

## Case Report

# A case of thoracoabdominal incision for nephrectomy in a patient with spine malformation

Ning Shao<sup>1,2</sup>, Chun Yang<sup>2</sup>, Ninghan Feng<sup>2</sup>, Deshui Yu<sup>2</sup>

<sup>1</sup>Department of Urology, Fudan University Shanghai Cancer Center, Shanghai 200032, China; <sup>2</sup>Department of Urology, Second People's Hospital of Wuxi, Nanjing Medical University, 68 Zhongshan Road, Wuxi 214002, Jiangsu, China

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**Abstract:** Open radical nephrectomy and laparoscopic radical nephrectomy were considered as standard treatment for renal cell carcinomas (RCC). However, it is difficult to operate on RCC patients with spine malformation by common methods. Under this circumstances, thoracoabdominal incision for nephrectomy could provide optimal exposure and may be a better choice. A 54-year-old woman with severe spine malformation was diagnosed with left renal cell carcinoma in our hospital. Computed tomography showed a 20\*30\*50 mm lower polar renal tumors. The patient underwent a thoracoabdominal incision for radical nephrectomy and recovered well. Up to now, no signs of recurrence or metastasis have been observed.

**Keywords:** Renal cell carcinoma, spine malformation, thoracoabdominal

## Introduction

Laparoscopic surgery gradually comprise the standard minimally invasive approaches to renal cell carcinomas (RCC) [1]. Due to the development of laparoscopic surgeries in recent years, many studies believed that laparoscopic radical nephrectomy (LRN) has less postoperative discomfort and shorter recovery period compared with (open radical nephrectomy) ORN [2, 3]. However, LRN may be difficult for some special patients, such as patients with severe spinal deformities, severe adhesions or multiple abdominal operation history [4]. In such situations, ORN may be a better choice [5]. Here we report a rare case of a 54-year-old RCC patient with severe spine malformation that have been successfully treated after a thoracoabdominal incision for radical nephrectomy.

