

# Laparoscopic nephrectomy (including nephroureterectomy)

## 1 Guidance

- 1.1 Current evidence on the safety and efficacy of laparoscopic nephrectomy (including nephroureterectomy) appears adequate to support the use of this procedure provided that the normal arrangements are in place for consent, audit and clinical governance.
- 1.2 Patient selection is important when this procedure is being considered for the treatment of malignant disease. Long-term follow-up data are lacking, and clinicians are encouraged to collect data on rates of recurrence in patients with malignant disease.

## 2 The procedure

### 2.1 Indications

- 2.1.1 Indications for nephrectomy (including nephroureterectomy) include renal cell or urethral cancer and benign conditions that lead to a poorly functioning or non-functioning kidney. These benign conditions may be due to or associated with symptomatic hydronephrosis, chronic infection, polycystic kidney disease, dysplastic kidney, hypertension and renal calculus.
- 2.1.2 The standard treatment for an irreversibly damaged kidney or localised kidney cancer is an open nephrectomy. Under general anaesthesia, the kidney is removed through an incision in the loin or the front of the abdomen.

### 2.2 Outline of the procedure

- 2.2.1 A transperitoneal or retroperitoneal approach may be used for laparoscopic nephrectomy. In the transperitoneal approach, the abdomen is insufflated with carbon dioxide through a trocar and then three or four small abdominal incisions are made. In the retroperitoneal approach, a small incision is made in the back and a dissecting balloon is inserted to create a retroperitoneal space. After the balloon is removed, the space is insufflated with carbon dioxide and two or three additional small incisions are made in the back for the laparoscopic instruments. The kidney is freed by laparoscopic dissection, and is then enclosed in a bag and removed through an appropriate incision or placed in an impermeable sac, morcellated and removed through one of the port sites. The ureter is sometimes removed along with the kidney (laparoscopic radical nephroureterectomy).
  - 2.2.2 Hand-assisted laparoscopic nephrectomy allows the surgeon to place one hand in the abdomen while maintaining the pneumoperitoneum required for laparoscopy. An additional small incision is made which is just large enough for the surgeon's hand, and an airtight 'sleeve' device is used to form a seal around the incision.
- ### 2.3 Efficacy
- 2.3.1 One non-randomised comparative study of 100 patients with renal cell carcinoma reported that there was no statistically significant difference in the estimated 5-year disease-free survival rate for laparoscopic and open nephrectomy (95.5% versus 97.5%, respectively). A case series of 157 patients with renal cell carcinoma who had the laparoscopic procedure reported an estimated 5-year disease-free survival rate of 91%.

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### This guidance is written in the following context

This guidance represents the view of the Institute which was arrived at after careful consideration of the available evidence. Health professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of health professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Interventional procedures guidance is for health professionals and people using the NHS in England, Wales and Scotland.

This guidance is endorsed by NHS QIS for implementation by NHSScotland.

2.3.2 Two non-randomised comparative studies, including 209 patients with upper urinary tract transitional cell carcinoma, reported no difference in recurrence rates between laparoscopic and open nephroureterectomy.

2.3.3 Two non-randomised comparative studies found that significantly less analgesia was required after laparoscopic nephrectomy than after open surgery. In a further two non-randomised comparative studies, the mean hospital stay ranged from 5.2 days to 8.9 days for open surgery, compared with 3.4 days to 6.8 days for laparoscopic surgery ( $p < 0.001$ ). In one study, the mean convalescence period was also significantly shorter for laparoscopic surgery: 23 days compared with 57 days for open surgery ( $p < 0.001$ ). For more details, refer to the Sources of evidence (see right).

2.3.4 The Specialist Advisors did not express any concerns about the efficacy of this procedure when performed by trained operators. However, they noted that there was a lack of data from randomised controlled trials.

## 2.4 Safety

2.4.1 Three non-randomised comparative studies reported complication rates for laparoscopic nephrectomy that were not significantly different from those for open nephrectomy. Six studies reported rates of conversion to open surgery: this occurred in 0% (0/54) to 10% (46/482) of procedures.

2.4.2 The complications reported in a large case series of 482 procedures (461 patients) included bleeding in 5% (22/482), re-intervention in 3% (15/482) and bowel injury in less than 1% (3/482). Other complications reported in the studies included paralytic ileus in 3% (2/60) of patients; injury to arteries in 3% (2/60), the spleen in 2% (1/60) and the adrenal gland in 2% (1/60); and urinary tract infection in 1% (2/157). Two case series reported mortality rates of less than 1% (2/263) and 1% (2/157). For more details, refer to the Sources of evidence.

2.4.3 The Specialist Advisors stated that potential adverse events included major haemorrhage from renal vessels, bowel injury and the need for conversion to open surgery.

## 2.5 Other comments

2.5.1 It was noted that training and competence in laparoscopic techniques were important for surgeons undertaking this procedure.

## 3 Further information

3.1 The Institute has produced guidance on laparoscopic live donor simple nephrectomy ([www.nice.org.uk/IPG057guidance](http://www.nice.org.uk/IPG057guidance)).

Andrew Dillon  
Chief Executive  
August 2005

## Information for the public

NICE has produced information describing its guidance on this procedure for patients, carers and those with a wider interest in healthcare. It explains the nature of the procedure and the decision made, and has been written with patient consent in mind. This information is available from [www.nice.org.uk/IPG136publicinfo](http://www.nice.org.uk/IPG136publicinfo)

## Sources of evidence

The evidence considered by the Interventional Procedures Advisory Committee is described in the following document.

*Interventional procedure overview of laparoscopic nephrectomy (including nephroureterectomy)*, March 2005

Available from [www.nice.org.uk/ip277overview](http://www.nice.org.uk/ip277overview)

## Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0903. *Information for the public* can be obtained by quoting reference number N0904.

The distribution list for this guidance is available at [www.nice.org.uk/IPG136distributionlist](http://www.nice.org.uk/IPG136distributionlist)

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