



# Comparative Analysis of Long-Term Postoperative Complications of Traditional, Laparoscopic and Retroperitoneoscopic Nephrectomy

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## Research Article

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## Abstract

**Introduction:** Intraoperative and postoperative complications of various nephrectomy methods are covered in a sufficient number of publications. However, the frequency of long-term postoperative complications of different methods of nephrectomy has been poorly studied. Late postoperative complications of traditional and video endoscopic nephrectomy methods were analyzed.

**Methods:** We studied the long-term results (after 6 months or more) of nephrectomy in 649 patients who were subjected to nephrectomy for benign and malignant diseases. The patients were divided into 3 groups: group 1-traditional nephrectomy (TN), group 2-laparoscopic nephrectomy (LN), and group 3-retroperitoneoscopic nephrectomy. Patients underwent nephrectomy for various reasons: a non-functional kidney due to various causes, complications of urolithiasis, stricture or obliteration of the pelvic-ureteral junction, different parts of the ureter, kidney neoplasms, and a donor kidney.

**Results:** Violation of skin sensitivity was recorded in 82 (27.15%) patients after TN, in 12 (5.58%) patients after LN and in 10 (7.58%) patients after RN ( $p= 0.004$ ). Pain in and around the postoperative scar was recorded in 61 (20.19%) patients after TN, in 12 (5.58%) patients after LN, and in 9 (6.81%) patients after PH ( $p= 0.003$ ). Postoperative ventral hernia was diagnosed in 54 (17.88%) patients after TN, in 3 (1.39 %) patients after LN, and in 5 (3.78 %) patients after RN ( $p = 0.001$ ). Postoperative hernia correction was required in 2 patients after RN. Abdominal deformity on the side of surgery or the site of kidney removal was detected in 32 (10.59%) patients after TN, in 3 (1.39 %) after LN, and in 2 (1.51 %) after RN ( $p= 0.001$ ). In addition, 5 (1.65 %) patients with TN had a purulent postoperative fistula, a colonic labial fistula, and empyema of the stump of the ureter, which required surgical treatment.

**Conclusion:** Long-term postoperative complications after laparoscopic and retroperitoneoscopic nephrectomy are significantly less common than after traditional nephrectomy. However, these complications deserve the attention of doctors, as they often lead to repeated operations and reduce the quality of life of patients in the long-term postoperative period.

**Keywords:** Traditional; Laparoscopic; Retroperitoneoscopic; Nephrectomy; Postoperative Complications; Hernias; Postoperative Scar

**Abbreviations:** TN: Traditional Nephrectomy; LN: Laparoscopic Nephrectomy.

## Introduction

Intraoperative and postoperative complications of traditional, laparoscopic and retroperitoneoscopic nephrectomy are covered in a sufficient number of publications [1-4]. According to Ritchey ML, et al. (1992) [5], surgical complications frequency of open nephrectomy based on treatment experience of 1910 patients is 19.8%, among them 6.9% are intestinal obstruction, 5.8% massive intraoperative bleeding (in 1.4% of cases damage to main vessels was noted), in 1% of cases damage to various internal organs was noted, mainly to the colon. Mortality after nephrectomy is 0.5% [5]. While gaining experience in minimally invasive kidney surgery, there were evidences of laparoscopic nephrectomy complications that emerged later. In general, laparoscopic nephrectomy complications range from 5.0 to 25.8% [6,7]. Early postoperative complications, along with bleeding and unrecognized damage to internal organs, include formation of intestinal fistulas, ligature abscesses, postoperative hernias, as well as infectious processes in area of postoperative wounds, sepsis, skin

pancreatic fistula and postoperative purulent fistula [4]. The long-term postoperative complications frequency of various nephrectomy methods was studied insufficiently. In this study we have analyzed late postoperative complications (after 6 months or more) of various nephrectomy methods.

## Materials and Methods

The study included data on surgical treatment of 649 patients (292 men and 357 women) who underwent nephrectomy for benign and malignant diseases. Long-term results were observed 6 months or more after surgery. First group included 302 patients (average age  $61.3 \pm 6.17$  years) who underwent traditional nephrectomy (TN), second group included 215 patients (average age  $62.9 \pm 7.13$  years) who underwent laparoscopic nephrectomy (LN) and third group - 132 patients (average age  $60.2 \pm 5.12$  years) who underwent retroperitoneoscopic nephrectomy.

The patients were underwent nephrectomy due to various reasons: a non-functioning kidney for different reasons, complications of the urolithiasis, stricture of the pelvic-ureteral segment, stricture or obliteration of different ureter parts, kidney neoplasms and donor kidney (Table 1).

Disease (n = 649)	Number of patients	
	n	%
A non-functioning kidney due to various reasons (pyelonephritis, hydronephrosis, trauma, chronic glomerulonephritis, renal artery stenosis)	131	20,18
Stricture and obliteration of the pelvic-ureteral segment, different parts of the ureter with severe renal impairment	99	15,25
Complications of the urolithiasis (kidney and ureter stones)	116	17,87
Donor kidney	44	6,77
Kidney Neoplasms	259	39,90
Total	649	100,00

**Table 1:** Distribution of patients included in the study group depending on the causes leading to nephrectomy.

The kidney was removed mainly from the lumbotomy incision in 542 (83.51%) patients, in 38 (5.86%) from the laparotomy, and in 69 (10.63%) from the iliac incision.

