

# Laparoscopic liver resection

## 1 Guidance

- 1.1 Current evidence on the safety and efficacy of laparoscopic liver resection 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 for laparoscopic liver resection should be carried out by a multidisciplinary team. Surgeons undertaking laparoscopic liver resection should have specialist training and expertise both in laparoscopic techniques and in the specific issues relating to liver surgery.

## 2 The procedure

### 2.1 Indications

- 2.1.1 A common indication for laparoscopic liver resection is a solitary liver metastasis from colorectal cancer, but it may also be used for hepatocellular carcinoma (HCC) and for benign liver tumours or cysts.
- 2.1.2 The early stages of primary and secondary liver cancer are often asymptomatic. As the tumour grows, symptoms may include jaundice, loss of appetite, loss of weight, nausea and tiredness. Benign liver tumours are usually small and asymptomatic, but if they become large they may cause symptoms such as pain, nausea and vomiting.
- 2.1.3 Open surgical resection is the standard treatment for patients with localised colorectal metastases of the liver or HCC. A number of alternative therapies have also been developed, including hepatic artery infusion chemotherapy, percutaneous ethanol injection, cryoablation, microwave coagulation therapy, laser-induced thermotherapy and radiofrequency ablation.

Benign liver tumours are usually treated only if they are causing symptoms; the standard treatment is open surgical resection.

### 2.2 Outline of the procedure

- 2.2.1 Laparoscopic liver resection is performed under general anaesthesia. The abdomen is insufflated with carbon dioxide and a number of small incisions are made to provide access for the laparoscope and surgical instruments. Diathermy is used to mark the line of transection on the liver surface. The hepatic parenchyma is then transected and the main blood vessels and bile ducts are divided and closed with clips or staples. The resected liver is enclosed in a bag and removed through a small incision in the umbilical area. Haemostasis of the transection line may be obtained by several techniques including cautery, haemostatic swabs and fibrin glue.
- 2.2.2 Hand-assisted laparoscopic liver resection 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 study of 55 patients reported that there was no difference in the overall patient survival rate or disease-free survival rate between laparoscopic liver resection and open resection. In five studies (n = 217) that compared laparoscopic liver resection with open resection in patients with malignant tumours, there were no statistically significant differences in the extent of the resection margins.

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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 Four of six non-randomised comparative studies reported that the postoperative hospital stay was significantly shorter after laparoscopic liver resection (mean stay ranged from 4 to 15 days) than after open liver resection (mean stay ranged from 8 to 22 days). For more details, refer to the Sources of evidence (see right).
- 2.3.3 The Specialist Advisors noted that there were concerns that resection margins may be compromised which may put the patient at risk of increased local tumour recurrence.

## 2.4 Safety

- 2.4.1 All of the studies reported the rate of conversion to laparotomy, which ranged from 0% (0/30) to 15% (2/13). Five of seven studies reported that blood transfusion was necessary during laparoscopic surgery in 0% (0/18) to 13% (4/30) of patients. Complications included chest infection in 15% (2/13), liver failure in 8% (1/13), ascites in 8% (1/13), atelectasis of the left lower pulmonary lobe in 8% (1/13) and biliary leak in 5% (1/21) of patients. For more details, refer to the Sources of evidence.
- 2.4.2 The Specialist Advisors stated that potential adverse effects included death due to uncontrollable haemorrhage, bile leakage, gas embolism, deep vein thrombosis and infection.

## 3 Further information

- 3.1 The Institute has issued guidance on radiofrequency ablation of hepatocellular carcinoma ([www.nice.org.uk/IPG002](http://www.nice.org.uk/IPG002)), radiofrequency ablation for the treatment of colorectal metastases in the liver ([www.nice.org.uk/IPG092](http://www.nice.org.uk/IPG092)) and selective internal radiation therapy for colorectal metastases in the liver ([www.nice.org.uk/IPG093](http://www.nice.org.uk/IPG093)). The Institute has also published a cancer service guideline on *Improving Outcomes in Colorectal Cancers* ([www.nice.org.uk/csgcc](http://www.nice.org.uk/csgcc)).

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July 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/IPG135publicinfo](http://www.nice.org.uk/IPG135publicinfo)

## Sources of evidence

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

*Interventional procedure overview of laparoscopic liver resection*, January, 2005

Available from [www.nice.org.uk/ip289overview](http://www.nice.org.uk/ip289overview)

## Ordering information

Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N0893. *Information for the public* can be obtained by quoting reference number N0894.

The distribution list for this guidance is available at [www.nice.org.uk/IPG135distributionlist](http://www.nice.org.uk/IPG135distributionlist)

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