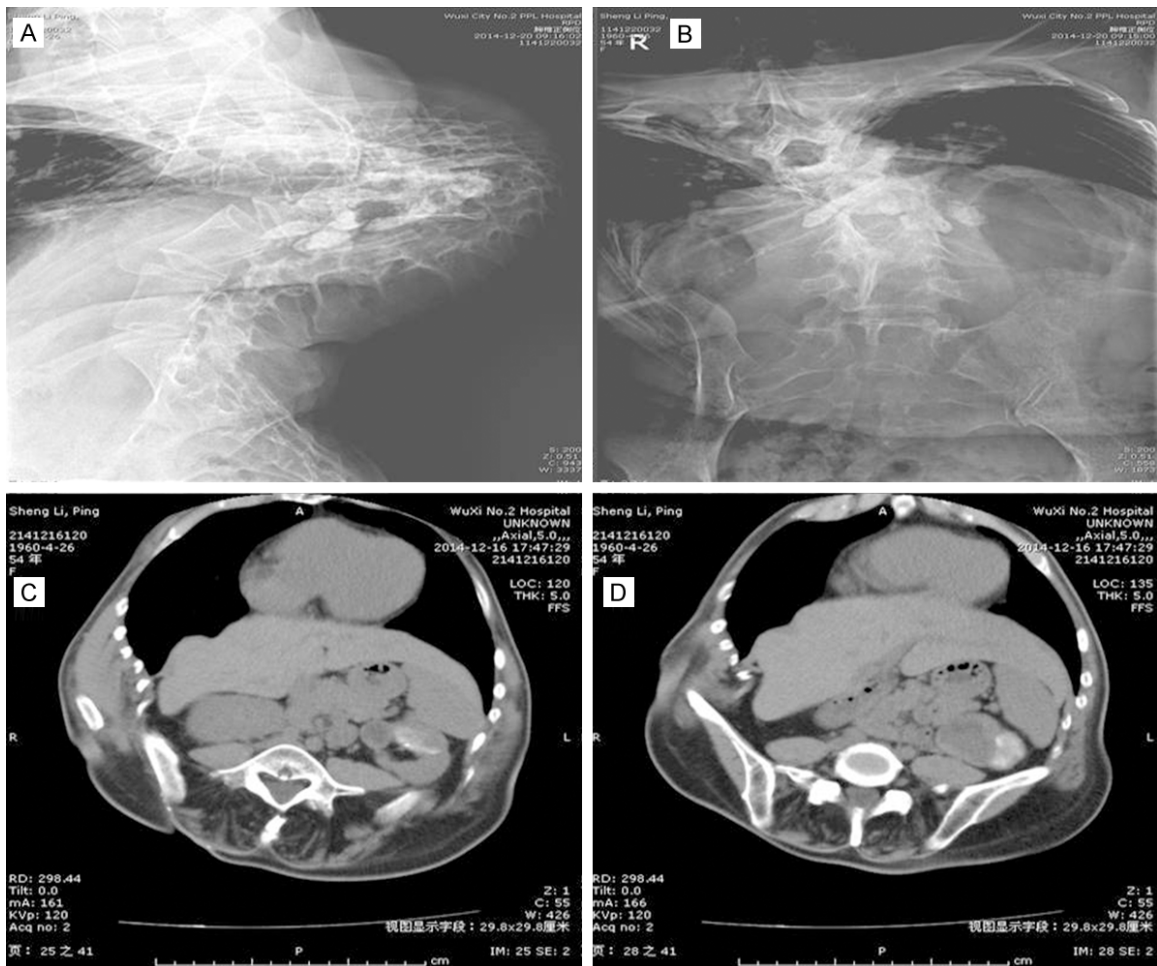
## Case report

A 54-year-old patient presented with left waist discomfort for a few months. However, there was no hematuria and fever. B-ultrasound and computed tomography of the abdomen and pelvis showed a 20\*30\*50 mm<sup>3</sup> tumor at

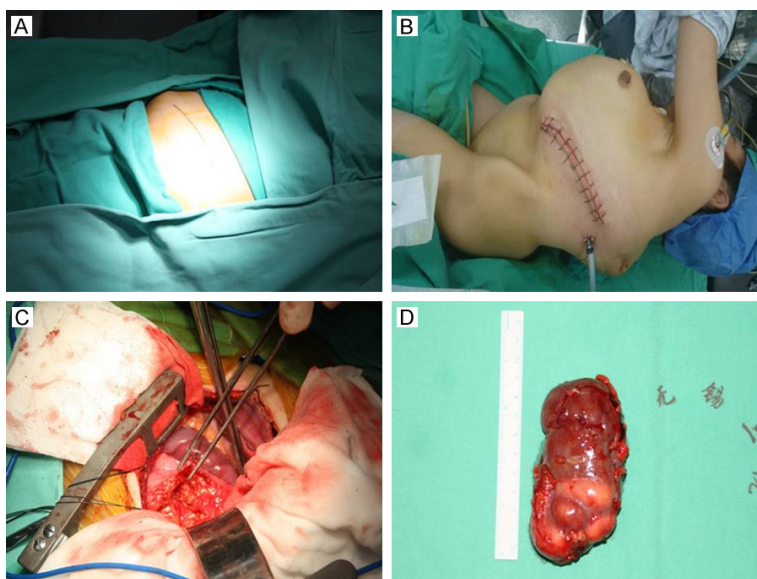
the lower left kidney. In addition, the patient's spine was severe deformed, as an "N" shaped (**Figure 1**). The thoracic spine was serious kyphoses, sectional lumbar vertebrae arranged in a horizontal line. The A-P diameter was longer than transverse diameter of the chest. The costal arch and ilium were overlapped. The area of abdominal wall that can be palpated was only 5\*5 cm<sup>2</sup>, with the costal arch and ilium surrounding. There was no evidence of intra-abdominal metastasis. As a result, we diagnosed the tumor as a clinically classified T1bN0M0.

