

TITLE: A NEW APPROACH FOR THE SURGERY OF LARGE RENAL
MASSES: ABDOMINAL WALL FLAP INCISION

AUTHORS: Levent N. Türkeri, Yusuf Temiz, Abdurrahman Özgür,
Fikret Fatih Önel*

INSTITUTION: Marmara University School of Medicine,
Department of Urology

RUNNING TITLE: ABDOMINAL WALL FLAP INCISION

CORRESPONDING AUTHOR: Fikret Fatih Önel, MD.
Fellow of Urology

Department of Urology
Marmara University Hospital,
Tophanelioglu Cd. 13-15
Altunizade 34662
Istanbul, Turkey

Ph: 90 – 533 – 5141099
Fax: 90 – 216 – 3258579
E-mail: ffonol@yahoo.com

INTRODUCTION:

Renal cell carcinoma (RCC) is the 3rd most common malignant tumor of the genitourinary tract after prostate and bladder carcinoma [1]. The standard treatment of localized RCC is radical nephrectomy, which was first defined by Robson in 1963 [2]. The classical definition of radical nephrectomy includes isolation and ligation of renal artery and vein followed by mobilization of the Gerota's fascia and removal of ipsilateral adrenal gland, local lymph nodes and proximal ureter. Although radical nephrectomy is an aggressive surgery, removal of one of the kidneys is well tolerated by the patients without additional co-morbidities in the long-term, and provides high cure rates in appropriately selected patients.

Renal oncologic surgery has certain prerequisites such that the type of surgical approach should provide quick and easy access to the surgical area, and should provide wide exposure that enables optimum control and ligation of the vessels before removal of the tissues contained within Gerota's fascia. The type of approach should also aid in the identification and dissection of metastatic lesions as well as minimizing the risk of per-operative complications. However, there is no perfect single approach that can meet all of these requirements. The type of incision during radical nephrectomy should be tailored according to the individual patient since the habitus and medical condition of the patient, the size and the location of the lesion, the presence or absence of venous neoplastic extension, the surgeon's experience and the

operating facilities can considerably influence the choice for the approach.

Flank incision may be suboptimal for large tumors, for tumors invading the upper pole or in the presence of vena caval tumor thrombus. Thoracoabdominal incision allows an excellent exposure for large and/or upper pole tumors but requires entry to the pleural cavity and division of the diaphragm. Transabdominal incision (either Chevron or anterior subcostal) is the most commonly utilized incision providing a very good exposure. However, Chevron incision requires the division of both rectus muscles, and proper visualization and dissection of a large lower pole tumor can be quite challenging with this incision. We have used a new type of incision for surgical approach to large renal masses and compared its efficacy with the classical Chevron incision.

PATIENTS AND METHODS:

In this study, the data of 40 cases (23 males, 17 females, mean age: 63 years) operated by the same surgeon (L.T.) in our department between 2002-2004 were reviewed. Patients were preoperatively evaluated with computed tomography (CT) and/or with magnetic resonance imaging (MRI) where indicated. Chevron incision was used in the first 15 cases, while AFI was used in the last 25 cases. The mean greatest tumor diameters as measured in the final pathological examination, the duration of operation, per-operative blood loss, incision related complications, and the duration of hospitalization were compared between the 2 groups by SPSS 10.0 statistical software.

Surgical Technique in the Chevron Incision: In the supine position with a slight hyperextension, a transabdominal incision was made from the tip of the 12th rib, two fingerbreadths below the costal margin. The incision was then extended towards the xiphoid and curved across the midline in a symmetric fashion on the other side.

Surgical Technique in the Abdominal Flap Incision: In the supine position and the patient slightly hyperextended, an incision was made starting from the anterior axillary line two fingerbreadths below the costal margin, and extended towards the xiphoid, then it was curved down in the abdominal midline towards the umbilicus (Figure 1). Depending on the lower extent of the renal mass, it was occasionally carried down below the navel.

