



PERI-OPERATIVE MANAGEMENT OF THE MORBIDLY OBESE PATIENT

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KEY RECOMMENDATIONS

All trained anaesthetists should be competent in the management of morbidly obese patients and familiar with the equipment and protocols in the hospitals in which they work.

All patients should have their height and weight recorded. Where possible this should be measured rather than relying on the patient's estimate. The Body Mass Index (BMI) should be calculated and recorded.

Although BMI is not an ideal measure of risk, it is the most useful of the currently available markers and is a simple measure to apply.

Every hospital should have a named consultant anaesthetist and a named theatre team member who will ensure that appropriate equipment and processes are in place for the peri-operative management of morbidly obese patients.

Protocols including details of the availability of equipment should be readily to hand in all locations where morbidly obese patients may be treated.

Mandatory manual handling courses should include the management of the morbidly obese.

Pre-operative assessment is a key component in the assessment and management of risk.

Early communication between those who will be caring for the patient is essential and scheduling of surgery should include provision for sufficient additional time, resources and personnel.

The absolute level of the Body Mass Index should not be used as the sole indicator of suitability for surgery or its location.

INTRODUCTION

The prevalence of obesity in the developed world has increased significantly in recent years, a trend that has been just as apparent in Great Britain and Ireland as elsewhere. Increasing numbers of obese patients will present for surgery. Although patients with mild degrees of obesity pose few additional problems for peri-operative management, those whose weight is greatly increased require special consideration, equipment and handling. Every major hospital is likely to have to deal with patients whose weight exceeds 150 kg and some of these will present as emergencies.

It is important to recognise the difference between large patients and those who are obese. Some considerations such as medical equipment and manual handling will be very similar for these two different groups of patients but there are many other important considerations for those who have an excess of body fat. Obese patients may present for an elective procedure, for bariatric surgery, for emergency surgery or for obstetric anaesthesia or analgesia. All anaesthetists and theatre staff are likely to have to deal with these patients. Simply treating these patients as being 'larger than usual' is inappropriate. Additional, specialised equipment is often necessary. The availability of this equipment needs to be planned in advance rather than when a patient appears. Pre-operative assessment and preparation, choice of anaesthetic technique, patient positioning and handling, and postoperative care all require special consideration and differ qualitatively as well as quantitatively.

This publication provides guidance on what individuals and departments should do to be prepared for patients who will present for surgery and, in particular, aims to assist those who have to deal with these patients only on an occasional basis.

GENERAL CONSIDERATIONS

Obesity may be defined as a BMI $>30 \text{ kg.m}^{-2}$. Morbid obesity refers to those with a BMI >40 , or $>35 \text{ kg.m}^{-2}$ in the presence of obesity-related comorbidity. Safe and successful treatment of the morbidly obese patient requires a level of organisational commitment, protocols, expertise and staff training. These are commonly available in those hospitals that have a bariatric surgery programme, but may not necessarily be in place in hospitals that occasionally treat morbidly obese patients for non-bariatric surgical procedures whether elective or emergency.

The specific needs of obese patients must be addressed. These include psychological and personal needs as well as the need for appropriate counselling and information. The general approach should be non-perjorative while not avoiding the important risks and issues. Careful use of appropriate terminology can help avoid distress and thereby allow better communication with the patient. Patient support groups, e.g. the British Obesity Surgery Patients Association (BOSPA), use terminology such as “patients with morbid obesity”.

Hospitals performing “occasional” surgery in the obese should have suitable processes in place to ensure best practice. These should include:

Staff training

One or more consultants with a special interest in anaesthesia for the obese patient should take a lead in providing internal training and advice. There should be a designated lead consultant who is responsible for ensuring that appropriate systems are in place and that suitable equipment is readily available.

A designated member of theatre staff should take a lead role in training and service provision in liaison with the lead anaesthetist. Theatre teams should have special training in the issues relating to the care of morbidly obese patients. Such training could be provided either by internal or external teaching sessions, or by appropriate secondments, documented and updated as required. Additional staff may be required. Local protocols or policies should specify where these individuals may come from, e.g. ward staff,

recovery staff, porters etc. All individuals involved must have undergone appropriate manual handling training.