Considering the patient's distinctive anatomy, it was not suitable for LRN. Therefore, the patient received a left, open, thoracoabdominal incision for nephrectomy for clear visual field and optimal exposure. She was anesthetized and placed in the right lateral decubitus position. A thoracotomy was made in the ninth intercostal space from midclavicular line to anterior axillary line and deepened to open the chest and the abdomen (**Figure 2**). After lateral incision of the diaphragm and the side peritoneum adhesiolysis, the left renal was exposed. After resection and suture of the diaphragm, closed drainage of pleural cavity was placed in the eighth inter-

## Thoracoabdominal incision for nephrectomy



**Figure 1.** The patient's spine were severe deformed, as a "N" shaped in X-ray examination. (A and B) Computed tomography scan showing a tumor in the left kidney (C and D).



**Figure 2.** A thoracotomy was made in the ninth intercostal space (A and B). The incision was deepened to open the chest and the abdomen (C). The resected kidney compared with the 10 cm ruler (D).

costal space and removed 72 h later. The operation lasted 2 h with 100 ml intraoperative blood loss. The postoperative pathological diagnosis was renal clear cell carcinoma. The patient tolerated the operation well and left the hospital after 1 week. The patient was regularly followed up every 6 months. No signs of recurrence or metastasis have been observed to date.

### Discussion

The "gold standard" operation for localized RCC is radical nephrectomy in patients that not be eligible for nephron sparing surgery to date. ORN was the primary treatment

**Table 1.** Previous reports RCC patients with severe scoliosis

Year	Author	Age	Sex	Disease	Treatment
2018	Na Z	62	Male	Multiple metastases of RCC	Endoscopic resection
2018	Chunyang J	86	Male	Metastasis from RCC to the chest wall	Biopsy and radiotherapy
2018	Daichi T	26	Male	RCC patients with severe right convex scoliosis	Transperitoneal laparoscopic surgery
2013	Hermans T	76	Male	RCC patients with severe scoliosis	Transperitoneal laparoscopic surgery

RCC: renal cell carcinomas.

method before 1991 [6]. However, LRN developed fast and acquired wide acceptance since Clayman pioneered the use of LRN in the same year [7]. In addition, the surgical approach is determined by the size and the location of the tumor, such as transperitoneal and extraperitoneal flank incision.

The thoracoabdominal approach was firstly performed in patients with large tumors and at the upper portion of the kidney [8]. The incision is begun in the eighth or ninth intercostals, even in the seventh intercostals for some huge tumors [9]. And it can provide a better exposure than any other approaches, in spite of the additional complications, such as phrenic nerve injury, pulmonary atelectasis and slower recovery of gastrointestinal function. Furthermore, it also takes advantages of shorter operation time and less bleeding. There was no significant difference in pain and postoperative recovery between these approaches [10].

As the development of the laparoscopic and robot operations, thoracoabdominal incision for nephrectomy was rarely applied. However, for some special cases, it may be a better choice. Here, we met a rare patient with severe spine malformation. The size of the tumor in this case was not huge and the location was not upper portion. However, the costal arches and ilia are overlapped. The abdominal area with no bone structure is narrow, and the height of the spleen is lower than that of the left kidney. The traditional incision was difficult for both ORN and LRN. As a result, we chose the thoracoabdominal approach for optimal exposure and achieved the same satisfactory result. The operation went smoothly and the patient recovered well.

Previous case reports mostly focused on the especial locations of RCC metastasis. For instance, Na Zhang reported a rare distant metastasis of RCC to the nasal cavity and

Chunyang Jiang reported a case with metastasis from RCC to the chest wall [11, 12]. However, few reports discussed the patients with congenital malformation, especially for severe spine malformation (**Table 1**). Only two case reports discussed RCC patients with severe scoliosis before our report [13, 14]. Both of them chose transperitoneal LRN as the best treatment. Nevertheless, our case had more serious spine malformation than both of previous cases. Therefore, ORN through thoracoabdominal approach was selected. Despite this case being challenging, the surgery was completed very well. We thought the thoracoabdominal incision for nephrectomy was a better choice for some special patients.

