Issue date: August 2006

NHS
National Institute for Health and Clinical Excellence

Thoracoscopically assisted oesophagectomy

1 Guidance

1.1 Current evidence on the safety and efficacy of thoracoscopically assisted oesophagectomy appears adequate to support the use of this procedure, provided that normal arrangements are in place for consent, audit and clinical governance.

1.2 This procedure is technically demanding, and surgeons undertaking it should have special expertise and specific training in laparoscopic and thoracoscopic surgical techniques and should perform their initial procedures with an experienced mentor.

1.3 Patient selection and management should be carried out in the context of a multidisciplinary team that has a regular practice in open oesophagectomy.

1.4 Clinicians should submit data to the Minimally Invasive Gastro-Oesophageal Cancer Surgery (MIGOCS) National Database (www.e-dendrite.com/databases.htm) or the Association of Upper Gastrointestinal Surgeons of Great Britain and Ireland (AUGIS) data set (www.augis.org/news/default.html).

2 The procedure

2.1 Indications

2.1.1 The most common indication for thoracoscopically assisted oesophagectomy is oesophageal cancer. Occasionally, premalignant conditions (such as high-grade dysplasia in the context of Barrett's oesophagus) or severe benign disease (such as oesophageal stricture) may also be treated with oesophagectomy.

2.1.2 Oesophagectomy by open surgery is the conventional treatment for patients with resectable cancer of the oesophagus. Depending on the type, location and extent of lesions, the procedure may involve total or partial resection of the oesophagus, with or without dissection of regional lymph nodes. The procedure is usually performed through two main incisions: one in the chest to mobilise the oesophagus and one in the abdomen to dissect and prepare the stomach (or sometimes intestine) for oesophageal reconstruction. The new gastric tube is then drawn up the chest and connected to the remaining healthy oesophagus in the chest or neck.

2.2 Outline of the procedure

2.2.1 Thoracoscopically assisted oesophagectomy is a minimally invasive procedure that is performed under general anaesthesia and single-lung ventilation. The procedure consists of a thoracic stage and an abdominal stage.

2.2.2 For the thoracic stage, the right lung is usually collapsed. Four to six small incisions are made, usually on the right side of the chest, to create thoracoscopic ports (holes) through which a camera (connected to a video recorder and monitor) and instruments are inserted in order to perform the thoracic stage of the operation. This kind of technique is an example of video-assisted thoracoscopic surgery.

2.2.3 The abdominal stage of the operation usually involves dissection of the stomach to construct the new oesophagus and can be performed either laparoscopically or via an open technique. This is followed by either cervical anastomosis or an intrathoracic endoscopic anastomosis.

2.3 Efficacy

2.3.1 There was heterogeneity between the studies in terms of clinical indication, tumour type, anatomical location and staging, use of adjunctive treatments (such as chemotherapy or radiotherapy), oesophagectomy techniques and experience of surgeons.

2.3.2 In a retrospective comparative study of 149 patients (77 video-assisted thoracoscopic surgery, 72 open surgery), survival rates were estimated as being similar for the two groups at 3 years (70% and 60% for video-assisted thoracoscopic surgery and open surgery, respectively) and 5 years (55% and 57%, respectively). In a case series of 75 patients, which included patients in the comparative study, the estimated 5-year survival of 37 patients with no nodal involvement was 80%, whereas 5-year survival for the entire series, including patients with nodal involvement, was 57%.

2.3.3 In another case series, 2-year survival in 38 patients with oesophageal cancer who underwent minimally

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invasive oesophagectomy was 100% in patients with stage 0 or stage I disease, 58% in patients with stage II disease, 48% in patients with stage III disease and 0% in patients with stage IV disease.

2.3.4 In a case series of 222 patients who underwent minimally invasive oesophagectomy, quality of life after the operation, as assessed by the short-form-36 questionnaire, was similar to preoperative values and to the general population norm.

2.3.5 In the comparative study of 77 patients who underwent video-assisted thoracoscopic surgery and 72 patients who underwent open surgery, the number of resected mediastinal lymph nodes (used as a surrogate marker for completeness of tumour excision) was similar for the two techniques (33.9 ± 12 and 32.8 ± 14 nodes, respectively). For more details, refer to the 'Sources of evidence' section.

2.3.6 The Specialist Advisers stated that the probability of complete resection of tumours may be lower with this procedure than with open surgery. Other uncertainties about the efficacy of the procedure include whether the extended operating time for the procedure is justified in terms of improved outcomes, and whether morbidity and mortality are reduced compared with open surgery.

2.4 Safety

2.4.1 In three case series, conversion to open surgery during the procedure (by thoracotomy or laparotomy) was noted in 2% (1/46), 7% (11/162) and 7% (16/222) of patients. It was noted that these rates were from centres with extensive experience in oesophageal surgery.

2.4.2 In five case series, 30-day mortality varied from 0% (0/54) to 3% (5/151) of patients. In-hospital mortality was 0% (0/39), 5% (8/151) and 13% (4/30) in three case series.

2.4.3 In a retrospective comparative study, the reported incidence of complications was similar for video-assisted thoracoscopic surgery (32% of patients, 25/77) and open surgery (38% of patients, 27/72). However, pulmonary complications were less common with video-assisted thoracoscopic surgery than with open surgery ($p = 0.047$), and reduction in lung vital capacity 3–4 months after the procedure was significantly less with video-assisted thoracoscopic surgery (15%) than with open surgery (22%) ($p = 0.016$).

2.4.4 In the largest case series of 222 patients, reported complications included anastomotic leak (12%), pneumonia (8%), vocal cord palsy (4%), chylothorax (3%), gastric-tip necrosis (3%), minor tracheal perforation (1%) and tracheal tear (1%). Other complications reported in the same case series were atrial fibrillation (12%), pleural effusion (6%), lung atelectasis (5%), myocardial infarction (2%), delayed gastric emptying (2%), acute respiratory disease (2%), wound infection (1%), pancreatitis (1%), deep vein thrombosis (1%), pulmonary embolism (1%), renal failure (1%), *Clostridium difficile* colitis and jejunostomy-tube infection (0.5%). For more details, refer to the 'Sources of evidence' section.

2.4.5 The Specialist Advisers stated that the theoretical adverse events include major vascular injury and bleeding, major airway damage, damage to adjacent structures, thoracic duct injury/chyle leakage, recurrent laryngeal nerve damage and post-thoracoscopy pain.

3 Further information

3.1 The Institute has published interventional procedures guidance on photodynamic therapy for high-grade dysplasia in Barrett's oesophagus (www.nice.org.uk/IPG082) and a clinical guideline on managing dyspepsia in adults in primary care (www.nice.org.uk/CG017).

Andrew Dillon
Chief Executive
August 2006

'Understanding NICE guidance'

NICE has produced information describing its guidance on this procedure for patients and carers ('Understanding NICE guidance'). 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/IPG189publicinfo

Sources of evidence

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

'Interventional procedure overview of thoracoscopically assisted oesophagectomy', July 2005.

Available from: www.nice.org.uk/IP326overview

Ordering information
Copies of this guidance can be obtained from the NHS Response Line by telephoning 0870 1555 455 and quoting reference number N1107. 'Understanding NICE guidance' can be obtained by quoting reference number N1108.

The distribution list for this guidance is available at www.nice.org.uk/IPG189distributionlist

Published by the National Institute for Health and Clinical Excellence, August 2006; ISBN 1-84629-279-4

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N1107 1P 10k Aug 06