RESULTS:

There was no significant difference between the 2 groups with regards to patient characteristics and localization of the tumors as demonstrated by preoperative imaging studies (Table 1). The presence of tumor thrombus was demonstrated in 3 and 1 patients in the AFI and Chevron incision groups, respectively. Mean operation duration for AFI group was 3.7 hours where it was 3 hours for Chevron incision group (t-test, $p>0.05$). Mean greatest tumor diameter, as measured in the pathology specimen was 7.4 cm (range: 4-13 cm) in the Chevron incision and 11.3 cm (range: 3-35 cm) in the AFI group (t-test,

$p < 0.05$). Inferior venacavotomy was performed in 3 and 1 patients in the AFI and Chevron incision groups, respectively. Mean per-operative blood loss were 1100 cc. and 590 cc. in the Chevron incision and AFI groups, respectively (t-test, $p < 0.05$). Major complications, such as splenic, liver, intestinal or vascular trauma, or pneumothorax were not encountered in any of the cases. One patient in the Chevron incision group developed incisional hernia during the postoperative follow-up period. A summary of the postoperative outcomes in each group is demonstrated in Table 2. Postoperative pathology revealed oncocytoma in 1 and renal cell carcinoma (RCC) in 14 patients in the Chevron incision group while the diagnosis was oncocytoma in 1, polycystic kidney in 1 (nephrectomy due to mass effect of enlarged kidneys), and RCC in 23 patients in the AFI group.

DISCUSSION:

Various approaches and incision types have been used in the surgical treatment of renal masses. It may not be an easy task to decide for the best approach for the individual case. Whether manipulation of the kidney before the ligation of vessels increases the risk of tumor cell spillage is also unclear [3]. However, it is believed that extensive manipulation may very well increase the risk. Therefore, initial control of the vascular pedicle is considered as an important aspect of the operation.

The optimum approach and the type of incision for radical nephrectomy are related to a variety of factors. One type of incision or approach to the kidney does not suit all patients and all tumors. Flank approach is generally chosen in patients with small tumors and during partial nephrectomy. Although it has the disadvantages of providing limited exposure to the vessels and the abdominal viscera, it has a lower rate of perioperative complications and enables a quicker recovery because the peritoneum and intraabdominal organs are not violated [4]. Abdominal route is preferred in cases with suspected renal vein, inferior vena cava and/or visceral involvement. Anterior approach with Chevron incision is a widely accepted technique in terms of providing easy access to the vessels and allowing extensive surgery where needed. However, it has the disadvantages of division of both rectus muscles, and difficulty in exposure to the lower portion of the mass especially in large and/or lower pole located tumors [5].

In our experience, the size of the renal mass and the clinical stage were the most important factors in decision making for the type of incision. AFI allows an easy access to the major abdominal vessels, wide exposure of the renal mass which enhances the quality of the dissection and safe division of the renal pedicle which is usually at the center of the surgical field (Figure 2), and a good cosmetic result (Figure 3) even after the removal of very large tumors (Figure 4). Also, it is the method of choice if there is a need for lymph node dissection or removal of the ureter as in the case of radical nephroureterectomy for transitional cell carcinoma of the upper urinary tract. Large lymph nodes in

the paraaortacaval area can be safely removed through AFI. In our study, excellent exposure and subsequent safe dissection was reflected in a significant decrease in the mean per-operative blood loss although much larger tumors were operated in this group. We also could not find any difference in terms of intra- or post-operative complications in comparison to Chevron incision.

Laparoscopic radical nephrectomy has been increasingly performed for localized renal tumors at many urological centers across the world with good surgical and oncological outcomes [6-8]. The presence of a high stage tumor, renal vein and/or inferior vena cava thrombus, and extensive adhesions are generally accepted as the most important factors that limit the use of laparoscopic approach [9-11]. The removal of a large specimen with laparoscopic resection can especially be troublesome, which will require a longer incision on the abdomen that will disrupt the cosmetic advantage of laparoscopic surgery. Therefore, open surgical approach seems more convenient in a complex nephrectomy case where the use of AFI may offer the most favorable results.

In conclusion, transabdominal approach with AFI is very useful for radical nephrectomy as far as optimum application of oncologic principles to large-sized renal masses is concerned. Experience of the surgeon, either performing open or laparoscopic, and clinical stage of the tumor are important factors in deciding the type of incision ideal for individual cases. In our

experience, AFI provides the best exposure and improved control of renal vessels and vena cava during radical nephrectomy, and a safe dissection even in very large tumors with minimal blood loss, thus allowing for a safe and effective surgical procedure.

ACKNOWLEDGEMENTS:

None.

REFERENCES:

- 1- Bell DA, DeKerion JB: Renal tumors; in Walsh PC, Retik AB, Vaughan ED, Wein AJ (eds): Campbell's Urology 7th Edition, Philadelphia, WB Saunders, 1998, vol.3, 2283-2326.
- 2- Robson, CJ: Radical nephrectomy for renal cell carcinoma. J Urol 1963; 89: 37-42.
- 3- Karl HK, Gerald HM, Fritz H: Renal, bladder, and prostate cancer: An update , The proceedings of the V Congress on Progress and Controversies in Oncological Urology (PACIOU V), Rotterdam, the Netherlands, October 1998.
- 4- Battaglia M, Ditunno P, Martino P, Palazzo S, Annunziata G, Selvaggi FP: Prospective randomized trial comparing high lumbotomic with laparotomic access in renal cell carcinoma surgery. Scand J Urol Nephrol. 2004; 38: 306-314.
- 5- Droller MJ: Anatomic considerations in extraperitoneal approach to radical nephrectomy. Urology 1990; 36: 118-123.
- 6- Dunn MD, Portis AJ, Shalhav AL, Elbahnasy AM, Heidorn C, McDougall EM, Clayman RV: Laparoscopic vs. open radical nephrectomy: a 9 year experience. J Urol 2000; 164: 1153-1160.
- 7- Portis AJ, Yan Y, Landman J, Chen C, Barrett PH, Fentie DD, Ono Y, McDougall EM, Clayman RV: Long-term followup after laparoscopic radical nephrectomy. J Urol 2002; 167: 1257-1262.

- 8- Wille AH, Roigas J, Deger S, Tüllmann M, Türk I, Loening SA: Laparoscopic radical nephrectomy: Techniques, results and oncological outcome in 125 consecutive cases. *Eur Urol* 2004; 45: 483-489.
- 9- Nadu A, Mor Y, Chen J, Sofer M, Golomb J, Ramon J: Laparoscopic nephrectomy: initial experience in Israel with 110 cases. *Isr Med Assoc J* 2005; 7: 431-434.
- 10- Siqueira TM Jr, Kuo RL, Gardner TA, Paterson RF, Stevens LH, Lingeman JE, Koch MO, Shalhav AL: Major complications in 213 laparoscopic nephrectomy cases: The Indianapolis experience. *J Urol* 2002; 168: 1361-1365.
- 11- Simon SD, Castle EP, Ferrigni RG, Lamm DL, Swanson SK, Novicki DE, Andrews PE: Complications of laparoscopic nephrectomy: The Mayo clinic experience. *J Urol* 2004; 171: 1447-1550.

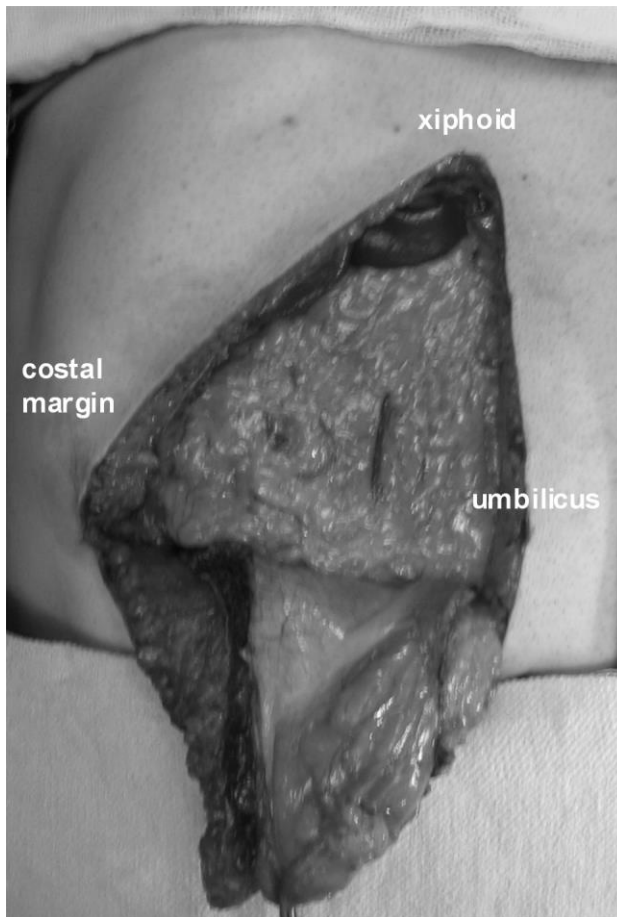
LEGENDS TO ILLUSTRATIONS:

Figure 1: The abdominal wall flap incision (AFI): The incision is made starting from the anterior axillary line two fingerbreadths below the costal margin and extended towards the xiphoid, then it is curved down in abdominal midline towards the umbilicus.

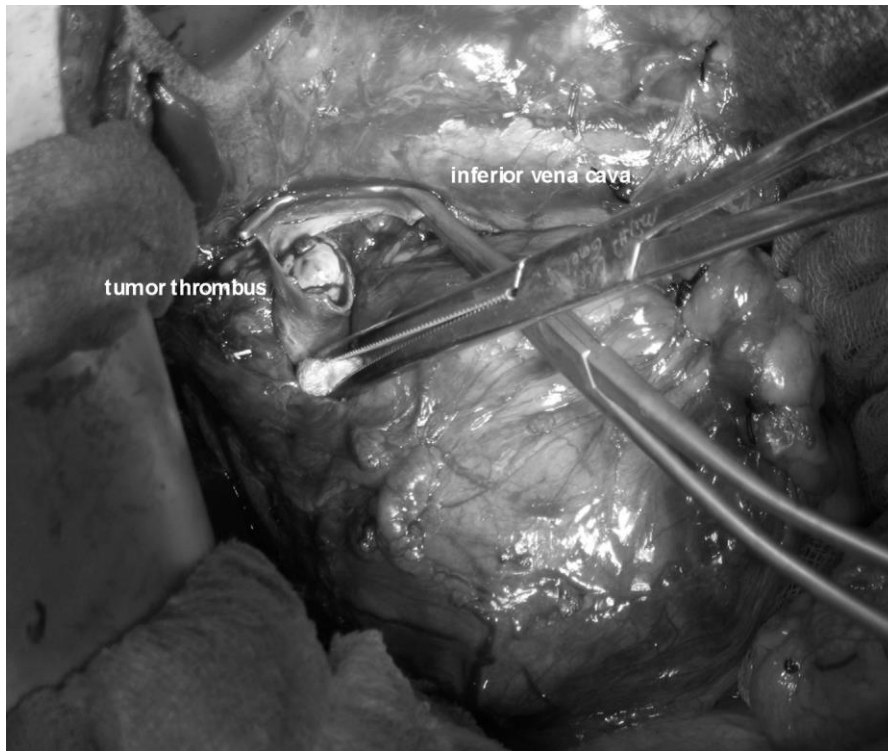


Figure 2: AFI allows an easy access to the major abdominal vessels and wide exposure of the renal mass enhancing the quality of the dissection and safe division of the renal pedicle.



Figure 3: Postoperative cosmetic result after AFI.

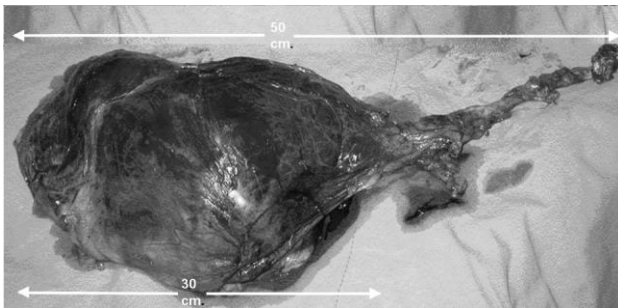


Figure 4: A large renal mass removed via AFI.