## Conclusions

Here we reported a rare case of RCC patient with severe spine malformation. The patient was successfully treated 2 years after a thoracoabdominal incision for radical nephrectomy.

## Disclosure of conflict of interest

None.

**Address correspondence to:** Deshui Yu, Department of Urology, Second People's Hospital of Wuxi, 68# Zhongshan Road, Wuxi 214002, Jiangsu, China. Tel: 18262279692; Fax: 0510-68562222; E-mail: urologydsy@163.com

## References

- [1] Ludwig WW, Gorin MA, Pierorazio PM and Allaf ME. Frontiers in robot-assisted retroperitoneal oncological surgery. *Nat Rev Urol* 2017; 14: 731-741.
- [2] Berger A, Brandina R, Atalla MA, Herati AS, Kamoi K, Aron M, Haber GP, Stein RJ, Desai MM, Kavoussi LR and Gill IS. Laparoscopic radical nephrectomy for renal cell carcinoma: oncological outcomes at 10 years or more. *J Urol* 2009; 182: 2172-2176.

- [3] Liu G, Ma Y, Wang S, Han X and Gao D. Laparoscopic versus open radical nephrectomy for renal cell carcinoma: a systematic review and meta-analysis. *Transl Oncol* 2017; 10: 501-510.
- [4] Golombos DM, Chughtai B, Trinh QD, Thomas D, Mao J, Te A, O'Malley P, Scherr DS, Del Pizzo J, Hu JC and Sedrakyan A. Minimally invasive vs open nephrectomy in the modern era: does approach matter? *World J Urol* 2017; 35: 1557-1568.
- [5] Oake J and Drachenberg D. A case of renal cell carcinoma in a patient with situs inversus: operative considerations and a review of the literature. *Can Urol Assoc J* 2017; 11: E233-E236.
- [6] Robson CJ, Churchill BM and Anderson W. The results of radical nephrectomy for renal cell carcinoma. *J Urol* 1969; 101: 297-301.
- [7] Clayman RV, Kavoussi LR, Soper NJ, Dierks SM, Meretyk S, Darcy MD, Roemer FD, Pingleton ED, Thomson PG and Long SR. Laparoscopic nephrectomy: initial case report. *J Urol* 1991; 146: 278-282.
- [8] Karakousis CP and Pourshahmir M. Thoracoabdominal incisions and resection of upper retroperitoneal sarcomas. *J Surg Oncol* 1999; 72: 150-155.
- [9] Merrill DC. Modified thoracoabdominal approach to the kidney and retroperitoneal tissue. *J Urol* 1977; 117: 15-18.
- [10] Kumar S, Duque JL, Guimaraes KC, Dicanzio J, Loughlin KR and Richie JP. Short and long-term morbidity of thoracoabdominal incision for nephrectomy: a comparison with the flank approach. *J Urol* 1999; 162: 1927-1929.
- [11] Zhang N, Zhou B, Huang Q, Chen X, Cui S, Huang Z and Sun Y. Multiple metastases of clear-cell renal cell carcinoma to different region of the nasal cavity and paranasal sinus 3 times successively: a case report and literature review. *Medicine (Baltimore)* 2018; 97: e0286.
- [12] Jiang C, Zhao S, Yang B, Tang T, Hou R, Liu X and Zhao H. Rare ectopic metastasis from clear cell renal cell carcinoma to the chest wall after 10 years: a case report. *Medicine (Baltimore)* 2018; 97: e0687.
- [13] Tamura D, Ito A, Kikuchi D, Tsuyukubo T, Kato R, Kato Y, Konari S, Omori S and Obara W. Laparoscopic nephrectomy in a patient with severe scoliosis: a case report. *Asian J Endosc Surg* 2018; [Epub ahead of print].
- [14] Hermans T, Pasmans H and Fossion L. Transperitoneal laparoscopic radical nephrectomy in a patient with severe scoliosis. *Urology* 2013; 82: 485-488.