## Results

The most common complication in long-term postoperative period was a violation of skin sensitivity in the area of scars (Table 2). In 82 (27.15%) patients after TN, skin sensitivity violation was detected during examination

and determination of skin, tactile and pain sensitivity in the area of postoperative scar ( $p = 0.002$ ). At the same time, patients complained about discomfort feelings. In patients from LN group, the above changes were detected in 12 (5.58%) patients and after RN in 10 (7.58%). Pain caused in and around postoperative scar was recorded in 61 (20.19%) patients after TN, 12 (5.58%) patients after LN, and 9 (6.81%) patients after RN ( $p = 0.003$ ). In most patients pain intensified after exercise.

Complications	Nephrectomy Method						p-value
	TN (n = 302)		LN (n = 215)		RN (n = 132)		
	n	%	n	%	n	%	
Violation of skin sensitivity in the area of post operation scar	82	27,15	12	5,47	10	7,58	0,002
Postoperative wound pain	61	20,19	12	6,34	9	6,81	0,002
Postoperative hernia	54	17,88	3	1,39	5	3,78	0,001
Surgery side abdominal deformity	32	10,59	3	1,39	2	1,51	0,001
Purulent postoperative fistula	3	0,99	-	-	1	0,75	0,720
Colonic labial fistula	1	0,33	-	-	-	-	
Empyema of the stump of the ureter	1	0,33	-	-	-	-	
Total	238	78,80	30	13,95	27	20,45	0,0001

**Table 2:** Long-term complications of traditional and video endoscopic nephrectomy.

Sensitivity impairment and pain can be explained by the fact that small sensitive nerve branches intersect during access. During patient examination after video endoscopic surgery, skin sensitivity violations and pain were less pronounced compared to patients after traditional surgery. Postoperative ventral hernia was diagnosed in 54 (17.88%) patients after TN. Only 22 of them underwent hernia removal operations and the rest required constant wearing of a bandage because patients refrained from subsequent surgery. In 3 (1.39%) patients who underwent LN, a postoperative hernia was revealed, which required the wearing of a bandage and in 5 (3.78%) after RN ( $p = 0.001$ ). Postoperative hernia correction was required in 2 patients after RN.

Abdomen deformation on the side of surgical intervention or place of kidney removal was detected in 32 (10.59%) patients after TN, in 3 (1.39%) after LN, and in 2 (1.51%) after RN ( $p = 0.001$ ). When performing a laparotomy or lumbotomy, not only a direct injury is caused to the body muscles, but the muscle nerves are also intersected, which leads to muscle weakness and atrophy. This is the reason for abdomen deformation in postoperative period and, as a last stage, the formation of postoperative ventral hernias. Due to smaller diameter access, video endoscopic approaches have a lower percentage of mentioned complications. In 3 (0.99%) patients after TN, a purulent postoperative fistula was formed. One of them developed a purulent fistula a year after operation. The patient was operated, the stone was removed from remaining lower third of ureter and ureterectomy was performed, after which the wound healed. Another patient, 6 months after TN for calculous pyonephrosis developed pain in the iliac region and high fever. According to ultrasound scan, an abscess of iliac region was established on the side of removed kidney and was opened. However, purulent excretion from the wound did not stop. After 3 months, a

festering swab spontaneously moved away from the wound, and the wound healed. A purulent postoperative fistula was formed in third patient 6 months after the operation. The fistulous passage was expanded, non-absorbable threads were removed from the wound, after which the wound healed. 9 month after RN a purulent postoperative fistula was formed in 1 patient (0,75%), which was associated with the ligature and after sanitation the fistula was eliminated. 3 month after TN a large intestinal labial fistula was diagnosed in 1 (0.33%) patient. The patient refused proposed surgical intervention and after 12 months the fistula independently closed during a follow-up study. 6 months after TN, one patient (0.33%) was diagnosed with empiric stump of the ureter, which required surgical treatment.

## Discussion

Intraoperative and early postoperative complications, in particular postoperative wound pain after various nephrectomy methods, have been widely published in world literature [1,8], long-term postoperative nephrectomy complications of nephrectomy on the side of postoperative scar have not been studied sufficiently. In our observations, skin sensitivity violation and pain in the area postoperative scar was observed up to 27.15% after TN and up to 7.58% after video endoscopic methods of nephrectomy.

