2.2 Extraperitoneal Laparoscopic Radical Nephrectomy

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Introduction

Radical nephrectomy is the gold standard treatment of kidney cancer. Its principles were described by Robson [1] in 1963: primary ligation of the renal artery and vein, removal of the kidney together with its envelopes, including Gerota’s fascia, the adrenal gland, and regional lymphadenectomy. These principles are still considered valid; however, during the last decade the operative approach has been modernized. Since the first laparoscopic radical nephrectomy reported by Clayman [2] in 1991, this minimally invasive technology has gained much popularity. Three variants are currently used worldwide: the transperitoneal laparoscopic, the extraperitoneal laparoscopic and the hand-assisted approach for radical nephrectomy.

All these techniques have their specific advantages and drawbacks. The transperitoneal laparoscopic approach is preferred by many surgeons because it offers a large working space. Hand-assisted laparoscopic renal surgery is a hybrid procedure, during which the surgeon places his nondominant hand into the abdominal cavity. This helps to overcome some inherent obstacles associated with conventional laparoscopy, such as loss of tactile feedback and special orientation, thereby reducing the learning curve. In our department, we decided to develop the extraperitoneal laparoscopic approach, because the access to the renal pedicle is quicker, safer and easier. Postoperative morbidity is diminished because of the absence of intraperitoneal complications: patients have less pain and there is no ileus.

Preoperative Preparation

The patient must fast starting at midnight on the night before surgery. Blood type and cross-match are determined. When inducing anesthesia, prophylactic antibiotic therapy with a second-generation cephalosporin is administered. Prophylactic treatment with low-molecular-weight heparin is begun on the day of surgery.

Instruments

- Video unit
  - Preferably two monitors
  - Insufflation system
  - Suction device
  - Monopolar and bipolar cautery energy source
- Trocars
  - 12-mm blunt port trocar
  - Two 12-mm trocars
  - Two 5-mm trocars
- Laparoscope
  - Zero degree lens
- Primary surgeon
  - Rotating tip coagulating scissors
  - Bipolar coagulator
- Suction-irrigation
- Clip applier, medium large (9-mm) metallic clips
- Linear stapler (Endo-GIA)
- Entrapment sac (Endocatch)
- Needle holder (required only exceptionally)

**Operative Technique**

- A nasogastric tube and a Foley catheter are inserted prior to surgery.
- The patient is positioned in lateral decubitus, with the lumbar support raised to its maximum height (Fig. 1). The legs are flexed slightly forward and paced on the anterior leg rest. The posterior leg rest is removed to leave room for the assistant who holds the laparoscope and camera (Fig. 2). The primary surgeon stands behind the patient, his assistant and the scrub nurse in front of him. A second assistant or the scrub nurse holds the camera. The optimum is to have two video screens (Fig. 3).
- A mini-lumbotomy (2-cm incision) is done in the posterior axillary line 1–2 cm below the 12th rib (Fig. 4a). The abdominal wall and the transversalis fascia are incised. The posterior pararenal space is dissected with the finger, the peritoneal reflection is pushed forward (Fig. 5). Two 5-mm trocars are inserted with digital guidance in the anterior axillary line, one in the upper part and one in the lower part of the abdomen (Fig. 4d,e). A 12-mm trocar is placed 2 cm above the iliac crest, in the mid axillary line (Fig. 4c). A 12-mm trocar is placed in the posterior axillary line above the iliac crest (Fig. 4b). The blunt port trocar with a foam grip is placed and anchored with sutures to the initial mini-lumbotomy.
- After insufflation and insertion of the laparoscope, identification of the psoas muscle, and dissection

![Fig. 1. Patients positioned in lateral decubitus](image1)

![Fig. 2. Patient positioned with flexed legs](image2)

![Fig. 3. Distribution surgical team and instruments](image3)