy specimen along with thrombus.

Total operative time ranged between 120 to 180 minutes. Intra-operative splenic injury was observed in 2 (4%) while aortic injury in one (2%) patient and one patient had colonic injury.

Post operatively one (2%) developed pulmonary embolism, 2 (4%) chest infection, 2 (4%) wound infection and 3 patients (6%) required blood transfusion. Mean hospital stay was seven days. Most common histopathology was clear cell carcinoma, detail of histopathology (Table 2).

Table 2: Histopathological type.

Type	No	%
Clear cell	42	84
Papillary cell	6	12
Oncytoma	2	4

DISCUSSION

This study is retrospective, descriptive and hospital based study. Very few local studies are available in pattern, presentation of renal tumors and experience of transperitoneal radical nephrectomy. We collected our data regarding these aspects and compared with international and available local data. The incidence of renal cancer among Asian countries is less compared to Western countries. The age adjusted incidence per 100,000 ranges from 9.3 to 11.6 in the Western population compared to 1.1 to 6.0 among the Asian population.¹¹ The analysis of patient's demographic feature showed male predominant with 3:2 which is comparable with available studies. Most of the cases in our review were more than 50 years and the peak incidence was between the fifth and sixth decades of life, which is one decade earlier than western world population where RCC is primary a disease of elderly with typical presentation in sixth and seventh decades.^{12,13}

The female gender is hypothesized to have lower incidence due to less risk factors like smoking and occupational exposures. Differences in sex hormone levels have no correlation with cancer incidence and therefore have no importance in renal cancer as compared to breast cancer.¹⁴

Local symptoms arise only after tumor achieved adequate size to displace or invade other

organs. In our study common presenting symptoms was haematuria (66%) loin pain (48%) and loin mass (12%). Symptomatic presentation is relatively different in Lagos study where haematuria (40.6%), loin pain (86%) and palpable loin mass (90.6%). The classical triad appeared in four patients 8%, it is similar to international reports 7-10%. The mean size of tumours in our study population was 8.34cm (3-24 cm) which is generally larger than reported mean sizes which range from 4.7-6.3cm.¹⁵ This shows that our patients present late and neglect their initial problems. In our study some patients (10%) presented with constitutional symptoms such as; pyrexia, weight loss and anemia, as documented in international literature.^{8,16} Our study population had a younger mean age at presentation (52.38 years) compared to other reports with mean age ranged between 62-66 years. However a younger mean age group of 53 years was also noted among the South Koreans.¹⁷

In our patients tumor limited to Gerota's fascia in 40 patients (80%) and in 6 (12%) tumor was extending into renal vein or inferior vena cava. These findings are comparable to a study conducted by Marshall F and his colleagues.⁹ In our cases venacavotomy and thrombectomy were performed after achieving proximal and distal vascular control. Lymphadenectomy was performed in patients who were having enlarged hilar lymph nodes.

Total operative time ranged between 120 to 180 minutes with a mean of 130 minutes, which is same as has been reported by Mejean.¹⁸ Intra-operative splenic injury was seen in 2 patients (4%), aortic injury one (2%) and colonic injury occurred in one (2%) patient. These results were compared with study conducted by Mejean where rate of intestinal complications was 1.8% and a splenic injury occurred in 8% of left nephrectomy. Post operatively one (2%) of our patient developed pulmonary embolism, 2 (4%) chest infection, 2 (4%) developed wound infection and 3 patients (6%) required blood transfusion. Wound infection was observed in 6.4% patients in the study by Harranz.¹⁹ However, no patient had wound infection in the study by Amanullah and associates.²⁰

Most common histology types in our study showed similar patterns compared to reported Western and Asian population, in which clear cell

was the dominant histology types (84%).¹⁷

CONCLUSION

Most of our patients presented in fifth decade. Most common presentation was haematuria. Transperitoneal anterior subcostal incision is the best approach especially for larger tumours. It gives excellent exposure of renal pedicle and useful for the management of intra-operative complications. Radical nephrectomy along with removal of tumour thrombus is a valuable method for the treatment of renal cell carcinoma having tumour thrombus either in renal vein or inferior vena cava.

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The Authors:

Rana Ata ur Rehman,
Trainee Registrar
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Fazal Ur Rehman Khan,
Associate Professor
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Shahzad Ashraf,
Professor
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Nadir Khan,
Assistant Professor
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Nasir Abraham,
Senior Registrar
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Muhammad Muzammil Tahir
Professor
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Muhammad Usman Khan
Professor
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore

Corresponding Author:

Rana Ata ur Rehman,
Trainee Registrar
Department of Urology and Kidney Transplantation,
Shaikh Zayed Hospital,
Lahore