Laparoscopic interventions are at the very beginning of its evolution in the Clinic of Urology. The first steps have been made primarily to cope with problem of varicocele. We continued to gain laparoscopic experience by switching to solving some demanding intervention, primarily kidney cyst. The only logical next step lead to laparoscopic renal surgery. So, after a few successful primary simple nephrectomy, the next step was to perform a laparoscopic radical nephrectomy. Today, at the Clinic of Urology, Clinical Center of Serbia we successfully perform much more demanding interventions, such as extraperitoneal laparoscopic radical prostatectomy. In this paper we present our experience with the first laparoscopic radical nephrectomy, which was done at the Clinic of Urology, Clinical Centre of Serbia.

Key words: laparoscopy, laparoscopic radical nephrectomy, Veress needle, renal cell carcinoma (RCC).

INTRODUCTION

The first laparoscopic radical nephrectomy dates back to the late eighties. The first "single site" Laparoscopic nephrectomy was described by Roman and associates1 (20086). At that same year, the same authors describes two more cases of the same intervention. In all three cases, there were no significant complications both, during the intervention nor in the perioperative period. The duration of surgery was 133 minutes, estimated intraoperative blood loss was about 30 ml and the length of the skin incision for the extraction of the sample was about 45 mm. Laparoscopic nephrectomy was accompanied by a lesser degree of postoperative pain and less need for postoperative analgesia.

This procedure reduces the number of hospitalization days, reduced convalescence time. A particular aspect may be thrown on the cosmetic outcome of the scar. Compared to a conventional open surgical procedure, in the course of laparoscopic surgery is the observed difference in the perioperative complications, as well as the intraoperative blood loss, even though it was found that, during laparoscopic surgery is less blood loss due to better control hemostases2-5.

As well as any other surgery, laparoscopic radical nephrectomy carries out its own hazards, which have to be recognized by urologist at any time during the operations. Particular care should be taken on a counter indications for this type of surgery such as non-regulated coagulopathy, untreated infections, especially infections of the anterior abdominal wall, as well as threatening hypovolemic shock4. Earlier surgical intervention is not an absolute contraindication for laparoscopic radical nephrectomy. In patients who were subjected to prior surgical procedures in the abdomen, it is reasonable to expect a higher percentage of adhesions that extend the operating time, as well as percentage of bowel injury during insufflation of gas through Veress needle, dissociation, and bowel preparation. Much more dangerous is violations of vascular structures during the preparation of renal vascular pedicle7, which in some cases can end with death. All this implies that when performing laparoscopic interventions, including laparoscopic radical nephrectomy, it require an extra caution, especially if the intervention is taking inexperienced operator.

Every beginning is difficult, but if one take to account that the learning curve for laparoscopic radical nephrectomy, especially for urologists who have already some experience in laparoscopic renal surgery, is a relatively short6,7, the final outcome can only be encourage.

CASE REPORT

We report a case of a 55 year old patient RR, a security guard from Belgrade. It is the patient who was two months prior to admission to the clinic began to feel pain in the right flank by type of renal colic. The doctors in primary medicine has treated him with analgesic therapy. Since the month of initiation of therapy passed and his situation has not improved, the patient was referred to the Clinic of Urology for further diagnosis and treatment.
The patient had not had any associated chronic diseases. He was not subjected to previous surgery. He was not a smoker nor consumer of alcohol. The family history did not state a presence of disease that would be of importance to heredity or cases of malignant diseases.

At the first examination the patient was provided with complete blood count (CBC) analysis, biochemical analysis, as well as analysis of the urine sediment and urine culture (UC). The only deviation from the reference values was observed in the level of sedimentation, which was accelerated, with values of 32. Patient felt a dull pain in the right flank with the same intensity as prior regardless of analgesic therapy. Otherwise, the patient feel well without any discomfort in urination. Ultrasound exam verified the normal findings in the left kidney, bladder was with orderly edges without intraluminal proliferation and with small homogeneous prostate. On the right kidney was observed the existence of tumor formation, localized interpolar with partial expansion on the hilum of the right kidney. Formation was non homogenous demarcated and encapsulated, with overall dimensions of 70x55 mm.

Incidentally in upper calices group of right kidney there was seen calculus measuring about 10 mm in diameter. There was no sign of any degree of renal deterioration on both sides. Hilar glands did not appear enlarged, nor glands in retroperitoneal space along the main blood vessels. It was decided to perform MSCT for better understand the situation and the decision on definitive treatment. Findings on MSCT showed a presence of tumor with size 73x54 mm, interpolar localized to the hilum of the right kidney. The tumor was heterogeneous soft tissue character and with type of renal cell carcinoma (RCC). Tumor was not penetrate kidney capsule and was not engage renal blood vessels, but was in close contact with the same (Figure 1,2). In the upper pole of the kidney there was a stone measuring about 8 mm in diameter.

