Preoperative and postoperative management of patients undergoing major upper gastrointestinal surgery

Glyn G. Jamieson FRACS, FACS
Dorothy Mortlock Professor of Surgery, University of Adelaide, Department of Surgery, Royal Adelaide Hospital, Adelaide, Australia

Haile T. Debas MD
M. Galante Distinguished Professor of Surgery and Dean of the School of Medicine, University of California, San Francisco, California, USA

Modern surgery of the gastrointestinal tract is a very safe procedure in patients who are healthy, apart from the specific problem for which they are having their operation. Furthermore, whether a patient is generally fit can usually be ascertained simply from the history. Thus, regardless of age, if patients live an independent existence, do their own shopping and gardening and can walk up several flights of stairs without difficulty, the likelihood of a battery of preoperative tests turning up some abnormality critical to the outcome of an operation is remote.

However, because any major surgery can lead to problems where it may be helpful to know what the preoperative situation was, it is usual to carry out simple investigations in all such patients before surgery. These include determining the patient's blood group and haemoglobin level, obtaining a chest radiograph and, in older patients, an electrocardiogram, and general examination of renal function by measuring the blood creatinine level.

There are other tests which are appropriate to specific operations and these are considered below.

Oesophageal surgery

Preoperative

Diagnosis and operative planning

Today most patients have already had an endoscopy and biopsy by the time they present to the surgeon. If the diagnosis has been made from barium contrast studies, then endoscopy and biopsy should be carried out before surgery. If contrast studies have not been undertaken, they should be carried out as they are helpful in operative planning, giving an anatomical record for observation.

Before surgery all patients should undergo computed tomography to look for both lung and liver metastases, either of which might greatly alter a planned operative approach. Computed tomography may also give information about tumour size and its degree of invasiveness, although the latter is not a sufficiently reliable assessment upon which to base decisions about the operability of a tumour.

If a cervical operation is planned some surgeons advocate an assessment of vocal cord function before operation.

It is worth emphasizing at the outset that age is not a significant factor in oesophageal surgery: the major determinants of outcome are the patient's cardiovascular and respiratory fitness.

Cardiovascular fitness

An electrocardiogram is useful for showing any disturbances of cardiac rhythm and sometimes also to reflect past ischaemic events. An exercise electrocardiogram or stress test may uncover incipient ischaemia but the authors prefer to use the cardiac ejection fraction determined by a gated blood flow scan as a means of determining cardiac health. If the ejection fraction is less than 40% this is regarded as a significant risk factor.
for surgery, and in general terms is a contraindication to a major procedure.

Respiratory fitness

All patients should have an assessment of their lung function and blood gases. Values which should raise concern about a patient’s ability to withstand major surgery are: (1) forced expiratory volume of gas less than 1 litre, (2) a vital capacity less that 70% of normal; and/or (3) an arterial oxygen tension of less than 70 mmHg. In patients with marginal lung function it is sometimes best to perform a tracheostomy at the same time as upper gastrointestinal surgery for optimal access to the patient’s airways.

Nutrition

Patients with oesophageal cancer are often in a poor nutritional state. The measurement of serum albumin is a relatively crude test of the nutritional state but, taken with the patient’s dietary history and evidence of weight loss, it is probably as accurate a measure as is available. Prolonged intravenous feeding is not indicated because any gains in terms of nutrition are usually lost by the complications from the intravenous line. Nevertheless it does seem sensible to commence nutritional support in such patients in the week before surgery and this can be done by a fine nasoenteric tube, an elemental diet or a feeding jejunostomy. The last technique may be used more often in the future with the development of laparoscopic jejunostomy.

Preoperative and perioperative therapy

Neomycin, 200 ml as a 1% solution, is given to the patient orally several hours before surgery in order to reduce oral and oesophageal flora. A broad-spectrum cephalosporin is also given intravenously immediately before surgery. This drug can be continued for 24 h but is then discontinued and subsequent antibiotics are given for specific indications only.

If a non-thoracotomy oesophagectomy is planned it is useful to digitalize the patient the day before surgery as there is a high incidence of cardiac arrhythmias when the surgeon’s hands are dissecting behind the heart. Digitalis helps prevent such arrhythmias.

Antithrombotic measures such as intermittent calf compression should always be used, and some surgeons also use minidose subcutaneous heparin.

After the induction of anaesthesia various tubes are passed and monitors and lines established such as nasogastric tube, urinary catheter, intravenous lines, central venous lines and pulse oximetry for measuring oxygen saturation, intra-arterial line for monitoring blood pressure, epidural catheter for pain relief.

Postoperative care

There are few, if any, scientific studies examining the best way of caring for patients after major oesophageal surgery. Surgeons tend to develop their own beliefs, based on their own and others’ experience, and sometimes hold to these beliefs as though they are established fact rather than surgical lore. The authors present here an approach which they believe is cautious and has proved effective.

The aim is always to extubate patients as soon as possible after surgery, and preferably while still in the operating theatre. The use of epidural anaesthesia has been very beneficial for pain relief, allowing early extubation. A chest radiograph is taken in the recovery area immediately after the operation, both to check the position of chest drains and particularly to make sure that there has been full lung expansion and that there is no pneumothorax.

Most patients spend their first few days in an intensive care or intensive nursing ward, during which time the patient’s haemodynamic and respiratory status is carefully monitored and intensive chest physiotherapy is begun.

The epidural catheter is left in for as long as possible, and the urinary catheter for a further 24 h after the epidural catheter is removed (often on the third or fourth day after surgery).

It is unlikely that a nasogastric tube plays any useful role in these patients but, being creatures of habit and tradition, the authors still tend to leave it in for a few days after operation. It is usually removed some time after the third day.

Chest drains

Two chest drains are left, one anteriorly to remove air and one posteriorly to the region of the anastomosis (if in the chest) to drain blood and pleural fluid. The anterior drain may be clipped after 24 h and removed after a further 24 h. The posterior drain is left until after oral feeding is established, some time in the second week after surgery. Patients should be nursed in the semiupright position to help prevent gastro-oesophageal regurgitation.

Feeding

A feeding jejunostomy catheter is inserted in all patients and means that there is no urgency at all to recommence oral feeding.

Jejunostomy feeds are usually begun (initially with normal saline) on the third day after the operation and full-scale feeding is introduced slowly over the following week.

Patients are allowed to suck ice chips from the first night of their operation but are not given anything else