The occurrence rate of postoperative hernias after surgical interventions made from median laparotomic access is 5-14%, and after lumbotomy and anterolateral access this rate is even higher and reaches the level of up to 48% [9]. This is due to massive dissection of muscle layers, nerves and blood vessels that feed the soft tissues, leading to atrophy and fibrosis of the abdomen side wall [10,11]. Introduction of endoscopic technology into surgery has significantly reduced occurrence rate of postoperative hernias. According to some

authors, after laparoscopic cholecystectomy, its frequency varies from 0.23 to 5.4% [12,13]. Rare complications are described, such as the appearance of dome diaphragm hernia after laparoscopic nephrectomy [14]. Hajhamad MM, et al. (2016) [15] described the case of internal hernia formation after laparoscopic left-sided nephrectomy.

In our observations, the frequency of postoperative hernias and abdomen deformation on the side of surgery after TN was significantly higher than after LN and RN. In addition, after traditional operations, various purulent-inflammatory complications in the form of fistulas, empyema of ureter stump were revealed. Bozkurt M, et al. (2017) [16] reported an unusual case of pancreatic fistula development on the 71<sup>st</sup> day after laparoscopic radical nephrectomy on the left side. Also, there are cases in literature about the appearance of pancreatic fistula after 10 years as a rare complication after nephrectomy on the left side [17].

## Conclusion

Our observations show that long-term postoperative complications after video endoscopic methods occur much less than after traditional nephrectomy. However, those complications deserve a thorough attention of doctors, as they often lead to repeated operations and reduce patients quality of life in the long-term postoperative period.

## References

1. McCartney CJ, Sinha A, Katz J (2004) A qualitative systematic review of the role of N-methyl-D-aspartate receptor antagonists in preventive analgesia. *Anesth Analg* 98(5): 1385-1400.
2. Frank MA, Sanzharov AE, Miroshnichenko VI, Shamuratov RSh, Murzin MO, et al. (2017) Laparoscopic operations in urology and their complications. *Ural Medical Journal* 146(2): 96-99.
3. Kadyrov ZA, Odilov AYu, Yagudaev DM (2018) Comparative analysis of intra- and postoperative complications of retroperitoneoscopic and laparoscopic nephrectomy for large tumors. *Oncourology* 14(4): 22-28.
4. Pavlovskaya ZA, Kapsargin FP, Pavlovsky SV, Alekseeva EA, Zueva LF (2016) Difficulties in diagnosing, treating and preventing the development of persistent purulent fistula after an emergency nephrectomy (clinical case). Actual issues of urology: materials of the V Congress of Siberian Urologists with international participation-Krasnoyarsk 309-317.
5. Ritchey ML, Kelalis PP, Breslow N, Etzioni R, Evans I, et al. (1992) Surgical complications after nephrectomy for Wilms' tumor. *Surg Gynecol Obstet* 175(6): 507-514.
6. El-tohamy SA, Shello HM (2013) Retroperitoneal versus transperitoneal laparoscopy for simple nephrectomy. *Egypt J Anaesth* 29(2): 109-116.
7. Montes SF, Rodríguez IG, Ugarteburu RG, Villamil LR, Mendez BD, et al. (2015) Intraoperative laparoscopic complications for urological cancer procedures. *World J Clin Cases* 3(5): 450-456.
8. Sultanov KG, Odilov AYu, Kadyrov ZA (2013) Long-term complications of traditional and retroperitoneoscopic nephrectomy and nephroureterectomy. *Medical Bulletin of Bashkortostan* 8(2): 150-152.
9. Brekhov EI, Yurasov AV, Gribunov YuP, Repin IG, Alekseev AK, et al. (2009) Features of diagnosis and surgical correction of postoperative myofascial defects of the lateral abdominal wall and lumbar-lateral region. *Surgery* 10: 10-14.
10. Alekseev AK, Brekhov EI, Zhitnikov GV (2006) The incidence of postoperative hernias in patients undergoing surgery on the urinary system from the lumbotomy access. *Herniology* 3(11): 8-9.
11. Forster H (2009) Meshshrinkage - fact or myth? Data from a prospective randomized clinical trial. *H Forster et al Hernia* 1(13): 53.
12. Klein SR, Veles V, Davis IP (1992) Endoscopic hernia repair. Auto Suture Company. A division of Unaited States Surgical Corporation.
13. Lanzafame RJ (1994) Laparoscopic cholecystectomy combined with ventral hernia repair. *J Laparoendosc Surg* 4(4): 287.
14. Matveev VB, Komarov IG, Volkova MI, Skvortsov IYa, Komarov MI, et al. (2013) The safety and feasibility of using transperitoneal laparoscopic access to perform radical nephrectomy for clinically localized kidney cancer. *Oncourology* 4: 14-21.
15. Hajhamad MM, Rajan R, Kosai NR, Bahadzor B (2016) Transmesenteric small bowel herniation causing intestinal obstruction following laparoscopic transperitoneal nephrectomy. *Formosan J Surgery* 49(4): 161-164.
16. Bozkurt MA, Can O, Altunrende F (2017) A Pancreatic Fistula as a Rare Complication of Laparoscopic Radical Nephrectomy: A Case Report. *Urol Case Rep* 12: 20-22.
17. Malhotra MK (2016) Delayed pancreatic fistula-rare complication of left nephrectomy. *J Med Sci* 15(3): 483-484.