Clinical stage was T2,N0,M0.

Having regard to the position of tumor, the patient age and previous laparoscopic experience, it was proposed to patient a laparoscopic radical nephrectomy with preservation of ipsilateral adrenal gland.

![Figure 1](image1.jpg)

**FIGURE 1.** MSCT

![Figure 2](image2.jpg)

**FIGURE 2.** MSCT (CLEARLY VISIBLE ONLY ONE RENAL ARERY)

![Figure 3](image3.jpg)

**FIGURE 3.** THE PATIENT PLACED IN THE LEFT DECBITAL POSITION

After a detailed explanation of the nature of the disease, the planned surgical treatment with possible complications and potential risk for the conversion of the intervention, the patient consented to the proposed intervention, as verified by personal signature on the informed consent form.
SURGICAL TECHNIQUE

The patient was initially placed in a supine position for premedication and for introduction to general endotracheal anesthesia (GETA). Nasogastric suction was placed for decompression of the stomach and the urinary catheter to monitor fluid balance. The patient was placed in the left decubital position and the cleaning of operative field has been done (Figure 3).

After operative field was prepared, we proceed with surgical intervention. Instrumentation that was used during the intervention follows below:

- Scalpel;
- Two Alison grips;
- Surgical forceps;
- Scissors;
- Needle holder;
- Suture for reconstruction of subcutaneous tissue (1/0);
- Suture for the reconstruction of the skin (3/0).

Ports:
- One 10 mm working port (metal port);
- One 11 mm optical port for the placement of the camera - plastic port;
- Two 5-mm working port plastic;
- Reduction of 10 mm port;
- Bipolar cable A60003C;
- Monopolar cable A0357.

Laparoscopic instrumentation:
- Monopolar scissors A64320A (WA608800C sleeve, handle WA60101C);
- Monopolar hook A64320A (sleeve WA608800C);
- Bipolar Merryland dissector WA6430C (sleeve WA60800C, drškaWA60101C);
- Hem-o-Lock larger (M);
- Suction;
- Endobag 15 mm (M);
- Laparoscopic Needle holder, Storz 26173KAF.

All laparoscopic instruments are Storz.

Pneumothorax is established through placement of the Veress needle along the right edge of the m. rectus 5 cm laterally and cranially from umbilicus. During placement of Veress needle we respected all the postulates for safe placement. After the establishment of pneumothorax in the same place it was placed 11 mm optical trocar. Exploration was performed in order to look for the possible injury during placement Veress needle. Afterwards, we proceed with the placement of the working ports. One 10 mm working port with gear is placed on the four finger breadths from the optical port, and diagonal to the optical port.

Second one, 5-mm port was placed on the middle line of the anterior superior iliac spine and the umbilicus. Another 5-mm working port was placed near the ksifoid procesus, used for continued traction and for preparation during operation and traction of the liver (Figure 4).

The initial step was deliberation of hepatic colonic flexure up to the level of the iliac vessels. After that we approached to incision of the peritoneum along the avascular Told line, but not completely in order to avoid the descends of kidney medial. In that way one can avoid compromisation of renal vascular pedicle. After that one performed the deliberation of duodenum for better access to the lower v. cava. Afterwards, the incision of Gerot fascia has performed up high under the liver that has been elevated using clamps introduced through the fourth working port. Gerot fascia is incised over a length of 5 cm. Dissociation occurred subseuqint to the front side of the inferior vena cava with the front wall of the vessel fully denuded. The lateral side of the inferior vena cava was released. After that one encountered the confluence of spermatic vein and the confluence of the renal veins. By careful dissociation one released the entire lumen of the spermatic and renal veins. Spermatic vein, that has been liberated in the length of 5 cm, was ligated with the two hem-of-lock clips and cut proximally and distally. Next step was into further preparation of adipose tissue parakaval laterally until it was seen musculus psoas. Left ureter was identified, and liberated up to the level of the iliac vessels. The ureter was ligated at the level of the iliac blood vessels with one hem-o-lock clip and cut off. Further approach to the release of the lower half of the
right kidney was enabled. Once the lower pole of the right kidney has sufficiently been released, the operating plan is redirected to the renal vascular structures. Again the renal vein was explored and generally additionally released. After that it was easy to identified the renal arteries. It position was somewhat cranial and posterior of renal vein. Renal artery was ligated after a sufficient release with hem-o-lock. We waited a few minutes to establish the renal outflow in fully, as was confirmed by collapsing the renal veins. Next step was ligation of the renal vein. This was done with two hem-on-lock clips proximally and distally; the latter are placed right next to the confluence of renal vein in the inferior vena cava. Vein was cut, giving a clear plan to renal artery, that was further deliberated to a suitable length for safe ligation (3 cm in length). Afterwards, the placement of the two hem-o-lock clips were applied proximally and distally and renal artery was cut.