The risk of injury to patients and staff or damage to equipment is decreased by appropriate staff training. Continuing staff assessment and appraisal should ensure that competence is maintained.

Risk reduction

Appropriate risk reduction strategies could take the form of a guideline or checklist of key points to be considered at each stage of the patient journey (surgical outpatients, anaesthetic pre-assessment clinic, inpatient admission, theatres, recovery/high dependency, ward/discharge suite). Specific points to be addressed should include:

- Case selection
- Preoperative assessment
- Waiting list management (Day case/inpatient listing, notification of clinical areas). It is also important to match the availability of an anaesthetist with the list and patient
- Counselling or referral for counselling, e.g. smoking cessation, pre-operative dietary advice
- Thromboprophylaxis
- Planning for postoperative care (location, analgesia, physiotherapy, etc)
- Discharge planning
- Each hospital should have its own policy or protocol for the management of the morbidly obese patient
- Each patient should be individually risk assessed and the care and treatment for that patient should be consultant-led
- Each hospital should implement an early warning system similar to that for latex allergy

Special equipment

Special equipment may be required, as standard equipment (beds, operating tables, ambulance and transfer trolleys) is often rated to a maximum safe weight well below that of the morbidly obese patient. At least one theatre, and an appropriate number of critical care beds, should be appropriately equipped for the morbidly obese patient.

Every operating table, trolley and bed should be labelled with its maximum weight. For patient positioning, table attachments must be secure and risk assessed for suitability according to manufacturers' recommendations, pressure areas must be pre-assessed using a suitable tool and aids used accordingly, such as pressure reducing mattresses, gel pads, etc. Additional care must be taken to ensure that limbs are secured and no metal is touching the skin. Width extensions are available on some operating tables to ensure that parts of the body are not overhanging the edges of the table.

Specialised beds should be available that can accommodate additional weight and enable the patient to be raised to a standing position without the need for manual handling. It may be worth considering performing the procedure on the patient's bed in order to reduce manual handling. Those units with maternity facilities may wish to consider a maternity bed that is wider and may accommodate greater weight limits.

Each area should have a list of available Manual Handling equipment within the hospital including the weight limits for each item and its storage location, e.g. hoists, prone turners and sliding sheets. All staff should attend manual handling updates and receive training on items of equipment outside their area. Lifting and handling courses should be available locally and should cover how to handle morbidly obese patients.

Items such as larger gowns, larger TED stockings, blood pressure cuffs and tourniquets should be available.

Wherever possible, equipment should be electrically operated (bed, operating table, trolley, hoist), although a manual option is an essential safety feature in case of electronic failure. Patients should be encouraged to move themselves whenever possible. Appropriate risk assessments should be performed.

Patients are often placed in a semi-recumbent posture with leg supports, a buttock support pad to prevent slipping down or off the table and with a head up posture. Placing the patient in the lateral or prone position may lead to additional difficulties and should only be undertaken for good reason.

Local guidelines

Many patients present “out of hours” or on theatre lists run by staff members who are unaccustomed to treating morbidly obese patients. An appropriate set of departmental guidelines should be immediately available, with locally produced instructions or checklists. These could be intranet-based or in the form of laminated cards available in theatres or recovery areas. An “obesity pack” (including specific equipment, protocol guidelines and contact numbers) may be helpful in some departments.

PREOPERATIVE ASSESSMENT

Obese patients may present for surgery to treat their obesity (bariatric surgery) or for unrelated surgery. Most of the principles of assessment are common to both forms of surgery. Mechanisms should be in place to identify those obese patients who are at particularly high risk. All patients should have their height and weight recorded and the BMI calculated and recorded. Where possible the height and weight should be measured rather than relying on the patient's estimate.

Patients should be assessed in a multi-disciplinary clinic with ready access to imaging, laboratories and specialist services such as cardiology (including echocardiography and stress-testing) and respiratory medicine (including spirometry and arterial blood gas analysis). Advice from a consultant anaesthetist should also be readily available. This approach will minimise the number of hospital visits that the patient requires.

Specific attention should be paid to those comorbidities which place obese patients at higher risk such as cardiac, respiratory and metabolic disease. History taking will be a key element of assessment, but obese patients' exercise level may be severely limited by their weight, presenting condition or both.

Investigations of obese patients may be limited by their weight or size. Radiographs may be of poor quality, as may trans-thoracic echocardiography. Some patients may be too big to undergo imaging techniques such as CT or MRI.

Interventions that can reduce risk may be triggered by assessment; these include weight loss, exercise training and the treatment of obstructive sleep apnoea.

Respiratory system

Obese patients have a reduced functional residual capacity. This will lead to airway closure and desaturation in the supine position, as well as more rapid desaturation if difficulty is encountered intubating the trachea. A careful history should be taken of dyspnoea, exercise tolerance and for obstructive sleep apnoea.

Room air pulse oximetry may be a useful screening tool for further investigations; a supine SpO₂ <96% on room air may indicate that further investigations (spirometry, arterial blood gases) or referral to a respiratory physician are appropriate.

Intubation may be more difficult because of the presence of a fat pad at the back of the neck, or because of deposition of fat into the soft tissues of the neck. Such patients may also be at greater risk of acid reflux, and appropriate antacid prophylaxis should be instituted.

Sleep apnoea and the obesity hypoventilation syndrome are common in this group of patients. Consideration should be given to the use of CPAP/BiPAP for those affected and if possible this should be commenced pre-operatively to allow the patient to be familiar with the technique.

Morbidly obese patients with co-existing asthma or chronic obstructive pulmonary disease (COPD) are at even greater risk of peri-operative respiratory complications. Wheeze in obese patients may be due to airway closure rather than asthma – an assessment of the effectiveness of bronchodilator therapy may be useful in differentiating the two conditions.

Cardiac Disease

Cardiovascular disease is more common in obese patients and this includes hypertension, hyperlipidaemia, ischaemic heart disease and heart failure.

A careful history and examination may reveal signs and symptoms of cardiac disease, but may also be limited by the patient's exercise tolerance. It may be worth considering a pharmacological stress test for patients who are unable to exercise sufficiently.

It may be difficult to measure the patient's blood pressure accurately using an upper arm cuff; other places, such as the forearm, may need to be used, and consideration given before surgery to direct arterial blood pressure measurement.

Metabolic Disease

Morbidly obese patients have a high incidence of diabetes. They should be assessed for the adequacy of glucose control, e.g. glycosylated haemoglobin,

and also for the presence of complications of diabetes, especially cardiac disease, renal disease and autonomic dysfunction.

Dietary advice and more careful glucose control peri-operatively may reduce complications such as infection or keto-acidosis.

Despite their weight, morbidly obese patients may have a very poor nutritional status and it may be important to address this preoperatively and/or postoperatively.

Weight Loss and Exercise

Pre-operative weight loss may reverse some of the pathophysiological changes of obesity, but it must be controlled. Starvation or low/very low calorie intake may be dangerous and lead to cardiac arrhythmias or sudden death. Patients who have previously had bariatric surgery may have latent malnutrition due to malabsorption. A supervised exercise programme leading up to surgery may help with weight loss, glucose tolerance and respiratory function.

Thromboprophylaxis

Obese patients are at significantly greater risk of venous and pulmonary thromboembolism. All obese patients must be considered for mechanical and pharmacological thromboprophylaxis. The “correct” dose of low molecular weight heparins has not been established in obese patients. Thromboprophylaxis must also be coordinated with any regional anaesthetic techniques that may be being considered.

Pre-operative assessment will also allow the opportunity to plan for surgery and for early discharge, which may be more complicated than for patients of normal weight. There will also be an opportunity to continue the consent process, particularly for discussion of any specific increased risks related to anaesthesia.

Following full consideration of the assessment and an explanation of the potential risks, the patient may wish to reconsider whether or not to proceed with surgery.

INTRA-OPERATIVE CARE

Airway management

- Previous anaesthetic charts should be checked for evidence of airway problems.
- A history of obstructive sleep apnoea is an important predictor for airway problems after induction.
- Evidence of gastro-oesophageal reflux should be sought at the preoperative visit, with a low threshold for prescribing antacid prophylaxis.
- Adequate manpower is essential, such that turning the patient in an emergency should be possible and accomplished without too much delay.
- More assistance than normal for the anaesthetist may be necessary.
- The anaesthetic assistant should be familiar with and prepare difficult airway equipment prior to induction.
- Pre-oxygenation should be performed in a reversed Trendelenberg position as this prolongs the time to desaturation during apnoea [4,5].
- Consideration should be given to modifying the traditional “sniffing the morning air” intubation position to the “ramped” position [6].
- Surgical access to the airway is technically more difficult and is associated with an increased risk of peri-operative complications in the obese patients.
- Some patients may require awake intubation; appropriate skills and equipment must be immediately available.

Regional Anaesthesia

The use of regional anaesthesia in the morbidly obese patient and avoidance of general anaesthesia is a tempting prospect. However, attempts at successfully achieving this may be doomed to failure due to the size of the patient.

Good preoperative assessment is essential and in particular an exit strategy, which may be giving a general anaesthetic or may involve abandoning the operation altogether, should be discussed with the patient.

Appropriate resuscitation and regional anaesthesia equipment, including longer regional block, needles should be available.

The most important thing for a successful regional anaesthetic block is an experienced anaesthetist! This is even more important for the obese patient. If the anaesthetist does not perform regional blocks regularly, then the best thing to do is to request the help of an experienced regional anaesthetist when faced with a patient like this.

For suitable operations such as surgery on the lower limbs, spinal anaesthesia may be a good option. Often the midline of their back can be easily identified by sitting these patients up, and placement of the spinal needle can be relatively easy. This technique can be successfully used where appropriate in the day case setting, particularly with a low dose technique. However, the potential difficulties should not be underestimated and the possibility of aorto-caval compression must be borne in mind.

Peripheral blocks can be much more challenging. The main difficulties are access and palpation of recognisable landmarks. This is more likely to be successful in the hands of an experienced regional anaesthetist.

DAY CASE SURGERY

It is important not to exclude obese patients on the basis of their BMI or weight alone. Some advice on management for day cases has already been published^{8,9}

The Department of Health Day Surgery Operational Guide suggests that patients up to a BMI of 40 kg.m⁻² would normally be suitable. Patients with a BMI of 40 kg.m⁻² or more should, at least, have their notes reviewed by an experienced day surgery anaesthetist prior to acceptance. Lack of a robust process in the past has led to over-restrictive criteria. There is no evidence to suggest that there is increased morbidity of any serious nature.

It is now common practice to accept all patients for day surgery:

- whose management would not be modified if admitted as an inpatient
- who have no identifiable increased risk by being treated as a day case

Comorbidity is common but stable concomitant disease, including diabetes mellitus, is acceptable and should be assessed and managed as for other patients.

Equipment Needs

Many day surgery facilities use trolleys for the entire admission and the upper weight-bearing limit must be known. Alternative arrangements will need to be made to carry patients who exceed the limit.

Choice of Anaesthetic Technique

Choice of technique should, as for all day cases, facilitate rapid recovery and minimal post-operative symptoms to allow an early return to normal function. The avoidance of opioid medication avoids many potential difficulties. The importance of early ambulation after surgery in order to decrease the incidence of deep venous thrombosis cannot be over-emphasised and techniques which delay ambulation should be avoided if possible.

Local anaesthesia, including regional techniques, may be particularly suitable for some obese patients and subarachnoid block can be performed on day cases. The higher failure rate of local techniques in this group of patients does not preclude their use¹¹.

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