With this a vascular pedicle of the right kidney has been entirely restrained. After that one can easy approach for safe deliberation of upper pole of the right kidney along a clear plan to the adrenal gland. Deliberating the upper pole of the kidney is easier with approach from the lateral abdominal wall and by the posterior side along the muscle psoas. Thus, the right kidney was entirely freed and ready for extraction.

Via 15 mm port, which was introduced in place of the first 5 mm port endobag has been introduced to place the right kidney entirely. In the intervention morselator was not used. Kidney was drawn through the extended cut on the front of the abdominal wall in the length of 5 cm, with it's longitudinal position (Figure 5). When extending incision muscles of the anterior abdominal wall were only dissociated, not cut.

Additional control of hemostasis of renal lodges was performed, the position of the hem-o-lock's were checked, followed by the placement of drain through the 10 mm port. After that the evacuation of the remaining gas from the abdominal cavity was made, ports were removed, and reconstruction of surgical wounds was performed of the port sites. The bandage was placed on operational openings (Figure 6).

**DISCUSSION**

Laparoscopic radical nephrectomy involves removal of the entire kidney with the corresponding ureter to the level of the iliac vessels, together with Gerot fascia. Removal of the adrenal gland is directly conditioned by the position of the tumor, so that all tumors localized in the upper third of the kidney require removal of the corresponding adrenal gland. Lymphadenectomy is still controversial. In this particular case there was no need for removal the adrenal gland nor to perform lymphadenectomy.

On the day of surgery the patient received a third-generation cephalosporin (a one-time bolus), followed by orally antibiotic therapy with third generation of cephalosporin entire time thorough postoperative recovery. Time of surgery was 150 minutes. During the operation, the total intraoperative blood loss was 50 ml. Quantity of insufflated gas (CO2) was 352 liters. Similar preliminary results were published by other authors1. Although some authors report burning sensation on the side of patients, or some degree of pain sensation "burning recovery, our patient did not feel any pain. Diuresis on urinary catheter was approximately 2500 ml per day, and the drain was not evacuated any content.

The nasogastric tube was removed immediately after transporting the patient from the operating room. On the first postoperative day, the patient was transfer to semi-intensive care ward. Drain was removed at the second postoperative day. During first two postoperative days there was no evacuation of the contents. The urinary catheter was removed at the second postoperative day, the patient was then properly urinated. He was discharged from the hospital at the fifth postoperative day in good general condition. During hospitalization, the patient wasn’t febrile. Operative incisions are healed primarily. On the tenth postoperative day, the stitches were removed. Patient felt good and, said with his own words, "he fill like he was not operated on." Histopathologic findings, spoke in favor of renal cell carcinoma (RCC), clear cell type, with second degree of nuclear grade (by Fuhrman), and pathological stage of disease was pT1b, Nx, Mx (PH number of biopsies: 3436-447/14 Figure 7).

**CONCLUSION**

Laparoscopic radical nephrectomy is an adequate substitute for an open surgical procedure. The therapeutic effect is the same, radicality of operations is ensure, intraoperative blood loss is minimiz, the number of days of hospitalization small and postoperative recovery and comfort of patients is increasing. This case has shown that even with a modest laparoscopic experience, a urologist relatively experienced in open surgery, can quickly and safely, but at the same time with more caution, perform radical nephrectomy equally effective and safe.
SUMMARY

Laparoskopske intervencije su na samom početku svoje evolucije na Klinici za urologiju. Prvi koraci su učinjeni prvenstveno u smislu rešavanja varikocele, nakon čega su laparoskopska iskustva nastavila da se stiču prelaskom na rešavanjem nešto zahtjevnijih intervencija, prvenstveno cista bubrega. Kao jedini logičan sledeći korak nametala se laparoskopska bubrežna hirurgija. Tako, nakon nekoliko primarnih uspešnih jednostavnih nefrektomija, sledeća stepenica je bila izvodjenje laparoskopske radikalne nefrektomije. Danas se na Klinici za urologiju, Kliničkog centra Srbije sa uspjehom izvode i mnogo zahtjevnije intervencije, kao što je laparoskopska radikalna ekstraperitonealna prostatektomija. U ovom radu prikazujemo naše iskustvo sa prvim laparoskopskom radikalnom nefrektomijom koja je bila učinjena na Klinici za urologiju, Kliničkog centra Srbije.

Ključne reči: laparoskopija, laparoskopska radikalna nefrektomij, Veress igla, renal cell carcinoma (RCC).

REFERENCE: